

**DRAFT**

# **LANGLADE COUNTY BROADBAND PLAN**



PREPARED BY NORTH CENTRAL WISCONSIN REGIONAL PLANNING COMMISSION

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# CHAPTER 1

## Background

# 1. BACKGROUND

Broadband is essential in today's world. Every segment of the population, businesses, and government relies on the integration of the internet. For Langlade County to remain competitive, it needs to both expand and improve broadband throughout the county. Both the state and federal governments have established a grant program to help promote the adoption of broadband across unserved and underserved areas.

The Broadband Equity, Access, and Deployment (BEAD) Program will provide \$42.45 billion for expanding high-speed internet access by funding planning, infrastructure deployment, and adoption programs in all 50 states. Wisconsin's allocation of BEAD funding is just over \$1 billion. To qualify for this funding, local entities must engage in broadband planning to gain insight into each community's vision for broadband development. These local plans may include outreach initiatives, conducting local needs assessment, and developing local or regional broadband plans. Ultimately, these local broadband planning activities will inform the state Five-Year Action Plan which will guide broadband deployment and implementation of the BEAD program.

The broadband plan outlines a comprehensive strategy designed to bridge the digital divide by increasing connectivity and accessibility of broadband in Langlade County. Further, this plan will identify both barriers and goals to infrastructure expansion and broadband adoption. As a result, Langlade County will be better positioned to apply and hopefully receive BEAD funding for broadband deployment.

The Langlade County Broadband Committee will review this plan annually and update the plan as necessary.

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## PURPOSE

The objective of the Broadband Plan is to offer insights into the current state of broadband deployment in Langlade County. The information presented in this plan aims to help the county understand broadband, thus assisting local officials in making well-informed decisions in supporting the right broadband deployments. The plan is to help facilitate the optimal broadband connections to residents, taking into consideration the cost associated with these deployments. Access to quality and affordable high-speed internet opens new opportunities for economic development, education, public safety, entertainment, and healthcare for Langlade County.

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## PREVIOUS BROADBAND PLANNING EFFORTS

### **NCWRPC Broadband Assessment Report, 2022**

The North Central Wisconsin Regional Planning Commission has identified Broadband as a foundational pillar critical to a strong economic recovery and increasing economic resilience in the North Central Wisconsin Regional Recovery Plan. This plan acknowledges that Covid-19 magnified the significance of broadband access and the quick shift to a virtual world created significant disadvantages for businesses, workers, and residents alike. Additionally, this plan sought to expand broadband infrastructure and increase both the affordability and performance of broadband.

Specifically, this plan highlighted that most of the North Central Wisconsin Regional area geographically remains unserved or underserved for broadband access, with the exception being more urbanized areas. Throughout the Region overall, about 62 percent of households have broadband access. Therefore, the most significant consideration is the establishment of needed infrastructure throughout the Region to allow residents to access broadband. This Plan also recommends an examination of a multitude of factors that influence broadband adoption, including household income, educational attainment, age, and employment status. Other important considerations include the rural digital divide, cost, and digital literacy.

The following **goals** have been identified to be most important to the vision of the broadband future of the Region. When setting the goals top considerations include successfully expanding broadband access to residences, businesses, and institutions throughout the Region, fostering quality broadband service that meets the needs of residences, businesses, and institutions throughout the region, and optimizing digital inclusion, digital literacy, and competitive costs.

- Create universal broadband infrastructure throughout the Region.
- Bring high-performance broadband service throughout the Region.
- Make broadband affordable and competitive.
- Advance digital literacy and inclusion.

### **Wisconsin Digital Equity Plan, 2023**

The Wisconsin Broadband Office and its partners formed this Wisconsin Digital Equity Plan by engaging communities through targeted outreach, gathering data, and conducting analysis to understand the unique needs of Wisconsin's covered populations. This plan is rooted in data and analysis of digital equity needs, it is also centered around stories and direct experiences of Wisconsinites engaged through this outreach. Five core values that capture the many pieces that are needed to achieve true digital equity across the state are: Access, Affordability, Adoption, Trust, and Sustainability. For each of these values, targeted goals objectives, strategies, and metrics were crafted to address specific digital equity gaps in Wisconsin. While targeted strategies to reach goals for each covered population will be different, the following overarching

strategies have been identified to guide this digital equity plan: 1. Engage new stakeholders and grow existing partnerships to expand the Wisconsin Digital Equity ecosystem. 2. Develop programs and activities to support and complement the Digital Equity Plan strategies. This Digital Equity Plan has been carefully aligned with the Broadband Equity, Access, and Deployment (BEAD) program, specifically the BEAD Five-Year Action Plan.

### **Wisconsin Five Year Action Plan, 2023**

This Five-Year Action Plan details the current state of internet access, adoption and affordability in Wisconsin. The plan identifies the needs and gaps and how Wisconsin can achieve universal service by 2030. Over the course of the past year, the Wisconsin Broadband Office has engaged in robust outreach and engagement, data collection and technical assistance to create this comprehensive Five-Year plan that reflects community engagement, local coordination, and alignment with digital equity planning.

The **goals** of Wisconsin's Five-Year Action Plan are to:

- Achieve the highest possible level of broadband deployment and adoption.
- Deliver sustained, long-term impact on broadband access and digital opportunity for all Wisconsin residents.
- Increase the affordability and reliability of broadband service in Wisconsin.
- Ensure a sufficient and trained broadband workforce for internet service providers, contractors, and subcontractors to construct, operate and maintain current and new broadband infrastructure.
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### **Wisconsin Governor's Task Force on Broadband Access Report, 2024**

Preparing for BEAD has been a focus of the Task Force. The Task Force provided guidance on the development of the [BEAD Five-Year Action Plan](#) that outlined goals and priorities for the State. The scale and complexity of the BEAD Program warrant additional focus for streamlining processes and resolving bottlenecks in capacity to ensure a prompt and effective implementation. As the Task Force evaluated preparations for BEAD, it found opportunities to improve permitting and locating, workforce opportunities, Tribal coordination, and grant administration.

This year, the Task Force heard a presentation from the Wisconsin Department of Transportation Broadband Permit Coordinator, and a locating presentation by Scott Nyman of Wittenberg Telephone Company. The Task Force discussed and learned about permitting and locating issues related to miscommunication, policy inconsistencies, labor shortages, and lack of accountability. In turn, the Task Force included permitting and locating recommendations to help address these issues proactively in lights of the tight BEAD implementation timelines.



In discussions around permitting, Task Force members heard about challenges related to crossing railroads, and the timely and accurate locating of underground facilities, as well as concerns related to costs to attach to utility-owned poles for aerial deployment and some permitting backlogs. In some cases, permitting delays have delayed construction until the subsequent building season and forced ISPs to seek extensions on grant projects. Further, providers are seeing a strain in capacity for locating services, which must be completed before they can begin construction. If a contractor crew arrives at a location for work and no locates have been completed, they must cancel their planned work and may lose several days of construction.

Permitting and locating delays are costly, making it difficult to schedule contractors and sequence deployment projects. These delays cause increased interest payments on debt financing, lost staff and contractor time, and delays in acquiring new customers. The Task Force recommends policy makers consider legislation or guidance that create firm and predictable timelines and reasonable and transparent costs.

Workforce development was another critical area of focus for the Task Force last year. With significant funding that has been injected into the telecommunications industry the past few years, and historical amount on the way, meeting the ever-increasing workforce demand has been and will continue to be a key challenge.

The Task Force deemed that it important that Wisconsin create a sustainable pipeline of talent and help aid in the connection of that pipeline to potential employers. Workforce development boards, economic development organizations, high schools, technical colleges, internet service providers, state agencies, and more will all play an important role in ensuring this pipeline is available and sustainable. Wisconsin must include all available workforce and make concerted efforts to engage veterans, formerly incarcerated individuals, individuals who are members of a racial or ethnic minority group, and more.

The Task Force also considered that it was important to promote jobs in the broadband sphere as a viable, meaningful, well-paying career. Increased awareness in areas like high schools will lead to more talent and dollars staying inside Wisconsin's economy. Many internet service providers would prefer to hire local and train within their company. To do that, Wisconsin needs a local pipeline of talent and interest. Workforce development continues to be an ongoing area of emphasis as the state plans to administer the BEAD and DE programs. Considering and executing these recommendations will put Wisconsin in a better position to succeed with respect to workforce development in the telecommunications industry.

NTIA has delegated states to administer the BEAD Program. The PSC has been successfully administering broadband grants since 2014. With the timeline requirements of BEAD, the Task Force made grant administration recommendations to streamline processes and have the necessary human resource and technical support available for administering BEAD.

Tribal coordination is a recommendation that will play an important role in preparing for BEAD. The Task Force recognizes that the Tribal Nations of Wisconsin have their own sovereignty, have their own plans for equitable access to broadband, and have tailored needs for each unique Tribal Nation. There have been past issues of ISPs building or claiming to build on Tribal lands without the Tribes permission or permits, ISPs not wanting to build on Tribal lands because they find the process difficult, and inaccuracy of broadband service data on Tribal lands. The State of Wisconsin, ISPs, and local governments continue to work on transparency, communication, and collaboration with Tribal Nations. The Task Force voices that Tribal coordination is key in order to meet the requirements of the BEAD Program and achieve Internet for All Wisconsinites.

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## PLANNING PROCESS

The planning process for this initiative examined essential background information and data, facilitated the development of broadband deployment, and proposed adoption strategies. To ensure a comprehensive and locally informed approach, Langlade County established a dedicated committee tasked with overseeing the planning process, offering valuable local insights, and ensuring effective oversight.

The process involved documenting broadband objectives sourced from both regional and local perspectives. Furthermore, it entailed a thorough mapping of the existing state of broadband infrastructure, including pinpointing areas of high demand. This mapping exercise will help pinpoint coverage gaps and areas requiring substantial improvements.

In addition to these steps, the initiative involved the identification of potential barriers to broadband expansion and explored various funding options. These efforts collectively aim to provide the county with valuable guidance, enabling them to engage with local Internet Service Providers (ISPs) effectively and advance their broadband access goals.

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## BROADBAND COMMISSION

The Langlade County Economic Development Corporation formed a Broadband Commission in 2014 with a standing working committee. The Committee came forward to Langlade County Board of Supervisors to form a Commission in 2022.

Invited membership consists of a representative designated by each of the following entities:

<b>Member</b>	<b>Affiliation</b>	<b>Member</b>	<b>Affiliation</b>
	LC Economic Development/Commission		
Angie Close	Chair	Kathleen Koller	Town of Ainsworth
Chris Giles	Town of Ainsworth	Kristen Rolling	Town of Neva
Vacant	Town of Norwood	Leah Antoniewicz	Town of Upham
Niel Schueller*	Town of Summit	Lyn Olenksi	Town of Elcho
Steve Maier*	LC Supervisor	Karen Braatz	Town of Price
Mark Kautza	USDA of Antigo	Paula Resch	Town of Norwood
Jason Hilger*	Administrator	Rosemary Servi	Town of Antigo
Al Murray*	Member	Tammy Hitz	Town of Ackley
Ben Pierce	LC Board Chair	Tracy Bailey	Town of Parrish
Mike Cragoe*	Member/Town of Upham	Vondalee Straley	Town of Evergreen
Mark Westen	Sheriff	Doug Curler*	Town of Neva
Tom Edleman	Village of White Lake	Eric Boman*	Town of Upham
Dave Stilen	Town of Upham	Duane Haakenson	LC Zoning
Carol Blawat	Village of White Lake	John Medo	LC Supervisor
Connie Kakes	Town of Rolling	Scott Nyman	Cirrinity
Cynthia Walrath	Town of Peck	Todd Kruse	Frontier
Dawn Moller	Town of Vilas	Aaron Salata	Bertram Comm
Carmen Lehrer	Town of Vilas	PSC	Mark Leonard
Deb Burkhart	Town of Summit		
Heather Baker	Town of Wolf River		
Jane Kolpack	Town of Polar		

Members with an asterisk next to their name are active working members, others are additional contacts/resources



# CHAPTER 2

## Broadband: What It Is and Why It Matters

## 2. BROADBAND: WHAT IT IS AND WHY IT MATTERS

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### INTRODUCTION

Broadband accessibility has become a requirement, and not just a luxury for communities, businesses, workers, and residents in today's world. The benefits of broadband access and the drawbacks of a lack of access are quickly making broadband an essential utility. Broadband accessibility is a vital resource for businesses to operate and stay competitive in an increasingly digital economy. Broadband accessibility is also critical for residents, as those who lack access to high-speed internet have a harder time accessing jobs, healthcare, education, job and skills training, and services.

For most Americans, broadband is commonplace in professional, personal, and social environments. Yet, broadband is the country's most inequitable infrastructure with around 15 percent of households not having subscriptions to any form of "broadband" internet service. Many residents and businesses in Langlade County do not have access to adequate broadband, while others have no access to broadband at all, and are thus not able to use broadband internet service, putting them at a disadvantage as the world's reliance on the internet grows.

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### WHAT IS BROADBAND?

Broadband is the provision of a high-speed connection to the internet via the transmission of data through wide bandwidths, allowing for multiple signals to be transferred at once, as opposed to dated dial-up technology where only a single-line of data can be transferred. Broadband internet access is always on and is faster than dial-up access. The Federal Communications Commission (FCC) defines broadband as any of the following high-speed technologies: fiber, cable, fixed wireless, or satellite.

The standard for reliable broadband internet access is defined by the FCC as internet access with a download speed of 100 Mbps and an upload speed of 20 Mbps. Generally, these speeds are the minimum speeds where video streaming and a few in-home devices can work simultaneously. However, higher internet speeds are becoming increasingly important as broadband demand and data traffic rates continue to increase.

## ***Benefits of Broadband Connectivity***

- **Economic Development**

Broadband connectivity enables communities to develop, attract, retain, and expand job-creating businesses. Without reliable access to broadband, businesses and workers will likely be located where there is broadband.

- **Education**

Broadband access provides students and educators with vast amounts of educational resources, enables online/remote education, and facilitates real-time collaboration and communication.

- **Healthcare**

Broadband plays a crucial role in transforming healthcare and offers numerous benefits to patients and healthcare providers. Broadband enables telemedicine and remote consultations with doctors which is particularly valuable for patients in rural or underserved areas.

- **Public Safety**

Broadband connectivity greatly enhances public safety by enabling faster communication among first responders and emergency services during emergencies. Broadband also allows for the deployment of video surveillance and monitoring in public spaces along with enabling emergency alerts through various digital channels.

- **Entertainment**

Broadband has enhanced entertainment by offering high-quality streaming, on-demand content, social media engagement, online gaming, and much more.

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## TYPES OF INTERNET CONNECTIONS

**Digital Subscriber Line (DSL):** Transmits data over already available traditional copper telephone lines. DSL is good for light internet use but is not recommended for activities that require significant speed like video streaming.

**Cable Modem:** provides broadband through the same cables that generate sounds and pictures to a cable TV set. Cable internet usually provides reliable speeds but is not available in all areas.

**Fiber-Optic:** converts electrical signals carrying data to light and sends the light through transparent glass fibers. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps. Currently, availability is limited, and it is costly to install.

**Fixed Wireless:** connects a home or business to the internet through a radio link between the customer's location and the internet service provider. Often used in rural areas and speeds are comparable to DSL or cable modem.

**Mobile Wireless:** relies on a cellular network to provide internet access to devices like smartphones and tablets.

**Satellite:** Another form of wireless internet from satellites orbiting the earth that can be useful in serving sparsely populated areas. It must have a good line-of-sight, but speeds are slower and there can be high installation costs.

Source: Federal Communications Commission

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## HOW FAST SHOULD BROADBAND BE?

The Federal Communications Commission (FCC) broadband capability requires consumers to have access to actual download speeds of at least 100 Mbps and actual upload speeds of at least 20 Mbps to be considered unserved locations. For grant funding, the Public Service Commission of Wisconsin will target businesses lacking 25 Mbps download and 3 Mbps upload. Underserved locations are those that do not have access to at least 100/20 Mbps.



## Typical Internet Speeds

Speed	Number of users/devices	Tasks
5 Mbps	1-2	Online browsing, email, and research
25 Mbps	3-5	Downloading large files, business communications, and basic business Wi-Fi use
75 Mbps	5-10	Video streaming, numerous point-of-sale transactions, and frequent file-sharing
150 Mbps	10-15	Video conferencing, frequent cloud computing, and data backups
250 Mbps	15-20	Seamless streaming, conferencing, and server hosting
500 Mbps	20-30	Multiple servers hosted, heavy online backups, and constant cloud-based computing
1 GB	30 +	Extreme speed operations with zero interruptions

Source: Business.com

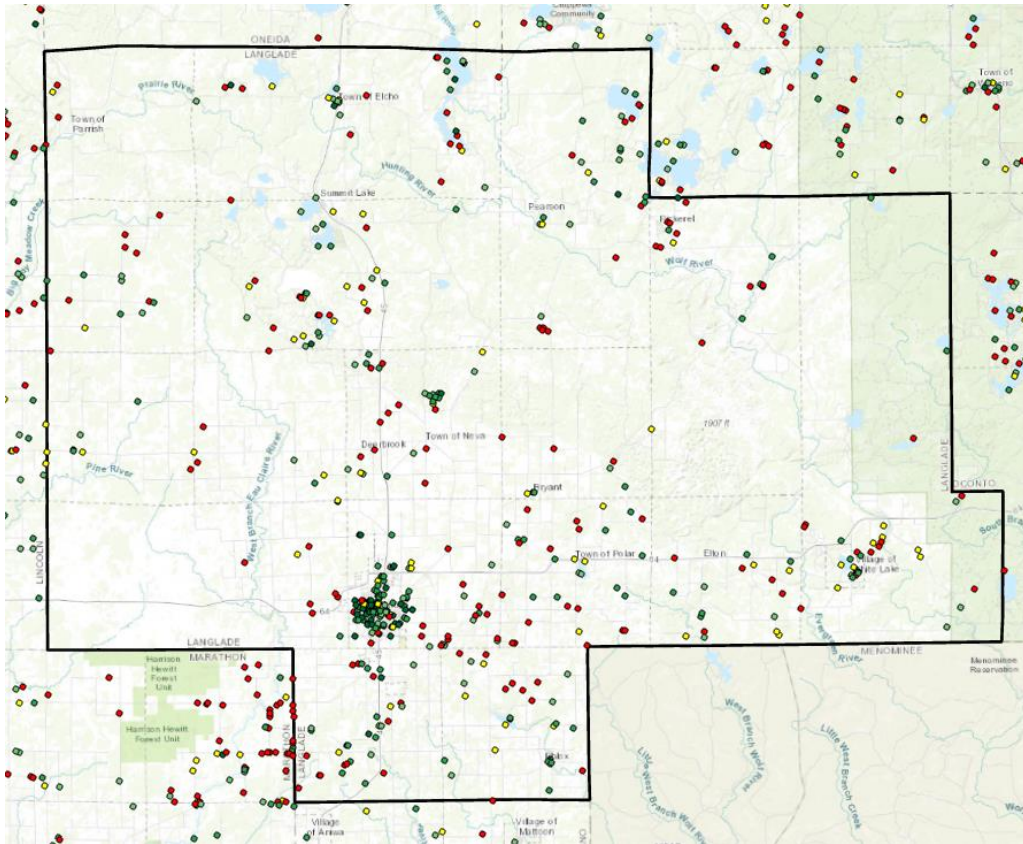
**The Llanglade County Broadband Commission recommends broadband speeds initially should be at least 100 megabits per second download and 20 megabits per second upload.**

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### WISCONSIN SPEED TEST COLLECTION

In a partnership with the North Central Wisconsin Regional Planning Commission (NCWRPC) Wisconsin Economic Development Corporation (WEDC) and the Wisconsin Public Service Commission (PSC), a statewide internet speed testing application was secured to help collect locations, estimate cost, and upload/download speeds. The public can also note if they have no service or cannot afford service at their location. This application is a crowdsource data collection application. Counties and municipalities need to promote the speed test application to get enough tests to analyze the results. Llanglade County as of February 20, 2024, has 780 total tests and a participation rate of 4.4 percent. Tests can be taken, and results reviewed at [www.wisconsinspeedtest.net](http://www.wisconsinspeedtest.net).

## Wisconsin Speed Test



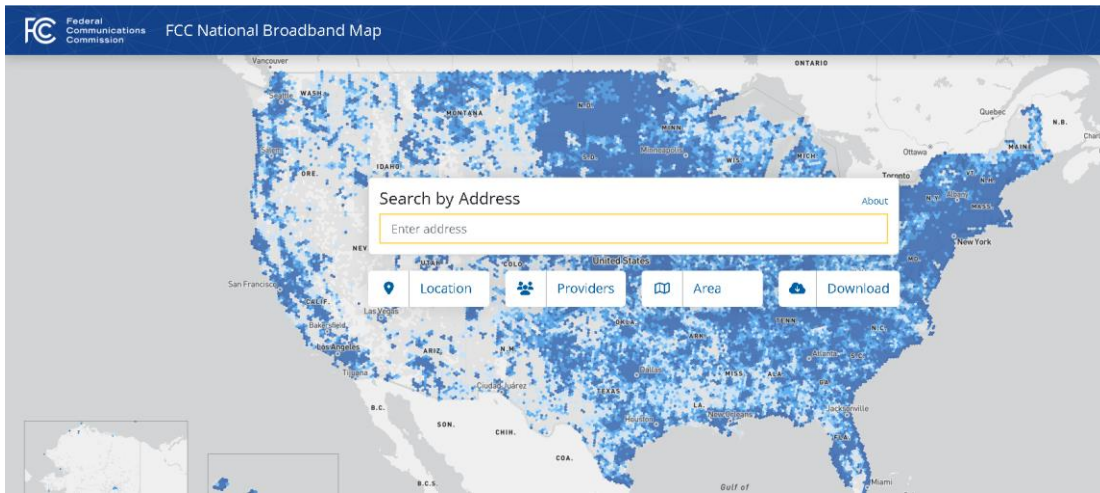
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## NATIONAL BROADBAND MAP

In November of 2022, the FCC released a pre-production draft of its new National Broadband Map. This map was the first of its kind, showing address-level broadband coverage data for homes and businesses in the nation. Previously, the FCC had mapped broadband coverage data as reported by the census block. This led to the overstatement of broadband coverage and inaccuracies in the map. The new map displays fixed and mobile broadband availability in the United States and allows users to search by address, view provider coverage areas, display location and area summaries, download the data, and more. The map also allows users to filter by data vintage, residential vs. business service, technology type, and speed.

A recent update to the map was released in May of 2023 and incorporated millions of availability and location challenges from the public, state, local, and Tribal governments nationwide. Challenges to the map are a critical mechanism to create the most accurate and up-to-date map possible. Location challenges allowed users, where appropriate, to challenge that an address was either incorrectly located, missing, an incorrect unit count, not contained within the correct building footprint, not broadband serviceable, or the wrong building type. Availability challenges allowed users to challenge that a provider was incorrectly reported at an address for reasons

such as the provider requested more than the standard installation fee to connect service, failed to schedule a service installation within 10 business days of a request, denied a request for service, or did not offer the technology reported to be available. As a result of other advancements and the challenge process, the National Broadband Map will continue to improve and be updated twice a year.



Service: Residential Technology: Any Technology Speed: 2-100/20

Address: 800 CLERMONT ST ANTIGO, WI 54409

Data As Of: Dec 31, 2023 (latest) | Last Updated: 7/23/24

Selected Location: 800 CLERMONT ST ANTIGO, WI 54409  
Status: Served | Business | Unit Count: 1

Provider	Technology	Down (Mbps)	Up (Mbps)	Chall.
Beetram Internet	Unlicensed Fixed Wireless	50	15	
HughesNet	GSO Satellite	100	5	
Starlink	NGSO Satellite	220	25	
Viasat	GSO Satellite	100	3	
<b>Business-Only Service</b>				
Frontier	Copper	10	1	
Frontier	Fiber to the Premises	5000	5000	
Spectrum	Fiber to the Premises	1000	35	
T-Mobile	Licensed Fixed Wireless	0.2	0.2	
UNITED STATES CELLULAR	Licensed Fixed Wireless	25	3	



# **CHAPTER 3**

## **Langlade County Community Profile**

# 3. LINCOLN COUNTY COMMUNITY PROFILE

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## PURPOSE

Demographics play a critical role in broadband planning by offering insights that guide strategic decisions. They enable targeted investment by identifying areas with high demand for broadband services, ensuring efficient allocation of resources. Additionally, demographic data helps address inequalities in access, promoting equitable connectivity across various segments of the population. By estimating demand and usage patterns, planners can design networks that cater to specific needs. This customization extends to business development, education, and digital inclusion efforts, fostering economic growth and bridging societal gaps. Demographics essentially serve as a foundation for inclusive and well-informed broadband planning, enabling better connectivity and opportunities for all.

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## GENERAL POPULATION

Population growth has slowed at the state level and continued to decline at the county level. In the 2000s, the County shrank by 3.7 percent while the state grew by 6 percent. In 2010, Langlade County had a total population of 19,977 residents. By 2022, 19,512 persons resided in the County, which is a 2.3 percent decrease from the 2010 census total. From 2000 to 2010, the County's population shrank by 1,288 residents, which represents a percent decrease. Overall, Langlade County's population decreased by 5.9 percent between 2000 and 2022. In comparison, the state's population grew by 9.8 percent between 2000 and 2020, with a 3.6 percent increase between 2010 and 2022.

Understanding the population of an area provides insights into the potential user base for broadband services. Higher population density often correlates with greater demand for internet access, making it important to allocate resources to meet this demand effectively. Moreover, population distribution across urban and rural areas influences the deployment strategy, as densely populated urban centers may require different infrastructure solutions compared to sparsely populated rural regions. Additionally, the size of the population affects the economic viability of broadband projects.

Table 3-1 displays the total population for each local unit (minor civil division), the county, and the state. Thirteen out of the nineteen municipalities in Langlade County lost population from 2000 to 2020. During this time, the City of Antigo saw the largest net decrease, losing 485

people. At the same time, the Town of Langlade experienced the largest net increase, adding 106 people. Not reflected in the population numbers is the seasonal population, particularly the summer visitor season.

<b>Table 3-1: Population</b>					
<b>Minor Civil Division</b>	<b>2000</b>	<b>2010</b>	<b>2022</b>	<b>2000-20 % Change</b>	<b>2000-20 Net Change</b>
Ackley	510	524	490	-3.9%	-20
Ainsworth	571	469	602	5.4%	31
Antigo	1,487	1,412	1,502	1.0%	15
Elcho	1,317	1,233	1,201	-8.8%	-116
Evergreen	468	495	379	-19.0%	-89
Langlade	472	473	578	22.5%	106
Neva	994	902	851	-14.4%	-143
Norwood	918	913	940	2.4%	22
Parrish	108	91	80	-25.9%	-28
Peck	354	349	314	-11.3%	-40
Polar	995	984	1,047	5.2%	52
Price	243	228	325	33.7%	82
Rolling	1,452	1,504	1,375	-5.3%	-77
Summit	168	163	120	-28.6%	-48
Upham	689	676	604	-12.3%	-85
Vilas	249	233	142	-43.0%	-107
Wolf River	856	731	643	-24.9%	-213
V. of White Lake	329	363	244	-25.8%	-85
<b>City of Antigo</b>	<b>8,560</b>	<b>8,234</b>	<b>8,075</b>	<b>-5.7%</b>	<b>-485</b>
<b>Langlade County</b>	<b>20,740</b>	<b>19,977</b>	<b>19,512</b>	<b>-5.9%</b>	<b>-1228</b>
<b>State</b>	<b>5,363,675</b>	<b>5,686,986</b>	<b>5,892,128</b>	<b>9.8%</b>	<b>528,453</b>

*Source: U.S. Census & American Community Survey, 2018-2022*

## HOUSEHOLDS

Understanding the number of households holds significant importance in broadband planning, as it influences the scope of infrastructure deployment, service coverage, resource allocation, financial viability, and equitable access.

In 2022, there were 8,443 households in Langlade County following several decades of household growth until 2010. The early 2000s saw a 4.2 percent increase in the number of households. Between 2010 and 2020, the number of households decreased 4.1 percent. Generally, the number of households across the country has been increasing as more people decide to live alone and more couples have fewer children or no children at all for several decades.

**YEAR-ROUND AND SEASONAL HOUSING**

Table 3-2 displays the percentage of seasonal and year-round housing in the County. Not reflected in the population numbers is the seasonal population, particularly the summer visitor season. In 2020, 22 percent of housing units were seasonal housing.

The county has several tourist destinations and popular vacation home areas. There are campgrounds, resorts, hotels, short-term rentals, and seasonal housing units in the county. This summertime population places an increased demand on county and local government resources and should be considered in the broadband planning process.

<b>Table 3-2: Year-round and Seasonal Housing</b>		
<b>Minor Civil Division</b>	<b>Seasonal Housing</b>	<b>Year-Round Housing*</b>
Ackley	10%	90%
Ainsworth	38%	62%
Antigo	4%	96%
Elcho	57%	43%
Evergreen	19%	81%
Langlade	39%	61%
Neva	12%	88%
Norwood	11%	89%
Parrish	58%	42%
Peck	27%	73%
Polar	6%	94%
Price	16%	84%
Rolling	4%	96%
Summit	50%	50%
Upham	58%	42%
Vilas	51%	49%
Wolf River	54%	46%
V. of White Lake	15%	85%
City of Antigo	1%	99%
<b>Langlade County</b>	<b>22.0%</b>	<b>88.0%</b>
<b>State</b>	<b>7.0%</b>	<b>93.0%</b>

*Source: American Community Survey, 2018-2022*

\* Year-round population percentages do not include vacant housing.



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## BROADBAND SERVICEABLE LOCATIONS (BSL)

A broadband serviceable location (BSL) is a business or residential location in the United States at which mass-market fixed broadband internet access service is, or can be, installed. BSLs were estimated using Langlade County tax parcels. Centroids were created for each parcel with an improvement value that was counted as a BSL. Table 3-3 summarizes the BSL by minor civil division.

<b>Table 3-3 Broadband Serviceable Locations (BSL)</b>			
<b>Minor Civil Divisions</b>	<b>Estimated BSL</b>	<b>BSL Per Sq Mile</b>	<b>Housing Units</b>
Ackley	326	4.59	209
Ainsworth	619	8.59	527
Antigo	771	24.79	641
Elcho	1574	20.93	1369
Evergreen	338	9.35	245
Langlade	517	7.13	423
Neva	540	14.31	405
Norwood	532	14.74	423
Parrish	115	3.16	96
Peck	235	6.32	186
Polar	534	14.86	424
Price	172	4.74	108
Rolling	707	19.66	542
Summit	166	4.57	146
Upham	945	12.80	859
Vilas	188	5.25	134
Wolf River	1045	8.79	866
V. of White Lake	177	74.12	169
City of Antigo	3,271	504.22	4,413
Langlade County	12,772	14.39	12,185

Source: NCWRPC and Langlade County GIS Tax Parcels

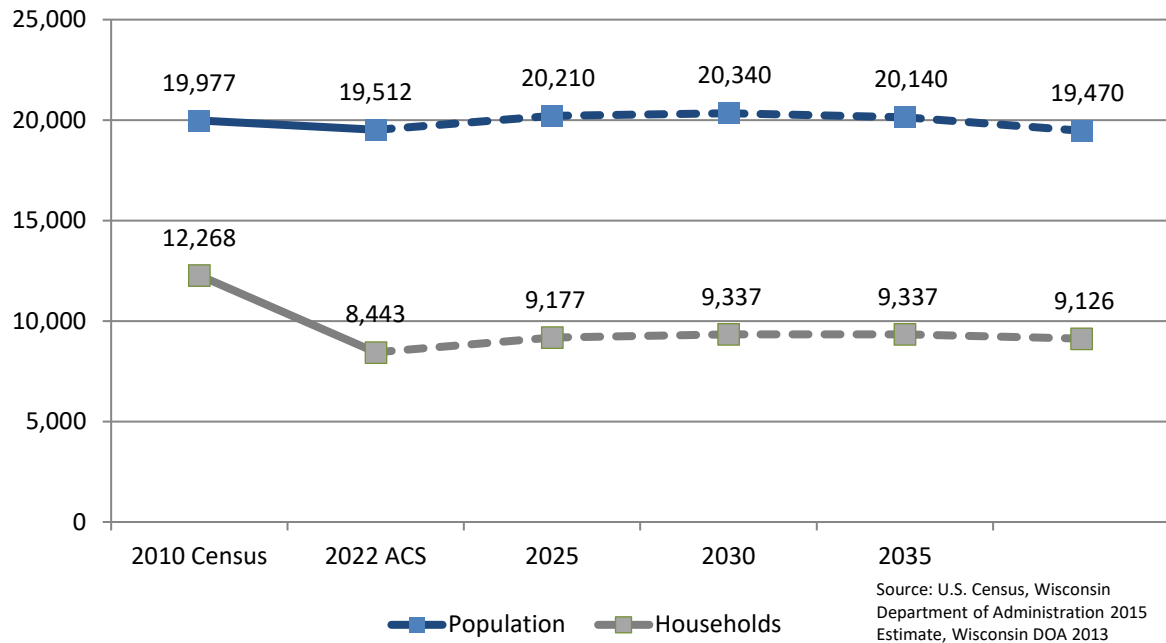
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## LANGLADE POPULATION AND HOUSEHOLD PROJECTIONS

Figure 3-1 shows the population and household future projections for Langlade County. Despite the past few decades of population declines, the County is expected to grow by 4.2 percent over the next 8 years. After peaking in population in 2030, the population is expected to decline by 4.3 percent through 2040.

The number of households in the County is projected to increase by 10.6 percent between 2022 and 2030. The population is expected to then slightly decline by 2.3 percent between 2030 and 2040.

**Figure 3-1 Langlade County Population and Household Projections**



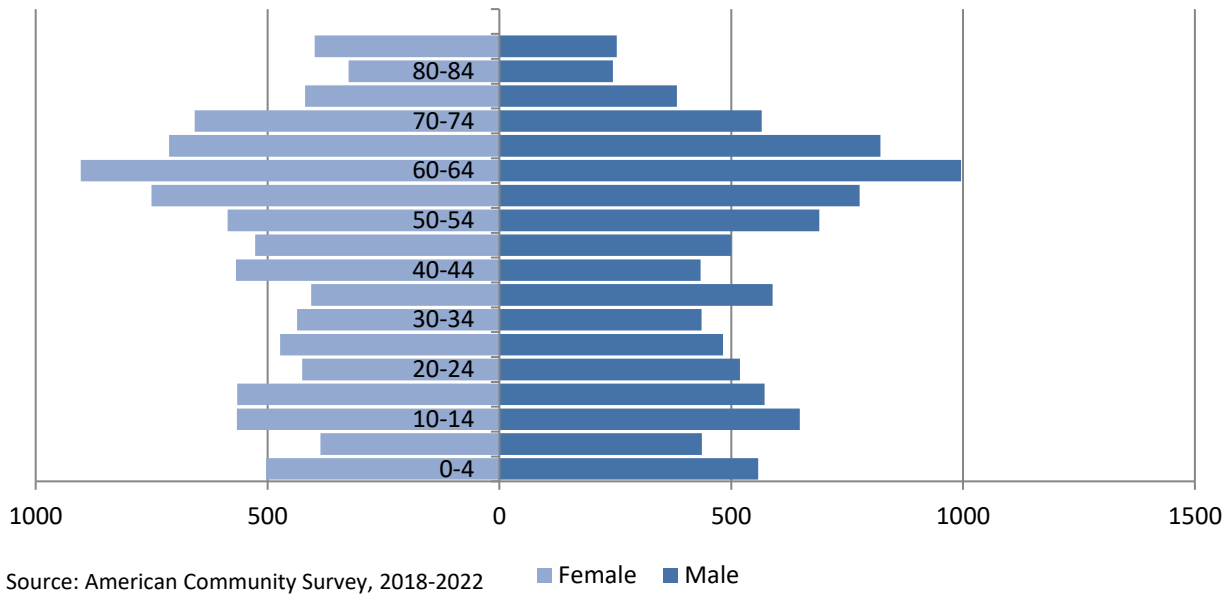
## AGE DISTRIBUTION

Population distribution is important to the planning process. In particular, understanding and considering age-related factors will better ensure that broadband services will effectively meet the needs of all community members, regardless of age. Factors like tailoring infrastructure for different age groups based on varying needs and preferences are important. For example, communities with a significant number of elderly residents might need services like telemedicine. Age distribution can also provide insights into broadband adoption and usage patterns. Understanding the adoption of broadband by age group can help determine where resource allocation is most appropriate.

Like many rural counties in Wisconsin, Langlade County is aging faster than the state and country. In 2010, the median age in Langlade County was 44.9 years old, compared to 38.1 for the state. By 2022, the median age in the county increased to 48.6 years old, compared to 39.9 for the state. Furthermore, the percentage of the county's population 62 years old or older is increasing. In 2010, 22.8 percent of the county's total population was 62 years old or older. By 2022, 30.4 percent of the county population was 62 years old or older. Comparatively, the state's share of the population 62 years or older increased from 16.2 in 2010 to 21.8 percent of the population in 2022. It is believed that this age demographic has been slower adopters of broadband and internet usage more generally.

On the other hand, the share of the population that is 17 and younger in the county has increased over the last 12 years (2010-2022), from 16.7 percent in 2010 to 19.4 percent in 2022. Similarly, in 2010, 17.5 percent of the state’s population was under 18 in 2010 and rose to 21.6 percent in 2022. Similarly, to the senior citizen population, this younger age cohort has technology needs, and many younger people rely heavily on having reliable internet access for school or connecting with their peers online.

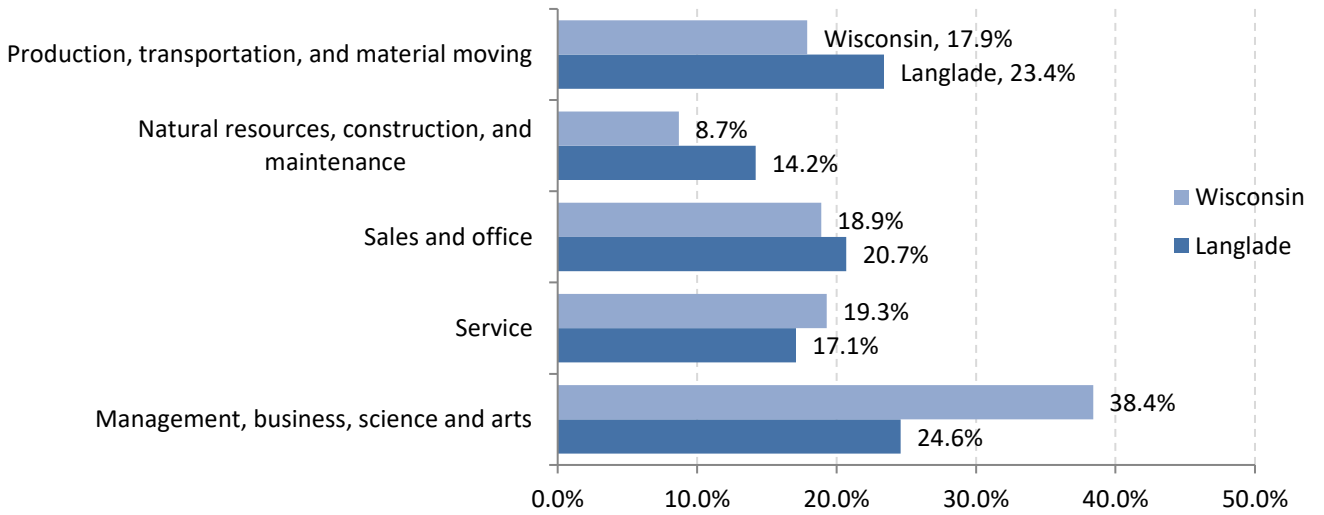
**Figure 3-2 Langlade County 2020 Age Pyramid**



## EMPLOYMENT

In 2022, there were 8,948 residents employed. (Note that these are persons employed and many of them work outside the county.) This reflected a 7.0 percent decrease in the county’s employment since 2010, compared to a 5.3 percent growth for the state, as shown in figure 3-3. The decrease in the number of workers in Langlade County is likely tied to the aging population leaving the workforce. Prominent resident occupations in the county include the production, transportation, and material moving industries as well as management, business, science, and arts industry category. The production, transportation, and material moving industry categories, natural resources, construction, and material moving categories, and sales and office industry categories have a bigger share of jobs in the county than the state overall.

**Figure 3-3 Langlade County and Wisconsin Employment Industries**



Source: American Community Survey, 2018-2022

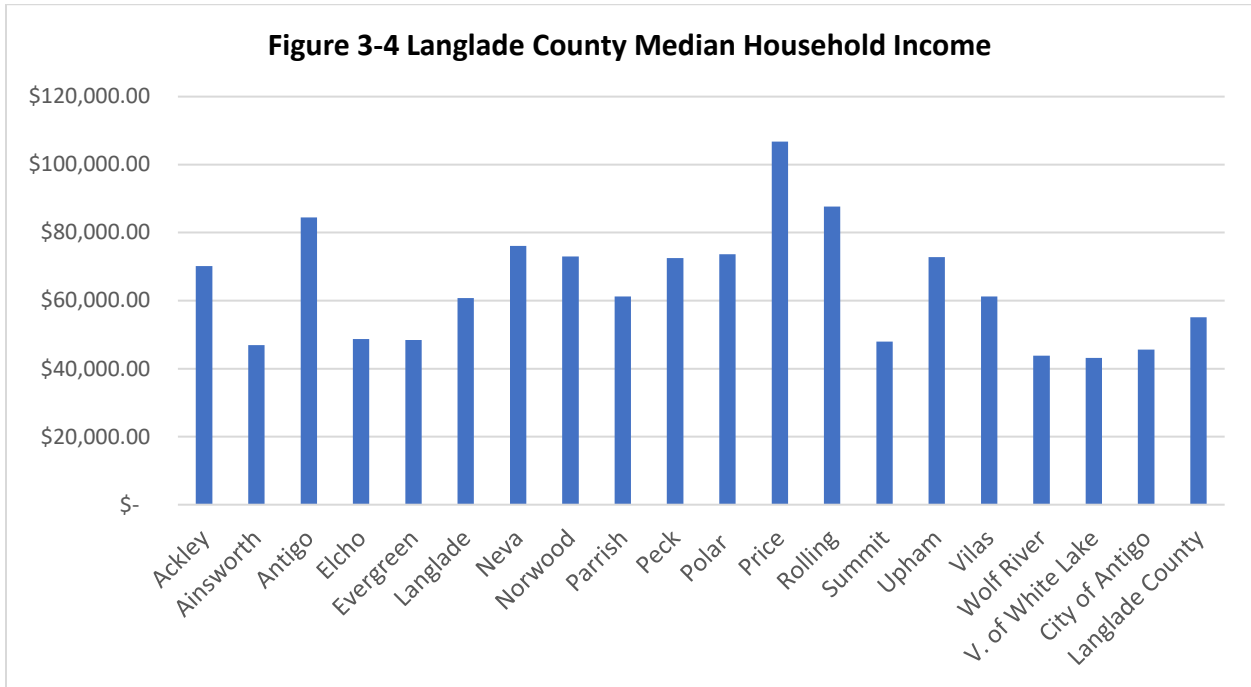
## INCOME

Income levels are important in broadband planning due to their impact on affordability, digital inclusion, and the overall effectiveness of broadband initiatives.

Median household income is displayed in figure 3.4. The county median household income rose about 34.3 percent between 2010 and 2022, compared to a state increase of 40.2 percent. Meanwhile, the county's per capita income increased by 49.8 percent, compared to the state's increase of 50.7 percent. Overall, the total county median income and per capita income is lower than the state level.

However, when incomes are adjusted for inflation, it is apparent that household incomes have stagnated. Had the median household income risen with the Consumer Price Index, it would have been \$56,204.42 in 2022, slightly higher than the actual \$55,091 median household income. The decrease in household size during this time likely plays a role, as per-person capita incomes within the county have kept up with inflation over time. Per capita income would have been \$30,167.73 if it rose similarly to inflation. However, the per-person capita income in 2022 was actually \$32,989. The municipalities with the highest median household income include the Towns of Antigo, Price, and Rolling. The lowest median incomes include the Towns of Ainsworth and Wolf River.

**Figure 3-4 Langlade County Median Household Income**



American Community Survey, 2018-22



# CHAPTER 4

## Current Broadband Assessment of Llanglade County

## 4. CURRENT BROADBAND ASSESSMENT OF LANGLADE COUNTY

This section primarily provides an overview of the current state of broadband supply (available broadband services) in Langlade County from readily available sources. This section is supplemented by the Wisconsin Speed Test (M-Lab) data, American Community Survey Data, FCC form 477 data, and Wisconsin Department of Public Instruction data.

Broadband adoption is typically measured in the percentage of households that subscribe to home broadband internet service. Broadband internet includes internet via cable, fiber optic, wireless or DSL service. On the other hand, wireless internet (ex. Mobile cellular service), is typically not considered broadband, yet many households only use mobile cellular service to connect to the internet.

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### WISCONSIN SPEED TEST COLLECTION

In a partnership with the North Central Wisconsin Regional Planning Commission (NCWRPC) Wisconsin Economic Development Corporation (WEDC) and the Wisconsin Public Service Commission (PSC), a statewide internet speed testing application was secured to help collect locations, estimate cost, and upload/download speeds. The public can also note if they have no service or cannot afford service at their location. This application is a crowdsourced data collection application. Counties and municipalities need to promote the speed test application to get enough tests to analyze the results. Langlade County currently has 780 total tests and a participation rate of 4.4 percent. Tests can be taken, and results reviewed at [www.wisconsinspeedtest.net](http://www.wisconsinspeedtest.net).

#### **Speed Test Results for Langlade County**

- While the 2023 State median download speed is 68.7 Mbps, the Langlade County median (37.3 Mbps) does not meet the FCC's minimum standard to qualify as broadband (100 Mbps).
- Wisconsin's monthly median download speeds have been steadily increasing over the past several years, while there is no significant improvement for Langlade County.
- Monthly median upload speeds between the State and Langlade County are similar. Langlade County's speeds were about 2 mbps faster than the State in 2023 (19.1 Mbps vs. 16.8 Mbps). As a reminder, the FCC's current minimum upload standard for broadband is 20 Mbps.



<b>Table 4-1 Langlade County Speed Test Average Download and Upload Speeds</b>		
<b>Minor Civil Division</b>	<b>Average Download Speeds (Mbps)</b>	<b>Average Upload Speeds (Mbps)</b>
Ackley	7.8	1.6
Ainsworth	26.0	12.6
Antigo	45.5	21.1
Elcho	34.8	14.0
Evergreen	14.2	5.6
Langlade	20.7	5.0
Neva	17.0	7.7
Norwood	17.8	9.0
Parrish	2.1	0.3
Peck	14.9	8.5
Polar	22.2	14.9
Price	18.4	2.7
Rolling	26.1	14.6
Summit	11.3	1.8
Upham	28.3	9.6
Vilas	35.6	32.0
Wolf River	20.2	9.0
V. of White Lake	48.4	28.3
City of Antigo	94.2	52.2
<b>Langlade County</b>	<b>37.3</b>	<b>19.1</b>
<b>State</b>	<b>68.7</b>	<b>16.8</b>

Source: Speedtest participant data

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## AMERICAN COMMUNITY SURVEY

The U.S. Census Bureau’s American Community Survey gathers information from households to understand broadband adoption. The 2018-2022 5-year American Community Survey revealed that approximately 85 percent of households in Langlade County have access to an internet subscription. A few rural towns have relatively low rates of broadband or internet subscriptions per household; with the Towns of Evergreen, Peck, Price, Summit, Vilas, and Wolf River having under 75 percent of households with broadband access. On the other hand, 8 municipalities in the county have relatively high broadband adoption rates (greater than 85 percent).

Approximately 71.7 percent of households within Langlade County have a broadband subscription (cable, fiber optic, or DSL), not including cellular data plan service. While typically not as reliable or as fast as broadband, mobile data subscriptions, and more costly satellite internet services help fill the internet gap within the County by providing access to the internet

for households without broadband subscriptions. Mobile data services are often required for households that cannot afford a broadband subscription, while both mobile data and satellite services are often required for those who do not live in an area where broadband service is readily available. The percentage of households with a cellular data plan and no other internet subscription in the county is 16 percent. The Towns of Ackey and Langlade each have at least 30 percent of households only with access to the internet through a cellular data plan (i.e., cell phone service).

Comparatively, Langlade County has a smaller proportion of households than the state with access to broadband by about 3 percent. Additionally, the percentage of households with cellular data but no other internet plan is greater than the state by approximately 5 percent. Also, the percentage of Langlade County households with broadband access can also be compared to neighboring counties. Except for Marathon County (which is significantly more urban), Langlade County households have comparable or better access to broadband than the surrounding counties. As mentioned, 85 percent of Langlade County households have some kind of internet subscription. This is compared to approximately 83 percent of Lincoln County households, 85 percent of Oneida County households, 86 percent of Menomonee County households, and 88 percent of the state having internet service access.

In general, broadband adoption rates within the county are typically highest in and around population centers, and lowest in the more sparsely populated areas. This disparity in broadband adoption rates is partly due to differences in the availability of broadband in these areas, as broadband availability is much higher in more densely populated areas than in areas with low-density populations.

<b>Table 4-2 Langlade County Households with an Internet Connection</b>		
<b>Minor Civil Division</b>	<b>% of Households with Internet Subscription</b>	<b>% of Households with Cellular Data Plan &amp; No Other Internet Subscription</b>
Ackley	82.5%	30.6%
Ainsworth	85.9%	13.0%
Antigo	91.0%	14.9%
Elcho	91.3%	16.4%
Evergreen	71.4%	26.9%
Langlade	88.9%	30.6%
Neva	78.6%	11.5%
Norwood	90.5%	23.1%
Parrish	84.4%	15.6%
Peck	72.1%	26.2%
Polar	84.6%	17.6%
Price	92.3%	18.7%
Rolling	78.0%	22.4%
Summit	73.6%	28.3%
Upham	91.8%	19.0%
Vilas	61.0%	18.6%
Wolf River	72.4%	16.9%
V. of White Lake	78.9%	16.3%
City of Antigo	86.1%	12.0%
<b>Langlade County</b>	<b>84.9%</b>	<b>16.0%</b>
<b>State</b>	<b>88.1%</b>	<b>11.1%</b>

Source: American Community Survey, 2018-22

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## FEDERAL COMMUNICATIONS COMMISSION FIXED BROADBAND DEPLOYMENT

The data and [National Broadband Map](#) in this sub-section are primarily drawn from internet service provider (ISP) reporting to the Federal Communications Commission (FCC) via Form 477. All facilities-based ISPs are required to file data with the FCC twice a year (Form 477) where they offer Internet access service at speeds exceeding 200 kbps in at least one direction.

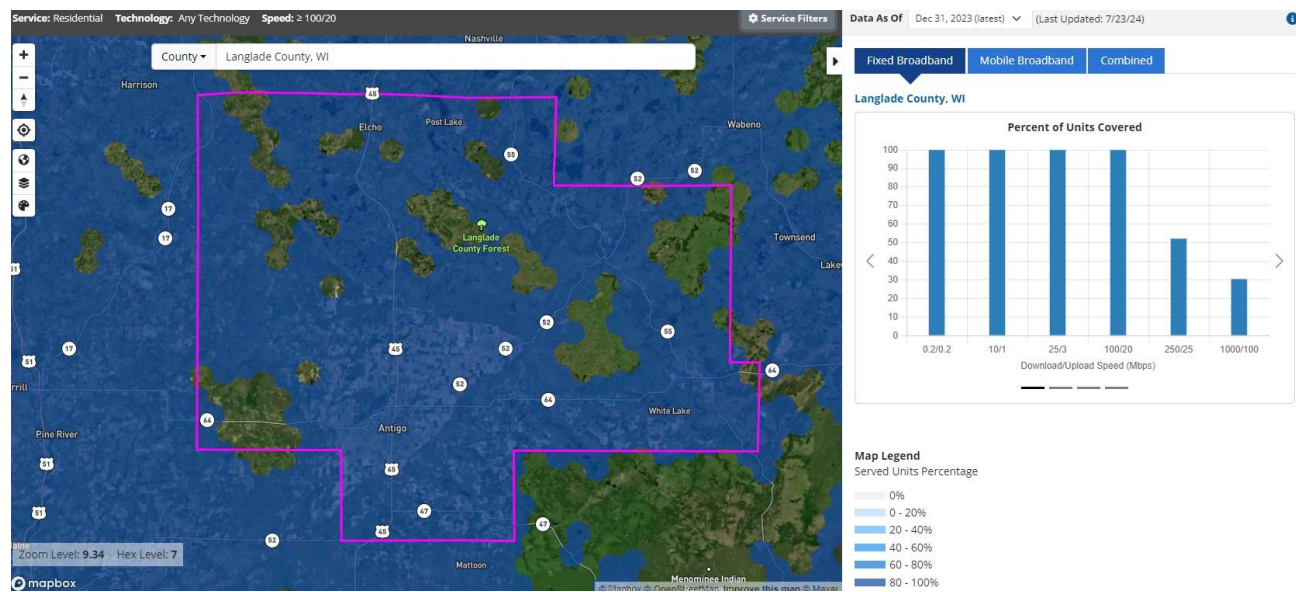
There are two important factors to remember about FCC Form 477 Reporting and “Advertised Speeds.”

(1) Fixed providers file lists of census blocks in which they can or do offer internet service to at least one location. Rarely, some ISPs may provide more detailed mapping to the WBO. So, while a map may suggest that an entire census block has the reported broadband service available, this is often not the case and only one customer may be connected within that entire block. To confuse things further, on occasion, an ISP may only report those census blocks in which they

have a franchise agreement with a municipality or are exclusively allowed to cover; they may also provide some service in an unreported area.

(2) ISPs report their “advertised speed.” Actual speeds can be significantly lower. A 2020 Purdue study found that “on average, FCC advertised download speeds were 10.7 times higher than average [M-Lab] test speeds in the country compared to 7.4 times regarding upload speeds.” The report also found that advertised speeds are closer to the speed test results in urban counties, while the gap in rural counties is larger. This is very important and justifies the need for studies such as this. Higher, inaccurate reported speeds may deter much needed investment, especially in rural areas such as Langlade County, if the State and Federal governments are basing policy and financial decisions on advertised speeds (and not actual speeds). As explained in the Purdue article and Section VI, actual speeds will differ for numerous reasons, including some factors not controlled by the ISPs, such as the choice of subscription plans by the end user.

### ISP Percent of Units Covered according to FCC



Source: FCC

## WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION (DPI) DATA

The Wisconsin Department of Public Instruction (DPI) has become a state leader in internet/broadband data collection in recent years. DPI partners with local school districts and public libraries for data collection. The DPI Digital Equity Gap webpage (<https://dpi.wi.gov/broadband>) includes a variety of resources and DPI has partnered with M-Lab to collect data on internet connection speeds across Wisconsin.

The 2022-2023 Digital Equity Survey showed two of the four school districts in the county participated in the DPI survey on broadband. Specifically, DPI received data from the School Districts of Antigo, and Rhinelander, but not Elcho or White Lake. This survey revealed that the vast majority of students in the county have access to the internet at home (>90%). The primary reason why some homes lack internet access is the absence of internet available in their area. At the same time, respondents indicated that the internet was less reliable to them at home, even if they had access to it (>30%). Further, the vast majority of respondents mentioned that they have issues with streaming on their primary device.

School District	% of respondents without home internet	% of respondents without home internet due to affordability	% of respondents without home internet due to availability
Antigo Unified District	8.7%	31.4%	62.7%
Rhinelander School District	2.6%	50%	50%

Source: Department of Public Instruction Digital Equity Survey, 2022-2023

\*No Data for Elcho School District or White Lake School District

School District	% of respondents with partially or completely unreliable internet	% of respondents who cannot reliably stream video on primary device	% of respondents who have issues with quality or interruptions of the stream on primary device
Antigo United School District	39.2%	82.2%	17.8%
Rhinelander School District	33.7%	91.5%	8.5%

Source: Department of Public Instruction Digital Equity Survey, 2022-2023

\*No Data for Elcho School District or White Lake School District

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## OVERVIEW

In Langlade County, the recent internet speed test collection effort and several other past initiatives have revealed disparities in internet access. While the statewide median download speed exceeds 100 Mbps, Langlade County lags with a median of just **37.3 Mbps**, barely meeting the FCC's broadband standard. However, according to the speed test data, upload speeds in the county are a little better than the state average. The American Community Survey reports that approximately **85 percent of households have internet subscriptions**, but there are variations among towns, with rural areas facing lower rates of broadband access. To bridge the digital divide, mobile data subscriptions and satellite internet services are used by a substantial portion of households in areas without broadband. The Federal Communications Commission's data highlights the challenge of advertised speeds significantly exceeding actual speeds, especially in rural regions. Furthermore, the Wisconsin Department of Public Instruction's data indicates that **internet reliability is an issue for many residents**, impacting streaming capabilities. Addressing these disparities in internet access and speeds, especially in less densely populated areas, is essential for improving digital connectivity in Langlade County.

# CHAPTER 5

## Common Barriers to Broadband Connectivity

## 5. COMMON BARRIERS TO BROADBAND CONNECTIVITY

In today's interconnected world, widespread broadband connectivity is essential, yet several barriers hinder its adoption. Common challenges like affordability, a lack of interest in broadband adoption, and connectivity hurdles associated with rural areas continue to persist. These challenges are highlighted in detail below:

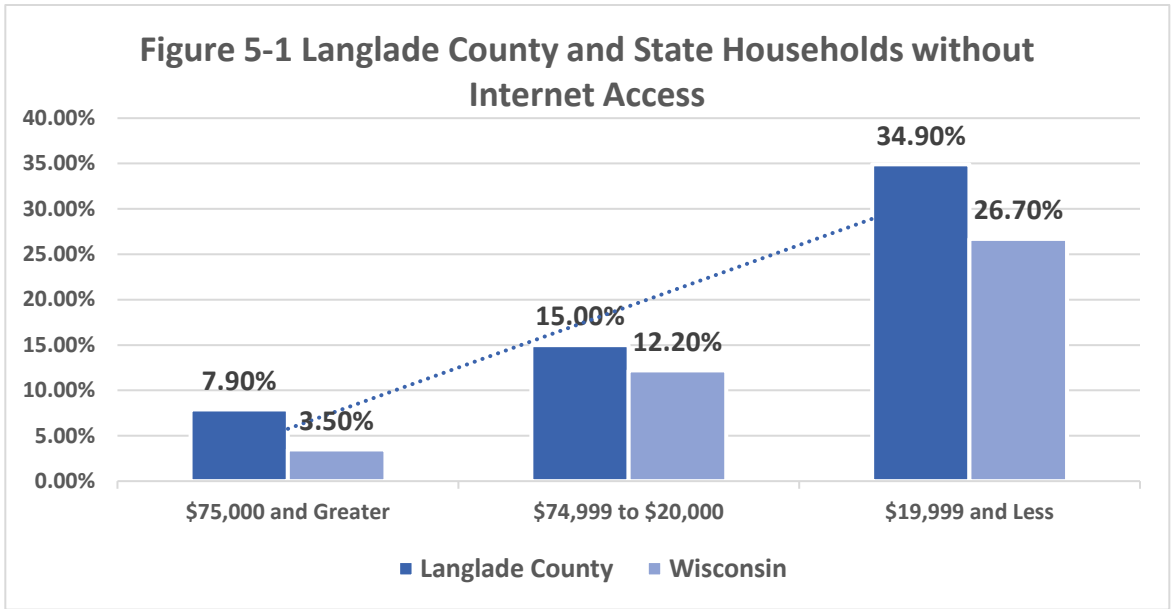
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### AFFORDABILITY BARRIER

The affordability of broadband continues to be a significant challenge for many households. Monthly broadband costs can range from as low as \$10 (ex. with a subsidy) to over \$100 depending on the speed, the type of internet (ex. fiber, DSL, etc.), and whether the service area is rural. Broadband for commercial use can be up to \$1000 per month. In general, American consumers pay higher prices than broadband consumers in other countries, with one study finding that Americans pay two or three times more per month than European consumers. Research has found that cost is the primary barrier to low-income households having an internet connection at home. According to the Pew Research Center, 45 percent of people mention cost as the reason they do not have broadband at home.

Figure 5-1 shows household incomes and internet subscription rates for Langlade County and Wisconsin. Among County households with incomes of \$75,000 and above, a substantial 92.5 percent have access to broadband in their homes. Households with incomes of \$74,999 to \$20,000, 76.7 percent have access to broadband in their homes. For households with incomes below \$20,000, only 64.5 percent of households have broadband access. Comparing the share of households at the state level with broadband access shows a similar pattern, with the highest earners having the most access to broadband. However, as a whole, the state has a higher proportion of households with broadband access across each income group than Langlade County.





Source: American Community Survey, 2018-2022

Overall, an examination of Langlade County households without an internet subscription shows a clear correlation between internet access and household income. Additionally, at the time of the 2022 American Community Survey, many low-income households were getting internet for free through the Affordable Connectivity Program. Since this program has now ended, many lower income families will likely no longer be able to afford to keep their service, exacerbating broadband inequity.

This is substantiated by the fact that a 2015 U.S. Department of Commerce study revealed that 24 percent of households do not use the internet at home because of cost concerns. Further, 23 percent of all households that did not use the internet at home in 2015 would purchase internet if it was less expensive. In general, broadband affordability is a major barrier to broadband connectivity, and programs and policies to mitigate this should be promoted.

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### NO INTEREST BARRIER

Lack of interest is another significant barrier to more broadband connectivity in certain places. According to a 2015 study by the U.S. Department of Commerce, 55 percent of households that were not using the internet cited a lack of need or interest as the primary reason for their non-adoption. This trend was consistent regardless of demographics, rural or urban residence, or the presence of school-aged children at home.

Several factors might be contributing to this lack of interest. In some regions, people might not be fully aware of the benefits of broadband connectivity or may not understand how to use it to its full potential. Benefits like telehealth, online banking, and online booking/shopping are just a few examples of basic online services that greatly benefit people and have been fully embraced

by most people. Along these lines, the lack of digital literacy can also play a role. If people are not familiar with the internet or lack the skills to use the internet effectively, they may not perceive the need for the Internet. Lastly, cultural and societal factors might also contribute to the level of interest in using the internet.

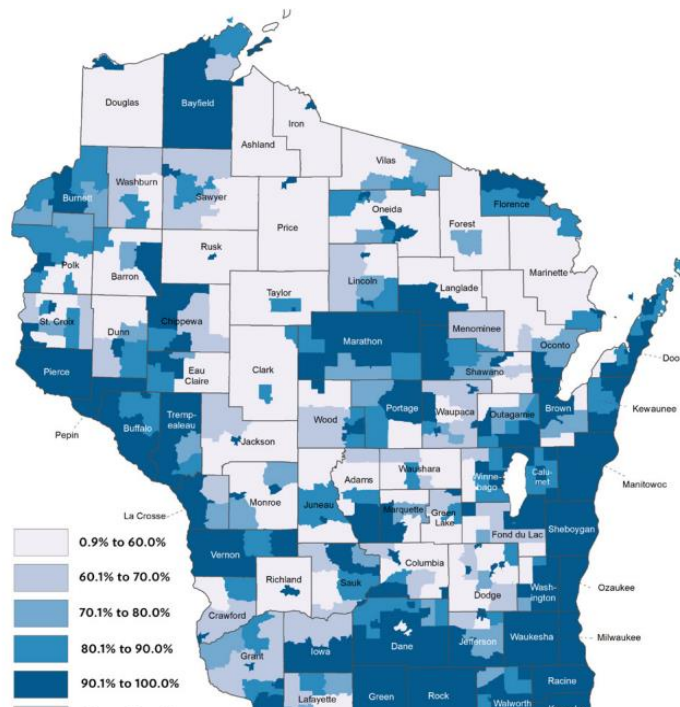
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## ACCESSIBILITY BARRIER

Rural broadband faces several challenges that make it a significant barrier to achieving widespread internet connectivity in rural areas. Currently, around 22 percent of Americans in rural areas and 27 percent of Americans in Tribal lands lack coverage from fixed terrestrial 25/3 Mbps broadband, as compared to only 1.5 percent of Americans in urban areas.

Most of the challenges of bringing fast broadband to rural areas are a direct result of the low density of housing in most rural areas. This low density leads to high costs for land-based broadband technology, which results in costs customers will not always pay. The second challenge is that companies that have never sold in a competitive market struggle with marketing and selling broadband. Also, internet service providers might face operational risks associated with failing to execute the business plan as well as increased costs, supply chain issues, etc. Lastly, there are competitive risks to deploying broadband in new markets. Competition can cut costs, try to get customers to sign long-term contracts, or react by upgrading their broadband.

### Share of Population with Access to Broadband (25/3 MBPS) by Wisconsin Census Tract



Source: FCC Form 477 Data, 2019 & UW Extension, 2021

# **CHAPTER 6**

## **Broadband Strategies and Programs**

# 6. BROADBAND STRATEGIES AND PROGRAMS

## ADOPTION STRATEGIES

Increasing broadband adoption is essential for bridging the digital divide. Some of the strategies that public and private entities have done to promote broadband adoption include the following:

1. **Digital literacy programs:** Increasing people's knowledge about the advantages of broadband and teaching them how to use the internet proficiently can enhance their overall internet experience and encourage broader adoption. For instance, local libraries are ideal places to teach residents how to effectively use and access digital resources.
2. **Community Outreach:** Engaging the community through outreach programs can raise awareness of the importance of broadband access and the opportunities it brings.
3. **Infrastructure development:** Investing in building and expanding broadband infrastructure will enable more people to connect to the internet. This includes building more fiber optic networks, fixed wireless, and satellite-based connections. Sometimes, this means providing incentives to service providers to expand their coverage. This includes tax breaks, grants, or streamlined permitting processes.
4. **Public Wi-Fi initiatives:** Setting up public WI-FI hotspots in areas with limited connectivity can provide access to people without broadband at home.
5. **Broadband Affordability:** Promote broadband affordability programs such as the Federal Communication Commission's Affordable Connectivity Program or its successor.

# GRANTS AND BROADBAND ADOPTION PROGRAMS

There are several programs and initiatives aimed at promoting broadband access and adoption. Both the state of Wisconsin and the federal government have implemented programs that are available to either residents or internet service providers.

At the **state level**, the Public Service Commission (PSC) of Wisconsin's Broadband Office has awarded grants to organizations, (ex. telecommunications utilities, municipalities, or counties) or telecommunications utilities to encourage the deployment of broadband and improve broadband access for Wisconsin residents.

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## BROADBAND EXPANSION GRANT PROGRAM

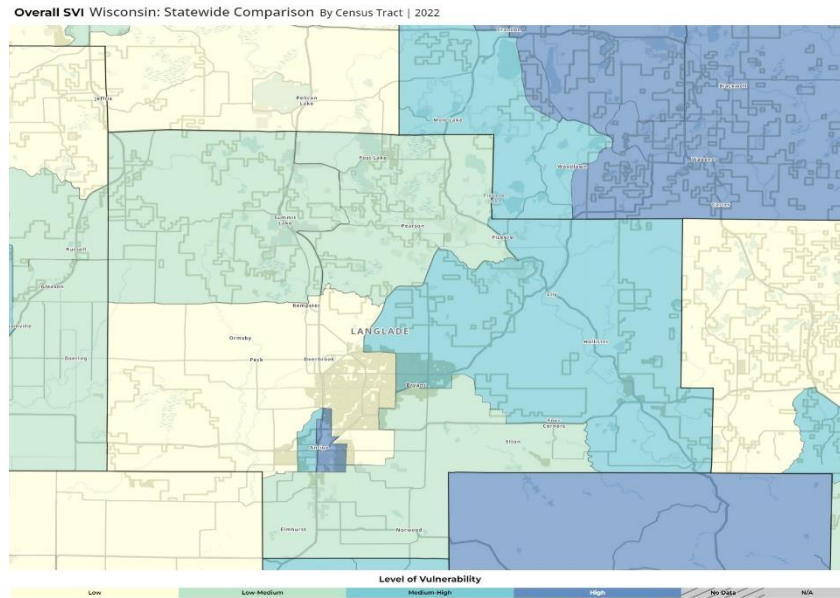
Over the past 9 years, the State has run the *Broadband Expansion Grant Program* to encourage the deployment of broadband capability in underserved areas of the state. Since the program's inception, over \$200 million in grants have been given to ISPs for broadband expansion.

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## CAPITAL PROJECTS BROADBAND INFRASTRUCTURE

Under the program name Capital Projects Broadband Infrastructure, the PSC, at the discretion of the Governor, administers limited federal funds to expand broadband access, adoption, and affordability. For-profit internet service providers, telecommunications utilities, co-operatives, local governments, and non-profit organizations are eligible to apply for grants. In fiscal year 2023, the Commission awarded funds from the federal American Rescue Plan Act (ARPA) of 2021 under the Capital Projects Fund (CPF) Broadband Infrastructure Grant Program. CPF Broadband Infrastructure Grants will provide up to \$42 million in grant funding during **Fiscal Year 2024** to eligible applicants. As part of the merit criteria, 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.

## Langlade County Social Vulnerability



Source: CDC, 2022

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### ARPA BROADBAND ACCESS

More broadly, the American Rescue Plan Act (ARPA) *Broadband Access Grants* Program administered federal funds for the purpose of expanding broadband, access, adoption, and affordability. ISPs, telecommunications utilities, co-operatives, local governments, and profit and non-profit organizations are eligible to apply for grants. Under the 2020 CARES Act, approximately \$5.3 million of total funds were awarded to 12 applicants/projects to expand broadband access. In 2022, using ARPA funds, just under \$100 million was allocated for 83 broadband expansion projects.

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### RURAL DIGITAL OPPORTUNITY FUND (RDOF)

The Rural Digital Opportunity Fund (RDOF) will disburse up to \$20.4 billion over 10 years to bring fixed broadband and voice service to millions of unserved homes and small businesses in rural America. Building on the success of the Connect America Fund Phase II Auction (CAF II Auction), RDOF uses a two-phase, competitive reverse auction (Auction 904) that prioritizes higher network speeds and lower latency to ensure the deployment of robust, sustainable high-speed networks that meet the needs of consumers now and in the future.

The RDOF Phase I Auction ended on Nov. 25, 2020, and awarded \$9.2 billion in support to 180 winning bidders, including incumbent telephone companies, cable operators, electric cooperatives, satellite operators, and fixed wireless providers. Winning bidders have committed to deploy broadband to more than 5.2 million homes and small businesses in census blocks that previously lacked broadband service with minimum speeds of 25 megabits per second downstream and 3 megabits per second upstream (25/3 Mbps) as determined by FCC Form 477 data. Phase II will cover locations in census blocks that are partially served, as well as locations not funded in Phase I. The Rural Digital Opportunity Fund will ensure that networks stand the test of time by prioritizing higher network speeds and lower latency so that those benefitting from these networks will be able to use tomorrow's Internet applications as well as today's.

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## ALTERNATIVE CONNECT AMERICA COST MODEL (ACAM)

The **Alternative Connect America Cost Model (ACAM)** provides funding to rate-of-return carriers that voluntarily elected to transition to a new cost model for calculating High-Cost support in exchange for meeting defined broadband build-out obligations. ACAM models the forward-looking economic costs of deploying a high-speed network and delivering broadband service. Carriers that elected this option receive predictable monthly payments to provide voice and broadband service to all funded locations over the program's 10-year support term (2017-2026). Carriers that elected ACAM funding must meet the deployment obligations published in the Public Notice authorizing them to receive A-CAM support. Some of these requirements include maintaining existing voice and broadband service and offering broadband speeds of at least 10 Mbps downstream/1 Mbps upstream (10/1 Mbps) to a number of eligible locations equal to the number of fully funded locations. (locations for which the carrier receives support for the full cost of build-out). Or offer broadband speeds of at least 25/3 Mbps to several eligible locations equal to a certain percentage of fully funded locations depending on the population density of the carrier's service area.

**ACAM II**, established by the 2018 Rate-of-Return Reform Order provides funding to rate-of-return carriers that voluntarily elected to transition to a new cost model for calculating high cost support in exchange for meeting defined broadband build-out obligations. Carriers that elected this option receive predictable monthly payments based on support of up to \$200 for each funded location over the program's 10-year support term (2017-2026). (Carriers electing ACAM II support receive transition payments if their ACAM II support is less than their 2018 legacy support.) Participating carriers must meet annual deployment milestones starting in year four, 2022. Carriers that elected ACAM II funding must meet the deployment obligations such as maintaining existing voice and broadband service as of December 31, 2018, and offering broadband speeds of at least 25 mbps downstream.

The **Enhanced Alternative Connect America Model (Enhanced A-CAM)** is a progressive iteration of its precursor, the A-CAM (Alternative Connect America Model), a funding program designed to address rural connectivity challenges within the broadband telecommunications

sector. The new Enhanced A-CAM program sets forth a more ambitious and forward-looking framework for participating carriers to offer broadband and voice service at speeds of 100/20 Mbps (download/upload) or faster to all Enhanced A-CAM required locations within its study area (as determined by the National Broadband Map), compared to the previous A-CAM Program speed requirements of 25/3 Mbps, ([FCC Report & Order](#)). The primary purpose of Enhanced A-CAM is to synchronize study areas with the Broadband, Equity, Access, and Deployment (BEAD) program funding initiatives. This alignment is aimed at preventing redundant funding efforts and potential strategic manipulation within the same geographical zones.

## BIPARTISAN INFRASTRUCTURE LAW (BEAD & DIGITAL EQUITY ACT)

The recent Bipartisan Infrastructure Bill (BIL) provides \$65 billion to connect more Americans to high-speed broadband internet that is affordable and reliable. Within BIL there are several programs that support broadband planning, infrastructure, and adoption. Wisconsin will administer funding under the *Broadband Equity, Access & Deployment Program (BEAD)* program and *Digital Equity Act (DEA)* programs. BIL grant programs are not intended for household or individual applicants. Instead, states will lead planning and grantmaking efforts to provide funding to internet service providers which will build and provide service to households and businesses.

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### BEAD PROGRAM

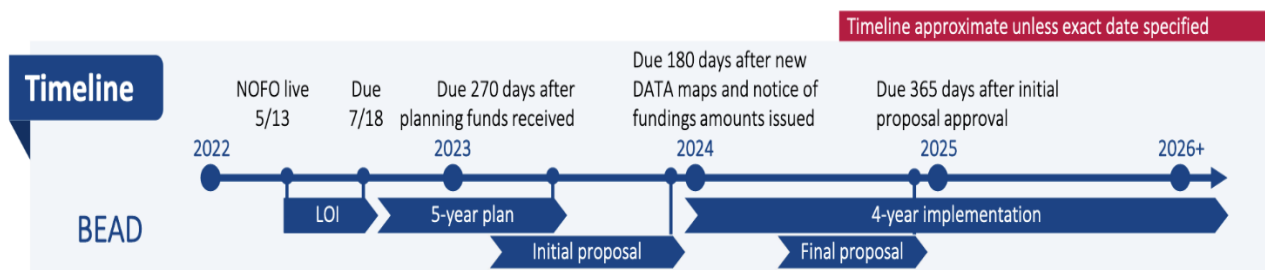
Wisconsin's allocation of the BEAD program is approximately \$1.06 billion, which was determined through a formula based on the state's proportion of locations lacking access to broadband service. Ultimately, BEAD will support the deployment of primarily fiber internet technology that provides service of 100/20 Mbps to all households and residences in Wisconsin that lack access to 25/3 Mbps service.

The following are eligible uses of funds:

1. Planning for the deployment of high-speed Internet, including conducting research, collecting data, outreach, and training.
2. Deploying or upgrading Internet in unserved or underserved areas or improving service to community anchor organizations
3. Installing Internet and Wi-Fi in multi-unit residential buildings
4. Adoption and digital equity programs
5. Workforce development programs and vocational training



## Timeline for Bead Planning



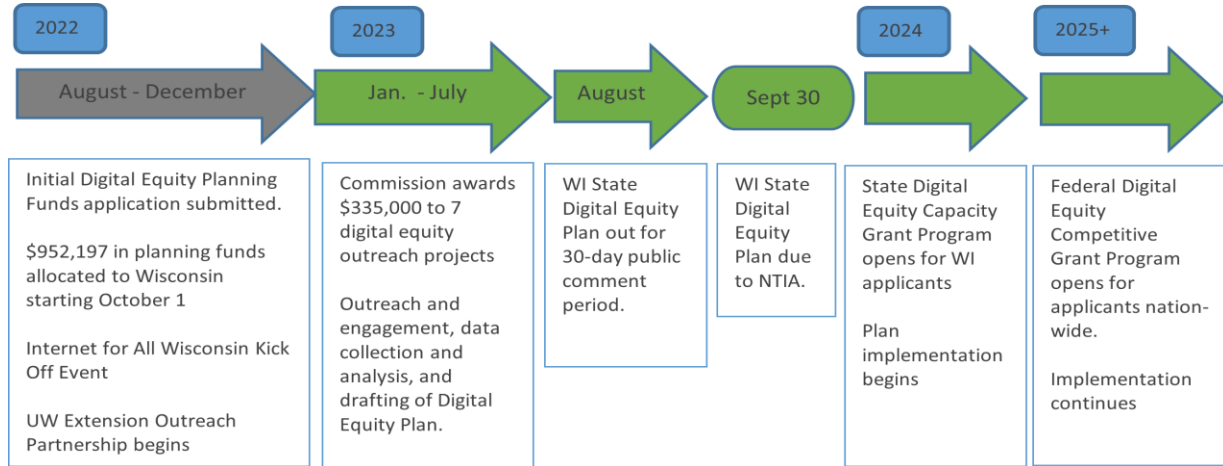
## HOUSEHOLD ADOPTION PROGRAMS

Broadband costs continue to be a significant barrier for many low-income households. Local, state, and federal partners have aimed to make broadband affordable by subsidizing the cost of internet for many households.

## DIGITAL EQUITY ACT

The Digital Equity Act (DEA) consists of three separate planning and implementation grant programs that promote digital equity. Digital equity is the condition where all citizens have the skills, devices, and broadband service necessary to fully participate in the economy and society of Wisconsin. Specific populations will be targeted with digital equity funding including residents of rural areas, individuals of color, aging individuals, and more. Funding will be distributed through three programs, two of which are administered by the PSC. The first program is the State Planning Program, which provides funding to states based on a formula for the development of a state digital equity plan. Wisconsin's share of planning funds is \$952,197. Secondly, the State Capacity Grant Program provides funding to states through a formula to support digital equity projects and implement each state's digital equity plan. Wisconsin's estimated share of capacity grant funding is approximately \$24 million to \$30 million over five years. The final program is the Competitive Grant Program, administered by NTIA, which will support digital equity projects nationally over a five-year period.

## Estimated Digital Equity Act Programs Timeline




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## AFFORDABLE CONNECTIVITY PROGRAM

The Federal Communications Commission’s (FCC) Affordable Connectivity Program (ACP) is a benefit program that helps to ensure households can afford broadband at their home. The ACP provides a discount of up to \$30 per month toward internet service for eligible households and up to \$75 per month for households on qualifying Tribal lands. Additionally, households can receive one-time discounts of up to \$100 to purchase a laptop, desktop computer, or tablet from participating providers if they contribute up to \$50 toward the purchase price. One of the guidelines to be eligible for the ACP is that a household must have an income that is at or below 200 percent of the federal poverty guidelines. Other potential eligibility criteria include participation in certain assistance programs (Ex. SNAP, Medicaid, WIC, etc.), participation in Tribal specific programs (Ex. Bureau of Indian Affairs General Assistance), or approval to receive free and reduced-price school lunch programs.

Participation by internet service providers is voluntary by the company, but most providers in Wisconsin are participating in the ACP program. Several providers offer one or more plans that are covered in full by the ACP discount, resulting in those plans costing nothing for those households.

**In the beginning of 2024, the ACP stopped accepting new applications with the program on track to run out of funding by April 2024, unless more funding is allocated by Congress. At the time of the enrollment freeze, approximately 1,845 households, or about 22 percent of all households in Langlade County had enrolled in the ACP. It is estimated that over 25 percent of households in Langlade County qualified for the ACP benefit based on the income requirement.**

**It is recommended that residents struggling to afford internet utilize the Wisconsin Public Service Commission's Internet Discount Finder to see a list of discounted internet service options available.**

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## LIFELINE

Lifeline is another FCC program that helps make communications services more affordable for low-income consumers. Lifeline provides subscribers with a discount on qualifying monthly telephone service, broadband Internet service, or bundled voice-broadband packages purchased from participating wireline or wireless providers. Lifeline provides up to a \$9.25 monthly discount on service for eligible low-income subscribers and up to \$34.25 per month for those on Tribal lands. Subscribers may receive a Lifeline discount on either a wireline or a wireless service, but they may not receive a discount on both services at the same time. Lifeline also supports broadband Internet service and broadband-voice bundles. FCC rules prohibit more than one Lifeline service per household.

To participate in the Lifeline program, consumers must either have an income that is at or below 135 percent of the Federal Poverty Guidelines or participate in certain federal assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), Medicaid, Federal Public Housing Assistance, Supplemental Security Income, the Veterans and Survivors Pension Benefit, or certain Tribal Programs.



## BROADBAND FUNDING

Funding and financing broadband projects is essential for expanding access to high-speed internet and bridging the digital divide. Various sources of funding are available, including private sector investments, government programs at federal and state levels, tax incentives and credits to encourage private sector participation, bond financing by local governments, and grants from foundations and nonprofits, particularly for projects emphasizing digital inclusion. Public-private partnerships can also play a crucial role in leveraging resources for broadband expansion. These funding options collectively provide the necessary financial support to develop and deploy broadband infrastructure, ultimately improving internet connectivity and accessibility for underserved and rural communities.

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### PRIVATE SECTOR INVESTMENTS:

Telecommunications companies and Internet Service Providers (ISPs) frequently allocate resources to expand broadband infrastructure, particularly in areas with a potentially lucrative customer base. Collaboration through public-private partnerships can also incentivize and facilitate such investments.

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### FEDERAL AND STATE PROGRAMS:

Governments at both the federal and state levels administer programs and initiatives to support broadband expansion. These may include subsidies, grants, and other financial incentives aimed at bolstering infrastructure development.

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### TAX INCENTIVES AND CREDITS:

In certain scenarios, government authorities may provide tax incentives or credits as a means to stimulate private sector participation in broadband infrastructure investment. These incentives serve to encourage companies to engage in these critical projects.

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### BOND FINANCING:

Local governments have the option to issue bonds as a financial mechanism to fund broadband projects. The expectation is that the revenue generated from broadband services will eventually cover the debt incurred through bond issuance.

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## GRANTS AND FOUNDATIONS:

A variety of foundations, nonprofit organizations, and philanthropic entities may extend grants and financial support to broadband initiatives. These sources of funding often prioritize projects focused on digital inclusion and promoting equitable access to broadband services.





# CHAPTER 7

## Broadband Goals

## 7. BROADBAND GOALS

The following are goals identified by several entities to bolster broadband access, affordability, and adoption. The State of Wisconsin's Governor's Task Force worked with the Public Service Commission of Wisconsin (PSC), Federal Communications Commission (FCC), National Telecommunications and Information Commission (NTIA), and other state and federal agencies, and the public to create a series of goals and initiatives.

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### STATE OF WISCONSIN GOALS

2024 Governor's Task Force on Broadband Recommendations for the State of Wisconsin:

Preparing for BEAD has been a focus of the Task Force. The Task Force provided guidance on the development of the [BEAD Five-Year Action Plan](#) that outlined goals and priorities for the State. The scale and complexity of the BEAD Program warrant additional focus for streamlining processes and resolving bottlenecks in capacity to ensure a prompt and effective implementation. As the Task Force evaluated preparations for BEAD, it found opportunities to improve permitting and locating, workforce opportunities, Tribal coordination, and grant administration.

This year, the Task Force heard a presentation from the Wisconsin Department of Transportation Broadband Permit Coordinator, and a locating presentation by Scott Nyman of Wittenberg Telephone Company. The Task Force discussed and learned about permitting and locating issues related to miscommunication, policy inconsistencies, labor shortages, and lack of accountability. In turn, the Task Force included permitting and locating recommendations to help address these issues proactively in lights of the tight BEAD implementation timelines.

In discussions around permitting, Task Force members heard about challenges related to crossing railroads, and the timely and accurate locating of underground facilities, as well as concerns related to costs to attach to utility-owned poles for aerial deployment and some permitting backlogs. In some cases, permitting delays have delayed construction until the subsequent building season and forced ISPs to seek extensions on grant projects. Further, providers are seeing a strain in capacity for locating services, which must be completed before they can begin construction. If a contractor crew arrives at a location for work and no locates have been completed, they must cancel their planned work and may lose several days of construction.

Permitting and locating delays are costly, making it difficult to schedule contractors and sequence deployment projects. These delays cause increased interest payments on debt financing, lost staff and contractor time, and delays in acquiring new customers. The Task Force recommends policy



makers consider legislation or guidance that create firm and predictable timelines and reasonable and transparent costs.

Workforce development was another critical area of focus for the Task Force last year. With significant funding that has been injected into the telecommunications industry the past few years, and historical amount on the way, meeting the ever-increasing workforce demand has been and will continue to be a key challenge.

The Task Force deemed that it important that Wisconsin create a sustainable pipeline of talent and help aid in the connection of that pipeline to potential employers. Workforce development boards, economic development organizations, high schools, technical colleges, internet service providers, state agencies, and more will all play an important role in ensuring this pipeline is available and sustainable. Wisconsin must include all available workforce and make concerted efforts to engage veterans, formerly incarcerated individuals, individuals who are members of a racial or ethnic minority group, and more.

The Task Force also considered that it was important to promote jobs in the broadband sphere as a viable, meaningful, well-paying career. Increased awareness in areas like high schools will lead to more talent and dollars staying inside Wisconsin's economy. Many internet service providers would prefer to hire local and train within their company. To do that, Wisconsin needs a local pipeline of talent and interest. Workforce development continues to be an ongoing area of emphasis as the state plans to administer the BEAD and DE programs. Considering and executing these recommendations will put Wisconsin in a better position to succeed with respect to workforce development in the telecommunications industry.

NTIA has delegated states to administer the BEAD Program. The PSC has been successfully administering broadband grants since 2014. With the timeline requirements of BEAD, the Task Force made grant administration recommendations to streamline processes and have the necessary human resource and technical support available for administering BEAD.

Tribal coordination is a recommendation that will play an important role in preparing for BEAD. The Task Force recognizes that the Tribal Nations of Wisconsin have their own sovereignty, have their own plans for equitable access to broadband, and have tailored needs for each unique Tribal Nation. There have been past issues of ISPs building or claiming to build on Tribal lands without the Tribes permission or permits, ISPs not wanting to build on Tribal lands because they find the process difficult, and inaccuracy of broadband service data on Tribal lands. The State of Wisconsin, ISPs, and local governments continue to work on transparency, communication, and collaboration with Tribal Nations. The Task Force voices that Tribal coordination is key in order to meet the requirements of the BEAD Program and achieve Internet for All Wisconsinites.

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## NORTH CENTRAL WISCONSIN REGIONAL RECOVERY PLAN BROADBAND GOALS

The following goals were identified in the North Central Wisconsin Regional Recovery Plan. The Advisory Committee, who were represented by economic development professionals from throughout the region, identified these goals as the most important to the vision of the future of broadband in the region.

1. Create universal broadband infrastructure throughout the region.
2. Bring high-performance broadband service throughout the region.
3. Make broadband affordable and competitive.
4. Advance digital literacy and inclusion.

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## LANGLADE COUNTY MISSION STATEMENT AND GOALS

### **Mission Statement**

“Expand broadband infrastructure including fiber optic cable and tower broadcasting to maximize coverage and provide affordable service opportunities throughout Langlade County”

### **Goals (in order of priority)**

1. In recognition of infrastructure need and importance of broadband infrastructure to emergency and health services, **support establishment direct of fiber connections to all Fire, Rescue, Police and Health Service Addresses** in Langlade County with goal of 100 mbps download speeds and 20 mbps upload speeds at those buildings.
  - a. Prioritize service to fire and rescue buildings in all communities prior to replication within any individual community where any individual project cannot provide service to multiple buildings.
  - b. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
  - c. Provide free public hotspots at emergency and health service locations to allow a public access for use by those unable to afford or unable to attain home service.
2. In recognition of infrastructure need and importance of broadband infrastructure to local government services including County, City, Village and Township offices and road departments, **support establishment of direct fiber connections to all**

- County, City, Village and Township Administration Offices, Road Departments and Community Buildings** in Laclede County with goal of 100 mbps download speeds and 20 mbps upload speeds at those buildings.
- a. Prioritize service to Government Administration offices in all communities prior to replication within any individual community where any individual project cannot provide service to multiple buildings.
  - b. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
  - c. Provide free public hotspots at Government Office locations to allow a public access for use by those unable to afford or unable to attain home service.
3. In recognition of infrastructure need and importance of broadband infrastructure to education including schools and libraries, support establishment of direct fiber connections to **School District Offices, Buildings and Public libraries** in Laclede County with goal of 100 mbps download speeds and 20 mbps upload speeds at those buildings.
- a. Prioritize service to School District offices in all communities prior to replication within any individual community where individual projects cannot provide service to multiple buildings.
  - b. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
  - c. Provide free public hotspots at school and library locations to allow a public access for use by those unable to afford or unable to attain home service.
4. To extend broadband capabilities to area where fiber optic cable installation is infeasible due to low customer numbers, support establishment of extended high capacity fiber optic distribution lines **to current transmission towers** throughout the County.
- a. Prioritize towers which provide fee free placement of emergency response communications and repeaters on the towers.
  - b. Prioritize to unserved and underserved communities at current tower locations with data showing maximum line of sight coverage to the largest number of addresses. Service as provided by tower transmissions must provide a minimum of 25 mbps download and 10 mbps upload speeds to all residents within the line of sight.
  - c. Prioritize areas where cost of services available exceed \$120 per month for broadband service of 25 mbps download speeds or less as demonstrated through countywide speed testing data.
  - d. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.

5. To extend broadband capabilities to area where fiber optic cable installation is infeasible due to low customer numbers, support **development and establishment of new transmission towers and new short run high capacity fiber optic distribution lines** throughout the County. Service as provided by tower transmissions must provide a minimum of 25 mbps download and 10 mbps upload speeds to all residents within the line of sight.
  - a. Prioritize towers which provide fee free placement of emergency response communications and repeaters on the towers.
  - b. Prioritize to unserved and underserved communities at tower locations with data showing maximum line of sight coverage to the largest number of addresses.
  - c. Prioritize areas where cost of services available exceed \$120 per month for broadband service of 25 mbps download speeds or less as demonstrated through countywide speed testing data.
  - d. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
6. Support establishment of extended **high capacity fiber optic distribution lines directly to established business locations** throughout the County.
  - a. Prioritize to unserved and underserved communities first.
  - b. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
  - c. Prioritize areas where cost of services available exceed \$120 per month for broadband service of 25 mbps download speeds or less as demonstrated through countywide speed testing data.
7. Support establishment of extended high capacity fiber optic distribution lines **directly to established residential locations** throughout the County.
  - a. Prioritize to unserved and underserved communities first.
  - b. Prioritize upgrade of lowest speed services first as demonstrated through established countywide speed testing data.
  - c. Prioritize areas where cost of services available exceed \$120 per month for broadband service of 25 mbps download speeds or less as demonstrated through countywide speed testing data.
8. Support establishment loops of high capacity fiber optic distribution lines within Langlade County to provide redundant services which would limit broadband interruptions could result from damage to a single fiber line without redundant connections.

# CHAPTER 8

## Recommendations and Conclusion

# 8. RECOMMENDATIONS AND CONCLUSION

## RECOMMENDATIONS

Comprehensive strategies are needed to address gaps in broadband infrastructure, affordability, and adoption. Below are recommendations for bridging these gaps:

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### INFRASTRUCTURE INVESTMENT

Investing in infrastructure is crucial for improving broadband access and connectivity. Broadband funding, including BEAD and other available sources, presents significant opportunities for the expansion of high-speed internet access in Langlade County. Here are recommendations for governments and organizations looking to invest in broadband infrastructure:

#### 1. Assessment and Planning:

- Utilize current assessment of broadband infrastructure and coverage to fully understand broadband gaps.
- Collaborate with Internet Service Providers (ISPs) to expand broadband services to high-priority areas, residents, and businesses within Langlade County. Consider submitting a “Request for Information (RFI)” to learn more about ISPs services and their plans.
- Understand the physical broadband technologies that can best meet the needs of the community (Ex. Fiber, DSL, Fixed Wireless, etc.). Each solution will be influenced by factors such as: available infrastructure and broadband providers, capital costs, topography, potential sources of interference, current community adoption, and existing and future broadband needs. For example, DSL may be effective up to 2-3 miles maximum, while fixed wireless towers may be effective up to 5-10 miles if there is a good line of sight.
- Consider the allocation of funding for broadband infrastructure development in areas that first prioritize “unserved” areas and then “underserved” rural areas.
- Utilize relevant data and maps to position the community for potential grant projects.
- Keep informed about current funding opportunities, including the Bead program, along with details and deadlines for applying for grants.

#### 2. Public Awareness and Engagement

- Continue to engage the Langlade Broadband Committee and ensure that they are actively involved in decision-making.

- Compile a list of Community Anchor Institutions (CIAs), who will be needed to provide letters of support. CIAs are organizations and entities that play a vital role in their communities by providing essential services and resources. These institutions typically serve as hubs for education, healthcare, and various community services.
  - Involve the community in the decision-making process by conducting public forums and awareness campaigns. Engaged citizens are more likely to support and participate in broadband infrastructure development.
3. Remove Barriers
- Adopt dig-once and joint trench-use policies and ordinances. Require that conduit or fiber installation will be allowed in R-O-W and require related notification.
  - Adopt public rights-of-way policies that waive fees or expedite use for broadband installation.
  - Adopt tower ordinances that allow agreements for the installation/cp-locating of antennae and equipment.
  - Amend zoning, subdivision, and design review ordinances to consider, encourage, or require the installation of broadband. Potentially include design plates or cross-sections with standards.
4. Regular Assessment and Adjustment
- Once broadband infrastructure is deployed, periodically review the effectiveness of infrastructure investments, and adjust as needed. Encourage residents to continue taking speed tests.

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## PROMOTE AFFORDABLE BROADBAND

1. Public Awareness and Engagement
- Promote the PSC's Internet Discount Finder which provides resources that support affordable access to broadband.
  - Utilize the (ACP) government outreach toolkit.
  - Raise awareness about these programs through advertising, both online and offline. Use social media, newspapers, radio, and TV to reach a wide audience.
  - Partner with community centers, schools, libraries, and local nonprofits to spread the word. They can assist in reaching specific demographics.
  - Engage local government officials to endorse and support affordability programs. They can help with funding, resources, and promotion.
2. Tracking and Reporting
- Monitor the impact of your promotion efforts through analytics and data collection, adjusting strategies as needed.
  - Watch for additional funding for the ACP program or its successor program.

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## BROADBAND EDUCATION

### 1. Increase Digital Literacy

- Provide digital literacy training to help individuals and families navigate the internet safely and effectively.
- Organize workshops and classes at local schools, libraries, and community centers.
- Partner with local organizations to deliver training programs.

### 2. Raise Awareness

- Create public awareness campaigns about the advantages of broadband access, such as education, job opportunities, healthcare, and entertainment.
- Highlight success stories of individuals and communities that have benefited from broadband.

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## IMPLEMENTATION

1. Designate a point of contact who can help facilitate the next steps and communicate directly with ISPs.
2. Work with and support ISP efforts to expand broadband infrastructure.
3. Pursue additional broadband funding opportunities and watch for updates to the Affordable Connectivity Program.
4. Utilize this report to inform future broadband efforts.



## CONCLUSION

This broadband plan outlines a strategy for the deployment and expansion of high-speed internet access within a specific region or community. Typically, such a plan includes key components like an assessment of current broadband infrastructure and demand, identification of funding sources and financial strategies, mapping of coverage gaps, and goals for improving connectivity. It often involves collaboration between public and private sectors, aiming to enhance digital inclusion and equitable access to the internet. Broadband plans play a crucial role in addressing the digital divide and promoting economic growth and innovation by ensuring that robust internet connectivity reaches all residents and businesses within the target area.

The digital age has ushered in a world of opportunities, but millions are still left on the wrong side of the digital divide, unable to access the benefits of high-speed internet. Now, it's time to act and change that. The information in this plan is intended to help the county engage internet service providers and leverage BEAD funding to help make good decisions to benefit citizens of Langlade County with expanded high-speed broadband expansion.





# ATTACHMENTS

A. Broadband Maps

B. PSC Broadband Summary

C. Internet Service Providers

D. Additional Resources

E. Glossary

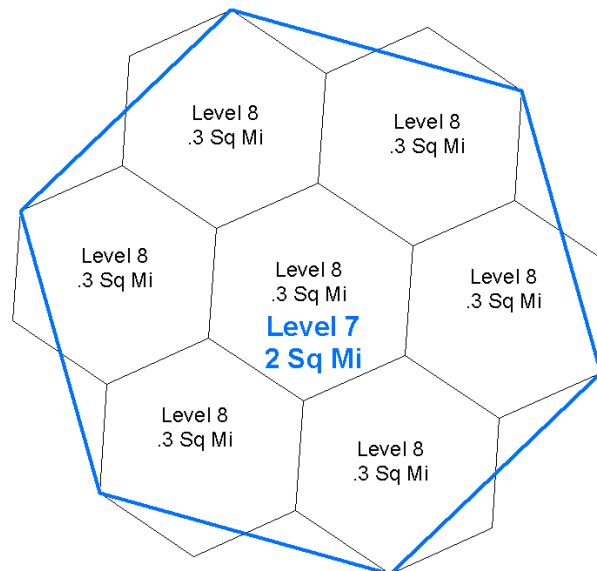
F. Resolutions

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## A. BROADBAND MAPS

## Mapping Process

Much of the data on the maps are displayed using hexbin geometry used on the FCC broadband maps. The FCC collected data from providers on coverage and broadband type by this geometry. Level 7 is 2 square miles in size and Level 8 is .3 square miles in size. See the graphic below.



### Map 1- Broadband Serviceable Locations (BSL)

Summary of development patterns and density. Centroids of tax parcels with improvement values greater than zero were summarized within level 8 hexbins. Summary of the total number of centroids counted by hexbins displayed on the map.

### Map 2a - Managed Forest Lands (MFL)

Summary of large areas of managed forest lands. Tax parcels coded in a MFL programs were union with hexbins level 8. If greater than 75% of the area of hexbins level 8 was in MFL they are displayed on the map

### Map 2b – Assessed Agricultural Lands

Summary of large areas of assessed agricultural lands. Tax parcels coded with an assessment code of agriculture were in union with hexbins level 8. If greater than 25% of the area of hexbins level 8 was assessed agriculture, they are displayed on the map.

## Map 2c – Assessed Tax Exempt Lands

Summary of large areas of tax-exempt lands. Tax parcels coded with an assessment code for tax-exempt status were union with hexbins level 8. If greater than 50% to 75% and greater than 75% of the area of hexbins 8 was assessed tax exempt are displayed on the maps

## Map 3 – Critical Facilities

Summary of critical facilities. Airports, Ambulance Service, Fire Stations, Hospitals, Health Services, Business and Industrial Parks, Campgrounds, city, village, and town facilities, schools, correctional facilities, DNR Ranger Stations, Emergency Operation Centers, Libraries, Nursing Homes, Post Offices, and Tech Colleges. Summarized within hexbins level 7.

## Map 4a- Rural Digital Opportunity Fund (RDOF)

Census blocks of areas covered by the Rural Digital Opportunity Fund program. Provided to areas that lacked 25/3 Mbps fixed broadband service. 40 percent deployment by 2025, 60 percent by 2026, 80 percent by 2027, and 100 percent by 2028.

## Map 4b- Existing Grant Areas

Wisconsin Public Service (WPS) existing broadband grant footprint locations 2014 to 2022

## Map 5a- Broadband Availability Copper

Summary of FCC reported copper broadband availability. Copper broadband refers to a type of internet connection that utilizes copper-based infrastructure, primarily copper telephone lines, to deliver internet services to users' homes or businesses. The most common technology associated with copper broadband is Digital Subscriber Line (DSL). DSL technology enables the simultaneous transmission of voice and data signals over the same copper line by utilizing different frequency bands. DSL comes in different variants, such as ADSL (Asymmetric DSL) and VDSL (Very-high-bit-rate DSL), offering varying speeds and capabilities. Areas reported at level 8 hexbins.

## Map 5b- Broadband Availability Cable

Summary of FCC reported cable broadband availability. Cable internet, also known as broadband cable or cable broadband, refers to a high-speed internet connection that utilizes the same coaxial cable infrastructure that delivers cable television signals to homes and businesses. This type of internet connection offers faster speeds compared to traditional dial-up and DSL (Digital Subscriber Line) connections. Areas reported at level 8 hexbins.

## Map 5c- Broadband Availability Fiber

Summary of FCC reported fiber broadband availability. Fiber internet, also known as fiber-optic internet, is a high-speed broadband internet connection that utilizes fiber-optic cables to transmit data at incredibly fast speeds. Fiber-optic technology employs thin strands of glass or plastic fibers to carry digital information as pulses of light, enabling faster and more reliable data transmission compared to traditional copper-based cables. Areas reported at level 8 hexbins.

## Map 5d- Broadband Availability Fixed Wireless

Summary of FCC reported fixed wireless broadband availability. Fixed wireless broadband is a type of high-speed internet connection that utilizes wireless communication technology to provide internet access to homes, businesses, and other locations. Unlike mobile wireless connections, which are designed for on-the-go access, fixed wireless connections are stationary and provide consistent connectivity to a specific location. Areas reported at level 8 hexbins.

## Map 5e- Broadband Availability Mobile

Summary of FCC reported mobile broadband availability. Mobile broadband refers to high-speed internet access provided through wireless networks, enabling users to connect to the internet using mobile devices such as smartphones, tablets, laptops, and other portable devices. Unlike fixed broadband connections, which are typically stationary and serve specific locations, mobile broadband provides on-the-go connectivity, allowing users to access the internet from virtually anywhere within the coverage area of a mobile network. 4G and 5G areas are summarized at hexbins level 7 hexbins.

## Map 6- Average Download Speeds (may split 6a and 6b for Fixed and Mobile)

Information was collected from wisconsinspeedtest.net and Ookla Open Data speed tests. These areas are summarized at level 7 hexbins. Areas that reported no service are highlighted.

## Map 7- Average Upload Speeds (may split 7a and 7b for Fixed and Mobile)

Information was collected from wisconsinspeedtest.net and Ookla Open Data speed tests. These areas are summarized at level 7 hexbins.

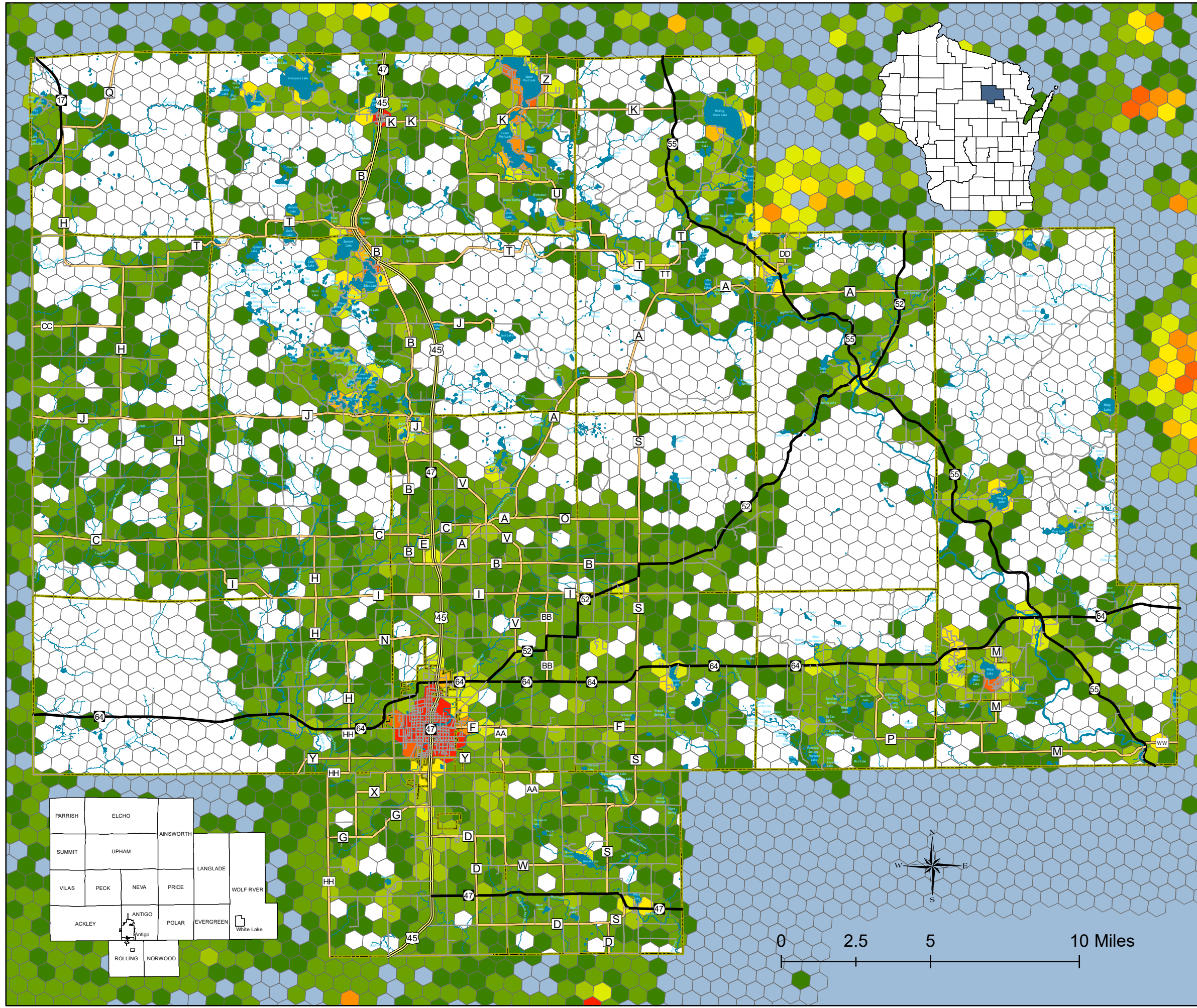
## Map 8- Recommended Broadband Expansion Areas

Areas determined by existing data and committee input for potential project locations.



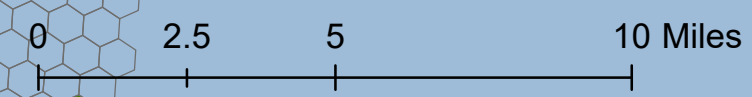
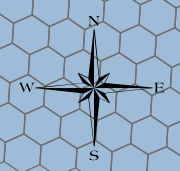
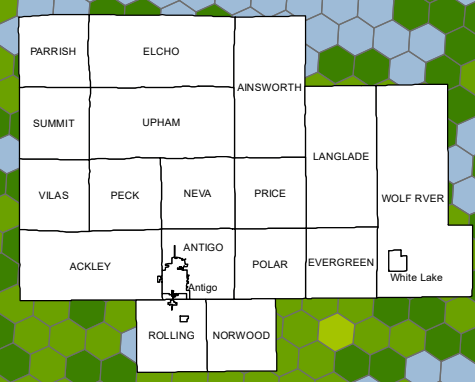
Map 1 **DRAFT**  
**Broadband Serviceable Locations (BSL)**

Langlade County, Wisconsin



Minor Civil Divisions  
 U.S. Highway  
 State Highway  
 County Highway  
 Local Road  
 Water  
**BSL Count**  
 0  
 1 - 2  
 3 - 10  
 11 - 20  
 21 - 30  
 31 - 40  
 41 - 50  
 51 - 75  
 76 - 99  
 > 100

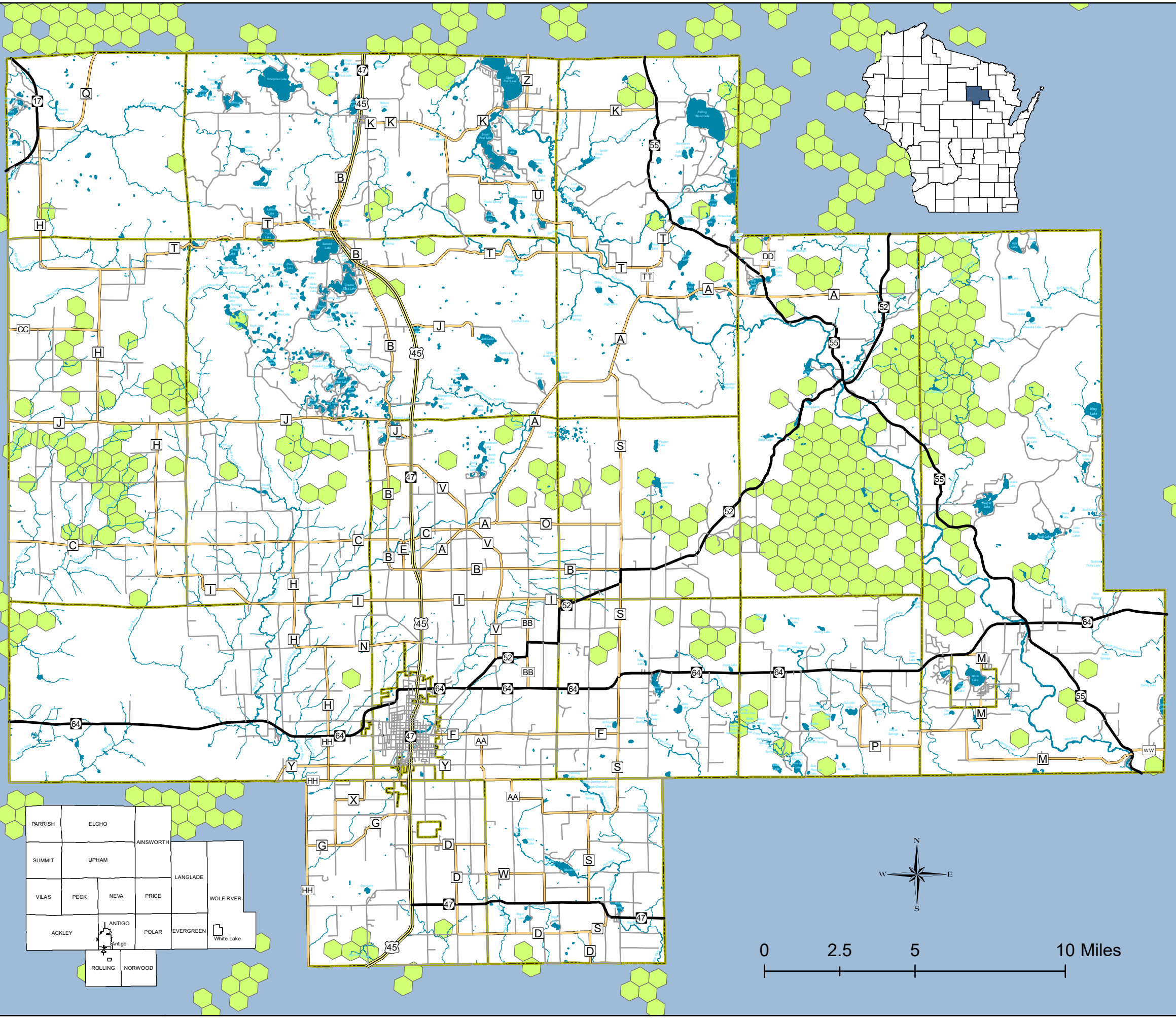
Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
 This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



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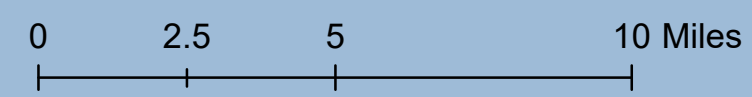
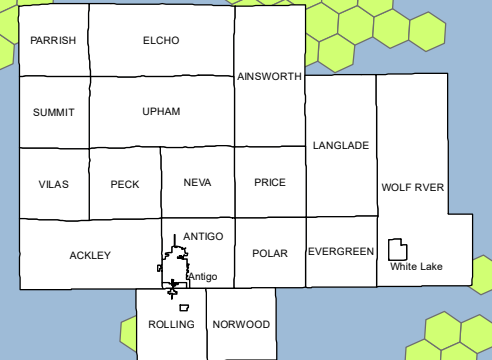
Map 2a **DRAFT**  
**Managed Forest Lands (MFL)**

Langlade County, Wisconsin



- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water
- > 75 % MFL

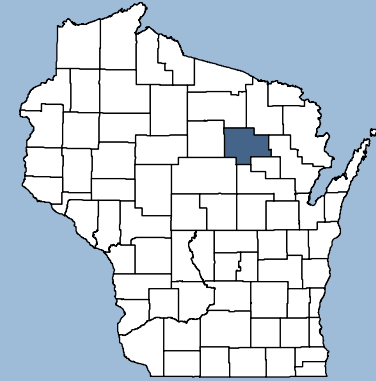
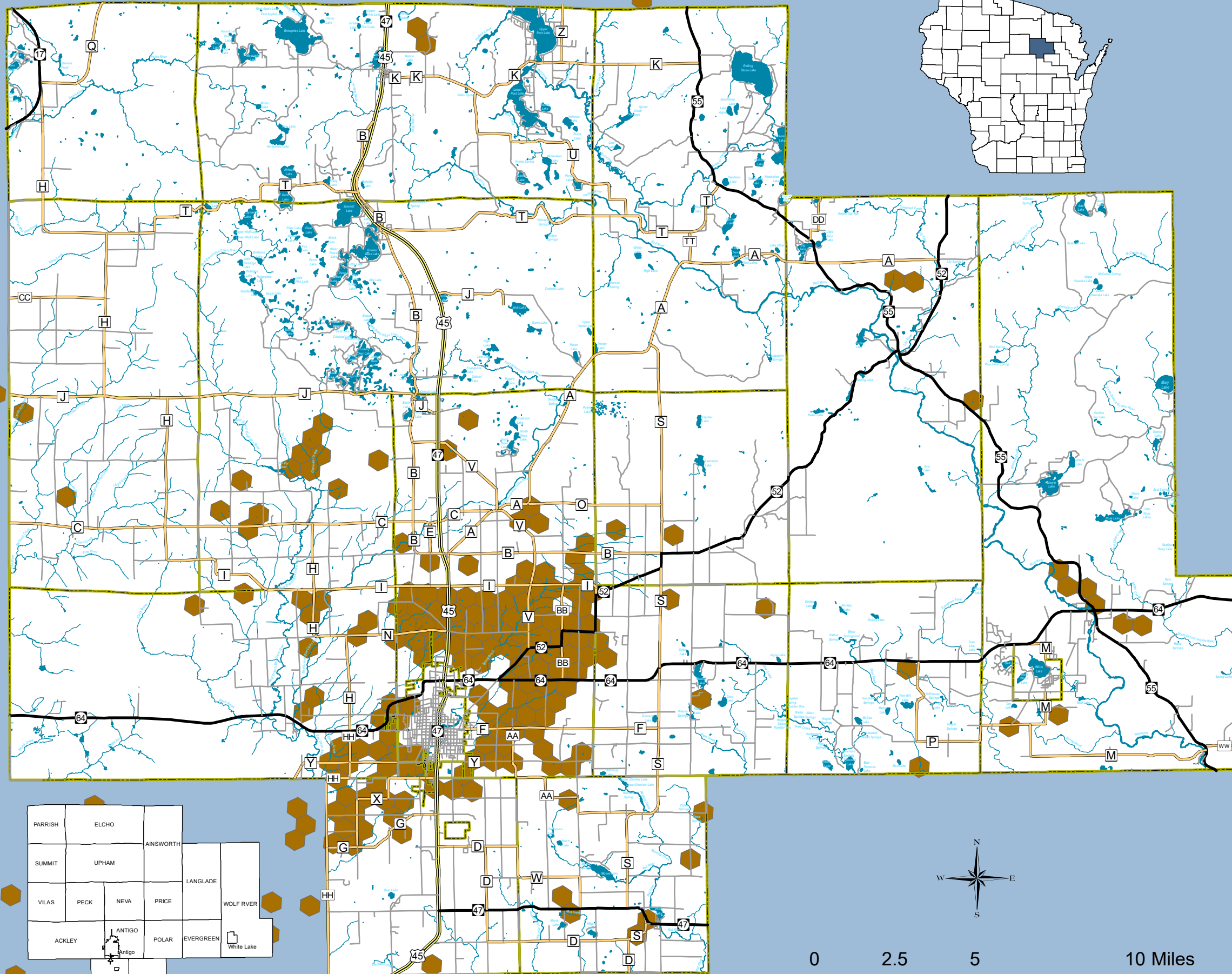
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Map 2b **DRAFT**  
**Assessed Agricultural Lands**

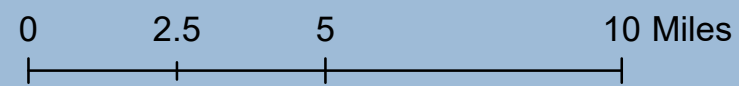
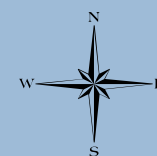
Langlade County, Wisconsin



-  Minor Civil Divisions
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Water
-  > 25%

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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PARRISH	ELCHO	ANSWORTH		
SUMMIT	UPHAM		LANGLADE	
VILAS	PECK	NEVA	PRICE	WOLF RIVER
ACKLEY	ANTIGO	POLAR	EVERGREEN	White Lake
ROLLING	NORWOOD			

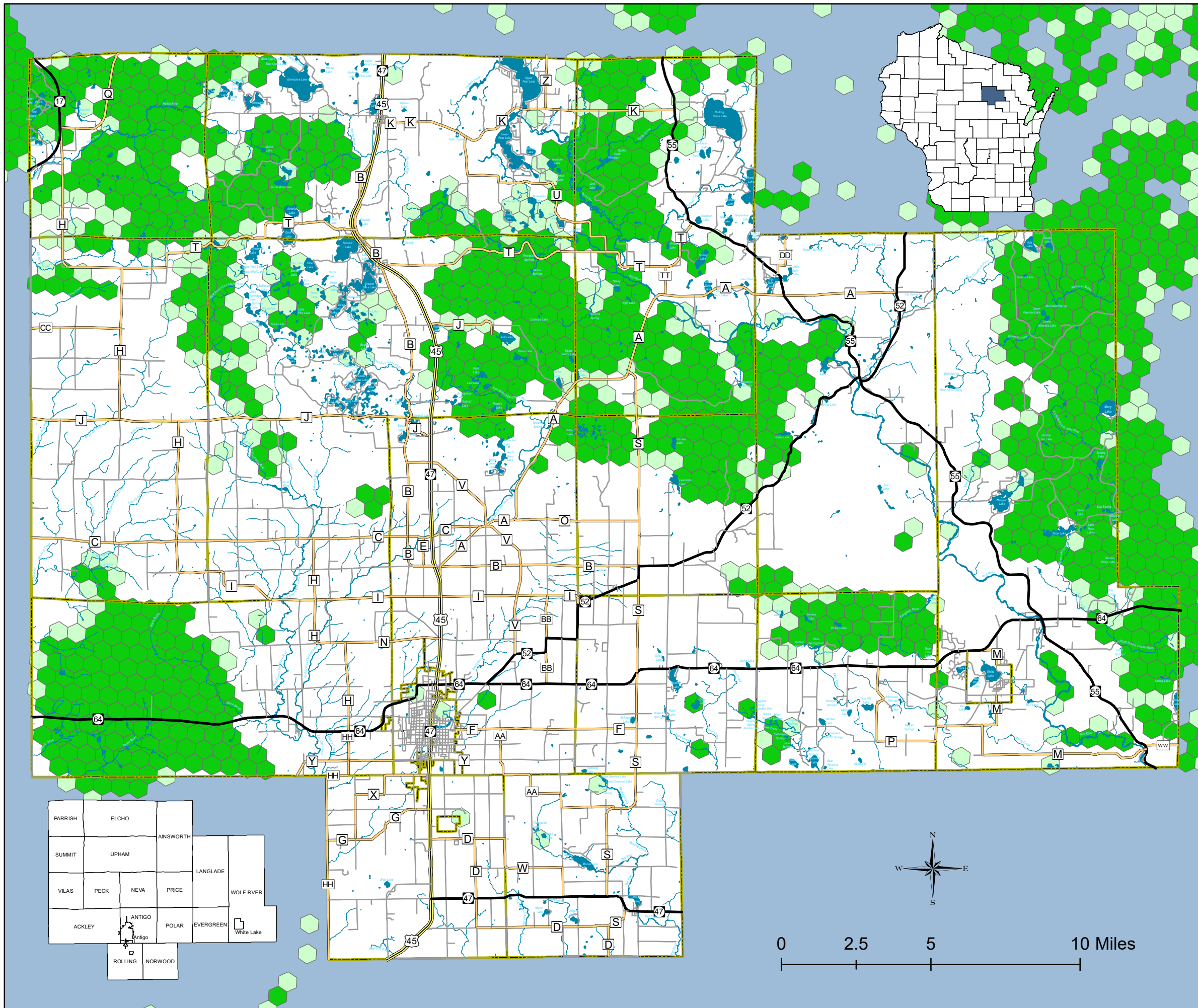


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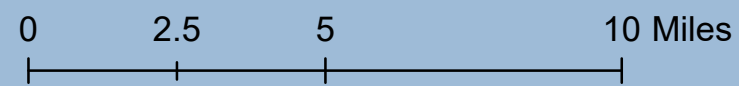
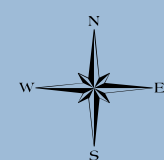
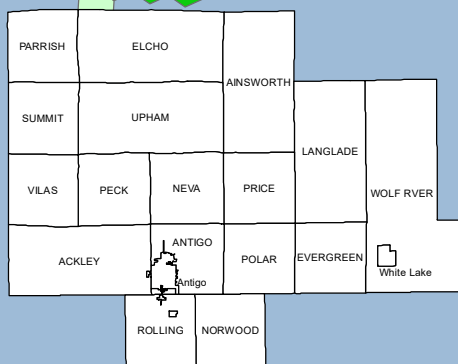
Map 2c **DRAFT**  
**Assessed Tax Exempt  
 Lands**

Langlade County, Wisconsin



- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water
- 50 to 75%
- > 75%

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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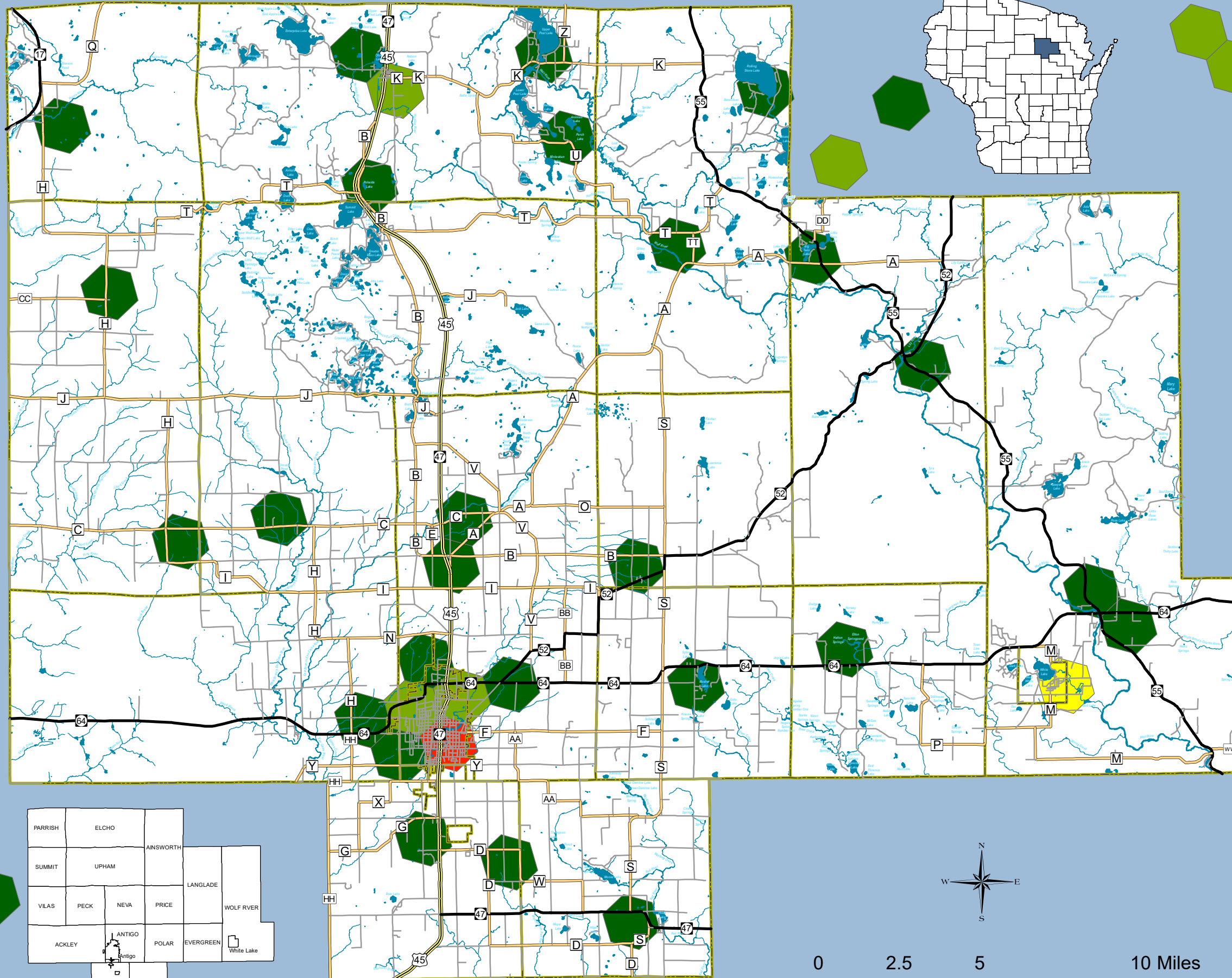


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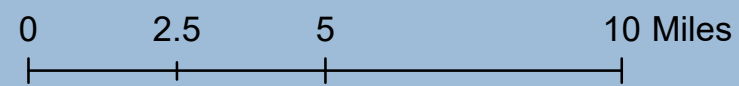
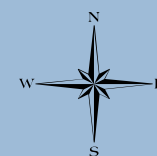
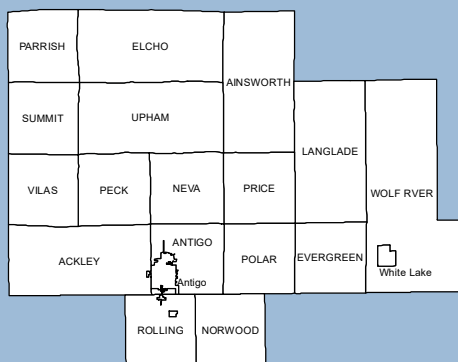
Map 3 **DRAFT**  
Critical Facilities

Langlade County, Wisconsin



	Minor Civil Divisions
	U.S. Highway
	State Highway
	County Highway
	Local Road
	Water
<b>Count</b>	
	1 - 2
	3 - 5
	6 - 8
	9 - 12
	13 - 20

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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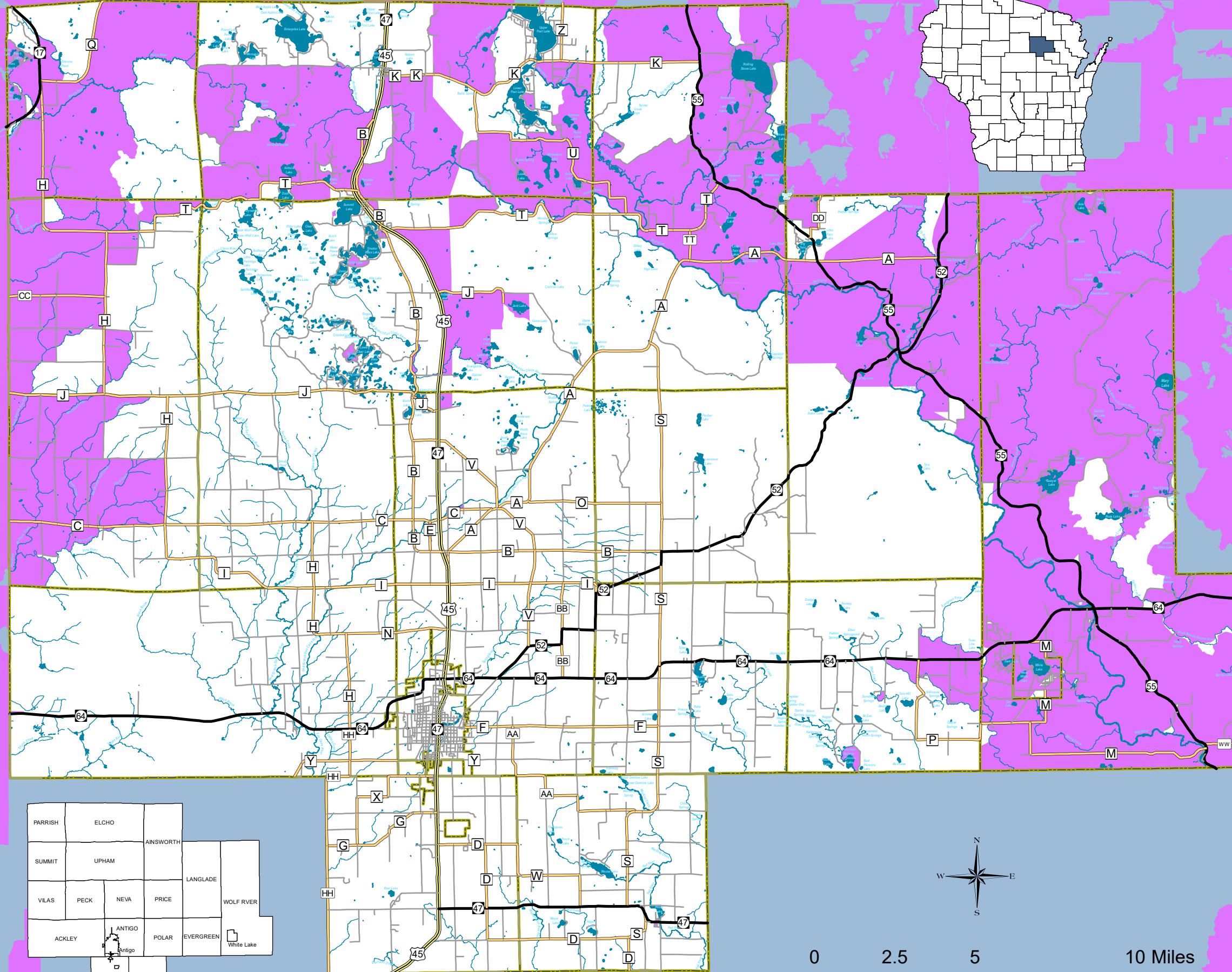


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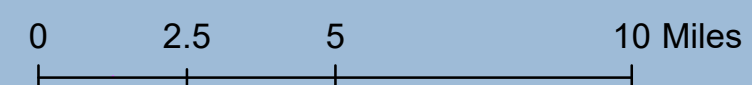
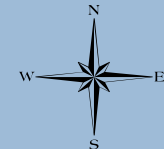
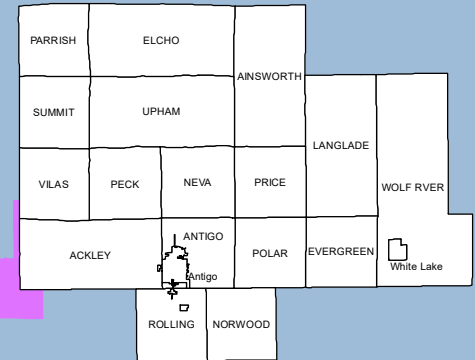
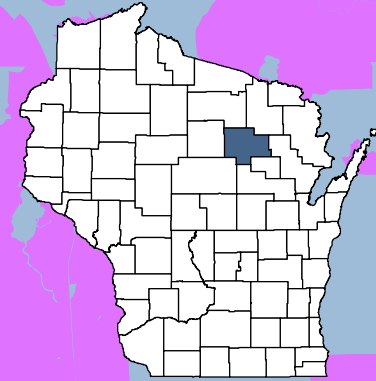
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Map 4a **DRAFT**  
**Rural Digital Opportunity Fund (RDOF)**

Langlade County, Wisconsin



- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water
- RDOF Areas

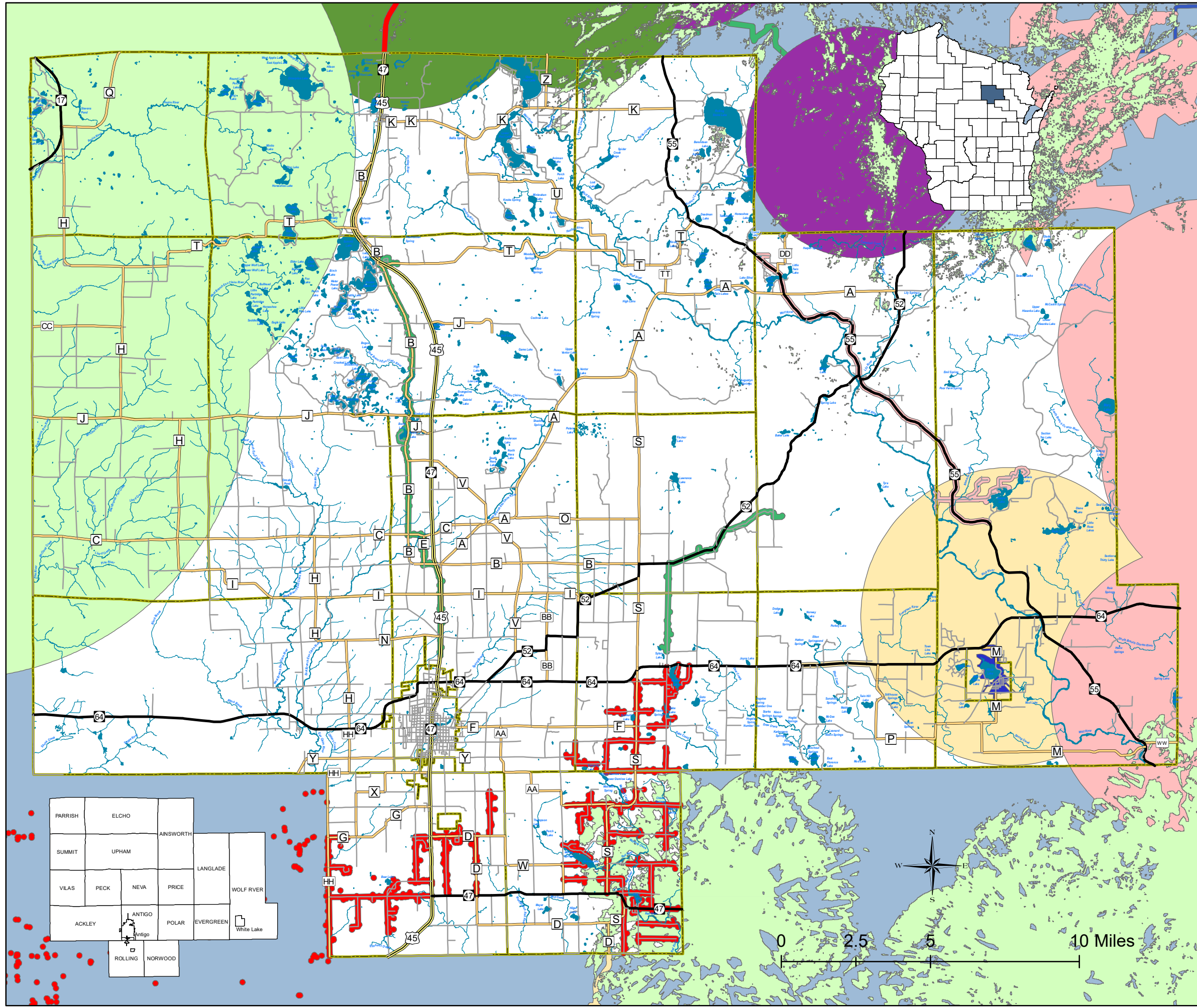


Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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Map 4b **DRAFT**  
**Existing Grant Areas**

Langlade County, Wisconsin

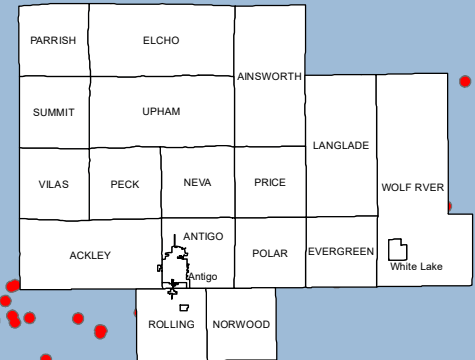


- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water

**Grant Round**

- No Year Noted
- 2015
- 2016
- 2017
- 2018, Round 1
- 2018, Round 2
- 2019
- 2020
- 2022 ARPA

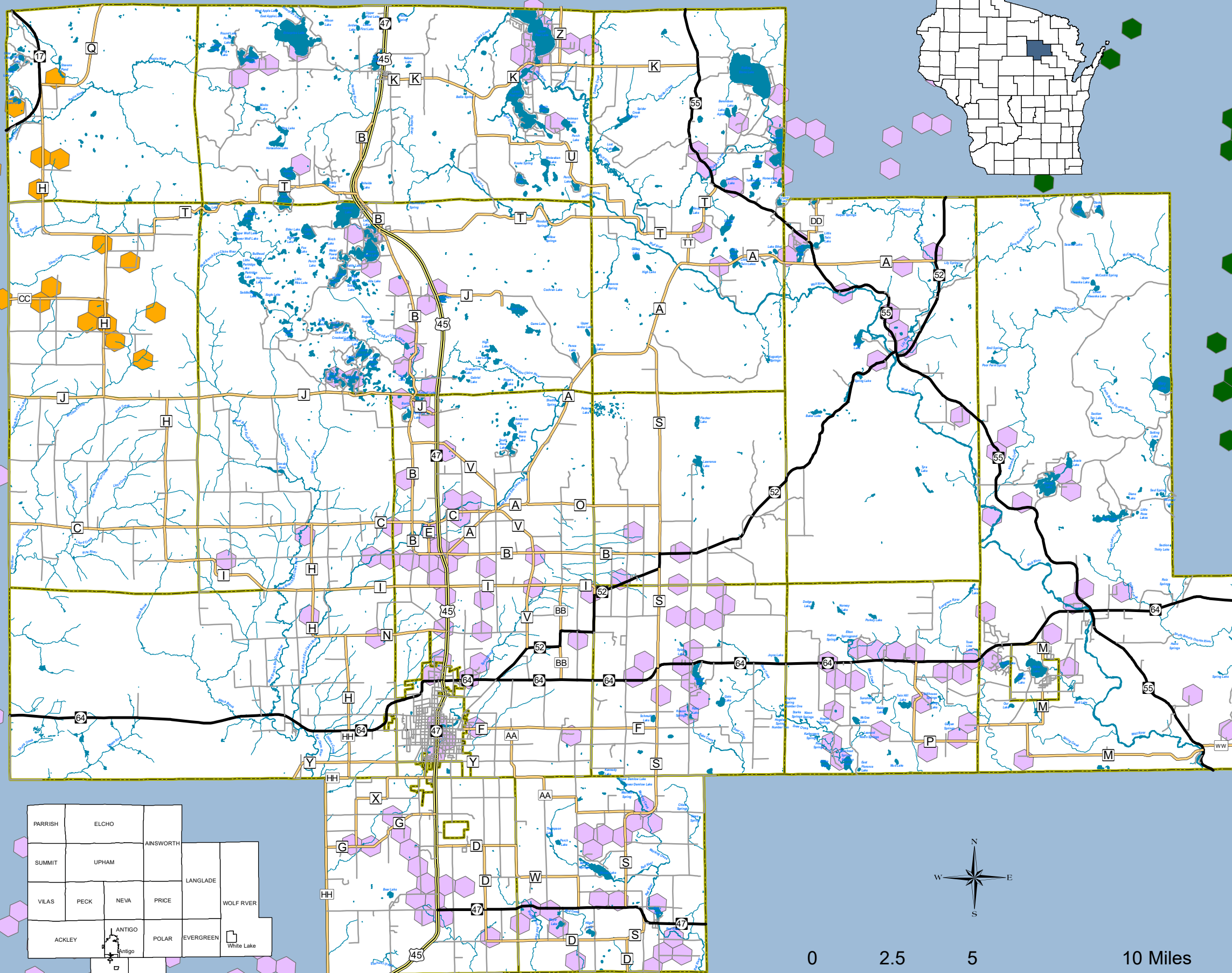
Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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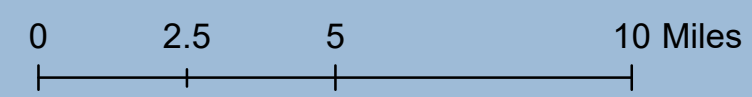
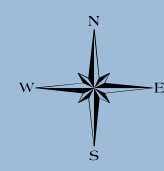
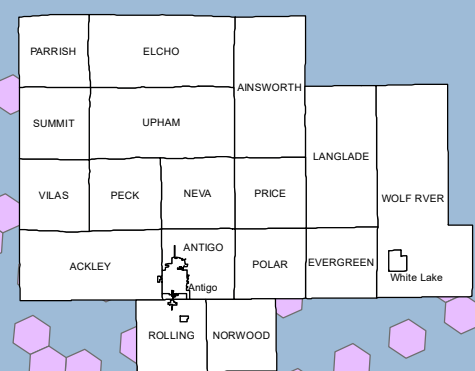
Map 5a **DRAFT**  
**Broadband Availability**  
**Copper**

Langlade County, Wisconsin



	Minor Civil Divisions
	U.S. Highway
	State Highway
	County Highway
	Local Road
	Water
<b>Copper Provider</b>	
	Brightspeed
	CenturyLink
	Frontier

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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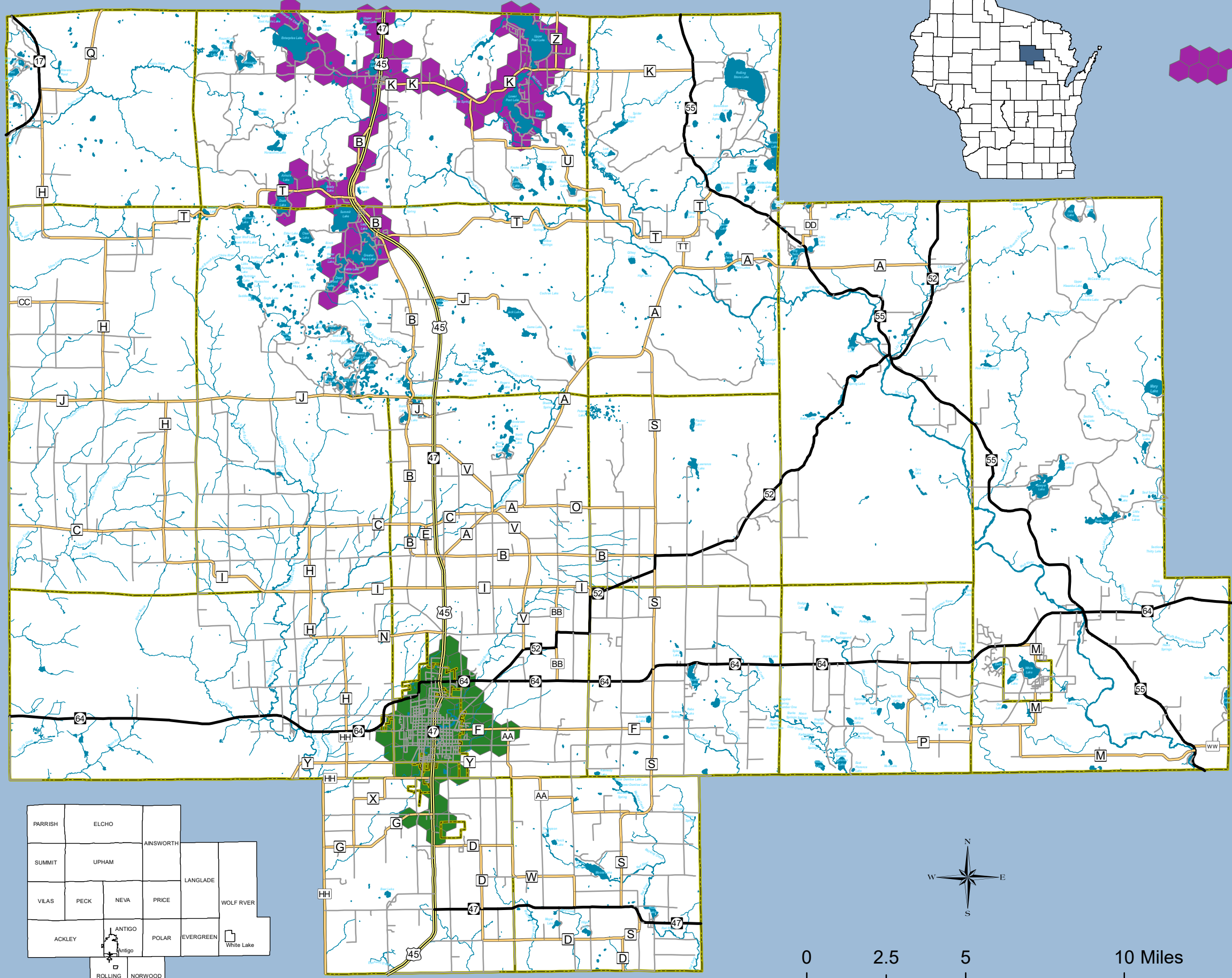
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**Wisconsin Regional**  
**Planning Commission**

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Map 5b **DRAFT**  
**Broadband Availability**  
**Cable**

Langlade County, Wisconsin



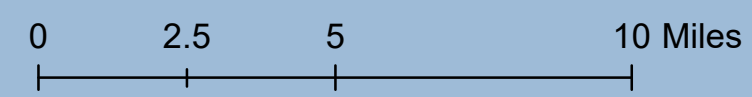
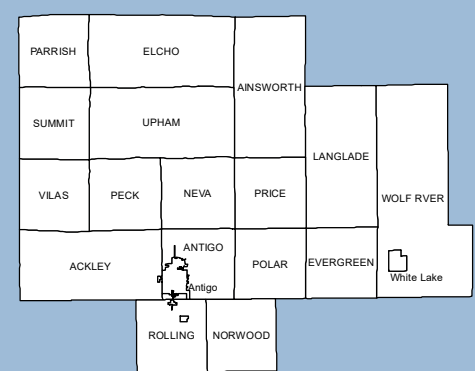
**Minor Civil Divisions**

- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water

**Cable Provider**

- Astrea
- Charter Communications Inc

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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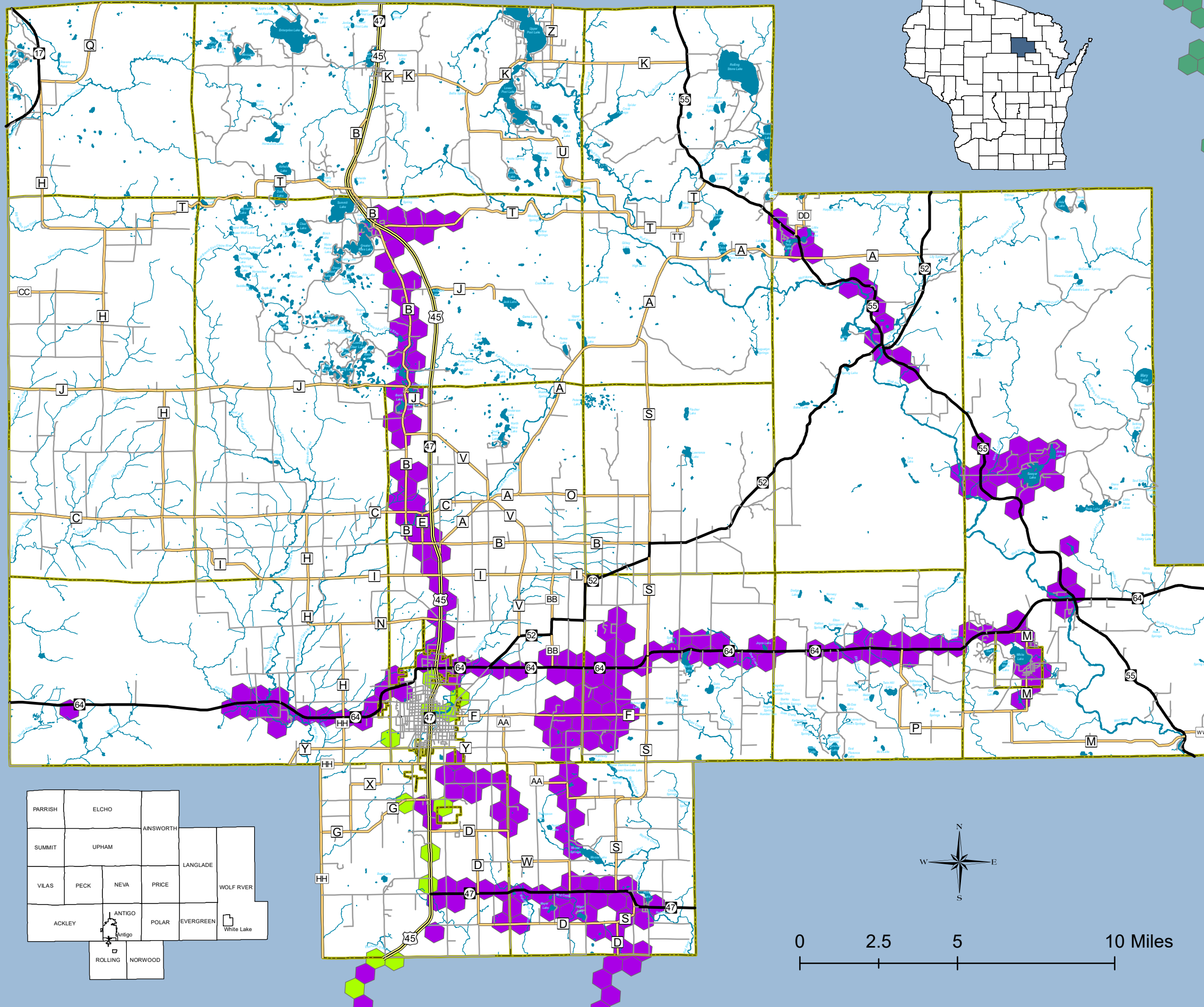











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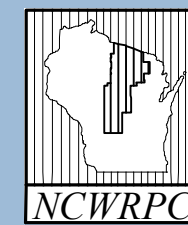
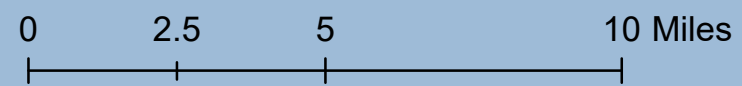
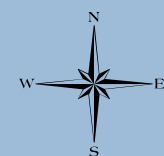
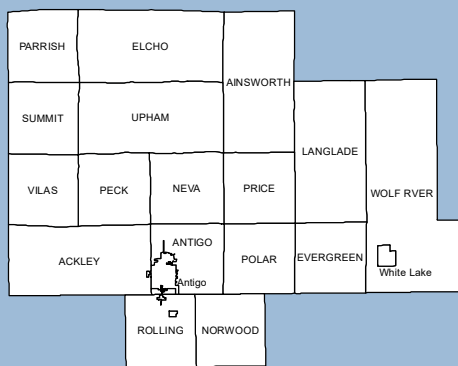
Map 5c **DRAFT**  
**Broadband Availability**  
**Fiber**

Langlade County, Wisconsin



 Minor Civil Divisions  
 U.S. Highway  
 State Highway  
 County Highway  
 Local Road  
 Water  
**Fiber Provider**  
 Astrea  
 Charter Communications Inc  
 Cirrinity

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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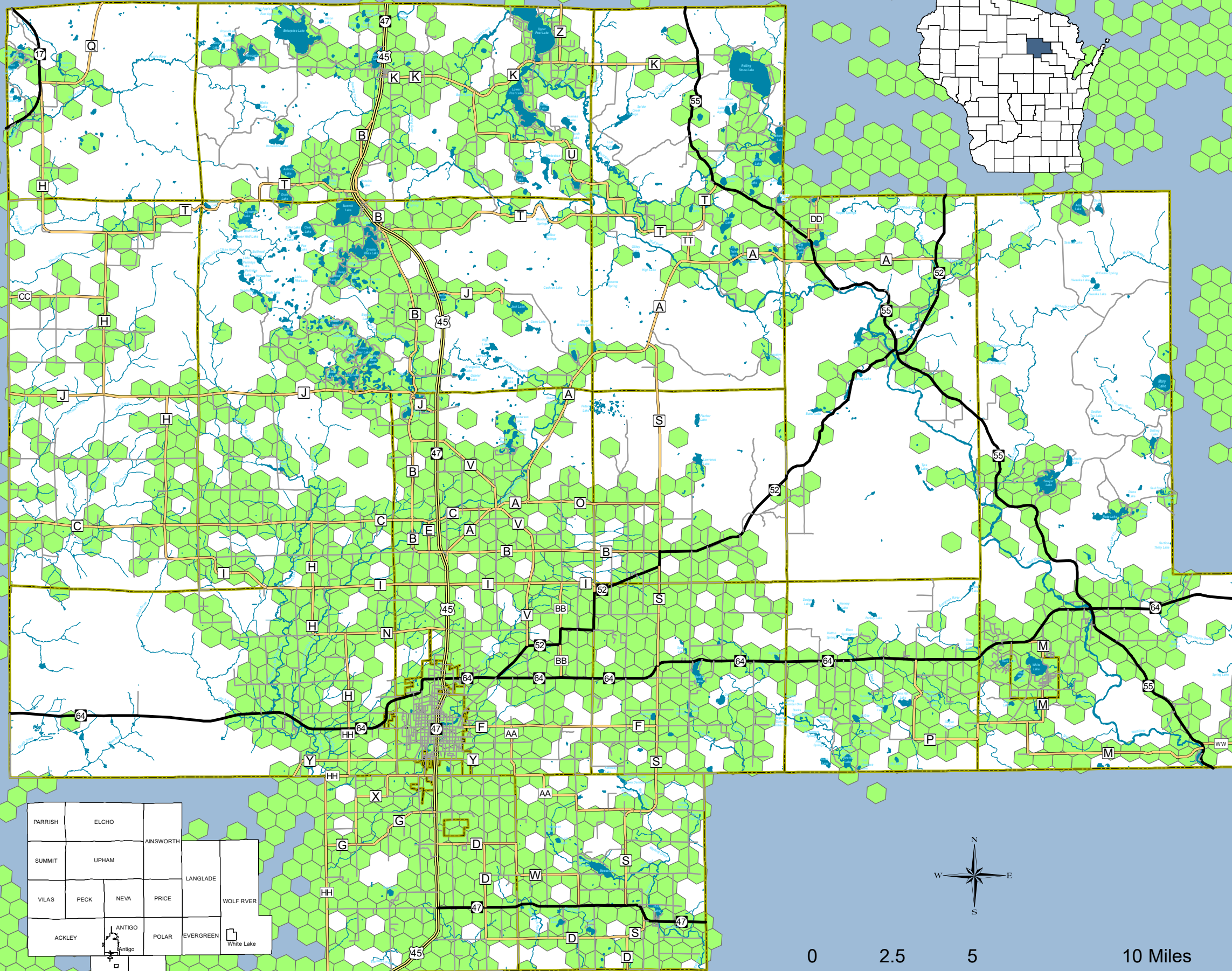
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# Broadband Availability Fixed Wireless

Langlade County, Wisconsin

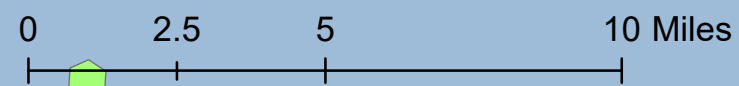
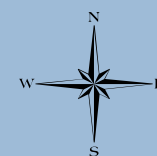
-  Minor Civil Divisions
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Water
-  Fixed Wireless Coverage



Source: WI DNR, NCWRPC, Langlade Co, WisDOT

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

PARRISH	ELCHO	ANSWORTH		
SUMMIT	UPHAM		LANGLADE	
VILAS	PECK	NEVA	PRICE	WOLF RIVER
ACKLEY	ANTIGO	POLAR	EVERGREEN	White Lake
ROLLING	NORWOOD			











Prepared By:  
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 Wisconsin Regional  
 Planning Commission**

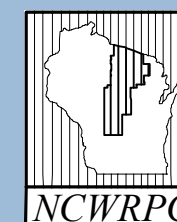
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Map 5e **DRAFT**  
**Broadband Availability**  
**Mobile**

Langlade County, Wisconsin

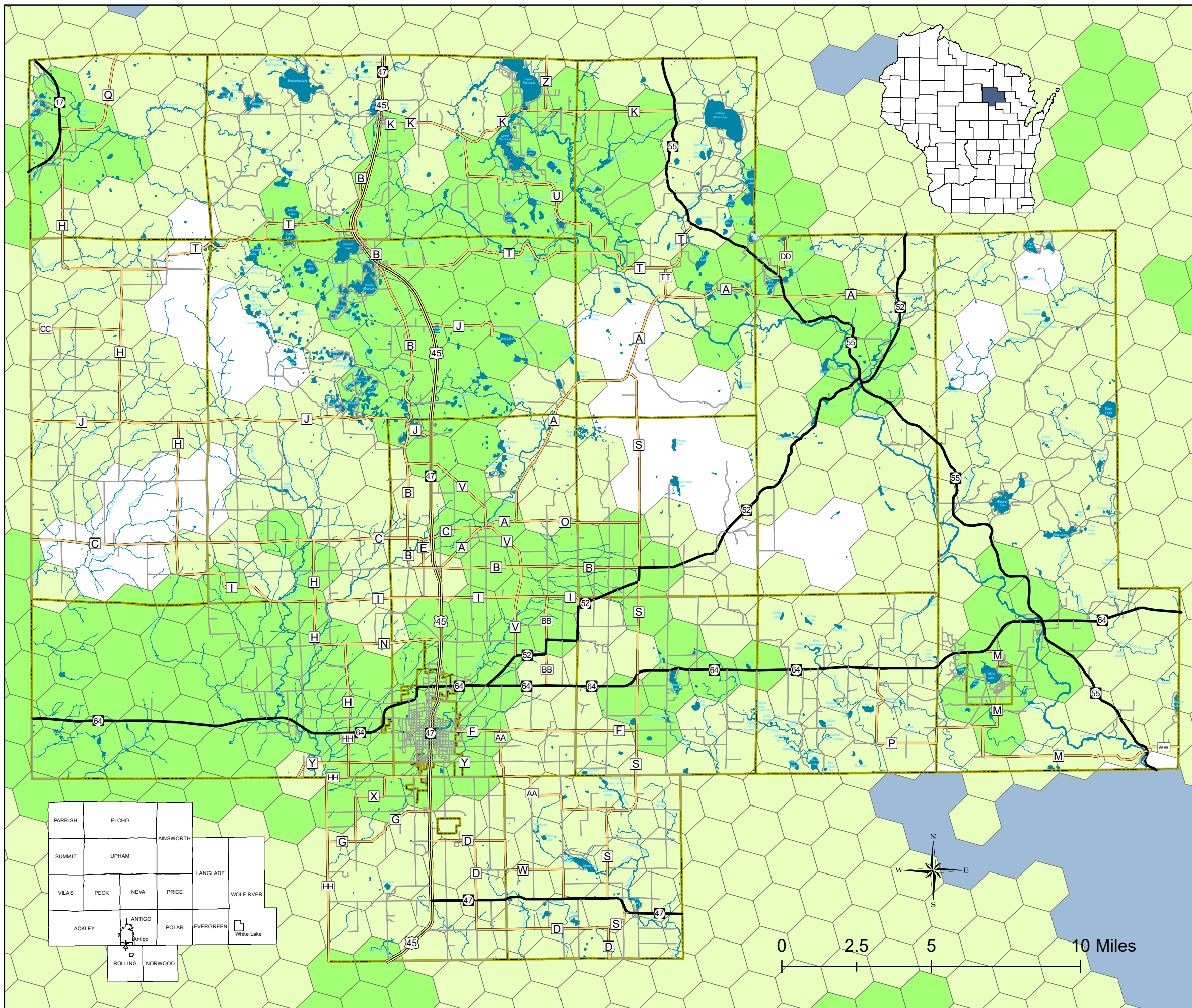
-  Minor Civil Divisions
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Water
-  5G Coverage
-  4G Coverage

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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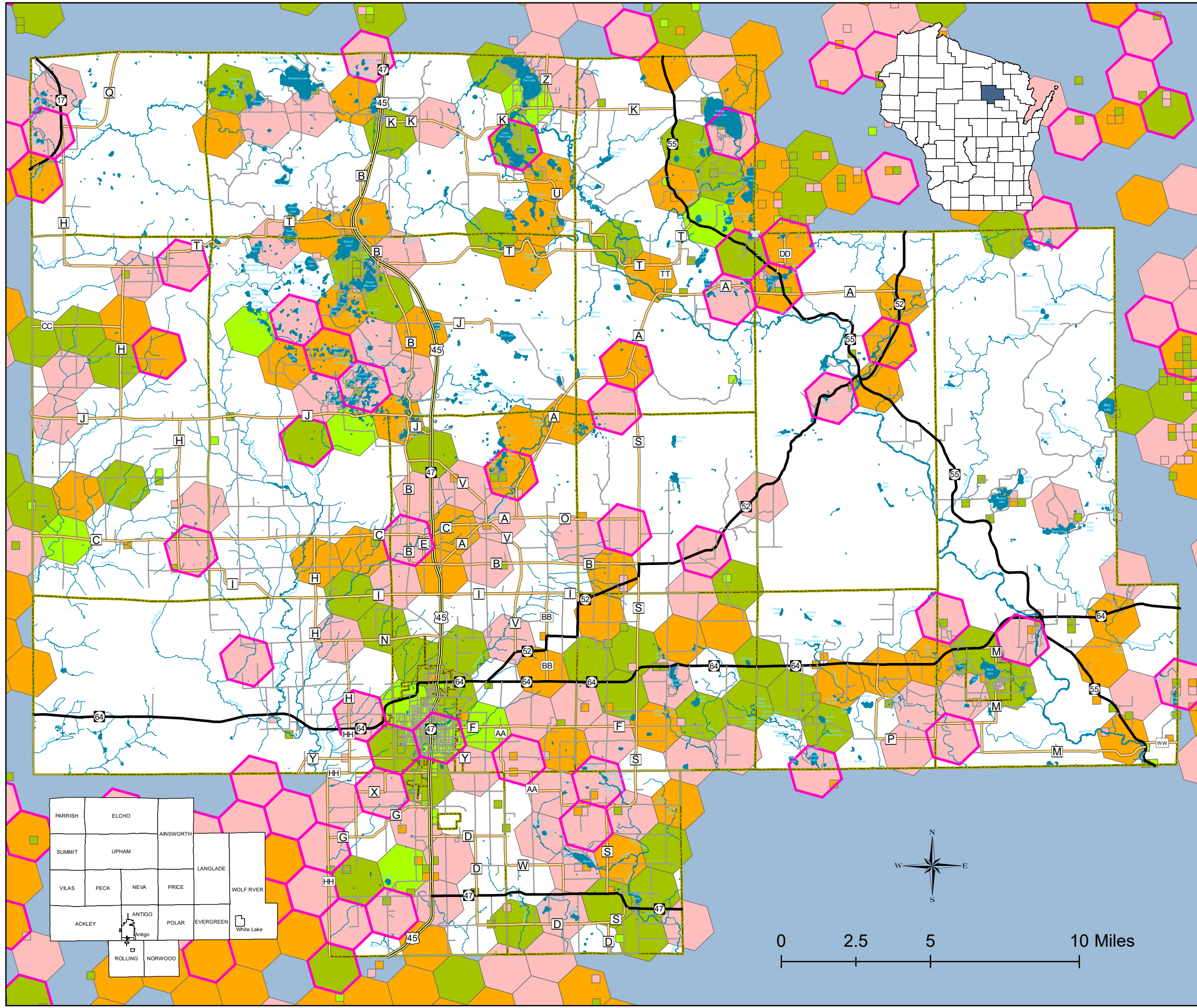
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PARRISH	ELCHO	ANSWORTH		
SUMMIT	UPHAM	LANGLADE		WOLF RIVER
VILAS	PECK	NEVA	PRICE	
ACKLEY	ANTIGO	POLAR	EVERGREEN	White Lake
ROLLING	NORWOOD			

Map 6 **DRAFT**  
**Average Download  
 Speeds**

Langlade County, Wisconsin



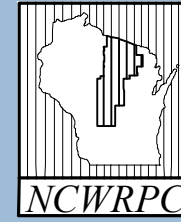
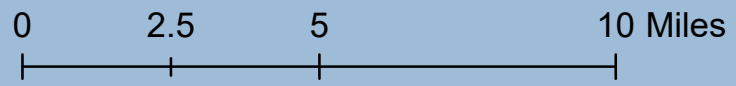
Minor Civil Divisions  
 U.S. Highway  
 State Highway  
 County Highway  
 Local Road  
 Water  
**Download Speed**  
 < 10 Mbps  
 10 to 25 Mbps  
 25 to 100 Mbps  
 > 100 Mbps  
 Reported No Service

From wisconsinsspeedtest.net - August 8, 2023  
 No service reported - Cost and or can not find a provider.

Small square test locations from Ookla speed test  
 Fixed wired only October 2022 - Open Data

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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PARRISH	ELCHO	ANSWORTH	
SUMMIT	UPHAM	LANGLADE	
VILAS	PECK	NEVA	PRICE
ACKLEY	ANTIGO	POLAR	EVERGREEN
ROLLING	NORWOOD	White Lake	

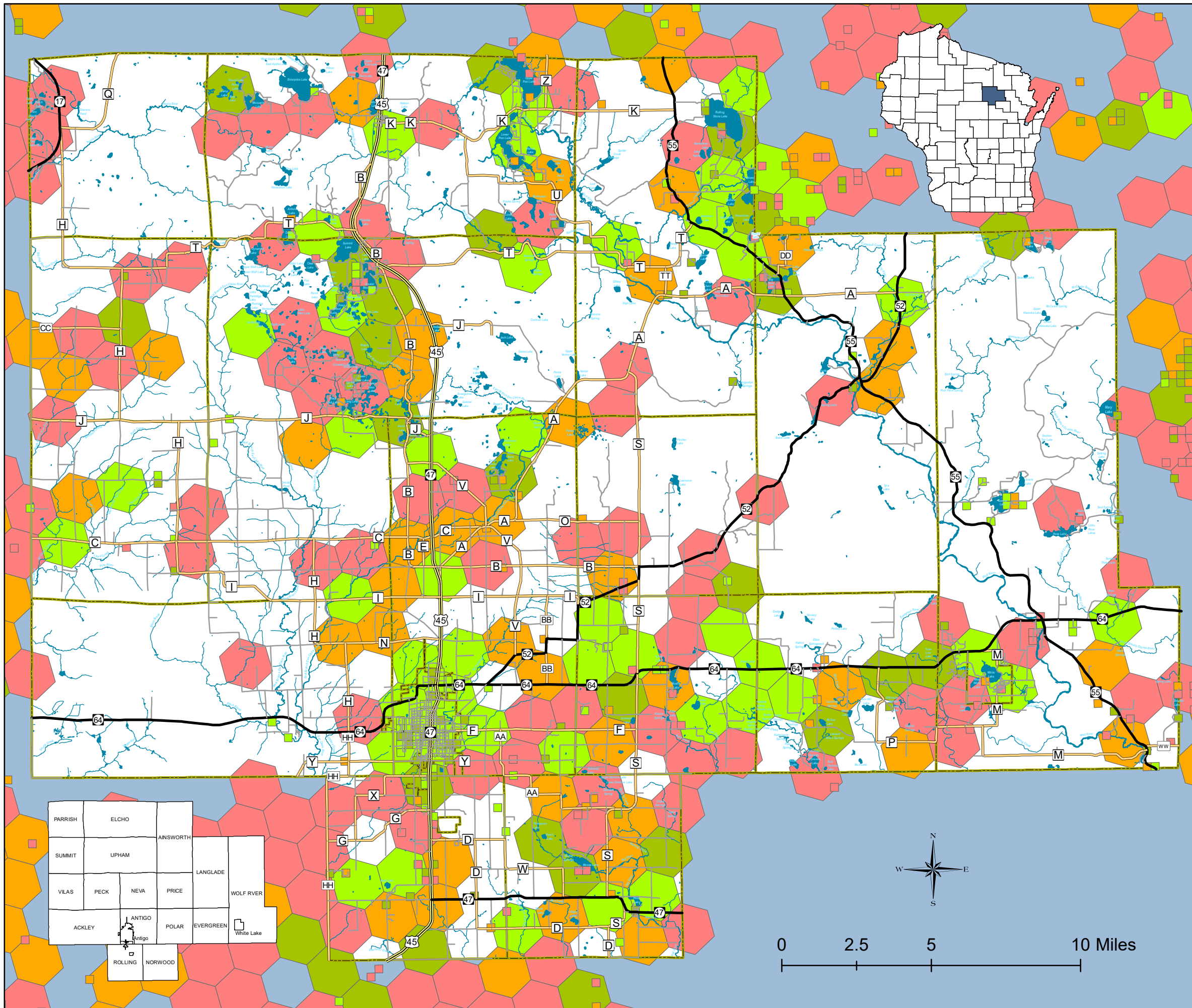


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Map 7 **DRAFT**  
**Average Upload  
 Speeds**

Langlade County, Wisconsin



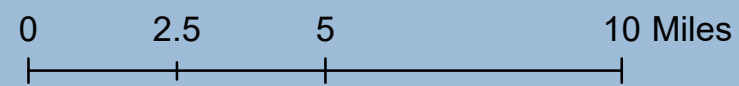
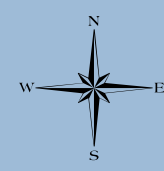
Minor Civil Divisions  
 U.S. Highway  
 State Highway  
 County Highway  
 Local Road  
 Water  
**Upload Speed**  
 < 2 Mbbs  
 2 to 5 Mbbs  
 5 to 10 Mbbs  
 > 10 Mbbs

From wisconsinsspeedtest.net - August 8, 2023  
 No service reported - Cost and or can not find a provider.

Small square test locations from Ookla speed test  
 Fixed wired only October 2022 - Open Data

Source: WI DNR, NCWRPC, Langlade Co, WisDOT  
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PARRISH	ELCHO	ANSWORTH		
SUMMIT	UPHAM	LANGLADE		WOLF RIVER
VILAS	PECK	NEVA	PRICE	
ACKLEY	ANTIGO	POLAR	EVERGREEN	White Lake
ROLLING	NORWOOD			

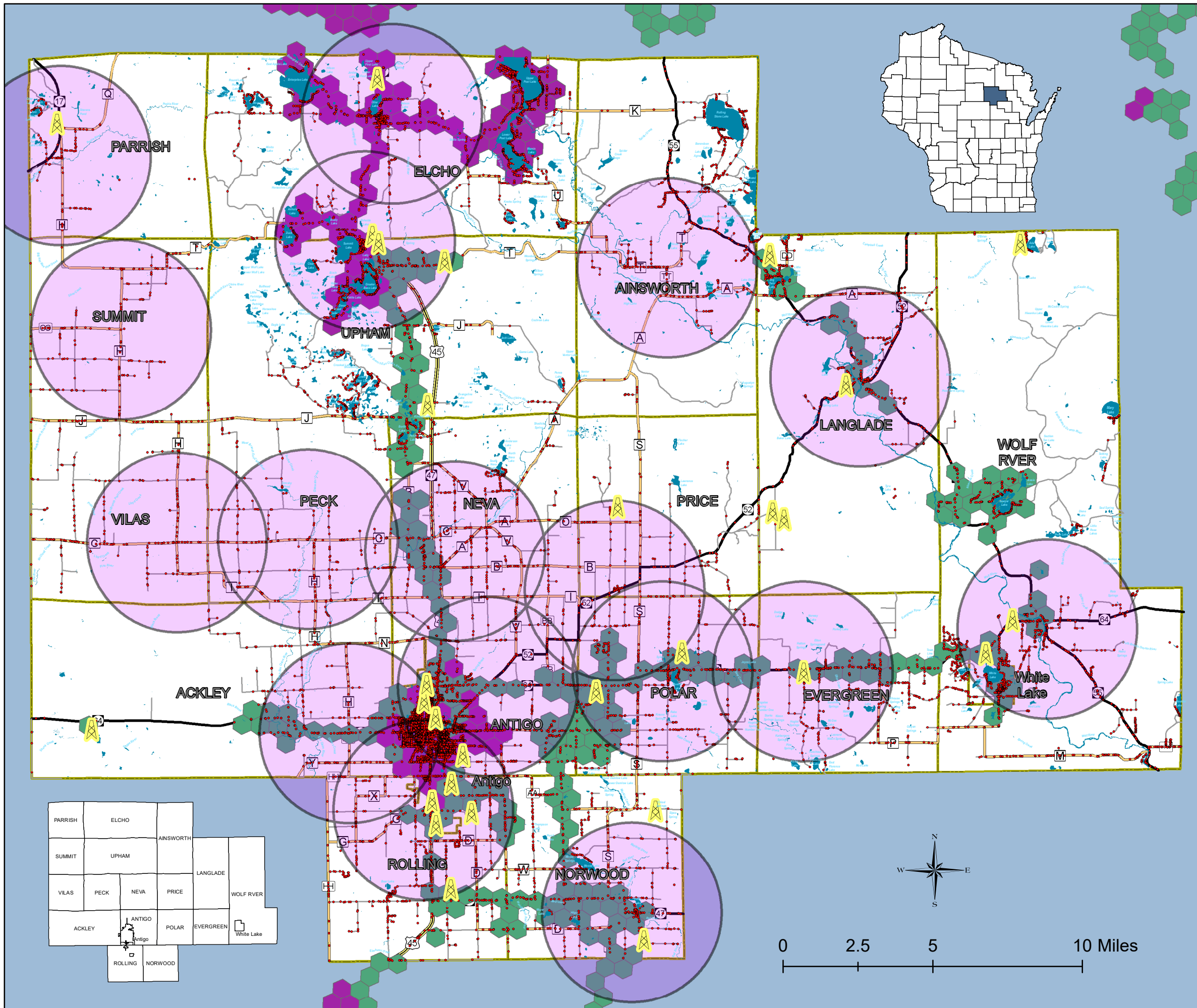


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# Possible Fixed Wireless Tower Locations

Langlade County, Wisconsin



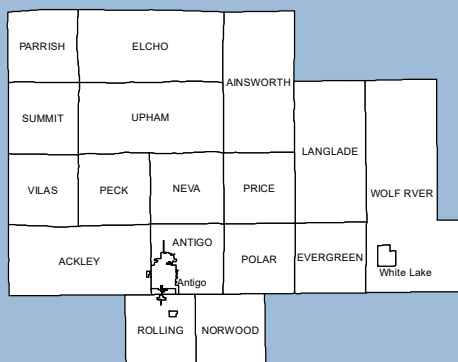
- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water
- 3 Mile Buffer
- Addresses
- Existing Communication Towers

Location	Address Counts
Town of Ainsworth	291
Town of Rolling	692
Town of Parrish	114
Town of Peck	195
Town of Elcho	467
Town of Vilas	161
Town of Price	271
Town of Antigo	583
Town of Ackley	326
Town of Upham	773
Town of Summit	130
Town of Evergreen	273
Town of Polar	426
Town of Neva	421
Town of Norwood	297
Town of Wolf River	351
Town of Langlade	271

**ADDRESS COUNTS PER TOWER LOCATION DOES NOT INCLUDE ADDRESSES FROM CITY OF ANTIGO OR VILLAGE OF WHITE LAKE**

Source: WI DNR, NCWRPC, Langlade Co, WisDOT


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### Legend


 Minor Civil Divisions

### BEAD Planning Areas


 Ainsworth-Price


 Elcho West-Parrish


 Evergreen-White Lake-Wolf River S


 Langlade-Wolf River N+C

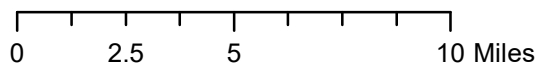
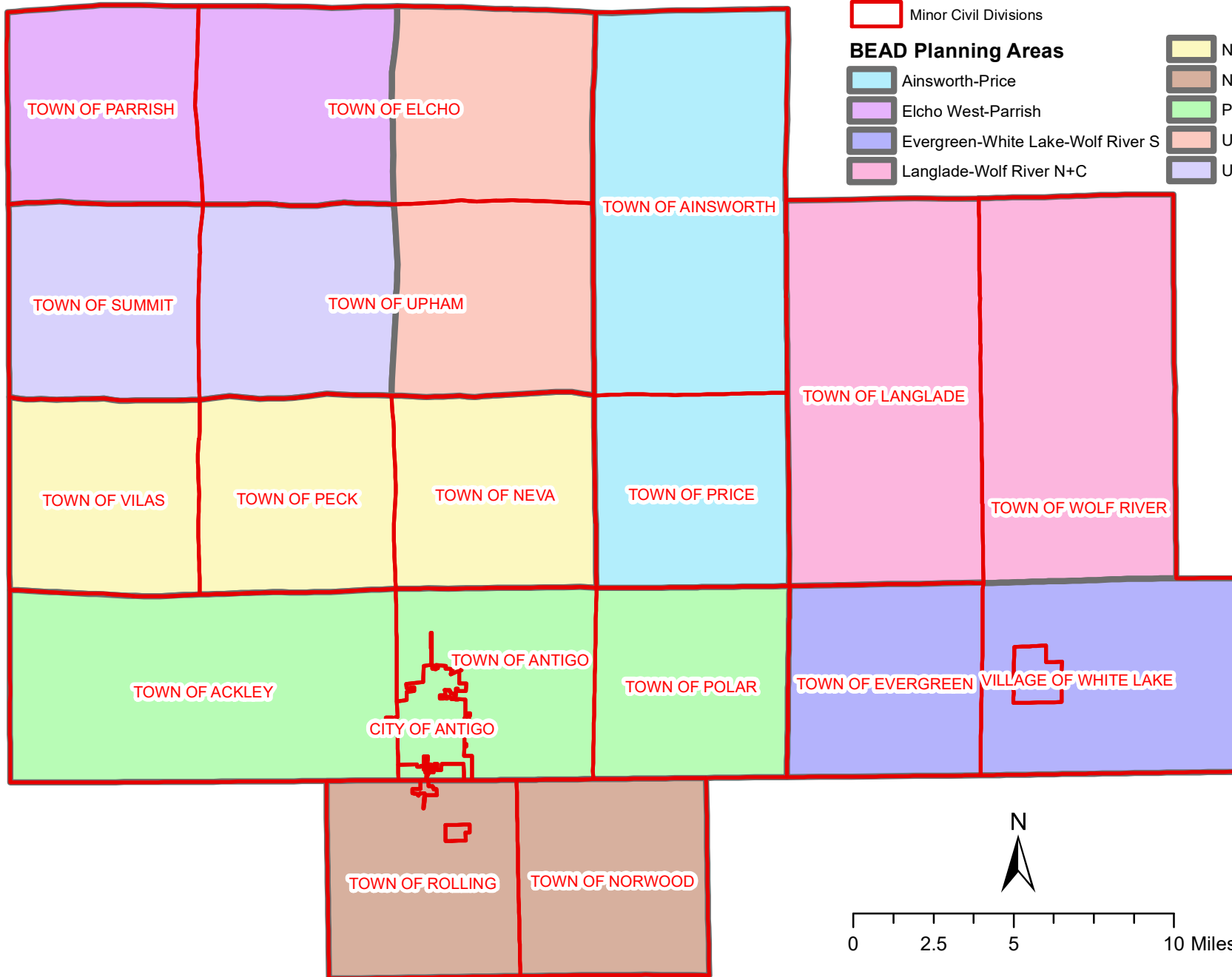
 Neck-Peck-Vilas

 Norwood-Rolling

 Polar-Antigo-Ackley

 Upham East-Elcho East

 Upham West-Summit





Area	Total Serviceable Locations	< 25 Mbps Download	< 100 Mbps Download	> 100 Mbps Download
		Unserviced Locations	Underserved Locations	Served Locations
Ainsworth-Price	1,050	822	197	31
	100.0%	78.3%	18.8%	3.0%
Elcho West-Parrish	870	312	16	542
	100.0%	35.9%	1.8%	62.3%
Evergreen-White Lake-Wolf River S	1,287	192	753	342
	100.0%	14.9%	58.5%	26.6%
Langlade-Wolf River N+C	1,013	606	123	284
	100.0%	59.8%	12.1%	28.0%
Neva-Peck-Vilas	1,143	988	48	107
	100.0%	86.4%	4.2%	9.4%
Norwood-Rolling	1,593	519	617	457
	100.0%	32.6%	38.7%	28.7%
Polar-Antigo-Ackley	5,471	783	378	4,310
	100.0%	14.3%	6.9%	78.8%
Upham East-Elcho East	1,445	397	16	1,032
	100.0%	27.5%	1.1%	71.4%
Upham West-Summit	1,113	602	30	481
	100.0%	54.1%	2.7%	43.2%
<b>County Total</b>	<b>14,985</b>	<b>5,221</b>	<b>2,178</b>	<b>7,586</b>
	<b>100.0%</b>	<b>34.8%</b>	<b>14.5%</b>	<b>50.6%</b>



## B. PSC COUNTY SUMMARY

# Wisconsin Broadband Access- Serviceable Locations (BSL)

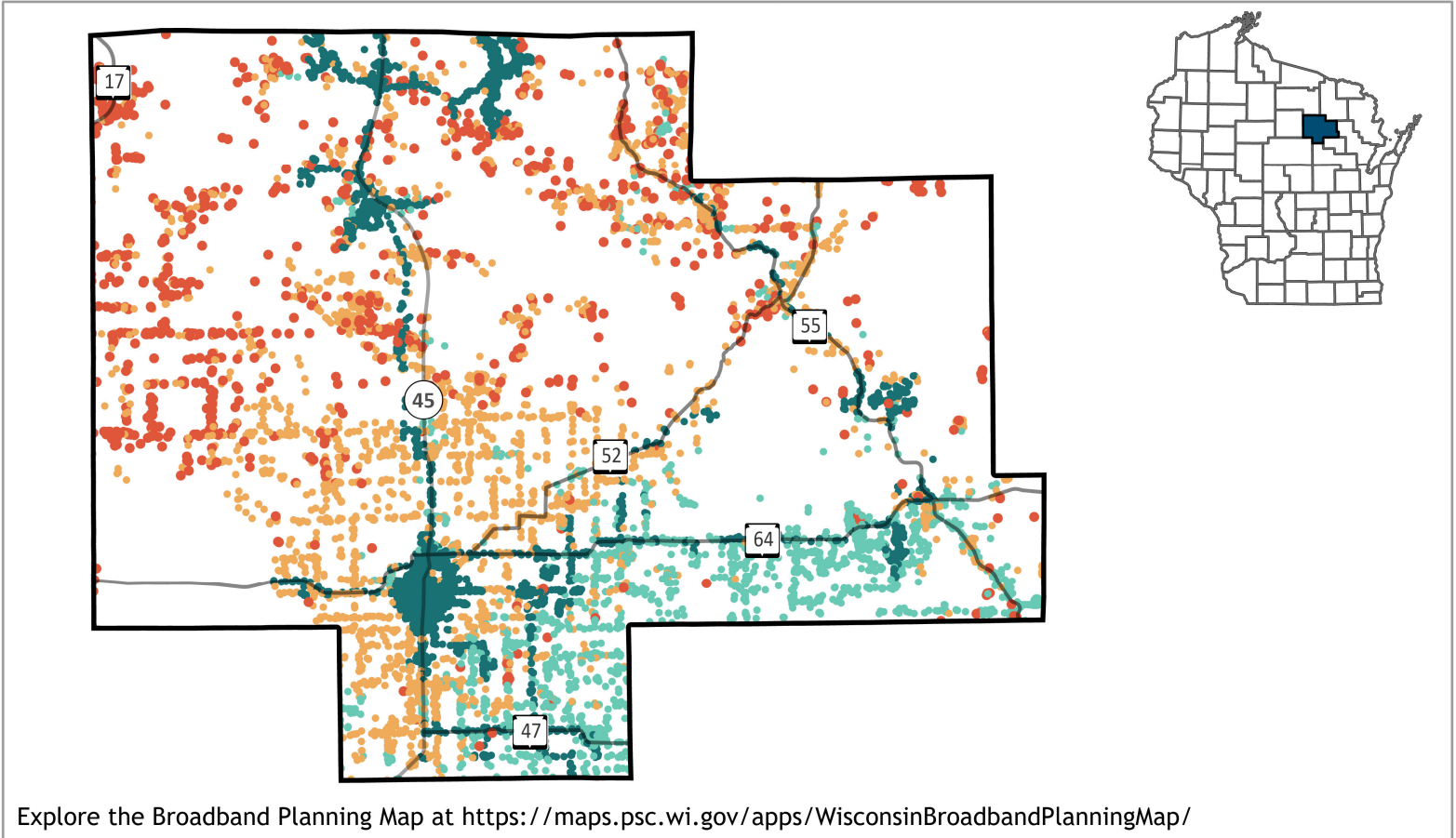
## Langlade County



Total BSLs **13,538**

Underserved,  
Unservd and No  
Service Count **6,467**

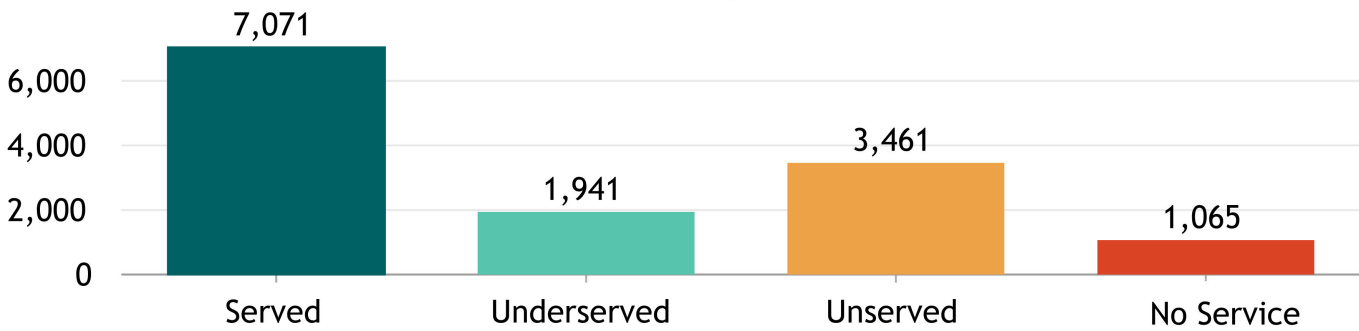
Source: FCC Broadband Data Collection BSL Service Status as of June 30, 2023



Explore the Broadband Planning Map at <https://maps.psc.wi.gov/apps/WisconsinBroadbandPlanningMap/>

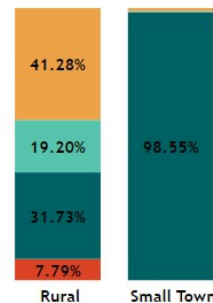
- Served  
>= 100/20 (Mbps)
- Underserved  
>25/3 and <100/20 (Mbps)
- Unservd  
<25/3 (Mbps)
- No Service

BSL count, by service status



"Broadband service" = an internet service with a minimum speed 100/20 Mbps

% of BSLs, by urbanicity type, by service status



Note: For counties having 100% BSL in the same urbanicity type only one bar is displayed.

# Wisconsin Broadband- Enforceable Funding Commitment

Langlade County



13,538

Count of Total BSLs

6,467

Count of Underserved, Unserved, and No Service BSLs

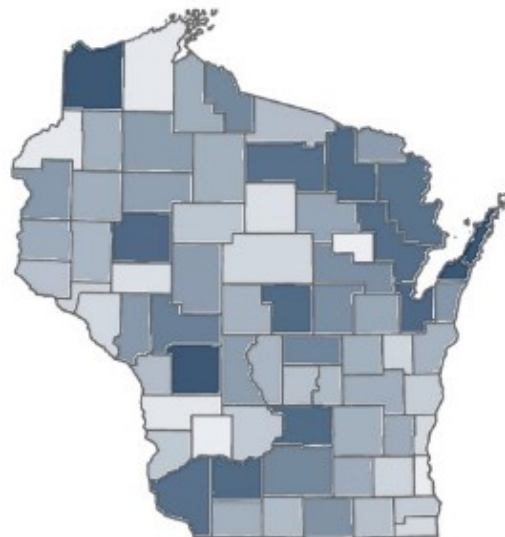
Source: FCC Broadband Data Collection BSL Service Status as of June 30, 2023

"Enforceable Funding Commitment", (EFC) for the purposes of BEAD is any "in progress" award that will build service of at least 100/20 to all locations by either a wireline cable or fiber connection, or a licensed fixed wireless connection. This includes a subset of state awards, all ARPA awards, all USDA Reconnect awards, RDOF, and E-ACAM.

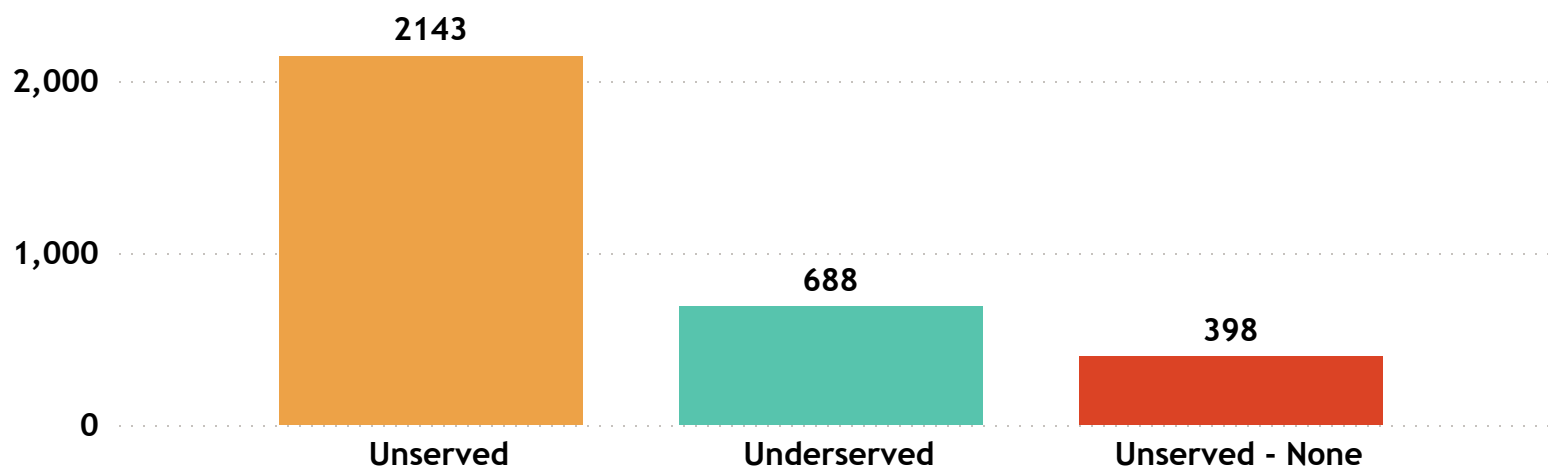
**Estimated Underserved, Unserved and No Service Locations without Enforceable Funding Commitment**

**3,229**

Estimated Underserved, Unserved and No Service Locations without EFC (count of locations **min** to **max**)



Estimated Underserved, Unserved, and No Service locations without EFC



## Langlade County

FCC service as of December 31, 2022

14

ISP

---

AirNet  
Astrea  
Bertram Internet  
Brightspeed  
Bug Tussel Wireless LLC  
CenturyLink (owned by Lumen)  
Charter Communications Inc  
Cirrinity  
Consolidated Communications, Fidium  
Frontier  
Northwoods Connect (owned by Bug Tussel Wireless LLC)  
T-Mobile US  
United States Cellular Corporation  
Verizon

# Wisconsin Broadband Affordability- Plan Cost

'Broadband service' = an internet service with a minimum speed 100/20 Mbps

ISPs in Wisconsin: 126

ISPs in Langlade County : 14

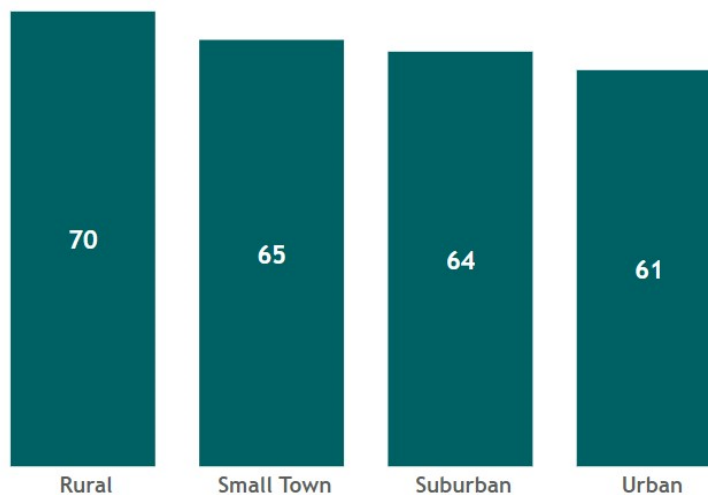
State Minimum Broadband Monthly Price Range  
\$ 49.95 - \$ 156.50

State Average of Minimum Broadband Price/ Month  
\$64.85

WI Household (HH) Median Income  
\$67,080

**AFFORDABILITY CRITERIA:**  
**1.17% of Household Income**

WI Average Minimum Broadband Price/ Month (in \$) by Urbanicity



Source: Service offerings from ISPs representing 2,200 price offerings across all counties.

HH annual income-range (\$)	Broadband Plan* monthly cost
less than \$15K	less than \$15
\$15K - \$24K	\$15 - \$24
\$25K - \$39K	\$25 - \$38
<b>\$40K - \$54K</b>	<b>\$39 - \$52</b>
\$55K - \$69K	\$53 - \$67
\$70K - \$84K	\$68 - \$81
\$85K - \$99K	\$82 - \$96
\$100K - \$150K	\$97 - \$146
\$150K+	\$147+

\* Broadband plan: is a plan providing internet service of a minimum speed of 100/20Mbps

The commonly accepted Broadband cost-burden threshold's income (see worldwide affordability target by 2025)

## Langlade County

Average of Minimum Broadband Price/ Month

**\$ 64.58**

## Langlade County

Household (HH) Median Income

**\$ 52,074**

Wisconsin HHs: 2,401,818

Langlade County HHs: 8,539

Source: ACS 5y 2017-2021

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## C. INTERNET SERVICE PROVIDERS

## REGIONAL INTERNET SERVICE PROVIDERS

\* Indicates known Internet Service Provider in Langlade County

Provider	Website	Phone	Mailing Address
<b>Airnet*</b>	netpros-inc.net	715-241-0200	117 S. 17th Avenue Suite B Wausau, WI 54401
<b>AirRunner Networks</b>	www.airrun.net	715.443.3700	216 Main St #3, Marathon City, WI 54448
<b>Amherst Telephone Company</b>	amherstcomm.net	715.842.5529	120 Mill St, Amherst, WI 54406
<b>Astrea*</b>	astreaconnect.com	800.236.8434	105 Kent St, Iron Mountain, MI 49801
<b>AT&amp;T*</b>	www.att.com	210.821.4105	208 S. Akard Street, Suite 2954, Dallas, Texas 75202.
<b>Bertram Internet*</b>	gobertram.com	920.351.1023	300 Industrial Dr, Random Lake, WI 53075
<b>Brightspeed*</b>	www.brightspeed.com	833.692.7773	1120 S Tryon St, Charlotte, NC 28203
<b>Bug Tussel Wireless LLC*</b>	btussel.com	877.227.0924	417 Pine St, Green Bay, WI 54301
<b>Cellcom*</b>	www.cellcom.com	920-339-4000	1580 Mid Valley Drive, De Pere, WI 54115
<b>CenturyLink*</b>	www.centurylink.com	877.862.9343	100 CenturyLink Dr. Monroe, LA 71203
<b>Charter Communications Inc (Spectrum)*</b>	www.spectrum.com	855.860.9068	5720 Bandel Rd NW, Rochester, MN 55901
<b>Cirrinity (Wittenberg Telephone Company)*</b>	cirrinity.net	715.253.2111	104 W Walker St, Wittenberg, WI 54499
<b>Community Antenna System Inc</b>	comantenna.com	888.394.4772	1010 Lake Street Hillsboro, WI 54634
<b>Consolidated Communications</b>	www.consolidated.com	844-968-7224	2116 S 17 <sup>th</sup> St, Mattoon, IL
<b>Country Wireless</b>	countrywireless.com	715.389.8584	205 W Willow Dr, Spencer, WI 54479
<b>Ethoplex</b>	www.ethoplex.com	262-252-9000	N115 W19150 Edison Drive, Germantown, WI 53022

<b>Frontier*</b>	frontier.com	844.817.0206	401 Merritt 7, Norwalk, CT 06851
<b>HughesNet*</b>	www.hughesnet.com	844.7.37.2400	11717 Exploration Lane, Germantown, MD 20876
<b>LTD Broadband</b>	ltdbroadband.com	507.369.6669	PO Box 3064, Blooming Prairie, MN 55917
<b>Lumen</b>	www.lumen.com	877.753.8353	3340 Peachtree Road NE Suite 200 Atlanta, GA 30326
<b>Marquette-Adams Telephone Cooperative</b>	www.marquetteadams.com	608-586-4111	113 N, 113 S Oxford St, Oxford, WI 53952
<b>Mediacom Wisconsin LLC</b>	mediacomcable.com	844.987.3260	100 N Marquette Rd Suite 116, Prairie du Chien, WI 53821
<b>Norvado</b>	norvado.com	800.250.8927	105 N Avon Ave, Phillips, WI 54555
<b>Nsight</b>	www.nsigntel.com	920.865.7000	122 S St Augustine St, Pulaski, WI 54162
<b>Reach</b>	reachconnects.com	715.298.4414	1710 Garfield Ave, Wausau, WI 54401
<b>Solarus</b>	www.solarus.net	715.421.8111	440 E Grand Ave, Wisconsin Rapids, WI 54494
<b>SonicNet Inc.</b>	www.sonicnet.us	715.301.0600	103 N Railroad St, Eagle River, WI 54521
<b>Starlink*</b>	www.starlink.com	888.479.9644	500 Center Ridge Dr Austin, TX 78753
<b>TDS Telecom</b>	tdstelecom.com	855.220.2592	525 Junction Road Madison, WI 53717
<b>T-Mobile US*</b>	www.t-mobile.com	844.249.6310	12920 Se 38th St., Bellevue, WA, 98006
<b>Union Telephone Company</b>	uniontel.net	715.335.6301	W North St, Plainfield, WI 54966
<b>US Cellular Corporation*</b>	www.uscellular.com	800.819.9373	8410 W Bryn Mawr Ave, Chicago, IL 60631
<b>Verizon*</b>	www.verizon.com	800.922.0204	One Verizon Way, Basking Ridge, New Jersey 07920
<b>Viasat*</b>	www.viasat.com	844.702.3199	6155 El Camino Real Carlsbad, CA 92009

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## D. ADDITIONAL RESOURCES

## A Pocket Guide To

# 5G HYPE

**5G, or “fifth generation” wireless, is a set of new standards and technological improvements that will enable faster wireless connectivity once implemented.**

Compared to current 4G LTE networks, in which users connect to towers thousands of feet away, typical 5G networks require much more densely deployed infrastructure, with small cell base stations less than 1,000 feet from devices. The cell sites will be connected to each other and the broader Internet by fiber optic cables. 5G networks are being marketed both for mobile (e.g., cell phones) and fixed (e.g., home Internet access) uses and as smart city infrastructure.

## We Still Need Wires

Though 5G will offer high-speed wireless connections to end devices, fiber optic lines still have far greater capacity and reliability, and they’re the only technology that can deliver sufficient bandwidth to each 5G cell site.



## 5G Won't Fix the Broadband Market

Competition is limited by economic considerations, not technology. 5G providers are unlikely to rival cable directly because big companies prefer to divide markets rather than engage in robust competition. 5G development won't open the market to new competition because only the biggest telephone companies, like AT&T and Verizon, have access to the volume of spectrum needed.



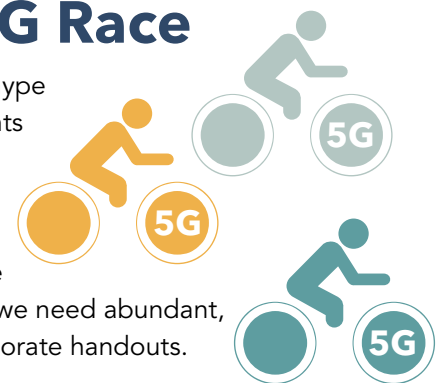
## 5G Won't Solve the Digital Divide

Since 5G connectivity relies on fiber optics that aren't available in many rural areas, these communities won't receive 5G access anytime soon. The same market reality discouraging investment in rural broadband will also discourage 5G investment. Even in urban areas, companies like AT&T and Verizon are unlikely to start investing in the low-income neighborhoods they have neglected for years.



## There's No 5G Race

The “5G Race” is marketing hype designed to scare governments into giving companies large subsidies and consumers into paying a premium for prototype devices. To achieve widespread 5G deployment, we need abundant, open fiber networks, not corporate handouts.



*This fact sheet is a response to the hype around 5G in the United States, primarily from the big wireless companies.*

# 5G and Fiber-to-the-Home (FTTH) are complementary technologies that are each best suited to different applications.



## RELIABILITY



## SPEED



## AFFORDABILITY



## BEST USES

### 5G

Requires line-of-sight. Trees, buildings, and sometimes weather can impact reliability.

Eventually more than 1 gigabit to devices in ideal conditions, but often slower based on environmental factors and congestion.

Mobile plans often have restrictive data caps with overage fees and throttling.

Well suited for mobile uses, like cell phones and smart transportation, in densely populated areas.

### FTTH

Very reliable connectivity not impacted by environmental conditions.

No known limits on speed with providers commonly offering 1 gigabit or even 10 gigabits.

Varies by the provider with locally-based networks offering the best prices.

Ideal option for fixed Internet access at a home or business in both urban and rural areas, using Wi-Fi to connect most devices.

## FCC Small Cell Order Hurts Local Control



In late 2018, the Federal Communications Commission (FCC) adopted an Order that limits how municipalities and local governments can negotiate with carriers over 5G small cell deployments. By preempting local authority, the FCC has undermined the ability of communities to promote digital equity, to the benefit of national telecom companies.

## Don't Fall for Big Telecom's 5G Hype



Wireless technologies like 5G are complementary to robust, wired networks. On their own, 5G networks will not achieve key goals, such as connecting rural America and closing the digital divide.

## Additional Resources



[The Wireless Industry's 5G Hype is Funny and Overblown](#) from New America



[FCC Stomps on Local Control in Latest Small Cell Order](#) from the Institute for Local Self-Reliance



[Dive Deep Into 5G with Mobile Expert Sascha Segan](#) from Community Broadband Bits Podcast



[Moving Toward 5G: What Cities Need to Know](#) from Next Century Cities



[Straight Talk About 5G](#) from Community Broadband Bits Podcast



[Guide to FCC Small Cell Order](#) from Next Century Cities



[Will 5G end up leaving some people behind?](#) from NBC News



# Satellite Is Not Broadband

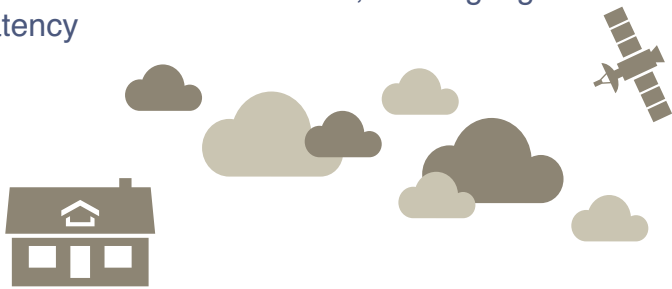
In 1996, Congress recognized the need for both urban and rural communities to have high-speed Internet service and passed the Telecommunications Act to encourage deployment across the entire U.S. New technologies have helped bring high-quality connectivity to more people than ever before, but many rural Americans still don't have access to broadband.



**High-quality connectivity needs to be fast, affordable, and reliable. Satellite is none of the three.**

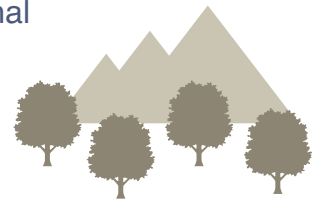
## High Latency

- Signal travels long distance from home to satellite to ISP and back, causing lag or latency



## Unreliable Connections

- Natural phenomenon, such as trees, hills, and clouds can interfere with signal
- Erratic performance and dropped connections are common



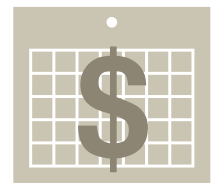
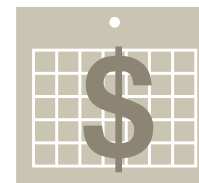
## Slow Speeds

- Subscribers rarely reach minimum federal standards for broadband, regardless of advertising claims
- Maximum speeds require optimal conditions



## Bad Service Plans

- Often require long-term commitments
- Service costs may increase after subscribers sign a contract
- Data Caps drive up the cost and interfere with subscribers' service until next billing cycle



"If it rains, or if it snows, or if they need to [listen to] a podcast or they want to watch anything educational, do research, listen to teachers online, they cannot do so because the connection ping time is so bad and on top of that, it uses too much of our plan.... Our kids can't do their homework at home."

— Gerald Pine, Retired USAF; Eureka Springs, AR  
Comment to the FCC



Banner County, Nebraska.  
Public Domain Image from Wikimedia Commons



# Rural areas need Internet access on par with urban areas.

## Education

K-12 education in both rural and urban areas relies heavily on online resources. If satellite Internet service can handle the required upload capacity, uploading homework often uses up allocated data, driving up the cost of a family's plan. Rural kids who must rely on satellite Internet service are steps behind their urban peers.

Distance learning is a necessity when colleges and technical training programs are too far away from home. Satellite Internet access prevents rural residents from improving their economic opportunities through education.



## Healthcare for Seniors and Veterans

Slow upload speeds prevent rural Americans from using telehealth applications if they depend on satellite Internet access.



## Economic Development

Rural industries such as agriculture and food processing increasingly rely on high-speed Internet access for daily operations, including real-time commodity price reporting and Just-in-Time inventory management. Other companies seek out rural and exurban areas with fiber connectivity for large data centers and distribution centers. Satellite Internet does not have the capacity to meet the needs of these businesses.

Peaceful rural areas can also attract families, enhancing the tax base and strengthening the community. People can establish home-based businesses or work remotely, but satellite Internet access limits the ability to do so.



## Calling Satellite Internet “Broadband” Means Leaving Rural Communities Behind

The fact that we can access the Internet using satellites is a triumph of technology. But it is better suited to truly remote locations, like in largely unsettled areas of Alaska and northern Canada. Satellite is not a long term solution for the vast majority of rural America that already has a wire running to the home for electricity. It may be useful while rural communities are waiting to be connected with better options, but embracing satellite as a long term solution condemns those regions to rapidly declining property values and few opportunities for economic development.



Franklin, Nebraska.

Public Domain Image from Wikimedia Commons

# Broadband 101



A handy guide to the **basics of broadband terminology** and **technology for policymakers and concerned citizens.**

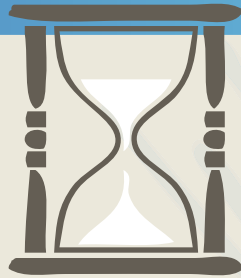
INSTITUTE FOR  
Local Self-Reliance

## Basic Terminology

- **Bits** are the base unit of information in computing. Network speeds are usually measured in “bits per second”
  - 1 **Kilobit** (Kbps) = 1,000 bits transferred per second (bps) Dial-up connections are 56 Kbps
  - 1 **Megabit** (Mbps) = 1,000,000 bps; about 30 seconds to download an MP3 song
  - 1 **Gigabit** (Gbps) = 1,000,000,000 bps; about 10 seconds to download an HD movie
- **Bytes** are the base unit for file size and used in computing monthly caps
- FCC Definition of “**broadband**” is minimum speeds of 25 Mbps downstream and 3 Mbps upstream; many uses of connectivity require faster speeds than the minimum of 25/3
- “**Download**” is the speed, measured in bits, that your computer receives data
- “**Upload**” is the speed that your computer sends data
- “**Symmetric**” connections are comparable in upload and download speeds. DSL and cable often has upload speeds 5-10x slower than downstream. Businesses increasingly need symmetric connections to maximize productivity

## Traditional Technology

• **DSL** uses the copper telephone lines to deliver access to the Internet. Common DSL downstream speeds are .5 to 6 Mbps, though they can get up to 40 for people living very close to the equipment that generates the signal. Upstream speeds are often below 1.5 Mbps and rarely exceed 4.



• **Cable**, fittingly enough, uses a cable network to deliver services. Speeds commonly vary from 6-30 Mbps download and 1-3 Mbps upload on standard tiers. Some cable companies offer 100 Mbps down and 10 Mbps up for a hefty premium. However, **cable networks are shared**, meaning you may not achieve the advertised speeds during periods of peak usage due to congestion from your neighbors.

• **Wireless** Internet access is a complement to wired connections, not a substitute. Many 4G networks have **caps that strictly limit usage**. For more on wireless, see our Wireless Fact Sheet.

<http://muninetworks.org/content/wireless-internet-access-fact-sheet>

## Common Broadband Goals

- Faster speeds now
- Affordable service
- Reliable performance
- Universal access
- Scalable Networks (often fiber-optic) that allow capacity to grow as rapidly as demand



## Fiber Optics

- The Gold Standard.
- Basic idea: Lasers shoot pulses of light across very thin strands of glass.
- Fiber optic networks are **reliable**, **resilient**, and use technology that offers nearly **unlimited** expansion. They have fewer points of failure than copper and cable networks.
- Fiber strands last for **decades** and capacity can be increased by upgrading the lasers on each end without having to lay new fiber.
- The high cost of new fiber networks is mostly the labor to put the cables in place on poles or in conduit underground; operating costs are lower than for cable, DSL, or wireless networks.

## Cable and DSL Are Inadequate


- 21st Century businesses require faster connections – “basic broadband” is not sufficient
- DSL/Cable technology is unreliable: Interrupted Service = Lost Revenue
- Cable and DSL advertise “up to” speeds – actually reaching those speeds is rare

"All the Internet-connected, data-hungry gadgets that are coming to market sent a strikingly clear message: we're going to need faster broadband networks."

*FCC Chairman Genochowski, 2013*

## COMPETITION

- In many industries, market competition ensures good outcomes. Unfortunately, cable and Internet networks are, and will remain, largely uncompetitive.
- Most of us have two options at home for Internet access. DSL is the slow, less expensive option and cable a more expensive, faster option.
- Wired telecommunications networks are a **natural monopoly** - they have very high upfront capital costs and declining marginal costs. This makes **robust competition all but impossible...** and Wall Street knows it.



“We're big fans of [Comcast's] Video and High-Speed Internet businesses because both are either monopolies or duopolies in their respective markets.”

*SeekingAlpha.com, 2012*

**Learn More – Increase Your Understanding – Impress Your Friends, Neighbors, and In-Laws!**

To learn more about broadband and the Internet, check out our other fact sheets, case studies, reports, podcasts, and more on **MuniNetworks.org**

Brought to you by the Institute for Local Self-Reliance at **ILSR.org**

# WIRELESS INTERNET 101

Wireless is the technology that today most resembles magic. We want to be mobile, not tethered. Our desires notwithstanding, the future of telecommunications is more complicated than simply removing wires.

Consider your home network. You likely use a Wi-Fi router to share a DSL or cable wired connection to your home. Even as wireless devices become increasingly common,

most homes will still have a wired connection (ideally using fiber optics).

There is no single “wireless” technology. There are many different standards, speeds, and issues. Your phone may support 4G LTE, Wi-Fi, and Bluetooth – each is unique in capacity and limitations.

## BASIC TERMINOLOGY

**Spectrum:** This is the entire range of electromagnetic wavelengths from the colors we see to frequencies used by radio and television broadcast stations. The Federal Communications Commission (FCC) regulates how the spectrum may be used and by whom.

**Licensed spectrum:** Specific ranges of radio wavelengths that may only be used by those holding licenses from the FCC. Technologies include 3G, 4G, LTE, WiMax, and others.

**3G, 4G:** G is short for “Generation” of commercial cellular network. However, marketing departments have perverted these designations so the 4G used by AT&T is not the same as 4G used by Verizon, etc.

**LTE:** “Long Term Evolution” is a wireless standard (4G) used by most cell phone companies to deliver cellular wireless services, most often to mobile phones.

**Fixed Wireless:** Connects two non-mobile locations, such as between a house and tower. The antennas are often directional to allow higher power and faster speeds than used for mobile phones.

**Data Caps:** limits on the amount of data a device may use over a period of time.

**Unlicensed spectrum:** Specific ranges of radio wavelengths dedicated to a commons that anyone may use, often with power limits. Includes microwaves, garage door openers, Wi-Fi, cordless phones, and others.

**Wi-Fi:** Sometimes confused with “wireless.”

Wi-Fi is a specific set of wireless protocols commonly used by computers and mobile devices. Many different firms manufacture Wi-Fi devices that meet standards to communicate with each other.

## KEY POINTS



**Cell phones do not use satellites.**

The signal travels from your phone to an antenna, likely on a tower (as shown on left) within a few miles of your location.

**Wireless networks require wires.**

When your cell phone connects to the tower, the signal travels via wires to a processing hub, then again via wires to another antenna to connect “wirelessly” to the call recipient.

**Wireless networks require better fiber optic networks.**

The explosion of wireless demand requires higher capacity fiber optic connections to antenna sites. Wired and wireless networks complement each other; they are not substitutes.

**Home Wi-Fi** connections are often already faster than the Internet connection. Your wireless network may peak at 54 Mbps or more whereas your Internet connection may only be 5-10 Mbps.

## REAL WORLD MEASUREMENTS

Today's mobile wireless technology alone does not meet our demand for fast Internet access. 4G wireless is slower than modern wired cable connections.

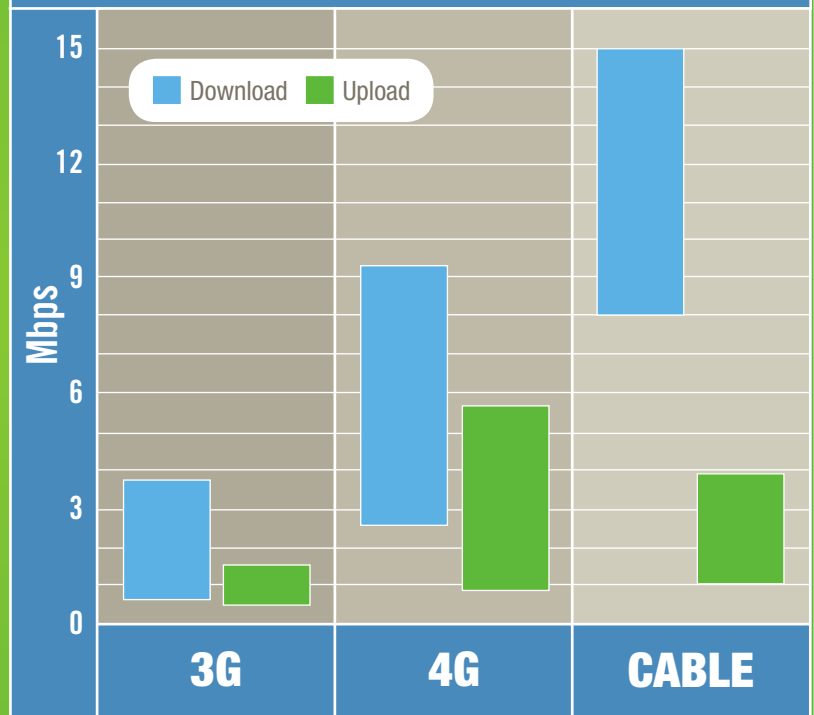
Though wireless speeds continue to improve, each tower is shared by many users whereas home wired connections are shared by comparatively fewer users. As a result, these wireless connections are unlikely to overtake modern wired connections in the home.

In 2012, PC World tested wireless Internet services from four mobile carriers in 13 U.S. cities. 3G was comparable to home DSL connections and 4G a bit slower than home cable connections. Both download and upload speeds were tested. Cable reference based on PC World tests of multiple cable companies' standard tier.

### PC WORLD SPEED TEST RESULTS

3G Download / Upload	4G Download / Upload
Fastest: 3.84 / 1.44 Mbps	Fastest: 9.12 / 5.85 Mbps
Slowest: .59 / .56 Mbps	Slowest: 2.81 / .97 Mbps

## COMMON SPEEDS (in Mbps)



## DATA CAPS

Wireless Internet providers often impose **data caps** that discourage subscribers from using certain applications, most notable streaming video. These are generally business decisions, not technical limitations. Nonetheless, they are a reason wireless is not replacing wireline connections at home.

Exceeding **data caps** results in overages or interruptions in service that make wireless alone an expensive solution for businesses that regularly transfer large amounts of data.

Wireless providers justify data caps as a means of managing **congestion**, but consumer advocate groups argue the real motivation is maximizing revenue. An analogy is trying to manage rush hour traffic jams by limiting how many miles one can drive per month.

## WIRELESS LIMITATIONS

**Objects** such as trees, hills, and buildings can degrade wireless signals.

**Satellite Internet service** is wireless but is expensive and suffers from technical limitations. We have not found anyone subscribing to satellite Internet when a DSL or cable option was available.

**Congestion** can result when too many devices are attempting to share the same antenna. This can be resolved by deploying more antennas, each of which should have a fiber connection. Cities with ubiquitous fiber networks can offer better wireless options.

### ADDITIONAL RESOURCES:

Collect all of our Internet-Related Fact Sheets at [MuniNetworks.org/fact-sheets](http://MuniNetworks.org/fact-sheets)

[Broadband Bits Interviews with Dewayne Hendricks](#)

[New America Foundation - Wireless Future Project](#)

[Public Knowledge - Mobile Innovation](#)

[Free Press - Save the Internet](#)

For more information, visit [MuniNetworks.org](http://MuniNetworks.org)

[@CommunityNets](#) ; [broadband@municipalnetworks.org](mailto:broadband@municipalnetworks.org)

# Next Century Cities

## The Opportunity of Municipal Broadband

The Federal Communications Commission estimates that 21 million Americans don't have access to broadband internet (though this analysis has been widely proven to underreport the scale of the problem).<sup>1</sup> Municipal broadband networks provide an opportunity to connect the unconnected to the essential twenty-first century infrastructure. Over 500 municipalities have invested in creative public networks, using a variety of models to connect rural and underserved communities. Building a municipal network is rarely a community's first choice, but cities and towns have taken it upon themselves to connect residents to broadband when existing cable and telephone companies have chosen not to offer competitive services.

### The Benefits of Municipal Networks



*Municipalities use a variety of funding methods to build broadband networks. Most use funding mechanisms without direct taxpayer dollars, such as revenue bonds, loans, or Tax Increment Financing.*

Longmont, Colo. financed its city-wide fiber network through revenue bonds, putting no financial burden on the taxpayer.<sup>2</sup> Residents in Islesboro, Maine voted to accept a slight property tax increase to finance the bond that paid for their fiber network. The cost of funding the bond was comparable to the price they had been paying for poor quality DSL service.<sup>3</sup>

**For more information:** [How municipal networks are financed](#); [Creative funding sources for fiber infrastructure](#)



*Municipal networks are not a small undertaking but can provide immense long-term benefits to a community even beyond improved internet access.*

Chattanooga, Tenn.'s municipal network EPB not only retired its telecom debt, but revenues from fiber services were so high that the electric utility was able to forego several rate increases.<sup>4</sup> Virginia Beach, Va. leverages its fiber network to connect the city's government buildings, schools, fire stations, and more. By connecting these anchors directly as opposed to purchasing service from an ISP, the city saves at least \$500,000 per year.<sup>5</sup> Portland, Ore. had been paying \$1,310 per month per site to a private ISP to connect its schools. The district eventually switched to a publicly owned network, and was able to connect schools to a speed 40 times greater for just \$616 per month per site.<sup>6</sup>

**For more information:** [Municipal networks deliver local benefits](#); [Community broadband creates public savings](#)

### Why We Need Broadband

Americans need access to broadband in order to start businesses, compete for jobs, complete homework assignments, apply for a mortgage, find a polling location, and much more.

Connecting Communities



## The Benefits of Municipal Networks



*Municipal networks provide the robust access necessary for job growth and economic development.*

Lafayette, La.'s network helped attract new technology businesses to town, diversifying the local economy which had previously been dependent on oil and gas. In Chattanooga, the fiber network is estimated to have created up to 5,200 new jobs and up to \$1.3 billion in economic and social benefits in the community between 2011-2015.<sup>7</sup>



*Fiber utilities can drastically improve utility efficiency and city cost savings.*

Lafayette's "smart" electric grid uses fiber to monitor power and alert the city when there's an outage. As a result, the average length of a power outage in Lafayette is one quarter the state average, which saves ratepayers about \$25 million per year.

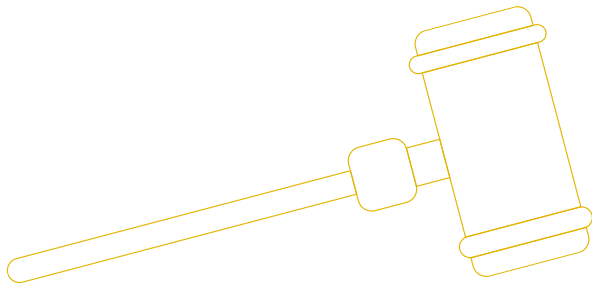


*Locally owned networks are committed to local success.*

Municipal networks are small, and the people who run them are members of the community themselves, creating a high level of visibility and accountability that is often not present with larger ISPs. Typically, the result is exceptional customer service, a vested interest in the community, and awards (see: [Ammon, Id.](#); [Longmont, Colo.](#); and [Clarksville, Tenn.](#)).

### What's Holding Us Back

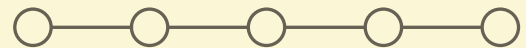
Municipal broadband networks present an opportunity to connect communities to this vital future-proof infrastructure—but many states have legislation in place that outright bans or de facto bars municipal networks from being built. Conservative analysis shows that over 11 million Americans—over half of the country's estimated unconnected population—who do not have access to broadband live in states where municipal networks are barred or outright banned by state legislation.



### How States Can Help

States can facilitate connectivity by:

- Allowing local governments the authority to build and manage network infrastructure and offer broadband services
- Including municipal governments among eligible awardees in broadband grant and loan programs



*Find more information about the hundreds of municipal broadband success stories from the Institute for Local Self-Reliance's [Community Broadband Networks Initiative](#) and from [Next Century Cities](#).*

### Sources

<sup>1</sup> <https://docs.fcc.gov/public/attachments/FCC-19-44A4.pdf>

<sup>2</sup> <https://muninetworks.org/content/longmont-prepares-vote-fiber-bonds-community-broadband-bits-episode-68>

<sup>3</sup> <https://muninetworks.org/content/islesboro-maine-finalizes-fiber-agreement-mainland>

<sup>4</sup> <https://muninetworks.org/sites/www.muninetworks.org/files/2017-05-TPA-boondoggle-rebuttal-final.pdf>

<sup>5</sup> <https://muninetworks.org/sites/www.muninetworks.org/files/2017-virginia-fact-sheet.pdf>

<sup>6</sup> <https://ilsr.org/wp-content/uploads/2012/11/fact-sheet-public-finance.pdf>

<sup>7</sup> <http://ftpcontent2.worldnow.com/wrcb/pdf/091515EPBFiberStudy.pdf>

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## E. GLOSSARY

## GLOSSARY

**ADSL:** Asymmetric Digital Subscriber Line - This is a type of digital communication technology used for transmitting digital data over traditional copper telephone lines. ADSL is a common method for providing high-speed internet access to homes and businesses. The term "asymmetric" in ADSL refers to the fact that it allows for different data transfer rates in the upstream (from the user to the internet) and downstream (from the internet to the user) directions. Typically, ADSL provides a much faster downstream speed compared to the upstream speed. This is because it is designed to cater to the typical internet usage pattern where users download more data (e.g., web pages, videos, and files) from the internet than they upload.

**Backhaul:** Backhaul refers to the part of a telecommunications network that connects the core or backbone network to smaller subnetworks or distribution points. It is a crucial component in the overall network infrastructure, as it facilitates the flow of data between various network segments, ensuring efficient data transport.

**Bandwidth:** commonly refers to the speed of internet service, measured in bits per second.

**Broadband:** Commonly refers to high-speed internet access that is always on and faster than traditional dial-up access. Broadband includes several high-speed transmission technologies, such as fiber, wireless, satellite, digital subscriber line, and cable. For the Federal Communications Commission (FCC), broadband capability requires consumers to have access to actual download speeds of at least 25 Mbps and actual upload speeds of at least 3 Mbps.

**Broadband Adoption:** The use of broadband in places where it is available, measured as the percentage of households that use broadband in such areas.

**Broadband Serviceable Location (BSL):** a business or residential location in the United States at which mass-market fixed broadband Internet access service is, or can be, installed.

**CO:** Central Office - is a facility used by a telecommunications service provider to manage and distribute telecommunications services, including landline telephone, broadband internet, and sometimes other services like DSL, ISDN, or traditional fax services. These central offices play a critical role in connecting customers to the larger telecommunications network.

**Dark Fiber:** Unused fiber infrastructure that has not been "lit" with Internet service. When someone is building a fiber network, the cost of adding more fiber than immediately required is negligible and the cost of having to add more fiber later is very high. Therefore, many include dark fiber in projects – fibers that can be leased to others or held in reserve for a future need.

**Digital Divide:** The gap between those of a populace that have access to the internet and other communications technologies and those that have limited or no access.

**Digital Equity:** Parity in digital access and digital skills that are now required for full participation in many aspects of society and the economy. Digital equity links digital inclusion to social justice and highlights that a lack of access and/or skills can further isolate individuals and communities from a broad range of opportunities.

**Digital Inclusion:** Access by individuals and communities to robust broadband connections; internet-enabled devices that meet user needs; and the skills to explore, create, and collaborate in the digital world. Digital inclusion programs can be used to promote digital equity.

**Digital Literacy:** The ability to leverage current technologies, such as smartphones and laptops, and internet access to perform research, create content, and interact with the world.

**Download Speed** refers to the rate at which digital data is transferred from the Internet to a computer. How quickly you receive online data like texts, images, and videos is based on download speed.

**DSL:** Digital Subscriber Line - DSL refers to a technology that provides high-speed internet access over traditional copper telephone lines. It allows for a faster internet connection than dial-up and is a common method for broadband internet access in many areas.

**FTTC:** Fiber to the Curb (or Cabinet) - It is a broadband internet service delivery architecture that combines fiber-optic technology with traditional copper or coaxial cables to provide high-speed internet access to homes and businesses.

**FTTH:** Fiber to the Home - It is a type of broadband internet service delivery architecture that uses optical fiber cables to provide high-speed internet access directly to residential homes and businesses.

**FTTN:** Fiber to the Node - It is a broadband internet service delivery architecture that combines fiber-optic technology with traditional copper or coaxial cables to provide high-speed internet access to homes and businesses.

**FTTP:** Fiber to the Premises – same as FTTH is a broadband internet service delivery architecture that provides high-speed internet access by extending fiber-optic cables directly to residential homes, businesses, or other types of properties.

**Gbps:** Gigabits per Second - It is a unit of data transfer speed used to measure the rate at which data is transmitted or received over a network or data connection. A gigabit is a unit of digital information that represents one billion individual bits.

**Gig-** Shorthand for 1 gbps (1,000 mbps) download speeds. More colloquially, a speed fast enough that any number of applications can use the network without creating congestion.

**HFC:** Hybrid Fiber-Coaxial – same as FTTN

**Internet Service Provider (ISP):** an entity that provides access to the internet and the services available, which a customer buys internet from.

**IoT:** Internet of Things - It refers to a network of physical objects or "things" that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the Internet. These objects can be everyday items such as appliances, vehicles, wearable devices, industrial machines, or even buildings.

**Jitter:** Jitter refers to the deviation or variability in the timing or periodicity of a signal or event. It is commonly used in the context of digital data transmission, electronics, and telecommunications. Jitter can manifest as small, random variations in the timing of signal edges, which can lead to problems such as data errors or reduced performance in various systems.

**Latency:** is a measure of the delay or lag in data communication over the internet or any other network. It represents the time it takes for data to travel from the source (sender) to the destination (receiver) and back. Latency is typically measured in milliseconds (ms).

**LOS:** Line of Sight - refers to the unobstructed and direct path between two points that enables visual or electromagnetic communication. Line of sight is important in fields like wireless communication and optical communication, where obstacles or terrain can block signals.

**Mbps:** Mbps: Megabits per Second - is a unit of measurement used to express data transfer speeds in telecommunications and computing. Megabits per second measure the rate at which data is transmitted or received over a network or data connection. A megabit is a unit of digital information that represents one million individual bits.

**PING:** Packet Internet Groper - When you PING a host, your computer or device sends a small data packet to the target host's IP address and waits for a response. The primary purposes of using the PING command are checking network connectivity and measuring latency.

**Public Service Commission (PSC):** an agency responsible for the regulation of Wisconsin public utilities, including those that are municipally owned. The PSC staff's the Wisconsin Broadband Office (WBO), which leads statewide efforts to expand access, adoption, and affordability. WBO provides support to residents seeking internet access, manages broadband grant programs, compiles broadband service maps, and builds capacity through planning and outreach.

**RF:** Radio Frequency refers to the range of electromagnetic frequencies that are commonly used for wireless communication and broadcasting. RF waves are a type of electromagnetic radiation, which includes various forms of energy traveling through space in the form of oscillating electric and magnetic fields. RF waves occupy a specific portion of the electromagnetic spectrum, typically ranging from about 3 kilohertz (kHz) to 300 gigahertz (GHz). This range includes frequencies commonly used for radio broadcasting, television, cellular communication, Wi-Fi, and many other wireless technologies.

**SDSL:** It is a type of digital communication technology that provides high-speed internet access over standard copper telephone lines. Unlike Asymmetric Digital Subscriber Line (ADSL), which offers different upload and download speeds, SDSL provides equal upload and download speeds. This symmetry is particularly advantageous for businesses and applications that require consistent data transfer rates in both directions.

**SVI:** Social Vulnerability Index (SVI) is a widely used tool in the field of disaster management and public health that assesses the vulnerability of communities to various natural and man-made hazards. It was developed by the Centers for Disease Control and Prevention (CDC) in the United States and is primarily used for disaster preparedness, response, and recovery efforts.

**Upload Speed:** refers to the rate at which online data is transferred from a computer to the Internet. Sending emails, video calling, and uploading pictures to the internet requires good upload speed.

**VDSL:** Very-high-bit-rate Digital Subscriber Line - It is a type of digital subscriber line (DSL) technology used for high-speed internet access over traditional copper telephone lines. VDSL is an improvement over earlier DSL technologies like ADSL (Asymmetric Digital Subscriber Line) and SDSL (Symmetric Digital Subscriber Line) in terms of data transfer rates.

**Wi-Fi:** a technology that produces a wireless local area network allowing a computer or other device to connect to the internet wirelessly. Equipment in the device communicates with the Wi-Fi router, which is connected to the network with some type of physical cable or wire. Examples include the Wi-Fi in a home or hotspot at a coffee shop.



# F. RESOLUTIONS

# LANGLADE COUNTY



RESOLUTION #11-2022

INTRODUCED BY: ADMINISTRATIVE COMMITTEE

**INTENT: SUPPORT FORMATION OF A BROADBAND COMMISSION AND SEEKING BROADBAND EXPANSION TO PROVIDE INTERNET SERVICE TO ALL RESIDENTS OF LANGLADE COUNTY**

**WHEREAS**, large areas within Langlade County lack internet service or have internet service data upload and download speeds lower than those required for reliable data processing and data transmission; and

**WHEREAS**, reliable High-Speed Internet service and infrastructure related to internet service are critical components in providing police, fire, rescue communication services and access to internet application which increase efficiency of these services and therefore improve public safety; and

**WHEREAS**, reliable High-Speed Internet service at homes are a critical need for students of all area school districts which now require utilization of technology including tablets and laptops for daily assignments and without internet services some students are left behind in required classes and classwork; and

**WHEREAS**, reliable High-Speed Internet service at homes are a critical need for Colleges, Universities and other higher forms of advance education for provision of remote instruction and learning and without internet services some Langlade County residents do not have opportunities for advanced education without relocation from Langlade County addresses; and

**WHEREAS**, reliable High-Speed Internet service at homes and facilities are a critical need for health care providers that can monitor patient health remotely (also known as Telemedicine) and without that ability many people including aging and disabled must relocate their homes to areas with appropriate Telemedicine opportunities; and

**WHEREAS**, businesses of all varieties now require Reliable High-Speed Internet service to provide access to financial transactions, and regional and worldwide markets and areas within Langlade County without Reliable High-Speed Internet service fail to retain and attract businesses and industry which sustain the local work force; and

**WHEREAS**, the COVID pandemic has accentuated the need for Reliable High-Speed Internet service in all homes, businesses and industry locations as a primary utility; and

**WHEREAS**, based on the above facts, the Langlade County Board of Supervisors believes that provision of Reliable High-Speed Internet service for all locations within Langlade County is extremely important to the residents, businesses, industry and economy of Langlade County; and

**WHEREAS**, based on the above facts, the Langlade County Board of Supervisors believes that provision of Reliable High-Speed Internet service for all locations within Langlade County will improve efficiency of emergency and medical services and improve the safety of all residents and visitors of Langlade County; and

**WHEREAS**, the Committee recommends the establishment of a Broadband Commission organized under the Langlade County Economic Development Corporation, and further recommends the Commission include the following members:

1. One Member from the Langlade County Economic Development Corporation as designated by action of the Corporation.
2. One Member from the Langlade County Administrative Committee as designated by action of the Committee.



3. One Member from the Langlade County Sherriff's Department or dispatch center as designated by the County Sherriff.
4. One Member of a Langlade County fire department or a representative of all fire departments within the County as determined by nomination from the departments.
5. One Member of the Aspirus Health Program as designated by that organization.
6. One member from each of the Antigo, Elcho and White Lake School Districts as appointed by the School Board.
7. One member from each Town~~ship~~ Government, City and Village within Langlade County as appointed by the appropriate Board or Council.

**WHEREAS**, the Committee requests that at its earliest convenience, the Langlade County Economic Development Corporation Board of Directors establish a Broadband Commission and approve the members of the Broadband Commission at a scheduled and posted public meeting of the Board; and

**WHEREAS**, the Committee recommends that the Broadband Commission, at its first meeting, appoint a Broadband Commission Chairman by a majority vote of its members; and

**WHEREAS**, the Committee recommends that the Broadband Commission Chairman act as the single point contact for broadband opportunities in Langlade County.

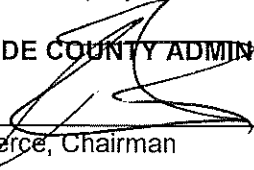
**NOW THEREFORE BE IT RESOLVED**, that the Langlade County Board of Supervisors hereby requests and supports the creation of a Broadband Commission organized under the Langlade Economic Development Corporation;

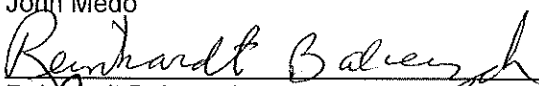
**BE IT FURTHER RESOLVED**, that the Langlade County Board of Supervisors agrees to cooperate with recommendations of the Broadband Commission and may authorize County sponsorship of grant funding requests and County budget funding for Broadband based activities with future approvals by the Board.

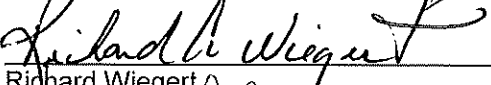
**BE IT FURTHER RESOLVED**, that the Langlade County Board of Supervisors recognizes the authority for Broadband Commission activities, including appointment of County representation on the Commission and review and forwarding of Broadband Commission requests for County support to the Administrative Committee.

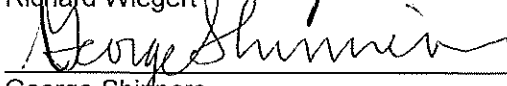
**BE IT FURTHER RESOLVED**, that the Langlade County Board of Supervisors supports Broadband Commission activities to make Reliable High-Speed Internet service, at Federal minimum service standards, available to all areas of Langlade County, with priority given to projects based on areas that are unserved or underserved.

**LANGLADE COUNTY ADMINISTRATIVE COMMITTEE:**

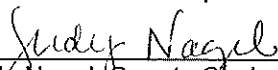
  
 \_\_\_\_\_  
 Ben Pierce, Chairman

John Medo  
  
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 Reinhardt Balcerzak

  
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 Richard Wiegert

  
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 George Shimmers

Adopted by the County Board of Langlade County,  
 this 28 th day of February, 2022.

  
 \_\_\_\_\_  
 Judy Nagel, County Clerk  
 FN