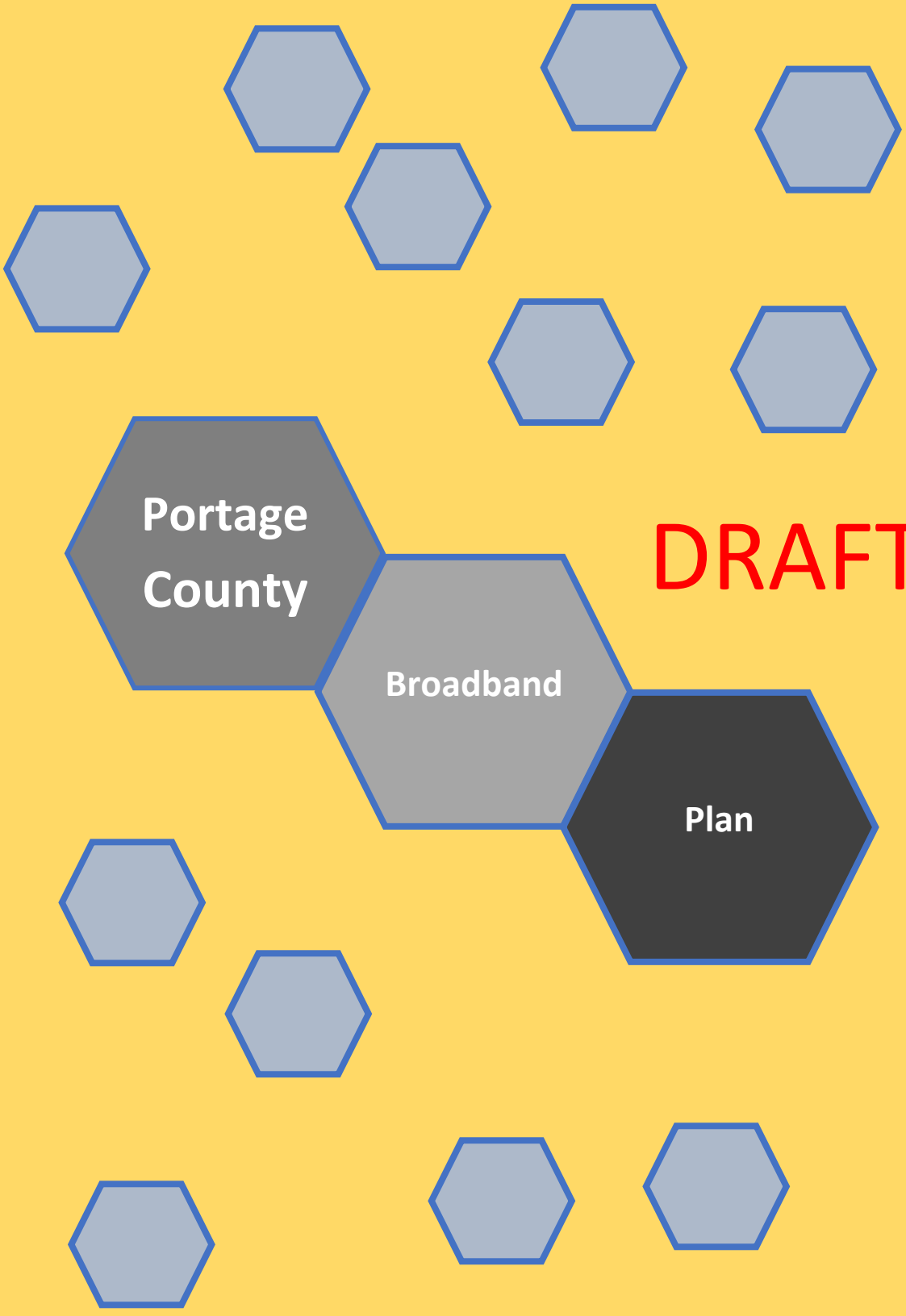

DRAFT

Prepared By: North Central Wisconsin Regional Planning Commission

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CHAPTER ONE

BACKGROUND

Broadband is essential in today's world. Every segment of the population, businesses, and government rely on the integration of the internet. For Portage 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 outlined is a comprehensive strategy designed to bridge the digital divide by increasing connectivity and accessibility of broadband in Portage County. Further, this plan will identify both barriers and goals to infrastructure expansion and broadband adoption. As a result, Portage County will be better positioned to apply and hopefully receive BEAD funding for broadband deployment.

PREVIOUS REGIONAL EFFORTS

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 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, 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.

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, the 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. Detailed cost estimates for infrastructure deployment were also generated. 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.

Portage County's Broadband Committee consulted with the North Central Wisconsin Regional Planning Commission (NCWRPC) at three sperate meetings during the planning process. The first meeting on July 11, established the plan's timeline, and next steps, and NCWRPC shared information on the broadband speed test being conducted. The second meeting on September 19, was an opportunity to discuss and review the draft plan format as well as formalize the goals of the Plan. The final meeting included a final review of the plan by the committee before the adoption of the Broadband Plan.

BROADBAND COMMITTEE

Portage County has formed a Broadband Committee to gather data for determining optimal projects and accessing grant monies to assist with that process, and attracting ISPs to partner with the county on making high-speed broadband accessible throughout the county.

- To be added

CHAPTER TWO

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% of households not having subscriptions to any form of "broadband" internet service. Many residents and businesses in Portage 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.

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 25 Mbps and an upload speed of 3 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

- 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.

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: coverts 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

HOW FAST SHOULD BROADBAND BE?

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. For grant funding, The Public Service Commission of Wisconsin will target businesses also lacking 25 Mbps download and 3 Mbps upload.

Typical Internet Speeds

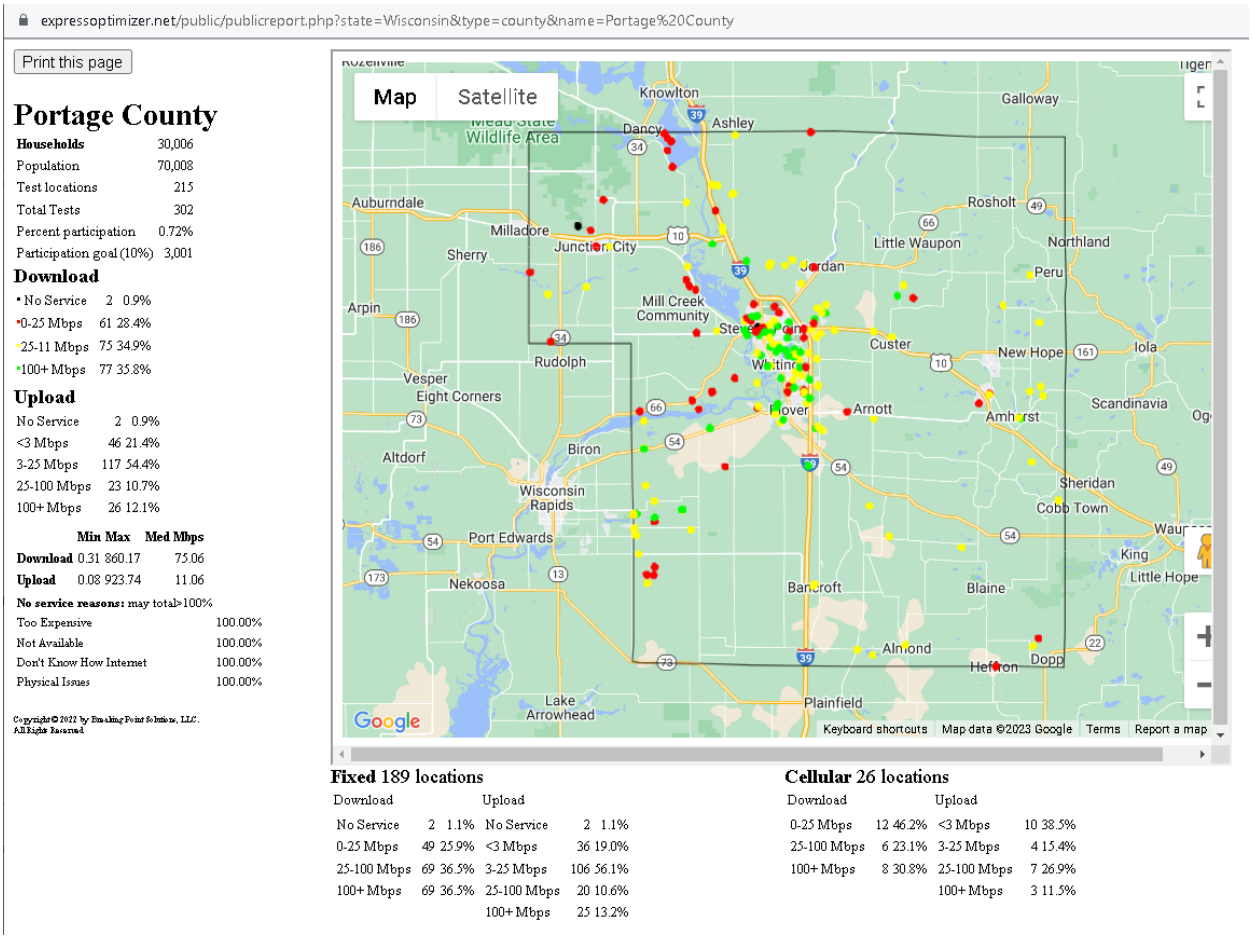
Speed	Number of users/devices	Tasks
5 Mbps	*1-2*	Online browsing, email, and research
25 Mbps	*3-5*	Downloading large files, business communications, and basic business Wi-Fi use
75 Mbps	*5-10*	Video streaming, numerous point-of-sale transactions, and frequent file-sharing
150 Mbps	*10-15*	Video conferencing, 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

Portage County goal is to have Internets speeds of 100 Mbps download and 100 Mbps upload are available county-wide.

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 analysis the results. Portage County currently has 302 total tests at 215 test locations and a participation rate of 0.72%. Tests can be taken, and results reviewed at www.wisconsinspeedtest.net.



expressoptimizer.net/public/publicreport.php?state=Wisconsin&type=county&name=Portage%20County

Print this page

Portage County

Households	30,006
Population	70,008
Test locations	215
Total Tests	302
Percent participation	0.72%
Participation goal (10%)	3,001

Download

No Service	2	0.9%
0-25 Mbps	61	28.4%
25-11 Mbps	75	34.9%
100+ Mbps	77	35.8%

Upload

No Service	2	0.9%
<3 Mbps	46	21.4%
3-25 Mbps	117	54.4%
25-100 Mbps	23	10.7%
100+ Mbps	26	12.1%

	Min	Max	Med Mbps
Download	0.31	860.17	75.06
Upload	0.08	923.74	11.06

No service reasons: may total>100%

Too Expensive	100.00%
Not Available	100.00%
Don't Know How Internet	100.00%
Physical Issues	100.00%

Fixed 189 locations

Download			Upload	
No Service	2	1.1%	No Service	2 1.1%
0-25 Mbps	49	25.9%	<3 Mbps	36 19.0%
25-100 Mbps	69	36.5%	3-25 Mbps	106 56.1%
100+ Mbps	69	36.5%	25-100 Mbps	20 10.6%
			100+ Mbps	25 13.2%

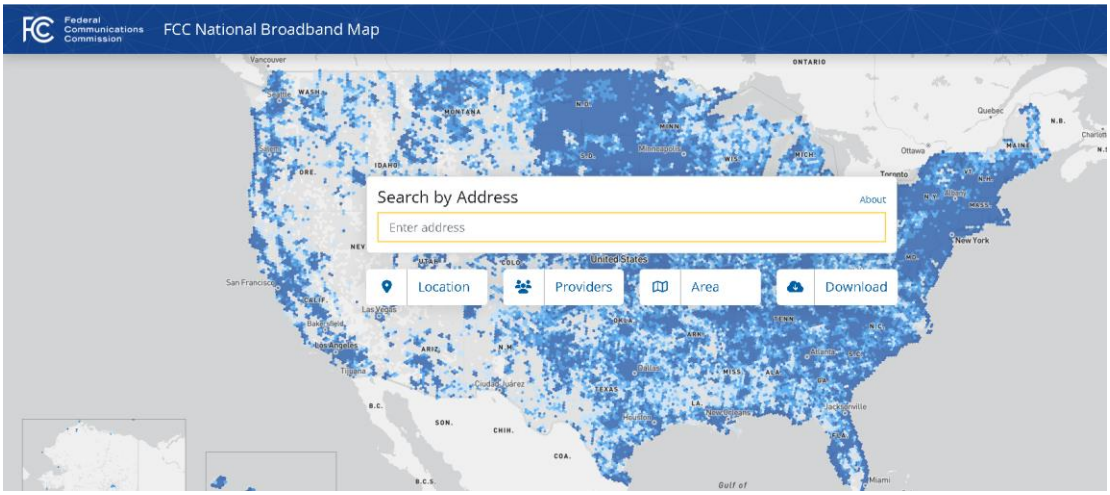
Cellular 26 locations

Download			Upload	
0-25 Mbps	12	46.2%	<3 Mbps	10 38.5%
25-100 Mbps	6	23.1%	3-25 Mbps	4 15.4%
100+ Mbps	8	30.8%	25-100 Mbps	7 26.9%
			100+ Mbps	3 11.5%

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 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.



CHAPTER THREE

DEMOGRAPHICS

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.

GENERAL POPULATION

Population growth has slowed at the state level and at the county level over the past two decades. In the 1990s, the County grew at 9.3 percent while the state grew at 4.0 percent. In 2010, Portage County had a total population of 69,437 residents. By 2021, 70,378 persons resided in the County, which is a 1.4 percent increase from the 2010 census total. Overall, Portage County's population increased by 4.8 percent between 2000 and 2020. In comparison, the state's population grew by 9.9 percent between 2000 and 2020, with a 3.6 percent increase between 2010 and 2020.

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 total population for each local unit (minor civil division), the county and the state. 16 out of the 27 municipalities in Portage County lost population from 2010 to 2021. During this time, the City of Stevens Point saw the largest net decrease, losing 730 people. At the same time, the Town of Almond experienced the largest percentage decrease, at 28.5 percent. The Village of Plover had the largest net increase, adding 1,605 people, with the Town of Lanark's

population growing 16 percent. Not reflected in the population numbers is the seasonal population, particularly the summer visitor season.

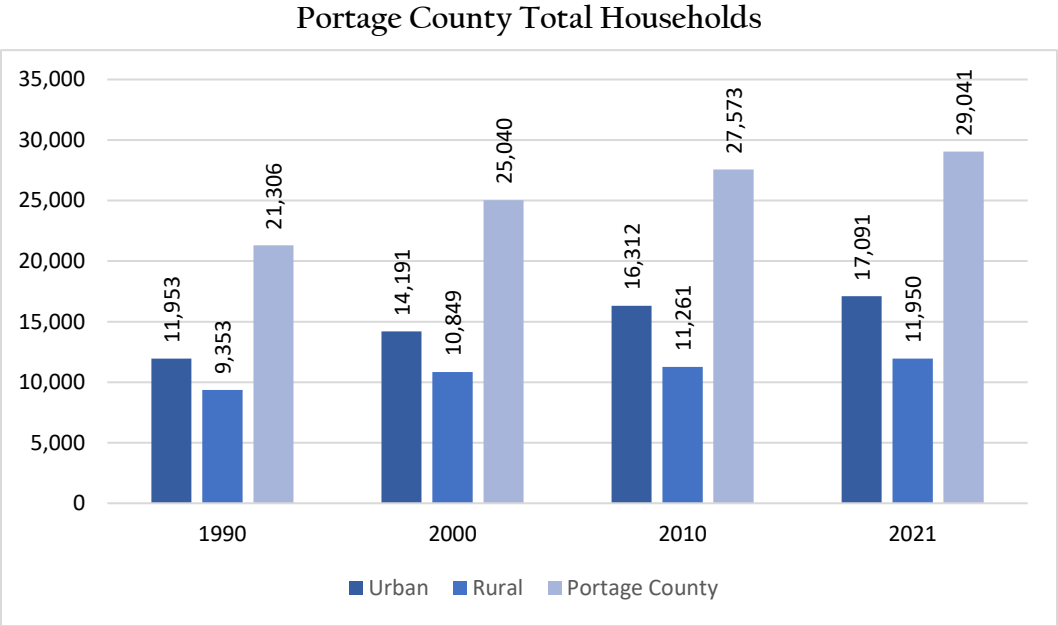
Table 3-1 Portage County Population								
Minor Civil Division	1990	2000	2010	2021	1990-2010 % Change	1990-2010 Net Change	2010-2021 % Change	2010-2021 Net Change
C. Stevens Point	23,006	24,492	26,482	25,752	15.1%	3,476	-2.8%	-730
V. Plover	8,176	10,520	11,830	13,435	44.7%	3,654	13.6%	1,605
V. Whiting	1,838	1,760	1,598	1,535	-13.1%	-240	-3.9%	-63
V. Park Ridge	546	488	473	461	-13.4%	-73	-2.5%	-12
Urban Area	**33,566**	**37,260**	**40,383**	**41,183**	**20.3%**	**6,817**	**2.0%**	**800**
V. Almond	455	459	441	441	-3.1%	-14	0.0%	0
V. Amherst	792	964	1,031	1,015	30.2%	239	-1.6%	-16
V. Amherst Jct.	269	305	297	291	10.4%	28	-2.0%	-6
V. Junction City	502	440	418	382	-16.7%	-84	-8.6%	-36
V. Nelsonville	171	191	230	193	34.5%	59	-16.1%	-37
V. Rosholt	512	518	436	463	-14.8%	-76	6.2%	27
T. Alban	860	897	758	820	-11.9%	-102	8.2%	62
T. Almond	590	679	727	520	23.2%	137	-28.5%	-207
T. Amherst	1,335	1,435	1,361	1,450	1.9%	26	6.5%	89
T. Belmont	540	623	604	602	11.9%	64	-0.3%	-2
T. Buena Vista	1,170	1,187	1,196	1,161	2.2%	26	-2.9%	-35
T. Carson	1,327	1,299	1,153	1,293	-13.1%	-174	12.1%	140
T. Dewey	849	975	1,060	1,172	24.9%	211	10.6%	112
T. Eau Pleine	944	931	890	938	-5.7%	-54	5.4%	48
T. Grant	1,673	2,020	1,712	1,968	2.3%	39	15.0%	256
T. Hull	5,559	5,493	5,323	5,294	-4.2%	-236	-0.5%	-29
T. Lanark	1,154	1,449	1,539	1,785	33.4%	385	16.0%	246
T. Linwood	1,035	1,111	1,387	1,162	34.0%	352	-16.2%	-225
T. New Hope	694	736	709	656	2.2%	15	-7.5%	-53
T. Pine Grove	949	904	1,045	1,037	10.1%	96	-0.8%	-8
T. Plover	2,223	2,415	1,778	1,558	-20.0%	-445	-12.4%	-220
T. Sharon	1,742	1,936	2,045	1,986	17.4%	303	-2.9%	-59
T. Stockton	2,494	2,896	2,914	3,008	16.8%	420	3.2%	94
Rural Area	**27,839**	**29,863**	**29,054**	**29,195**	**4.4%**	**1,215**	**0.5%**	**141**
Portage Co.	**61,405**	**67,123**	**69,437**	**70,378**	**13.1%**	**8,032**	**1.4%**	**941**
Wisconsin	**4,891,769**	**5,363,675**	**5,637,947**	**5,895,908**	**15.3%**	**746,178**	**4.6%**	**257,961**

Source: US Census Bureau

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 2021, there were 21,041 households in Portage County following at least three decades of household growth. The early 2000s saw a 10 percent increase in the number of households. Between 2010 and 2020, the number of households grew 5.3 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. In 2020, 1.5 percent of housing units were seasonal housing.

The county has some tourist destinations and popular vacation home areas. While an insignificant number, the summertime population places an increased demand on county and local government resources and should be considered in the broadband planning process.

Table 3-2: Portage County Seasonal and Year-Round Population		
Minor Civil Division	Seasonal	Year-round
C. Stevens Point	0.4%	94.6%
V. Plover	0.6%	96.3%
V. Whiting	0.0%	94.6%
V. Park Ridge	0.0%	98.3%
V. Almond	0.0%	88.9%
V. Amherst	0.0%	94.4%
V. Amherst Jct.	0.0%	92.9%
V. Junction City	0.0%	80.6%
V. Nelsonville	0.5%	93.4%
V. Rosholt	0.0%	84.6%
T. Alban	3.2%	86.9%
T. Almond	26.8%	73.0%
T. Amherst	8.8%	93.5%
T. Belmont	5.4%	90.6%
T. Buena Vista	16.1%	79.3%
T. Carson	7.5%	91.5%
T. Dewey	2.6%	93.6%
T. Eau Pleine	3.1%	92.5%
T. Grant	15.1%	85.3%
T. Hull	0.0%	96.4%
T. Lanark	0.0%	95.6%
T. Linwood	6.4%	84.6%
T. New Hope	4.0%	94.8%
T. Pine Grove	6.5%	84.2%
T. Plover	2.6%	91.0%
T. Sharon	4.5%	91.7%
T. Stockton	6.1%	90.2%
Portage County	1.5%	93.5%
State	7.1%	87.8%

Source: US Census Bureau

BROADBAND SERVICEABLE LOCATIONS (BSL)

Broadband Serviceable Locations (BSL) were estimated using Portage 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.

Broadband Serviceable Locations			
Minor Civil Division	BSL	BSL per SQMI	SQMI
City of Stevens Point	6884	471.1	14.6
Village of Almond	199	193.2	1.0
Village of Amherst	441	368.7	1.2
Village of Amherst Junction	133	123.2	1.1
Village of Junction City	170	142.8	1.2
Village of Milladore	5	1223.5	0.0
Village of Nelsonville	100	95.8	1.0
Village of Park Ridge	224	1026.4	0.2
Village of Plover	3647	448.2	8.1
Village of Rosholt	208	190.1	1.1
Village of Whiting	549	259.2	2.1
Town of Alban	626	17.3	36.1
Town of Almond	362	8.4	43.2
Town of Amherst	734	19.0	38.6
Town of Belmont	447	12.3	36.2
Town of Buena Vista	632	10.3	61.2
Town of Carson	640	11.6	55.0
Town of Dewey	484	10.3	47.0
Town of Eau Pleine	519	9.0	57.6
Town of Grant	1114	15.6	71.2
Town of Hull	2533	77.5	32.7
Town of Lanark	768	21.3	36.0
Town of Linwood	528	15.6	33.8
Town of New Hope	436	12.0	36.3
Town of Pine Grove	407	10.8	37.8
Town of Plover	1611	35.7	45.1
Town of Sharon	1007	15.5	64.9
Town of Stockton	1379	23.9	57.8

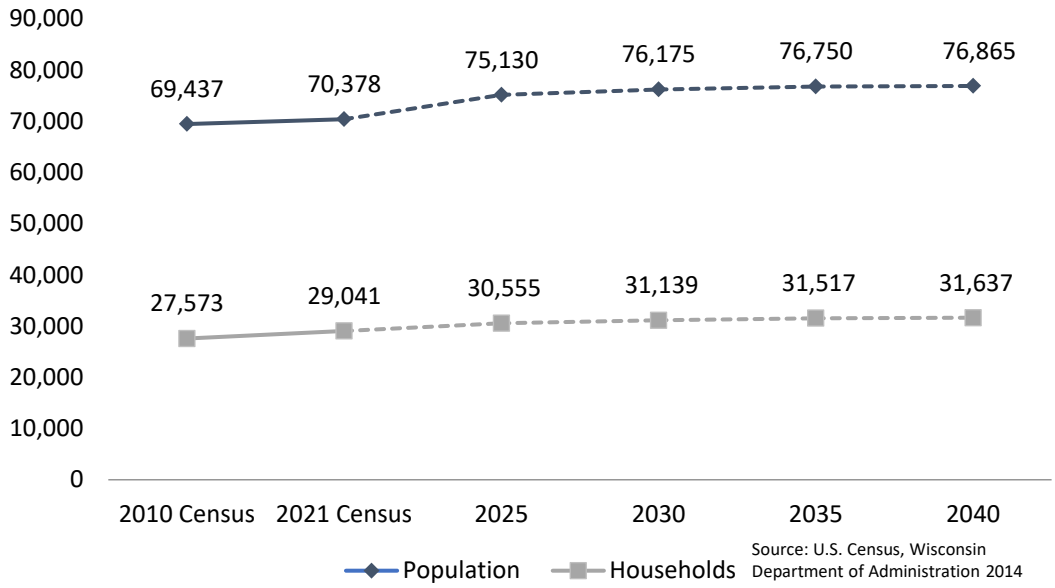
Source: NCWRPC and Portage County GIS

PORTAGE POPULATION AND HOUSEHOLD PROJECTIONS

Figure 3-3 shows the population and household future projections for Portage County. Despite slow population growth over the last decade, the County is expected to grow by 8.2 percent over the next 10 years. The County's population will continue to grow the following decade (2030-2040) by 0.9 percent.

The number of households in the County is projected to increase by 7.2 percent between 2021 and 2030. The number of households is expected to continue to grow by 1.6 percent between 2030 and 2040.

Figure 3-3: Portage County Population and Household Change



AGE DISTRIBUTION

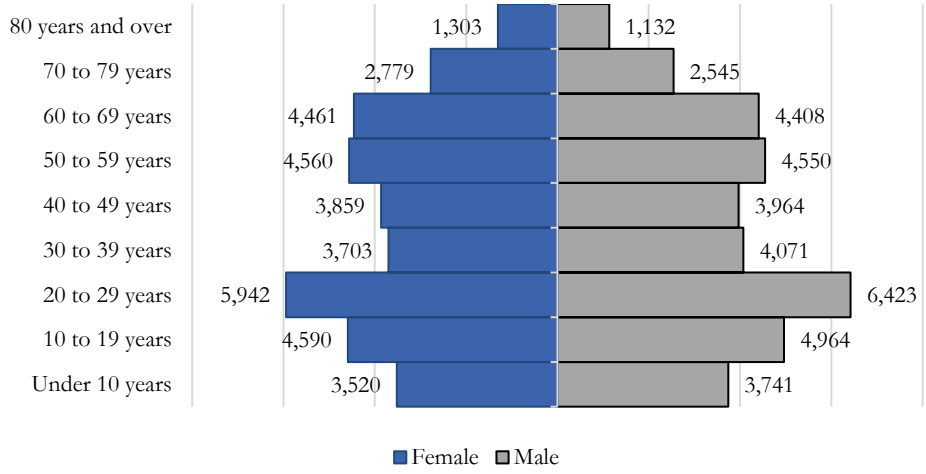
Population distribution is important to the planning process. In particular, understanding and considering age-related factors will better ensure that broadband services will effectively meet the needs of all community members, regardless of age. Factors like tailoring infrastructure for different age groups based on varying needs and preferences are important. For example, communities with a significant number of elderly residents might have a need for 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 counties in Wisconsin, Portage County has a strong baby-boom generation presence but a robust 20–29-year-old cohort. At the same time, the County's median age is lower than the State's. In 2010, the median age in Portage County was 36.1 years old, compared to 38.1 for the state. By 2020, the median age in the county increased to 38.5 years old, compared to 39.6 for the state. Furthermore, the percentage of the county's population 60 years old or older is increasing.

In 2010, 17.2 percent of the county's total population was 60 years old or older. By 2020, 23.6 percent of the county population was 60 years old or older. Comparatively, the state's share of the population 60 years or older increased from 18.4 in 2010 to 23.6 percent of the population in 2020. It is believed that this age demographic has been slower adopters of broadband and internet usage more generally.

At the same time, Portage County has a large share of the population between the ages of 10 and 29 years old. In 2021, 13.6 percent of the County population is between the ages of 10-19 years old, compared to 13.1 percent for the state. As for the 20-29 year old population, 16.6 percent of the County population is between these ages, compared to 12.9 percent for the state. Similar to the senior citizen population, this younger age cohort has technological needs, and many younger people rely heavily on having reliable internet access for school or connecting with their peers online. Students at local school districts and at area colleges like University of Wisconsin-Stevens Point rely on internet for online learning and without reliable broadband, many students could be left behind.

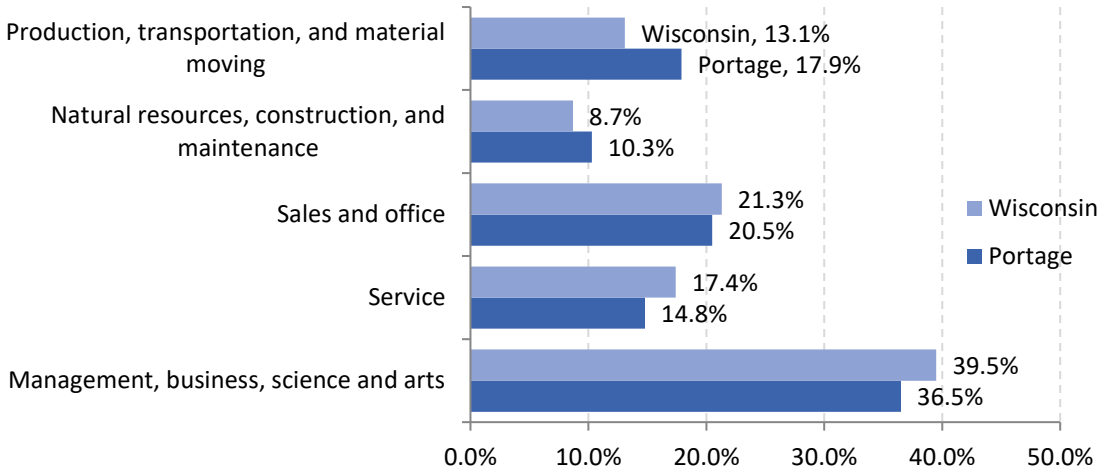
Figure 3-4: 2021 Portage County Age-Sex Pyramid



EMPLOYMENT

In 2021, there were 38,319 residents employed. (Note that these are persons employed and many of them work outside the county.) This reflected a 5.3 percent increase in the county's employment since 2010, compared to 3.9 percent growth for the state. Prominent resident occupational categories in the county include the management, business, science, and arts category as well as the sales and office category. The occupations related to the production, transportation, and material moving category are a larger share for the county than the state.

Figure 3-5 Portage County Resident Occupation



Source: American Community Survey

Gaining insight into the economic conditions of the county can provide valuable information regarding the prospects for enhancing broadband services. As reflected in figure 3-5, occupations like management, business, science, and arts and sales and office occupations are prominent occupations and likely rely on the internet regularly to do business. These businesses in the county should be further engaged to understand the specific needs and demands for internet access.

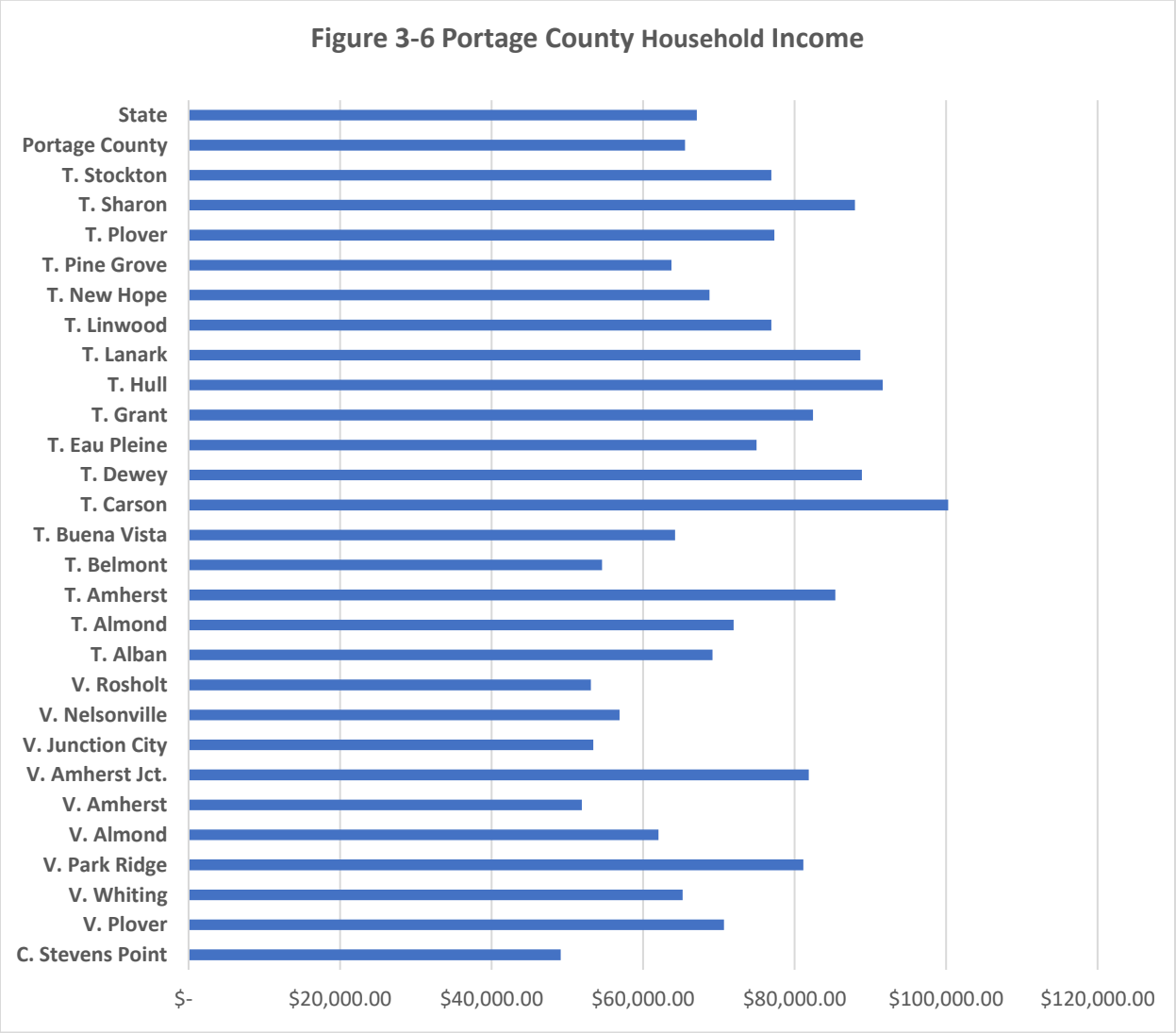
INCOME

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 3.6. The county median household income rose about 27.4 percent between 2010 and 2021, compared to a state increase of 30 percent. Meanwhile the county per capita income increased by 40.1 percent, compared to the state increase of 38.0

percent. Overall, the total county median income is lower than the state level, but per capita income is higher than the state level.

Median household income is displayed in figure 3-6. The county median household income rose about 27.4 percent between 2010 and 2021, compared to a state increase of 30 percent. Meanwhile the county per capita income increased by 40.1 percent, compared to the state increase of 38.0 percent. Overall, the total county median income is lower than the state level, but per capita income is higher than the state level. When incomes are adjusted for inflation, it is apparent that household incomes have kept up with and surpassed inflation. Had the 2010 County median household income risen with the Consumer Price Index, it would have been $62,117 in 2020, lesser than the actual $65,550 for 2020. The municipalities with the highest median household income include the towns of Carson, Hull, and Sharon. The lowest median incomes include Stevens Point, Amherst, and Rosholt.



American Community Survey, 2016-20

CHAPTER FOUR

ACCESS, AFFORDABILITY, ADOPTION

CURRENT BROADBAND ASSESSMENT OF PORTAGE COUNTY

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. Currently, 89.4 percent of households in Portage County have access to an internet subscription according to self-reported data from the American Community Survey. A few rural municipalities have relatively low rates of broadband or internet subscriptions per household; with the Towns of Alban, Eau Plaine, and Villages of Whiting and Junction City having the lowest percentage of households with broadband access in the county. On the other hand, the communities of Amherst Junction, Park Ridge with at least 95 percent of households with internet access, and several other rural towns have the highest broadband adoption rates in the county.

Approximately 79.2 percent of households within Portage have a broadband subscription (cable, fiber optic, DSL, or satellite), not including cellular data plan service. While typically not as reliable or as fast as broadband, cellular 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 11.3%. There are seven municipalities with at least 20% only having access to the internet through a cellular data plan (i.e., cell phone service).

Comparatively, Portage County has a higher proportion of households than the state with access to broadband by about 6 percent. Additionally, the percentage of households with cellular data but no other internet plan is greater than the state by approximately 4 percent. The percentage of Portage County households with broadband access can also be compared to neighboring counties. Overall, more Portage County households have access to broadband than the surrounding counties. As mentioned, 92.8 percent of Portage County households have a broadband subscription. This is compared to 84.6 percent of Waupaca County households, 82.4 percent of Waushara County households, 86.1 percent of Wood County households, and 87.4 percent of Marathon County households having broadband.

In general, broadband adoption rates within the county are typically highest in and around population centers, and lowest in the more scarcely 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.

Portage County Households with Internet		
Minor Civil Division	% of Households with an Internet Subscription	% of Households with Cellular Data Plan, no other Internet Subscription
C. Stevens Point	89.1%	9.9%
V. Plover	93.7%	8.7%
V. Whiting	82.0%	3.9%
V. Park Ridge	95.1%	6.9%
V. Almond	91.2%	9.9%
V. Amherst	86.7%	12.2%
V. Amherst Jct.	97.3%	20.7%
V. Junction City	82.3%	20.3%
V. Nelsonville	90.7%	6.7%
V. Rosholt	87.2%	16.7%
T. Alban	78.6%	10.9%
T. Almond	87.5%	22.6%
T. Amherst	93.1%	11.0%
T. Belmont	83.4%	23.0%
T. Buena Vista	82.9%	24.5%
T. Carson	88.0%	21.8%
T. Dewey	87.5%	21.9%
T. Eau Pleine	83.8%	15.1%
T. Grant	92.1%	10.0%
T. Hull	86.3%	7.4%
T. Lanark	93.2%	15.2%
T. Linwood	86.3%	28.6%
T. New Hope	84.3%	12.1%
T. Pine Grove	92.7%	19.6%
T. Plover	89.8%	17.9%
T. Sharon	84.2%	9.4%
T. Stockton	90.0%	12.0%
Portage County	89.4%	11.3%
State	86.9%	11.0%

Source: American Community Survey, 2017-2021

COMMON BARRIERS TO BROADBAND CONNECTIVITY

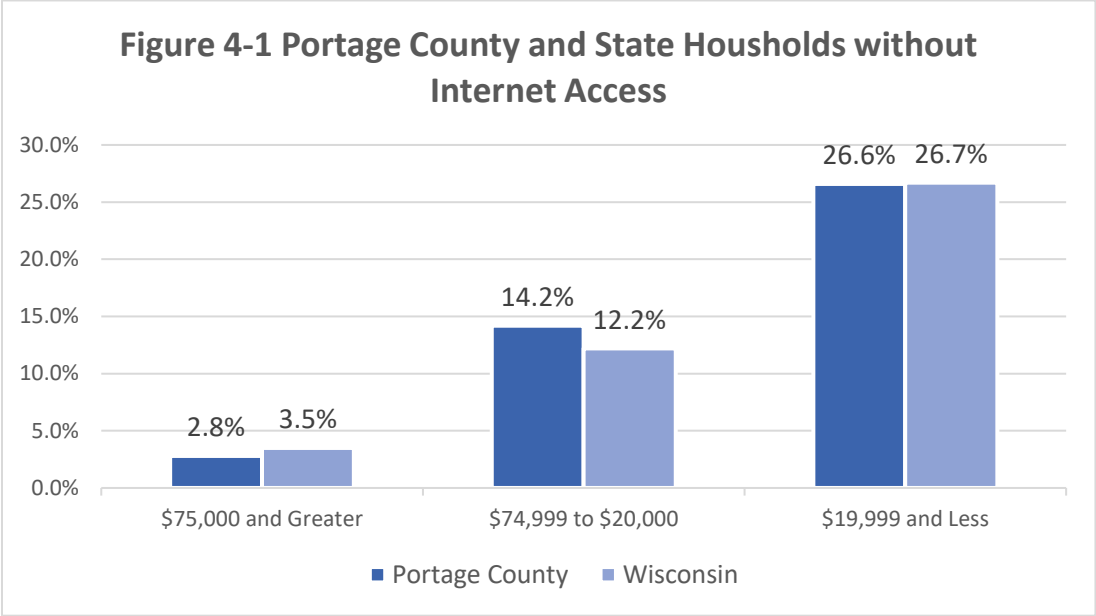
In today's interconnected world, widespread broadband connectivity is essential, yet several barriers hinder its adoption. Common challenges like affordability, a lack of interest in broadband adoption, and connectivity hurdles associated with rural areas continue to persist. These challenges are highlighted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

AFFORDABILITY

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% of people mention cost as the reason they do not have broadband at home.

Figure 4-1 shows household incomes and internet subscription rates for Portage County and Wisconsin. Among County households with incomes of $75,000 and above, a substantial 97.2 percent have access to broadband in their homes. Households with incomes of $74,999 to $20,000, 73.4 percent have access to broadband in their homes. For households with incomes below $20,000, 73.4 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 similar proportion of households with broadband access across each income group to Portage County.



Source: American Community Survey, 2017-2021

Overall, an examination of the Portage County households without an internet subscription shows a correlation between internet access and household income. 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.

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.

There are several factors that 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.

RURAL BROADBAND 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.

SOCIAL VULNERABILITY INDEX (SVI)

The 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. Here is a summary of the SVI:

Purpose:

The SVI is designed to help emergency planners, public health officials, and policymakers identify and prioritize communities that may be more susceptible to the adverse impacts of disasters. It assists in targeting resources and interventions to mitigate vulnerabilities and enhance resilience.

Components:

The SVI incorporates a variety of socio-economic and demographic factors that contribute to a community's vulnerability. These factors include poverty, lack of access to transportation, housing quality, education, unemployment, and age, among others.

Data Sources:

To calculate the SVI, data from the U.S. Census and other publicly available sources are utilized. This data is aggregated and analyzed to create a composite index for each census tract or block group, providing a spatially detailed assessment of vulnerability.

Composite Index:

The SVI generates a composite index score for each area, typically ranging from 0 to 1. Higher scores indicate greater vulnerability. These scores help in ranking communities from the most vulnerable to the least vulnerable.

Utility:

The SVI is instrumental in disaster planning and response. It assists in identifying areas where resources like emergency shelters, medical services, and outreach efforts should be concentrated, especially in the event of natural disasters such as hurricanes, floods, or pandemics.

Equity Focus:

One of the key benefits of the SVI is its focus on equity. It highlights disparities in vulnerability and helps ensure that resources are allocated fairly, taking into account the needs of marginalized and disadvantaged populations.

Evolving Tool:

The SVI is regularly updated to reflect changes in socio-economic and demographic conditions. This allows for a dynamic assessment of vulnerability, considering evolving community characteristics.

Policy Implications:

The SVI not only informs disaster response but also contributes to the development of policies and programs aimed at reducing vulnerability in at-risk communities over the long term.

In summary, the Social Vulnerability Index (SVI) is a comprehensive tool that quantifies the susceptibility of communities to various hazards. Its focus on socio-economic and demographic factors helps authorities make informed decisions to reduce vulnerability, enhance resilience, and promote equity in disaster management and public health initiatives. The Capital Projects Broadband Infrastructure grant program utilizes the SVI in its grant scoring.

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. ADD affordability programs.

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

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.

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.

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.

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.

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.

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.

BEAD

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.

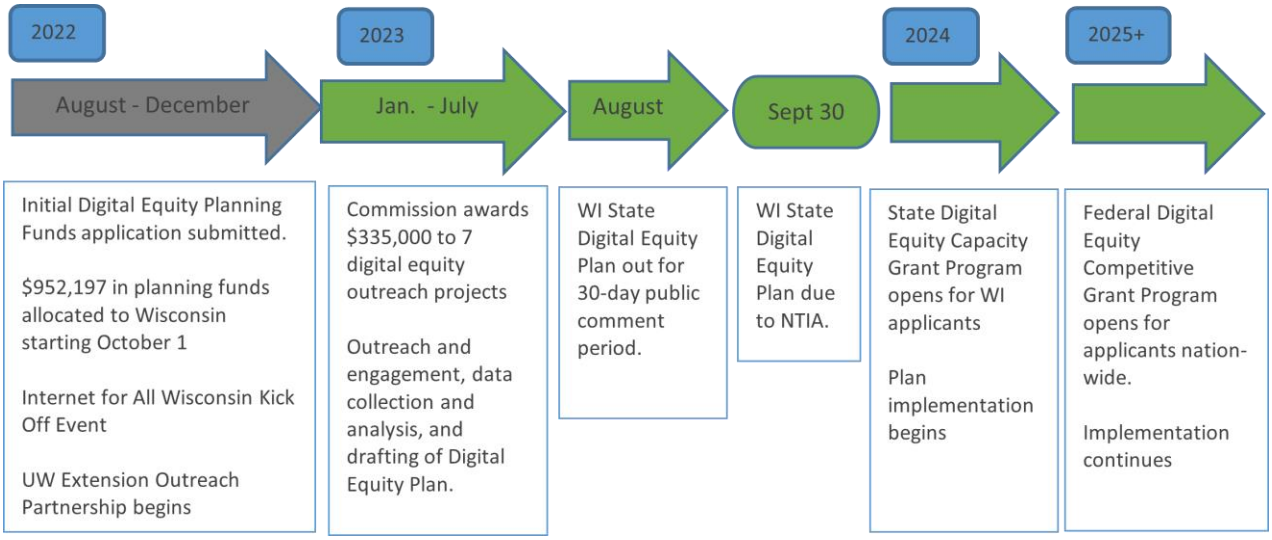
HOUSEHOLD ADOPTION PROGRAMS

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 include: 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



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% 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.

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% 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.

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.

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.

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.

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.

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.

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.

COST ESTIMATES

Cost estimation for broadband infrastructure and deployment and programs are important to help seek funding options and partners for each of the proposed broadband expansion projects. See the appendix for cost estimates for each of the proposed project areas based on the OptiDesign Rapid Design Study. Other cost estimates for programs could be developed to help increase the adoption of broadband in Portage County.

CHAPTER FIVE

BROADBAND GOALS

STATE OF WISCONSIN GOALS

2023 Governor's Task Force on Broadband Access produced recommendations in five areas for the State of Wisconsin:

PREPARING TO CAPITALIZE ON FEDERAL FUNDS

- Wisconsin needs to plan, coordinate, distribute, and capitalize on the increasing federal funding dollars available, including those through the Bipartisan Infrastructure Law (BIL) such as the Broadband, Equity, Access, and Deployment (BEAD) Program and Digital Equity Programs.
- Support the Wisconsin Broadband Office and Public Service Commission of Wisconsin in their drafting and submission of Wisconsin's 5-Year BEAD Action Plan and Digital Equity Plan.
- Find ways to reduce or combat the impacts of inflation and supply chain pressures to create a more hospitable environment for broadband expansion.
- Continue to find ways to braid BIL funds with other funding sources such as local, state, private, philanthropic, and other federal.
- Recognize and emphasize the importance of other sources of funding beyond the BIL. Advocate for increasing those funding sources to complement the BIL.
- Ensure that all Wisconsinites and broadband stakeholders are aware of federal and state funding opportunities by way of technical support, sharing best practices, webinars, workshops, newsletters, local, regional, and statewide in-person meetings, providing general assistance, and supporting applications.
- Help to secure Wisconsin's future by encouraging the use of federal dollars on forward thinking and future proof solutions.
- Support, engage with, and consider the needs of Internet Service Providers and Telecommunications Associations in their preparations for the BEAD program.
- Explore and promote available low-interest loan programs that help to support internet service providers in their pursuit of broadband infrastructure expansion.
- The Wisconsin State Legislature should consider flexibilities and/or waivers to existing State statutes that may be burdensome to federal funding investment.
- Fiber technology should be prioritized, but not exclusively required in publicly funded broadband deployment. Terrestrial fixed wireless solutions are viable in particularly hard-to-reach areas and/or as a short-term solution.

SUPPORTING LOCAL COMMUNITIES

- Support organizations such as the Public Service Commission of Wisconsin, University of Wisconsin – Madison, Division of Extension, and Wisconsin Economic Development Corporation in their technical assistance efforts.
- Maintain a continued focus on how best to assist local communities in broadband planning to ensure their involvement and participation in the rollout of federal funds.
- Support local broadband champions, including digital navigators embedded within the community.
- Help these champions and navigators carry out and see through their community connectivity vision.
- Continue to improve and promote broadband planning playbooks and toolkits available to local communities.
- Find more ways for the public to better understand and utilize broadband maps and data.
- Encourage public participation and input in the planning process where appropriate.
- Engage local communities through statewide listening sessions and take information and stories to the Task Force for continued advancement and strengthening of the Task Force annual report.

WORKFORCE DEVELOPMENT

- Support and include organizations such as workforce development boards, economic development, labor groups and unions, contractors, high schools, higher education and technical colleges, and State agencies (DPI, DWD, PSC). Ensure that these organizations are connected with internet service providers and telecommunications associations to increase awareness and create a sustainable and viable pipeline of talent.
- Ensure a sufficient and trained telecom workforce for internet service providers, contractors, and subcontractors to construct, operate and maintain current and new broadband infrastructure.
- Where practicable and with input from higher education and employers, Wisconsin should encourage hiring from within local communities to help retain local talent and grow good jobs within Wisconsin.

MAPPING AND DATA

- Promote the Federal Communications Commission's (FCC) National Broadband Map and the opportunities for the public and stakeholders to challenge availability and location data within the map.
- Continue to support statewide speed testing and surveying such as funding and promotion of the
- OptiMap (formerly known as Geo Partners) software and the Wisconsin Internet Self-Report (WISER) survey.
- Support local communities in their efforts to pursue, intake, and make meaning of local data.

- Align state mapping efforts and products with the federal government.
- Find ways to quantify and capture the quality of broadband service beyond basic metrics like download and upload speed.

AFFORDABILITY AND ADOPTION

- Continue outreach and promotion of the Affordable Connectivity Program (ACP) to reach the highest possible levels of participation in Wisconsin.
- Maintain federal funding for the ACP program to ensure access to this vital program for eligible households in Wisconsin. Consider establishing a state internet assistance affordability program.
- Increase outreach and engagement with underserved populations such as aging individuals, incarcerated individuals, veterans, individuals with disabilities, individuals with a language barrier, individuals who are members of racial or ethnic minority groups, and individuals who primarily reside in rural areas to ensure all Wisconsin residents can make full use of the internet.
- Wisconsin should develop and define standard metrics for affordability of broadband services for all Wisconsinites.

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.

- **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.**

CENTERGY-CENTRAL WI ALLIANCE FOR ECONOMIC DEVELOPMENT, BROADBAND GOALS

The following goals were identified in the Centergy Region to assist with planning at a regional level.

- **Inventory existing efforts across region, such as past Broadband Expansion Grant recipients, past broadband plans and studies, past surveys, existing maps, etc. Outcomes: This inventory and research will allow staff to create a baseline of existing and current efforts which will help inform us of the next steps in our planning process.**
- **Form a regional broadband committee with appointments from each of the counties and tribes. Outcomes: This committee will be the working group for the duration of the project. They will assist staff in outreach and communication to their respective counties/tribe and communities.**
- **Coordinate and implement sub-regional meetings for communities (these may be in-person or virtual depending on the input received from the regional broadband groups. Outcomes: These meetings/sessions will help inform the regional broadband vision and goals by providing stakeholders with an opportunity to be engaged.**

PORTAGE COUNTY GOALS

Internets speeds of 100 mbps download and 100 mbps upload are available county-wide.
This differs from the 100/10 goal from PSC, but fits better with virtual education and telehealth requirements

Affordable plans are available county-wide.
I don't know how to define affordable here $75 / month? $100 / month, some percentage of income?

Promote low cost or free access at community anchor points.
Community anchor points would include but not be limited to libraries, municipal halls, and schools

CHAPTER SIX

GAP ANALYSIS

DATA COLLECTION

COVERAGE GAPS

ADOPTION GAPS

INFRASTRUCTURE GAPS

IMPACT

ECONOMIC

EDUCATIONAL

HEALTHCARE

SOCIAL AND CIVIC

RECOMMENDATIONS

CHAPTER SEVEN

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 the citizens of Portage County with expanded high-speed broadband expansion.

We believe in a future where every household, every school, every business, and every individual has access to reliable and fast broadband. It's not just about connectivity; it's about empowerment, education, economic growth, and community development.

Advocate for Change: Raise your voice and demand better broadband access in your community. Write to your local representatives, attend town hall meetings, and participate in discussions about digital equity. Your advocacy can make a difference.

Support Local Initiatives: Get involved with local broadband projects and initiatives. Volunteer your time, skills, or resources to help bridge the digital gap in your area.

Stay Informed: Educate yourself and others about the importance of broadband access. Stay up-to-date with the latest developments in broadband technology and policy.

Connect with Communities: Share your knowledge and experiences with those who lack access. Help them understand the benefits of broadband and how to make the most of it once it's available.

Collaborate: Encourage public-private partnerships and cooperation among stakeholders. When communities, businesses, and governments work together, the path to broadband deployment becomes clearer.

Demand Accountability: Hold service providers and policymakers accountable for their promises. Ensure that broadband expansion projects are transparent, efficient, and effective.

Support Broadband-friendly Policies: Advocate for policies that promote broadband deployment and remove barriers to expansion. Support funding initiatives that prioritize digital inclusion.

Invest in the Future: Whether you're an investor, business owner, or community leader, consider investing in broadband infrastructure. A connected community is a thriving community.

Spread the Word: Use your influence on social media, in your workplace, and within your social circles to raise awareness about the importance of broadband access. Encourage others to join the cause.

Moving a plan forward involves a series of strategic steps and actions to ensure its successful implementation. Here are the next steps you can take:

1. Form a Dedicated Team: Assemble a team of individuals with the necessary skills and expertise to execute the plan. Assign specific roles and responsibilities to team members.

2. Develop a Detailed Action Plan: Create a comprehensive action plan that outlines the specific tasks, timelines, and resources required to implement the plan successfully. Set measurable objectives and key performance indicators to track progress.

3. Secure Funding: Identify and secure the necessary funding and resources to support the plan's execution. This may involve seeking grants, securing investments, or allocating budgetary resources.

4. Engage Stakeholders: Collaborate with relevant stakeholders, including government agencies, community organizations, private sector partners, and affected communities. Ensure that all stakeholders are aligned with the plan's goals and objectives.

5. Build Partnerships: Establish partnerships and alliances with organizations and entities that can contribute to the plan's success. Public-private partnerships can be particularly valuable in many cases.

6. Execute the Plan: Begin implementing the plan according to the action plan and timeline. Monitor progress closely and adjust as necessary to address challenges and changing circumstances.

7. Communication and Outreach: Develop a communication strategy to keep stakeholders informed and engaged throughout the implementation process. Regularly update them on progress, milestones, and achievements.

8. Quality Control and Risk Management: Implement quality control measures to ensure that the plan's objectives are met and that outcomes meet expected standards. Identify and mitigate risks that could impact the plan's success.

9. Evaluate and Adjust: Periodically assess the plan's progress and effectiveness. Use data and feedback to make informed adjustments to the plan, addressing any emerging issues or opportunities.

10. Celebrate Achievements: Recognize and celebrate milestones and achievements along the way. Acknowledge the efforts of the team and stakeholders to maintain motivation and momentum.

11. Document and Share Best Practices: As you implement the plan, document best practices and lessons learned. Share this knowledge with others who may benefit from similar initiatives.

12. Sustainability Planning: Develop a sustainability plan to ensure that the outcomes and benefits of the plan continue long after its initial implementation. Consider how to maintain and upgrade infrastructure, secure ongoing funding, and support ongoing adoption and usage.

13. Feedback and Continuous Improvement: Encourage feedback from stakeholders and the community. Use this feedback to continuously improve the plan and its execution.

14. Monitoring and Reporting: Establish a system for ongoing monitoring and reporting of progress to stakeholders, funders, and the community. Transparency is key to maintaining trust and support.

Remember that the process of moving a plan forward is dynamic and may require adaptability and resilience in the face of challenges. Effective project management, stakeholder engagement, and a commitment to the plan's objectives will be essential to its success.

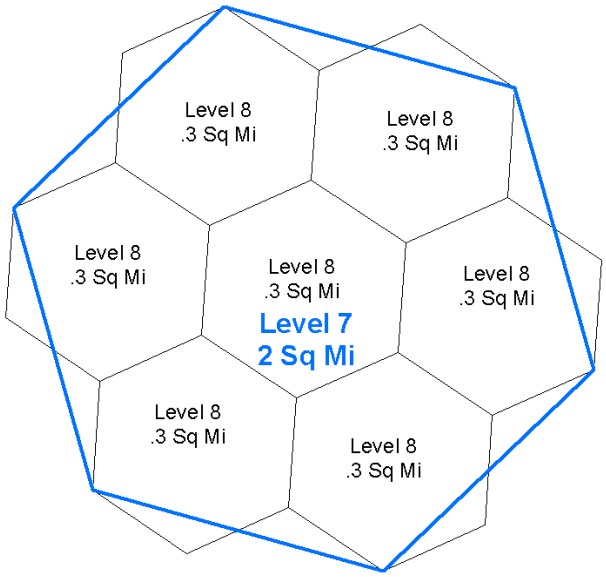
Let's work together to bridge the digital divide, transform lives, and create a brighter future for all. Let’s make connectivity a reality for everyone, everywhere!

APPENDIX 1

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 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)

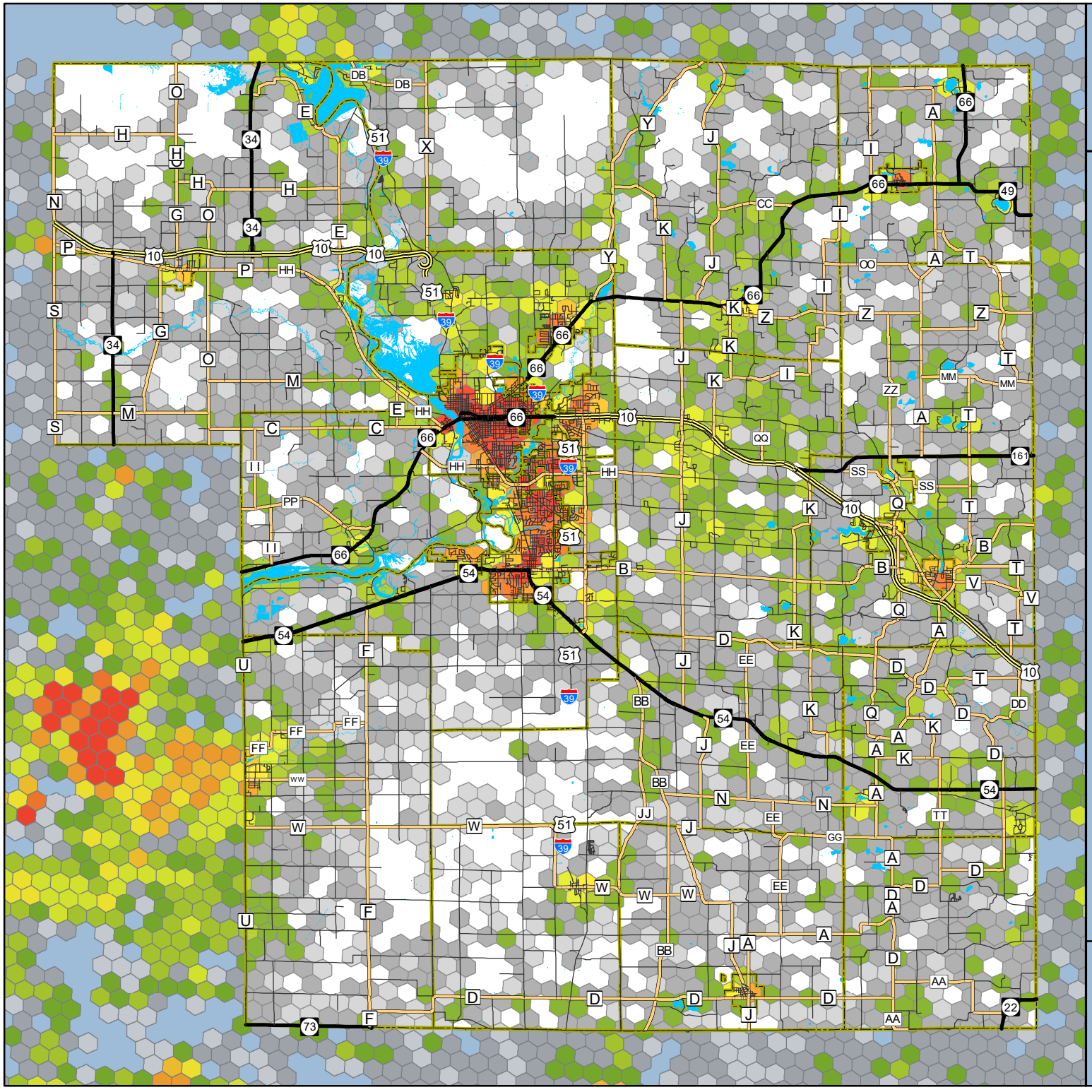
Information was collected from wisconsinspeedtest.net and Ookla Open Data speed tests. These areas are summarized at level 7 hexbins. Areas that reported no service are highlighted.

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**

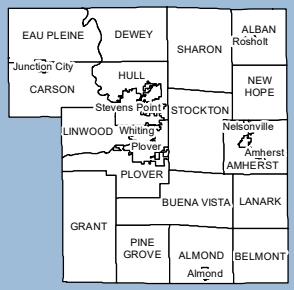
Broadband Serviceable Locations (BSL)

Portage County, Wisconsin

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

Count

- 1
- 2 - 5
- 6 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 150
- 151 - 200
- > 200



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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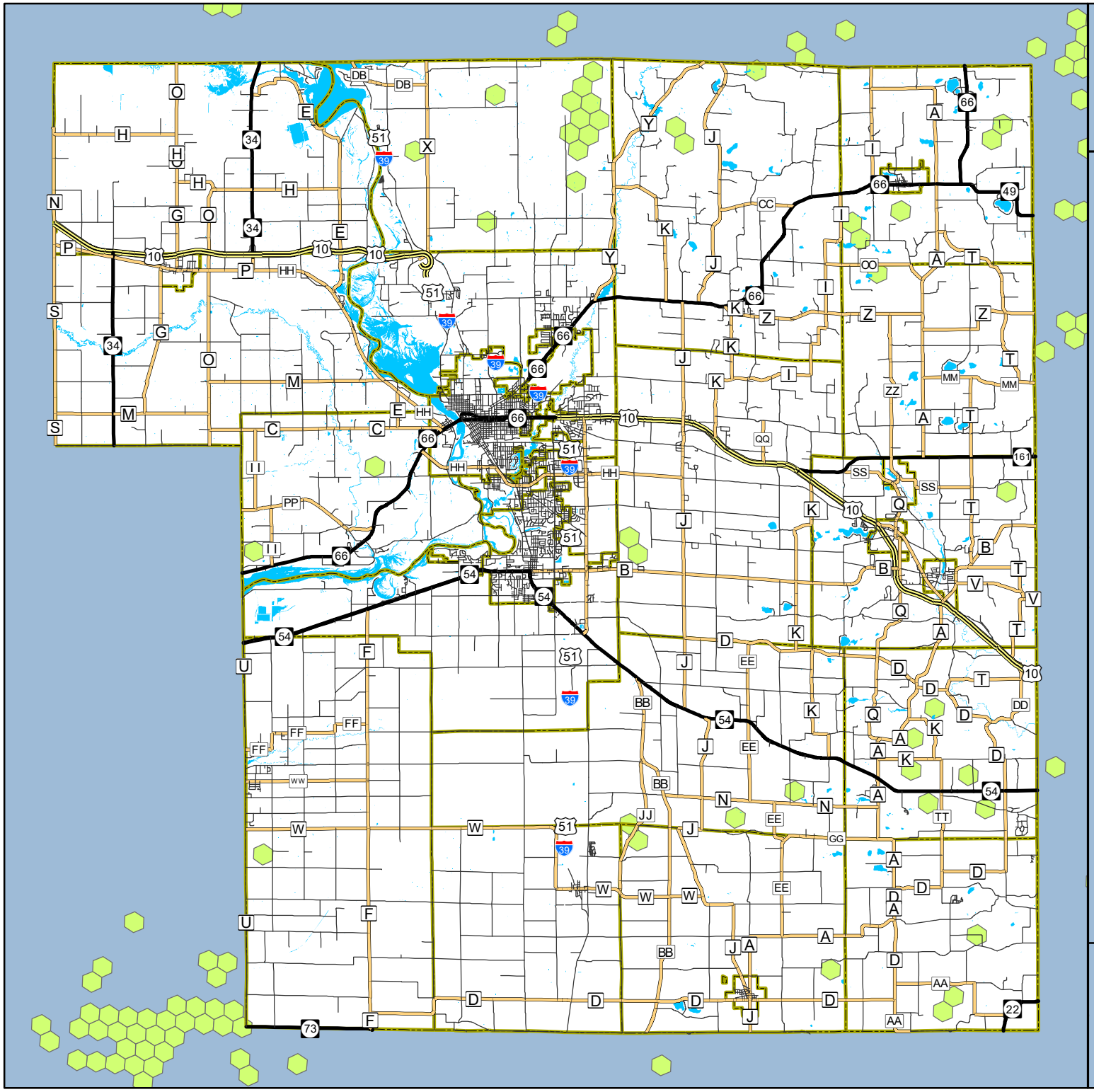
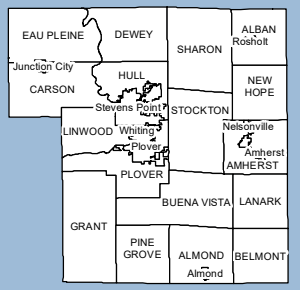
Map 2a **DRAFT**

Managed Forest Lands (MFL)

Portage County, Wisconsin



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



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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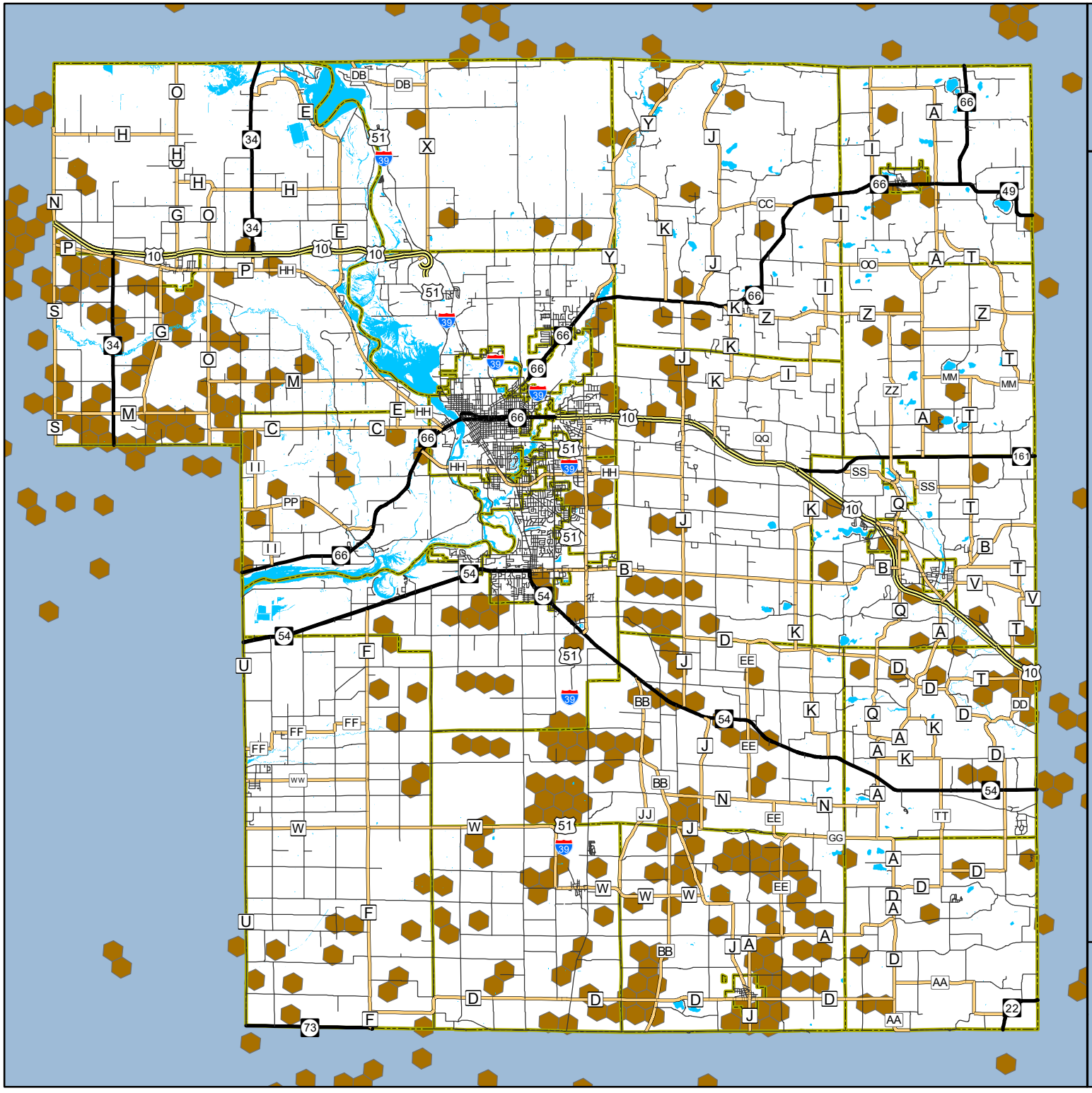
Map 2b **DRAFT**

Assessed Agricultural Lands

Portage County, Wisconsin



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

Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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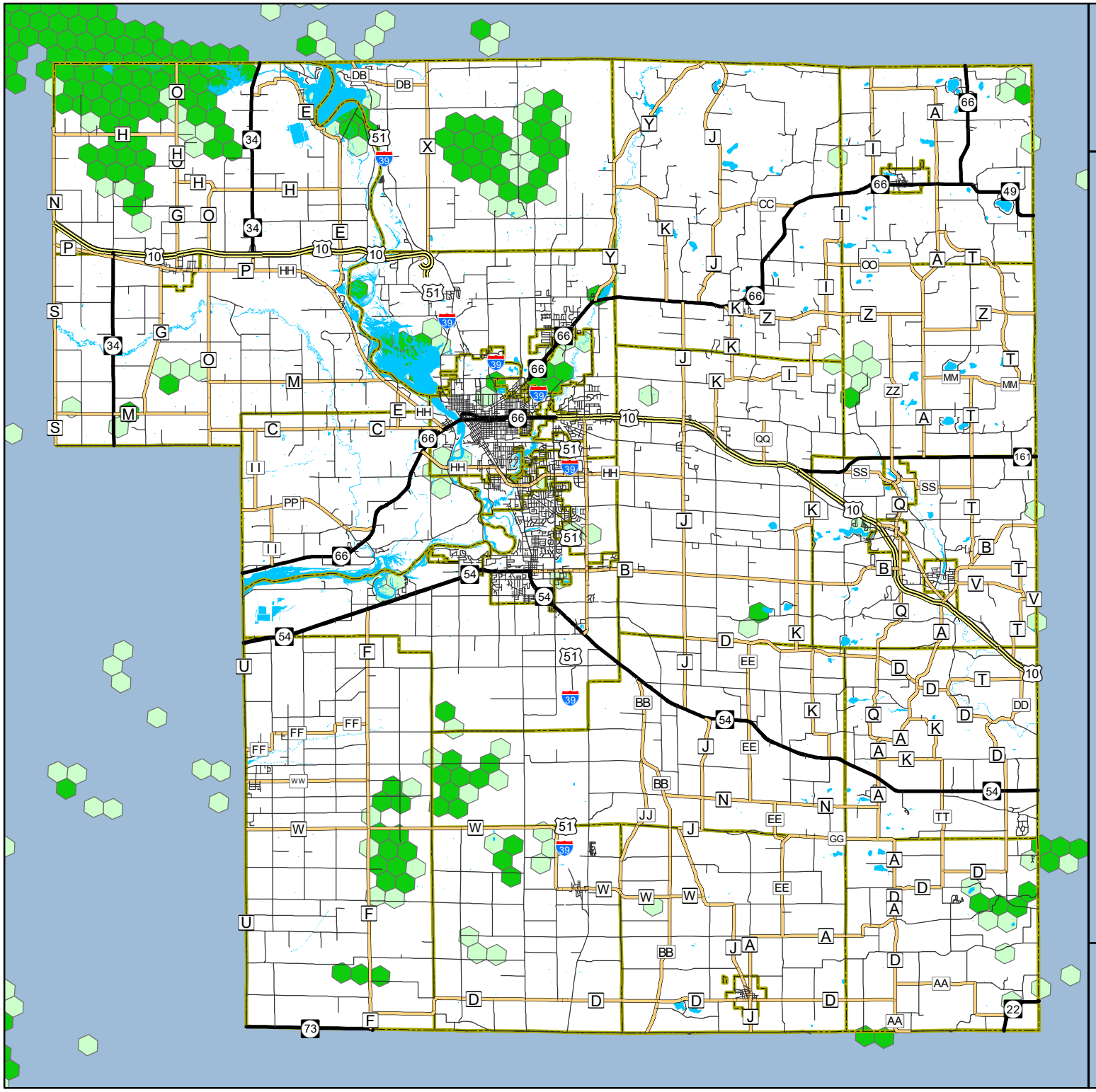


Map 2c **DRAFT**

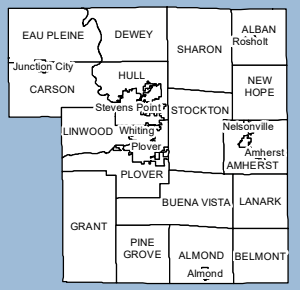
Assessed Tax Exempt Lands

Portage County, Wisconsin

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

Tax Exempt

- 50 to 75%
- > 75%



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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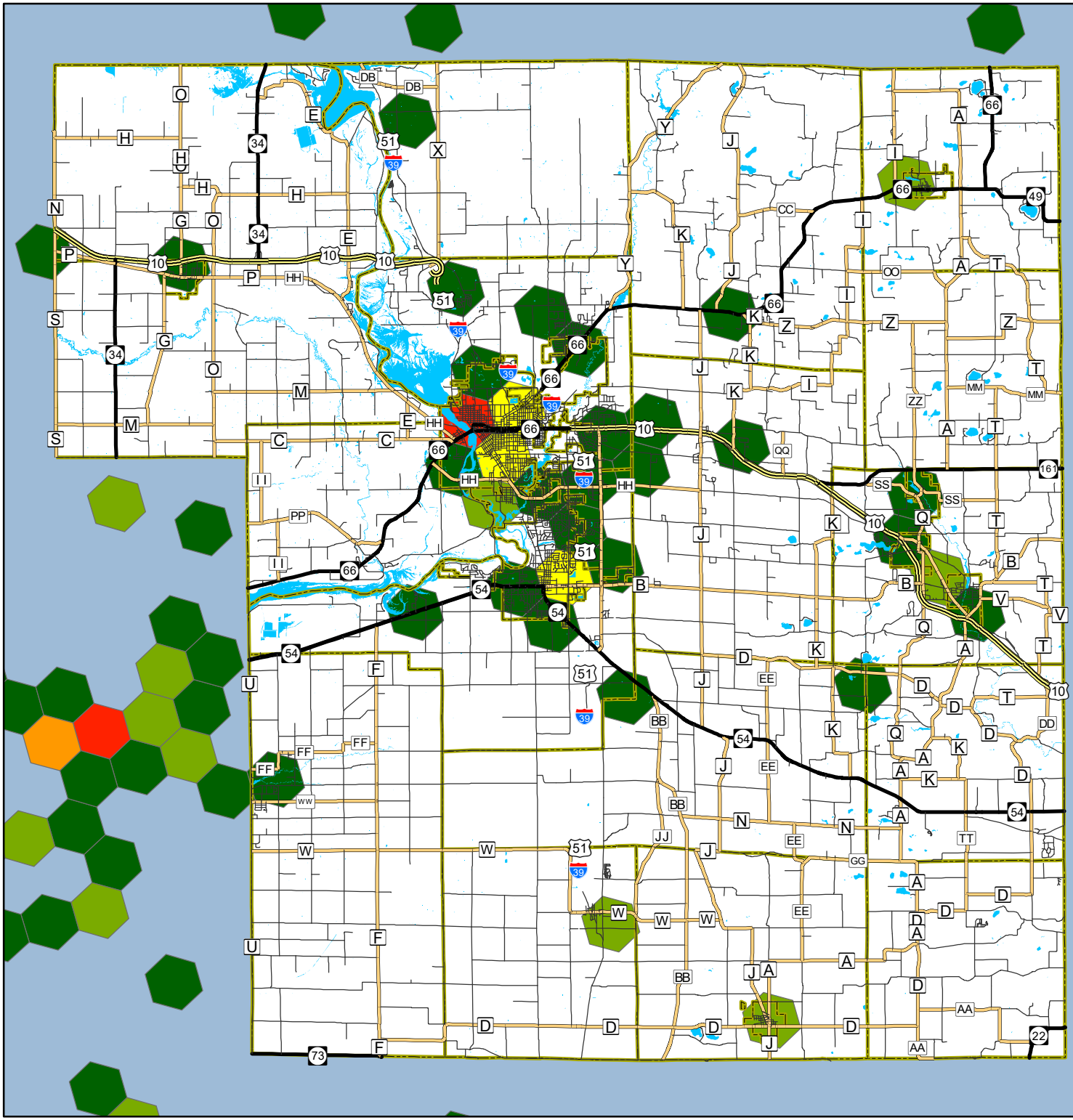
Map 3 **DRAFT**

Critical Facilities

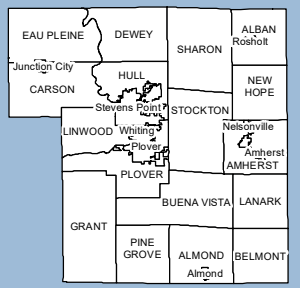
Portage County, Wisconsin



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

Count

- 1 - 2
- 3 - 5
- 6 - 8
- 9 - 12
- 13 - 20



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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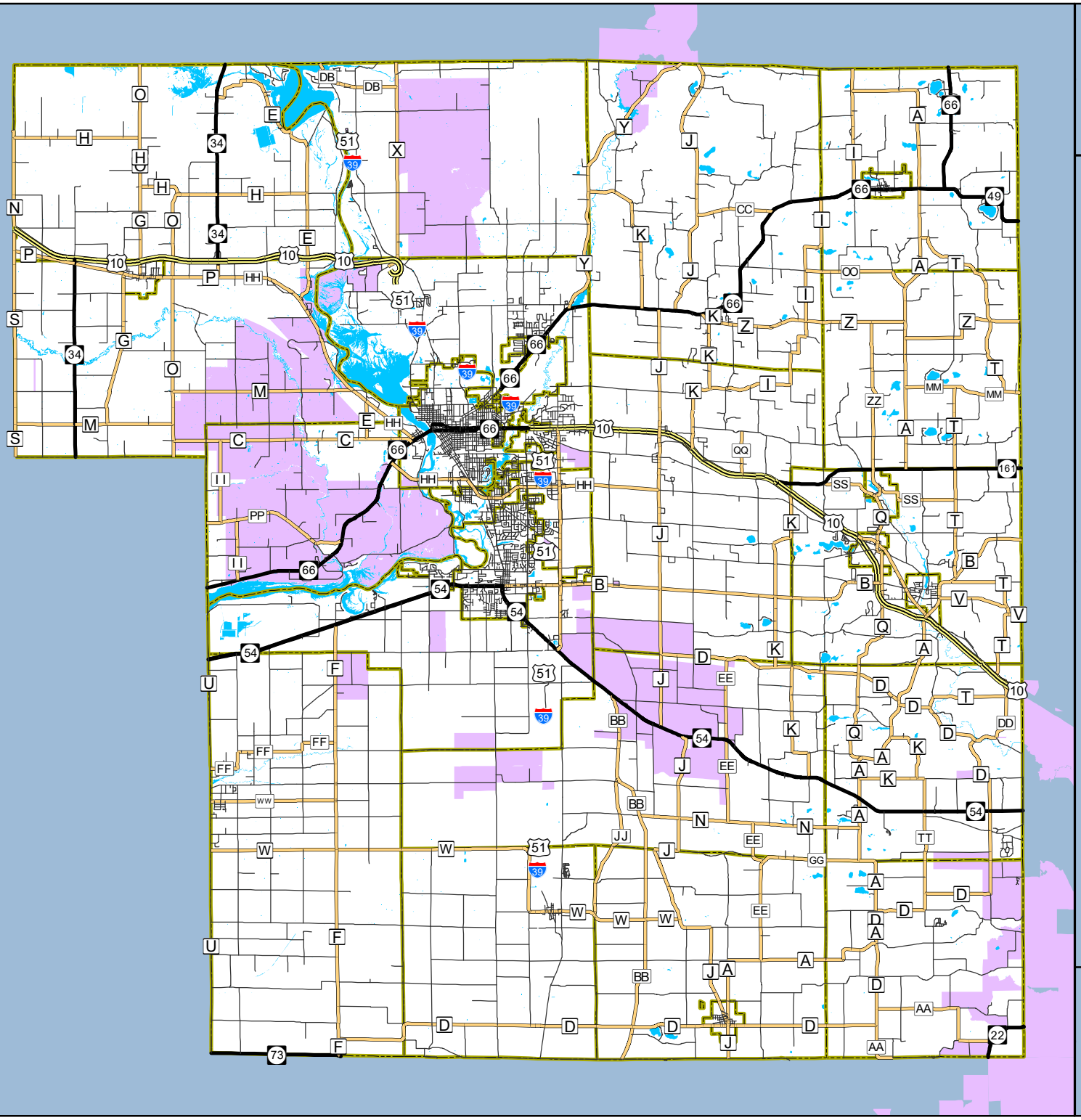
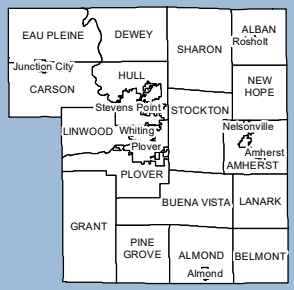
Map 4a **DRAFT**

Rural Digital Opportunity Fund (RDOF)

Portage County, Wisconsin



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



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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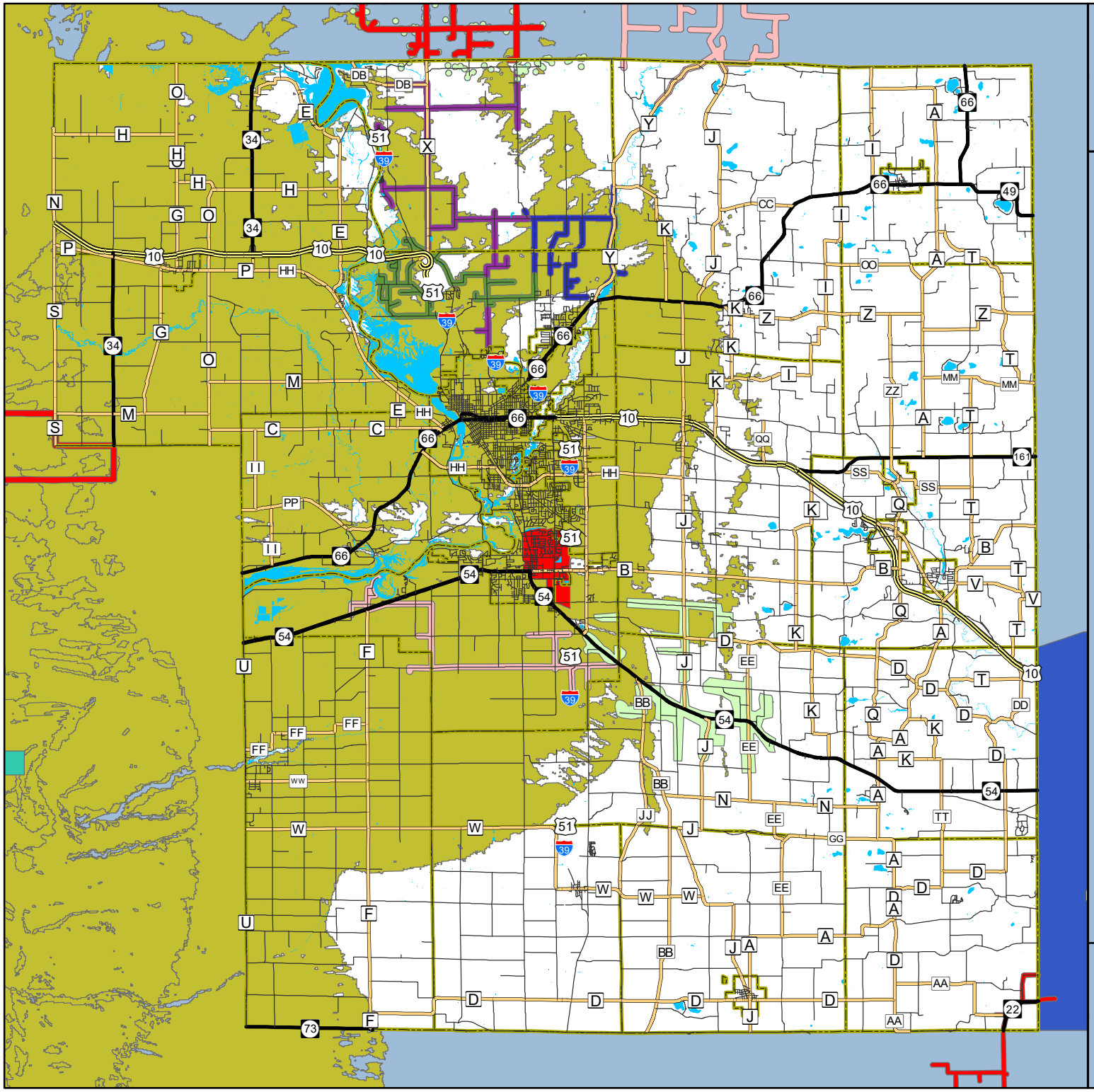


Map 4b **DRAFT**

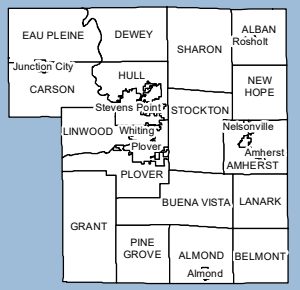
Existing Grant Areas

Portage County, Wisconsin

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

Grant Round

- No Year Noted
- 2014
- 2015
- 2017
- 2018, Round 1
- 2018, Round 2
- 2019
- 2020
- 2021
- 2022 ARPA



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC, PSC

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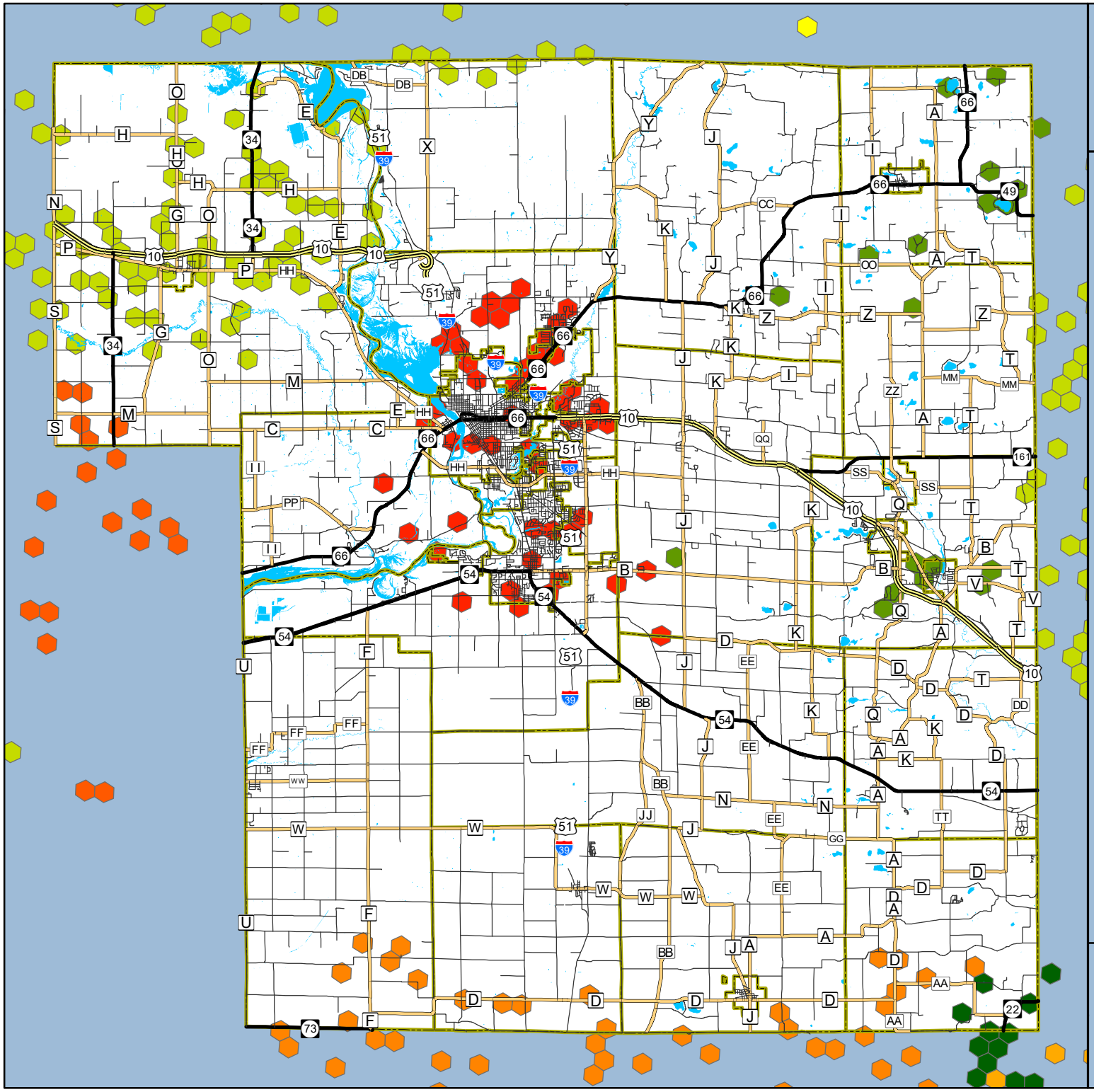


Map 5a **DRAFT**

Broadband Availability Copper

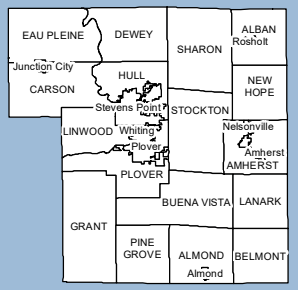
Portage County, Wisconsin

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

Copper

Provider

- AT&T Inc
- Amherst Telephone Company
- Brightspeed
- CenturyLink
- Frontier
- Solarus
- TDS Telecom
- Union Telephone Company
- Wittenberg_Telephone_Company



Source: WI DNR, NCWRPC, Lincoln Co, WisDOT, FCC

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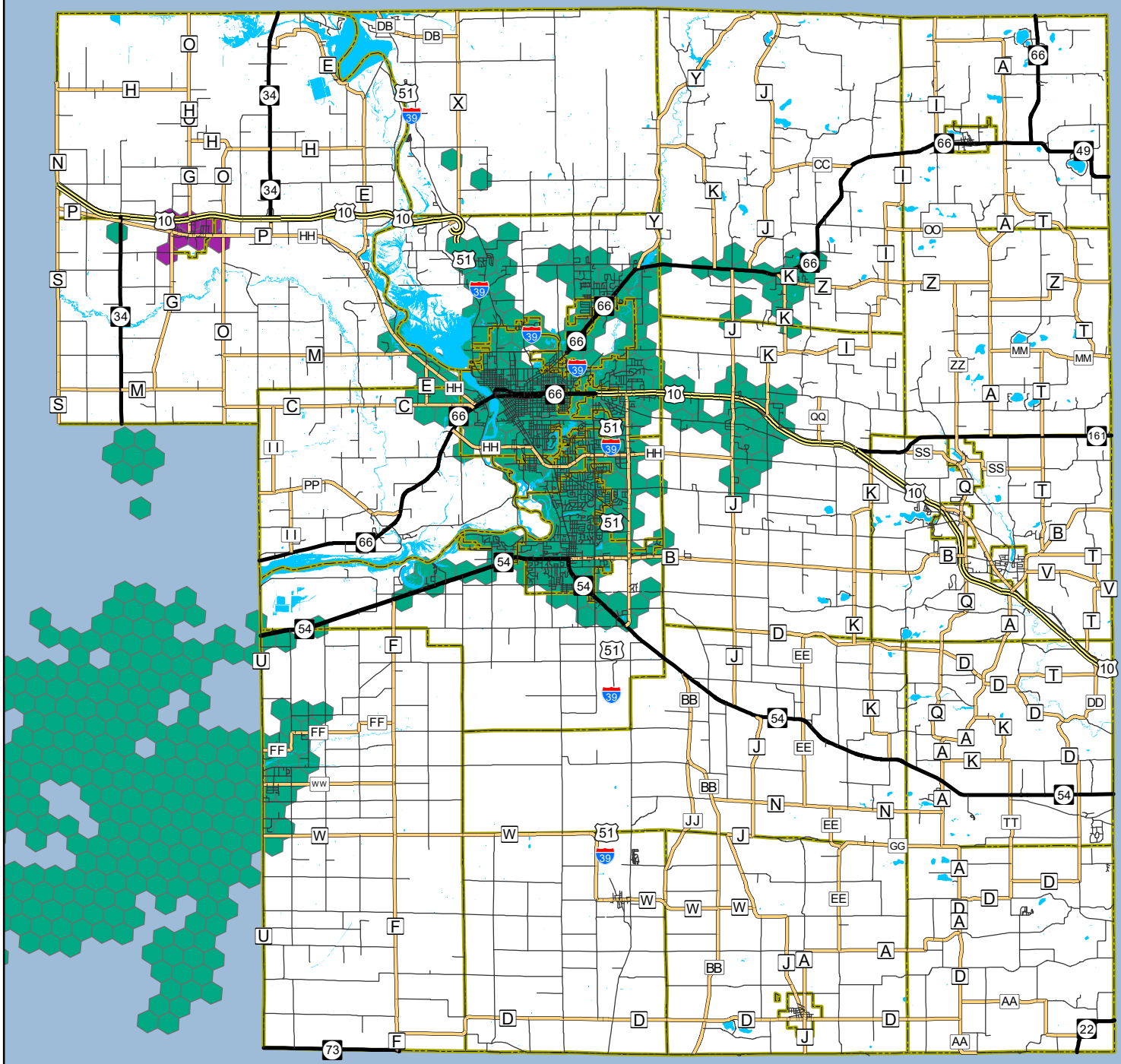
Map 5b **DRAFT**

Broadband Availablity Cable

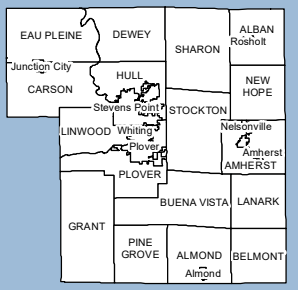
Portage County, Wisconsin



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

Cable Provider

- Astrea
- Charter Communications Inc



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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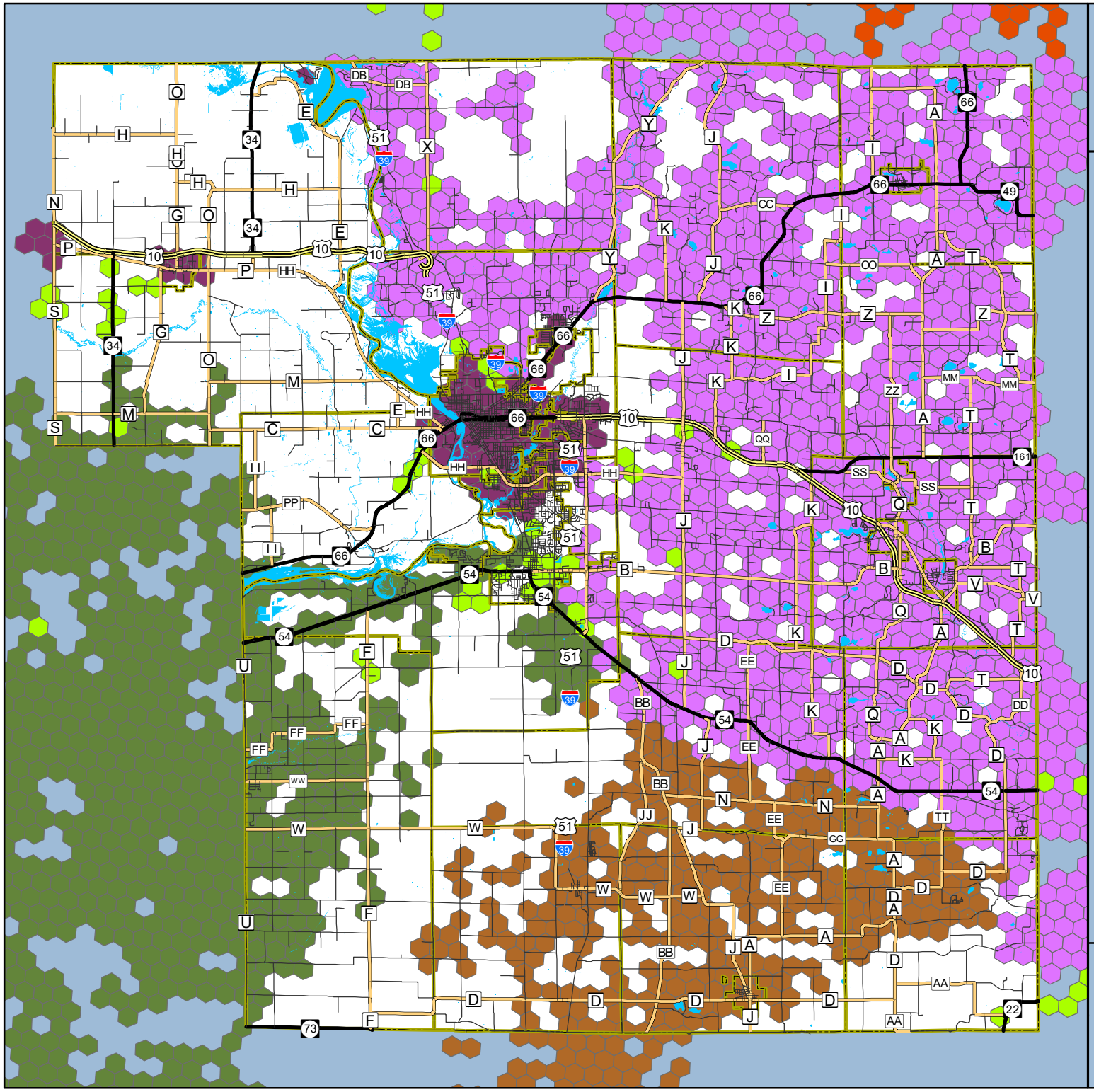


Map 5c **DRAFT**

Broadband Availability Fiber

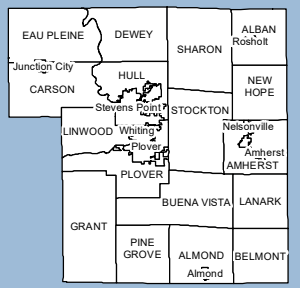
Portage County, Wisconsin

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

Fiber

Provider

- Amherst Telephone Company
- Charter Communications Inc
- Solarus
- TDS Telecom
- Union Telephone Company
- Wittenberg_Telephone_Company



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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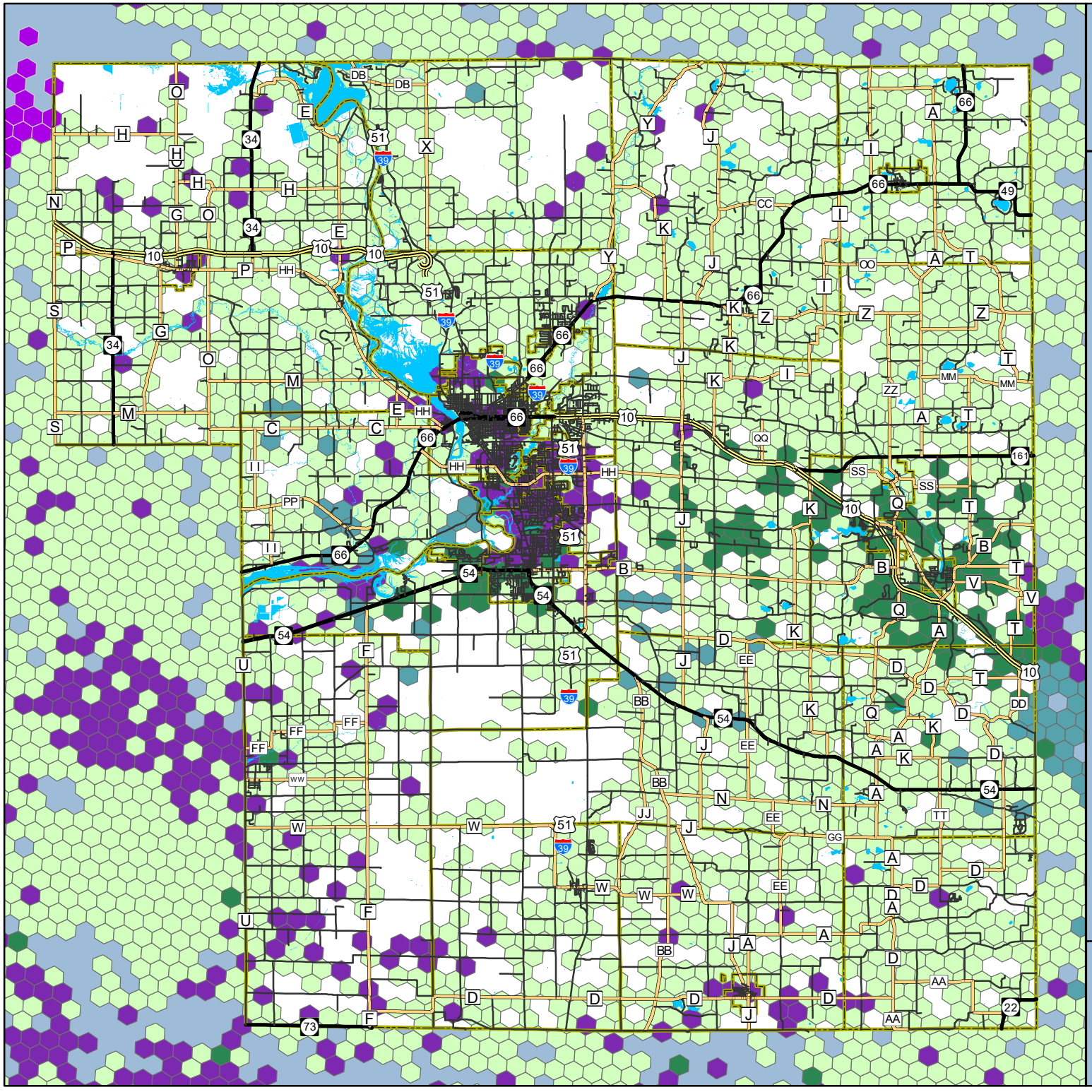


Map 5d **DRAFT**

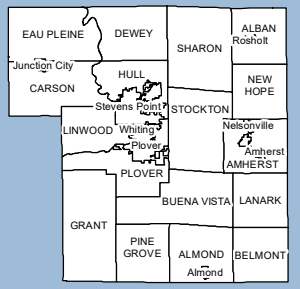
Broadband Availability Fixed Wireless

Portage County, Wisconsin

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

Provider

- AT&T Inc
- Bug Tussel Wireless LLC
- Country Wireless
- T-Mobile US
- US Cellular



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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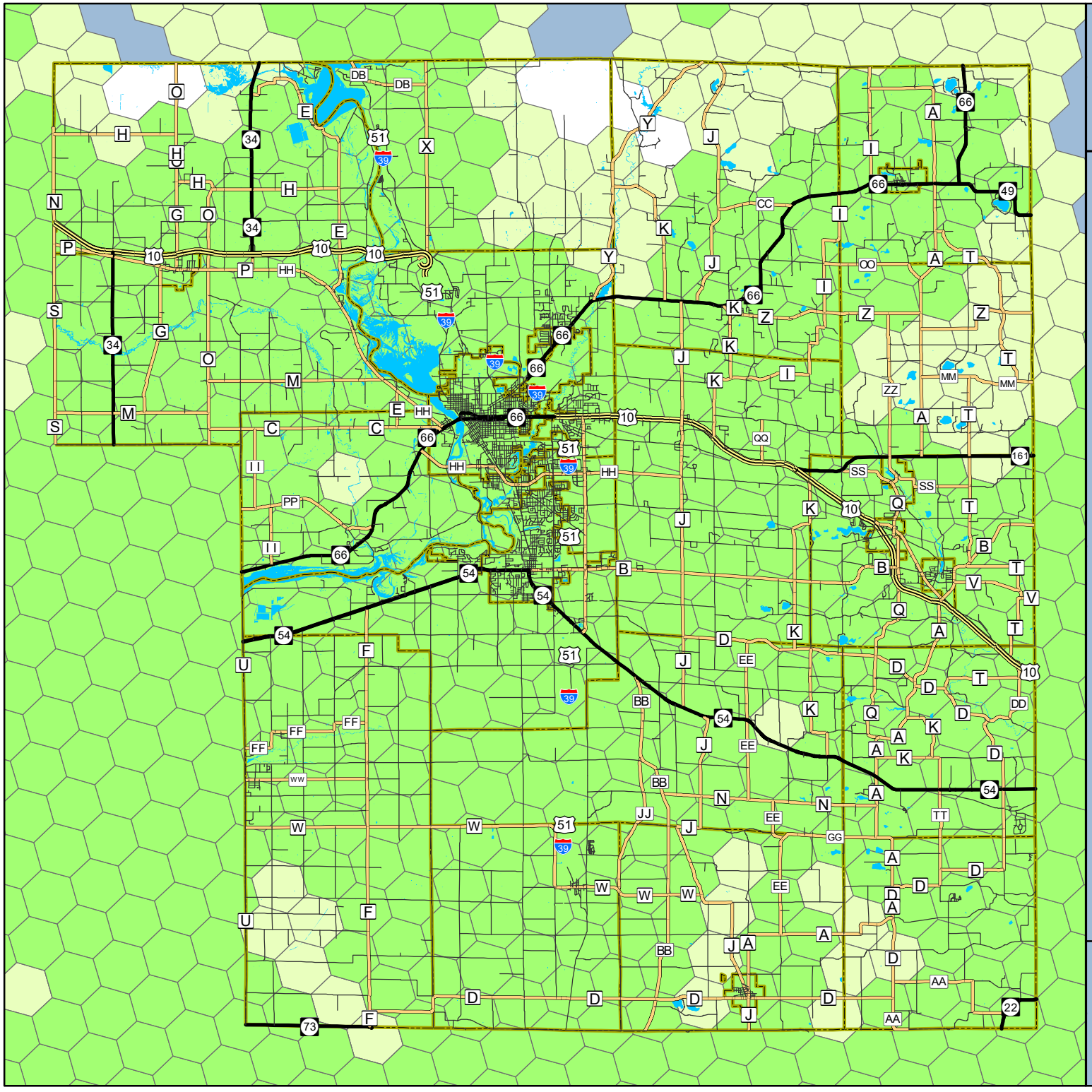
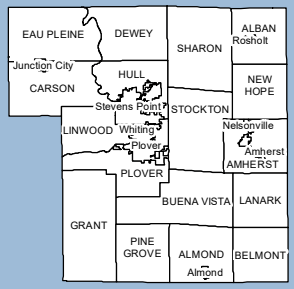
Map 5e **DRAFT**

Broadband Availability Mobile

Portage County, Wisconsin



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



Source: WI DNR, NCWRPC, Portage Co, WisDOT, FCC

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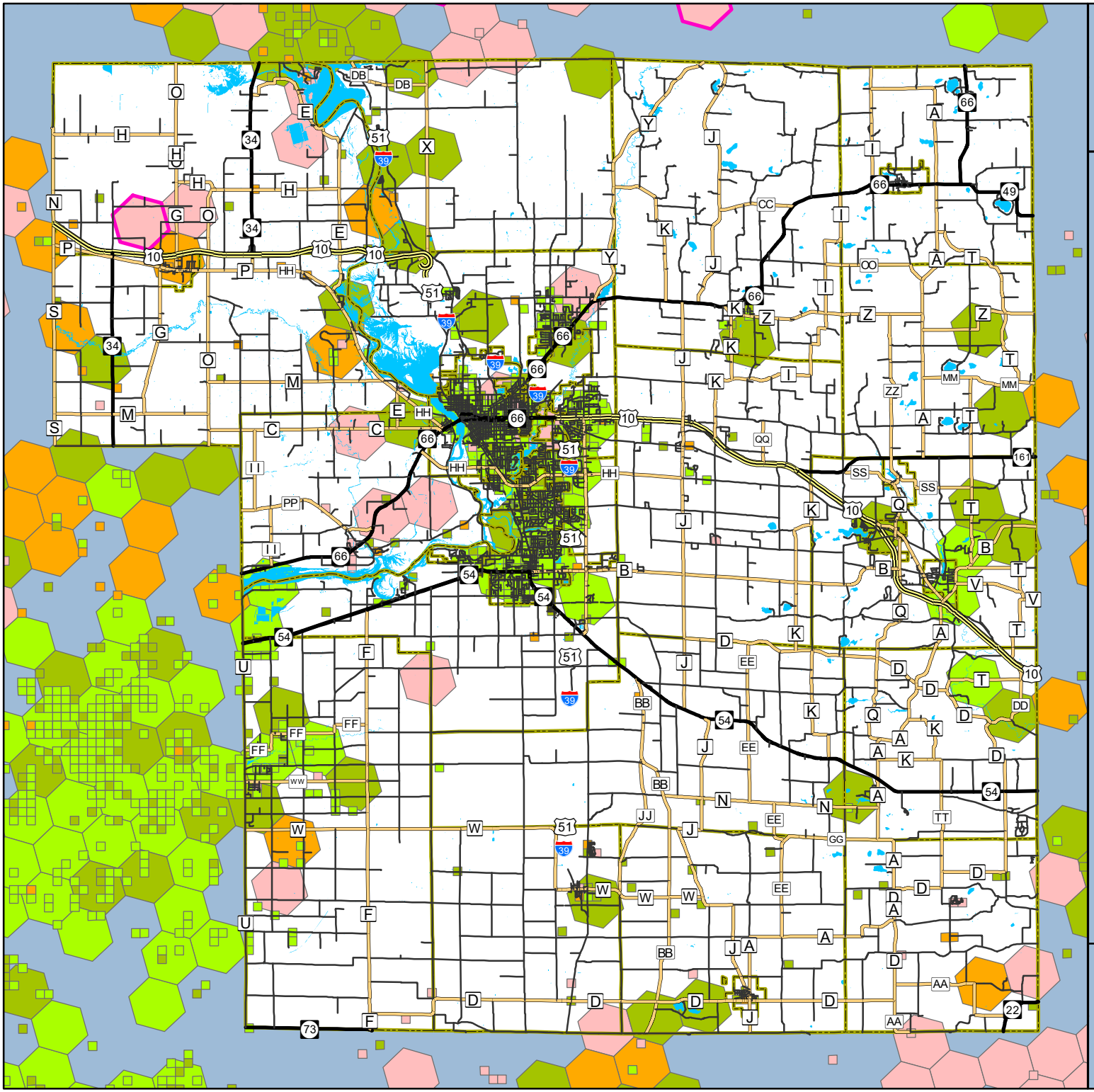


Map 6 **DRAFT**

Average Download Speeds

Portage County, Wisconsin

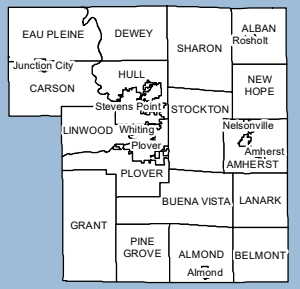
- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water

Download Speed

- < 10 Mbps
- 10 to 25 Mbps
- 25 to 100 Mbps
- > 100 Mbps
- Reported No Service

From wisconsinspeedtest.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, Portage Co, WisDOT, FCC

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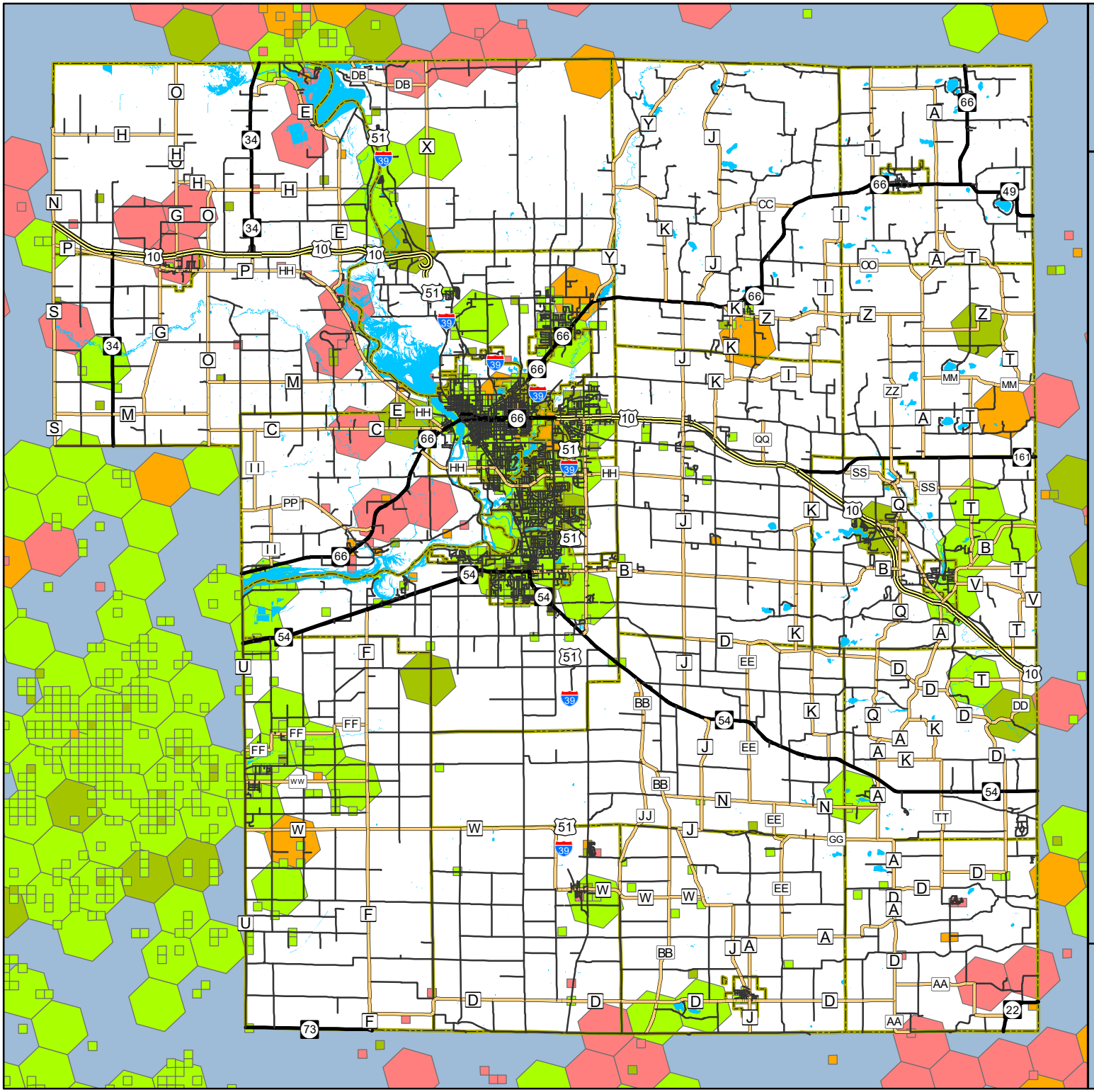
715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org



Map 7 **DRAFT**

Average Download Speeds

Portage County, Wisconsin

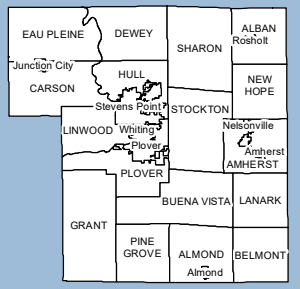
- Minor Civil Divisions
- U.S. Highway
- State Highway
- County Highway
- Local Road
- Water

Upload Speed

- < 2 Mbbs
- 2 to 5 Mbbs
- 5 to 10 Mbps
- > 10 Mbps

From wisconsinspeedtest.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, Portage Co, WisDOT, FCC

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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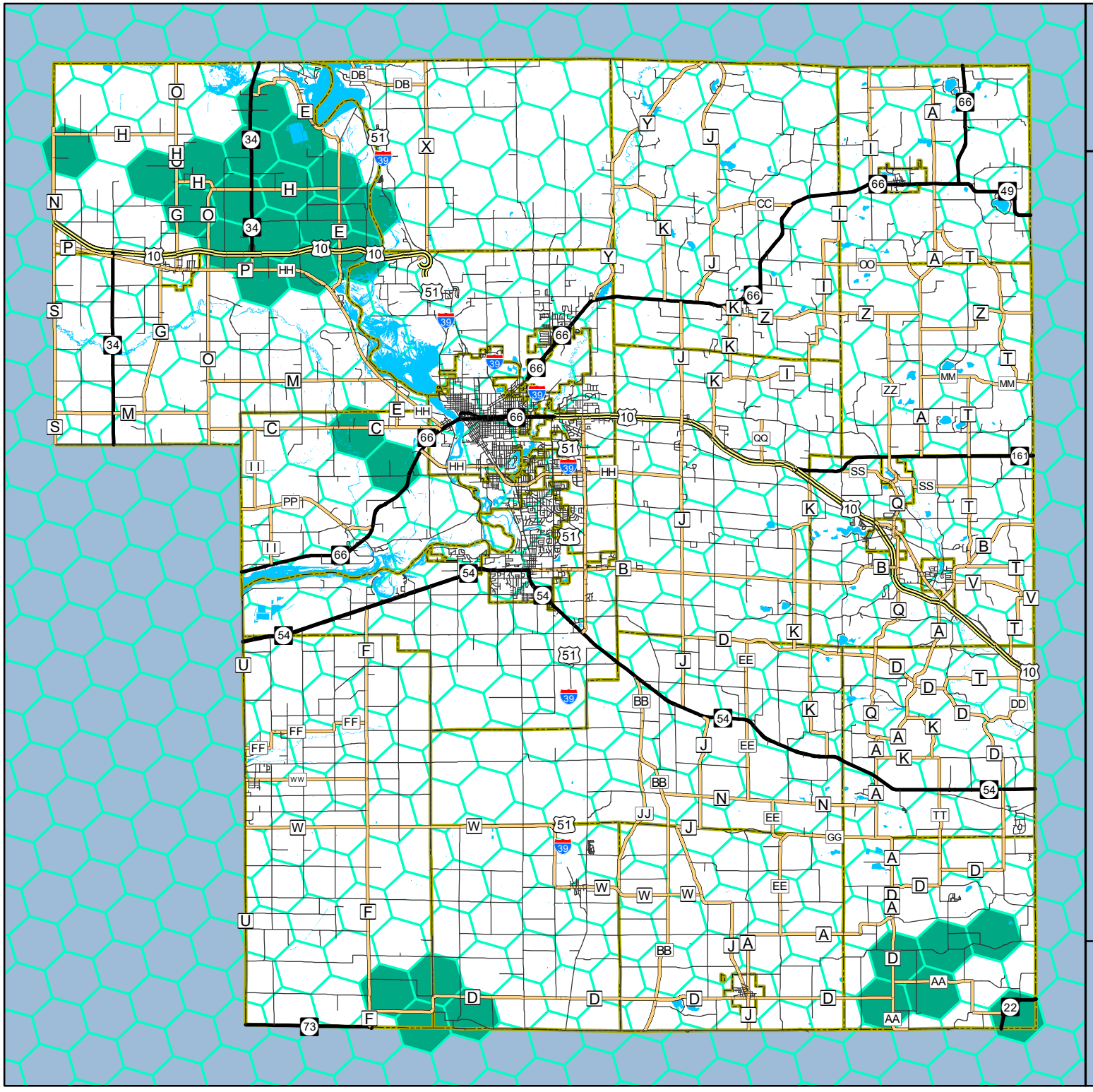
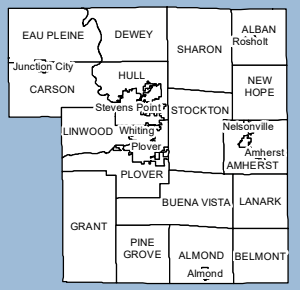
Map 8 **DRAFT**

Possible Project Areas

Portage County, Wisconsin



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



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REGIONAL INTERNET SERVICE PROVIDERS

Provider	Website	Phone	Mailing Address
Airnet	netpros-inc.net	715-241-0200	117 S. 17th Avenue Suite B Wausau, WI 54401
AirRunner Networks	www.airrun.net	715.443.3700	216 Main St #3, Marathon City, WI 54448
Amherst Telephone Company	amherstcomm.net	715.842.5529	120 Mill St, Amherst, WI 54406
Astrea	astreaconnect.com	800.236.8434	105 Kent St, Iron Mountain, MI 49801
AT&T	www.att.com	210.821.4105	208 S. Akard Street, Suite 2954, Dallas, Texas 75202.
Bertram Internet	gobertram.com	920.351.1023	300 Industrial Dr, Random Lake, WI 53075
Brightspeed	www.brightspeed.com	833.692.7773	1120 S Tryon St, Charlotte, NC 28203
Bug Tussel Wireless LLC	btussel.com	877.227.0924	417 Pine St, Green Bay, WI 54301
Cellcom	www.cellcom.com	920-339-4000	1580 Mid Valley Drive, De Pere, WI 54115
CenturyLink	www.centurylink.com	877.862.9343	100 CenturyLink Dr. Monroe, LA 71203
Charter Communications Inc (Spectrum)	www.spectrum.com	855.860.9068	5720 Bandel Rd NW, Rochester, MN 55901
Cirrinity (Wittenberg Telephone Company)	cirrinity.net	715.253.2111	104 W Walker St, Wittenberg, WI 54499
Community Antenna System Inc	comantenna.com	888.394.4772	1010 Lake Street Hillsboro, WI 54634
Country Wireless	countrywireless.com	715.389.8584	205 W Willow Dr, Spencer, WI 54479
Ethoplex	www.ethoplex.com	262-252-9000	N115 W19150 Edison Drive, Germantown, WI 53022
Frontier	frontier.com	844.817.0206	401 Merritt 7, Norwalk, CT 06851
HughesNet	www.hughesnet.com	844.7.37.2400	11717 Exploration Lane, Germantown, MD 20876
LTD Broadband	ltdbroadband.com	507.369.6669	PO Box 3064, Blooming Prairie, MN 55917
Lumen	www.lumen.com	877.753.8353	3340 Peachtree Road NE Suite 200 Atlanta, GA 30326

Marquette-Adams Telephone Cooperative	www.marquetteadams.com	608-586-4111	113 N, 113 S Oxford St, Oxford, WI 53952
Mediacom Wisconsin LLC	mediacomcable.com	844.987.3260	100 N Marquette Rd Suite 116, Prairie du Chien, WI 53821
Norvado	norvado.com	800.250.8927	105 N Avon Ave, Phillips, WI 54555
Nsight	www.nsighttel.com	920.865.7000	122 S St Augustine St, Pulaski, WI 54162
Reach	reachconnects.com	715.298.4414	1710 Garfield Ave, Wausau, WI 54401
Solarus	www.solarus.net	715.421.8111	440 E Grand Ave, Wisconsin Rapids, WI 54494
SonicNet Inc.	www.sonicnet.us	715.301.0600	103 N Railroad St, Eagle River, WI 54521
Starlink	www.starlink.com	888.479.9644	500 Center Ridge Dr Austin, TX 78753
TDS Telecom	tdstelecom.com	855.220.2592	525 Junction Road Madison, WI 53717
T-Mobile US	www.t-mobile.com	844.249.6310	12920 Se 38th St., Bellevue, WA, 98006
Union Telephone Company	uniontel.net	715.335.6301	W North St, Plainfield, WI 54966
US Cellular Corporation	www.uscellular.com	800.819.9373	8410 W Bryn Mawr Ave, Chicago, IL 60631
Verizon	www.verizon.com	800.922.0204	One Verizon Way, Basking Ridge, New Jersey 07920
Viasat	www.viasat.com	844.702.3199	6155 El Camino Real Carlsbad, CA 92009

GLOSSARY

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.

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.

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

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. BO provides support to residents seeking internet access, manages broadband grant programs, compiles broadband service maps, and builds capacity through planning and outreach.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

HFC: Hybrid Fiber-Coaxial – same as FTTN

Mbps: Mbps: Megabits per Second - t 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.

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.

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.

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.

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.

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.

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.

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.

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).

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.

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.

ADD MORE AND CLEAN THIS UP AND SORT