

Barry County, MI

BROADBAND FEASIBILITY ANALYSIS REPORT

January 2022



Barry County, MI

Broadband Feasibility

Analysis Report

Barry County Chamber & Economic Development Alliance

January 2022

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SUBMITTED ON: January 13th, 2021

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Antero Group is a holistic civil engineering, urban planning, and strategic consulting firm with offices in Chicago, South Bend, Denver, and Dallas-Fort Worth. We leverage interdisciplinary teams, creative thinking, and collaborative processes to design innovative and effective solutions. Our team believes that authentic, long-term partnerships are the best way to deliver projects that create lasting value.

Executive Summary

Barry County, Michigan is a rural County in southwestern Michigan, which has historically faced challenges in expanding and improving broadband services to area residents and businesses. This is due to a combination of factors including the high costs associated with such efforts, as well as a more rural and widespread population among others. Overall, only 75% of residents have access to the minimum levels of services considered by the Federal Communications Commission (FCC) as high-speed service (Connected Nation, 2021). This is in comparison to the rest of the state, in which 95% of residents have access to such speeds. This disparity, and the increasing gap in services at higher speeds, points to a critical need to explore and plan for broadband expansion in Barry County.

Based on the analysis completed and detailed in **Chapter 2** of this Plan, Barry County is at a significant disadvantage in terms of access to high-speed broadband services. Despite a gradually increasing population, many residents still lack access to broadband services, and even fewer have access to high-speed services. This is particularly true of the southern census tracts within the County (105,106,107, and 108). This analysis assessed several factors including population changes, business and industry trends, current access to services, and current access to high-speed services among other factors. Two categories of priority expansion areas were identified based on this analysis. These include general priority expansion areas in need of increased services (without regard for a specified technology type) and priority expansion areas in terms of expanding the fiber network. Fiber was deemed a high priority for the County as officials wish to ensure implemented technologies withstand the test of time and provide a solid foundation from which to build upon.

These priority expansion areas include the following communities and the surrounding areas:

Priority Expansion Areas	Priority Fiber Expansion Areas
1. Delton	1. Hastings
2. Dowling	2. Middleville
3. Woodland	3. Delton
4. Freeport	4. Nashville

With these areas identified, **Chapter 3** further details available funding and partnership resources, which may be pursued in the interest of initiating and advancing expansion efforts. This chapter includes a description of available funding and financing strategies, including several grant programs, which are intended to support more rural areas in improving high-speed broadband access. Furthermore, this chapter describes several potential partners ranging from area providers to non-profit organizations, which may provide technical support in the interest of expanding broadband services at various points in a project's lifecycle.

Equipped with this analysis, its findings, and the potential tools and resources to support implementation, this Plan is intended to guide Barry County in achieving its vision for the future of broadband services.

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List of Abbreviations

ACS – American Community Survey
ARPA – American Rescue Plan Act
ATAG – Antero Technical Assistance Grant
CDBG – Community Development Block Grants
CF – Community Facilities (Direct Loan and Grant Program)
CMIT – Connecting Michigan Task Force
CN – Choice Neighborhoods (Implementation Grant)
DLT – Distance Learning and Telemedicine (Grant Program)
DOT – Department of Transportation
DSL – Digital Subscriber Line
EAA – Economic Adjustment Assistance Program
EBB – The Emergency Broadband Benefit Program
EDA – Economic Development Administration
FCC – Federal Communications Commission
FY- Fiscal Year
GIS – Geographic Information System
GLE – Great Lakes Energy Cooperative
HUD – U.S. Department of Housing and Urban Development
IT – Information Technology
LTE – Long-Term Evolution
MDOT – Michigan Department of Transportation
MEDC – Michigan Economic Development Corporation
NAICS – North American Industry Classification System
NRTC – National Rural Telecommunications Corporation
NTIA – National Telecommunications and Information Administration
RDBG – Rural Business Development Grant
RDOF – Rural Digital Opportunity Fund
RLF – Revolving Loan Fund
TBD – To Be Determined
TIL – Telecommunications Infrastructure Loans (and Loan Guarantees)
USDA – United State Department of Agriculture
USP – Universal Service Program for High-Cost Areas

Chapter 1: Introduction

In May 2020, Barry County Telephone Company, Michigan was awarded an \$11.8 million grant from the U.S. Department of Agriculture's (USDA) ReConnect Program to provide affordable and fiber-based broadband services to rural areas in Barry County. In total, this funding will extend broadband services to 17 farms, 16 businesses, and 12,000 residents over a total of 127 square miles.

In order to strategically and efficiently implement broadband expansion efforts, the Barry County Chamber of Commerce and Economic Development Alliance (Chamber) selected Antero Group, LLC (Antero) to support the *Barry County Michigan Broadband Assessment and Implementation Plan* (Plan). This Plan will serve to guide the Chamber in maximizing the value of the funds awarded through the USDA ReConnect Program and any funds allocated by Barry County from the American Rescue Plan Act of 2021 for broadband expansion efforts.

Project Background

Barry County is a rural county with over 61,000 residents in Western Michigan. Due to a combination of capacity and budgetary constraints and a lower population density, the County is at a distinct disadvantage compared to larger more urban areas in terms of access to high-speed internet. In fact, the American Community Survey indicated only 80.8% of households in Barry County had internet access as recently as 2019. This lack of permanently fixed broadband connections to homes may have contributed to unrealized economic benefits. This is particularly true during the COVID-19 Pandemic with many residents forced to work or learn from their homes.

A lack of reliable data has proven a barrier to an accurate assessment of existing services, speeds, and gaps in service nationwide. Many available data sources overgeneralize data by census tract, which often provides only a piece of the full picture of existing broadband infrastructure, speeds, and service. For example, due to overgeneralizations, certain providers' service boundaries may not align with census tract boundaries. This can make it difficult for some residents to locate providers that service their addresses. This combination of inaccurate speed and service data has impacted the County's ability to pursue federal grants and more rapidly advance high-speed fiberoptic infrastructure to increase the accessibility of services to residents.

An interest in obtaining more reliable data, and an increase in reliance upon broadband services during the COVID-19 Pandemic, led Barry County to initiate this Project. Barry County aims to expand broadband service to both households and businesses with an emphasis on expanding the fiber network. Ideally, the fiber broadband network coverage rate for Barry County would be 98% with download speeds at a minimum of 100 Mbps and upload speeds of 10 Mbps.

Project Purpose

The Barry County Chamber of Commerce and Economic Development Alliance formed the Barry County Broadband Expansion Committee (Committee) to initiate the collection of more reliable data to support implementation of broadband expansion efforts. While some data has been collected, this data's accuracy

needs to be verified as well and additional data are needed to obtain a more complete picture of current speeds and service areas. Additionally, this data needs to be analyzed spatially to support the identification of high priority expansion areas, which would address major gaps in service.

This combination of needs was the driving force to initiate this Project, which will result in the collection of more accurate data and subsequent identification of high priority expansion areas. This Project will also result in the creation of strategic implementation guidance to further support broadband expansion efforts. This will include a list of partners, programs, and funding, which may be considered to further expansion efforts.

Project Funding

Through the \$11.8 million awarded to the Barry County Telephone Company through the USDA ReConnect Program, construction, improvement, and acquisition of facilities and equipment will be made possible to provide needed broadband services in eligible areas. The analysis, its findings, and resulting recommendations set forth in this plan will equip the County to implement this funding efficiently and to further pursue funding to expand broadband services to households and businesses in target expansion areas.

Strategic Planning

This Plan is guided by a shared vision for the future of broadband services within Barry County. To support the County in achieving this vision, a set of strategic goals and objectives was developed based on analysis results, feedback collected through surveys, and ongoing stakeholder engagement efforts.

Vision

Within the next 10 years, Barry County residents, institutions, businesses, and visitors alike will have access to affordable, reliable, and high-speed broadband services. Additionally, at least 75% of residents will have access to fiber services.

Goals

To realize this vision, the following goals were developed:

1. Extend broadband service with download speeds of at least 25 Mbps and upload speeds of at least 3 Mbps to all county households and businesses by the year 2025.
2. Increase broadband service with download speeds of 100 Mbps and upload speeds of 10 Mbps for high priority institutions (e.g., public services, educational institutions, etc.) within the County by 2027.
3. Increase broadband service to speeds of with download speeds of 100 Mbps and upload speeds of 10 Mbps for all county residents and businesses and increase broadband service with download speeds of 1,000 Mbps and upload speeds of 100 Mbps for high priority institutions by the year 2030.

Objectives

To further support the achievement of County broadband goals, the following objectives were developed to guide actionable next steps:

- 1. Extend broadband service with download speeds of at least 25 Mbps and upload speeds of at least 3 Mbps to all county households and businesses by the year 2025.**
 - a. Identify target expansion areas to initiate expansion efforts.
 - b. Pursue available funding opportunities to support expansion efforts.
 - c. Engage providers within the community.
 - d. Install necessary infrastructure to expand service to underserved areas.
 - e. Monitor key performance metrics to assess success.

- 2. Increase broadband service with download speeds of at least 100 Mbps and upload speeds of 10 Mbps for high priority institutions (e.g., public services, educational institutions, etc.) within the County by 2027.**
 - a. Identify high-priority institutions to establish priority improvement areas.
 - b. Pursue available funding and partnership opportunities to support increased speeds.
 - c. Engage providers within the community.
 - d. Improve the necessary infrastructure to support increased speeds.
 - e. Monitor key performance metrics to assess success.

- 3. Increase broadband service to speeds of with download speeds of at least 100 Mbps and upload speeds of 10 Mbps for all county residents and businesses and increase broadband service with download speeds of 1,000 Mbps and upload speeds of 100 Mbps for high priority institutions by the year 2030.**
 - a. Identify areas with speeds below the target download speeds and upload speeds.
 - b. Pursue available funding and partnership opportunities to support increased speeds.
 - c. Engage providers within the community.
 - d. Improve the necessary infrastructure to support increased speeds.
 - e. Monitor key performance metrics to assess success.

More specific implementation resources and further guidance can be found in Chapter 3.

Report Structure

This Report is intended to provide an overview of planning activities and analyses completed as a part of the Barry County Broadband Analysis. Furthermore, this Report will outline key findings, recommendations, and implementation guidance as the County works to achieve the shared vision for the future of broadband services within Barry County. This Report's structure is intended to allow for ease of reference and adaptability to change, ideally making for a plan that will serve the County throughout the years to come.

More specifically, this report has been divided into the following sections:

Introduction

Chapter 1

This chapter provides an introduction to Barry County, the Project, and the overall purpose of this effort. This includes a description of the history of broadband efforts in Barry County as well as the funding previously secured to initiate expansion efforts.

Recommendations

Chapter 3

This chapter relays strategic recommendations to support the achievement of Plan goals and objectives. This is accompanied by an implementation matrix designed to outline actionable next steps towards Plan implementation including potential program, partnership, and funding programs.

Analysis

Chapter 2

This chapter provides an overview of existing broadband services and speeds utilizing all available acquired data obtained throughout the course of this Project. Analysis results are articulated through a combination of charts, graphs, and maps of geospatial analysis results.

Conclusion

Chapter 4

This chapter may be referenced as a standalone resource to summarize the Plan, reiterate goals and objectives, and highlight key findings and recommendations regarding the Plan's implementation.

Chapter 2: Analysis

In order to provide tailored and actionable recommendations, a comprehensive analysis was completed to understand the current barriers and challenges impacting broadband expansion. This was completed through a combination of research, survey analysis, geospatial analysis, and discussions with the Barry County Broadband Expansion Committee. Discussion and analysis results lead to insights that informed the recommendations outlined in **Chapter 3** of this Plan.

Existing Conditions

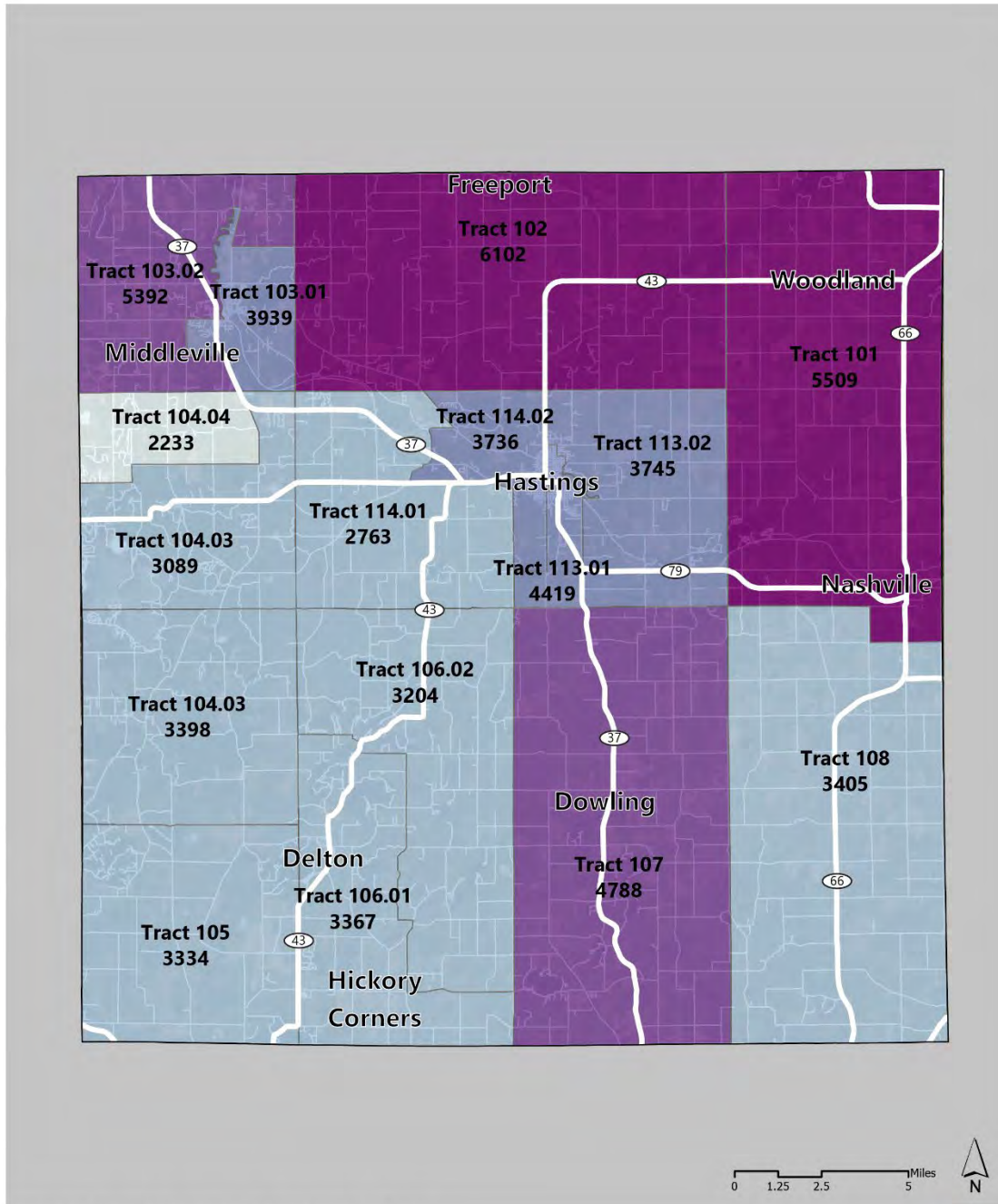
To better understand current conditions within Barry County, the most recently available data from a combination of governmental (e.g., U.S. Census) and organizational data (e.g., Connected Nations) was reviewed and assessed. The existing conditions detailed as follows include the assessment of the following key data points:

- Standard demographics and socio-economic data;
- Economic data;
- Data related to existing technology and internet access; and,
- Broadband data and survey responses provided by:
 - Local residents;
 - Businesses; and,
 - Service Providers.

Population and Households

In 2020, the US Census reported Barry County was home to a total of 62,423 residents and has experienced a 5.4% population growth over the last ten years. Currently, the most populated areas are Census Tracts 101, 102, 103.02, and 107, which include areas around Nashville, Woodland, Freeport, Hastings, Middleville and Dowling (see **Figure 2.1**). According to an analysis released by Bridge Michigan of 2020 Census Data by place, Yankee Springs Township (30.9%), Middleville (29.4%), Thornapple Township (18.4%), and Freeport experienced some of the most significant population growth over the last ten years. This substantial growth is considered a significant finding and requires additional consideration in the identification of Priority Expansion Areas. To ensure more rural areas were also considered during the development of this Plan, further analysis at the Census Tract level was also performed.

Figure 2.1 2020 Population



Barry County Broadband Analysis

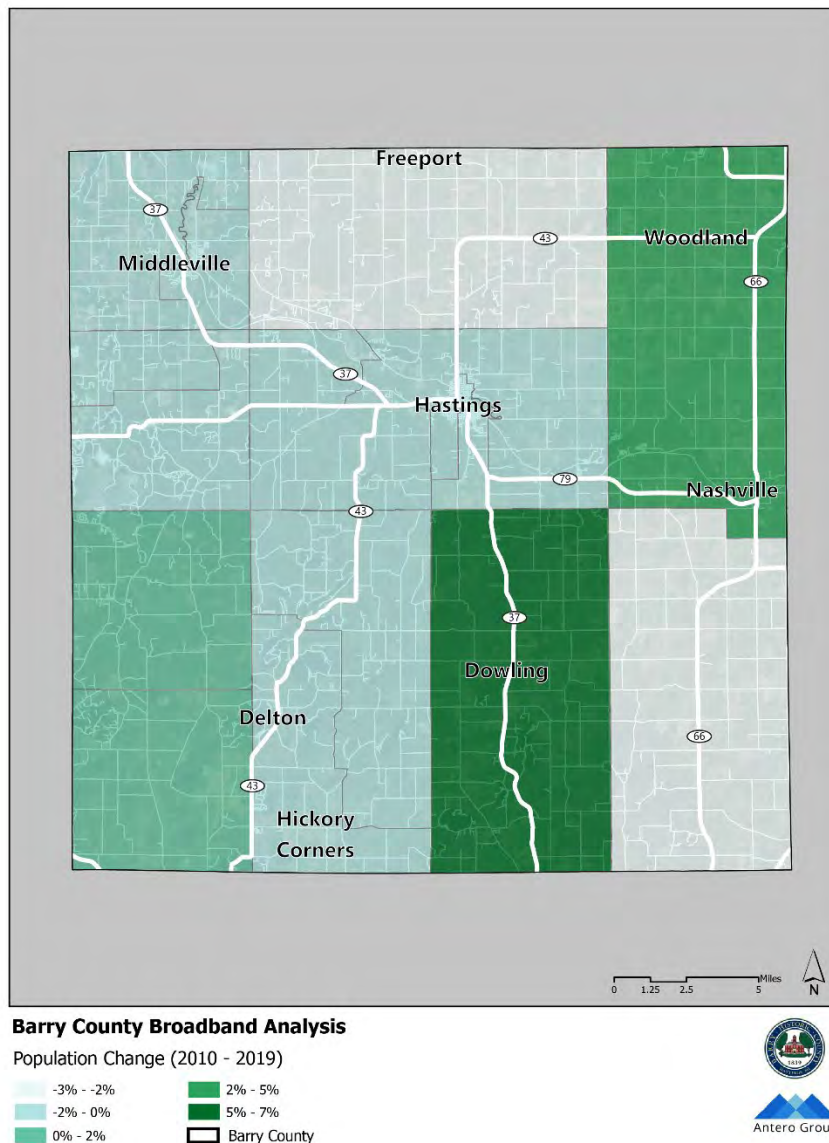
- 2020 Populations
- 0-2500
 - 2500-3500
 - 3500-4500
 - 4500-5500
 - 5500+
 - Barry County



Source: Antero Group, US Census, MDOT

Since 2010, general population changes in Barry County have been stable, as shown in **Figure 2.2** and **Table 2.1**. Between 2010 and 2014, the change of the total population, households, and housing units were minor, while between 2015 and 2019 the number of those characteristics changed slightly more. As shown in **Figure 2.2** the most significant population growth on a more widespread scale occurred within the south of the County in the area surrounding Dowling and the most significant population loss occurred to the north and southeast in the area surrounding Freeport and just south of Nashville. This is also reflected by reported population growth in Baltimore and Barry Townships and losses in surrounding Castleton and Woodland Townships (Wilkinson, 2021). As the population grew, the number of households and housing units grew as well. This growth points to a steady increase in demand for expanded high-speed broadband services in the coming years.

Figure 2.2 Population Change by Census Tract



Source: Antero Group, US Census, MDOT

During the same 10-year period, the median age slightly increased in the latter 5 years relative to the first 5 years (see **Table 2.1**). The median age of Barry County residents was higher than the State of Michigan in 2019 (42.5 and 39.7 years old, respectively). Although there was a slight trend indicative of an aging population within Barry County from 2010, the trend had slowed down and remained relatively stable with a figure of 42.6 years old. The stabilized aging trend could be helpful to promote the need for broadband expansion within Barry County as households with a younger profile tend to use computers and the internet more often for work and recreation.

Table 2.1 General Population Characteristics, 2010 - 2019

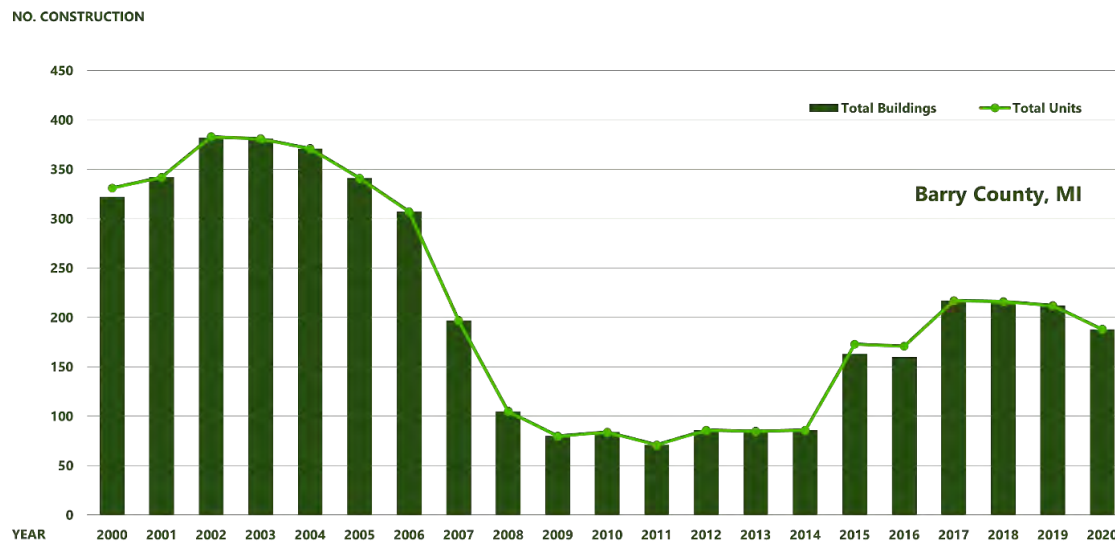
Barry County						Changes between						Changes between
	2010	2011	2012	2013	2014	2010 and 2014	2015	2016	2017	2018	2019	2015 and 2019
Total Population	59,576	59,422	59,249	59,121	59,107	-0.8%	59,147	59,316	59,607	60,057	60,540	2.4%
Total Households	22,843	22,831	22,455	22,610	22,700	-0.6%	22,836	22,858	23,539	23,840	24,296	6.4%
Total Housing Units	26,756	26,935	26,967	26,952	27,046	1.1%	27,044	27,071	27,329	27,468	27,586	2.0%
Median Age	39.9	40.8	41.3	41.9	42.1	5.5%	42.6	42.6	42.7	42.6	42.5	-0.2%
Median Household Income	\$51,869	\$52,061	\$53,541	\$52,186	\$53,730	3.6%	\$55,064	\$56,883	\$57,312	\$61,016	\$64,490	17.1%

Sources: U.S. Census Bureau ACS 5-Year Estimates, Antero Group

Also, the median household income in Barry County had increased steadily during the same 10-year period (see **Table 2.2**). In 2019, the median household income had increased to \$64,490, up 17.1% from 2015. Furthermore, this increased median household income was 12.9% higher than the median household income for the State of Michigan (\$57,144) in 2019. With this significant increase, the household purchasing ability for high-speed broadband services could potentially increase as well.

Since 2000, the variance of new residential construction permits issued has been significant, as shown in **Figure 2.3**. About 60.1% of the permits were issued before 2007 and 39.9% of permits were issued in and after 2008. Starting from 2015, the number of permits issued annually had increased to 188 in 2020. With an increase in new residential construction permits issued, there could be an opportunity for Barry County to provide high-speed fiber broadband services to these new residential units, particularly as additional utilities are installed.

Figure 2.3 New Residential Construction, 2000 - 2020



Sources: U.S. Census Bureau Building Permits Survey, Antero Group

In 2019, about 36% of the occupied housing units in Barry County were occupied by 3-or-more-person households (see **Table 2.2**). Although the percentage was smaller than that of 2-or-less-person households, the FCC recommends that a household with three or more high-use users should purchase a high-speed internet service for a better internet experience (FCC, 2020). This means that more than 1/3 of households in Barry County would largely benefit from high-speed broadband services at elevated speeds above 25 Mbps download and 10 Mbps upload.

Table 2.2 Housing Size, 2019

Barry County	Percent	Count
1-person household	23.5%	5,706
2-person household	39.9%	9,703
3-person household	12.8%	3,098
4-or-more-person household	23.8%	5,789
Occupied Housing Units	/	24,296
Total Housing Units	/	27,586

Sources: U.S. Census Bureau ACS 5-Year Estimates, Antero Group

Business and Industry

Current figures indicate Barry County is home to 1,509 businesses with a total of 13,852 employees (see **Table 2.3**). Businesses are listed by NAICS code, starting with the leading industry of Retail Trade (14.7% of businesses). The top five industries also represent over 50% of the industry share of total employees (42%). Also of note, the Manufacturing industry reports the highest number of employees of all industries in the county (16.9%) despite only recording 62 active businesses. This is likely due to the large size of existing manufacturing operations in the County (e.g., Hastings Manufacturing Company). Overall, the predominant industries operating within Barry County are indicative of an increased reliance upon broadband services. For example, a recent article published by Forbes Insights cites seven key industries with increased reliance on internet-based technologies including Communications, Energy, Financial Services, Healthcare, Manufacturing, Retail, and Transportation (Forbes, 2018).

Table 2.3 Business Summary, 2021

Barry County				
Industry by NAICS Code	No. Businesses	% Businesses	No. Employees	% Employees
Retail Trade	222	14.7%	1,563	11.3%
Other Services (except Public Administration)	201	13.3%	781	5.6%
Construction	154	10.2%	393	2.8%
Health Care and Social Assistance	123	8.2%	1,906	13.8%
Finance and Insurance	113	7.5%	1,182	8.5%
Accommodation and Food Services	104	6.9%	1,157	8.4%
Public Administration	89	5.9%	1,168	8.4%
Professional, Scientific, and Technical Services	80	5.3%	369	2.7%
Real Estate Rental and Leasing	66	4.4%	201	1.5%
Manufacturing	62	4.1%	2,343	16.9%
Wholesale Trade	48	3.2%	593	4.3%
Administrative and Support and Waste Management and Remediation Services	44	2.9%	240	1.7%
Educational Services	43	2.8%	946	6.8%
Arts, Entertainment, and Recreation	30	2.0%	176	1.3%
Transportation and Warehousing	28	1.9%	226	1.6%
Agriculture, Forestry, Fishing and Hunting	23	1.5%	167	1.2%
Information	20	1.3%	260	1.9%
Mining	2	0.1%	12	0.1%
Utilities	2	0.1%	26	0.2%
Management of Companies and Enterprises	1	0.1%	60	0.4%
Unclassified	54	3.6%	83	0.6%
Total	1,509		13,852	

Sources: Esri, Data Axle, Antero Group

Computer and Internet Usage

While it is important to look at demographic data to better understand the population, in this analysis there are other critical datapoints necessary for a complete assessment of existing conditions. One such metric is select characteristics of internet use available through the US Census Bureau (see **Table 2.4**). In 2019, the population in Barry County with a computer and a broadband internet subscription tended to be within a younger age range, higher degree of education, and active labor force status.

In 2019, the age group of residents 18 years and under showed the highest percentage of the overall population with access to both a computer and household broadband subscription (91.0%). While the group 65 years and older had the highest percentage of the population with no computer (22.7%). In the same year, about 7.2% of the total population had a computer but with no internet subscription and 6.9% of the total population had no computer in Barry County as shown in **Table 2.4**.

When cross referenced with education, a similar distribution was observed. In 2019, household population groups with a higher level of educational attainment tended to have a higher percentage of residents with at least one computer and a broadband service subscription as shown in **Table 2.4**. About 89.5% of household populations 25 years and over with a bachelor's degree or higher had at least one computer and a broadband subscription. However, for groups with educational attainment less than a high school graduate or equivalency, about 10.8% had at least one computer but no internet subscription and 22.7% had no computer.

Additionally, the civilian population 16 years and over in the labor force were more likely to have access to both a computer and a broadband subscription than the same aged population, which were not in the labor force (89.2% and 74.8% of civilian population 16 years and over). Based on this data, there appears to be a correlation between access to broadband service subscription, education, and employment.

Table 2.4 Internet Types by Selected Characteristics, 2019

Barry County	Total	With a computer		No computer			
		Broadband Internet Subscription	Percent Broadband Internet Subscription	Without an Internet Subscription	Percent Without an Internet Subscription	No computer in household	Percent no computer in household
AGE							
Under 18 years	13,469	12,253	91.0%	848	6.3%	314	2.3%
18 to 64 years	35,737	31,619	88.5%	2,626	7.3%	1,425	4.0%
65 years and over	10,641	7,175	67.4%	850	8.0%	2,413	22.7%
EDUCATIONAL ATTAINMENT							
Household population 25 years and over	41,951	34,794	82.9%	3,126	7.5%	3,770	9.0%
Less than high school graduate or equivalency	3,030	2,006	66.2%	326	10.8%	688	22.7%
High school graduate (includes equivalency), some college or associate's degree	30,026	24,824	82.7%	2,322	7.7%	2,708	9.0%
Bachelor's degree or higher	8,895	7,964	89.5%	478	5.4%	374	4.2%
EMPLOYMENT STATUS							
Civilian population 16 years and over	47,910	40,224	84.0%	3,539	7.4%	3,877	8.1%
In labor force	30,428	27,156	89.2%	2,276	7.5%	955	3.1%
Employed	29,021	25,888	89.2%	2,183	7.5%	911	3.1%
Unemployed	1,407	1,268	90.1%	93	6.6%	44	3.1%
Not in labor force	17,482	13,068	74.8%	1,263	7.2%	2,922	16.7%
Total population in households	59,847	51,047	85.3%	4,324	7.2%	4,152	6.9%

Sources: U.S. Census Bureau ACS 5-year Estimates, Antero Group

Compared to both West Michigan¹ and Michigan State in 2019, Barry County had the smallest percentage of households with computing devices, internet access, and broadband subscriptions, as shown in **Table 2.5**. Barry County's broadband subscription rate was 49% out of all households within the county, which was significantly lower than both West Michigan (63%) and Michigan State (66%). Barry County's overall access to computing devices, internet, and broadband subscription was below West Michigan's and Michigan State's average. This points to a significant need for increased accessibility of services.

Table 2.5 Household Computer and Internet Access, 2019

Barry County	Barry County		West Michigan		Michigan	
	Count	Percent	Count	Percent	Count	Percent
One or More Computing Devices	21,467	88%	536,213	90%	3,525,247	90%
Smartphone(s) Only	1,634	7%	41,815	7%	291,011	7%
No Computing Devices	2,829	12%	59,794	10%	409,794	10%
Internet Access	20,295	84%	511,063	86%	3,356,986	85%
Broadband Subscription	11,910	49%	377,690	63%	2,599,404	66%
No Internet Access	4,001	16%	84,944	14%	578,055	15%
Total Households	24,296	24,296	596,007	596,007	3,935,041	3,935,041

Sources: U.S. Census Bureau ACS 5-year Estimates, Antero Group

Between 2017 and 2019, the percentage of households with computing devices, internet access, and broadband subscriptions increased steadily (see **Table 2.6**). Beyond an increase in computing devices, the County also experienced an increase in the number of smartphones. Up to 2019, approximately 84% of households had internet access and 49% of households had a broadband subscription. Additionally, 41%

¹ West Michigan includes Allegan County, Barry County, Ionia County, Kent County, Lake County, Mason County, Mecosta County, Montcalm County, Muskegon County, Newaygo County, Oceana County, Osceola County, and Ottawa County.
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of households had internet access but did not obtain service through a broadband subscription. Another 12% of households did not have any computing devices and 16% of households did not have internet access (28,295 and 4,001 households, respectively). Barry County hopes to offer high-speed fiber broadband services to 95% of households within the county in the next five years, but with the most recent broadband subscription rate of 49%, care should be taken to further engage residents to ensure new services will fulfill their needs.






Table 2.6 Household Computer and Internet Access, 2017 - 2019

Barry County	2017 Percent	2018 Percent	2019 Percent	2019 Count	Changes between 2017 and 2019
One or More Computing Devices	86%	87%	88%	21,467	▲
Smartphone(s) Only	4%	5%	7%	1,634	▲
No Computing Devices	14%	13%	12%	2,829	▼
Internet Access	81%	82%	84%	20,295	▲
Broadband Subscription	48%	48%	49%	11,910	▲
No Internet Access	19%	18%	16%	4,001	▼
Total Households	23,539	23,840	24,296	24,296	





Sources: U.S. Census Bureau ACS 5-year Estimates, Antero Group

Broadband Service Providers

In 2020, a combination of sources—including the surveys issued to residents and businesses, Connected Nation Michigan, and provider advertisements—reported 23 potential providers currently offering service in Barry County.

Providers	Technology	Max Download Speed (Mbps)	Max Upload Speed (Mbps)	
 AT&T	AT&T Michigan	DSL	75	8
 BCTU Fiber • Voice • Data	Barry County Telephone Company	DSL, Fiber, Fixed Wireless, Fiber	16 (6 Fixed Wireless)	1
 blazinghog™	Blazing Hog	LTE	75	-
 COMCAST xfinity	Comcast/Xfinity	Cable	150	20
 HOME WORKS CONNECT Connecting you to the world.	HomeWorks Connect	Fiber	-	-

	Hughes Network Systems, LLC	Satellite	25	3
	JAS Networks, Inc.	Fixed Wireless	25	3
	Martell Cable Services	Cable	10	1.5
	MEI Telecom	Fixed Wireless	30	5
	Mercury Wireless	Fiber, Fixed Wireless	100	-
	Michwave Technologies	Fixed Wireless	20	10
	Nomad Internet	Mobile Wireless	-	-
	Starlink	Satellite	200	-
	Spark Services	Fixed Wireless	150	-
	Spectrum (Charter)	Cable	100	5
	Surf Air Wireless	Fixed Wireless, Fiber	25	5
	TDS Telecom	DSL	50	20
	T-Mobile	Mobile Wireless	-	-
	ViaSat (Exede)	Satellite	30	3

	Great Lakes Energy	Fiber	1000	1000
	Vogtmann Engineering, Inc.	Fiber	50	50
	Windstream Services, LLC	Fiber	-	-
	WOW!	Cable	1000	50

Geospatial Analyses

Through a combination of provider data and publicly available data, the following geospatial analysis supported the identification of potential service gaps and proposed priority expansion areas. All data collected to date reflects publicly available data collected from a combination of US Census Data, Connected Nation Michigan, the FCC, and other data sources as referenced herein. Despite several attempts to request data from area providers, at the time of publication of this Plan only data from WOW!, MEI, and Truestream (through Great Lakes Energy) have been received. Any data subsequently received, which may impact findings will be incorporated into this Plan and recommendations through issuance of an appendix.

Existing Services

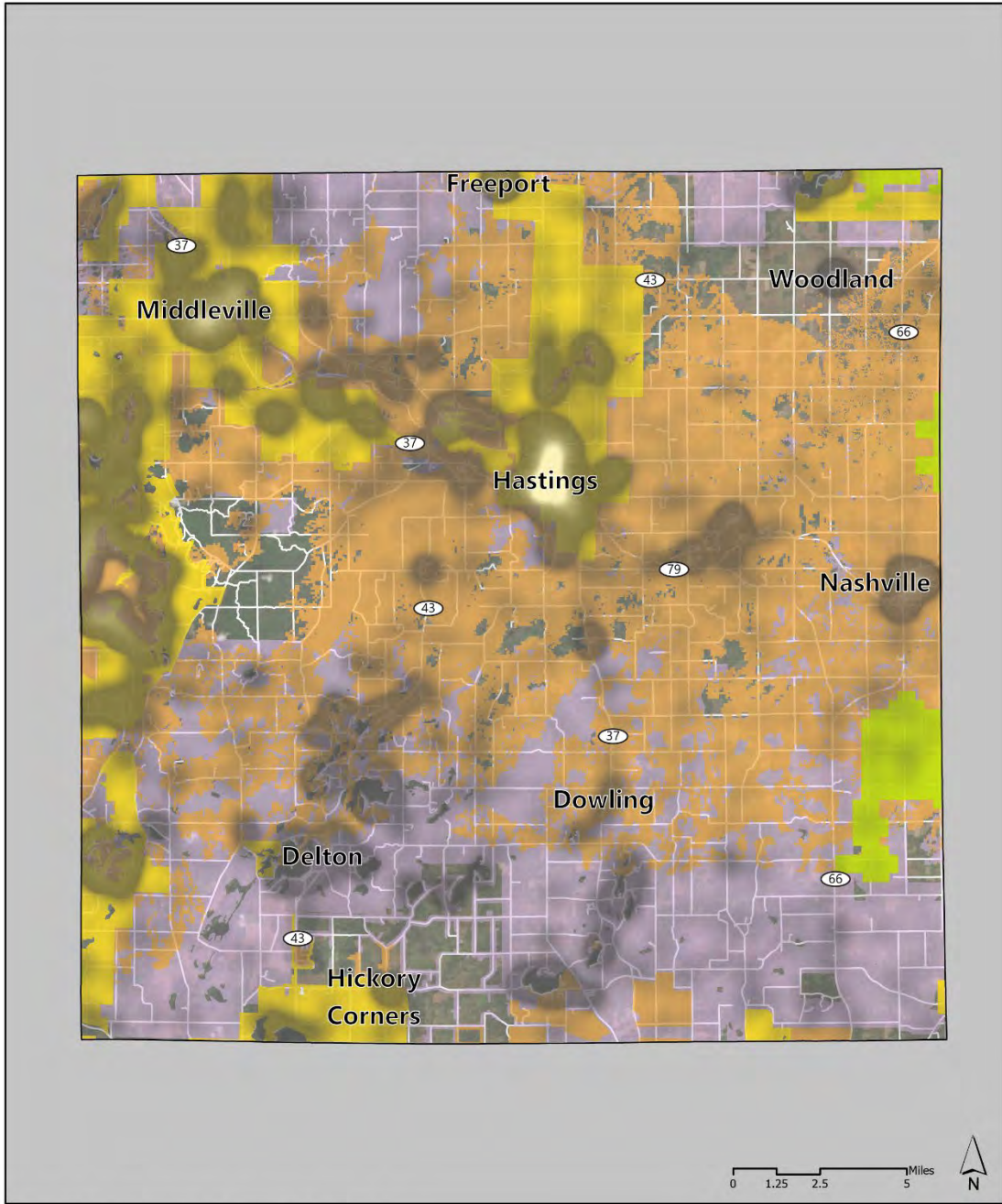
In terms of existing speeds, data made available through Connected Nation Michigan has indicated that 95.81% of households have access to at least 10 Mbps Download and 1 Mbps Upload speeds and only 0.91% of households have access to 1 Gbps speeds. While 10 x1 Mbps coverage is relatively similar between Barry County and Michigan overall, there are significant disparities in regard to any higher speeds. This is likely due to the presence of more rural communities within Barry County and a lack of population density, which can prove cost prohibitive to larger expansion efforts. The full distribution of speeds available within Barry County can be found in **Table 2.7** and is further visualized in **Figure 2.4**. As shown in **Figure 2.4**, areas with an apparent lack of access to high-speed service include Freeport to the north, Delton to the southwest, and the area to the southeast of Dowling. High-speed service is primarily centered around Hastings, Middleville, and along the boundaries of Barry County as adjacent communities' service areas overlap (e.g., Grand Rapids, Kalamazoo, etc.).

Table 2.7 Michigan County-Level Broadband Availability Estimates by Speed

Geography	10 x 1 Mbps	25 x 3 Mbps	100 x 10 Mbps	1 Gbps
Barry County	95.81%	75.89%	49.24%	0.91%
Michigan	98.91%	95.33%	92.71%	31.56%

Source: Connected Nation Michigan, 2021

Figure 2.4 Current Maximum Available Speeds



Barry County Maximum Speeds

- 1 GBPS
- 100M x 10M
- 25M x 3M
- 10M x 1M
- Barry County
- Population Density
- High
- Low



Source: Antero Group, Connected Nation Michigan, MDOT

Barry County leaders and officials have also expressed a particular interest in exploring the possibility of expanding the Fiberoptic network, which prompted an additional investigation regarding available technology. While specific locations and details related to existing fiber infrastructure were not made available during the course of analysis, **Table 2.8** and **Figure 2.5** provide an overview of the existing technologies available at various speeds throughout the County.



As shown, fixed wireless is accessible primarily throughout the north and central portions of the County with the exception of Woodland, while much of the southern portion of the County does not have access, with the exception of approximately five square miles to the southeast. In total, 64.06% of the County has access to high-speed fixed wireless services.

Cable is generally accessible to portions of Hickory Corners, Hastings, Freeport, Middleville and much of the western border of the County. The remainder of the County, primarily throughout the central area and to the northeast, appears to lack access to Cable services. Overall, 46.72% of the County has access to high-speed cable services.

DSL is intermittently accessible by the communities of Middleville, Freeport, Hastings, Nashville, Dowling, Delton, and Hickory Corners. There remain significant gaps in access to DSL services in Woodland, to the west of Nashville, and throughout the central and northern portions of the County in areas between 2.5- and 5-miles outside of the cities of Middleville and Hastings. In total, 15.04% of the County has access to high-speed DSL service.

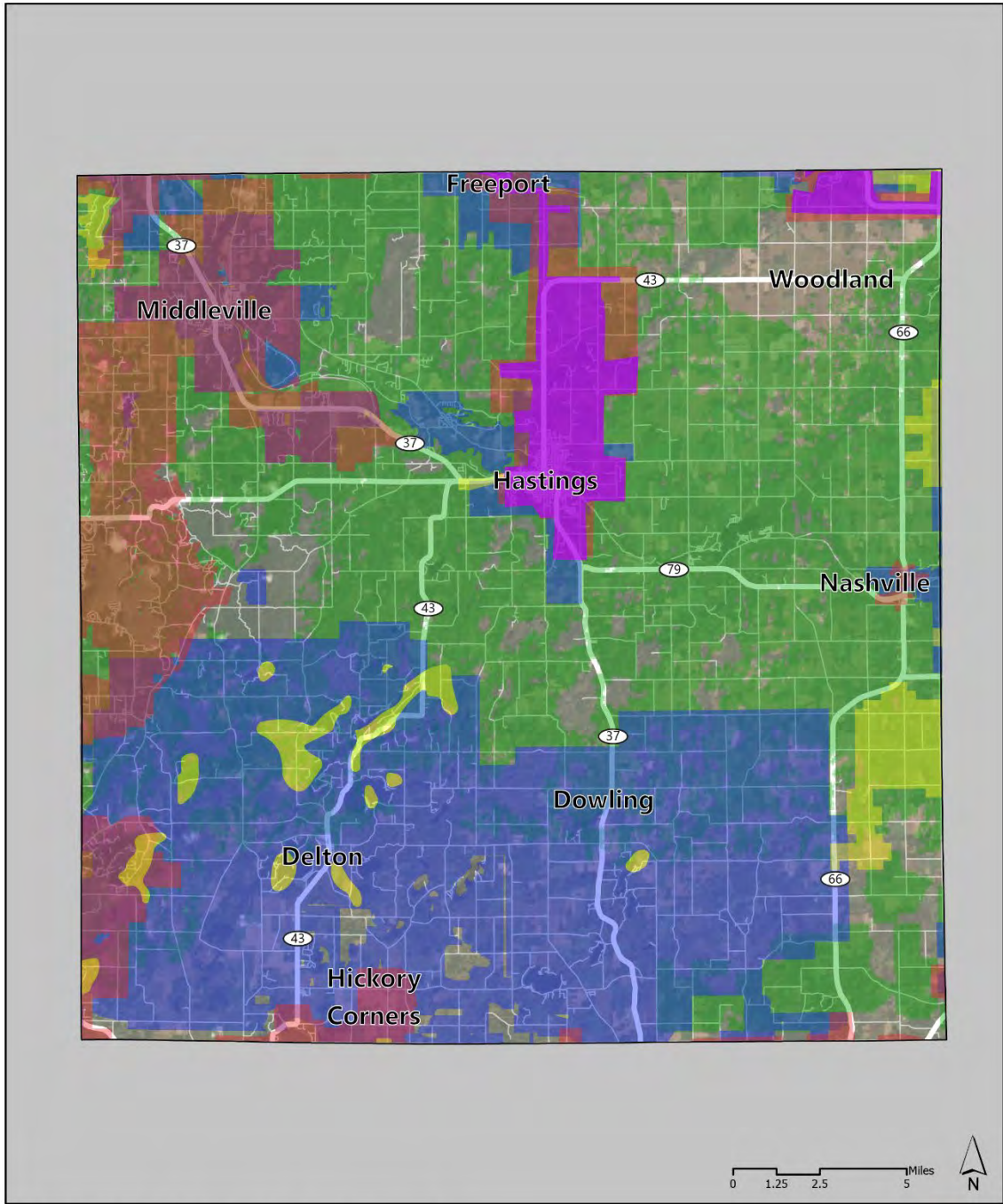
Finally, in terms of Fiber, the County significantly lacks access with limited service shown in the areas surrounding Delton, Hastings, and intermittently near the County borders. Overall, only 4.16% of the County has access to any fiber service and only 1.25% of the County has access to high-speed fiber service.

Table 2.8 Percentage of Households Served by Technology Type and Speed

	10 x 1 Mbps	25 x 3 Mbps	100 x 10 Mbps	1 Gbps
Cable	46.72%	46.72%	46.72%	0.00%
Fixed Wireless	74.93%	64.06%	0.00%	0.00%
DSL	55.66%	15.04%	5.99%	0.00%
Fiber	4.16%	1.25%	1.25%	0.91%

Sources: Connected Nation Michigan, 2021

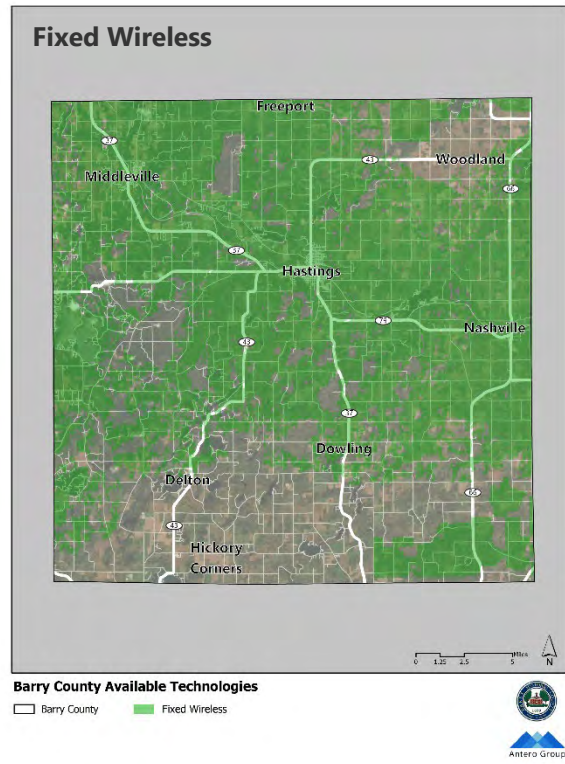
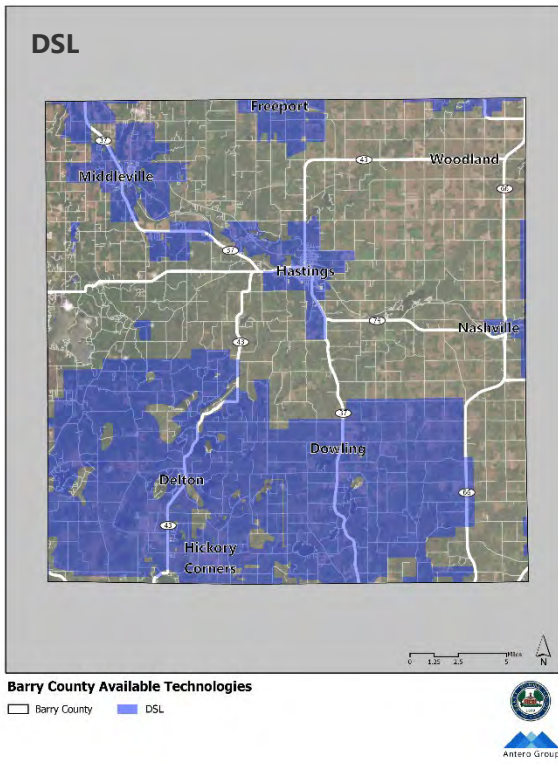
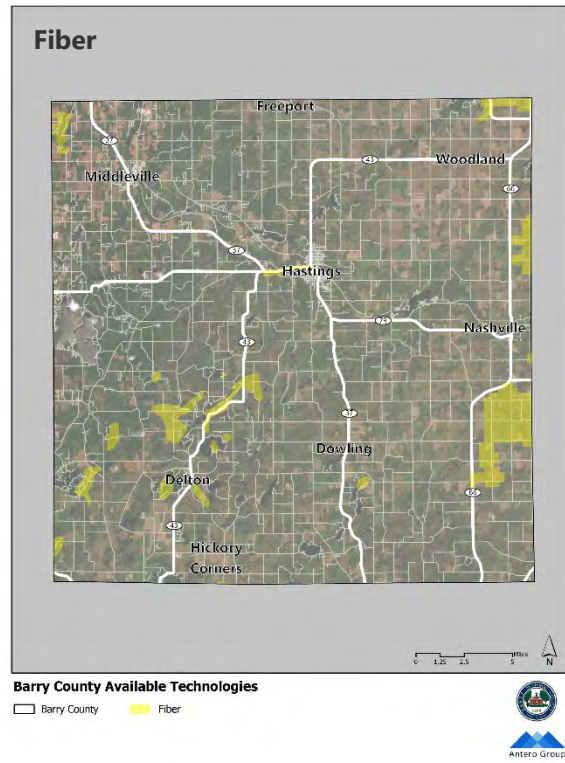
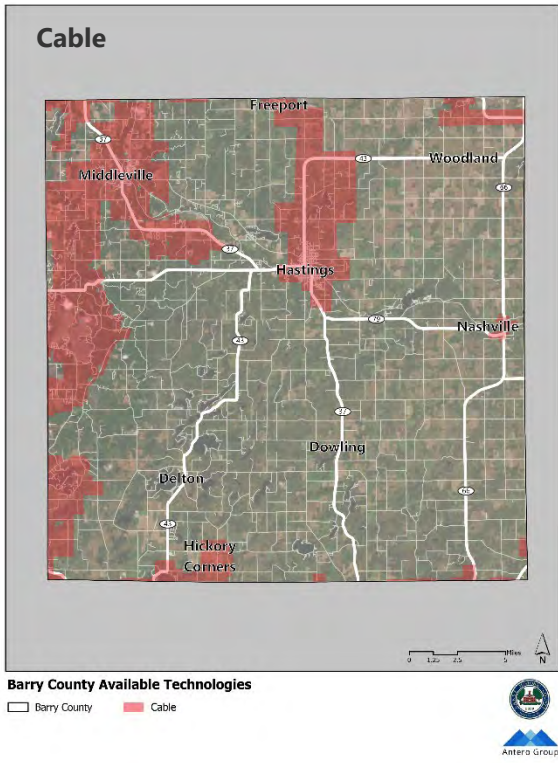
Figure 2.5 Available Technology



Barry County Available Technologies

- | | |
|--|--|
|  Barry County |  Fixed Wireless |
|  Cable |  WOW! Service Areas |
|  Fiber | |
|  DSL | |

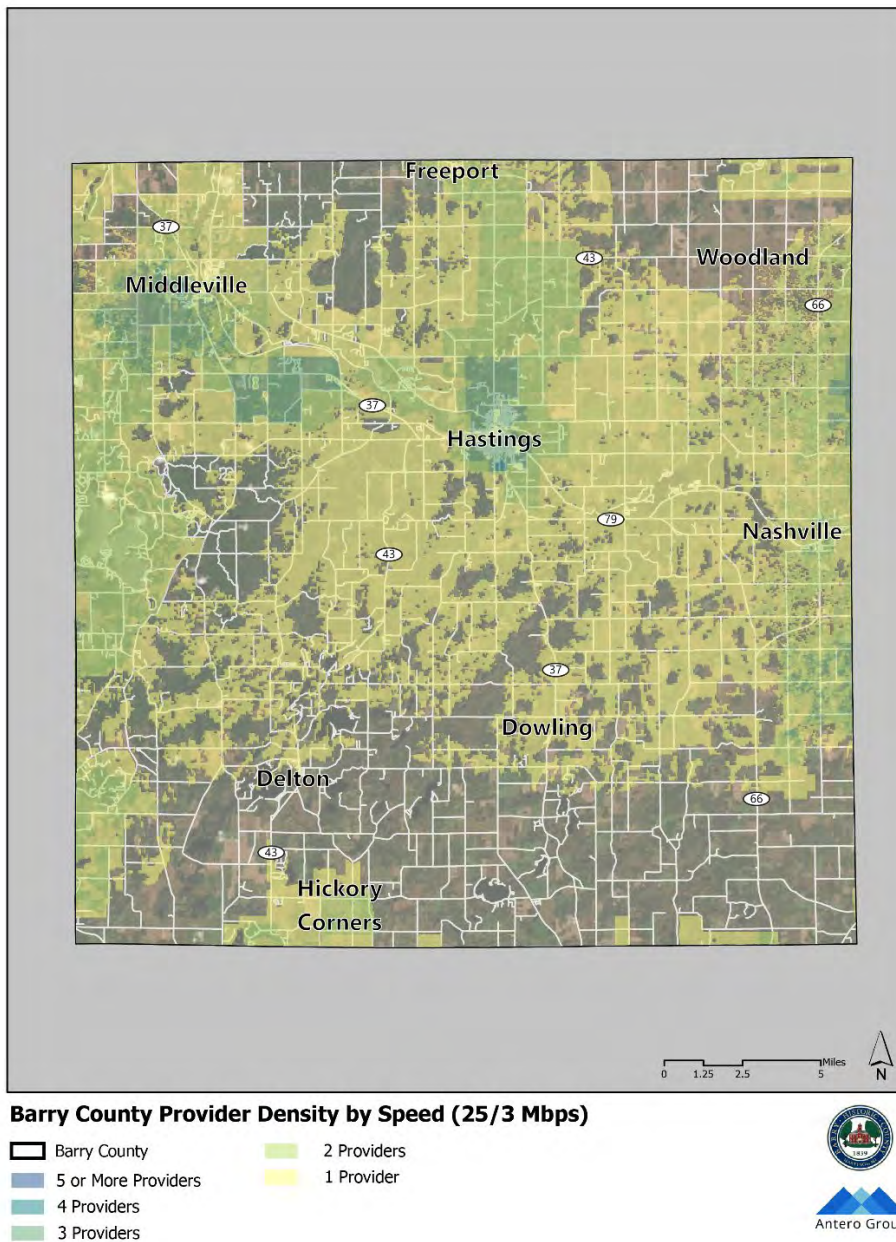




Source: Antero Group, Connected Nation, Michigan, MDOT, WOW!

Though there are 23 providers who offer service in Barry County, each service area varies widely. **Figure 2.6** shows the density of providers offering 25/3 Mbps speeds throughout Barry County. A speed of 25/3 Mbps was selected for visualization as this speed is currently recognized by the FCC as the minimum speed considered to be high-speed service. Both Hastings and Middleville have the highest density of providers offering service whereas Delton, Woodland, and much of the southern portion of the County have access to one or, in some cases, no providers offering high-speed services. These areas are viewed as a significant gap in services.

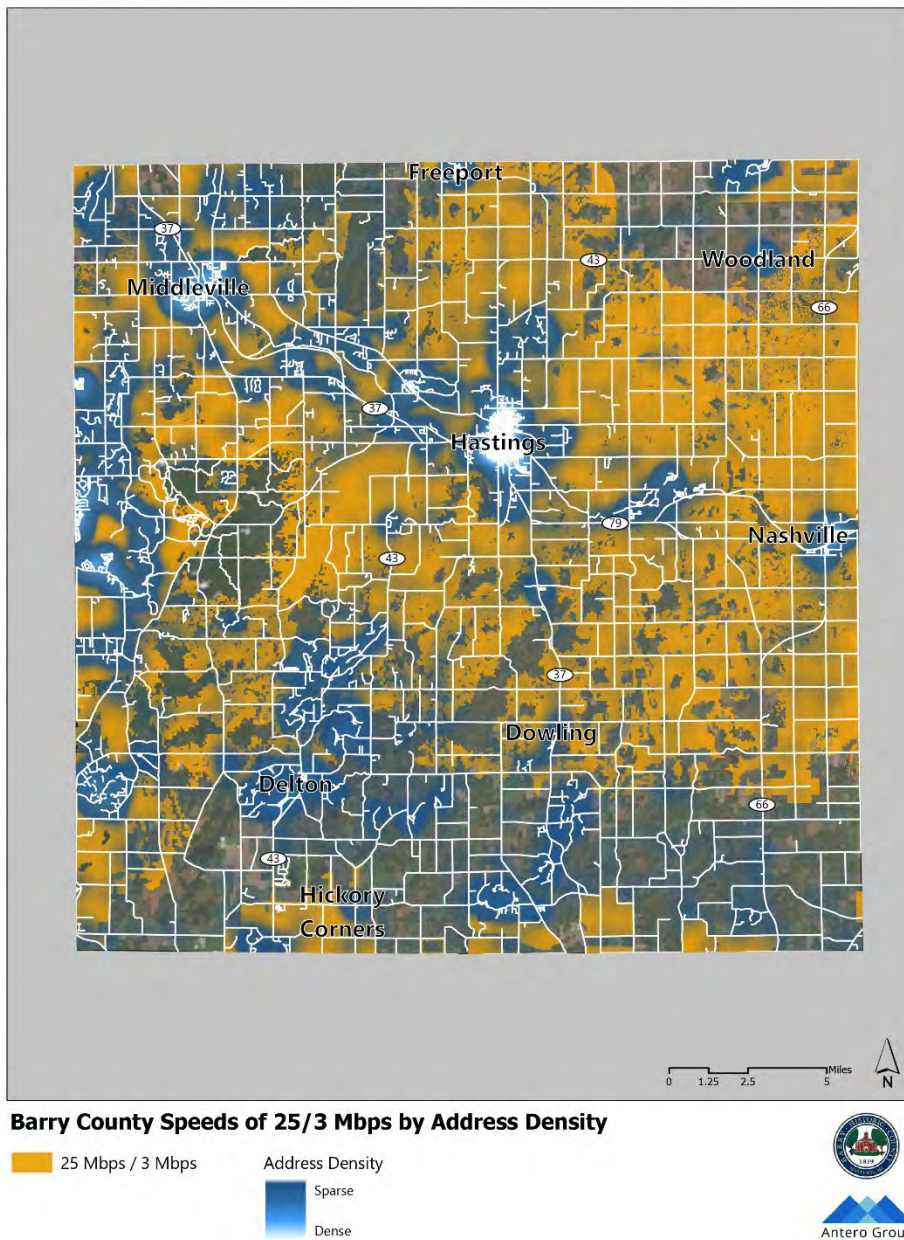
Figure 2.6 Density of Providers by Speed (25/3 Mbps)



Source: Antero Group, Connected Nation, Michigan, MDOT

When considering access to 25/3 Mbps and address density, these gaps in service are further contextualized. As shown in **Figure 2.7** Delton, Woodland, and the southeastern portion of the County have higher address density without access to high-speed services. Additionally, areas just outside of Middleville and Hastings appear to have intermittent gaps in service, which also warrant additional consideration throughout the planning process.

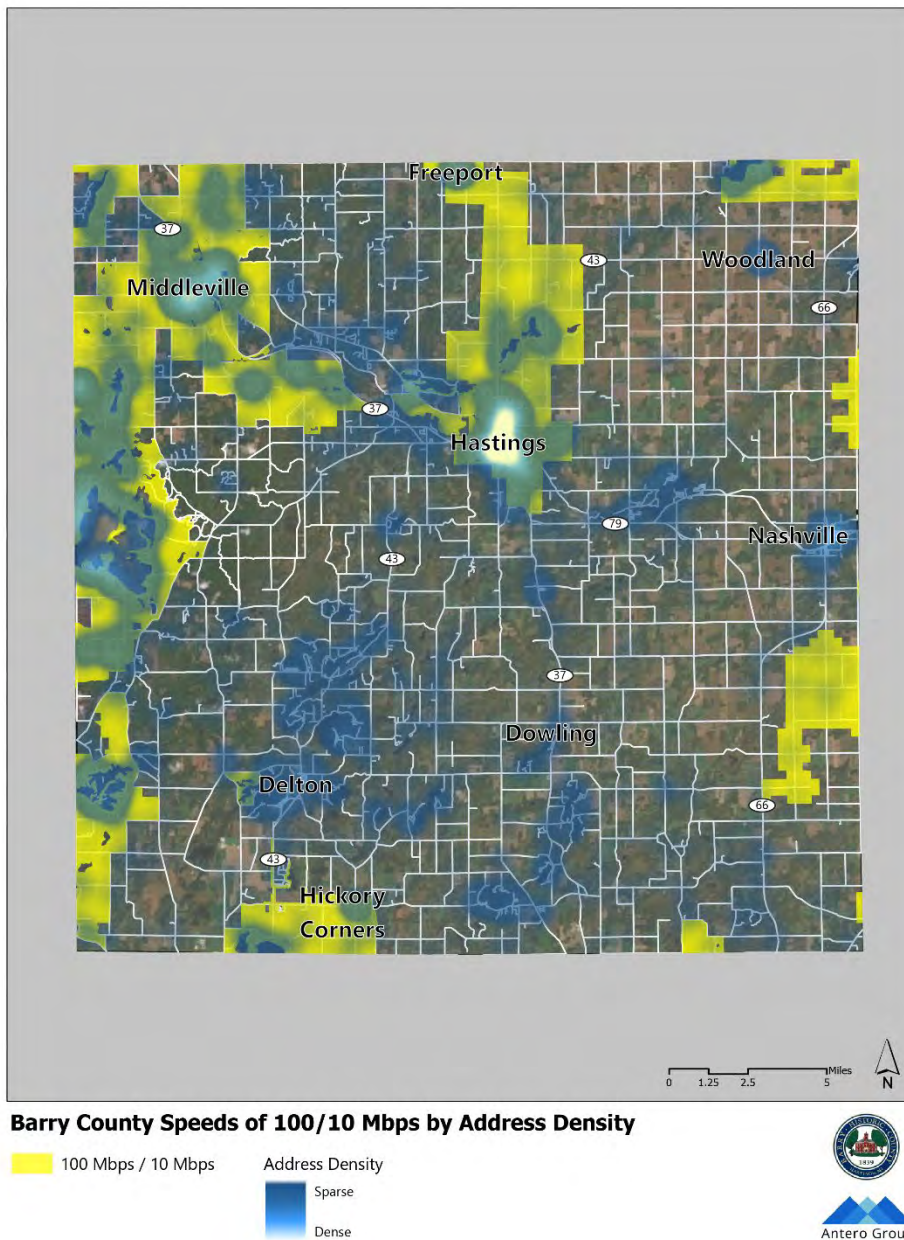
Figure 2.7 Speeds of 25/3 Mbps by Address Density



Source: Antero Group, Connected Nation, Michigan, MDOT

At higher speeds these gaps increase as shown in **Figure 2.8**. Portions of Hastings, Middleville, and areas along the border of Barry County are primarily the only areas with accessible speeds of 100/10 Mbps. Many of the areas with service near the County border likely have access due to proximity to major cities like Grand Rapids, Kalamazoo, and Battle Creek. Much of the area surrounding Hastings and the communities of Woodland, Delton, Dowling, and Nashville lack services of this speed entirely, which is considered to be a critical gap in service as households with three or more members may begin experiencing difficulties with video streaming and other heavy use activities at lower speeds.

Figure 2.8 Speeds of 100/10 Mbps by Address Density



Source: Antero Group, Connected Nation, Michigan, MDOT

Proposed Services

There are several areas in Barry County proposed or planned for future service. The map in **Figure 2.9** shows the winners of Phase I of the Rural Digital Opportunity Fund (RDOF), Broadband Infrastructure Program (BIP) 2021 Awards, Connecting Michigan Communities (CMIC) Grant Program Awards, and USDA ReConnect Awards.

The Rural Digital Opportunity Fund (RDOF) is a federal program consisting of \$20.4 billion to bring high speed fixed broadband service to rural homes and small businesses lacking access to such services. This program uses reverse auctions in a series of two phases. In Phase I, funding was awarded to support bringing broadband to over five million homes and businesses in areas entirely unserved by voice and broadband with minimum download speeds of 25 Mbps. Phase II, once initiated, will cover other areas that are partially served, as well as locations not funded in Phase I. Awards for Phase I of this program within Barry County will primarily support bringing services to rural areas between Hastings and Dowling, as well as rural areas to the southwest and southeast of the County.

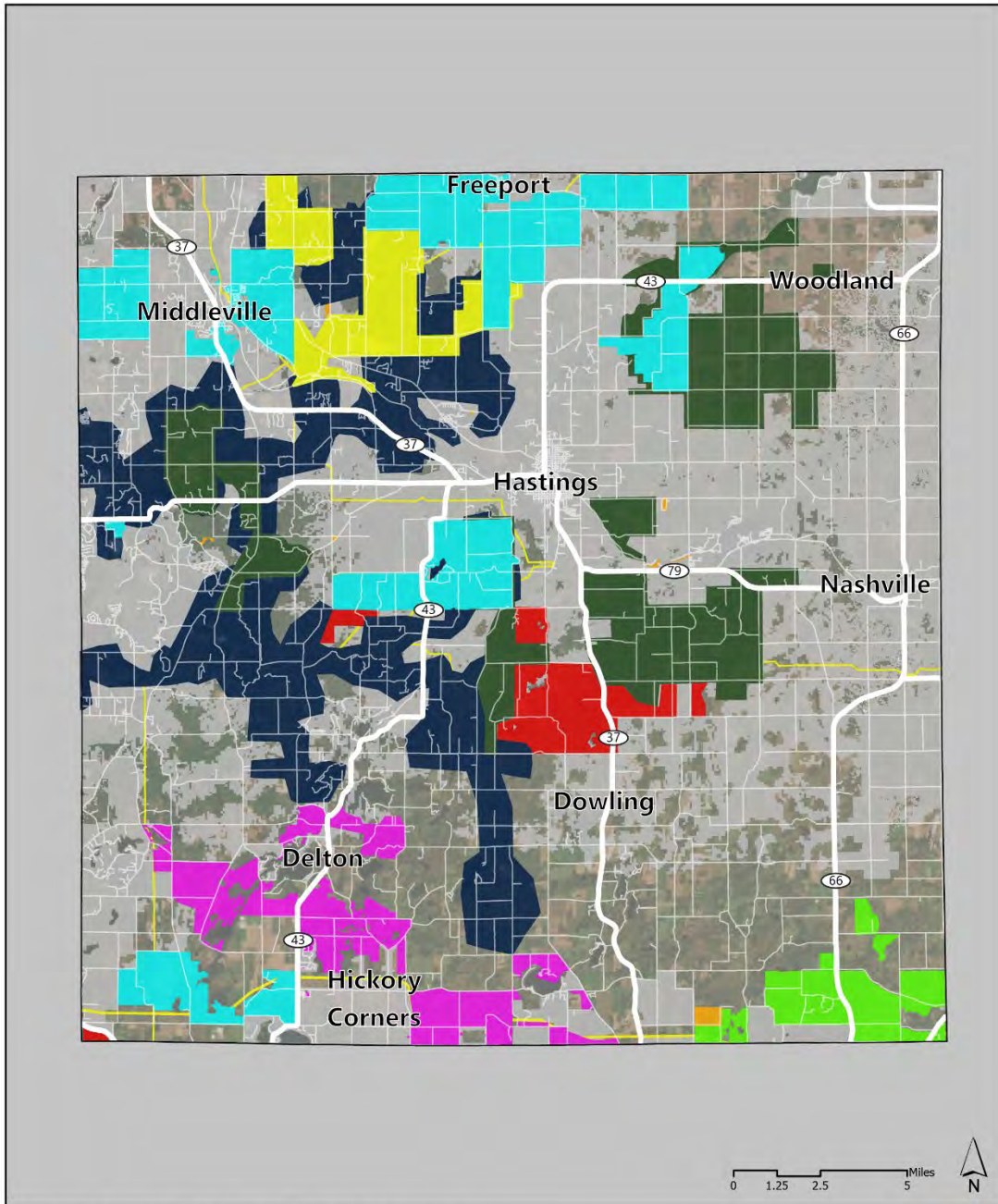
In late 2021, Barry County submitted an application for funding to the BIP Program in partnership with Great Lakes Energy Cooperative (GLE). This application is currently under review. If awarded, this project would bring fiber service to 3,072 residents and 227 businesses across Barry County from Freeport, to Middleville, to Hastings, and Hickory Corners. Great Lakes Energy also powers Truestream, which has indicated plans to expand services throughout Barry County as shown in **Figure 2.9**.

The Connecting Michigan Communities (CMIC) Grant Program awarded \$618,343 to Mercury Wireless to increase speeds to 100 Mbps/20 Mbps for a total project cost of \$824,457. This project will primarily serve more rural areas surrounding Delton to the southwest of the County. Grant requirements indicate this project should be complete by September 2025.

Finally, the USDA ReConnect Award received for Barry County consists of a 50% loan and 50% grant awarded for a total of \$11,880,198 to Barry County Services Company (BCSC) to continue to expand the availability of affordable services in rural areas. As a part of this project speeds will be increased in rural areas south of Hastings, surrounding Irving, Yankee Springs Township, and south of Woodland. This project will support the expansion of fiber services to homes in order to deliver speeds of up to one gigabyte.

As shown in **Figure 2.9** in comparison to areas with access to speeds of 25/3 Mbps, there remain gaps in service. Areas surrounding Woodland, Middleville, and Yankee Springs Township remain intermittently serviced. Additionally, more widespread gaps in service are observed to the east of Delton and south of Dowling. It should also be noted that though these projects have been awarded funding, it will take several years to fully implement these projects as outlined.

Figure 2.9 Planned and Proposed Service Areas



Barry County Proposed Service Areas

- | | | |
|--|---|---|
| ■ Barry Technology Services | ■ BIP 2021 Proposed Service Areas | ■ Current Speeds of 25/3 Mbps |
| ■ MEI Telecom, Inc. | ■ CMIC Awarded Grant Areas | ■ Electric Transmission Lines |
| ■ Mercury Wireless, Inc. | ■ MEI ReConnect Award 2022 | ■ Barry County |
| ■ NRTC Phase I RDOF | ■ MEI ReConnect Award 2023+ | |
| ■ Windstream Services, LLC | ■ Trustream Proposed Coverage | |

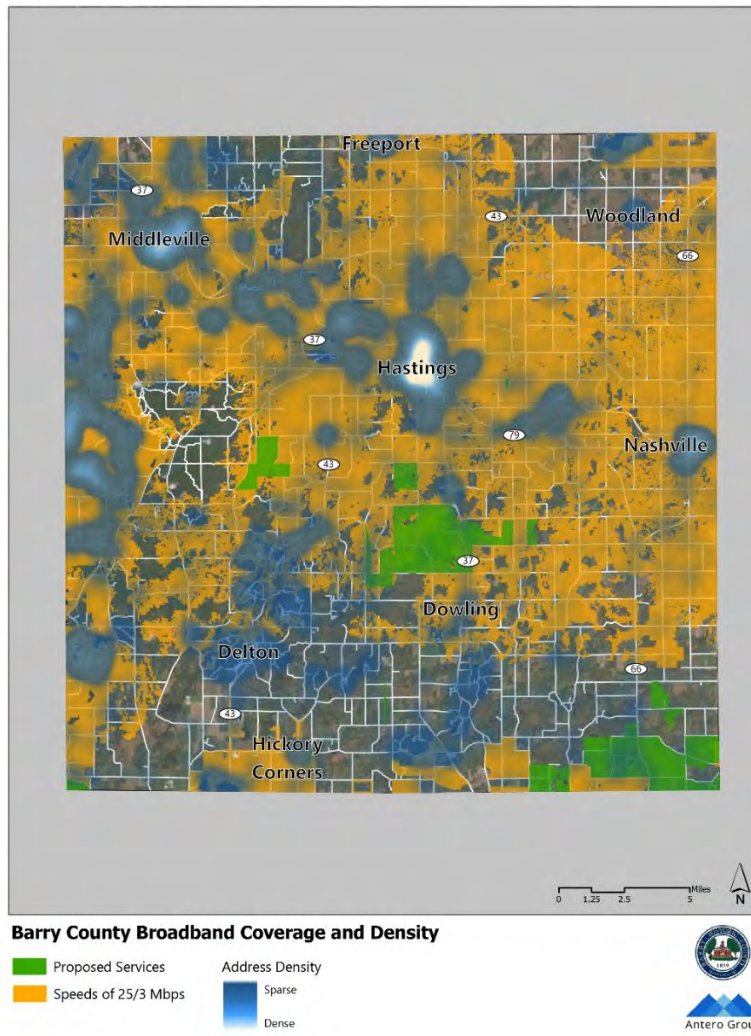


Sources: Antero Group, FCC, Connected Nation Michigan, MDOT, Barry County GIS

Service Gap Analysis

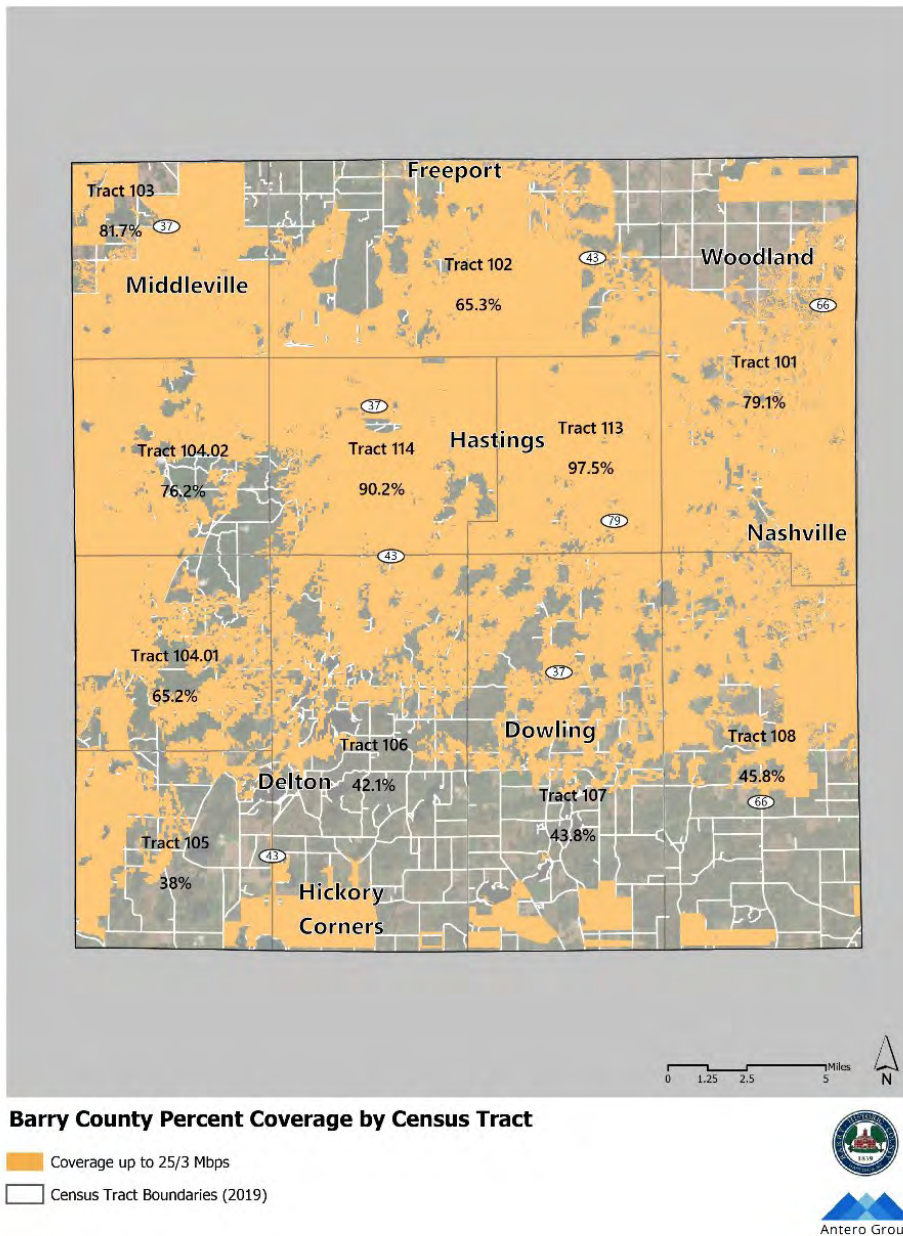
Twice per year the FCC requires broadband providers to report data related to broadband deployments. This is coordinated through the completion of Form 477, which establishes the necessary format and data required for successful submission. This data is only reported at the census tract level, which is overgeneralized as not all areas within a tract will have the same access to the same levels of service. Through the following combination of provider supplied data, data provided by Connected Nation Michigan, and publicly available data, the following map (see **Figure 2.10**) was created to show more accurate coverage areas in conjunction with current address density to highlight gaps more accurately. As shown, there is a lack of access to existing and proposed high-speed internet services in Dolton, Woodland, and areas to the south of Dowling in terms of areas with higher address density. Furthermore, several less dense areas to the west of Hastings, towards the southern border of the County, and intermittent areas near the northern border of the County lack access to high-speed services as well.

Figure 2.10 Coverage by Address Density



Though data related to current services is significantly limited due to a lack of access to provider supplied data, the following map in **Figure 2.11** shows available high-speed coverage from Connected Nation Michigan and the percent coverage of each census tract. As shown, tracts 105, 106, and 107 report the lowest percent coverage in terms of high-speed broadband services. Much of the southern portion of the County reports the lowest coverage rate, however, there are also gaps noted to the east of Woodland and to the west of Freeport. Though less significant there are also intermittent gaps to the northwest of Middleville and the southwest of Hastings.

Figure 2.11 Current Service Coverage by Tract



Sources: Antero Group, FCC, MDOT, Connected Nation

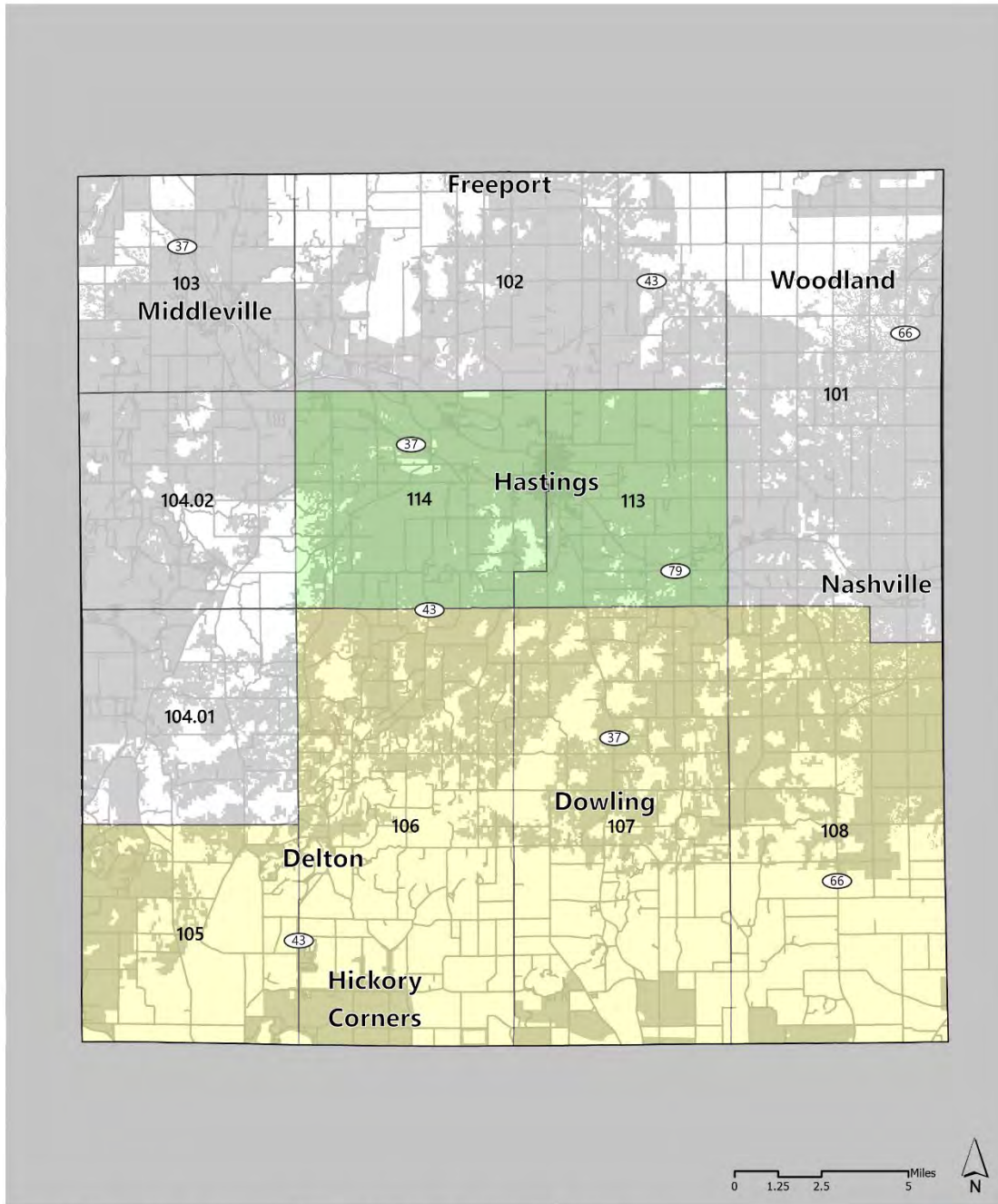
Furthermore, **Table 2.9** provides an overview of key demographic information, percentage of area with access to high-speed services, and reported speeds (as a result of the survey issued during this Project). These data points were compared to further assess any emerging priority expansion areas. The Tracts 113 and 114 report the highest rate of coverage, which both encompass the area surrounding Hastings and Middleville. Tracts 105, 106, 107, and 108 report less than 50% coverage. These tracts include the communities of Delton, Dowling, Hickory Corners, and much of the rural area to the south of the County. This is further visualized in **Figure 2.12**. There does not appear to be any significant difference in median household income, however, tracts with lower coverage do appear to correlate with lower numbers related to density, total population, and total households. These figures are relatively unsurprising as, nationally, the less dense or more rural a population the less feasible it can be for providers to outweigh the high costs associated with expanding and maintaining service in areas with a smaller potential customer base.

Table 2.9 Barry County Census Tract Data Summary

Tract	Population	Households	Area (Acres)	Density	Median Income	Percent High-Speed	Avg. PNG	Avg. JITTE	Avg. Download	Avg. Upload
Tract 101	6,233	2,694	47,178	0.13	50,290	71.9%	57	17	4.1	0.35
Tract 102	5,518	2,286	45,938	0.12	68,551	65.3%	56	16	4.95	1
Tract 103	8,161	3,117	22,994	0.35	72,607	81.7%	27	4	16.6	4.2
Tract 104.01	3,401	1,876	22,820	0.14	59,068	65.2%	26	4	8.7	4.5
Tract 104.02	4,294	2,417	22,948	0.18	70,553	76.2%	26	5	10	5.3
Tract 105	3,480	1,741	23,351	0.14	63,656	38.0%	23	2	8.3	0.8
Tract 106	6,736	3,606	46,462	0.14	69,044	42.1%	25	4	6.2	1
Tract 107	5,082	2,441	46,531	0.10	58,783	43.8%	50	5	4.2	1
Tract 108	6,350	1,414	45,030	0.14	63,534	45.8%	56	7	13.8	1.25
Tract 113	7,999	3,308	19,854	0.40	60,838	97.5%	39	5	12.8	2.3
Tract 114	6,350	2,686	25,202	0.25	66,234	90.2%	44	11	5.1	1.3

Source: Antero Group, FCC, US Census Bureau

Figure 2.12 Access to High-Speed Service by Tract



Barry County Access to High-Speed Services by Tract

- Less Than 50% High-Speed Access
- Over 50% High-Speed Access
- Over 90% High-Speed Access
- High-Speed Coverage



Sources: Antero Group, FCC, MDOT, US Census, Connected Nation

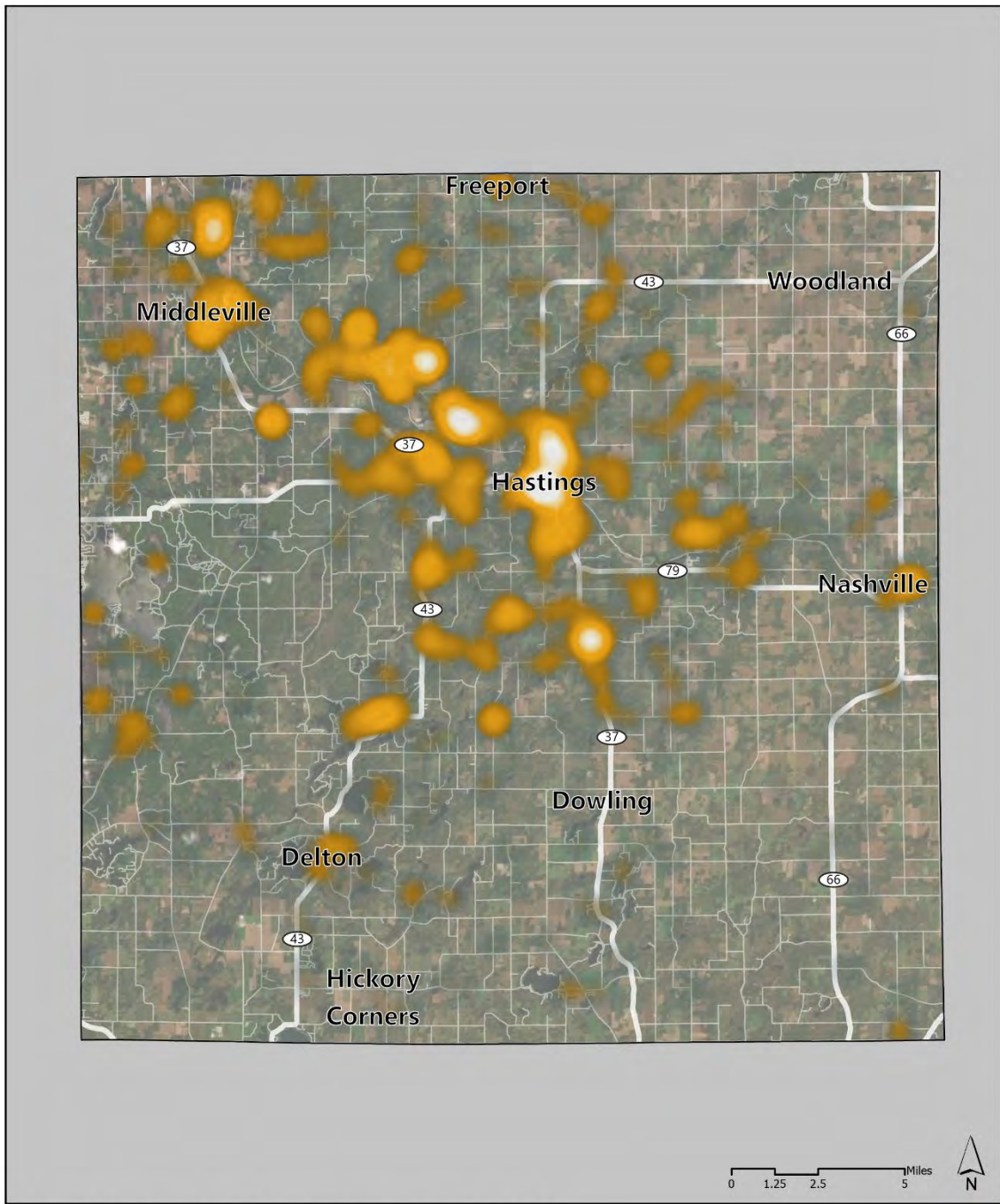
Broadband Surveys

In the interest of gathering more local level data, the Barry County Broadband Expansion Committee partnered with Antero Group to develop and issue two surveys designed to seek key data points from area residents and area businesses. Surveys were distributed through a multitude of media including social media posts, municipal websites, email blasts, and targeted online campaigns. Additionally, in recognition of residents faced with connectivity challenges, the surveys were also distributed at area festivals and events, through print media (e.g., post cards, flyers), through radio advertising, and through a targeted direct mail campaign in areas with known connectivity challenges. Overall, 966 households completed the resident survey, and 79 businesses completed the business survey for a response rate of approximately 5%.





Household Survey Responses

All areas within Barry County face varying levels of gaps in broadband service, either in terms of available speed or available service. One of the steps to better assess data on a local level is to further consider the emerging priority expansion areas through the analysis of survey results for these areas. **Figure 2.13** provides a heat map indicating where the highest concentrations of responses were observed. In general, the largest concentration of respondents was in and immediately surrounding Hastings (486), which has the largest population in the County. Other areas with higher concentrations of respondents include Middleville (237), Delton (79), and Nashville (47). Areas lacking responses were primarily located to the northeast and southern border of Barry County, which are in general more rural areas.

Figure 2.13 Household Survey Response Heat Map



Barry County Home Survey Response Heat Map

-  Barry County
-  Low
-  Survey Responses Density
-  High



Source: Antero Group, Michigan DOT

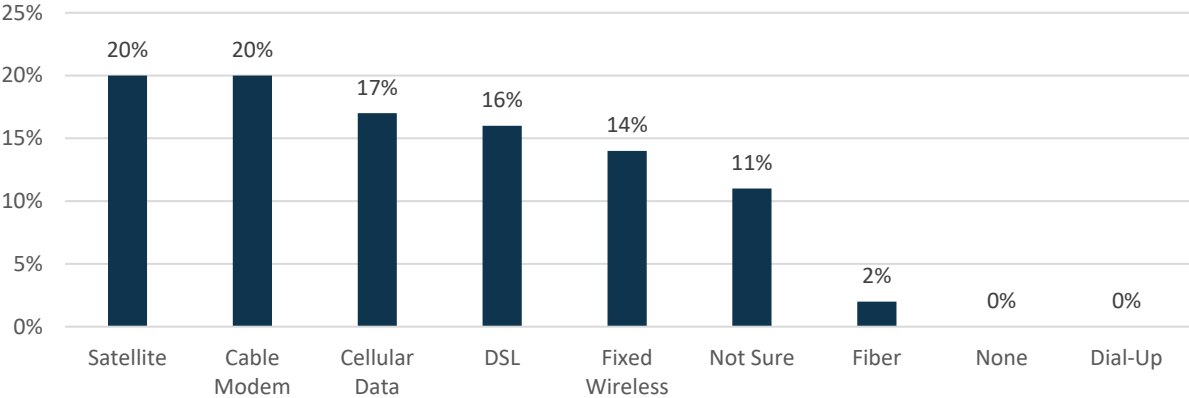
While all survey questions were analyzed and considered in the development of Plan recommendations, the following questions revealed key results, which significantly impacted the findings of this Plan. A full overview of the survey analysis is available in **Appendix B**.

Several questions within the survey were related to general demographics to assess for any potential biases and gain a better understanding of community level data. Overall, 82% of resident respondents indicated they lived in a rural household with an average household size of three persons per household. In terms of median household income, over 50% of respondents indicated an income over \$75,000 followed by 25% reporting between \$50,000 and \$75,000.

One of the driving factors for assessing broadband service within Barry County is an increased reliance in work from home arrangements. To further investigate this trend within the County communities, several questions were intended to collect feedback regarding the prevalence and frequency of these types of arrangements. Of residential respondents, 53% indicated that at least one person in their household works from home with an average of one person per household working from home. Of these respondents, 50% work from home five or more days per week.

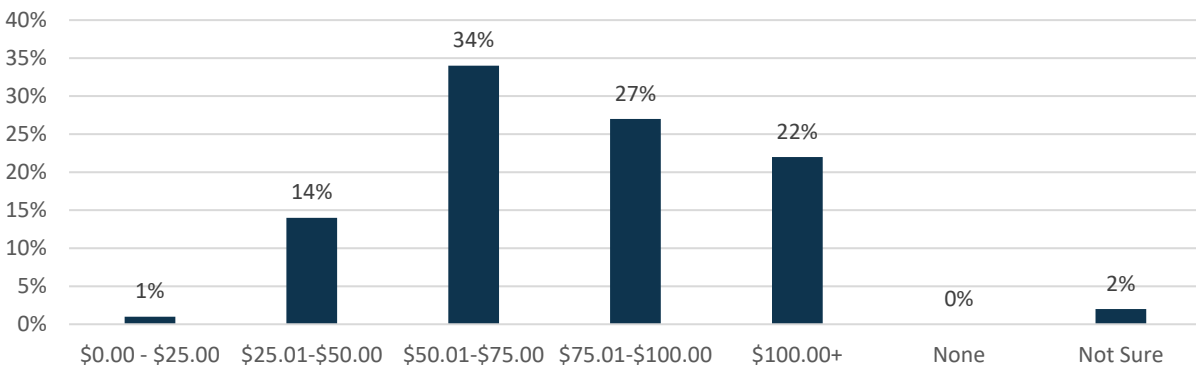
Based on responses received, the top five services used in Barry County include Satellite (20%), Cable Modem (20%), Cellular Data (17%), DSL (16%), and Fixed Wireless (14%). As shown in **Figure 2.14**, access to fiber was only reported by 2% of respondents. Survey responses related to available technology are similar to those reported by Connected Nation for Barry County as outlined in previous sections of this Plan.

Figure 2.14 Primary Internet Type Used at Home



The top five providers reported by respondents include MEI (18%), AT&T (15%), WOW! (10%), Spectrum (10%), Barry County Telephone Company (9%). As shown in **Figure 2.15**, 34% of resident respondents report a monthly bill between \$50 - \$75, 27% report a monthly bill between \$75.01 - \$100, and 22% of report a monthly bill over \$100. Respondents also indicated the most important factors considered in relation to potential providers is customer service and best available technology.

Figure 2.15 Average Monthly Cost



69% of residents indicated they are not satisfied with current service, and 90% of respondents would be interested in a new high-speed service. Residents reported that education (90%), remote work (83%), economic development (80%), quality of life (78%), and healthcare (69%) were community considerations in need of access to fast, affordable, and reliable internet services.

One of the final survey questions requested respondents to take the University of Michigan’s official speed test (<http://speedtest.it.umich.edu/>). The following average speeds were reported:

- Average Ping (ms): 44.3
- Average Jitter (ms): 9.0
- Average Download (Mbps): 6.35
- Average Upload (Mbps): 1.90

These results are lower than anticipated and indicate many resident respondents live within areas with average speeds close to 10 Mbps Download and 1 Mbps Upload, which is also largely supported by data available through Connected Nation Michigan. The FCC has defined the minimum broadband speed as 25 Mbps Download and 3 Mbps Upload, which only 75% of residents are within range of according to Connected Nation Michigan (2021). This current definition has also been a recent topic of debate as several major service providers require minimum download or upload speeds higher than the federal minimum. For example, Zoom recommends at least 3.8 Mbps upload speeds for use (Gershgorn, 2021).

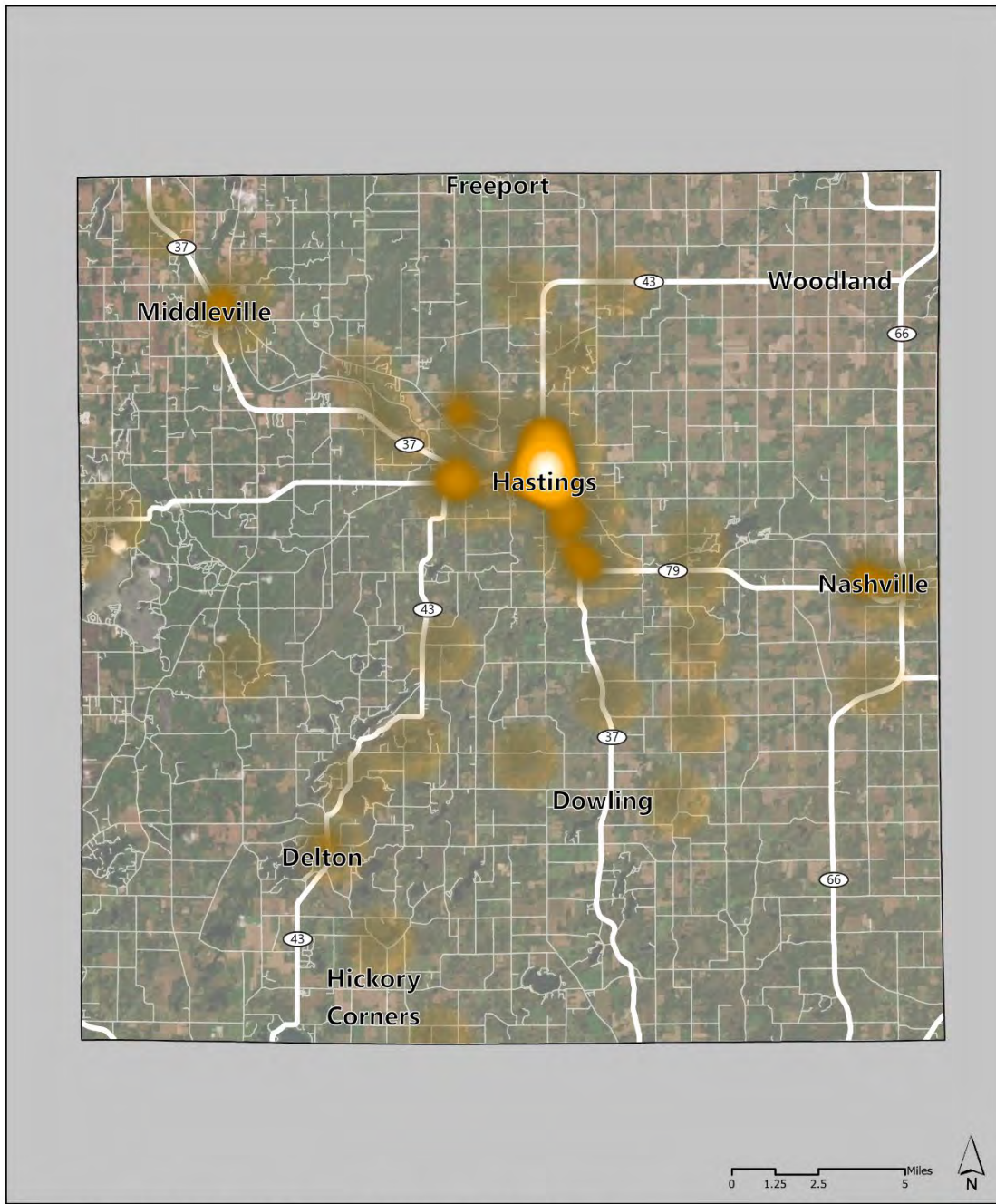
Business Survey Responses

Area businesses warrant additional consideration as employers are in varying stages of returning to the office, converting to a work-from-home arrangement, and seeking to grow and expand operations. To further investigate existing conditions related to business broadband services, a second survey was developed and intended to solicit more specific feedback for incorporation into Plan recommendations.

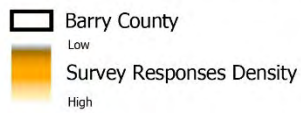
Figure 2.16 shows a heat maps where higher concentrations of survey responses were received.

Responses primarily were concentrated in Hastings, similar to resident responses due to the higher population and density. Other areas with higher concentrations of respondents include Middleville, Delton, and Nashville similar to resident respondents. Business responses appear to be more widespread with additional responses recorded in the southern portion of the County. Similar to the residential survey, the northeast area of the County lacks responses (e.g., Woodland).

Figure 2.16 Business Survey Response Heat Map



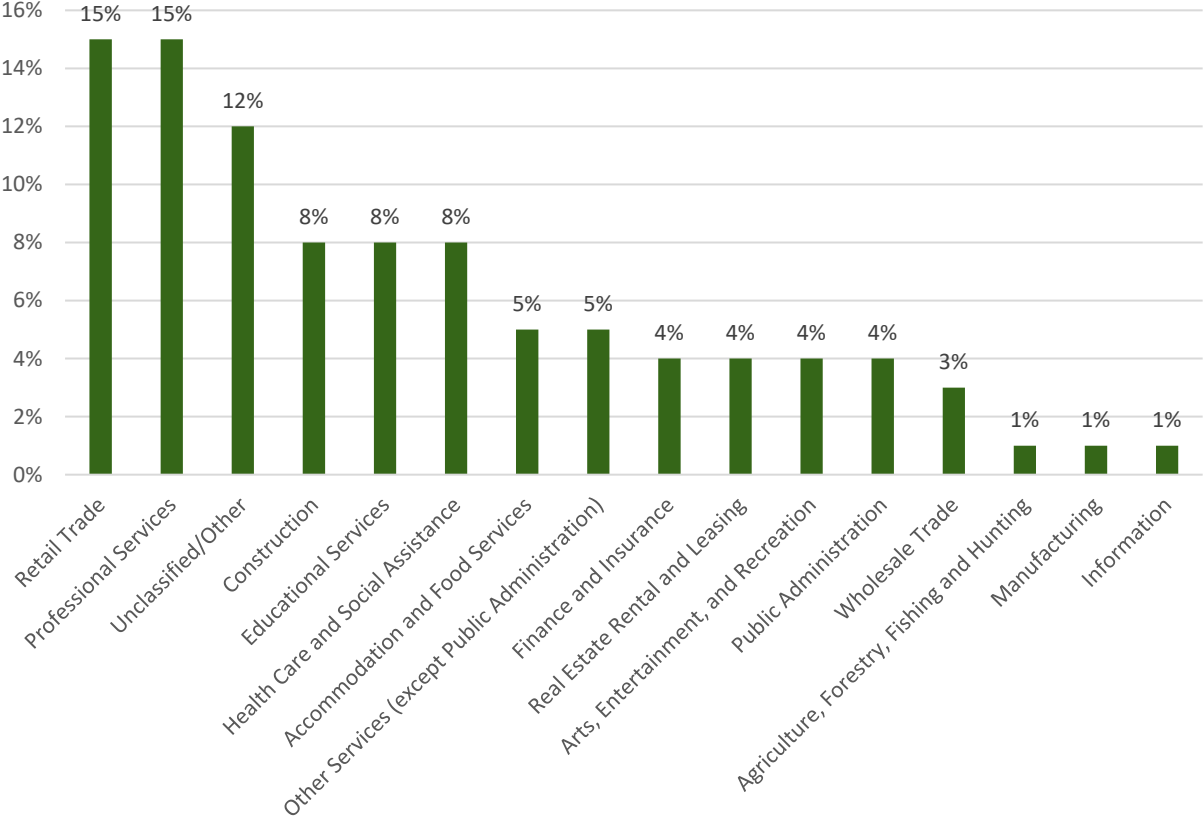
Barry County Business Survey Response Heat Map



Source: Antero Group, Michigan DOT

The first several questions within the business survey were intended to collect demographic information to assess for any potential biases and gain a better understanding of community level data. Overall, 51% of businesses indicated they were located within an urban area. As evidenced by **Figure 2.17**, many businesses appear to be located within or near Hastings, Michigan. Businesses also indicated 49% operate with 1-5 employees, 27% operate with 6-15 employees, 15% operate with 16-50, 7% operate with 51-100 employees, and 1% operate with over 100 employees. As shown in **Figure 2.17**, the top industries responsive to this survey are the Retail Trade, Professional, Scientific, and Technical Services, Unclassified/Other, Construction, Educational Services, and Health Care and Social Assistance. Businesses who indicated "Unclassified/Other" further specified a mix of non-profit entities and religious organizations.

Figure 2.17 Top Industries Responsive to Survey

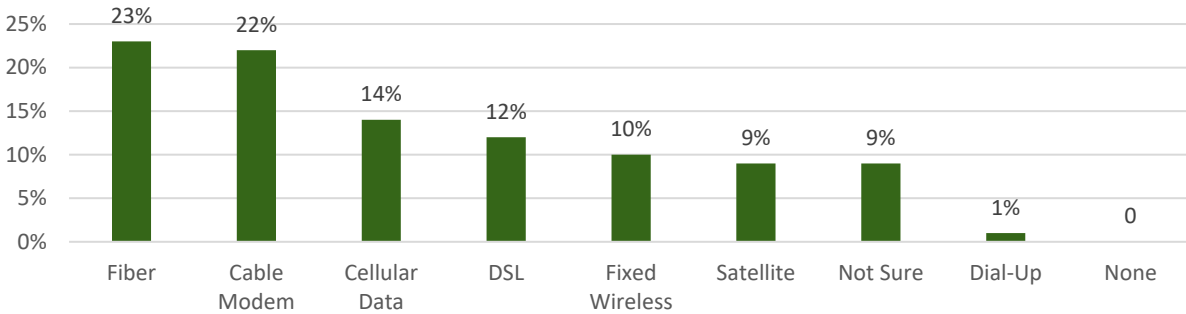


58% of businesses were located in a commercial property or storefront, while 29% of businesses operated from homes. Business respondents who indicated working from home further clarified they worked from home over five days per week (89%). This data is further indicative of an increased reliance on work from home arrangements.

Based on responses received, the top five services used by businesses in Barry County include Fiber (23%), Cable Modem (22%), Cellular Data (14%), DSL (12%), and Fixed Wireless (10%). Further, as shown in **Figure 2.18**, access to fiber was only reported by 2% of respondents. Survey responses related to

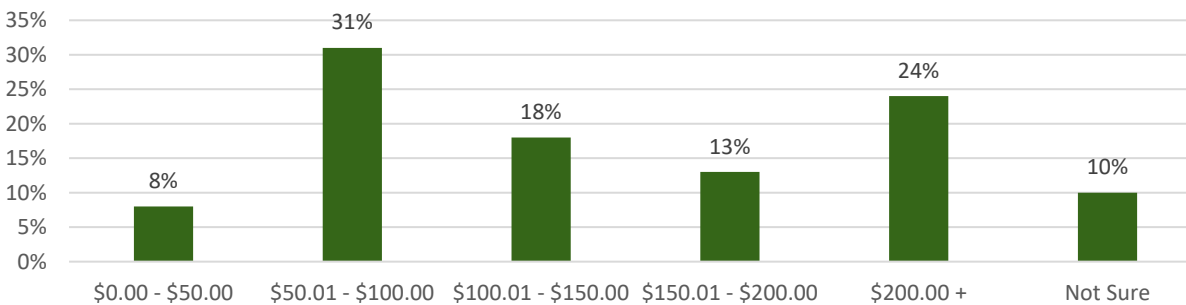
available technologies are similar to those reported by Connected Nation for Barry County as outlined in previous sections of this Plan.

Figure 2.18 Primary Internet Type Used by Businesses



The top five providers reported by business respondents include MEI (27%), WOW! (19%), AT&T (11%), Spectrum (6%), and Barry County Telephone Company (6%). As shown in **Figure 2.19** 31% of respondents report a monthly bill between \$50.01-\$100, 24% report a monthly bill above \$200, and 18% of respondents report a monthly bill between \$100.01-\$150.00.

Figure 2.19 Average Monthly Cost



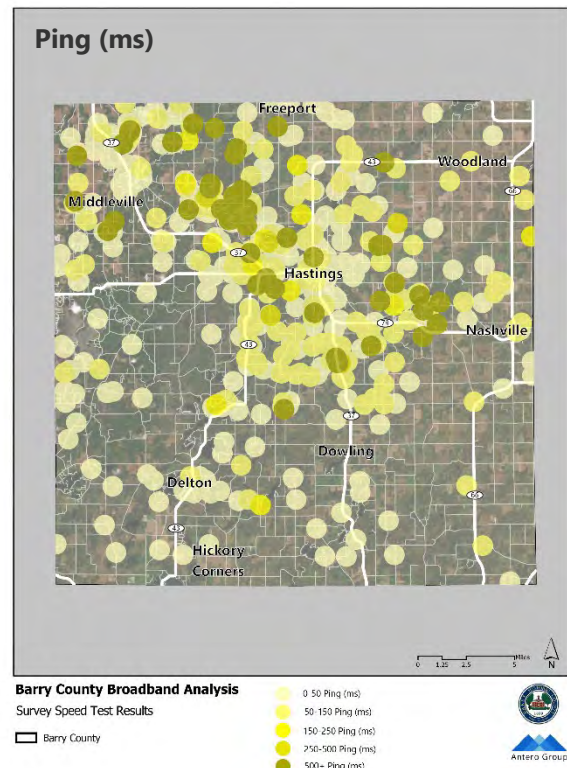
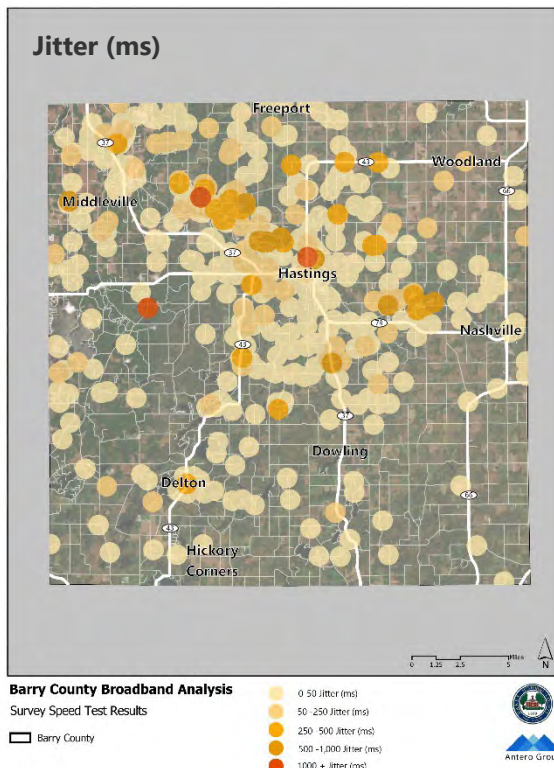
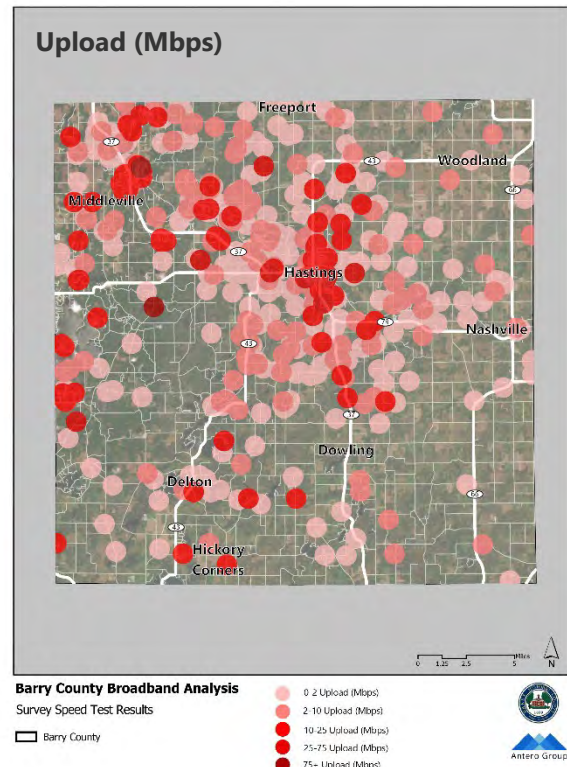
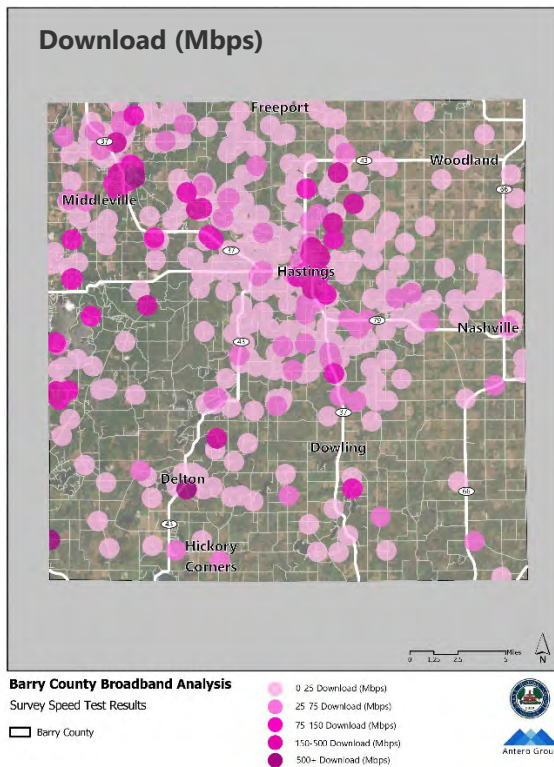
58% of businesses indicated they are not satisfied with current service, and 73% of respondents would be interested in a new high-speed service. Similar to resident responses, great customer service and best available technology were considered the highest priorities in terms of provider characteristics.

One of the final survey questions requested that respondents take the University of Michigan’s official speed test (<http://speedtest.it.umich.edu/>). The following average speeds were reported:

- Average Ping (ms): 48.1
- Average Jitter (ms): 106.25
- Average Download (Mbps): 76.1
- Average Upload (Mbps): 44.7

These results are significantly higher than the average responses received for resident respondents. This is likely due in part to a lower sample selection and a higher response rate from urban businesses likely near areas with better existing coverage. A map with combine household and business speed test results can be found in **Figure 2.20**.

Figure 2.20 Survey Speed Test Result Summary



Expansion Areas

Following the previously outlined analysis, several priority expansion areas were identified. Due to the County's desire to expand fiber broadband services, two categories of expansion areas were identified including overall priority expansion areas specifically to address gaps in high-speed service regardless of implemented technology, and high-speed fiber priority expansion areas.

In review, the population growth, particularly over the last five years, increased reliance on work and learn from home arrangements, and a nation-wide increased reliance upon broadband services to support residents and businesses in their daily lives is indicative of a critical need to improve broadband services throughout Barry County.

Due to the population growth exhibited within the last five years, the increased reliance on work and learn from home arrangements, and feedback received from existing residents and businesses, it is apparent that high-speed broadband is of high importance to improve the quality of life of residents in Barry County. These factors are of particular importance in relation to existing services, proposed and planned expansions, and future expansion efforts. The analysis as previously outlined will help to strategically guide expansion efforts in a way that is sustainable and responsive to community needs.

Both during and following the publication of this Plan, RDOF areas should be immediately prioritized for expansion as funding availability is present and increases the feasibility of completing these expansion projects. These areas have been determined by the FCC as high-need areas and are considered to be the most shovel-ready projects to initiate expansion efforts.

Expansion Barriers

The FCC recognizes the unique challenges presented to rural high-speed broadband access including a lack of competition by area providers, high costs and lower benefits in terms of the existing customer base, and a lack of existing infrastructure from which to connect and expand upon. The RDOF program was developed in the interest of combatting some of these barriers. However, there is still work to be done and other means of addressing these barriers, including: increasing opportunities to publicly bid expansion projects in the interest of diversifying the existing supplier pool, seeking other funding and financing opportunities geared towards supporting specific technology types, and adopting policies supportive of a more cost-effective and diverse market. More County specific recommendations will be discussed in Chapter 3 of this Plan.

Priority Expansion Areas

- 1. Dowling, MI:** The areas in and around Dowling are in need of expanded high-speed services as there has been an increase in the overall population over the last five years in Dowling and surrounding areas in Tract 107 and current services do not encapsulate some of the more densely populated areas in and around Dowling. Additionally, a lack of providers and varying technologies has also been a factor in the consideration of Dowling as a priority expansion area.
- 2. Freeport, MI:** The area both in and surrounding Freeport represent a gap in high-speed services. This is particularly true of Irving Township, which is located in a unique gap in

services between Freeport, Middleville, and Hastings. A slight increase in population and households are indicative of a need for increased speeds and service. As seen with other priority expansion areas, a lack of service provider options has further supported the Freeport area's identification as a priority expansion area. Its proximity to both Hastings and Middleville also present a unique opportunity to bridge the gap between the well served areas in Freeport and the more rural areas just outside of these cities.

- 3. Delton, MI:** Based on the analysis outlined above, Delton's increased population density and current lack of high-speed service are indicative of a significant need to improve services in this area. Furthermore, the lack of options of existing high-speed providers, where service is available, is of concern as a lack of competition between providers can lead to high costs and strained relationships between providers and customers, which is reflected in survey responses received for this area.
- 4. Woodland, MI:** The area in and to the west of Woodland currently lack high-speed service. The increase in population in the surrounding area point to a need for increased service. As previously highlighted in other priority expansion areas, a lack of provider options has also supported the identification of Woodland and the more rural areas to the west of Woodland as a priority expansion area. Moreover, its geographic proximity to Hastings has created an opportunity to more readily close a gap in services between the more well-served areas in Woodland and the well served areas of Hastings.

Priority Fiber Expansion Areas

In comparison to the rest of the State, only 1.25% of Barry County residents and businesses have access to high-speed fiber service, whereas the State average coverage is 19.76%. Many of the more rural counties (e.g., Barry, Allegan, Branch, Chippewa, etc.) exhibit the most significant disparities in terms of levels and speeds of service. Due to the County's desires to increase access to high-speed fiber service in particular, the following priority expansion areas were identified based on a review of the factors outlined previously.

- 1. Hastings, MI:** The area in and around Hastings has been identified as the most logical priority fiber expansion area. Hastings geographically speaking, is located more centrally to more densely populated areas indicating it would serve as a strategically located anchor to the County's forthcoming broadband network. Its geographic location in conjunction with a higher population density increases the feasibility of initiating the County's fiber network expansion efforts. A higher potential customer base may incentivize providers to more readily support initial implementation more readily. Limited Fiber technology already exists in Hastings further increasing the feasibility of implementation. Establishing this network more broadly would also support increased feasibility of expansion for other adjacent communities (e.g., Middleville, Irving, Yankee Springs, Dowling, Nashville, etc.).
- 2. Middleville, MI:** The area both in and around Middleville is a more logical secondary priority fiber expansion area again due to the slightly increased population density and its proximity to Hastings. Feasibility of such an expansion in Middleville would significantly increase should the possibility to connect to an existing network in Hastings be made available. Such a connection between the two communities would also support increased access to community members living in more rural areas between the two communities.

- 3. Delton, MI:** The area in and surrounding Delton provides the next most logical continuation point to expand the fiber broadband network to the southern portion of the County. From Delton, extending this network to other communities (e.g., Dowling, Hickory Corners, and other rural areas) becomes significantly more feasible.
- 4. Nashville, MI:** The area in and surrounding Nashville provides the next most logical continuation point to expand the fiber broadband network to the eastern portion of the County. From Nashville, extending this network to other communities (e.g., Woodland, and other rural areas) becomes significantly more feasible.

With the identification of priority expansion areas complete, the following chapter will detail more specific guidance for implementation. This will include more detailed recommendations to plan for and initiate expansion efforts as well as potential funding, financing, and partnership opportunities, which could be used to support implementation efforts.

Chapter 3: Recommendations

Based on the analysis detailed in **Chapter 2** of this Plan, several priority expansion areas have emerged. To further guide strategic expansion efforts, this chapter will provide an overview of different approaches to implementation, potential resources to initiate implementation, and will detail potential barriers to expansion efforts, which may require mitigation. These recommendations are intended to support the County in achieving the goals outlined within this Plan.

Expansion Strategies

Barry County has already initiated some efforts to improve and expand broadband services throughout the County. Prior to outlining recommendations for further expansion, it is important to consider and account for ongoing initiatives to avoid duplication of efforts.

Ongoing Efforts

As discussed in **Chapter 2**, Barry County has several active RDOF Phase I projects awarded to various area providers. More specifically, successful bidders with project areas in Barry County include:

- Barry Technology Services, LLC: Barry Technology Services was awarded a total of \$14,502.00 to improve broadband services in 26 locations across Michigan;
- MEI Telecom, Inc.: MEI was awarded a total of \$479,789.10 to improve broadband services in 175 locations across Michigan;
- Mercury Wireless, Inc.: Mercury Wireless was awarded a total of \$68,310,842.00 to improve broadband services in 167,684 locations across six states, including Michigan;
- National Rural Telecommunications Council (NRTC): NRTC was awarded a total of \$156,714,678.20 to improve broadband services in 125,335 locations across fourteen states, including Michigan;
- Windstream Services, LLC: Windstream Services was awarded a total of \$522,888,779.80 to improve broadband services in 192,567 locations across eighteen states, including Michigan.

Overall, the RDOF Program requires successful bidders to meet periodic buildout requirements and expand their reach to assigned locations by the end of the sixth year of the program, though bidders are encouraged to expand their reach as quickly as possible. An announcement released by the FCC on November 10th, 2021, indicated that less than 20% of awarded bids nation-wide have been deemed “ready-to-authorize” with even fewer deemed fully authorized. Of the successful awardees listed above, only Barry Technology Services, LLC has been deemed fully authorized, which may impact the rate of expansion of awarded RDOF projects in Barry County.

Furthermore, Barry County and the Great Lakes Electric Cooperative (GLE) partnered to submit an application for funding to the National Telecommunications Information Administration (NTIA) to deliver broadband to the townships of Barry, Carlton, Hastings, Hope, Irving, Johnstown, Orangeville, Rutland, Thornapple, and Yankee Springs. In total, \$16,961,332 was requested from the NTIA, which if awarded, would be matched with \$1,884,592 from GLE to extend fiber service to 3,072 residents and 227 businesses

across Barry County. This project is considered shovel ready and, contingent upon award, could begin as early as January 2022.

Approaches

Equipped with an understanding of the most severely underserved areas within Barry County, and ongoing efforts to expand services, it is clear there are areas in the County in need of increased service and increased access to high-speed services and fiber technologies. Though every community has the option to engage providers directly to expand services, this is often not feasible without additional funding or partners as the barriers of low population density and long distances remain an ongoing challenge.

Should the County proceed in taking the lead on expansion initiatives, there are several approaches that would support the County in achieving their goals of 100% availability of high-speed broadband services. These approaches include the following:

1. The County, as with any other community, may seek to self-fund the necessary infrastructure improvements required to extend service to all residents. Once this infrastructure is in place, the County may seek to partner with area service providers to operate the system. There is a significant cost burden associated with this approach and the financial return is uncertain due to a high number of variables to consider. For these reasons, this approach should be considered as a secondary option.
2. The County may also consider establishing partnerships with area service providers to seek grant funding, which may be used to initiate infrastructure improvements and expansions (e.g., as previously pursued through the latest NTIA application). One key factor to consider would be a combination of partnerships to ensure residents have access to a range of providers. This approach is highly recommended due to the recent increase in available funding (e.g., through the Infrastructure Investment and Jobs Act, FCC funding, etc.) and several other factors as outlined in subsequent sections of this chapter.

Policy and Program Considerations

Beyond installing the necessary infrastructure to further support increased broadband service, there are several ways in which policies may be modified or enacted to increase the likelihood of implementation at the County and local level. **Table 3.1** provides a list of several suggested policy and program considerations to encourage broadband expansion and potential resources to reference for further guidance. Furthermore, with increased access to information and transparency from local officials, garnering public support and increasing engagement efforts may further identify novel policy and program improvements.

Table 3.1 Policy and Program Considerations

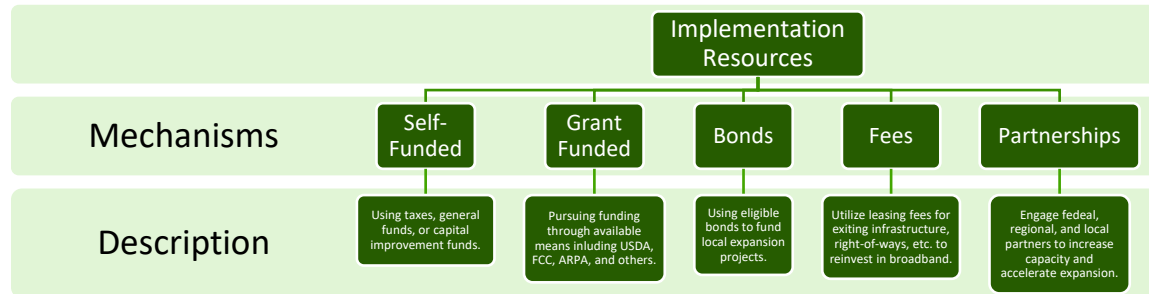
County and Local Governments		
<i>Consideration</i>	<i>Resources</i>	<i>Explanation</i>
Reduce permitting fees	FCC NTIA Connected Nation	Reducing permitting fees related to the installation of broadband infrastructure may support accelerated expansion by incentivizing providers.
Establish developer incentives	FCC NTIA Connected Nation	Incentivizing developers of forthcoming residential or commercial developments to install conduit or other broadband supportive infrastructure on their properties may also increase the feasibility and rate of expansion efforts.
Introduce demand-side incentives	FCC NTIA Connected Nation	Providing reduced fees or subsidizing service for health care providers, educational institutions, senior, and low-income community members may help to increase demand for high-speed service.
Reducing regulatory barriers and simplifying permitting requirements	FCC NTIA Connected Nation	The FCC considers reduction of regulatory barriers as a “cornerstone of the FCC’s strategy for bringing broadband to all Americans”. This can help to accelerate infrastructure investments. Examples include allowing access to existing utilities and rights-of-way.
Allocate portions of available funding for broadband infrastructure improvements	NTIA Connected Nation	Allocating portions of available funding to broadband expansion efforts at various stages (e.g., planning, engineering, construction) may be used as matching funds in some cases or show local support in support of applications for additional funding.
Continue to engage the community and increase opportunities for public participation	FCC NTIA Connected Nation	Engaging the public will help to ensure every home has access to high-speed and affordable broadband service and the opportunity to develop digital skills.

Implementation Guidance

As previously discussed in **Chapter 1**, rural communities face unique barriers to expanding and improving broadband services. For this reason, the approach of establishing various partnerships with area providers in the interest of seeking grant funding is recommended. The following section details the available funding, financing, and partnership opportunities available to Barry County in the interest of expanding

and improving upon broadband services. **Figure 3.1** shows an overview of available resources to support implementation efforts. These will be subsequently described in further detail.

Figure 3.1 Potential Implementation Resources



Sources: FCC, NTIA, SEDA-COG

Self-Funded

Allocating funds from the County or local government general funds or capital improvement funds is a viable means to fund infrastructure investments. Additionally, taxes from area businesses and residents may be used to initiate some of these projects. Due to the significant cost associated with expansion efforts and a potential for increased taxes through use of this method, it is not recommended this route be pursued, though it is a mechanism available to the County should it be deemed a necessary route to expansion.

Grant Funded

The American Rescue Plan Act, in conjunction with the recently approved Infrastructure Investment and Jobs Act, marks an historic investment in broadband infrastructure, which has released over \$75 billion in broadband deployment funding. These funds, in addition to other State and Federal grant programs, present a unique opportunity to pursue funding to implement expansion efforts. The following national and state programs may be considered to support implementation efforts:

Organization	Antero Group, LLC
Name	Antero Technical Assistance Grant (ATAG)
Due Date	Accepting applications on a rolling basis
Maximum Award	\$15,000*
Description	This Program is intended to provide qualifying communities with up to \$15,000 in technical assistance. The goal of this grant program is to provide professional services to local governments, nonprofits, tribes, and community organizations that are seeking to initiate, refine, or advance project ideas that contribute to more livable, resilient, and equitable communities. This program is intended to help communities and organizations prepare for a full-scale planning effort by helping selected applicants refine the vision and goals for a project, convene

	stakeholders, build capacity, clarify next steps, and equip them with resources that can be used for other funding sources and initiatives.
<i>*Funding is not directly awarded to successful recipients, rather this program offers \$15,000 in technical services.</i>	

Organization	Economic Development Administration (EDA)
Name	FY 2021 American Rescue Plan Act Economic Adjustment Assistance (ARPA)
Due Date	March 21, 2022
Maximum Award	\$5,000,000
Description	<p>Through this ARPA EAA NOFO, EDA aims to assist communities and regions impacted by the coronavirus pandemic, including historically underserved communities. The pandemic has caused, and continues to cause, economic injury to U.S. communities and regions in devastating and unprecedented ways.</p> <p>EDA’s ARPA EAA NOFO is designed to provide a wide range of financial assistance to communities and regions as they respond to, and recover from, the economic impacts of the coronavirus pandemic, including long-term recovery and resilience to future economic disasters. Under this announcement, EDA solicits applications under the authority of the Economic Adjustment Assistance (EAA) program, which is flexible and responsive to the economic development needs and priorities of local and regional stakeholders. This is the broadest NOFO EDA is publishing under ARPA and any eligible applicant from any EDA Region may apply. EDA expects to fund a number of projects under this NOFO that support communities negatively impacted by the downturn in the coal economy, supporting transitioning away from coal.</p>

Organization	Federal Communications Commission (FCC)
Name	The Emergency Broadband Benefit Program (EBB)
Due Date	Applications accepted on a rolling basis
Maximum Award	One monthly service discount and one device discount per household
Description	<p>The Emergency Broadband Benefit Program is an FCC program that provides a temporary discount on monthly broadband bills for qualifying low-income households. If a household is eligible, it can receive:</p> <ul style="list-style-type: none"> • Up to a \$50/month discount on broadband service and associated equipment rentals; • Up to a \$75/month discount if the household is on Tribal lands; or • A one-time discount of up to \$100 for a laptop, tablet, or desktop computer.

Organization	Federal Communications Commission (FCC)
Name	Universal Service Program for High-Cost Areas (USP)
Due Date	See details below
Maximum Award	See details below

Description	The federal universal service high-cost program (also known as the Connect America Fund) is designed to ensure that consumers in rural, insular, and high-cost areas have access to modern communications networks capable of providing voice and broadband service, both fixed and mobile, at rates that are reasonably comparable to those in urban areas. The program fulfills this universal service goal by all owing eligible carriers who serve these areas to recover some of their costs from the federal Universal Service Fund. This program encompasses the Connect America Fund, Rural Digital Opportunity Fund and the 5G Fund. These programs operate on a reverse auction process, which are open to service providers at varying periods of time.
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Organization	Michigan Economic Development Corporation
Name	Community Development Block Grant (CDBG)
Due Date	The FY 2022 Notice of Funding Opportunity has not yet been announced
Maximum Award	Michigan’s allocation for funding has not yet been announced
Description	The Community Development Block Grant (CDBG) Program provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons. Broadband efforts have recently been included as an allowable activity with a maximum allocation of \$2,000,000 per project.

Organization	National Science Foundation
Name	Project OVERCOME (OVERCOME)
Due Date	TBD
Maximum Award	\$300,000 in grants or \$1.5 million in loans
Description	At least 17 million U.S. residents lack the basic Internet access necessary for remote work, online learning, and telemedicine. While ensuring greater connectivity has always been important, the devastating effects of the COVID-19 pandemic have turned a desire to deliver broadband to everyone into a critical priority for the nation. The goal of Project OVERCOME is to select, launch, and oversee multiple proof-of-concept efforts to deploy novel broadband technology solutions to both rural and urban underserved communities.

Organization	United States Department of Agriculture (USDA)
Name	Community Facilities (CF) Direct Loan and Grant Program
Due Date	Applications accepted on a rolling basis
Maximum Award	Total budget: \$2,800,000,000 Direct Loan; \$43,000,000 Grant
Description	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that

	provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings.
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Organization	United States Department of Agriculture (USDA)
Name	<u>Learning and Telemedicine (DLT) Grant Program</u>
Due Date	60-day application window expected, start date is TBD
Maximum Award	Total appropriations amount is \$57,000,000
Description	The Distance Learning and Telemedicine program helps rural communities use the unique capabilities of telecommunications to connect to each other and to the world, overcoming the effects of remoteness and low population density.

Organization	United States Department of Agriculture (USDA)
Name	<u>Rural Business Development Grant Program (RBDG)</u>
Due Date	Dates have not been announced for 2022
Maximum Award	Anticipated program allocation of \$41,000,000
Description	The Rural Business Development Grant program provides funding designed to support targeted technical assistance, training, and other activities leading to the development or expansion of small and emerging private businesses in rural areas that have fewer than 50 new employees and less than \$1 million in gross revenues. Programmatic activities are separated into enterprise or opportunity type grant activities.

Organization	United States Department of Agriculture (USDA)
Name	<u>Rural Economic Development Loan & Grant Program in Michigan</u>
Due Date	March 31, 2022 and June 30, 2022
Maximum Award	\$300,000 in grants or \$1.5 million in loans
Description	<p>The Rural Economic Development Loan and Grant program provides funding for rural projects through local utility organizations. USDA provides zero-interest loans to local utilities which they, in turn, pass through to local businesses (ultimate recipients) for projects that will create and retain employment in rural areas. The ultimate recipients repay the lending utility directly. The utility then is responsible for repayment to USDA.</p> <p>USDA provides grants to local utility organizations, which use the funding to establish Revolving Loan Funds (RLF). Loans are made from the revolving loan funds to projects that will create or retain rural jobs. When the revolving loan fund is terminated, the grant is repaid to USDA.</p>

Organization	United States Department of Agriculture (USDA)
Name	<u>Rural eConnectivity Program Department of Agriculture Rural Utilities Service (ReConnect)</u>
Due Date	February 22, 2022
Maximum Award	One monthly service discount and one device discount per household
Description	<p>The Rural eConnectivity Program (ReConnect) Program provides loans, grants, and loan/grant combinations to facilitate broadband deployment in rural areas. In facilitating the expansion of broadband services and infrastructure, the program will fuel long-term economic development and opportunities in rural America. The Agency encourages applicants to consider projects that will advance the following key priorities:</p> <ul style="list-style-type: none"> • Assisting Rural communities recover economically from the impacts of the COVID-19 pandemic, particularly disadvantaged communities. • Ensuring all rural residents have equitable access to Rural Development programs and benefits from Rural Development funded projects. • Reducing climate pollution and increasing resilience to the impacts of climate change through economic support to rural communities.

Organization	United States Department of Agriculture (USDA)
Name	<u>Telecommunications Infrastructure Loans and Loan Guarantees (TIL)</u>
Due Date	Applications are accepted on a rolling basis
Maximum Award	Not applicable, see description below
Description	This program provides financing for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas. Most entities that provide telecommunications in qualified rural areas may apply. Funds may be used to finance broadband capable telecommunications service improvements, expansions, construction, acquisitions, refinancing, and more.

Organization	U.S. Department of Housing and Urban Development (HUD)
Name	<u>Choice Neighborhoods Implementation Grant (CN)</u>
Due Date	February 15, 2022
Maximum Award	\$50 million
Description	Choice Neighborhoods leverages significant public and private resources, enabling communities to transform disinvested neighborhoods that include distressed public housing and/or HUD assisted housing. Local leaders, residents, and stakeholders. As part of this neighborhood revitalization, Choice Neighborhoods strongly encourages grantees to increase broadband connectivity. Grantees are required to build the infrastructure to support

broadband internet in all new units. Grantees can also use their funds to install broadband in these units and establish neighborhood broadband programs.

In addition to the funding resources outlined above, the Biden administration signed a \$1 trillion infrastructure bill into law on November 15, 2021. There is limited information available about the specifics of how this funding will be disseminated into new and existing programs; however, \$65 billion of this funding has been allocated to broadband expansion efforts. It has been indicated that there will be a major emphasis on “future-proof” technologies, which is indicative of a heavy investment in fiber. Additionally, there is an emphasis on underserved areas both in terms of a lack of access to high-speed services and rural areas without existing services. Finally, it has been indicated that \$14.2 billion of this funding will be used to improve the affordability of services under the Affordable Connectivity Program.

Bonds

Municipal bonds are often pursued to initiate a range of infrastructure and other projects by state, county, and local governments. There are two primary types of municipal bonds, which the County or local municipalities may wish to consider including:

1. **General Obligation Bonds:** These funds are often used by local and county governments to fund a range of capital and other projects. These bonds are backed by “good faith and credit” of the local or regional government and does not consider potential revenue generated by the project. General obligation bonds do, however, obligate the local or county government as well as the taxpayers directly, which may lead to increased taxes.
2. **Revenue Bonds:** These funds are also often used by local and county governments; however, they require an expectation of revenue generated, though there is no obligation should financial targets not be met. Pursuing revenue bonds in the interest of expanding broadband services can be difficult due to a need to provide a history of past performance and a need to make the case to investors that a significant return on investment would be anticipated. This route to expansion has seen increased use in recent years, though there is little information available about the rate of success associated with such an approach.

Fees

Various fees may provide a stream of income to local and county offices, which may be used to provide continued investment into the broadband infrastructure network. This mechanism provides an ongoing source of income and may include any combination of the following fees:

- **Connection Fees:** Municipalities may explore a one-time-only connection fee, which would be requested of residents and businesses when fiber infrastructure is directly connected to new homes and businesses. Collecting such a fee may increase the feasibility of installation as this offsets the cost of the necessary personnel, equipment, and other resources to complete installation and activation.
- **Pass By Fees:** As new infrastructure is being installed, a pass by fee could be considered, similar to the pass by fees charged during the installation of new water or sewer mains. It is generally

understood that increased access to utilities increases property values, which is the basis for assessing such a fee.

- **Utility and Right-of-Way Leases:** Leasing access to existing infrastructure or granting paid access to the public right-of-way may provide a means for expansion while also bringing in passive revenue to reinvest into future expansion efforts.

Partnerships

The following partners may support an increased rate of expansion and help in identifying new policies and programs to create a supportive environment for broadband infrastructure efforts:

Area Providers: Area providers will remain valuable partners in the pursuit of extending and improving broadband services throughout the County. They offer the technical expertise to directly support implementation of new infrastructure and distribution of services. A range of providers should be engaged to ensure residents have access to a variety of service options.

Connected Nation: Connected Nation develops and provides the tools, resources, and methods that help states and communities create and implement solutions to their broadband and digital technology gaps. They assess plans for expansion and empower people with the technology, skills, and resources to improve their quality of life. They also support the development of public-private partnerships to bring technology access to targeted geographies and populations.

Connecting Michigan Taskforce (CMIT) / Michigan Economic Development Corporation (MEDC): Funded through the State of Michigan's Community Development Block Grant (CDBG) program as a technical assistance grant, MEDC and CNMI have formed the Connecting Michigan Taskforce (CMIT) and are working with a number of other state agencies and private sector partners to increased broadband access and adoption across the state.

Federal Communications Commission (FCC): The FCC regulates interstate and international communications through cable, radio, television, satellite, and wire. The goal of the Commission is to promote connectivity and ensure a robust and competitive market.

Great Lakes Energy Cooperative (GLE): GLE is the largest member-owned Cooperative in Michigan. Annual margins are eventually returned to member-owners in the form of capital credit refunds. Great Lakes Energy also offers services through True Stream.

National Telecommunications and Information Administration (NTIA): Located within the Department of Commerce, the NTIA is an Executive Branch agency that is principally responsible by law for advising the President on telecommunications and information policy issues.

Residents and Businesses: Engaging area residents and businesses offers an opportunity to provide educational benefits, garner community support, and ultimately increase the rate of expansion. This engagement also offers an opportunity to discuss new ideas for policies and programs, which could also support a more rapid implementation.

Table 3.2 below provides more specific implementation guidance based on the typical lifecycle of a single fiber broadband expansion project at the municipal level. This table is intended to function as a standalone resource that should be regularly referenced throughout expansion efforts to ensure project team members have ready access to available funding resources, potential project partners, and other key reference information as needed.

Table 3.2 Implementation Matrix

		Year 1				Year 2				Year 3				Year 4			
Task		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Planning	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ATAG, ARPA, EBB*, RBDG, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, GLE, NTIA, residents and businesses															
Due Diligence, Permitting	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, GLE, NTIA															
Procurement	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, NTIA															
Material Fabrication	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, TIL, CN, Bonds, Fees															
	<i>Partners</i>	Area providers															
Phase I	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, TIL, CN, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, GLE, NTIA, residents and businesses															
Install Backbone																	
40% Distribution Buildout																	
Install Network Equipment																	
Marketing and Pre-Sales																	
Roll-Out for Phase I Clients																	
Phase II	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, TIL, CN, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, GLE, NTIA, residents and businesses															
Complete Buildout																	
Marketing and Pre-Sales																	
Roll-Out for Phase II Clients																	
Project Closeout	<i>Timeline</i>																
	<i>Resources</i>	Self-Funding, ARPA, USP, CDBG, OVERCOME, CF, DLT, ReConnect, TIL, CN, Bonds, Fees															
	<i>Partners</i>	Area providers, Connected Nation, CMIT, FCC, GLE, NTIA, residents and businesses															

*EBB may be useful in terms of promoting new services, increasing the potential pool of customers, and increasing the affordability of increased or new services.

Sources: Lucas Broadband Project, Citizen's Coop,

In general, these resources may be used beyond the installation of fiber infrastructure at similar stages in the process (e.g., planning, due diligence, construction, etc.); however, due to the County's desire to expand fiber services, this specific type of project timeline was used for reference. It should be noted that deployment timelines may differ contingent upon the type of technology utilized to deliver services. To further support implementation efforts, a cost estimation tool created by Broadband USA in partnership with NTIA and the US Department of Commerce has been included in **Appendix C** and an example broadband expansion RFP template has been included in **Appendix D**. It should be noted that material pricing is rapidly changing, and the cost estimation tool should be used for preliminary planning purposes.

The following chapter will provide a summary of key points within this Plan. This will include revisiting the Plan goals established during this Project, key findings of the analysis completed in **Chapter 2**, priority expansion areas identified, and will briefly revisit the available implementation resources.

Chapter 4: Conclusion

Throughout the course of this Project, it has become clear that there are a number of areas within Barry County in critical need of improved broadband access. Many areas still do not have access to high-speed services, and some do not have access to services at all. This is particularly true of the four census tracts to the south of the County (105, 106, 107, 108). As previously stated, the County certainly has the option to engage providers to expand or improve services on their own accord or through the RDOF program, however, this will likely not prove a viable solution to achieving the County's goals. Furthermore, this approach would take at a minimum over six years as RDOF programs are implemented, which would only cover the portions of the county exhibited in **Figure 2.9**.

Following this realization, **Chapter 3** outlines more specific guidance on other potential approaches and resources, which may support the County in achieving its goals. Many of these approaches allow room for the County to take a leading role in the process. This helps to ensure that a variety of technologies and providers could be explored, which was indicated as an important consideration to residents and businesses as evidenced in the survey responses received during the course of this Project.

For ease of reference, the County's vision statement and goals have been restated as follows.

Vision

Within the next 10 years, Barry County residents, institutions, businesses, and visitors alike will have access to affordable, reliable, and high-speed broadband services. Additionally, at least 75% of residents will have access to fiber services.

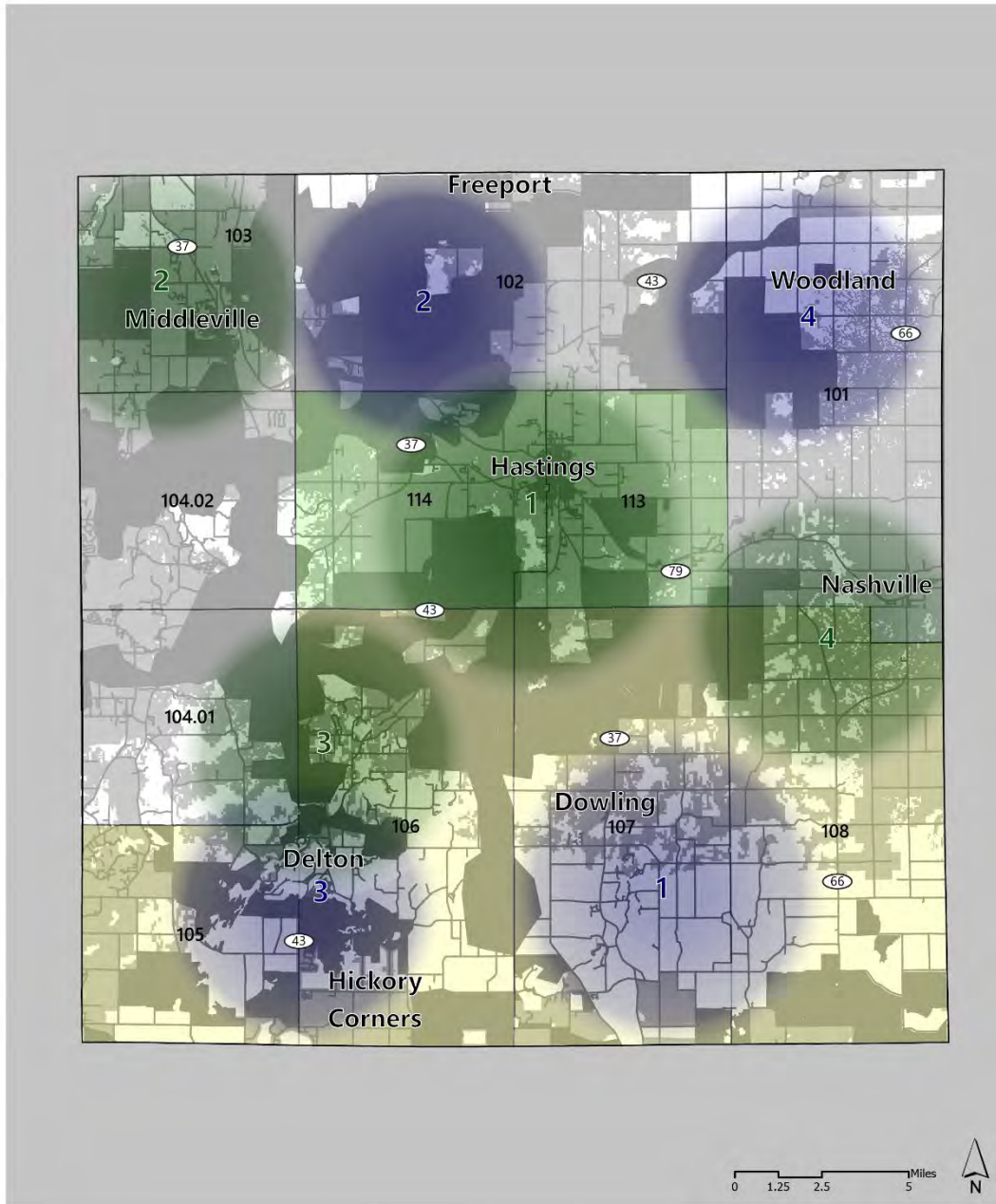
Goals

1. Extend broadband service with download speeds of at least 25 Mbps and upload speeds of at least 3 Mbps to all county households and businesses by the year 2025.
2. Increase broadband service with download speeds of 100 Mbps and upload speeds of 10 Mbps for high priority institutions (e.g., public services, educational institutions, etc.) within the County by 2027.
3. Increase broadband service with download speeds of at least 100 Mbps and upload speeds of 10 Mbps for all county residents and businesses and increase broadband service with download speeds of 1,000 Mbps and upload speeds of 100 Mbps for high priority institutions by the year 2030.

Two categories of priority expansion areas were identified. The first category includes communities with a general need for increased access and increased speeds without strong consideration for any given type of technology. The second category includes communities with an increased feasibility for fiber expansion. Fiber was deemed a significant interest of the County and certain communities are more well-equipped to serve as the starting point for expanding fiber services to, ultimately, all of Barry County residents. These areas differentiate slightly due to the proximity of certain communities to existing fiber technologies, to

other communities, and due to increased population density. These areas are shown in **Figure 4.1** and listed in **Table 4.1**.

Figure 4.1 Priority Expansion Areas



Barry County Priority Expansion Areas

- Less Than 50% High-Speed Access
- Over 50% High-Speed Access
- Over 90% High-Speed Access
- High-Speed Coverage
- Priority Expansion Areas
- Priority Fiber Expansion Areas
- Planned and Proposed Services



Table 4.1 Priority Expansion Areas

Priority Expansion Areas	Priority Fiber Expansion Areas
1. Dowling	1. Hastings
2. Freeport	2. Middleville
3. Delton	3. Delton
4. Woodland	4. Nashville

By pursuing the implementation of more discrete projects and using a variety of funding sources and program and partnerships, the County will position themselves well to incrementally and strategically establish a high-speed broadband network with accessible services for all County residents. This approach is generally considered more feasible as funding and capacity are less limited to a single source, which creates an opportunity for several projects to proceed simultaneously. Additionally, should one project be initiated, this can often increase the likelihood of receiving additional funds to initiate nearby projects in the interest of maximizing the benefits of the project already underway.

Once the County has identified priority projects to initiate expansion efforts, the following next steps may be considered to initiate the process to seek funding and advance projects through the construction phase. These generalized project next steps include:

1. Engage necessary stakeholders and review Plan goals and priority expansion areas.
2. Identify specific projects and set targeted project and funding goals.
3. Identify corresponding funding resources to pursue in the interest of initiating each project.
4. Select the necessary project team members (e.g., community task force, providers, etc.).
5. Initiate applications for funding or protocols to access other funding resources.
6. Review unsuccessful applications with regulatory agencies or initiate project work in accordance with necessary procurement and reporting requirements.
7. Review completed projects with the project team, discuss metrics to measure short- and long-term success (e.g., new customers, current average speeds, etc.), and discuss opportunities to further expand or improve services within adjacent areas.

Utilizing the resources and recommendations outlined within this Plan, Barry County is equipped with the necessary tools to advance Plan goals and initiate expanding high-speed broadband services to all County residents over the next ten years.

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Appendices

Appendix A: Internet Assessment Surveys

Internet Assessment Survey for Homes

INTERNET ASSESSMENT SURVEY FOR HOMES

Barry County Chamber of Commerce & Economic Development, in partnership with Antero Group, is conducting a survey to gather information on internet connectivity for homes in Barry County, MI. The gathered information will be used to determine the demand for internet services and support efforts to address gaps in services throughout **Barry County, MI**. Your feedback is very important to us!

Please limit yourself to one survey response per household. Your answers will be kept private, so please answer honestly. Thank you in advance for your input!

1. Where is your home located? (check only one)

- In a city or town In a rural area Not sure

2. What is the address of the home for which you are taking this survey?

Street address 1: _____

Street address 2: _____

City: _____

Zip Code: _____

3. How many people does your household have?

No. of People: _____

4. Which household income category best describes your household? (check only one)

- Less than \$10,000 \$20,000 - \$34,999 \$50,000 - \$74,999
 \$10,000 - \$19,999 \$35,000 - \$49,999 \$75,000 or more

I prefer not to answer this question

5. If your household works from home, how many people and how many days does each person work from home on average per week?

No. of people: _____ No. of Days: _____

No one in my household works from home

6. Do you have an internet service subscription to your home? (check only one)

Yes No (skip to question 12) Not sure

7. What is the primary type of internet used at your home? (check only one)

Fiber DSL Dial-up
 Cable Modem Fixed Wireless
 Cellular Data Satellite
 None Not sure

8. Which company provides your home internet service? (check only one)

Truestream Martell Cable Services, Inc
 WOW! MEI
 AT&T Michigan Spectrum
 Barry County Telephone Company Surf Broadband
 HomeWorks Connect Xfinity
 None Not sure

Other (please describe) _____

9. How much does your current home internet service cost per month? (check only one)

\$0.00-\$25.00 \$50.01-\$75.00 \$100.00+
 \$25.01-\$50.00 \$75.01-\$100.00
 None Not sure

10. When does your current home internet service contract end?

Date (mm/dd/yyyy): _____

- No end date Not sure

11. Are you satisfied with your primary internet service? (check only one)

- Yes No Not sure

12. If a new or alternative high-speed internet service were available to your home, would you be interested in purchasing it? (check only one)

(The average price for high speed is approximately \$45 per month; according to Federal Communications Commission, to be considered as high-speed internet, the download speed and the upload speed should be at least 25 Mbps and 3 Mbps, respectively.)

- Yes (skip to question 14) No Not sure

13. If not interested in purchasing a new, high, or higher speed internet service for your home, what might be the primary reasons? (check all that apply)

- My current internet access meets my needs
- My current internet access is my only option
- High-speed internet costs too much for me

- I do not use a computer
- I do not pay for my internet

- Other (please describe) _____

14. How important is fast, affordable, and reliable internet service in your area as it relates to the following community considerations? (check one for each attribute)

	Very important	Somewhat important	Not important
Education (for all ages)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development and jobs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remote work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. When considering an internet service provider, how important are the following characteristics of that provider? (check one for each attribute)

	Very important	Somewhat important	Not important
Locally owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Great customer service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Involved with the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Best available technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Please take the internet speed test at the University of Michigan’s official speed test website at <http://speedtest.it.umich.edu/> and let us know the results below. This will help us determine the speeds at your location.

(If taking the internet speed test on a phone, please connect the phone to Wi-Fi instead of a cellular network. Please enter 0 if you require a hotspot or do not have internet access in your home.)

Ping (ms): _____

Jitter (ms): _____

Download (Mbps): _____

Upload (Mbps): _____

17. Please provide your contact information and check the boxes that apply below if you are willing to share this information.

First Name: _____

Last Name: _____

Email: _____

Phone: _____

- I would like to receive additional information and updates about this project.
- I would be willing to sign a letter of intent to purchase a new service or a petition in support of grant funding to bring high-speed internet to my community.
- I would like my contact information shared with internet service providers interested in increasing service in the area.

Note: This question is optional. We will only use this information for the purposes you selected. This information will allow the project team and the internet service providers to better understand the demand for the internet and make an investment case.

Please feel free to share additional comments on your home and your community internet service below.

Once complete, this survey may be submitted in the following ways:

- 1) Online at <https://www.surveymonkey.com/r/barry-county-internet-survey-for-homes>
- 2) Mailing completed surveys to Antero Group at 1212 N Ashland Ave, Chicago, IL 60622
- 3) Scanning and emailing completed surveys to Antero Group at anterogroup1212@gmail.com

Please submit this survey by 10/30/21. If you have any questions about the survey or Antero Group, please feel free to get in touch with us at anterogroup1212@gmail.com. Thank you again for your support!

INTERNET ASSESSMENT SURVEY FOR BUSINESSES

Barry County Chamber of Commerce & Economic Development, in partnership with Antero Group, is conducting a survey to gather information on internet connectivity for businesses in **Barry County, MI**. The gathered information will be used to determine the demand for internet services and support efforts to address gaps in services throughout Barry County. Your feedback is very important to us!

Please limit yourself to one survey response per business. Your answers will be kept private, so please answer honestly. Thank you in advance for your input!

1. Where is your business located? (check only one)

- In a city or town In a rural area Not sure

2. What is the address of the business for which you are taking this survey?

Street address 1: _____

Street address 2: _____

City: _____

Zip Code: _____

3. Where is your business based? (check only one)

- In a commercial property or storefront In my home
- Other (please describe) _____

4. If your business operated from home, how many days per week do you work from home?

No. of Days: _____

- I do not operate my business from home

5. What business/industry category best describes your business? (check only one)

- Agriculture, Forestry, Fishing and Hunting
- Mining
- Utilities
- Construction
- Manufacturing
- Wholesale Trade
- Retail Trade
- Transportation and Warehousing
- Information
- Finance and Insurance
- Real Estate Rental and Leasing
- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administrative and Support and Waste Management and Remediation Services
- Educational Services
- Health Care and Social Assistance
- Arts, Entertainment, and Recreation
- Accommodation and Food Services
- Other Services (except Public Administration)
- Public Administration

- Unclassified/Other (please describe) _____

6. How many employees (full-time and part-time) does your business have? (check only one)

- 1-5
- 6-15
- 16-50
- 51-100
- 101-500
- 500+

- Not sure

7. What is the primary type of internet used at this business location? (check only one)

- Fiber

- Cable Modem
- Cellular Data

- None

- DSL
- Fixed Wireless

- Not sure

- Satellite
- Dial-up

8. Which company provides your business internet service? (check only one)

- | | |
|---|--|
| <input type="checkbox"/> Truestream | <input type="checkbox"/> Martell Cable Services, Inc |
| <input type="checkbox"/> WOW! | <input type="checkbox"/> MEI |
| <input type="checkbox"/> AT&T Michigan | <input type="checkbox"/> Spectrum |
| <input type="checkbox"/> Barry County Telephone Company | <input type="checkbox"/> Surf Broadband |
| <input type="checkbox"/> HomeWorks Connect | <input type="checkbox"/> Xfinity |
| <input type="checkbox"/> None | <input type="checkbox"/> Not sure |
| <input type="checkbox"/> Other (please describe) _____ | |

9. How much does your current business internet service cost per month? (check only one)

- | | | |
|---|--|------------------------------------|
| <input type="checkbox"/> \$0.00-\$50.00 | <input type="checkbox"/> \$100.01-\$150.00 | <input type="checkbox"/> \$200.00+ |
| <input type="checkbox"/> \$50.01-\$100.00 | <input type="checkbox"/> \$150.01-\$200.00 | |
| <input type="checkbox"/> None | <input type="checkbox"/> Not sure | |

10. Are you and your employees satisfied with your primary internet service? (check only one)

- | | | |
|------------------------------|-----------------------------|-----------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
|------------------------------|-----------------------------|-----------------------------------|

11. If a new or alternative high-speed internet service were available to your business, would you be interested in purchasing it? (check only one)

(According to Federal Communications Commission, to be considered as high-speed internet, the download speed and the upload speed should be at least 25 Mbps and 3 Mbps, respectively.)

- | | | |
|--|-----------------------------|-----------------------------------|
| <input type="checkbox"/> Yes (skip to question 13) | <input type="checkbox"/> No | <input type="checkbox"/> Not sure |
|--|-----------------------------|-----------------------------------|

12. If not interested in purchasing a new, high, or higher speed internet service for your business, what might be the primary reasons? (check all that apply)

- My current business internet access meets our needs
- My current business internet access is the only option
- High-speed internet costs too much for my business
- My business does not need a computer
- Other (please describe) _____

13. How important is fast, affordable, and reliable internet service in your area as it relates to the following community considerations? (check one for each attribute)

	Very important	Somewhat important	Not important
Education (for all ages)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development and jobs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remote work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. When considering an internet service provider, how important are the following characteristics of that provider? (check one for each attribute)

	Very important	Somewhat important	Not important
Locally owned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Great customer service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Involved with the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Best available technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Please take the internet speed test at the University of Michigan’s official speed test website at <http://speedtest.it.umich.edu/> and let us know the results below. This will help us determine the speeds at your location.

(If taking the internet speed test on a phone, please connect the phone to Wi-Fi instead of a cellular network. Please enter 0 if you require a hotspot or do not have internet access in your location.)

Ping (ms): _____ Jitter (ms): _____

Download (Mbps): _____ Upload (Mbps): _____

16. Please provide your contact information and check the boxes that apply below if you are willing to share this information.

First Name: _____ Last Name: _____

Business Title: _____

Business Name: _____

Email: _____

Phone: _____

- I would like to receive additional information and updates about this project.
- I would be willing to sign a letter of intent to purchase a new service or a petition in support of grant funding to bring high-speed internet to my community.
- I would like my contact information shared with internet service providers interested in increasing service in the area.

Note: This question is optional. We will only use this information for the purposes you selected. This information will allow the project team and the internet service providers to better understand the demand for the internet and make an investment case.

Please feel free to share additional comments on your business and your community internet service below.

Once complete, this survey may be submitted in the following ways:

- 1) Online at <https://www.surveymonkey.com/r/barry-county-internet-survey-for-businesses>
- 2) Mailing completed surveys to Antero Group at 1212 N Ashland Ave, Chicago, IL 60622
- 3) Scanning and emailing completed surveys to Antero Group at anterogroup1212@gmail.com

Please submit this survey by 10/30/21. If you have any questions about the survey or Antero Group, please feel free to get in touch with us at anterogroup1212@gmail.com. Thank you again for your support!

INTERNET ASSESSMENT SURVEY FOR HOMES

Barry County Chamber of Commerce & Economic Development, in partnership with Antero Group, is conducting a survey to gather information on internet connectivity for homes in Barry County, MI. The gathered information will be used to determine the demand for internet services and support efforts to address gaps in services throughout **Barry County, MI**. Your feedback is very important to us!

Please limit yourself to one survey response per household. Your answers will be kept private, so please answer honestly. Thank you in advance for your input!

1. What is the address of the home for which you are taking this survey?

Street address 1: _____

Street address 2: _____

City: _____

Zip Code: _____

2. If your household works from home, how many people and how many days does each person work from home on average per week?

No. of people: _____ No. of Days: _____

No one in my household works from home

3. What is the primary type of internet used at your home? (check only one)

Fiber

DSL

Dial-up

Cable Modem

Fixed Wireless

Cellular Data

Satellite

None

Not sure

4. Which company provides your home internet service? (check only one)

- | | |
|---|--|
| <input type="checkbox"/> Truestream | <input type="checkbox"/> Martell Cable Services, Inc |
| <input type="checkbox"/> WOW! | <input type="checkbox"/> MEI |
| <input type="checkbox"/> AT&T Michigan | <input type="checkbox"/> Spectrum |
| <input type="checkbox"/> Barry County Telephone Company | <input type="checkbox"/> Surf Broadband |
| <input type="checkbox"/> HomeWorks Connect | <input type="checkbox"/> Xfinity |
| <input type="checkbox"/> None | <input type="checkbox"/> Not sure |

Other (please describe) _____

5. How much does your current home internet service cost per month? (check only one)

- | | | |
|--|---|------------------------------------|
| <input type="checkbox"/> \$0.00-\$25.00 | <input type="checkbox"/> \$50.01-\$75.00 | <input type="checkbox"/> \$100.00+ |
| <input type="checkbox"/> \$25.01-\$50.00 | <input type="checkbox"/> \$75.01-\$100.00 | |
| <input type="checkbox"/> None | <input type="checkbox"/> Not sure | |

6. If a new or alternative high-speed internet service were available to your home, would you be interested in purchasing it? (check only one)

(The average price for high speed is approximately \$45 per month; according to Federal Communications Commission, to be considered as high-speed internet, the download speed and the upload speed should be at least 25 Mbps and 3 Mbps, respectively.)

- Yes (skip to question 14) No Not sure

7. Please take the internet speed test at the University of Michigan's official speed test website at <http://speedtest.it.umich.edu/> and let us know the results below. This will help us determine the speeds at your location.

(If taking the internet speed test on a phone, please connect the phone to Wi-Fi instead of a cellular network. Please enter 0 if you require a hotspot or do not have internet access in your home.)

Ping (ms): _____ Jitter (ms): _____

Download (Mbps): _____ Upload (Mbps): _____

8. Please provide your contact information and check the boxes that apply below if you are willing to share this information.

First Name: _____ Last Name: _____

Email: _____ Phone: _____

- I would like to receive additional information and updates about this project.
- I would be willing to sign a letter of intent to purchase a new service or a petition in support of grant funding to bring high-speed internet to my community.
- I would like my contact information shared with internet service providers interested in increasing service in the area.

Note: This question is optional. We will only use this information for the purposes you selected. This information will allow the project team and the internet service providers to better understand the demand for the internet and make an investment case.

Please feel free to share additional comments on your home and your community internet service below.

Once complete, this survey may be submitted in the following ways:

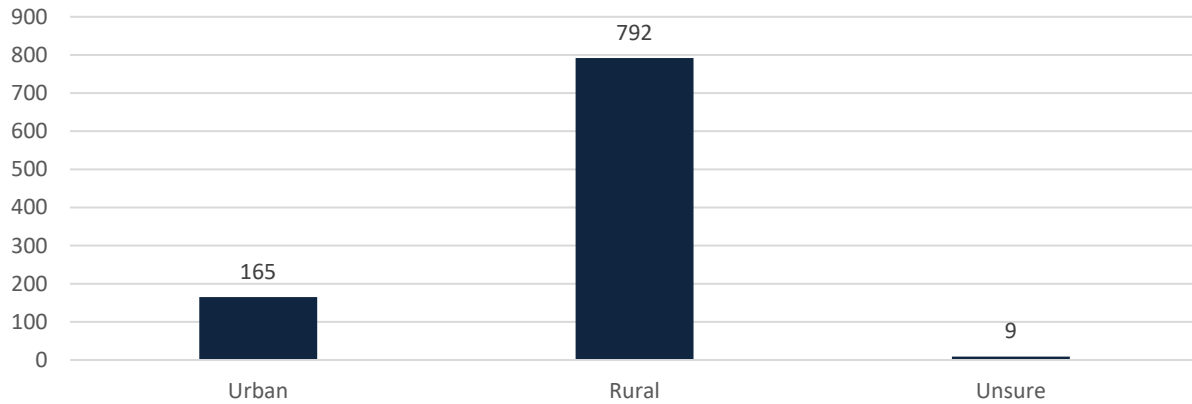
- 4) Online at <https://www.surveymonkey.com/r/barry-county-internet-survey-for-homes>
- 5) Mailing completed surveys to Antero Group at 1212 N Ashland Ave, Chicago, IL 60622
- 6) Scanning and emailing completed surveys to Antero Group at anterogroup1212@gmail.com

Please submit this survey by 10/30/21. If you have any questions about the survey or Antero Group, please feel free to get in touch with us at anterogroup1212@gmail.com. Thank you again for your support!

Appendix B. Survey Response Summary

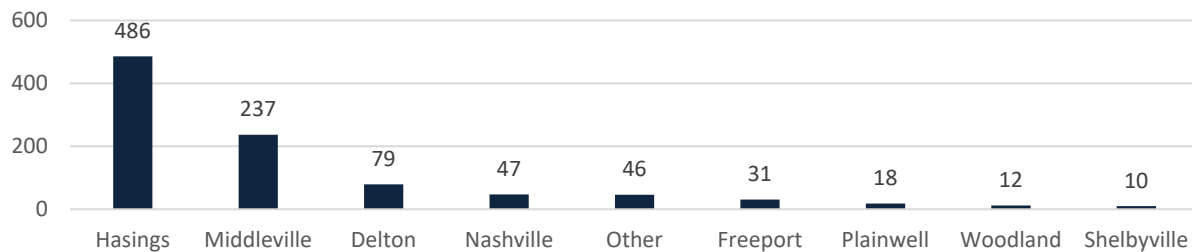
Home Survey Response Summary

Q1. Where is your home located?



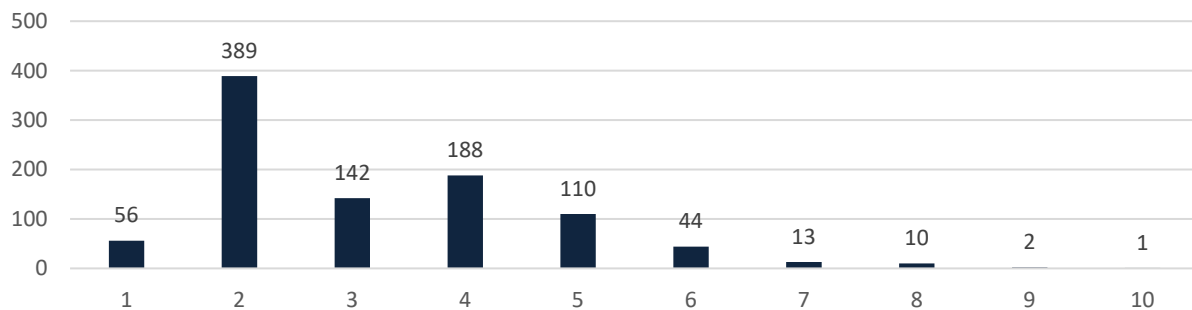
Q2. What is the address of the home for which you are taking this survey?

To protect the privacy of survey respondents only the distribution of respondent's cities will be included. Further, any city with a total response count less than 10 will be included in the "Other" category. These include Battle Creek, Bellevue, Brighton, Caledonia, Dowling, Hickory Corners, Irving Township, Lake Odessa, Rutland Township, Thornapple, Vermontville, and Wayland.

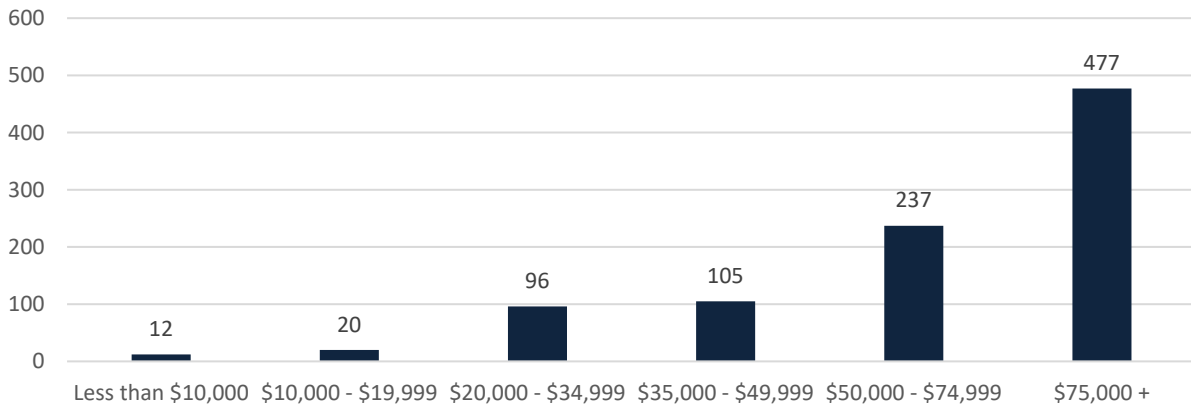


Q3. How many people does your household have?

On the median household size of respondents was 3.2 persons per household.



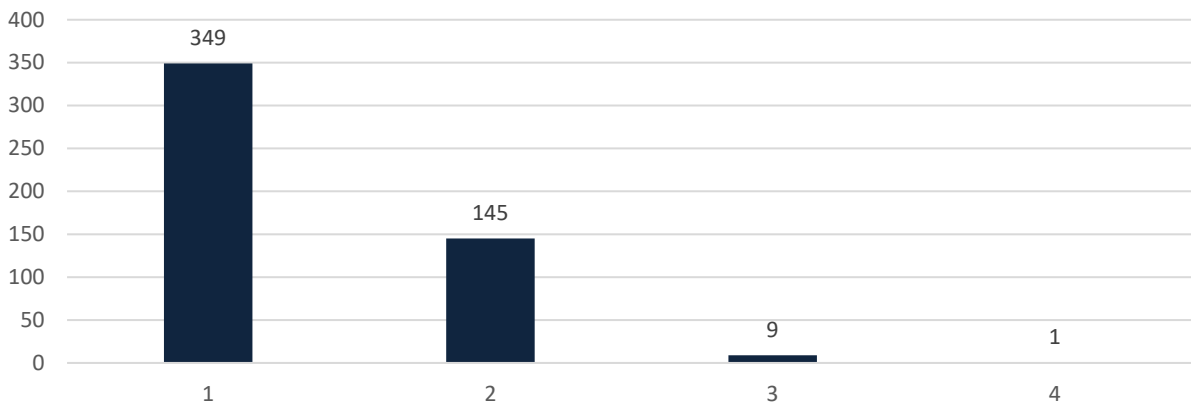
Q4. Which household income category best describes your household?



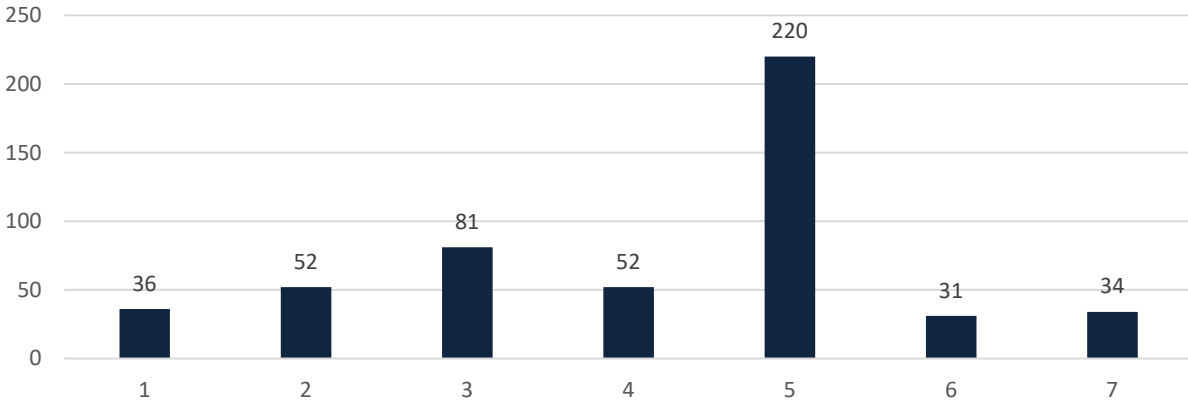
Q5. Does anyone in your household work from home?



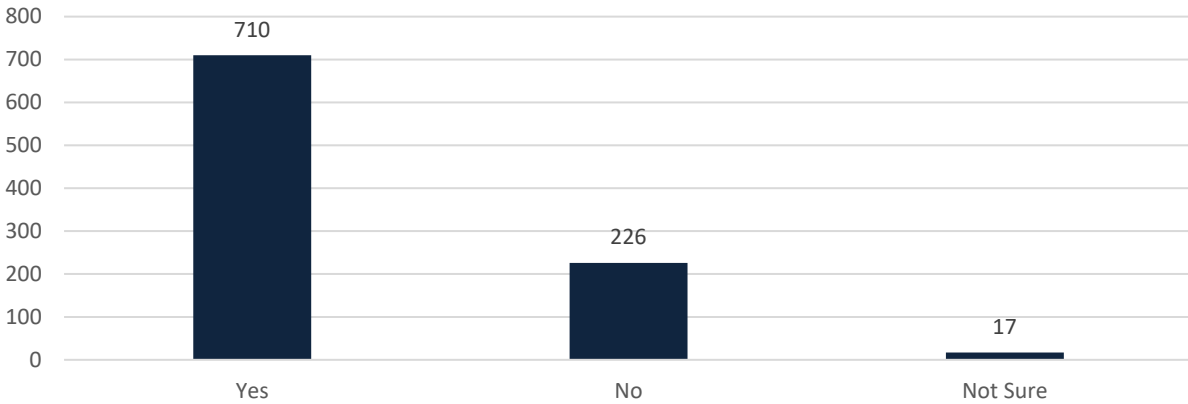
Q6. How many people work from home in your household?



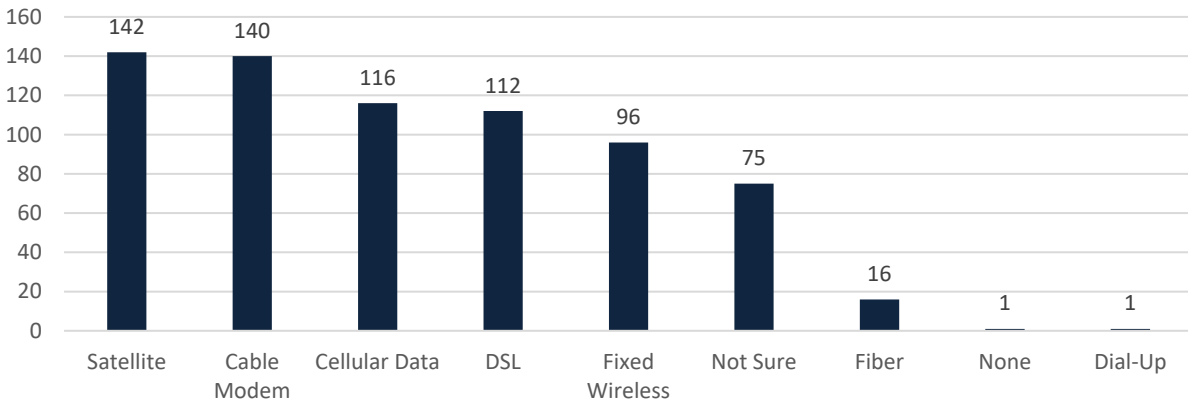
Q7. How many days does each person work from home on average per week?



Q8. Do you have an internet service subscription to your home?



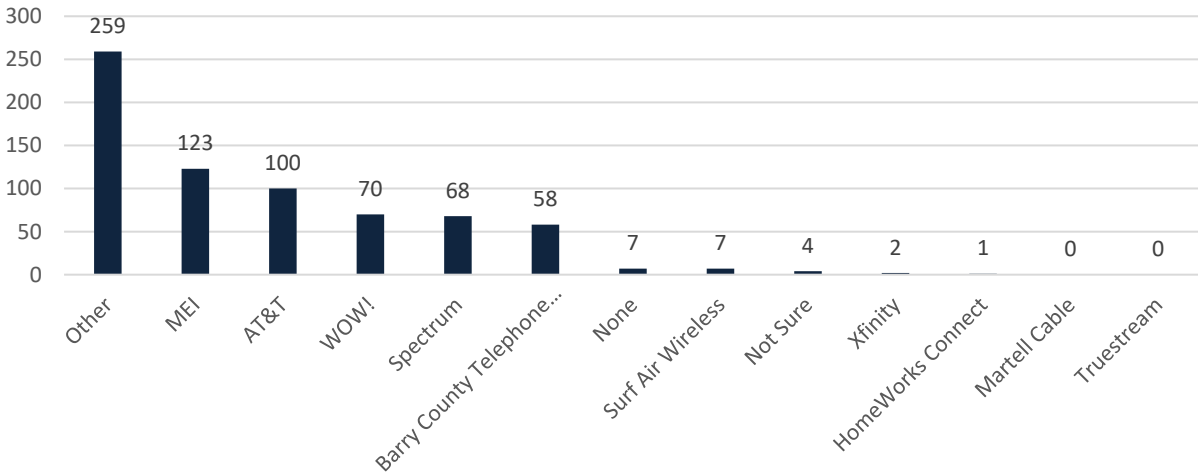
Q9. What is the primary type of internet used at your home?



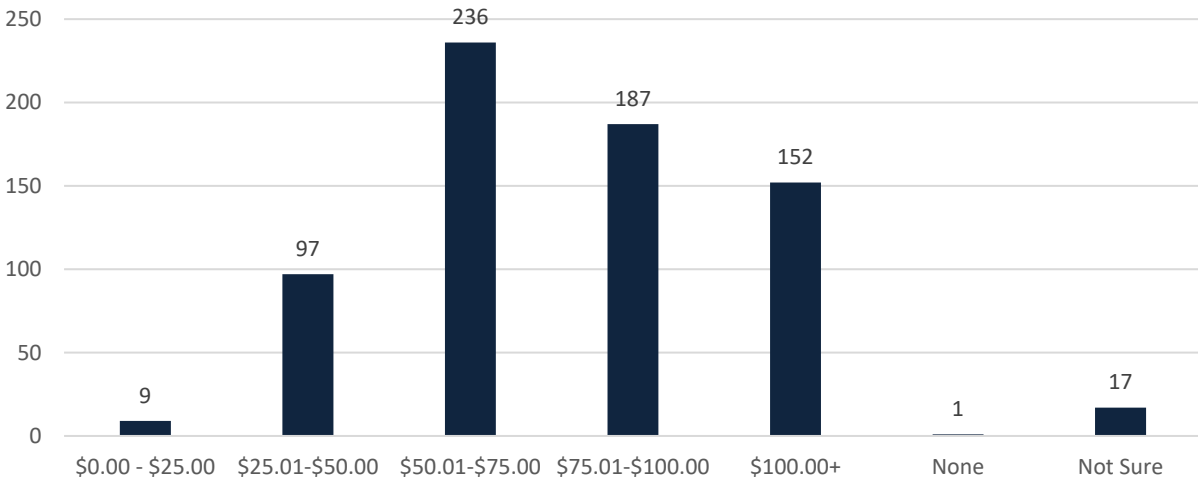
Q10. What company provides your home internet service?

Overall, 259 respondents indicated the option "Other" in response to service providers currently serving their home. Responses included:

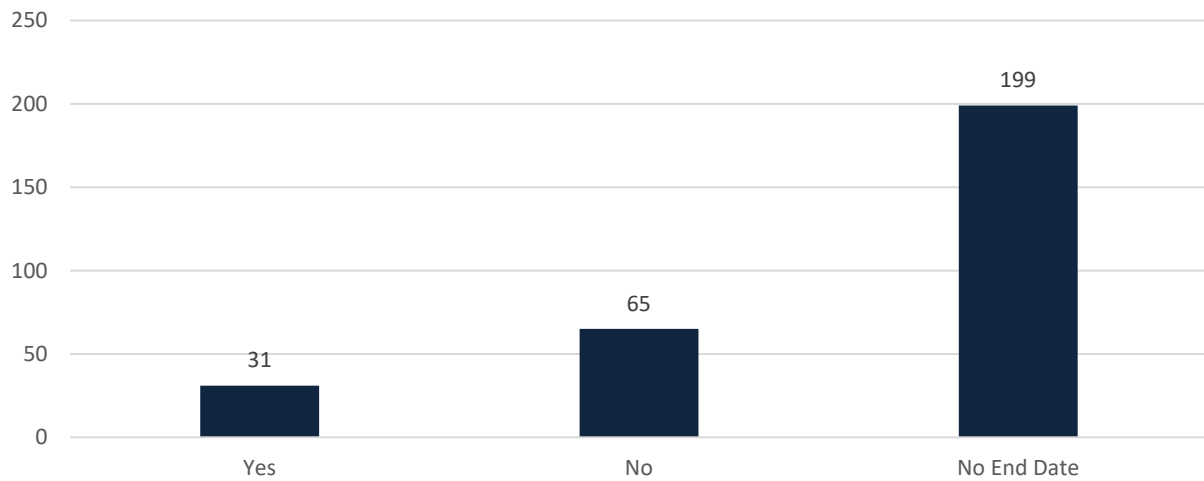
- Verizon
- ViaSat Excede
- T-Mobile
- Hughesnet
- Michwave
- Starlink
- Reliable Internet, LLC
- Blazing Hog
- Spark Services
- TDS
- Vogtmann Engineering, Inc.
- Dinamity
- Nomad
- Gotw3



Q11. How much do you pay for your current home internet service per month?



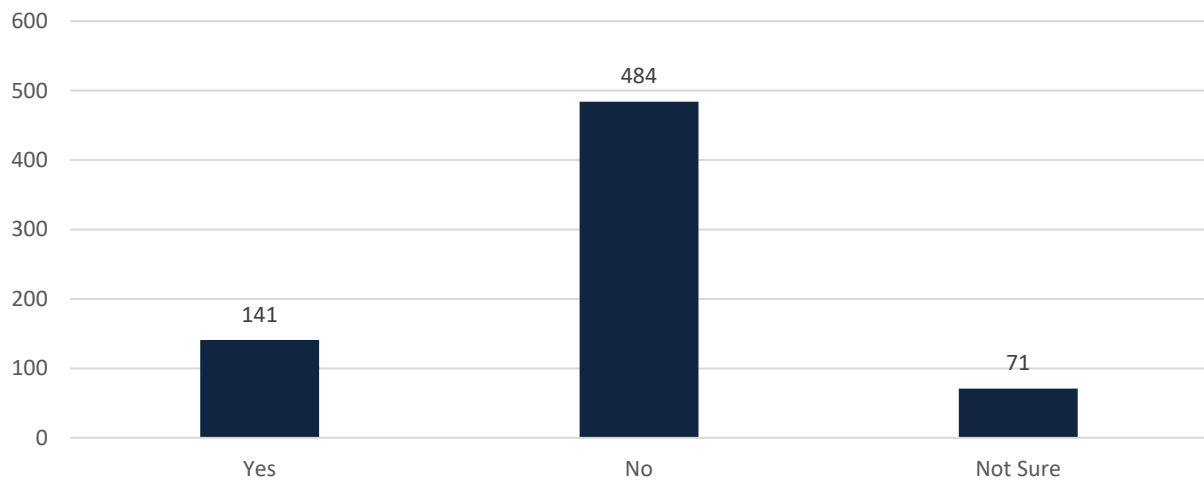
Q12. Do you know when your current home internet service contract ends?



Q13. When does your current home internet service contract end?

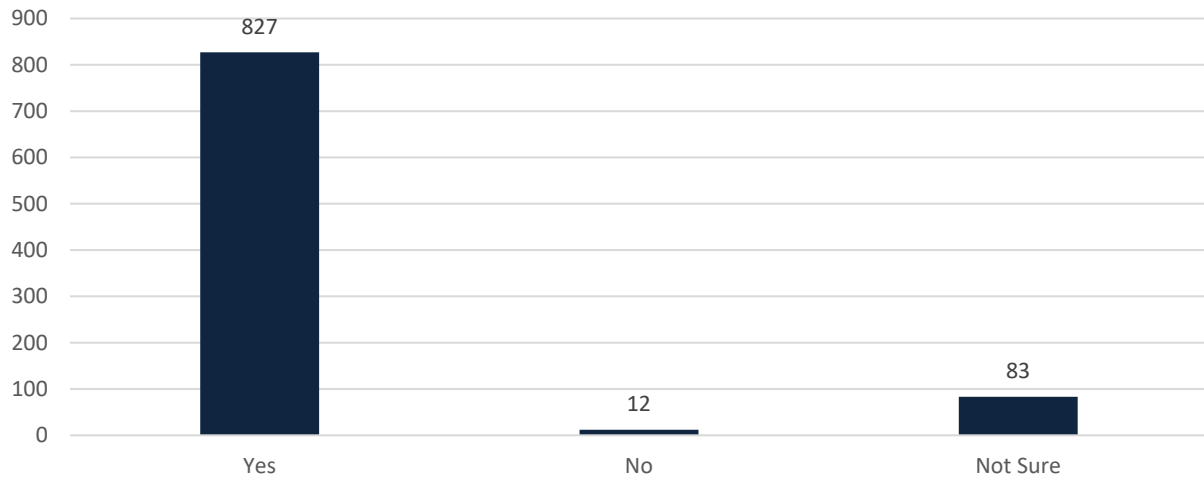
Responses to this question have been excluded from publication.

Q14. Are you satisfied with your primary internet service?



Q15. If a new or alternative high-speed internet service were available to your home, would you be interested in purchasing it? (The average price for high speed is approximately \$45 per month; according to the Federal Communications Commission, to be considered as high-speed internet, the download

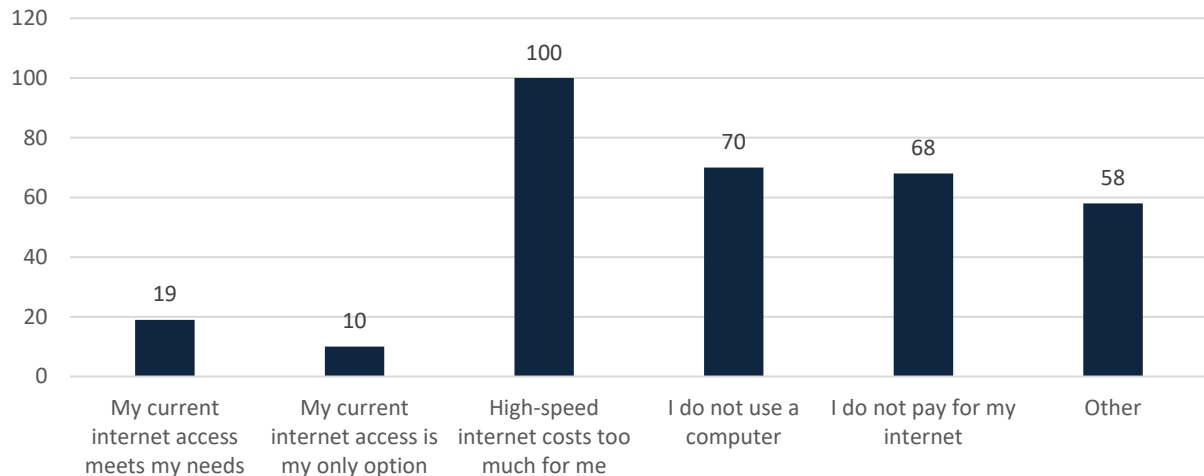
speed and the upload speed should be at least 25 Mbps and 3 Mbps respectively).



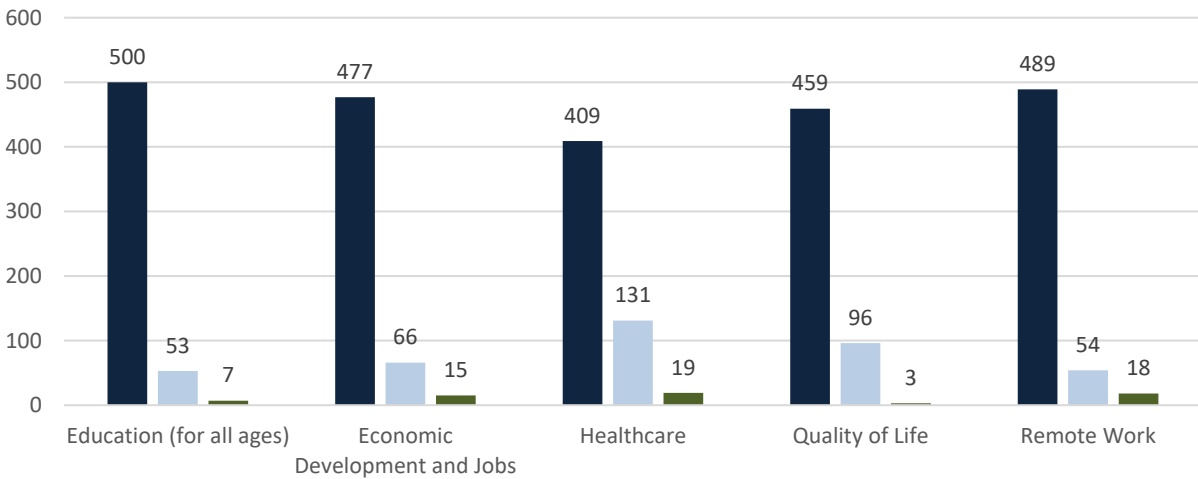
Q16. If not interested in purchasing a new, high, or higher speed internet service for your home, what might be the primary reasons?

Responses of “Other” were clarified to include a range of other considerations including:

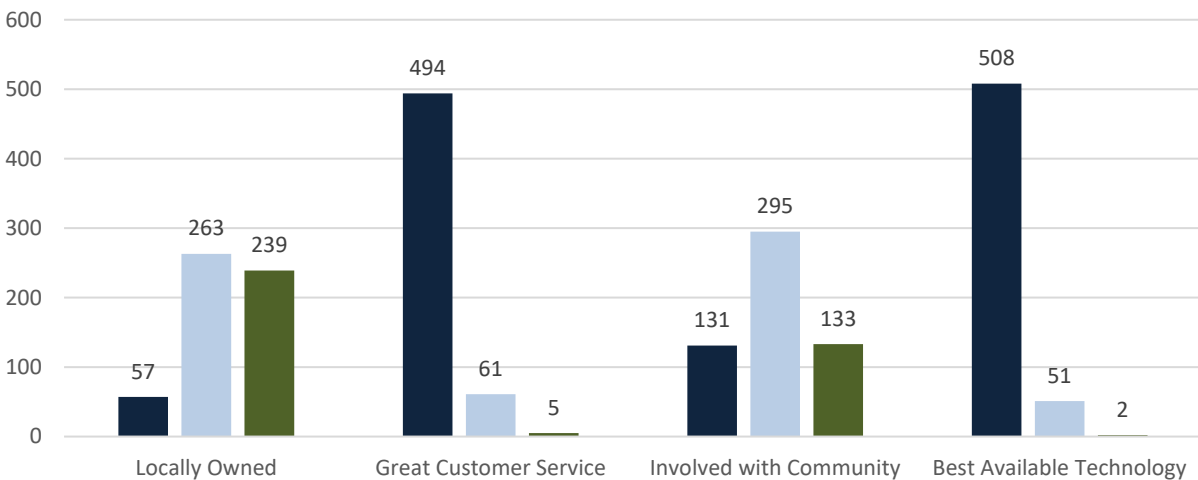
- *Would need to compare price and speed*
- *Needs to be compatible with my work requirements*
- *Fear of 5G due to health concerns*
- *Waiting on Fiber*
- *Already have higher speeds than what is being considered*



Q17. How important is fast, affordable, and reliable internet service in your area as it relates to the following community considerations?



Q18. When considering an internet service provider, how important are the following characteristics of that provider?



Q19. Please take the internet speed test at the University of Michigan’s official speed test website at <http://speedtest.it.umich.edu/> and let us know the results below. This will help us determine the speeds at your location. (If taking the internet speed test on a phone, please connect the phone to Wi-Fi instead of a cellular network. Please enter 0 if you require a hotspot or do not have internet access.)

Average Ping (ms): 44.3

Average Jitter (ms): 9.0

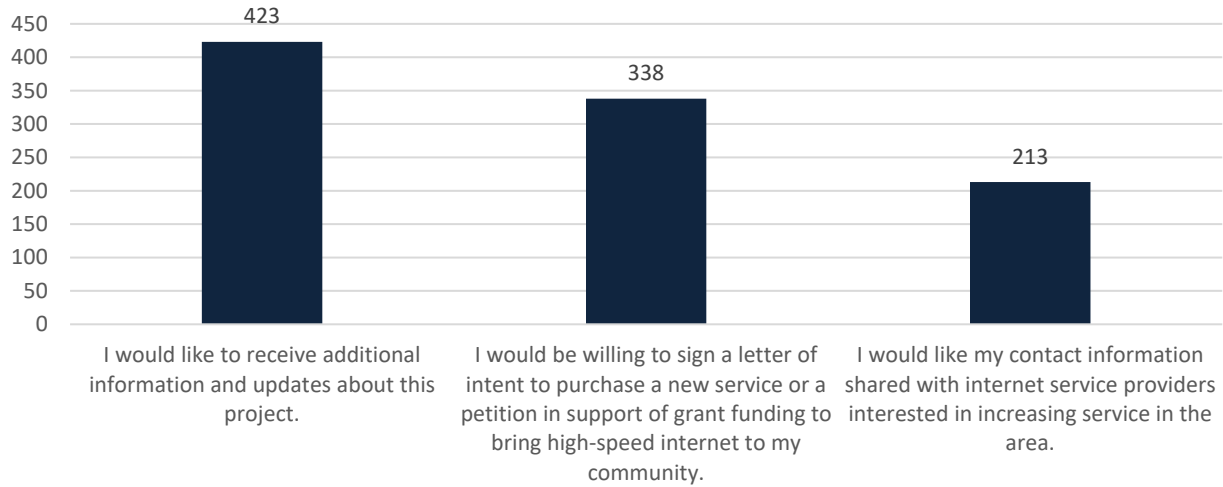
Average Download (Mbps): 6.35

Average Upload (Mbps): 1.90

Q20. Please provide your contact information.

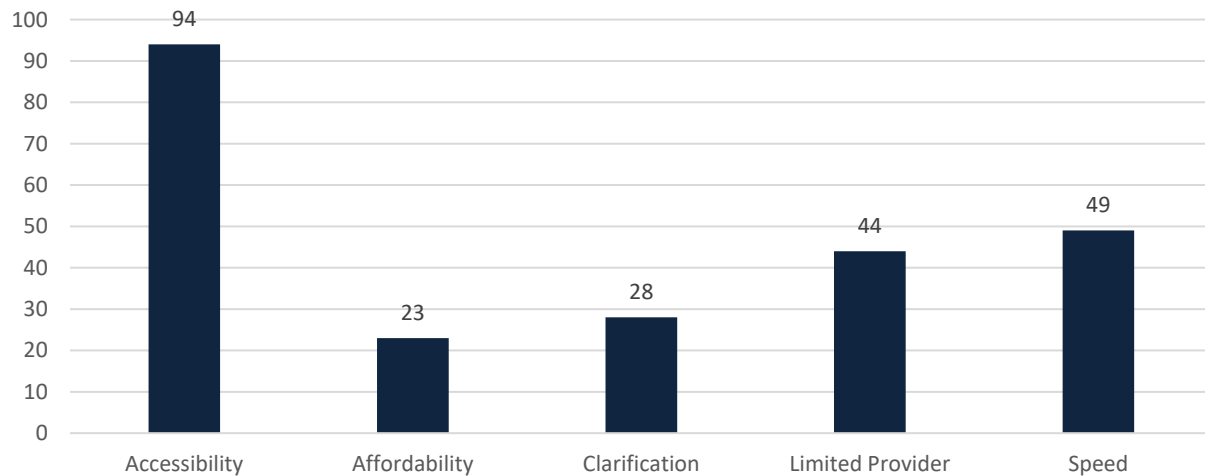
Responses to this question have been excluded from publication.

Q21. Please check the boxes that apply below if you are willing to share your contact information.



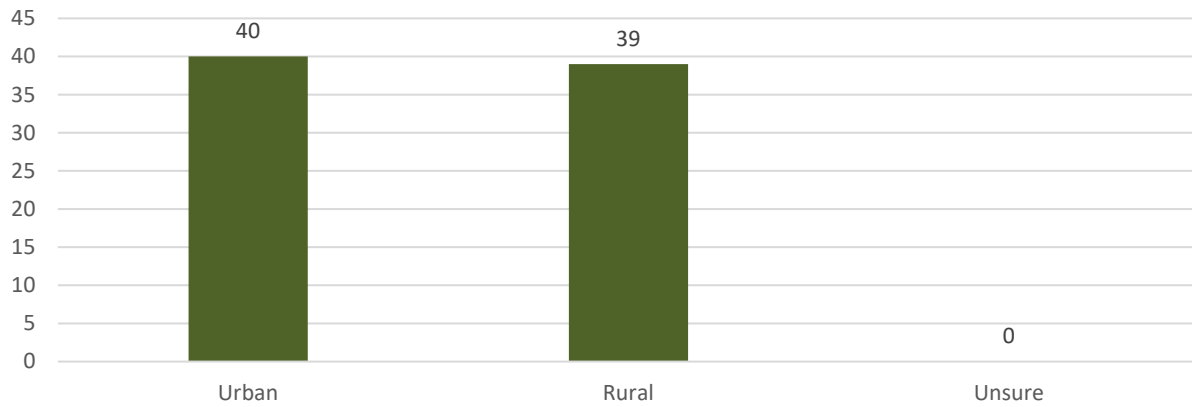
Q22. Please feel free to share additional comments on your and your community internet service below.

In order to prevent the release of any potentially identifiable information, open responses were categorized by topic and summarized through the following graphic.



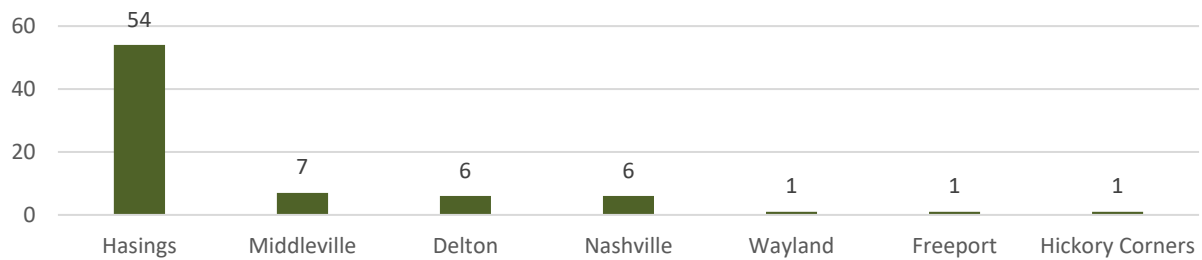
Business Survey Response Summary

Q1. Where is your business located?



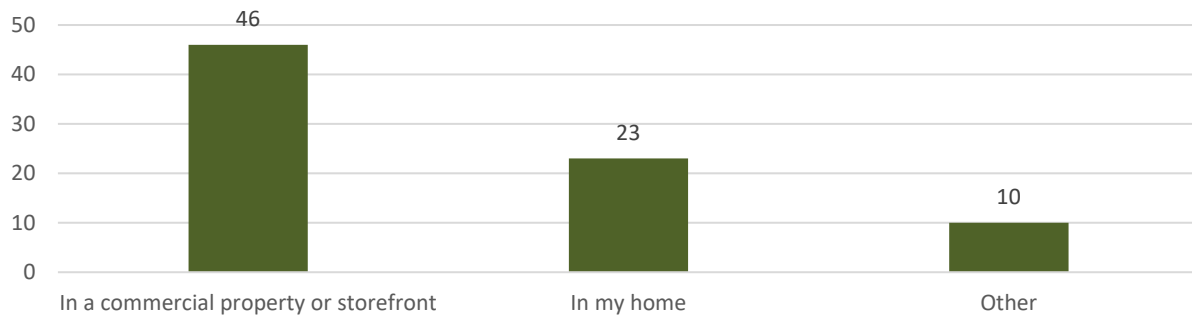
Q2. What is the address of the home for which you are taking this survey?

To protect the privacy of survey respondents only the distribution of respondent's cities will be included.

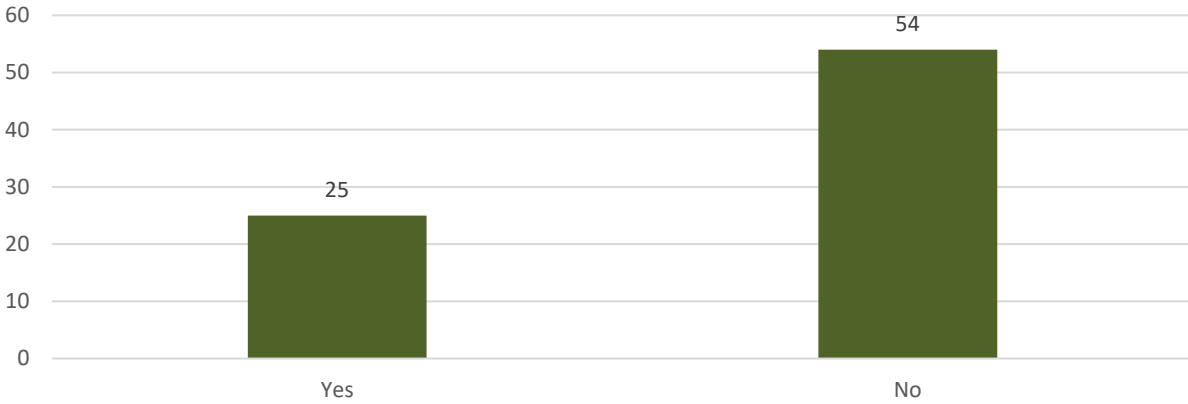


Q3. Where is your business based?

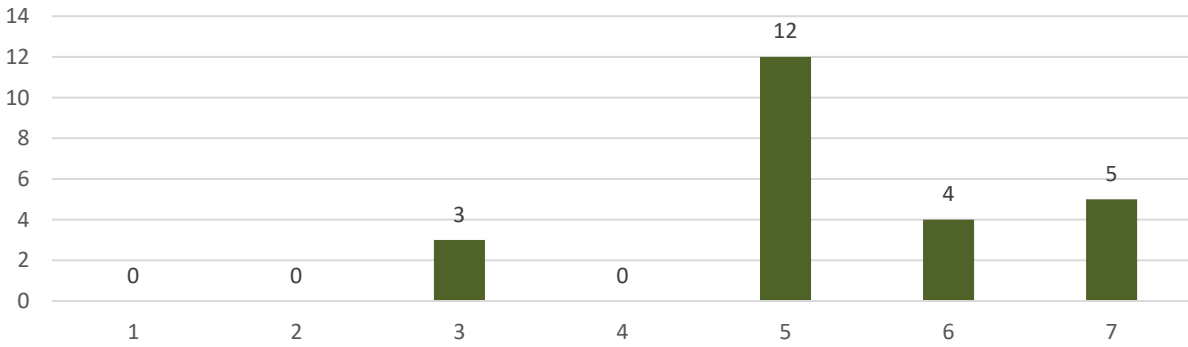
Other responses includes non-profit offices, business park, municipal buildings, educational institution, and religious entities.



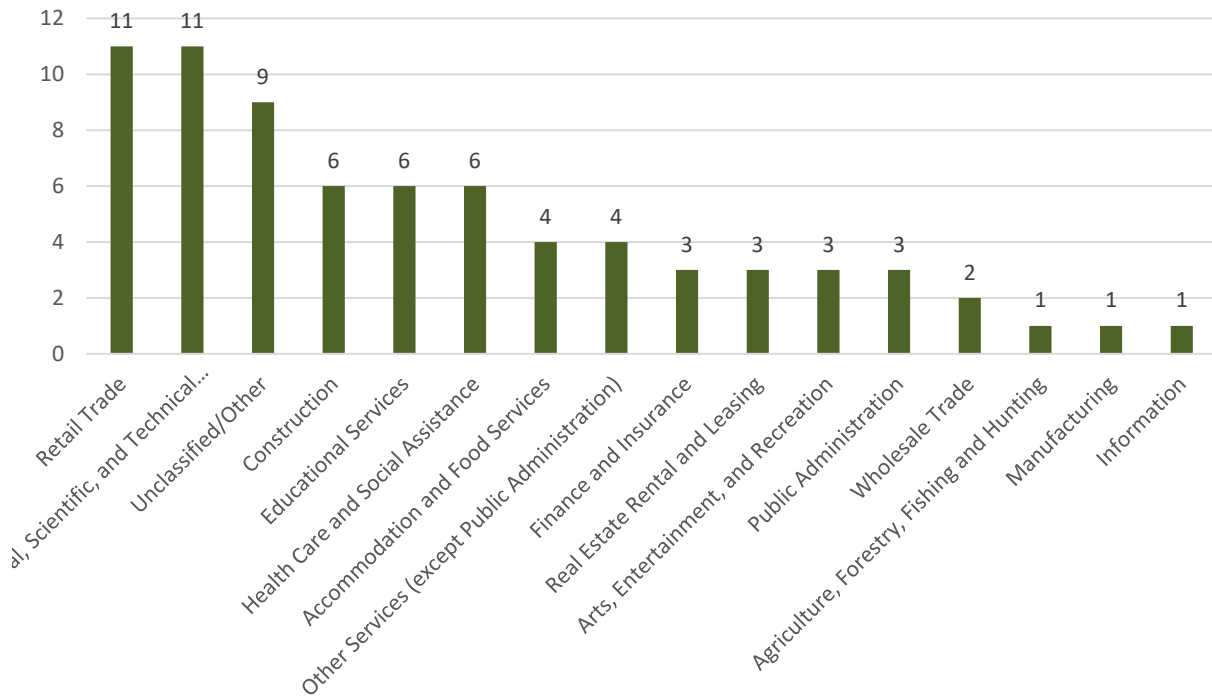
Q4. Is your business operated from home?



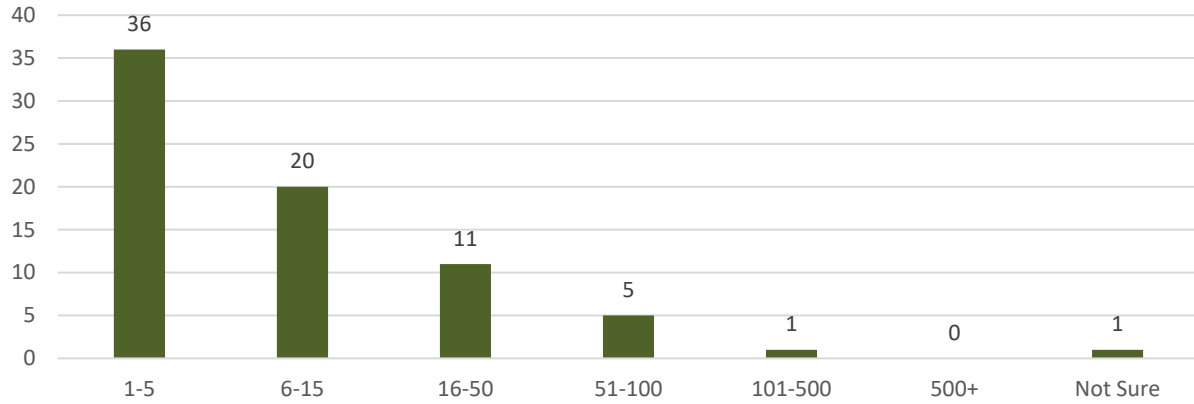
Q5. How many days per week do you work from home?



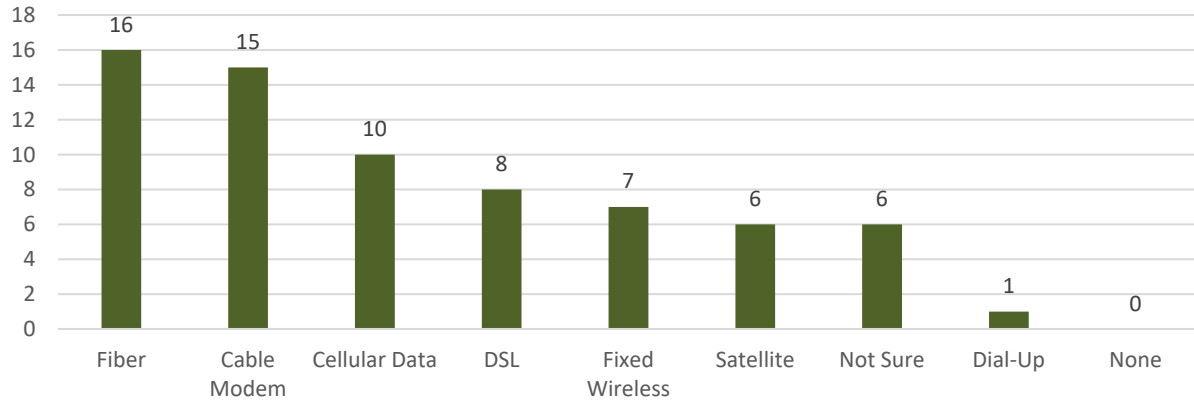
Q6. What business/industry category best describes your business?



Q7. How many employees (full-time and part-time) does your business have?



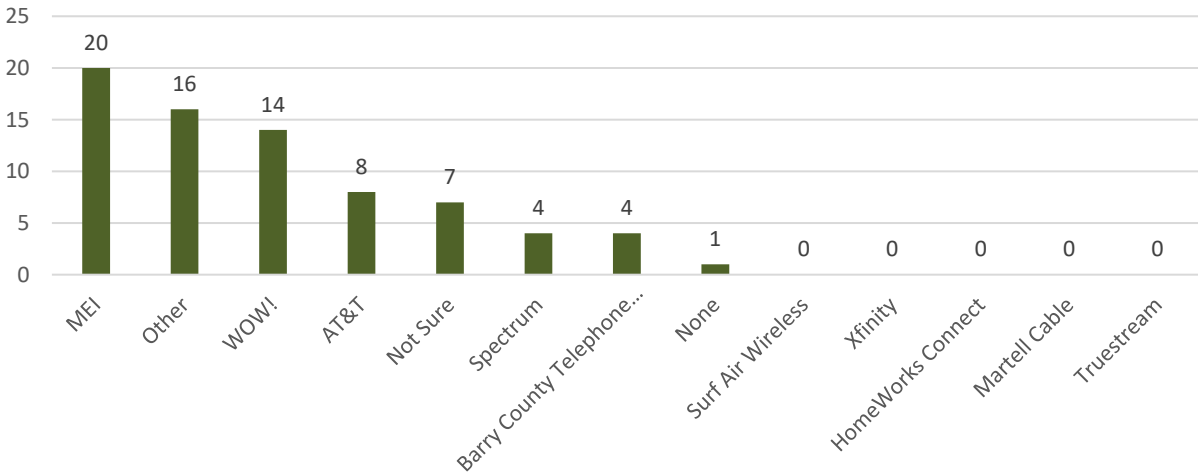
Q8. What is the primary type of internet used at this business location?



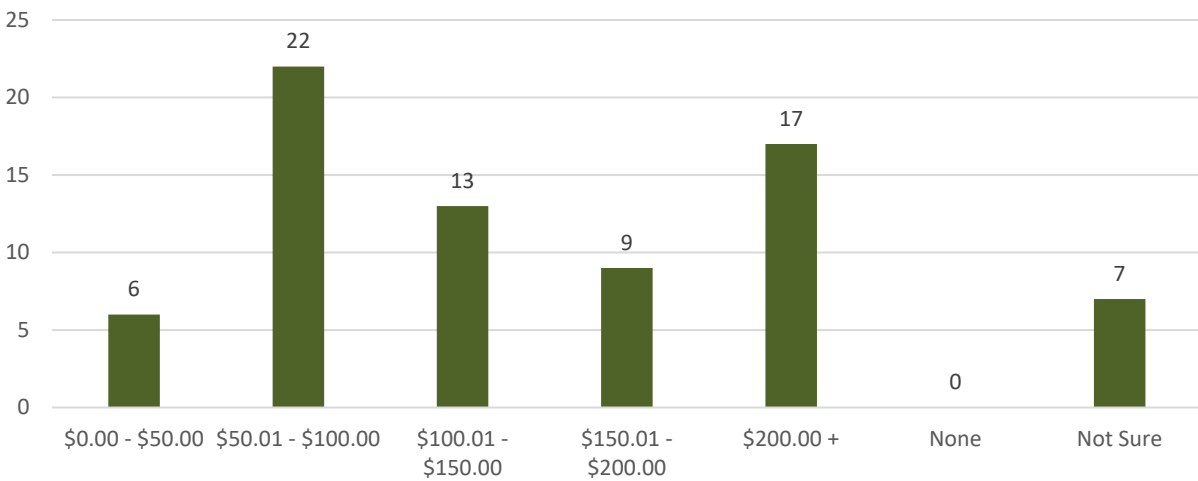
Q9. Which company provides your business internet service?

Overall, 16 respondents indicated the option "Other" in response to service providers currently serving their business. Responses included:

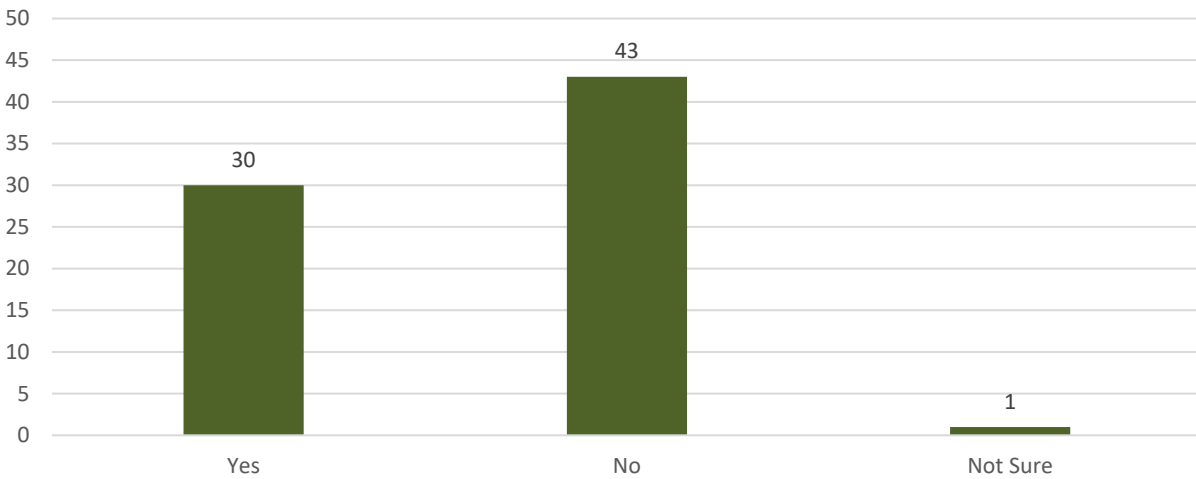
- Verizon
- Bix Wireless
- T-Mobile
- KCC Internet (Battle Creek Main Campus)
- Surf Air Wireless
- Starlink
- US Signal
- Michigan Statewide Education Network
- Hughesnet
- Excede
- Windstream
- TDS



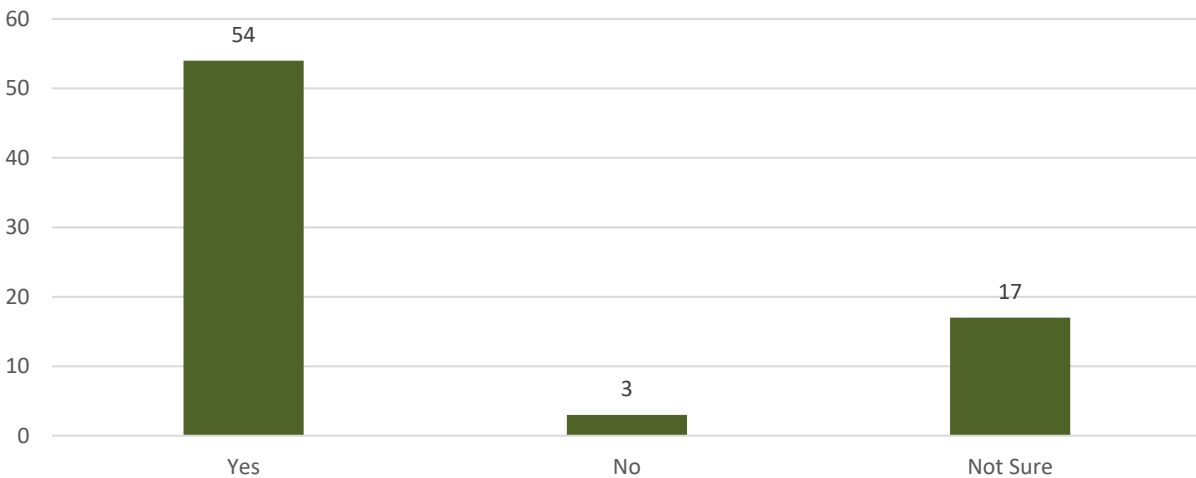
Q10. How much does your current business internet service cost per month?



Q11. Are you and your employees satisfied with your primary internet service?



Q12. If a new or alternative high-speed internet service were available to your business, would you be interested in purchasing it? (The average price for high speed is approximately \$45 per month; according to the Federal Communications Commission, to be considered as high-speed internet, the download speed and the upload speed should be at least 25 Mbps and 3 Mbps respectively).

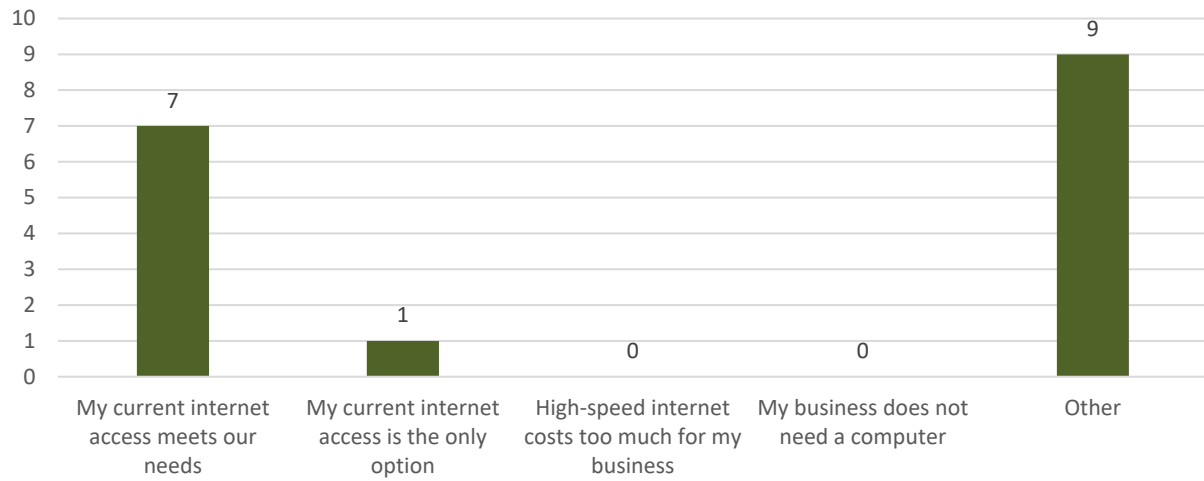


Q13. If not interested in purchasing a new, high, or higher speed internet service for your business, what might be the primary reasons?

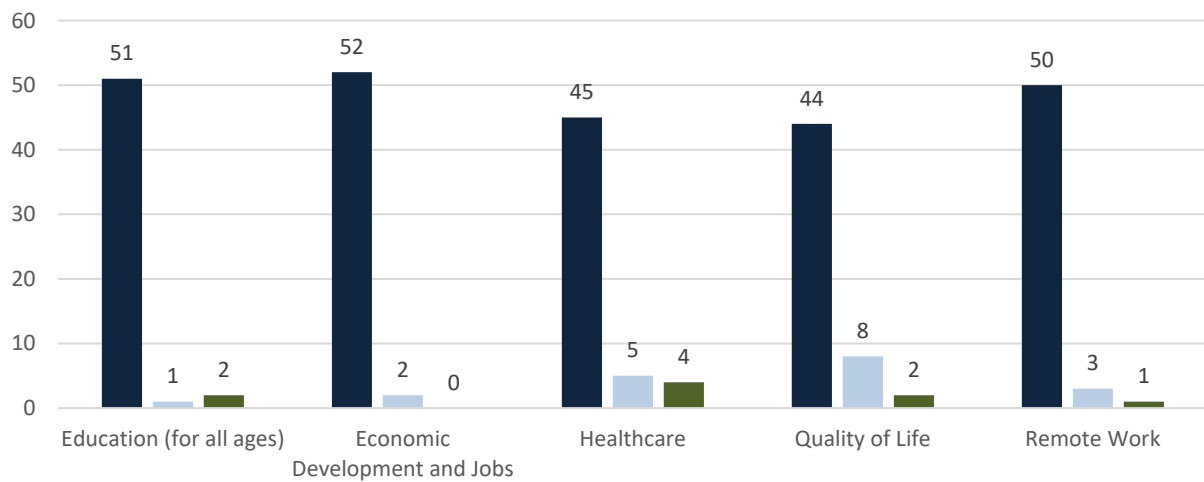
Responses of "Other" were clarified to include a range of other considerations including:

- *Would like to save money*
- *Would need to review any plan and costs*
- *Pricing first*
- *Will need to purchase in the future*
- *Would consider for a higher download speed*

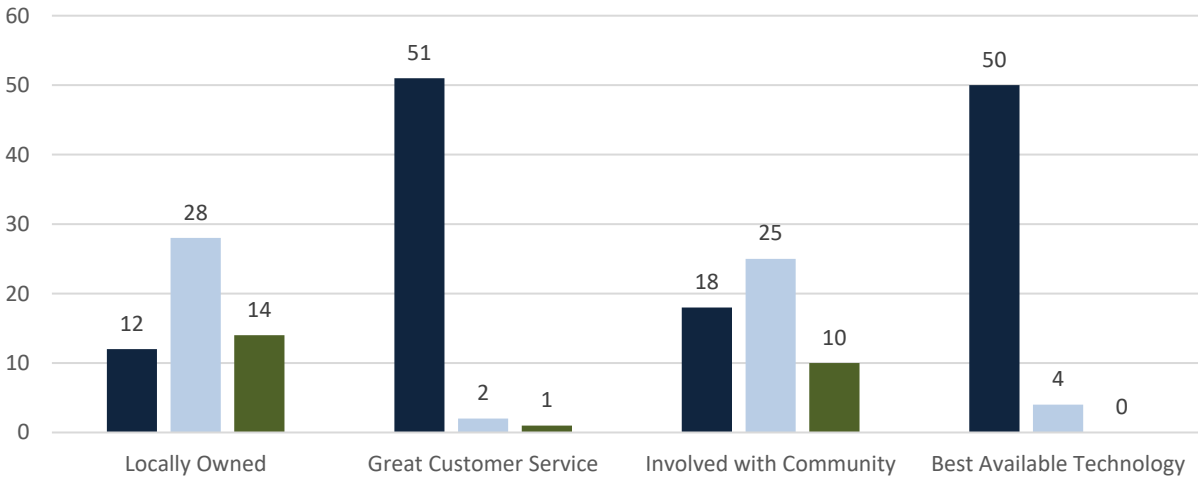
- *Not authorized to make this decision*



Q14. How important is fast, affordable, and reliable internet service in your area as it relates to the following community considerations?



Q15. When considering an internet service provider, how important are the following characteristics of that provider?



Q16. Please take the internet speed test at the University of Michigan’s official speed test website at <http://speedtest.it.umich.edu/> and let us know the results below. This will help us determine the speeds at your location. (If taking the internet speed test on a phone, please connect the phone to Wi-Fi instead of a cellular network. Please enter 0 if you require a hotspot or do not have internet access in your location.)

Average Ping (ms): 48.1

Average Jitter (ms): 106.25

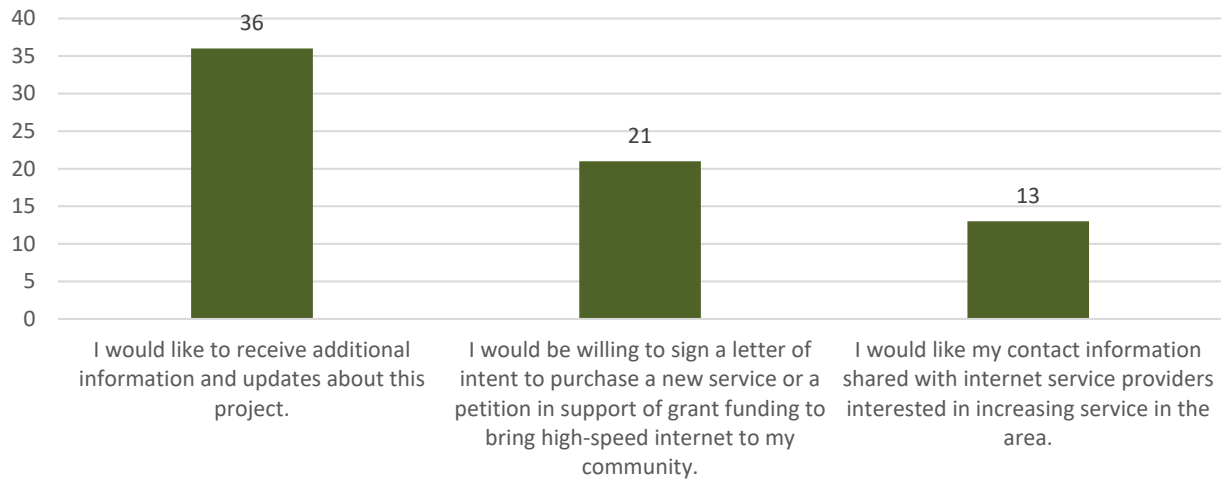
Average Download (Mbps): 76.1

Average Upload (Mbps): 44.7

Q17. Please provide your contact information.

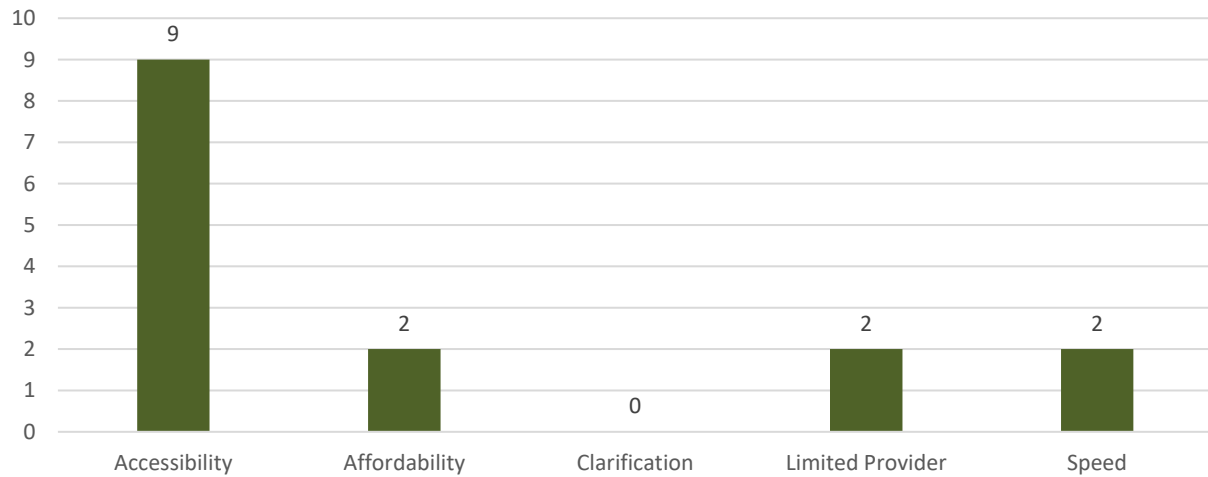
Responses to this question have been excluded from publication.

Q18. Please check the boxes that apply below if you are willing to share your contact information.



Q19. Please feel free to share additional comments on your and your community internet service below.

In order to prevent the release of any potentially identifiable information, open responses were categorized by topic and summarized through the following graphic.



Appendix C. Cost Estimation Tool

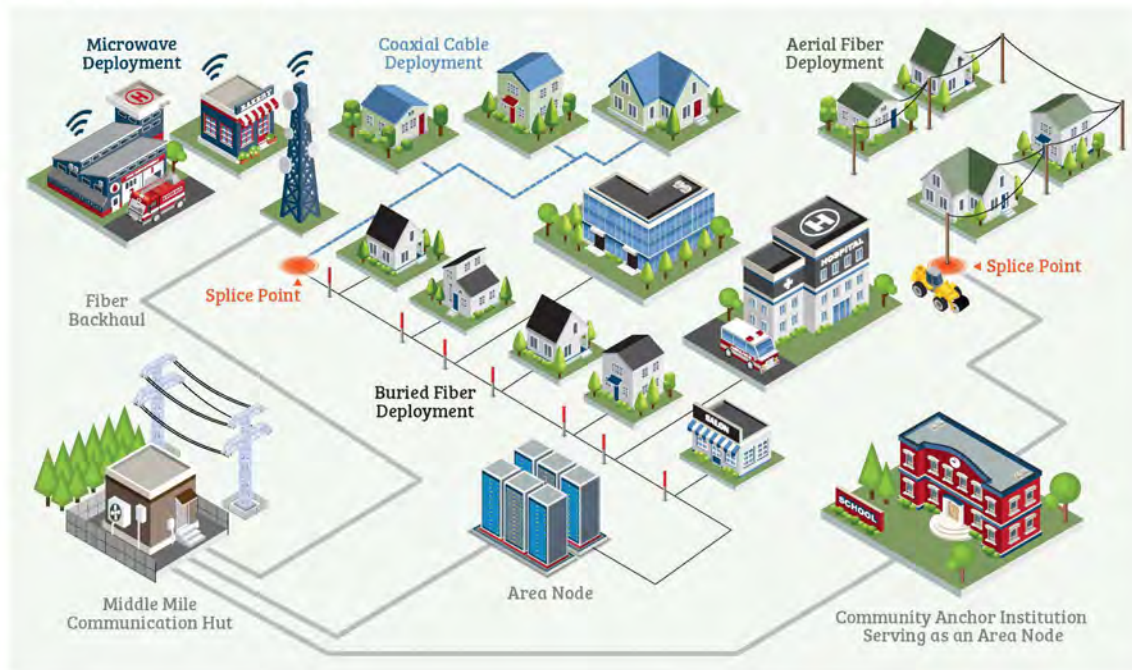


BroadbandUSA collected information about network construction expenses to increase awareness of the costs associated with deploying a broadband network. This information can help project leaders engage with providers and network operators in their area. This data is based on cost information collected during the National Telecommunications and Information Administration's (NTIA) recent broadband infrastructure grant program¹ as well as research on current market prices.

For help with specific project budgeting and procurement efforts, contact the BroadbandUSA Technical Assistance team at broadbandusa@ntia.doc.gov.

Using the Tool:

The graphic below depicts four of the most common types of network deployments: **Buried Fiber Deployment**, **Coaxial Cable Deployment**, **Aerial Fiber Deployment**, and **Microwave Deployment**. Costs associated with these four types of networks are outlined in the tables below and are color-coded to match the graphic. Please note that network costs can have significant variance, even greater than the cost ranges shown. The costs included in this tool are not comprehensive and each network's expenses will vary based on a number of factors, including community needs, geography and network deployment type.



1. This cost information is sourced from NTIA grant recipient data submitted between 2009 and 2015.



Buried Deployment Materials			
Component	Description	Cost Range	
	Fiber	Optical cable that transmits information that is broadcasted over the Internet. The larger the strand count, the greater the bandwidth that the fiber route can sustain. Costs will increase for greater fiber counts and will decrease with volume discounts.	\$0.50 – \$4.00 per foot
	Conduit	Tubing that encases fiber strands along a network route.	\$0.55 – \$2.00 per foot
	Fiber Optic Cable Splice Closure/ Handholes	Weatherproof encasement that envelops the exposed area between spliced cables. These serve as access points to a fiber network and are used for repair or interconnection.	\$100 – \$400
	Vaults	Protective enclosure for network equipment that allows for maintenance and adjustments.	\$1,000 – \$2,000
	Coaxial Cable	Network operators can enter into arrangements with incumbent operators to gain access to last mile coaxial resources in a service area.	Various
Aerial Deployment Materials			
Component	Description	Cost Range	
	Loose Tube Fiber?	Fiber with internal protective components that make it more resilient (often used for aerial networks).	\$1.00 – \$5.00 per foot
	Messenger Wire	Metal cable that supports aerial fiber.	\$0.30 – \$2.00 per foot
	Snowshoe	Mechanism that secures a fiber slack loop on an aerial network.	\$75 – \$150
Buildings, Equipment & Electronics			
Component	Description	Cost Range	
 	Communication Huts	Protective shelters for network equipment.	\$326,000 – \$342,000
	Generators	Backup power for network equipment.	\$70,000 – \$182,000
	Network Router	Device that directs traffic across an operator's network.	\$15,000 – \$25,000
	Network Switch	Electronic or optical device that opens or closes circuits, selecting paths for traffic over an operator's network.	\$2,500 – \$7,500
	Patch Panel	Device that makes connections between incoming and outgoing communications lines.	\$100 – \$500
	Transponder Card	Network card that acts to receive optical signals, reshape them and advance them through an operator's network.	\$5,000 – \$10,000
	Network Transceiver	Optical device that transmits and receives information, often providing data packet collision detection as well.	\$100 – \$500
	Mounting Hardware, Cables, Battery & Cabinet	Material that allows for the placement of network equipment.	\$300,000 – \$330,000
	Circuit Breaker Kit	Equipment that helps to maintain electricity input and output for network communications resources.	\$75 – \$150
	Battery and Rectifier System	Equipment used to convert power for network electronics.	\$20,000 – \$35,000
Network Node	Physical piece of network equipment that is capable of creating optical signals that are then sent over network resources.	\$220,000 – \$300,000	

2. While loose tube fiber is typically used for aerial deployments, it is not the only fiber option available for aerial deployments.



Wireless Deployment			
Component	Description	Cost Range	
	Microwave Relay	Station that receives signals and rebroadcasts them throughout an operator's network coverage area.	\$250 – \$1,000
	Microwave Receiver	Device that receives a signal from an operator's network. Receivers can be mounted directly to a customer's premise to receive service.	\$500 – \$2,500
	Microwave Transmitter	Device that broadcasts microwave data across an operator's network.	\$1,000 – \$10,000
	Site Routers	Routers located at a wireless site to transmit traffic from the site to potential customers.	\$2,500 – \$7,500
	Self-Organizing Network (SON) Device	Device that increases the reliability of the wireless network by automatically utilizing the most efficient network paths.	\$45,000 – \$55,000 (per tower)
	Microwave Antenna	Device that receives and transmits wireless data.	\$500 – \$5,000
	Outdoor Cabinet	Protective enclosure for network equipment that allows for maintenance and adjustments.	\$7,000 – \$11,000
	Backup Power Generator	On-site generator at a communication site to provide backup power to the wireless tower.	\$5,000 – \$50,000
	Backup Power Battery	On-site batteries to store backup power that would be used to support a wireless network if both the power grid and on-site generator were not operational.	\$1,000 – \$10,000
	Tower (appx. 75-feet) ³	Telecommunications tower used to support wireless antennas, transceivers and receivers.	\$7,500 – \$20,000
	Tower (appx. 150-feet) ³	Telecommunications tower used to support wireless antennas, transceivers and receivers.	\$15,000 – \$30,000
	Tower (appx. 250-feet) ³	Telecommunications tower used to support wireless antennas, transceivers and receivers.	\$40,000 – \$70,000
Network Construction Equipment ⁴			
Component	Description	Cost Range	
	Bucket Truck	Utility truck with an extension arm used in the construction of an aerial network to allow workers to reach high places.	\$145,000 – \$220,000
	Mobile Splicing Trailer	Trailer with the equipment necessary to cut fiber links.	\$13,000 – \$27,000
	Fiber Termination Equipment	Piece of equipment used for splicing fiber optic cables.	\$800 – \$3,000
	Mobile Wire Pulling Trailer	Trailer with the equipment to pull fiber through conduit.	\$27,500 – \$68,000
	Air Compressors and Blowers	Equipment used to advance fiber optic cable through conduit.	\$15,000 – \$35,000

3. Estimated ranges do not include deployment costs (e.g., foundation, land, tower construction).

4. Fiber deployment items are used for the deployment of all network types, as even microwave networks will require fiber backhaul.

Please note: This summary does not include cost ranges for the following common costs of network construction projects, as these elements cannot easily be generalized and are highly variable due to factors such as network type, location, topography and size:

- ✦ Construction equipment and labor
- ✦ Rights-of-Way
- ✦ Permits
- ✦ Engineering
- ✦ Data center costs
- ✦ Easements
- ✦ Maintenance/operational costs
- ✦ Splicing and testing equipment and labor
- ✦ Pole Replacement/Repair
- ✦ GIS mapping software and labor



[Seal Here]

Request for Proposal: Fiber Optic Installation

RFP #

Date

Address

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Overview

[Issuing Entity] is seeking bids from qualified contractors in the interest of installing new fiberoptic infrastructure at the following locations:

- Address, PIN, etc.
- Address, PIN, etc.
- Address, PIN, etc.

Bids must comply with all sections of this RFP and the products and services to be considered. The [Issuing Entity] reserves the right to request vendors present their proposal to the [Issuing Entity] review staff in person (or by means of virtual meeting).

Questions should be addressed, no later than [date] at [time] to [contact person] by email at [email@email.com]. [Issuing Entity] will have the final authority to the resolution of all questions.

Sealed proposals must be received by [date] at [time] at the [Name and Address]. The bid package should include two printed copies and should be sent to:

[Issuing Entity]
Attn: [contact person]
[street address]
[City, State Zip]

The envelope should be labeled “Fiber Installation RFP #XYZ”. Proposals received after the due date listed above will not be considered.

A bid opening will take place on [date] at [time] at [place].

[Issuing Entity] reserves the right to amend or terminate this Invitation to Bid, accept all or any part of a proposal, reject any or all bids, to waive any informalities or minor irregularities in bidding and to select other than the lowest bid if deemed in the best interest of [place]. To submit a bid, Vendors are required to attend a mandatory walk-through of the [place]. No considerations are given for not knowing condition of installation environment. Once a bid is accepted, the vendor will not be able to change pricing based on a condition not known to the vendor, after work begins.

Scope of Work

1.1 General Description

The general description of the Scope of Work (SOW) for this project is to provide and install [10 gig fiber optic cabling in support of a 10 Gigabit] network upgrade project. All bids must comply with all sections of this RFP and the products and services to be considered.

2.1 Product and Services Specifications

[Location] is accepting proposals for indoor- fiber optic cabling cable run as listed in Appendix A. Exact location of fiber run will be determined during the mandatory walk-through. See Appendix A for a project map and lengths.

- MDF closet in to switch closets (12 strand/ 6 Pairs MM)
- Plenum rated Armored OM3 Fiber
- Terminated LC
- Provide 20 Patch Cables (Length to TBD)
- To be terminated onto a 1U rack with the installer providing the termination enclosure.
- The MDF will have a single enclosure dedicated to each fiber cable.
- All fiber must be installed to manufactures' specifications, including but not limited to, maximum bend radius, and maximum pulling tensions.
- Old fiber and old termination enclosures needs to be removed

3.1 Installation Schedule

Cabling must be completed during hours or times agreed upon at signing of contract. Work must be completed by [date].

4.1 Changes to Scope of Work

[Issuing Entity], without invalidating the Contract, may order changes within the SOW consisting of additions, deletions, and/or modifications, the Contract Sum and the Contract Time being adjusted accordingly. All said changes in the SOW shall be authorized prior to any action by written "Change Order(s)," signed by [Issuing Entity].

5.1 Vendor Responsibilities

It shall be the responsibility of the selected vendor/contractor to provide the configuration and system quantities to all locations stated herein. It is the vendors responsibility to examine the scope of the proposed work to fully acquaint themselves with the specification and nature of the work to be accomplished. Vendors shall have no claim against [Issuing Entity] based upon ignorance of the nature and requirement of the services provided, misapprehension of the work environment, or misunderstanding of the specification or agreement provisions.

The intentional or accidental omission of necessary component(s) or system(s) shall require the selected vendor/contractor to supply said missing component(s) or system(s) at no cost to the [Issuing Entity]. [Issuing Entity] is not responsible for any omission, failure to detect any requirement, or any other condition required to complete the Scope of Work.

The successful vendor will be required to provide proof of insurance as outlined in **Appendix C** and sign an Indemnification Statement, a copy of which can be found in **Appendix D**.

The awarded Bidder shall:

- Have sufficient resources to complete the SOW within the allotted timeframe;
- Meet jointly with representatives of [Issuing Entity]. to exchange information and agree on details of equipment arrangements and installation interfaces for the cabling project;
- Furnish all labor, supervision, tooling, and miscellaneous mounting. Hardware and consumables for the cabling system installed at schools;
- Furnish, install, and terminate all fiber strands at each location according to the Product and Services Specifications;
- Install all cable in accordance with the Product and Services Specifications and/or manufacturer's recommendations and best industry practices;
- Develop and submit for approval a labeling system for the cable installation. At a minimum, the labeling system shall clearly identify all components of the system. Sample labels must be approved by the [Issuing Entity];
- Test (100%) all cables and termination hardware for defects in installation and to verify cable performance under installed conditions. Testing procedures should be included in proposal documentation;
- Documentation of testing and footage of each cabling run in proposal documentation. Final payment will be withheld until Issuing Entity] has receipt of paper documentation of the testing;
- Comply with all local and state building codes and obtain all necessary permits;
- Abide by, and be responsible adhering to, for all electrical and fire code regulations;
- Planned fiber path must be approved by the [Issuing Entity].
- Fiber runs must be properly supported above the drop ceiling utilizing J-Hooks or other cable support devices in accordance with TIA/EIA standards;
- Provide as-built diagram showing all jack numbers, pull boxes, cable paths, etc...

6.1 Pricing and Payment Structure

This Agreement calls for the construction of a "public work," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130/.01 et seq. ("the Act"). The Act requires contractors and subcontractors to pay laborers, workers and mechanics performing services on public works projects no less than the current "prevailing rate of wages" (hourly cash wages plus amount for fringe benefits) in the county where the work is performed. It shall be mandatory upon the vendor(s) to whom the contract is awarded, and upon any subcontractor thereof, to comply with the Act including but not limited to, all wage requirements and notice and record keeping duties, and to pay all laborers, workmen and mechanics employed by them not less than the general prevailing rate of wages in the locality for each craft or type of workman or mechanic needed to perform such work and the general prevailing rate for legal holiday and overtime work as ascertained by the Department of Labor. Vendors are required to increase wages as necessary during the term of this contract to keep current with prevailing wage rates. The Department publishes the prevailing wage rates on its website at <http://labor.illinois.gov/>. The Department revises the prevailing wage rates and the contractor/subcontractor has an obligation to check the Department's web site for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website. No changes will be allowed in the amount of this contract as additional compensation for such changes.

7.1 Evaluation Process

Please refer to **Appendix D** for further details regarding the evaluation process.

8.1 Discrepancies and Omissions

Vendors finding discrepancies or omissions in the RFP or having any doubts as to the meaning or intent of any part thereof shall submit such questions or concerns to [name and affiliation], by email (email@email.com). Addenda issued in correspondence to this RFP shall be considered a part of this RFP and shall become part of any final Contract that may be derived from this RFP. This RFP and its addenda will be part of any possible future contract with successful vendor(s). Contractors will be required to submit addend (if applicable) with signatures as part of their bid package to acknowledge addends.

9.1 Contingencies

This RFP should not be considered as a Contract to purchase goods or services but is a Request for Proposal in accordance with the Terms and Conditions herein and will not necessarily give rise to a contract. However, RFP responses should be as detailed and complete as possible to facilitate the formation of a contract based on the RFP response(s) that are pursued should [Issuing Entity] decide to do so. Proposals stating that pricing is valid dependent upon

availability and/or subject to prior sale will be considered as non-responsive. Completion of this RFP form and its associated Appendices are a requirement. Failure to do so will disqualify your RFP response submittal. Vendors must submit sealed RFP responses by the due date and time as specified herein. [add/delete as needed Electronic submissions will not be accepted]. Vendors will be considered nonresponsive if the above requirements are not met as requested.

10.1 Questions and Clarifications

Questions should be addressed, no later than [date], [time] to [person]

Email: email@email.com

Questions and answers will be posted and responded to via [website, email, etc...], by [date].

11.1 Award

[Issuing Entity] reserve the right to reject any or all responses, waive minor irregularities in bidding and to select other than low bid if it is deemed in the best interest of [Issuing Entity]. [Issuing Entity] will disqualify any proposal that is determined to be incomplete or non-responsive. [Issuing Entity] reserves the right to negotiate with the apparent acceptable vendor (s). The judgement of [Issuing Entity] on such matters shall be final. Price will be a factor when awarding the bid, however, it will not be the sole determining factor. The award will be based upon those considerations, which are determined to be in the best interest of [Issuing Entity] and will be made to the most responsive, responsible bidder whose proposal is determined to be the most effective and economical.

12.1 Termination: Default

[Issuing Entity] may terminate all or any part of a subsequent award by giving notice of default to Bidder, if Bidder: (1) refuses or fails to deliver the goods or services within the time specified; (2) fails to comply with any of the provisions of this RFP or so fails to make progress as to endanger performances, here under, or (3) becomes insolvent or subject to proceedings under any law relating to bankruptcy, insolvency, or relief of debtors. In the event of termination for default, [Issuing Entity] liability will be limited to the payment for goods and service delivered and accepted as the date of termination.

Response Requirements

1. Statement of Qualifications
 - a. Resumes of Key Personnel
 - b. Similar Project History
 - c. Summary of Relevant Qualifications
2. Project Understanding
 - a. Understanding of Scope of Work
 - b. Project Approach
 - c. Detailed Price Proposal (see **Appendix B**)
 - d. Proposed Timeline of Completion
3. References
 - a. Please include up to three references for projects recently completed under similar Scopes of Work.

By submitting a response to this RFP you acknowledge a need to provide payment and performance bonds as well as a Certificate of Insurance upon the successful award of this Project.

Appendix A: Physical Address

Building	Address
Building Name	Address
Building Name	Address

Appendix B: Pricing Structure

Table 1: [Fiber Location]			
Description	Qty.	Unit	Total
Fiber Optic Cabling (type)			
List all line items below			

Appendix C: Project Maps

[maps of sites and scope of project]

Appendix D: Bid Evaluation Rubric

1. Qualifications..... 35 points

Qualification of bidders and history of similar project experience will be reviewed to ensure the successful bidder is duly prepared to accept the outlined Scope of Work.

2. Overall Price Proposal..... 25 points

The overall price proposal will remain a significant factor in the review of proposals received in response to this RFP.

3. Testing Method and Warranty 20 points

All documentation provided on testing procedures and warranty coverage will be evaluated.

4. References 10 points

References will be contacted, and points awarded on their responses.