

# Community Technology Action Plan

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Prepared as part of the Connected  
Community Engagement Program



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# Executive Summary

Today, technology plays a pivotal role in how businesses operate, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has become dependent on how broadly and deeply the community adopts technology resources, which includes access to reliable, high-speed networks, the digital literacy of residents, and the use of online resources locally for business, government, and leisure. As noted in the National Broadband Plan (NBP), broadband internet is “a foundation for economic growth, job creation, global competitiveness, and a better way of life.”

The purpose of this document is to summarize the results of a community technology assessment for Ottawa County and to provide the next steps for addressing any deficiencies or opportunities for improving the local technology ecosystem in order to advance economic, social, and educational opportunities for families, businesses, and institutions in the community.

This Community Technology Action Plan was developed following a comprehensive community assessment performed by the Ottawa County Broadband Team as part of Connected Nation’s Connected Community Engagement Program. Using the Connected<sup>sm</sup> assessment toolkit, the community team was able to examine the access, adoption, and use of broadband and related technologies in the community.

One key output from this process is the Connected Community Scorecard, which is used to summarize the results of the community broadband assessment and relative standing of communities participating in this process. Through the work of the Ottawa County Broadband Team and information reflected in this document, Ottawa County achieved a score of 76.01 points out of 100 for overall broadband and technology readiness.

While the results indicate that the community has made tremendous strides and investments in technology, and recognizes Ottawa County as a Connected Certified community, priority projects were identified to help catapult the community to a new level of technology access, adoption, and use.

This plan is a blueprint for leveraging technology to improve quality of life and advanced community and economic development. Below are the detailed results and recommended strategies for Ottawa County.

## Project Background

The Ottawa County Board of Commissioners has actively supported enhanced broadband for residents and businesses for the last 10 years. The County has had multiple successes with expanding broadband into previously underserved areas through collaborative public-private partnerships; however, many underserved areas still remain. Ottawa County engaged in Connect Michigan’s “Connected” program as a means to better understand where these remaining underserved areas are situated, as well as to develop additional strategic partnerships so the County can continue to facilitate the extension and promotion of broadband to all of its residents and businesses. As a result of engaging in the “Connected” program, Ottawa County and Connect Michigan developed a series of recommendations designed to improve access to high speed internet throughout the County—thereby boosting economic development, communication, education, and quality of life throughout the region.

## Report Organization

The Connected program takes a comprehensive approach to examining the broadband/technology landscape in the community. All communities participating in the program examine community-wide infrastructure and the adoption and use of technology among households. In addition, communities are able to choose additional sectors for examination that match their community character and focus. Sectors include Agriculture, Business/Economic Development, Talent and Workforce, Government, Healthcare, Higher Education, K-12 Education, Public Safety, and Tourism. In addition to the community-wide infrastructure and households analyses, Ottawa County has chosen to examine the following sectors: Agriculture, Business/Economic Development, Government, Healthcare, Higher Education, K-12 Education, Libraries/Community Organizations, Public Safety, and Talent/Workforce Development.

# Assessment Summary

The following table provides highlights from the community broadband and technology assessment conducted as part of this plan and detailed in the remainder of the document.

## Broadband and Technology Assessment Summary

Community-Wide Infrastructure	
98.1%	Households with access to 25 Mbps internet
3.6%	Households with only one choice for fixed internet service provider
Areas of the community where service gaps persist: Chester, Grand Haven, Robinson, Port Sheldon, Crockery, Jamestown, and Zeeland Townships	
4.1%	Households with access to only one type of internet connection
22	Residential fixed internet service providers
Households	
23,098	Households without a fixed broadband connection
28%	Households with internet access dissatisfied with current service
Groups struggling with digital inclusiveness in the community: Households earning \$75k-\$99k annually, Households with active or retired military, Adults employed part-time or are self-employed, and Households without school-age children	
6	Average number of internet-enabled devices in the home
72%	Residents who digitally interact with local businesses at least weekly
37%	Residents who regularly telework
Agriculture	
40%	Agriculture operations with internet service less than 10 Mbps
17%	Producers using or planning to use connected equipment on the farm
71%	Agriculture operations using the internet weekly to conduct market research
Business and Economic Development	
92%	Businesses with a fixed internet connection
86%	Businesses with a website
42%	Businesses using or planning to use advanced technology applications
63%	Businesses using social media at least weekly
8	Organizations supporting economic development in the community
Government	
9	Municipalities with download speeds greater than 50 Mbps
6.5/10	Average municipal website analysis score
50%	Municipalities with a social media presence
35.5%	Municipalities using or planning to use more advanced technology applications
Healthcare	
Monthly	Average use of telehealth applications
64%	Healthcare facilities using electronic medical records
76%	Facilities with a social media presence
Higher Education	
93.3%	Courses delivered using web-enabled technology
100%	Classrooms covered by Wi-Fi
2/3	Institutions offering online degrees
K-12 Education	
49.3%	K-12 curriculum delivered with web-enabled technology
100%	K-12 schools with connections faster than 1 Gbps
0.81	Internet-enabled devices per student
88%	Schools with a social media presence
Libraries and Community Organizations	
13%	Adults without home internet accessing the web at libraries
164	Internet-enabled public computers
7	Average number of tech. training programs offered at libraries
75%	Libraries and organizations using or planning to implement more advanced technologies
Public Safety	
11	Ways in which agencies are working to ensure cybersecurity
27%	Public safety agencies using social media weekly
100%	Agencies indicating that mobile broadband is critical to their operations
Talent and Workforce	
49%	Employers who feel employee tech. skills match business needs
75%	Percent of businesses who require or encourage continuing education for employees
28%	Percent of community employees with advanced technology skills
13	Community organizations offering STEM+C opportunities for youth

## Challenges

The following table summarizes the broadband technology gaps and challenges in Ottawa County identified during the assessment.

Area	Challenge
Households	Digital interaction with: agriculture, community organizations, higher education, libraries, local government, and public safety.
	Digital literacy
	Fixed home broadband adoption
Agriculture	Use of technology-enabled equipment
Business/Economic Development	Advanced technology applications
	Business digital communications
Government	Advanced technology applications
	Digital communications
Healthcare	Digital communication
	Telehealth
	Advanced technology applications
K-12 Education	Student devices, one-to-one computing
	Electronic content delivery
	Digital communications
Libraries/Community Orgs.	Digital communications
Public Safety	Next Generation 9-1-1
Talent and Workforce	Continuing education policies

## Priority Projects

The following is a list of the recommended projects the community team aims to prioritize to ensure robust broadband and technology access, adoption, and use.

- Expand Broadband
- Promote Broadband

## Digital Equity

The data gathered during the Connected assessment allows an analysis of digital equity in the community. Digital equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services (National Digital Inclusion Alliance).

Data gathered through this process can help determine which groups in the community may be struggling with technology access, adoption, and use and thus which groups need assistance to create a truly digitally equitable community. The table below contains a summary of ten different metrics that aim to identify which groups are struggling with technology and the intersection between the challenges related to accessing broadband infrastructure and actually adopting broadband in a meaningful way. Twenty different demographic groups are included in the table and are divided by income, educational attainment, age, employment status, households with children, and military households. These metrics are designed to provide a high-level summary of issues facing specific groups in the community, and each metric is discussed in greater detail throughout this plan. These metrics are also critical in generating solutions and/or interventions that will be targeted to the appropriate group to ensure success. The dimensions include:

## Access

Households with dial-up, satellite, or mobile-only connections: These households may have service, but these are not ideal connections for a number of reasons include speed, data caps, latency, reliability, etc. The higher the percent, the more households rely on these non-fixed, non-terrestrial internet connections.

Households reporting a connection speed less than 3 Mbps: These households subscribe to internet service at speeds that limit the usefulness of that connection for those in the home. The higher the percent, the more households rely on internet connections less than 3 Mbps.

Households dissatisfied with the cost of service: These households subscribe to internet service, but indicate they are dissatisfied with that service because of the cost. They desire to be connected, but the cost of service is likely a burden. The higher the percent, the more households indicating they are dissatisfied with the cost of their service.

## Adoption

Fixed broadband adoption: This is the percent of households in each group that have subscribed to a fixed broadband connection internet at home. This measure does not include those connecting at home with satellite, mobile-only, or dial-up. The higher the percent, the more households there are with a fixed broadband subscription.

Non-adopting households citing cost as primary barrier: These are households who do not have a home internet connection that report not having one because service is too expensive. The higher the percent, the more households there are without an internet connection that cite cost as the primary barrier to obtaining such a connection.

Devices in the home: This is the average number of internet-enabled devices in the home. The lack of a device can prevent full online participation by all members of the household. A higher number indicates more devices in the home for members of the group.

Internet Digital literacy: This is the average digital literacy score on a scale from one to four across 38 different hardware, software, and online applications, with one indicating the respondent has no experience and four indicating they have advanced technology skills. Digital literacy is key to using technology to improve quality of life. A higher number indicates a higher average digital literacy among members of the group.

## Use

Daily internet access: This is the percent of respondents reporting that they access the internet multiple times per day. Internet use is a personal choice, but limited access and adoption can prevent more robust use of technology. The higher the percent, the more persons in each group are accessing the internet several times each day.

Teleworking: This is the percent of respondents indicating they telework in any capacity for their job. Technology is used more and more on the job and teleworking can provide new opportunities for residents to participate in a digital economy. The higher the percent, the more persons in each group are teleworking.

Section interaction: This is the average frequency at which residents in each group report digitally interacting with various sectors of the community on a scale of one to seven, with one indicating daily interaction and seven indicating no digital interaction. This metric may be used to encourage organizations to increase efforts to promote their electronic resources. A high number indicates a high average frequency of digital interaction with community institutions and sectors are reported among members of each group.

While all in the community struggle with some aspect of technology access, adoption, and use, some groups struggle more than others. Cells in the table are highlighted in red where the indicator for that particular group is negatively related to the community average. For example, cost as a barrier to home broadband adoption for households earning less than \$50,000 is highlighted in red as this group cites cost more frequently than the community as a whole.

Also included in the table, is a column indicating the percent of the community falling into each of the demographic groups. For example, 41.6% of households in the community earn less than \$50,000 annually. This information is intended to provide even greater context for the technology issues facing each group.

When implementing programs and projects that are designed to improve broadband and technology access, adoption, and use (such as those recommended at the end of this plan), the community should keep these groups in mind and examine the desired outcome of the project or program relative to the struggles faced by the various demographic groups.

Ottawa County Digital Equity Analysis											
Group	Population Estimate	Access			Adoption				Use		
		Dial-Up, Satellite, or Mobile Only	Less Than 3 Mbps	Dis-satisfied With Cost	Home Broadband Adoption	Cost as Barrier to Adoption	Devices in the Home	Digital Literacy	Use Internet Daily	Tele work	Sector Inter-action
Community Average		4.2%	4.3%	68.8%	83.4%	34.6%	6.4	2.73	97.6%	34.8%	2.08
Income <\$50k	41.6%	6.7%	6.3%	76.6%	78.3%	72.5%	4.6	2.38	95.6%	12.9%	1.86
Income \$50k-\$74k	21.0%	3.9%	5.9%	66.1%	79.7%	30.0%	5.6	2.64	96.4%	25.8%	1.97
Income \$75k-\$99k	14.8%	3.9%	1.7%	73.5%	72.8%	13.0%	6.4	2.79	97.3%	35.6%	2.14
Income >\$100k	22.6%	4.7%	3.4%	62.8%	76.2%	30.7%	7.3	2.84	98.9%	52.3%	2.26
Active or Retired Military	6.9%	8.2%	6.1%	79.2%	71.7%	22.0%	5.6	2.43	96.2%	27.7%	1.91
Non-Military	93.1%	4.5%	4.1%	67.7%	77.6%	36.6%	6.1	2.69	97.2%	32.2%	2.07
School-Age Children	23.2%	4.7%	4.6%	66.4%	79.9%	32.9%	8.3	2.93	98.7%	40%	2.46
No School-Age Children	76.8%	5.1%	4.3%	70.9%	75.7%	35.0%	5.0	2.54	96.3%	28.4%	1.87
Full-Time Employed	42.6%	2.8%	3.5%	68.5%	91.1%	36.7%	7.7	3.03	98.8%	50.1%	2.21
Part or Self Employed	13.4%	4.2%	6.1%	66.1%	86.1%	29.4%	6.4	2.70	97.9%	35.6%	2.16
Retired	16.9%	4.7%	4.1%	65.6%	90.0%	37.5%	4.4	2.15	95.5%	-	1.67
Age 18 to 34	33.9%	1.7%	2.9%	66.1%	88.2%	30.3%	7.6	3.24	99.6%	43.2%	2.26
Age 35 to 44	15.1%	3.3%	5.3%	69.1%	90.9%	38.1%	8.2	3.07	99.8%	49.9%	2.44
Age 45 to 54	16.7%	5.1%	3.6%	63.2%	88.2%	33.3%	7.9	2.77	98.9%	40.7%	2.13
Age 55 to 64	15.9%	3.8%	4.3%	80.2%	91.7%	38.5%	5.4	2.45	96.3%	33.8%	1.83
Age 65+	18.4%	4.2%	4.7%	65.6%	90.0%	45.5%	4.3	2.15	95.1%	11.5%	1.65
No Degree	59.5%	3.9%	4.3%	64.2%	88.3%	46.2%	6.9	2.64	97.1%	25.0%	1.95
Associate's Degree	9.4%	5.6%	6.2%	73.1%	84.1%	16.7%	6.1	2.69	99.1%	21.8%	1.97
Bachelor's Degree	20.9%	2.5%	3.4%	63.9%	90.3%	40.6%	7.4	2.91	98.2%	46.0%	2.07
Advanced Degree	10.2%	3.5%	3.8%	74.4%	92.5%	31.3%	6.6	2.86	98.9%	44.3%	2.35

# Connected Program Overview

Despite the growing dependence on technology, the United States Census reports that 27% of Americans do not have a high-speed connection at home. Connected Nation's studies also indicate that 19.1 million children do not have broadband at home, and 6.1 million of those children live in low-income households. In 2014, Connected Nation also surveyed 4,206 businesses in 7 states. Based on these data, Connected Nation estimates that at least 1.5 million businesses (20%) in the United States do not use broadband technology today.

In this environment, deploying broadband infrastructure, services, and applications, as well as supporting the universal adoption and meaningful use of broadband, are challenging— but required—to advance twenty-first century technologically empowered communities. From healthcare, agriculture, public safety, and tourism, to government, education, libraries, talent, and economic activity, every sector of a community requires the power of broadband and related applications to function at the highest capacity.

One thing is clear, broadband and related technologies have transformed nearly every facet of society. While many of these technology changes can be discussed on a global scale, local community technology advancements depend on community leadership and action. A critical first step in advancing broadband technology is identifying and understanding local assets along with opportunities and barriers to technology advancement. This plan is a roadmap to advancing technology in Ottawa County.

## Why Access, Adoption, and Use?

Connected Nation is dedicated to improving lives through the expansion of broadband and technology access, adoption, and use. It is often asked why we look beyond infrastructure when addressing broadband issues when many other community broadband assessments and studies are focused on the wires in the ground and the signals in the air. Access to infrastructure is only the beginning of a community's journey to fully leverage technology to improve quality of life and community and economic development. Connected Nation, through its Connected program, recognizes that in order to fully participate in a digital economy, communities need to address not only the access to broadband (supply), but also the ways in which it is adopted and used (demand). Wires and wireless signals are useless if they are not leveraged to improve civic engagement, retain families and youth, improve leadership, and develop local human capital.

### Access

Broadband access refers to the infrastructure that enables a high-speed internet connection. Broadband is delivered to a user via several technology platforms including cable, digital subscriber line (DSL—through a phone line), fiber optics, fixed wireless, mobile wireless, and satellite. While these are currently the primary methods of delivery, new innovations and technologies are being developed that continue to improve the efficiency and speed of connectivity.

Broadband availability is essential infrastructure for twenty-first century communities. Broadband empowers a community to access applications ranging from healthcare and education to business and government services. Unfortunately, many communities suffer from inequities of access on several fronts: between income levels; between urban and rural areas; between traditional business areas and nontraditional ones; and in differing levels of service due to geography or infrastructure limitations.

### Adoption

Broadband adoption is a different issue from broadband access. While access refers to one's physical connection to the internet, broadband adoption is the choice made by a resident, business, or institution to embrace and use broadband and its related technologies. Broadband adoption cannot occur without having access to high-speed infrastructure; however, even with access to the internet, broadband adoption may not follow.

Several studies have shown that even with access to broadband, residents, businesses, and institutions may not adopt. Barriers to adoption can often include cost (of either a device used to connect or the cost of the connection itself), lack of relevance to the user, or lack of digital literacy (knowledge and skills associated with the use of digital hardware or software). Lack of broadband infrastructure availability is also cited as a barrier.

The broadband adoption gap (the difference between the number of entities with access to broadband and the number of those same entities that use it), can increase or decrease depending on the demographics of a community. For example, low-income populations have lower adoption rates than those with higher incomes. This same disparity can be found between age cohorts, physical locations, employment status, educational levels, etc. However, regardless of socioeconomic status, demographic composition, or geographic location, every person should have the opportunity to participate in the digital economy.

## Use

The access and adoption of broadband and internet technologies leads to the use of that connection and applications to improve the quality of life of a community. Technology impacts every sector of our economy, and opportunities abound for residents, businesses, and institutions to leverage technology to make improvements in their day-to-day lives and operations.

The well-being of a community involves the complex interaction of several sectors including healthcare, K-12 and higher education, public safety, government, libraries, residents, private-sector businesses, and others. These distinct, yet entwined, sectors (and their many individual parts and entities) contribute to that community's place in the digital economy. As broadband and related technology have developed over time, applications pertinent to each of these sectors have been developed that allow them to function, provide services, generate revenue, and generally operate more efficiently, which impacts their contribution to the community. The use of broadband and technology is critical to the impact these sectors have on the overall quality of life in a community.

While access, adoption, and use form a spectrum of sorts, (i.e., one cannot adopt broadband without having access to it, and one cannot use broadband without adopting it), all three components are equally important for every member of a community to fully realize a digitally inclusive and digitally connected community. The Connected program is designed, and this report is framed, to examine the access, adoption, and use of broadband and technology across every sector of a community.

## The Connected Community Engagement Program

For more than a decade, Connected Nation has been assisting communities in the development of Community Technology Action Plans through various programs that have ultimately progressed into the Connected<sup>sm</sup> program.

The Connected Community Engagement Program is a facilitated broadband and technology planning program designed to address the most pressing technology challenges facing communities today. Connected engages local leaders to evaluate their community's current state of technology access, adoption, and use. Connected offers communities the opportunity to measure the supply, demand, and use of technology in the community with unprecedented data gathering, analysis, and planning. Connected's unique community technology assessment provides insight into the local technology ecosystem, identifies gaps and opportunities, and supports the development of an actionable technology plan to improve the community's standing in the digital economy.

Connected communities benefit in many ways:

Benchmarking and planning: Determine where the community stands in relation to similar places and national benchmarks. Inform a technology planning effort with unprecedented data on infrastructure, adoption, and use. Connected helps communities gather and analyze data on technology use across sectors, from agriculture to education and healthcare to public safety.

Recognition: Leverage Connected certification status and plan as a recruitment tool for residents and industry. Communities need a competitive advantage they can promote in order to thrive.

Network with other communities: Collaborate with other communities and partners—share best practices, spread policy insights, disseminate solutions, gather information, and adapt to evolving opportunities.

Create an empowered and informed community team: The Connected process educates, empowers, and unifies community leaders and cross-sectorial stakeholders to address broadband issues, develop a vision, and manage their action plan.

## Process

In order to determine the state of technology in Ottawa County, the community team participated in a 4-step community engagement process that consisted of:

**Community Team Creation** – Empowering a community team leader (local champion) and creation of a community team composed of a diverse group of local residents from various sectors of the economy including education, government, healthcare, the private sector, and libraries, among many others.

**Technology Assessment** – The community team uses a series of instruments to gather community technology data. These instruments include a sophisticated set of surveys distributed throughout the community to gather hyperlocal data on the access, adoption, and use of broadband and technology that is not available anywhere else. The Connected assessment framework is broken into three categories: Community-Wide Infrastructure, Households, and Community Sectors. The assessment first examines community-wide infrastructure by gathering information from various sources, including the Federal Communications Commission, broadband providers, and others. This analysis provides insight into the “supply” of broadband connectivity in the community.

The assessment then examines the current access, adoption, and use of broadband and technology among households in the community. This provides insight into the residential “demand” for technology and helps identify members of the community that have been excluded from fully participating in the digital economy.

Accompanying the access, adoption, and use analysis of households is a similar analysis for a wide-variety of community sectors. This analysis allows a community to tailor its assessment to the sectors of that community that most closely match the community’s needs, strengths, and aspirations. Communities can choose sectors for assessment from among Agriculture, Business/Economic Development, Talent and Workforce, Government, Healthcare, Higher Education, K-12 Education, Libraries/Community Organizations, Public Safety, and Tourism.

Each part of the assessment has a specific number of points available for the community to earn toward Connected certification. Each of the three portions of the assessment is equally important for a community. The table provides the total points available in each part of the assessment before weighting. Each sector assessment is worth 40 points.

Following the tabulation of the total raw score and subsequent weighting, the community is provided its final Connected Assessment score.

**Action Planning and Project Prioritization** – This process entails the compilation of the results of the assessment, identification of best practices, and priority technology projects by the community team in collaboration with Connected Nation facilitators. Completion of the Community Technology Action Plan marks the beginning of a community’s journey to improving its broadband landscape.

## Connected Certification

Beyond the development of the Community Technology Action Plan, Connected certification recognizes that a community has measurably demonstrated proficiency for effective access, adoption, and use of broadband and broadband-supported technologies. Communities scoring at least 75 points in their Connected assessment are recognized as Connected certified

Connected Assessment Scorecard			
Category	Total Raw Points	Weight	Total Weighted Points
Community-Wide Infrastructure	50	33.33%	33.33
Households	120	33.33%	33.33
Sectors	40 x # of Sectors Assessed	33.33%	33.33
<b>Total Possible Points</b>	170 (plus Sectors)	100%	100
<b>Points Needed for Connected Certification</b>			<b>75</b>

communities. This national platform recognizes communities that are excelling in their pursuit of accelerated access, adoption, and use of broadband. While an exciting accomplishment for any community, it is critical to

stress that Connected certification is not the end of the Connected program. In fact, Connected certification, while recognizing work completed to date, marks the launch of the Community Technology Action Plan. Maintaining community collaboration and progress during plan implementation is a difficult task but one that will result in an improved standing in the digital economy.

Additionally, Connected certified communities, and all communities engaged in the Connected program, are part of a nationwide network of stakeholders all working toward the same goal: improved broadband access, adoption, and use. While every community is different, many share common issues, and Connected works to identify the best practices for solving these issues and shares them with this network. Together, we can work to bring affordable, reliable, and high-capacity infrastructure to underserved areas; promote adoption via skills training and education; and facilitate the advanced use of technology among all sectors to create more sustainable, resilient, and prosperous communities.

## A Note on Broadband Availability Data

Broadband providers are required to file with the FCC a list of census blocks covered by their services twice annually. Under this current census block methodology, if even one household in a given block is served, the entire block is marked as having service. In rural areas, these blocks can be extremely large, increasing the likelihood of overstatement of service in the very areas that need help the most. For example, nationally, there are more than 3,200 census blocks that are larger than the entire District of Columbia (68 square miles in area) and 5 blocks that are larger than the entire state of Connecticut (5,567 square miles in area). Secondly, broadband providers that do not have GIS (geographic information system) capabilities are not able to visualize the spreadsheet-based file of census block IDs being filed through the FCC's Form 477 process to ensure accuracy, resulting in overstated and/or understated coverage reporting. Thirdly, some providers are simply missing from the Form 477 dataset entirely. Lastly, fixed wireless coverage is also reported as full census blocks, instead of service areas developed from propagation modeling. The FCC continues the problematic use of census blocks as the unit of measure for reporting, and thus accepts the well-established and inherent overstatement and understatement that such reporting yields.

Connected Nation and Connect Michigan work to mitigate the census block issue by working directly with broadband providers to help refine their coverage areas and offer them an opportunity to provide more detailed information on the infrastructure availability. Connect Michigan employs a confidence methodology to identify areas that are likely to be overstated and attempt to work with providers in those areas to refine their coverage areas. However, there is no requirement for broadband providers to offer more granular data. Some broadband providers in Michigan are more willing than others to offer more granular data or refine their coverage territory. Finally, Connect Michigan also conducts on-the-ground field validation of broadband coverage and wireless availability when possible. Drive testing and field validation offer an opportunity to reduce overstatement and create a more accurate map; however, this process is time and resource intensive. Data displayed in map form and as tabular data is developed from a combination of direct provider outreach and data collection, FCC Form 477 filings, State Broadband Initiative datasets, and independent research conducted by Connect Michigan. As such, broadband availability at an exact address location cannot be guaranteed, and the aggregate household availability statistics are estimates made using the most up-to-date and accurate information as is available.

# Community Assessment

The following sections provide detailed findings from the Connected Assessment for Ottawa County. Following the development of a broadband team, the community worked to gather data in three critical areas.

The **Community-Wide Infrastructure** section checks to see whether the broadband and technology foundation exists for a community. The criteria within this section endeavors to identify gaps that could affect a local community broadband ecosystem including issues related to last-mile connections, cost, and competition.

**Household** access, adoption, and use are important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The Households component of the Connected Assessment seeks to ensure the ability of all individuals to access and use broadband and to recognize the value of a connection and its impact on quality of life.

Robust use of technology among the intertwined **Sectors** of a community is a critical component of the broadband landscape because it is where the value of broadband can finally be realized. However, without supporting infrastructure and households that can afford, adopt, and use broadband, meaningful use of technology among various sectors is not possible. Meaningful use of broadband occurs when value to individuals, businesses, organizations, and institutions can be realized across the many sectors of a community.

Each section incorporates a series of metrics upon which the community is scored in order to quickly identify gaps and leverage opportunities. The table below contains Ottawa County’s overall Connected Assessment scorecard. The following pages dive into each of the underlying metrics for these sections to provide community stakeholders with an advanced and detailed understanding of the community’s technology strengths, weaknesses, and opportunities.

Ottawa County, Michigan Connected Community Scorecard				
Category	Possible Points	Raw Score	Weight	Weighted Score
<b>Community-Wide Infrastructure</b>	<b>50</b>	<b>50</b>	<b>33.33%</b>	<b>33.33</b>
<b>Households</b>	<b>120</b>	<b>73</b>	<b>33.33%</b>	<b>20.28</b>
<b>Sectors</b>	<b>360</b>	<b>248</b>	<b>33.33%</b>	<b>22.96</b>
<i>Agriculture</i>	40	29		
<i>Business/Economic Development</i>	40	27		
<i>Government</i>	40	27		
<i>Healthcare</i>	40	16		
<i>Higher Education</i>	40	37		
<i>K-12 Education</i>	40	23		
<i>Libraries and Community Organizations</i>	40	35		
<i>Public Safety</i>	40	28		
<i>Talent and Workforce Development</i>	40	26		
				<b>76.57/100</b>

## Community-Wide Infrastructure

Broadband access refers to the infrastructure that enables a high-speed internet connection. There are two primary types of broadband connections: fixed and mobile.

Fixed broadband is delivered to a user via several technology platforms including cable, digital subscriber line (DSL) over a phone line, fiber optics, and fixed wireless. Fixed broadband is designed for stationary use at a fixed location such as a home, business, or institution. Within a location, however, fixed broadband service is often broadcast as a Wi-Fi network to connect nearby devices.

Mobile broadband is a wireless technology used to connect portable devices to the internet. These networks are designed to provide seamless connectivity as the user moves from one location to the next.

Fixed and mobile broadband connections are equally important, but offer different types of functionality and operate on very different network technologies. Fixed and mobile broadband are often used in conjunction with one another and, as such, are not

functional substitutes. However, many households and businesses in rural areas without access to fixed broadband, rely on mobile broadband to substitute for a fixed network connection. While these connections work for some users, mobile broadband connections are often plagued by data caps, weather, vegetation, latency, and other issues of connection reliability and restriction.

Additionally, satellite internet is often a service of last resort in many rural areas. Satellite broadband users often experience the same restrictions of those using mobile broadband as a substitute for a fixed broadband connection. For these reasons, this plan examines fixed and mobile broadband separately. In discussions of fixed broadband access or adoption, satellite and mobile connections are not included.

Broadband availability is essential infrastructure for twenty-first century communities. Broadband empowers a community to access applications ranging from healthcare and education to business and government services. Unfortunately, many communities suffer from inequities of access on several fronts: between income levels; between urban and rural areas; between traditional business areas and nontraditional ones; and differing levels of service due to geography or infrastructure limitations.

Access to broadband is not simply a yes/no scenario. There are several aspects of broadband infrastructure that comprise the quality of the network in a community. For this reason, the

## Highlights

98.1%

Households with access to 25 Mbps internet

3.6%

Households with only one choice for fixed internet service provider

Chester, Grand Haven, Robinson, Port Sheldon, Crockery, Jamestown, and Zeeland Townships

Areas of the community where service gaps persist

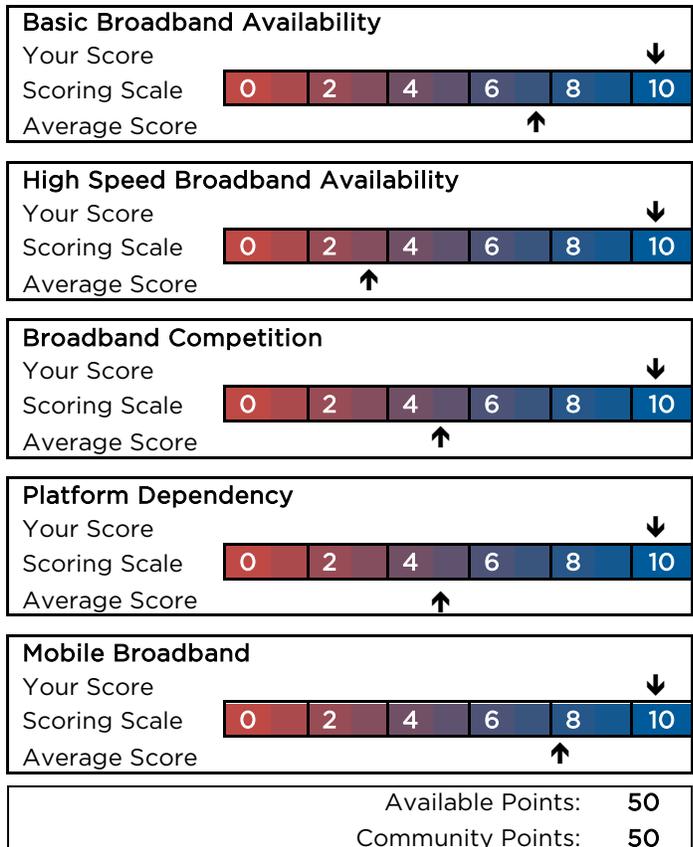
4.1%

Households with access to only one type of internet connection

22

Residential fixed internet service providers

### Community-Wide Infrastructure Assessment Score Summary



Community-Wide Infrastructure section is composed of six interrelated metrics that examine the quantity and quality of broadband in a community. These six areas are residential broadband availability, high-speed availability, competition, platform dependency, mobile broadband, and middle mile.

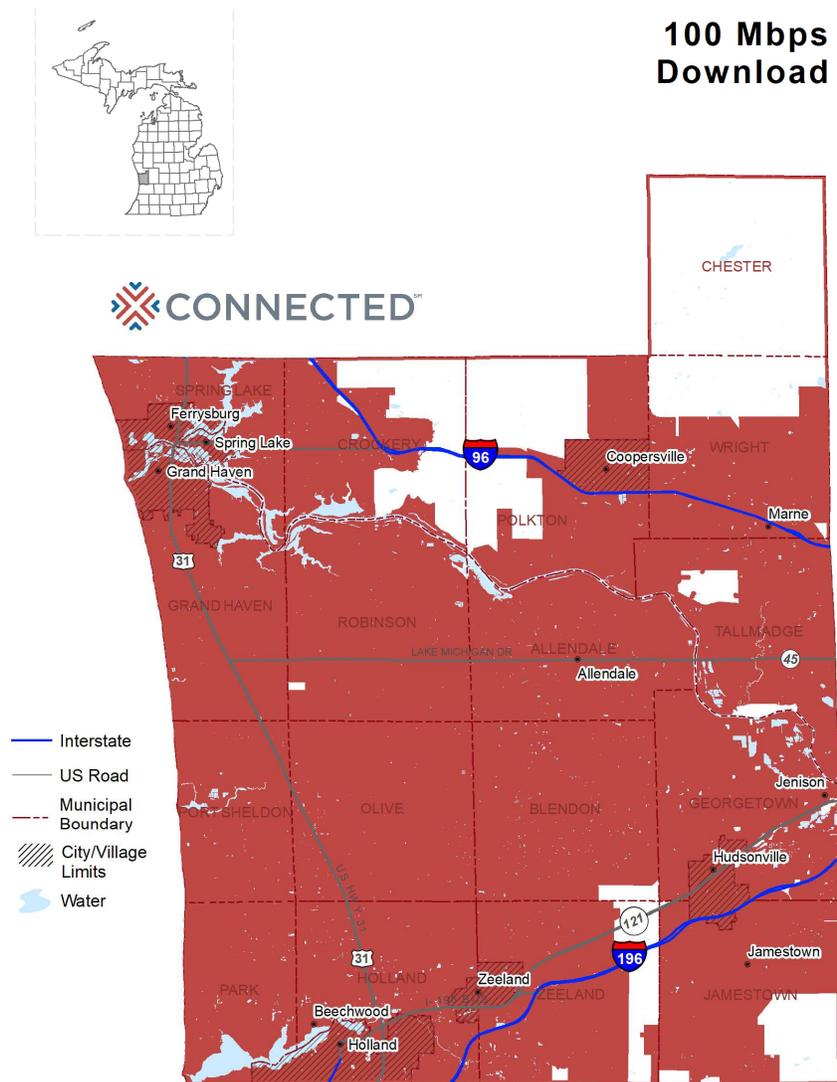


## High-Speed Availability

While the internet connection speed of 25 Mbps download and 3 Mbps upload is the FCC's current definition of "advanced broadband service," this definition must be considered temporary. In 2009, the definition of a broadband connection was 768 Kilobits per second download and 200 Kilobits per second upload. Four years later, in 2013, the FCC revised its definition again to 4 Mbps download and 1 Mbps upload. This moving target will continue upward as residents, businesses, and institutions continue to demand more of their internet connections and new bandwidth-intensive applications are developed. Trying to future-proof the definition of broadband is impossible, but by examining the availability of higher connection speeds, areas in need of intervention can be identified early.

High-speed broadband availability is measured by analyzing the percentage of homes in the community that have access to fixed broadband speeds of at least 100 Mbps download. In 2016, Ottawa County had 100,425 households. As of June 2017, approximately 97.8% had access to broadband of at least 100 Mbps download. On average, 42.6% of households in other Connected participating communities have access to broadband at this speed.

The map of High Speed Broadband Availability provided shows areas with and without broadband service at this speed (areas in white are those without such service). Four providers can offer internet service that can reach 100 Mbps download: AcenTek, Comcast, Charter, and Iserv.

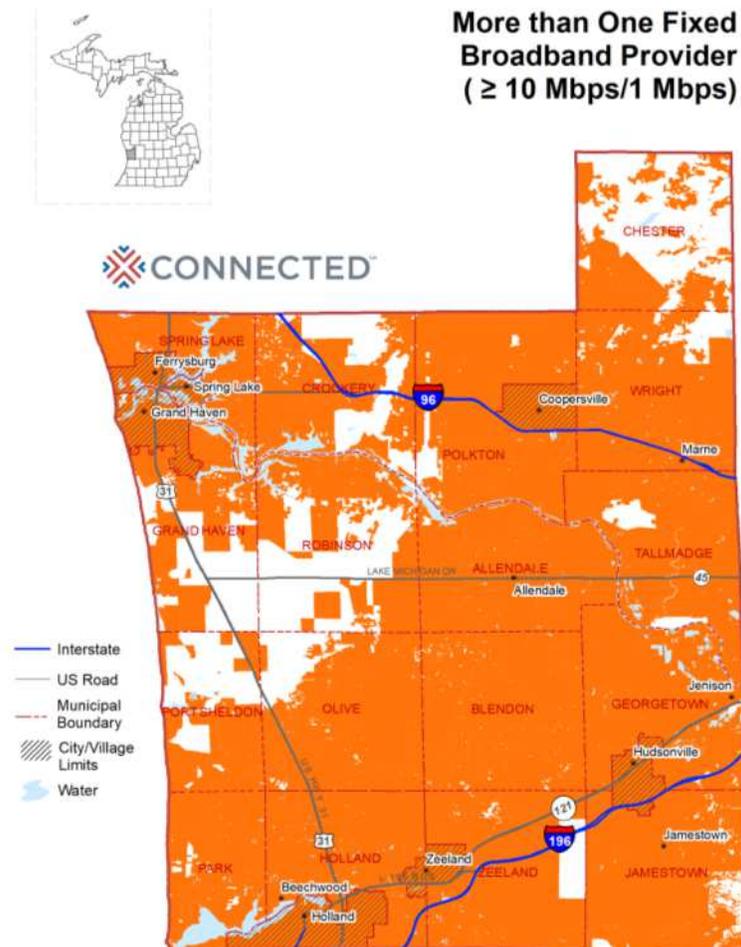


## Competition

In the majority of communities, broadband service is a private-sector industry. Internet connectivity can be delivered via several technology platforms including cable, DSL, fixed wireless, mobile wireless, fiber, and satellite. Companies offering service via these platforms often compete with each other in areas with high household density, but that competition can wane as household density decreases in rural areas. Because broadband service typically responds to market forces, competition impacts the cost of broadband service. Therefore, in theory, the more ISPs available to a consumer the lower the cost of service. More information on broadband cost can be found in the *Households/Affordability* section of this plan.

Broadband competition is measured by analyzing the percentage of homes in the community that have access to two or more fixed, terrestrial broadband providers with service of at least 10 Mbps download and 1 Mbps upload (non-mobile and non-satellite). In 2016, Ottawa County had 100,425 households. As of June 2017, approximately 96.4% had access to an internet connection from two or more providers offering speeds of at least 10 Mbps upstream and 1 Mbps downstream. On average, 67.3% of households in other Connected participating communities have access to two or more broadband providers.

“Competition between broadband services enables consumer alternatives, helps to lower costs, improves services, and induces broadband providers to upgrade their networks. By encouraging competition in communities, communities will benefit directly through the expanded services and competitive prices,” said Tom Wheeler, former chair of the Federal Communications Commission. The map of Broadband Competition provided shows areas with and without access to multiple carriers (areas in white are those without access to two or more providers). Ottawa County is served by twenty fixed technology carriers that provide service to residents and four mobile wireless companies. The list of carriers, their technology platform, maximum advertised download speed, and website is included on the next page. Some carriers offer more than one technology type.



## Ottawa County Broadband Providers

Ottawa County Broadband Providers			
Provider Name	Platform	Maximum Advertised Download Speed (Mbps)	Website
Charter Communications Inc.	Cable	100	<a href="http://www.charter.com">http://www.charter.com</a>
Comcast	Cable	150	<a href="http://www.xfinity.com">http://www.xfinity.com</a>
AcenTek	DSL	10	<a href="http://www.acentek.net">http://www.acentek.net</a>
AT&T Michigan	DSL	75	<a href="http://www.att.com/local/michigan/">http://www.att.com/local/michigan/</a>
Cavalier Telephone	DSL	6	<a href="http://www.windstream.com">http://www.windstream.com</a>
CenturyLink	DSL	85	<a href="http://www.centurylink.com">http://www.centurylink.com</a>
Frontier Communications	DSL	24	<a href="https://frontier.com">https://frontier.com</a>
Global Capacity LLC	DSL	6	<a href="https://globalcapacity.com">https://globalcapacity.com</a>
I-2000, Inc.	DSL	24	<a href="http://www.i2k.net">http://www.i2k.net</a>
Iserv	DSL	10	<a href="http://www.iserv.net">http://www.iserv.net</a>
MegaPath Corporation	DSL	6	<a href="https://www.megapath.com">https://www.megapath.com</a>
AcenTek	Fiber	1000	<a href="http://www.acentek.net">http://www.acentek.net</a>
AT&T Michigan	Fiber	75	<a href="http://www.att.com/local/michigan/">http://www.att.com/local/michigan/</a>
Iserv	Fiber	100	<a href="http://www.iserv.net">http://www.iserv.net</a>
Azulstar, Inc.	Fixed Wireless	6	<a href="http://www.azulstar.com">http://www.azulstar.com</a>
FreedomNet Solutions	Fixed Wireless	25	<a href="http://freedomnet.com">http://freedomnet.com</a>
I-2000, Inc.	Fixed Wireless	12	<a href="http://www.i2k.net">http://www.i2k.net</a>
Michwave Technologies, Inc.	Fixed Wireless	20	<a href="http://www.michwave.com">http://www.michwave.com</a>
NCATS	Fixed Wireless	20	<a href="http://www.ncats.net">http://www.ncats.net</a>
Stratos Networks	Fixed Wireless	10	<a href="http://www.stratospeed.com">http://www.stratospeed.com</a>
West Michigan Broadband	Fixed Wireless	8	<a href="http://www.westmichiganbroadband.com">http://www.westmichiganbroadband.com</a>
West Michigan Wireless ISP	Fixed Wireless	3	<a href="http://www.wmwisp.net">http://www.wmwisp.net</a>
AT&T Mobility	Mobile Wireless	10	<a href="https://www.att.com/shop/wireless.html">https://www.att.com/shop/wireless.html</a>
Sprint	Mobile Wireless	30	<a href="http://www.sprint.com">http://www.sprint.com</a>
T-Mobile	Mobile Wireless	10	<a href="http://www.t-mobile.com">http://www.t-mobile.com</a>
Verizon Wireless	Mobile Wireless	12	<a href="http://www.verizonwireless.com">http://www.verizonwireless.com</a>

## Platform Dependency

The Broadband Competition metric examines how many households have access to two or more ISPs, while the Platform Dependency metric looks at how many households have access to two or more technology types to which they can subscribe. It is important to ensure that households not only have access to multiple ISPs, but also have access to different technology types to meet their needs. Technology choice allows greater flexibility for households looking to find the right company, but also the right speed and connection reliability that meets their needs.

Broadband platform (or type) dependency is measured by analyzing the percentage of homes in the community that have access to two or more fixed broadband technology types with service of at least 10 Mbps download and 1 Mbps upload. In 2016, Ottawa County had 100,425 households. As of June 2017, approximately 95.9% had access to an internet connection from two or more technology platform types offering speeds of at least 10 Mbps upstream and 1 Mbps downstream. The map of Platform Dependency provided shows areas with and without access to multiple technologies (areas in white are those without access to two or more technologies). On average, 65.2% of households in other Connected participating communities have access to two or technology platforms.

The examination of broadband technology platform dependency is similar to that of the analysis of broadband provider competition. Technology platforms included in this analysis include cable, DSL, fixed wireless, and fiber optic (all of which are fixed, terrestrial platforms). Differing technology platforms offer different features and



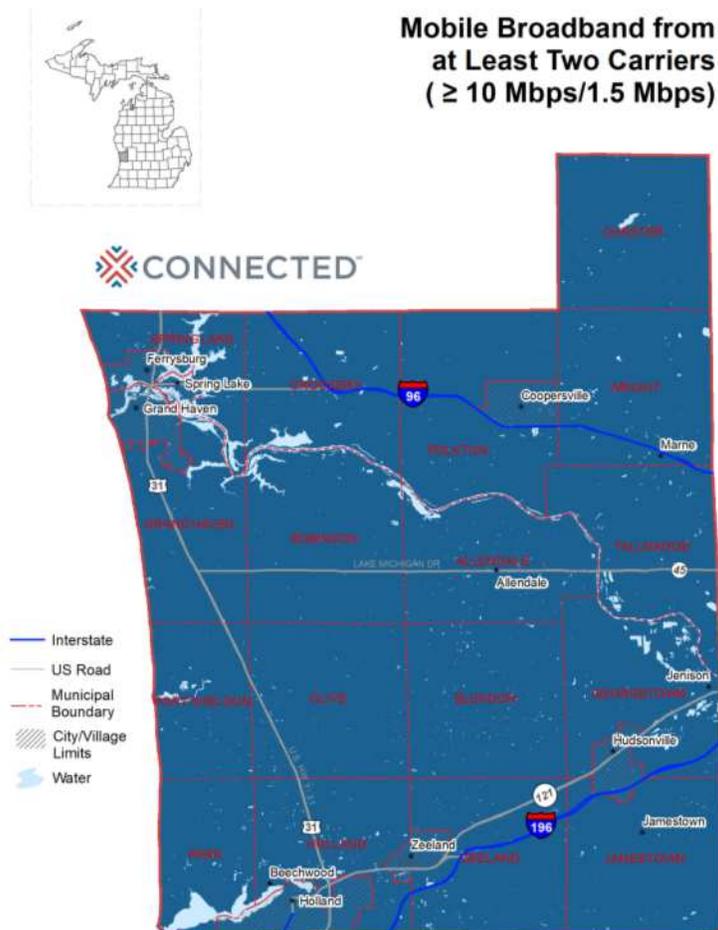
## Mobile Broadband

Mobile broadband is the technology that connects mobile, or cellular, phones to the internet. Mobile technology is designed to operate seamlessly as one moves about either in a car or otherwise. Mobile broadband is not considered in any of the previous infrastructure discussions, as those metrics are concerned with fixed, stationary broadband connections for homes, while mobile is just that—mobile, flexible, and dynamic. For this reason, mobile broadband availability is measured not by percent of households with availability, but by geographic area of the community. There are several factors that can impact the quality and availability of a mobile broadband signal including terrain, elevation, vegetation, man-made structures, weather, and large bodies of water. While some of these features have been considered when mapping and analyzing mobile access, local conditions in the community can greatly impact on-the-ground results.

Mobile broadband is becoming increasingly important to local economies, government services, public safety and utility organizations, as well as local residents. Robust mobile broadband service is key to the development of infrastructural upgrades, such as smart grid and other utility efficiencies, unlocks unlimited opportunities for business development, and provides support for educational, healthcare, and government services.

Mobile broadband availability is measured by examining the percent of geographic area of the community with access to mobile broadband from at least two mobile providers at speeds of at least 10 Mbps download and 1.5 Mbps upload. Ottawa County has a total land area of 563 square miles. As of June 2015, approximately all of this land area had access to two or more mobile broadband providers at the target speed. On average, 91.8% of the geographic area of other Connected participating communities have access to mobile broadband at this speed.

Ottawa County has four mobile broadband providers that serve at least some area of the community. The map of Mobile Broadband provided shows areas with and without access to mobile broadband, (areas in white are those without access to such services). Data for this metric are from June 2015, as more current information is unavailable from the Federal Communications Commission or other source.

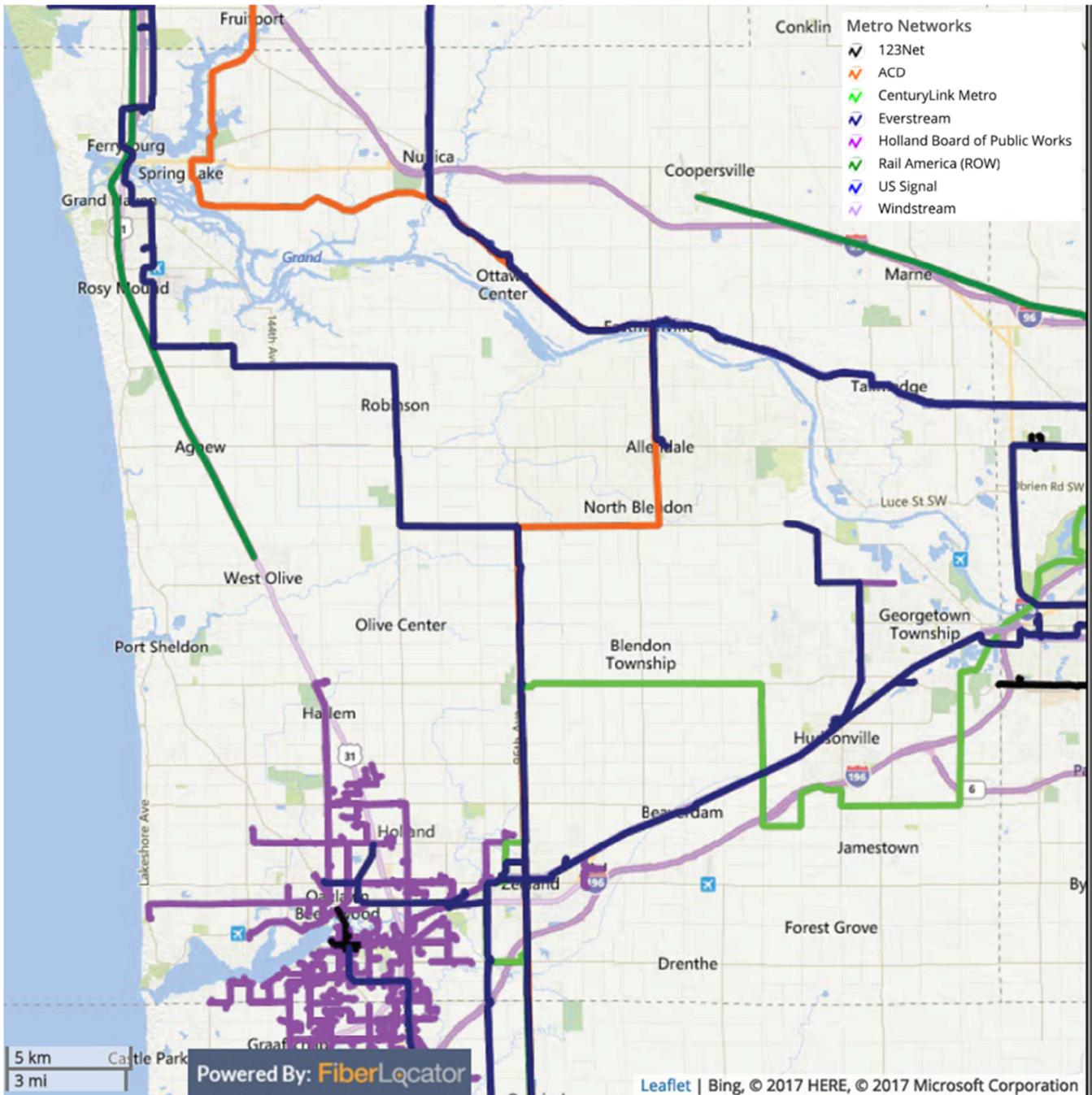


## Middle Mile

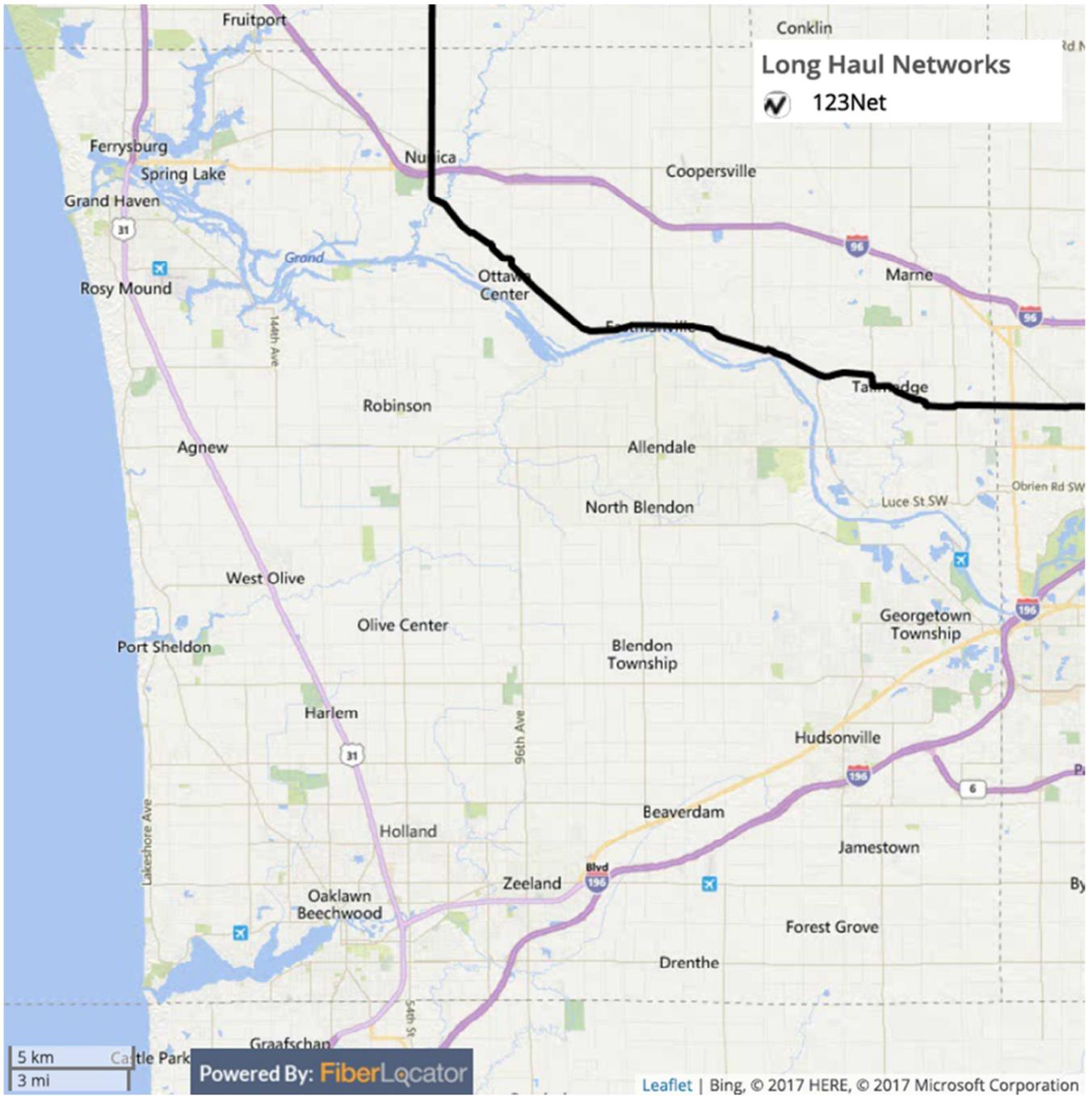
The term “middle mile” refers to segments of the telecommunications network that provide a link between local or “last mile” networks and the global network of internet users and servers. Middle mile is critical for communities as it provides the necessary data transport from local users to the broader internet. Middle mile infrastructure is typically made up of fiber optic cable, although microwave technology can also be used to support middle mile connectivity. A lack of middle mile infrastructure in a community can impact the availability and cost of last mile connections to residents, businesses, and institutions.

The following map provides a glimpse into the fiber-optic infrastructure in Ottawa County.

### Metro Fiber Routes and Carriers



### Long-Haul Fiber Routes and Carriers



## Households

While the Community-Wide Infrastructure section examines broadband access available to residents, businesses, and institutions throughout the community, the Households section examines the ways in which a community's residents access, adopt, and use broadband and related technology in their everyday lives.

While infrastructure information is available and consistent from one community to the next, the detailed assessment of household access, adoption, and use is not. In order to gather this information, the Ottawa County Broadband Team deployed the Connected Residential Technology Survey throughout the community. The survey is designed to gather detailed information on the access, adoption, and use of broadband and technology among residents of the community. The survey, distributed in the summer of 2017, gathered 2,600 responses. This return rate provides for a deep analysis into local issues and barriers preventing residents from leveraging technology to improve quality of life.

The Households section of the Connected assessment examines several areas in order to form a comprehensive view of the technology access, adoption, and use among residents. While each metric has a single identifying variable for scoring, the following pages provide deep insight into each metric to help identify underlying issues that can be remedied through strategic project implementation. The following areas are measured and reported: fixed, home broadband adoption, affordability, digital literacy, digital interaction, frequency of internet use, and frequency of telework. The community's Household metrics summary is on the following page.

## Highlights

23,098

Households without a fixed broadband connection

28%

Households with internet access dissatisfied with current service

- ✓ Households earning \$75k-\$99k annually
- ✓ Households with active or retired military
- ✓ Adults employed part-time or are self-employed
- ✓ Households without school-age children

Groups struggling with digital inclusiveness in the community

6

Average number of internet-enabled devices in the home

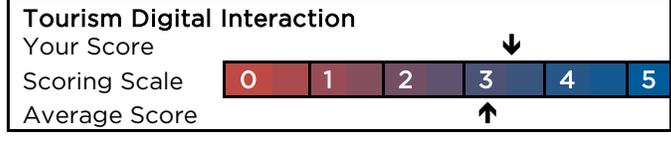
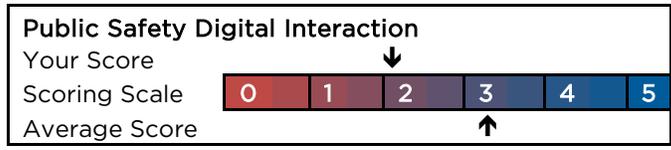
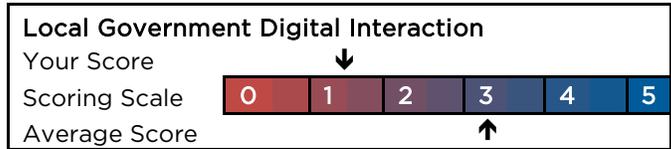
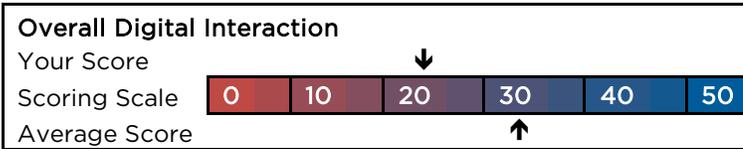
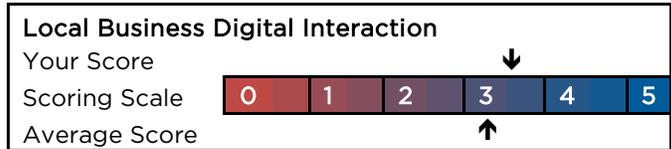
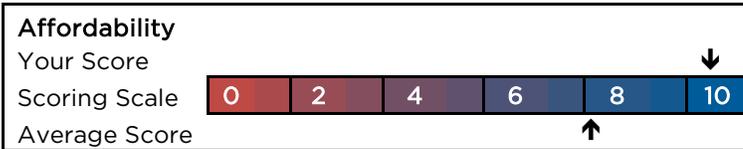
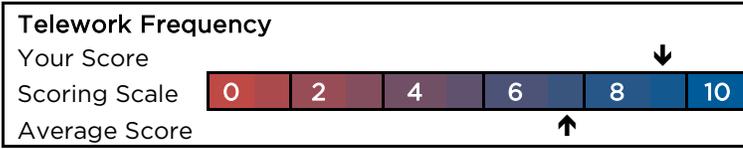
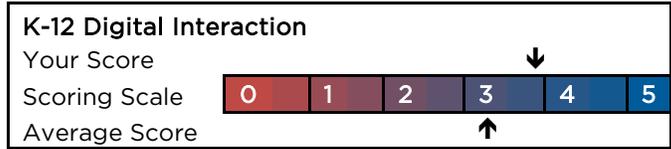
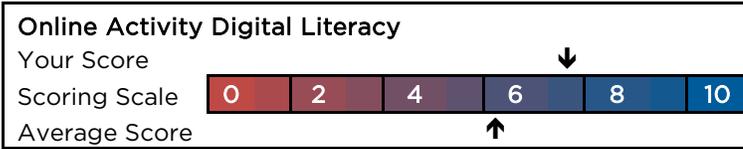
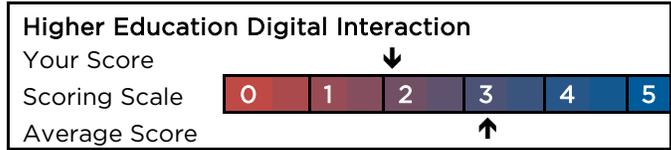
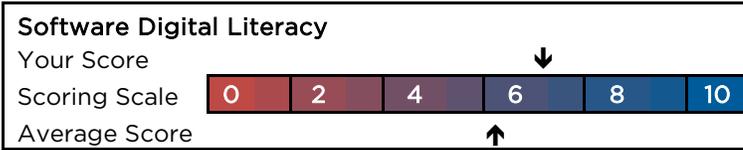
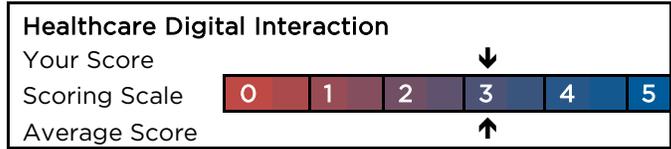
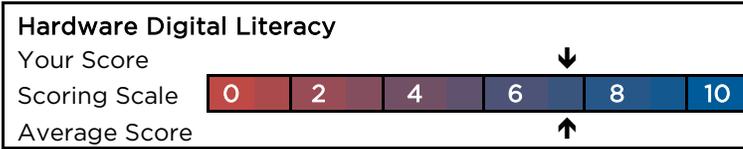
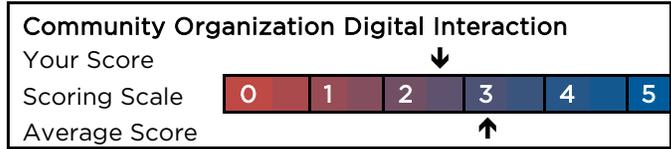
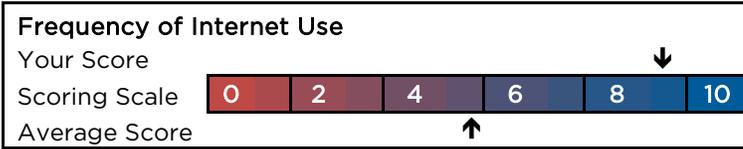
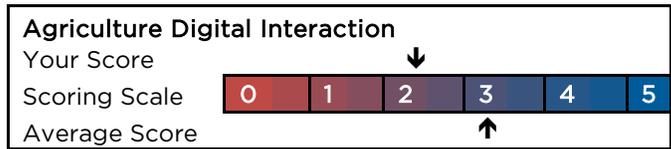
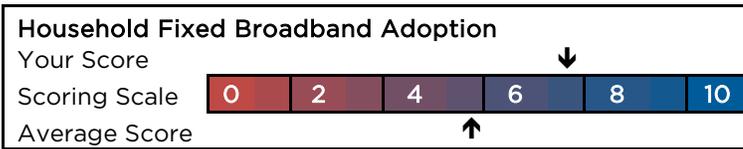
72%

Residents who digitally interact with local businesses at least weekly

37%

Residents who regularly telework

## Households Assessment Score Summary



	Available Points: <b>120</b>
	Community Points: <b>73</b>

## Household Access

### Speed and Platform

The metrics contained in the Community-Wide Infrastructure section examine the broad availability of broadband in the community across several aspects. However, just because broadband is available at certain speeds, does not mean that households and residents are adopting or subscribing to internet service at the maximum speed available. The chart shows the distribution of connection speeds as reported by households in the community.

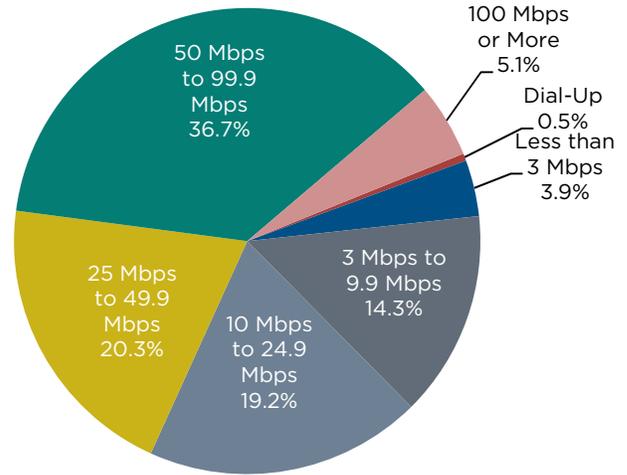
The average download speed among surveyed residents who are aware of their connection speed is 62.2 Mbps. Many community residents subscribe to slower speeds than the FCC benchmark. Additionally, survey results show that only 5.1% of residents report subscribing to 100 Mbps internet service or faster, a speed available in only some areas of the community. Across all Connected participating communities, the average reported connection speed is 41.1 Mbps.

Most respondents report connecting to the internet via a cable or DSL network. Some residents (5%) likely those that live in more rural areas, report using a satellite or mobile broad connection for their internet service. Mobile-only and satellite connections, along with dial-up, are not considered fixed, terrestrial broadband service.

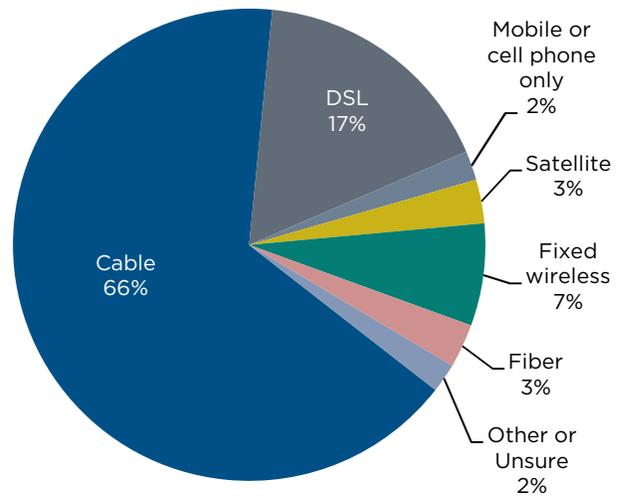
### Satisfaction

Competition provides residents and businesses with choices for service, allowing them the ability to switch providers if their current service does not meet their needs. According to the Residential Survey, 28% of households with a broadband connection state that their current internet service does not meet their needs. Among residents who state that their connection does not meet their needs, 68% state that the speed is too slow, 51% report the connection is unreliable, 69% report the cost is too high, and 28% state that poor customer

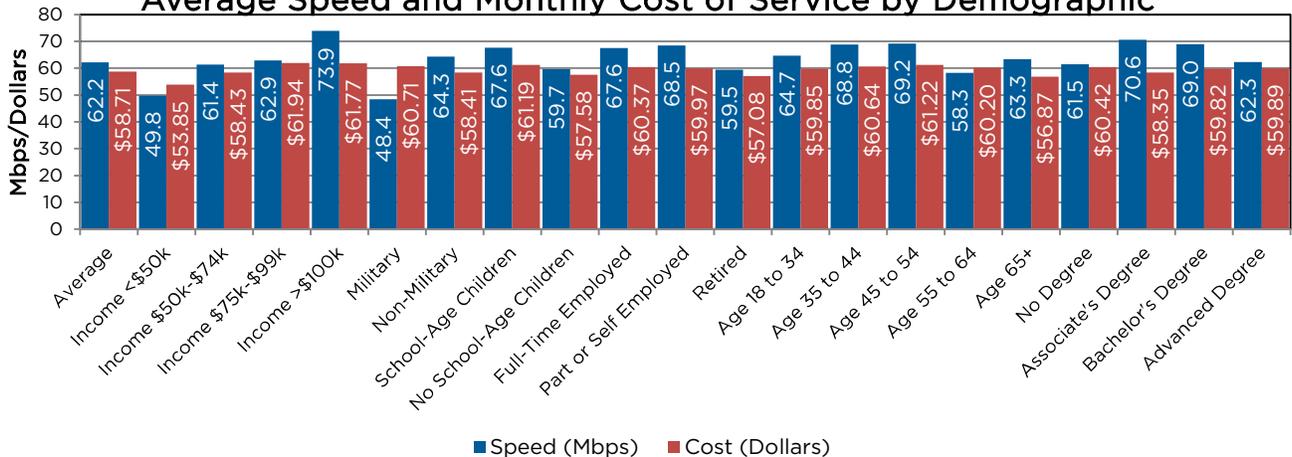
### Household Connections by Download Speed



### Household Connections by Platform



### Average Speed and Monthly Cost of Service by Demographic



service is the reason for dissatisfaction. By comparison, 46.9% of residents across all Connected participating communities indicate their current service does not meet their needs.

Additionally, many households are interested in having additional internet service choices at their location. Nearly all (91%) of responding households indicate that they are interested in having improved or additional internet service options. On average, 91.5% of households across all Connected participating communities indicate they are interested in additional choices for internet service.

Finally, the chart above provides a snapshot of the average connection speed and average monthly connection cost by demographic for the community.

### Household Adoption

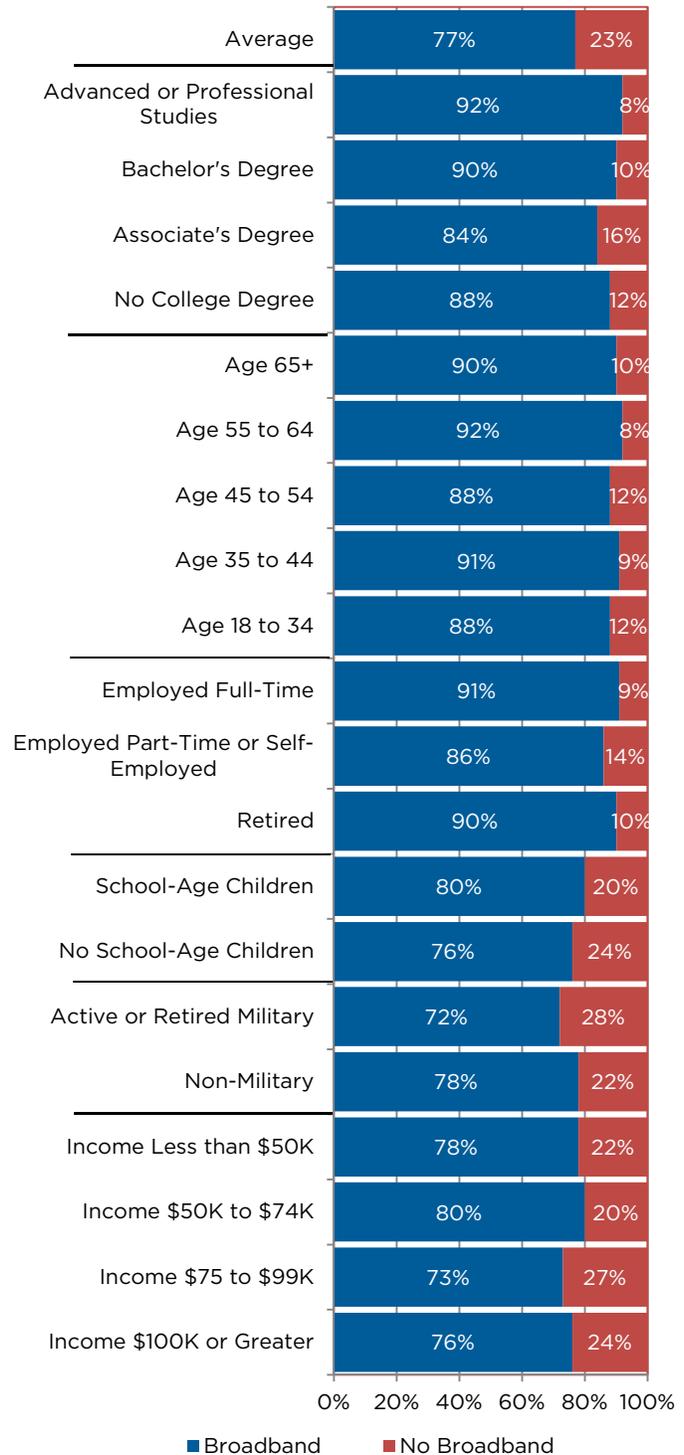
The adoption of home internet service is the single most critical step for families to experience the benefits of being connected to the digital economy. Adoption represents the choice families make to be connected or not. There are several factors that influence broadband adoption. Sometimes these factors are internal and influenced by behavior patterns and knowledge (e.g., digital literacy skill, awareness of benefits, etc.); other times these factors are external and the adopter has little or no control over them (e.g., cost and infrastructure availability). Adoption often follows broadband availability, but not always. With more and more services being conducted in an online environment and an increased desire to digitally communicate, those without a home broadband connection most often seek connections elsewhere, breaking the *access-first-adoption-second* pattern.

Home Broadband Adoption looks at the percent of the community's population that subscribes to (adopts) internet service. In 2016, Ottawa County had 100,425 households. According to the Residential Technology Survey, 77% of households in the community subscribed to internet service with a fixed broadband connection at home, (households indicating internet connections via dial-up, satellite, or mobile-wireless only are not included in this calculation). On average, 67.3% of households across all Connected participating communities subscribe to a fixed broadband connection.

While this statistic provides a macro-level look at adoption in the community, additional survey questions allow for a deeper analysis of adoption in order to find the demographic or socioeconomic groups struggling with digital inclusion.

For comparison, the United States American Community Survey estimates that 74.4% of households across the country have a fixed internet connection. Across Michigan, this figure is lower at 66.1% of households. Adoption

### Fixed Broadband Adoption by Demographic



in Ottawa County is higher than both the national and state average. The following pages explore the adoption of broadband among various groups in the community.

### Digital Divide

The chart provides insight into Home Broadband Adoption among current non-adopters in various demographic groups in the community. From this data, the following observations can be made regarding those on the wrong side of the digital divide in Ottawa County:

- Households earning \$75,000 to \$99,000 annually;
- Households with active or retired members of the military;
- Adults employed part-time or who are self-employed; and
- Households without school-age children.

Barriers to Broadband Adoption Among Current Non-Adopters in Various Groups							
Barrier to Adoption	Not Available	Too Expensive	No Computer	Access the Internet Elsewhere	Dissatisfied with Current Options	Don't need the internet	Other
All Non-Adopting Households	46%	34%	-	7%	3%	2%	8%
Non-Adopting Households w/ Income \$75k to \$99k	59%	13%	-	13%	-	-	14%
Non-adopting Homes without School-Age Children	49%	35%	-	9%	-	-	8%
Non-adopting adults working part-time or are self-employed	65%	29%	-	-	6%	-	-
Non-Adopting Active or retired military households	66%	22%	-	-	-	-	12%
Non-Adopting Households in Other Connected Participating Communities	39%	34%	6%	6%	5%	2%	8%

Once the broadband adoption rates for various socioeconomic and demographic groups have been identified, the next important step is to examine the barriers to broadband adoption among them. This analysis examines the groups of current non-adopters listed above and the barriers they face. The table shows the percent of households in each group that indicated their primary barrier to having a home internet connection.

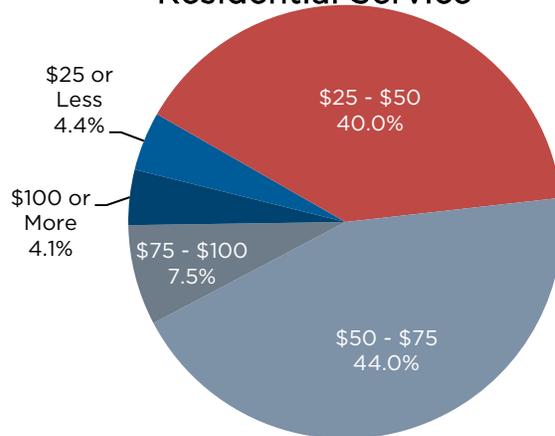
Across Ottawa County, the primary barrier preventing home broadband adoption is a lack of infrastructure. Among all households without a home internet connection, 46% cite a lack of availability as the primary barrier. This is also reflected among all the groups included in the table. The cost of a home internet connection is the second most often cited barrier to adoption. Among all non-adopting residents, 34% say that a home internet connection is too expensive.

### Affordability

The Affordability metric examines one of the primary barriers to broadband and technology adoption. The cost of having an internet connection can stem from several sources, including the monthly cost of service, installation and equipment costs in order to obtain service, and the cost of an internet-enabled device (e.g., computer, tablet, smart phone, etc.). These costs can be a burden for families with lower incomes and thus the choice to connect is controlled by the external cost of service for these households. This disconnection can leave families on the wrong side of the Digital Divide.

The affordability metric compares the average annual cost of internet service in the community as reported through the Residential Technology Survey and the median annual income of the community. In Ottawa County, the average monthly cost of internet service reported by residents is \$58.71. Multiplying this figure by twelve, households in the community pay, on average, \$704.52 per year for internet service. The US Census reports that in 2016, the median household income of the community was \$64,513. Therefore, on average, 1.1% of household income in the community is dedicated to internet service.

Reported Monthly Cost of Residential Service



By comparison, the average monthly cost of internet service in the United States is \$67.12, (according to the FCC). With a median household income across the country of \$53,889, Americans spend approximately 1.49% of their annual income on internet service. Across Michigan, the average price is \$80.56 per month. With a median household income across the state of \$52,492, Michiganders spend 1.84% of their income on broadband. Across all Connected participating communities, households report paying \$58.75 per month, on average, for internet service. While, as a whole, it appears that Ottawa County residents pay less per month for internet service than the national and state rates, a greater share of income among lower income households goes towards paying for internet service.

### Digital Literacy

Digital literacy is the “ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.” This definition of digital literacy from the American Library Association succinctly describes the goals of measuring and improving the digital literacy in a community. Technology skills are critical for competing in the global, digital economy.

The digital literacy metric examines three areas of technology skills: those associated with hardware, software, and online activity and communications. The Digital Literacy metric is examined in the Household Adoption section, (instead of the Household Use section) because, for some, a lack of digital skills can be a barrier to adopting a home broadband connection.

Respondents to the Residential Technology Survey were asked to assess their own technology skills among several devices, applications, and activities within each of the three digital literacy areas on the following scale:

1 = No Experience (“I need to learn.”)

2 = Basic Skill (“I know a little about this technology.”)

3 = Intermediate Skill (“I’m very comfortable using this technology.”)

4 = Advanced Skill (“I could teach this technology to someone else.”)

N/I = Not Interested (“I’m not interested in this technology.”)

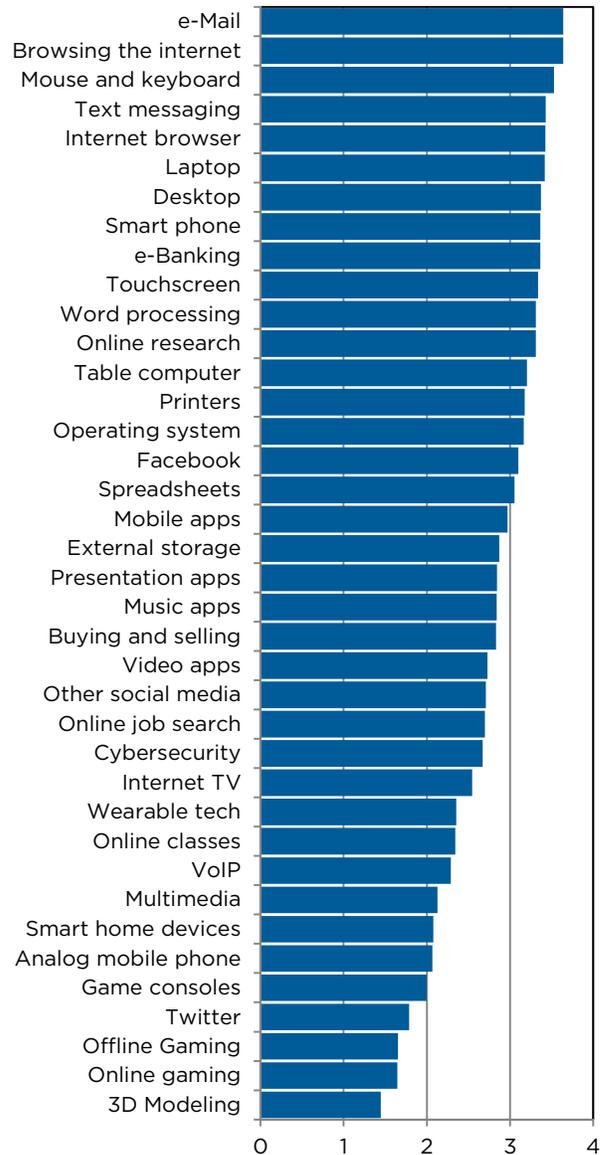
Among all residents in the community, the average score for Hardware Digital Literacy was 2.87, the average score for Software was 2.66 and for Online Activity, 2.83. Across all households participating in the Connected program, the average digital literacy scores are 2.76 for Hardware, 2.59 for Software, and 2.74 for Online Activity.

The chart explores the average overall digital literacy skill for each of the hardware, software, and online activities.

Below are a few notes of interest regarding digital literacy in the community:

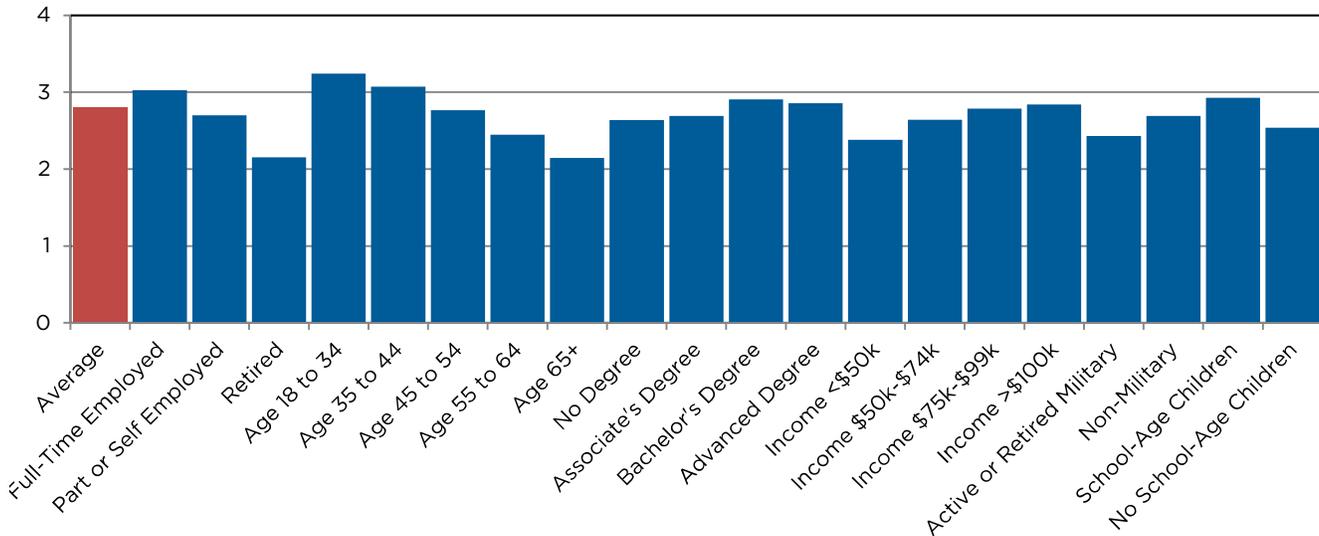
- More than 37% of residents stated that they “know a little about” or “need to learn” about staying safe online. Knowledge of cybersecurity drops significantly with age.

### Average Reported Digital Literacy by Application



- Overall, residents are quite comfortable with the three basic types of computers (i.e., desktop, laptop, and tablet), with an average skill rating of 3.3 across all three devices.
- Knowledge of both smart mobile phones and analog mobile phones tends to decline with age.
- Residents are significantly more comfortable with Facebook than they are with Twitter or other social media platforms, (avg. rating of 3.1, 1.8, and 2.7, respectively).
- Even though a large portion of residents are not proficient with cybersecurity, they are proficient with conducting online banking and bill payment, an activity typically fraught with opportunities for identity exposure or fraud. Nearly nine-tenths (89%) of residents say they are comfortable with e-banking or could teach it to others.

### Average Reported Digital Literacy by Demographic



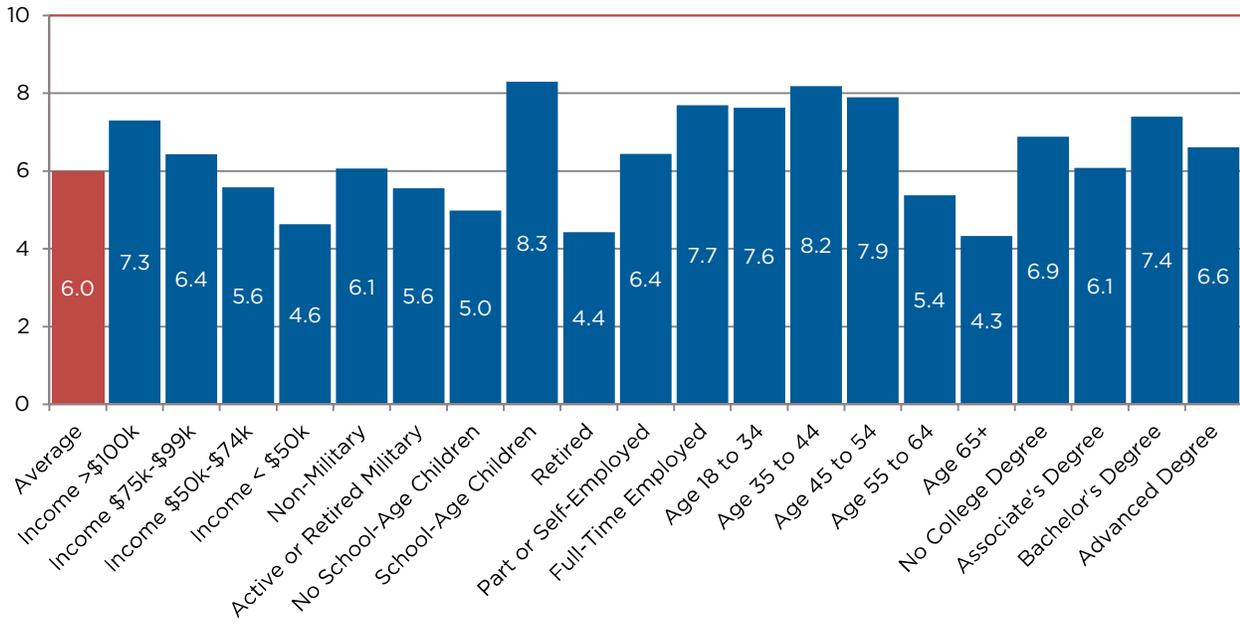
### Devices in the Home

In the early days of the internet, a desktop computer was the primary, and virtually the only, way of connecting to the internet. However, with the rise of Wi-Fi, mobile broadband, Bluetooth, and many other revolutionary technologies, residents have several ways in which they can access the internet. However, as seen in the barriers to broadband adoption chart, lack of an internet-enabled device is sometimes cited as a barrier to home broadband adoption.

The Residential Survey asks residents to report the total number of internet-enabled devices they have in the home. The average number of devices per household in Ottawa County is 6. Across all households in other communities participating in the Connected program, the average number of devices is 6.8.

Households earning less than \$50,000 annually, typically have fewer internet connected devices than those earning more. Adults aged 35-44 report the highest number of devices in the home by age. Additionally, households with school-aged children tend to have more devices than households without K-12 aged children.

### Average Number of Internet-Connected Devices In the Home by Demographic



## Household Use

Households with access to the internet that go on to adopt a high-speed connection, are then ready to use and leverage that connection to improve their quality of life in any way they see fit. From teleworking or operating a small business from home, to accessing e-government services and accessing educational opportunities, there are a myriad of ways in which residents can use their internet connections to enrich their lives. The following examines a few of those ways to provide insight into how Ottawa County residents are leveraging their connections.

## Frequency of Internet Use

The internet has moved from an occasional tool to one of the principal ways we communicate, perform research, work, or participate in leisure activities. Measuring the frequency of internet use among community residents allows a glimpse into the importance of the internet in their lives. More importantly, this analysis can identify the common traits among those who use the internet less frequently and develop solutions for including them in the digital ecosystem.

The Frequency of Internet Use metric is calculated by finding the average frequency with which survey respondents state they access the internet. For Ottawa County the majority of residents access the internet either constantly throughout the day or at least several times each day. Across all communities participating in the Connected program, 94.3% of residents indicate they access the internet at least several times every day.

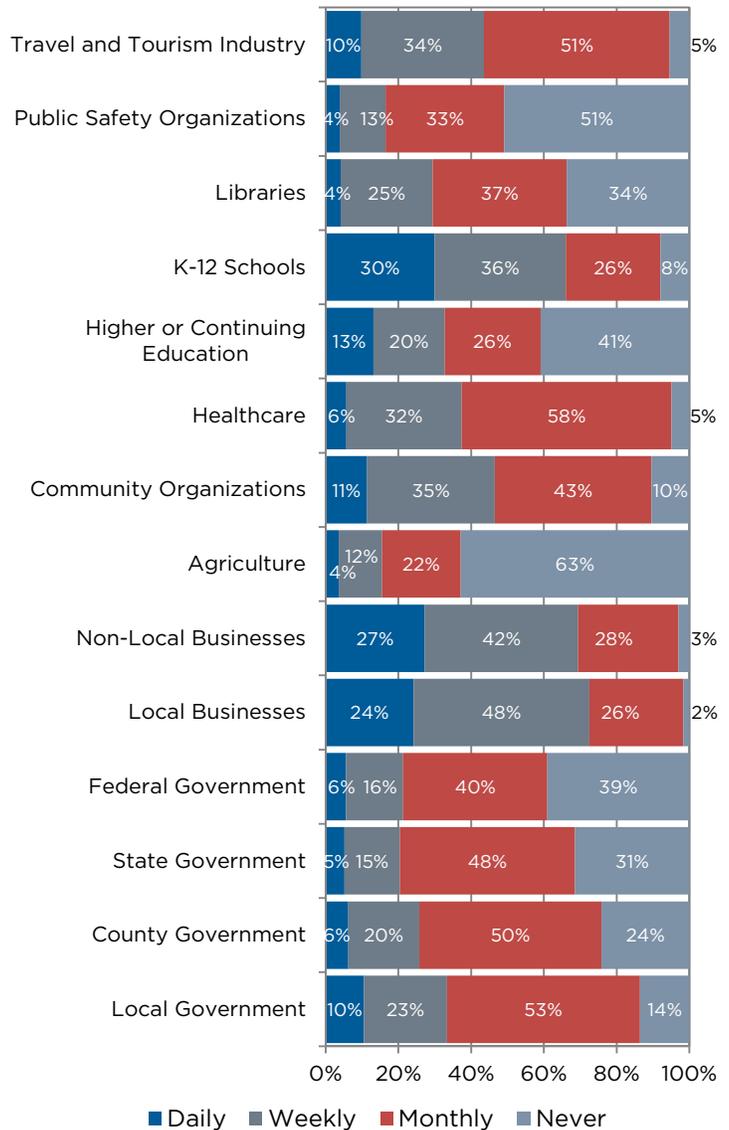
While frequency of internet use is a personal choice, for those completely without or with restricted access to the internet, those who cannot afford a connection, those without the skills to use the internet, and those with limited awareness of the opportunities afforded by the internet, their opportunity to make such a personal choice is severely limited.

## Digital Interaction

The Digital Interaction metric measures the frequency with which residents state they digitally interact with various sectors of the community. Respondents of the Residential Technology Survey were asked to indicate the regularity with which they access online information from or interact electronically with the following sectors/entities: Agriculture, Community Organizations, Healthcare, Higher Education, K-12 Education, Libraries, Local and Non-Local Businesses, Local, County, State, and Federal Government, Public Safety, and Tourism.

While the Frequency of Internet Use metric looks at the overall use of the internet by residents, this metric explores how residents are (or are not) digitally interacting with various community institutions. This information is helpful for guiding and developing the digital strategy and online presence of these entities in the community.

## Frequency of Digital Interaction Between Residents and Community Sectors



The chart provides a summary of the frequency with which residents digitally interact with the various sectors of their community.

Local government enjoys more frequent digital interaction that other levels of government, with 33% of residents reporting they interact with local government online at least weekly. Local and non-local businesses have approximately the same level of digital interaction from residents on a weekly basis. The K-12 schools distribution includes only households with K-12 aged children. Two-thirds (66%) of these households digitally interact with K-12 schools at least weekly, and 30% do so daily. The agriculture sector has the lowest frequency

### Teleworking

Teleworking, or telecommuting, refers to working outside of the conventional workplace and communicating with it by way of telecommunications or computer-based technology. Further, telework is a form of organizing and/or performing work, where work, which could also be performed at the employer’s premises, is carried out away from those premises. Teleworking is a spatially flexible work style that typically also involves greater flexibility in one’s daily routine. Teleworkers typically have higher incomes and higher rates of advanced degree attainment. While traditional teleworkers are often thought of as those in management occupations or professional service industries, recently, technology has enabled new opportunities for teleworkers across the occupational and industry sector spectrum.

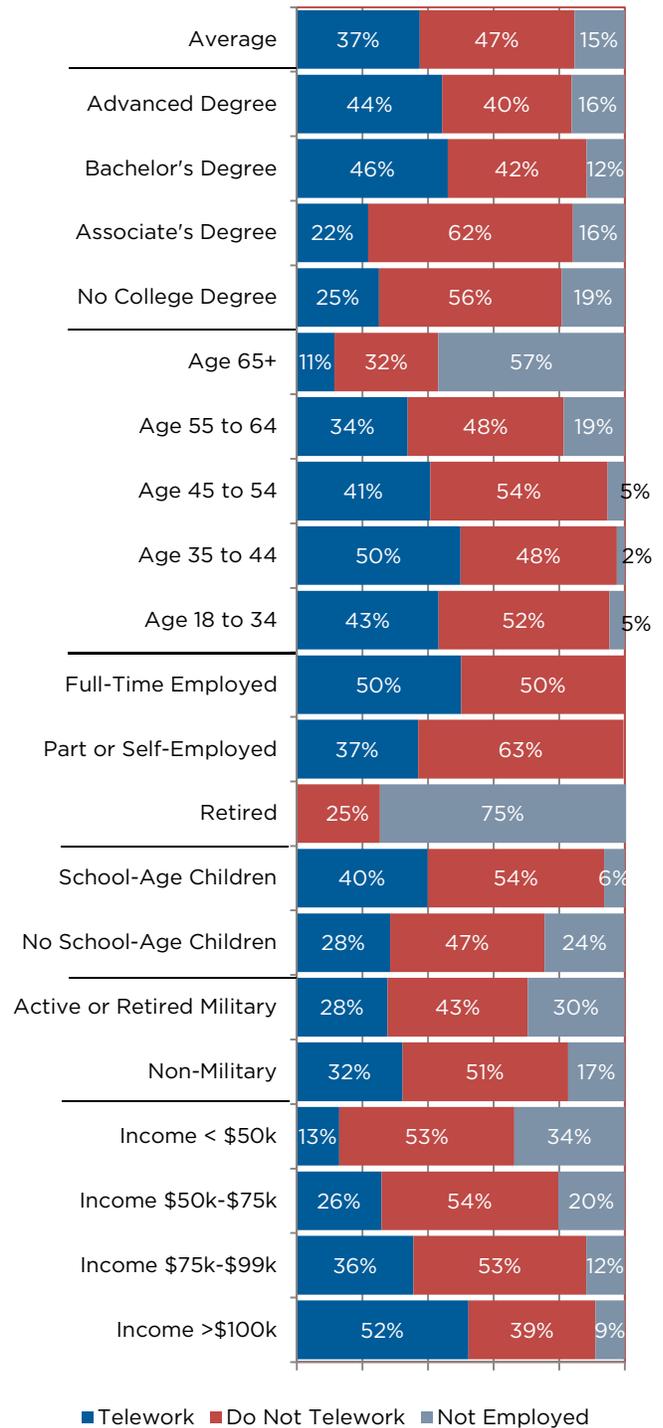
Teleworkers often do not register on typical measures of economic or workforce activity. Traditional economic development strategies typically involve the attraction or retention of employers. While this is a critical part of growing a local economy, telework represents an opportunity to attract or retain employees even though their employer may not be located within the community itself, as long as those employees have access to advanced broadband infrastructure. Across all communities participating in the Connected program, approximately 30.9% of residents indicate that they telework with some frequency.

The Frequency of Telework metric examines the regularity with which residents in the community telework or telecommute. Respondents to the Residential Technology Survey were asked, “Do you currently telework or telecommute in any capacity for your job?”

According to survey results, 37% of residents in the community are teleworkers, a rate slightly higher than the national average.

- Half of adults aged 35 to 44 report that they telework with some frequency.
- Among those with bachelor’s degrees, 46% telework, and 44% with a graduate degree or graduate study report that they telework. Only 25% of those without a college degree report that they telework in some capacity.

### Teleworking by Demographic



- Frequency of telework also follows a pattern of household income. Only 13% of households earning less than \$50,000 annually report that they telework, compared to 52% of those with household incomes greater than \$100,000.
- Nearly half (46%) of teleworkers report teleworking at least several days per week.
- Nearly two-thirds (61%) of current teleworkers would telework more frequently if allowed by their employer.

Shared or co-working office spaces can be an attractive use in city centers, small towns, and other similar environments. Oftentimes, teleworkers need to get out of their home office and socialize with other telecommuters or access office equipment too large or expensive for a home office (e.g., printers, plotters, mailing/postage equipment, etc.). A shared office space facility can provide these functions while bringing workers into a commercial setting to patronize restaurants or other service establishments.

The vast majority (95%) of teleworkers work from a home office, while another 20% work from a restaurant or coffee shop, 6% from a shared or co-working office space, and 5% from the library, (respondents could choose more than one option). More than one-quarter (28%) of teleworkers who do not currently use a shared office space say they would if it were available (43% said they would not, and 24% were unsure).

Additionally, there is a desire among non-teleworkers to take advantage of a telecommuting workstyle if allowed by their employer. Two-thirds (66%) of non-teleworkers said they would telework if enabled as part of their job. Among those wishing to telework by age, 31% are aged 18 to 34 and 27% age 35 to 44. Examining the group of hopeful teleworkers by income, 55% currently earn less than \$75,000 annually.

## Agriculture

Agriculture, in its many forms, is a critical industry and economic driver for many communities and regions. The agriculture industry has experienced a technological revolution since the mid-90s, much like the transformations taking place in every sector of the economy. Internet-connected technology allows agriculture producers to increase yields, reduce expenditures, and access best practices and information impacting the production of America's food. However, producers and value-added agriculture industries are generally located in the most rural areas. As has been echoed for years, rural areas are often left disconnected from the global economy due to a lack of broadband infrastructure. For those farmers fortunate enough to have an internet connection, their use of technology has transformed their operations and allows them to contribute to the economic activity of their communities.

The Agriculture section comprised six different metrics. Data for these metrics is derived from the Agriculture Survey that was distributed to agriculture producers throughout the community, as well as from the Residential Technology Survey. In Ottawa County, survey responses were received from fifteen agriculture producers in the community. Products of the respondents include blueberries, pork, beef, flowers, chicken, tree fruits, hydroponic vegetables, dry beans, wool, corn, wheat, and others.

The Agriculture metrics include operation adoption, operation-wide service, technology-enabled equipment, online activity, and digital communication.

## Highlights

40%

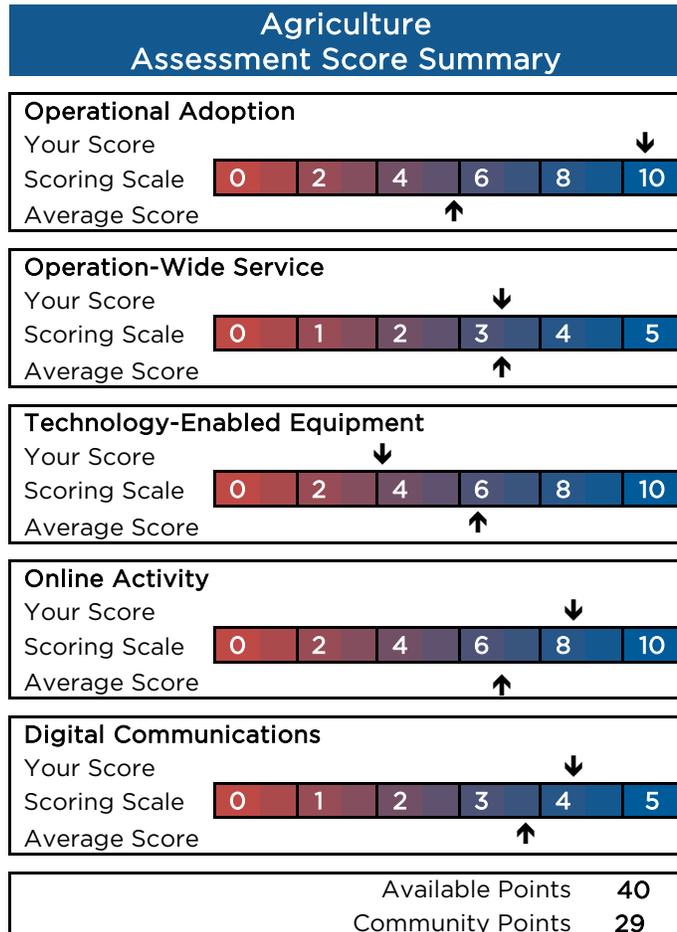
Agriculture operations with internet service less than 10 Mbps

17%

Producers using or planning to use connected equipment on the farm

71%

Agriculture operations using the internet weekly to conduct market research



## Access

### Connections on the Farm

Among agriculture producers in the community with an internet connection, most report connecting with a download speed less than 25 Mbps. The majority of producers (55%) subscribe to DSL internet over the phone lines. Cable internet accounts for 22% of agriculture connections. Additionally, most producers report paying less than \$75 per month for their service. By comparison across all agriculture producers in other participating Connected communities, the average connection speed is 33.3 Mbps and the average cost is \$71.85 per month.

### Operation-Wide Service

Many applications and connected equipment used on the farm require access to a wireless or Wi-Fi network often in remote and rural areas. The Operation-Wide Service metric measures the presence and scale of internet access across the breadth of agricultural operations in the community.

Producers were asked, “Can the internet be accessed throughout your operation?” Eight respondents indicate that they can access the internet throughout their operation. Six respondents said they can access a Wi-Fi network throughout the main operation buildings and immediate surrounding area, and the balance indicate they can access a Wi-Fi network throughout their entire property.

## Adoption

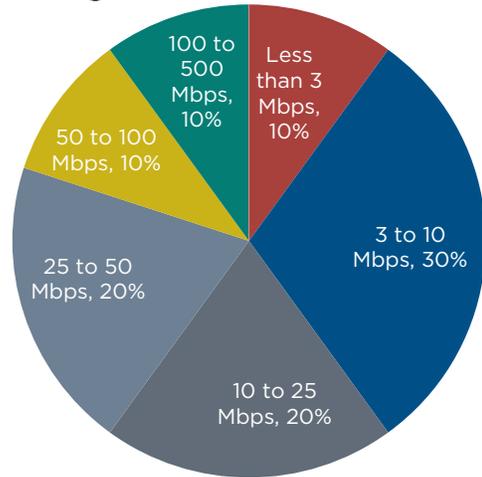
The Operation Adoption metric measures the number of agriculture producers in the community subscribing to internet service. Among respondents to the Agriculture Survey, 93% indicate they subscribe to a fixed broadband service. Often times, agriculture producers rely on a satellite or mobile broadband connection for their operation. These types of connections are not considered fixed broadband service. These types of internet services, while providing basic access, can often be plagued by connection latency, have costly monthly data plans, or can be impacted by weather, terrain, large expanses of open water, and other environmental factors. While no responding producers in Ottawa County indicate they use a satellite or mobile network for their connection, there are likely other agricultural operations in the community that do who did not respond to the survey.

## Use

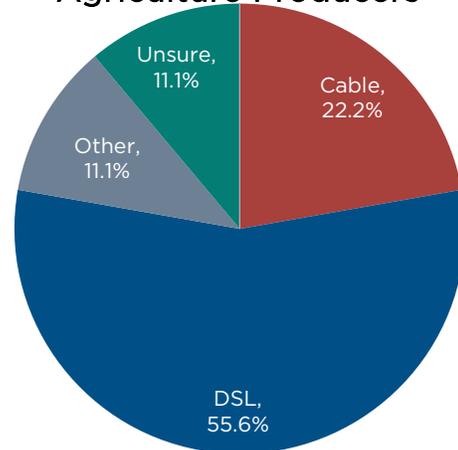
### Technology-Enabled Equipment

Twenty-first century agriculture operations have

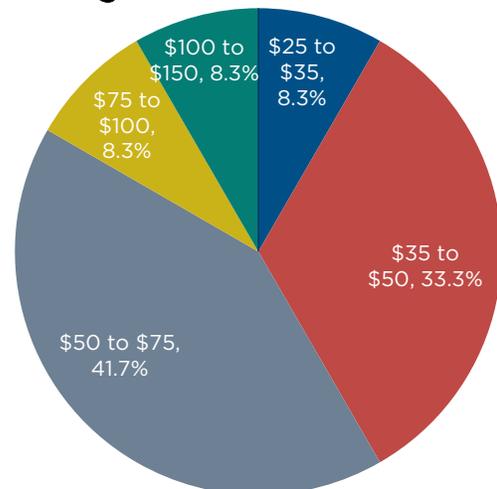
Connection Speed Among Agriculture Producers



Connection Type Among Agriculture Producers



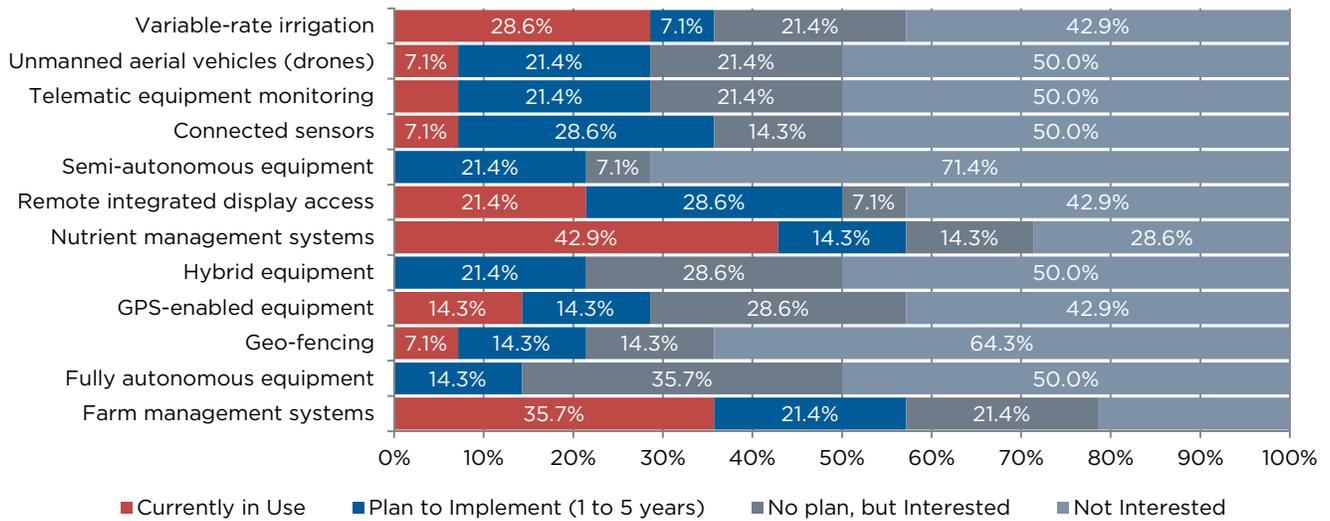
Connection Cost Among Agriculture Producers



many opportunities to use technology to improve efficiency and increase production. Specialty software and connected equipment can help realize these improvements.

Agriculture producers were asked about their current and planned use of a variety of technology-enabled equipment. Among respondents, 17.3% say they currently use or are planning to implement one or more of the various technologies within one year. Among agriculture producers across other Connected participating communities, 22% of agriculture producers indicate they currently use, or plan to use within one year, one or more of the technology-enabled equipment applications. The chart shows the use and interest in the variety of technology-enabled equipment among agriculture producers.

### State of Connected Equipment Implementation Among Agriculture Producers



The two most frequently used technologies are nutrient management systems (42.9% using) and variable rate irrigation systems (28.6% using). The least commonly used are various forms of autonomous or hybrid-fuel equipment. If they didn't currently use or had no plan to implement the various technologies, respondents were asked to indicate if they were interested in the technology or not. The potential for improving the use of technology-enabled equipment among agricultural producers in the community lies with those saying they were interested in learning more about the technology. For example, 35.7% of respondents don't currently use or have a plan to use fully autonomous equipment, but are interested in learning more about how the technology could improve their operation. Similarly, 21.4% are interested in learning more about unmanned aerial vehicles (drones).

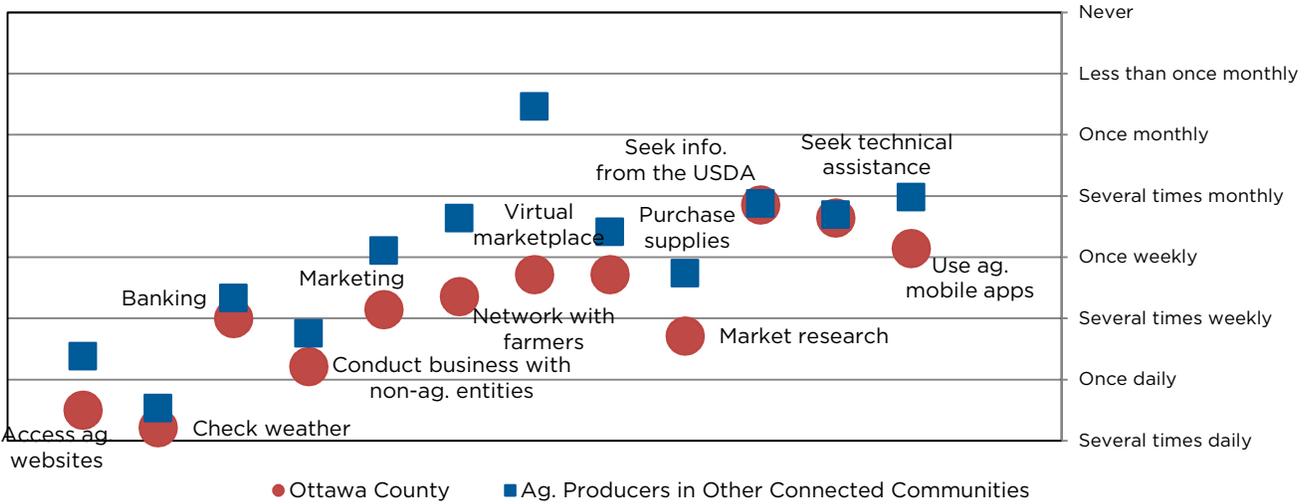
### Online Activity

While technology-enabled equipment can help improve efficiency on the farm, there are also a number of ways agriculture producers can use their internet connections to obtain the same result. An internet connection provides unparalleled access to a host of resources and information.

The chart shows the average frequency with which farmers perform the various online activities. The chart also shows the average frequency of use for these activities among all agriculture producers in Connected participating communities.

The most popular activities among respondents are checking the weather forecast and accessing agriculture-related websites—tasks which are conducted several times each day. This activity is closely followed in frequency by conducting business with non-agriculture businesses or entities, market research, marketing their business, and e-banking. As shown in the chart, ag. producers in Ottawa County tend to be more active online than operations in other Connected participating communities. This is particularly true among producers that participate in a virtual marketplace. In Ottawa County, this activity is performed several times per week, while in other communities, it is done just monthly.

### Frequency of Online Activity Among Agriculture Producers

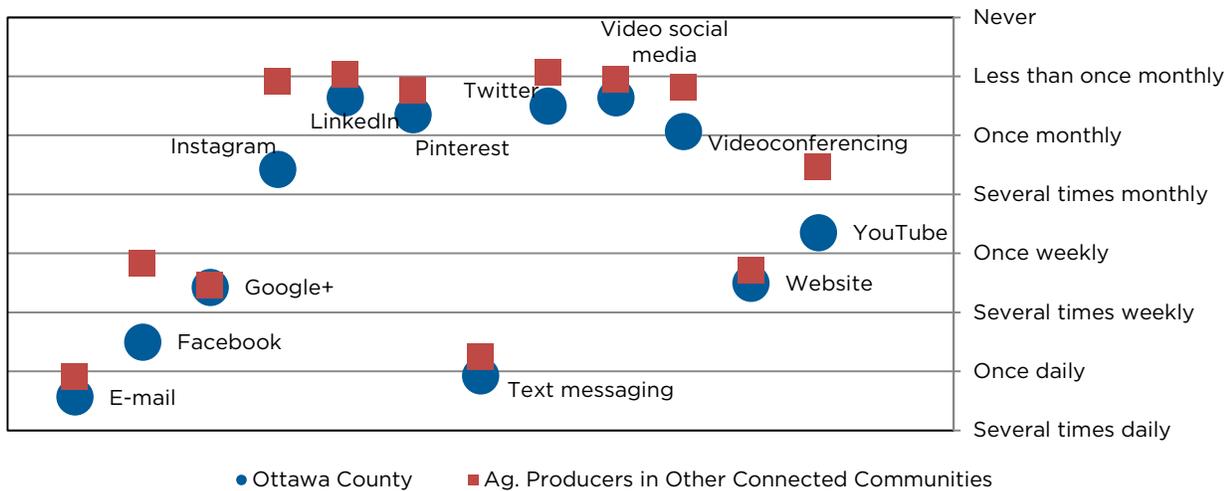


### Digital Communications

Technology coupled with an internet connection provides a myriad of ways to digitally interact with the world or even those in one’s own community. The Digital Communication metric examines how often agriculture producers are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from customers and the community.

The chart shows the average frequency with which agriculture producers use various digital communications tools. The chart also shows the average frequency of use for these tools among all agriculture producers in participating Connected communities across the country. E-mail, text messaging, and Facebook are the most popular platforms, while LinkedIn, Pinterest, Twitter, and video-based media are rarely used. Compared to producers in other Connected communities, those in Ottawa County tend to use the various tools with more frequency.

### Frequency of Digital Communication Among Agriculture Producers



## Business and Economic Development

Positive economic activity in a community depends on the success of its private-sector business establishments to develop new and innovative products, provide services, attract investment, and create jobs. Small business establishment and growth, entrepreneurship, and innovation are hallmarks of the American economic system, and internet connectivity, coupled with new technology, devices, and applications, is perpetuating these ideals in new and exciting ways.

The Business/Economic Development Section has seven metrics that measure the access, adoption, and use of broadband and related technologies in the community among two groups: 1) private-sector business establishments across all sectors (except agriculture and healthcare), and 2) the community's economic development organizations

## Highlights

92%

Businesses with a fixed internet connection

86%

Businesses with a website

42%

Businesses using or planning to use advanced technology applications

63%

Businesses using social media at least weekly

8

Organizations supporting economic development in the community

### Business/Economic Development Assessment Score Summary

<b>Business Broadband Adoption</b>	
Your Score	↓
Scoring Scale	0 1 2 3 4 5
Average Score	↑
<b>Business Website Use</b>	
Your Score	↓
Scoring Scale	0 2 4 6 8 10
Average Score	↑
<b>Business Advanced Use</b>	
Your Score	↓
Scoring Scale	0 1 2 3 4 5
Average Score	↑
<b>Business Digital Communications</b>	
Your Score	↓
Scoring Scale	0 1 2 3 4 5
Average Score	↑
<b>Organization Website Analysis</b>	
Your Score	↓
Scoring Scale	0 2 4 6 8 10
Average Score	↑
<b>Organization Digital Communication</b>	
Your Score	↓
Scoring Scale	0 1 2 3 4 5
Average Score	↑
Available Points	<b>40</b>
Community Points	<b>27</b>

and associations. This structure ensures that technology use is not only promoted for use by businesses, but also among the organizations that work to attract, retain, and grow the economy of the community. Two surveys were distributed throughout the community to capture information for this section. The Business Technology Survey received responses from 87 businesses across Ottawa County. Additionally, the following economic development organizations also participated in the survey: Allendale Area Chamber of Commerce, Chamber of Commerce Grand Haven, Spring Lake, and Ferrysburg, Coopersville Area Chamber of Commerce, Grand Haven Economic Development Corporation, Hudsonville Chamber of Commerce, Lakeshore Advantage, Riverview Group, and West Coast Chamber of Commerce.

The Business/Economic Development metrics among businesses include broadband adoption, website use, advanced application implementation, and digital communication. Among economic development support organizations, metrics include website analysis and digital communication.

## Access

### Connections for Businesses

Just as a home internet connection is critical for residents, a broadband connection for businesses is equally important. The charts provide insight into the speed, platform, and cost of broadband service among Business Survey respondents.

Half of responding businesses connect with a speed less than 50 Mbps. Approximately one in eight of businesses (13.4%) connect with a download speed of 100 Mbps or faster. Approximately 15% of businesses do not know their connection speed. All businesses across all communities participating in the Connected program have an average connection speed of 66.4 Mbps.

Most businesses connect to the web over a cable or DSL network. Additionally, a small number of businesses (3%)

utilize a mobile or satellite broadband connection as their primary source of connectivity. Among businesses in all Connected participating communities, 31.5% subscribe to cable internet, 20.4% to a DSL connection, and 14.5% to a fiber network.

Most responding businesses pay at least \$75 per month for broadband service, and 9.3% indicate they pay more than \$200. The cost of service is generally related to the subscribed to download speed for the business, but some businesses pay more for the same level of service than others. Across all businesses in all Connected participating communities, the average monthly cost of internet service is \$126.00.

Additionally, 29.4% of responding businesses indicate that they offer free Wi-Fi connectivity to the public at their location. Among responding businesses across all Connected participating communities, 25.7% indicate they offer free Wi-Fi to the public.

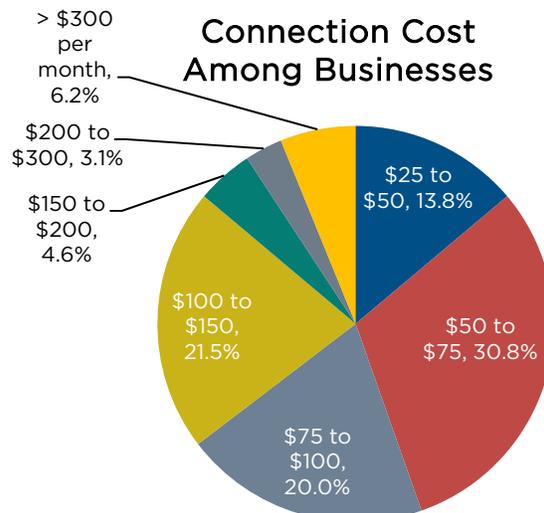
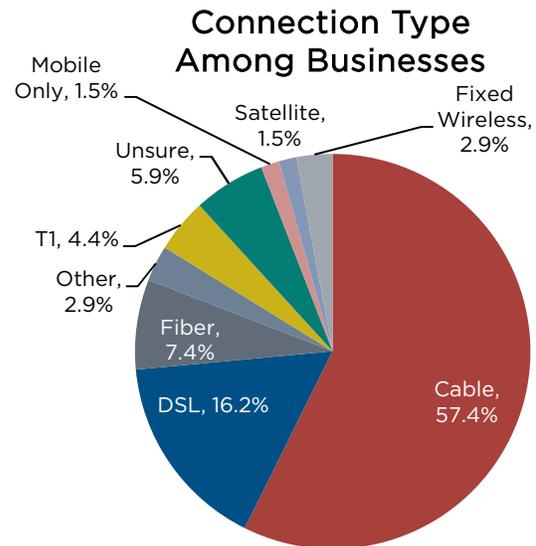
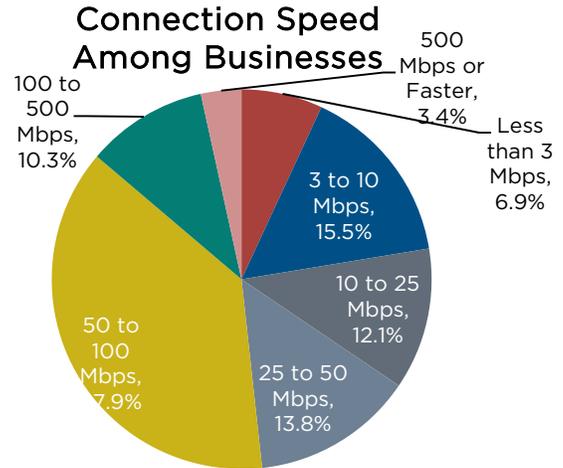
### Connections for Economic Development Organizations

Organizations that support economic development, and similar activities in a community, need to be connected to the internet in order to comprehensively promote the community's many assets to potential businesses, site selectors, visitors, and others. The table provides the speed, platform, and cost of service for each of the responding economic development organizations in the community.

## Adoption

### Business Broadband Adoption

The presence of a broadband connection can be one of the most critical needs for a business looking for a location. Competing in a global economy requires a



competitive advantage, and a broadband connection and its other related technologies, coupled with the adoption and meaningful use of that technology, can provide businesses with a resource to expand their market, create operational efficiencies, and find that advantage.

The Business Broadband Adoption metric measures the percent of businesses in the community that subscribe to, or adopt, broadband at their location. According to the business technology survey, 92% of responding businesses subscribe to fixed broadband service. However, a small

number (3%) of responding businesses have an internet connection through a mobile or satellite broadband network. These types of connections can be plagued by monthly data limits and can be limited by weather, vegetation, and terrain and are not considered in the calculation of fixed broadband adoption for businesses in the community. Among responding businesses without an internet connection, half indicate that internet service is too expensive, and half indicate that it is not needed for their business. Across businesses in all Connected participating communities, 87% have a fixed broadband connection, and 9% rely on a mobile-only or satellite service for their network connectivity.

Economic Development Organization Connectivity		
Organization	Connection Type	Connection Download Speed
Allendale Area Chamber of Commerce	Fiber-optic	50 to 100 Mbps
Chamber of Commerce Grand Haven, Spring Lake, Ferrysburg	DSL	10 to 25 Mbps
Coopersville Area Chamber of Commerce	Provided by school district	
Grand Haven EDC	Fiber-optic	10 to 25 Mbps
Hudsonville Chamber of Commerce	Unsure	10 to 25 Mbps
Lakeshore Advantage	Cable	50 to 100 Mbps
Riverview Group	Unsure	Unsure
West Coast Chamber of Commerce	Fiber-optic	10 to 25 Mbps

## Business Website Adoption

A website is one of the most basic ways in which a business establishes an online presence. A website provides a “virtual face” for a business.

According to the Business Technology Survey, 86.8% of responding businesses in the community have a website. Across all Connected participating communities, 78.7% of business survey respondents indicate that they have a website. Examining survey results further, businesses with annual revenues greater than \$500,000 are more likely to have a website than those with revenues less than \$500,000.

## Organization Website Analysis

Communities often have at least one entity responsible for economic development activities. These organizations are tasked with working to attract new business to the community and support existing and start-up establishments to grow the economy of the area. The website of these organizations may be the first point of contact a potential business or site selector has with the community as they seek a location. Therefore, the websites of these organizations should provide relevant information for their target audience in an easily accessible and flexible digital environment.

The Organization Website Analysis metric examines the website accessibility, experience, marketing, and technology aspects of organizations in the community that support economic development. This analysis is conducted using an online website analysis tool.

The website URL and associated scores are located in the table. The table also contains a link to the full website analysis report for each organization so issues can be quickly identified and fixed if desired. For comparison, the average website analysis score for economic development organizations across all Connected participating communities is 6.41/10.

Economic Development Organization Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
Allendale Area Chamber of Commerce	<a href="http://www.allendalechamber.org">www.allendalechamber.org</a>	8.5	7.3	7.8	5.2	8.0	<a href="http://bit.ly/2zr9DRG">http://bit.ly/2zr9DRG</a>
Chamber Grand Haven, Spring Lake, Ferrysburg	<a href="http://www.grandhavenchamber.org">www.grandhavenchamber.org</a>	8.5	8.3	7.6	5.5	7.8	<a href="http://bit.ly/2zEsMAv">http://bit.ly/2zEsMAv</a>
Coopersville Area Chamber	<a href="http://www.coopersville.com">www.coopersville.com</a>	7.8	6.9	7.5	5.7	7.4	<a href="http://bit.ly/2zqoOB1">http://bit.ly/2zqoOB1</a>
Grand Haven EDC	<a href="http://www.grandhaven.org">www.grandhaven.org</a>	8.8	7.1	5.8	5.8	7.5	<a href="http://bit.ly/2i8m2nE">http://bit.ly/2i8m2nE</a>
Hudsonville Chamber of Commerce	<a href="http://www.hudsonvillechamber.com">www.hudsonvillechamber.com</a>	4.6	5.2	7.1	3.3	5.0	<a href="http://bit.ly/2zIMwIQ">http://bit.ly/2zIMwIQ</a>
Lakeshore Advantage	<a href="http://www.lakeshoreadvantage.com">www.lakeshoreadvantage.com</a>	6.1	6.2	6.9	4.9	6.5	<a href="http://bit.ly/2zpd2hY">http://bit.ly/2zpd2hY</a>
Riverview Group	No Website						
West Coast Chamber of Commerce	<a href="http://www.westcoastchamber.org">www.westcoastchamber.org</a>	8.4	8.3	8.1	7.9	8.4	<a href="http://bit.ly/2yEvZ2W">http://bit.ly/2yEvZ2W</a>

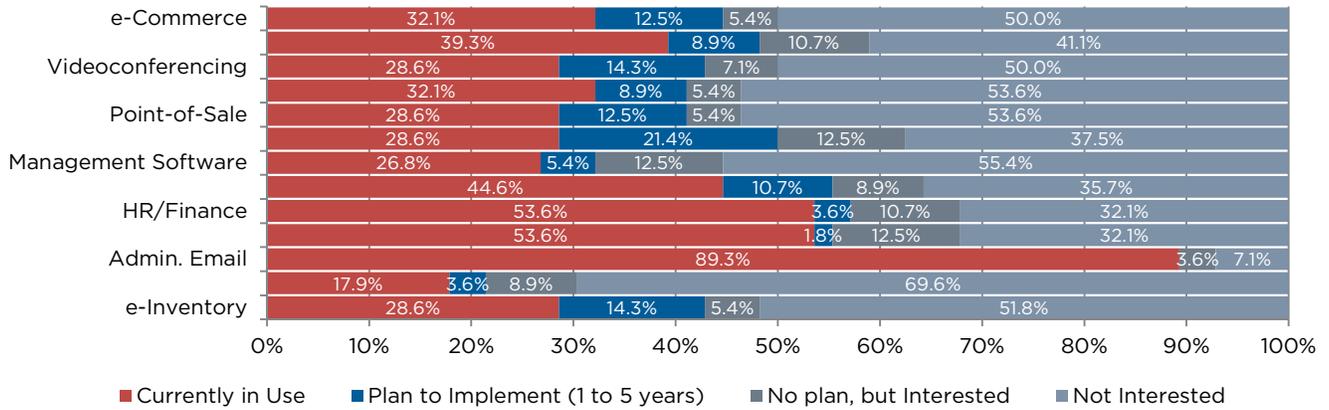
## Use

### Business Advanced Applications

Beyond a website, there are many internet-enabled technologies that can benefit businesses of all types. These technologies are aimed at increasing revenue and reducing expenditures to give businesses a competitive advantage. In the Business Technology Survey, respondents were asked to identify the advanced applications of technology they are currently using or plan to implement. In Ottawa County, 42.4% of businesses either currently use or plan to implement one or more of the advanced applications within one year. Across responding businesses from all Connected participating communities, 44.6% of businesses either currently use or plan to implement one or more of the advanced applications within one year. The advanced applications include:

- Electronic inventory device or software
- Electronic supply chain management resources
- E-mail service for at least 75% of administrative staff
- Employer-issued mobile device for at least 50% of administrative staff
- Human resources or finance-related software
- Participating in industry-specific online directories and aggregation services
- Industry-specific management or performance monitoring software
- Interactive online customer experience
- Point-of-sale software
- Teleworking policy for employees
- Videoconferencing used regularly
- Voice over Internet Protocol (VoIP) phone service
- Web-based e-commerce application

## State of Advanced Application Implementation Among Businesses



The three most common applications currently in use included e-mail service for at least 75% of administrative staff (89.3%), human resources or finance software (53.1%), and mobile devices for at least 50% of staff, (53.1%). The chart provides more information on the implementation state of each advanced application across all businesses.

While not every business has a need for every one of these advanced applications, there may be opportunities to leverage these technologies to help sustain and grow businesses in the community.

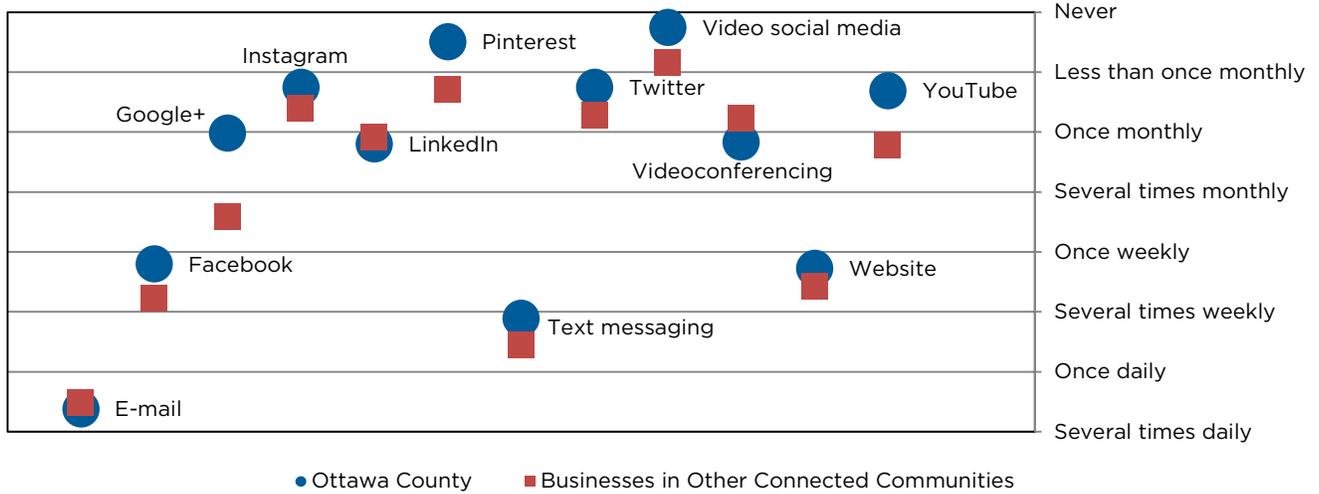
Among respondents, 9% state that they plan to implement one or more of the advanced applications within the next five years. More interesting are the 8.3% of businesses that state they have no plan to implement one or more of the advanced applications, but are interested in the technology. These businesses represent an opportunity for the community to educate and build awareness for how technology can enhance a business plan.

### Business Digital Communications

Similar to the use of internet-enabled technologies, broadband also enables businesses to communicate electronically with clients, potential customers, and colleagues. The Frequency of Business Digital Communication metric examines how often local businesses are leveraging digital tools and social media.

The chart shows the average frequency of use for each of the digital communications tools included in the survey. Additionally, the chart shows the average frequency of use of these tools by all responding businesses across other Connected participating communities.

### Frequency of Digital Communication Among Local Businesses



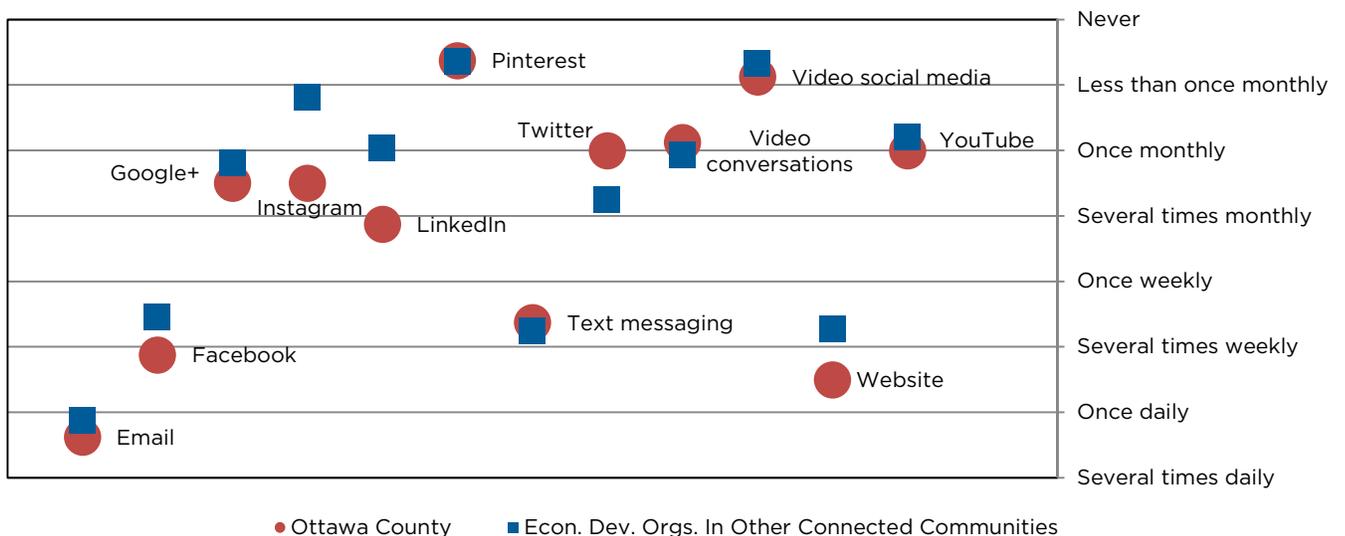
E-mail, text messaging, Facebook, and website updates are the most popular tools among businesses. Google+, LinkedIn, and Twitter represent the next most popular platforms for digital communication. Video-based social media is rarely used. Overall, businesses in Ottawa County generally use the listed digital communications tools slightly less frequently than businesses in other Connected participating communities.

### Organization Digital Communications

Digital communications tools are critical for economic development organizations to converse with potential businesses and site selectors as well as to market the assets of a community. Similar to the Frequency of Business Digital Communications, this metric examines the use of digital communications tools by the community’s organizations that support economic development activities.

The chart provides the average frequency with which economic development organizations use various digital communications platforms. The chart also provides a comparison to the use of these same tools among all economic development organizations from other Connected participating communities.

### Frequency of Digital Communication Among Economic Development Organizations



The digital communications strategies across all the responding organizations are quite similar and most frequently use e-mail, text messaging, Facebook, and website updates to communicate with the public. Twitter, LinkedIn, Instagram, and Google+ are the next set of popular tools among these organizations. Video-based tools are rarely used. Compared to economic development organizations in other Connected participating communities, organizations in Ottawa County tend to use the various tools slightly more frequently.

## Government

Residents and businesses in a community are served by several local units of government. From municipalities such as cities, villages, and townships, to boroughs, counties, regional development groups, and others, communities comprise several overlapping jurisdictions, all with varying responsibilities. Internet connectivity and related broadband-enabled applications, allows municipalities to take advantage of new and innovative ways to deliver existing or additional services to the public. E-government services allow citizens to conduct business and communicate with their local units of government more efficiently and conveniently, allowing for great civic participation and efficient use of public resources.

The Government section has three metrics that measure the access, adoption, and use of broadband and related technologies among the local units of government within the community. Surveys were distributed to all local units of government within the community. Partial or complete survey responses were received from eighteen municipalities or governmental entities providing insight into their broadband access, adoption, and use including: Blendon Township, City of Coopersville, City of Ferrysburg, City of Grand Haven, City of Zeeland, Holland Area Community Swimming Pool Authority, Holland Charter Township, Jamestown Charter Township, Olive Township, Ottawa County, Ottawa County Road Commission, Polkton Charter Township, Port Sheldon Township, Ottawa County Health Department, Robinson Township, Spring Lake Township, Tallmadge Charter Township, and Zeeland Charter Township. Metrics for the Government section include website analysis, digital communication, and advanced application use.

9  
6.5/10  
50%  
35.5%

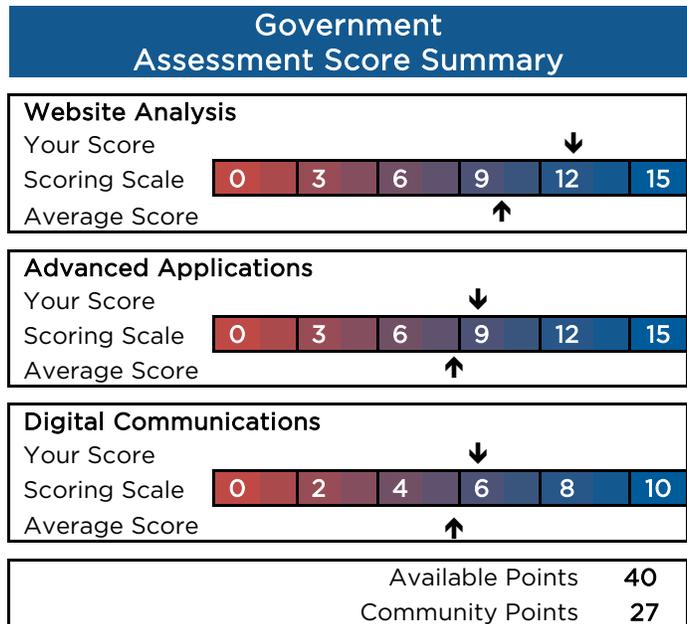
## Highlights

Municipalities with download speeds greater than 50 Mbps

Average municipal website analysis score

Municipalities with a social media presence

Municipalities using or planning to use more advanced technology applications



## Access

Just as with residents, businesses, and other institutions, the broadband connectivity available to and adopted by municipalities allows or limits the ability of that entity to offer e-government services to citizens. As the government connectivity table shows, the connection speed of municipalities is relatively similar across the county. The average connection speed for municipalities in other Connected communities is 98 Mbps. Additionally, Ferrysburg, Zeeland, Holland Area Community Swimming Pool Authority, Holland Charter Township, and Polkton Charter Township offer free Wi-Fi to the public at their location. In other Connected communities, 39% of municipalities offer free Wi-Fi to the public at their offices.

Government Connectivity		
Municipality	Connection Type	Connection Download Speed
Blendon Township	Cable	50 to 100 Mbps
City of Coopersville	T-1	50 to 100 Mbps
City of Ferrysburg	Fiber	25 to 50 Mbps
City of Grand Haven	Not provided	
City of Zeeland	Fiber	50 to 100 Mbps
Holland Area Community Swimming Pool Authority	Unsure	50 to 100 Mbps
Holland Charter Township	Fiber	Unsure
Jamestown Charter Township	Cable	50 to 100 Mbps
Olive Township	Fiber	50 to 100 Mbps
Ottawa County	Unsure	Unsure
Ottawa County Health Department	Unsure	Unsure
Ottawa County Road Commission	Fiber	10 to 25 Mbps
Polkton Charter Township	Fiber	3 to 10 Mbps
Port Sheldon Township	Fiber	Unsure
Robinson Township	Cable	50 to 100 Mbps
Spring Lake Township	Fiber	50 to 100 Mbps
Tallmadge Charter Township	Cable	50 to 100 Mbps
Zeeland Charter Township	Cable	Unsure

## Adoption

The website of a local government may be the first point of contact a resident or business may have with the municipality when an issue arises or information is required. The websites of local governments, therefore, should provide relevant information for their citizens in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's local governments. This analysis is conducted using an online website analysis tool. The Government Website Analysis table contains a link to the full website analysis report for each participating community. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

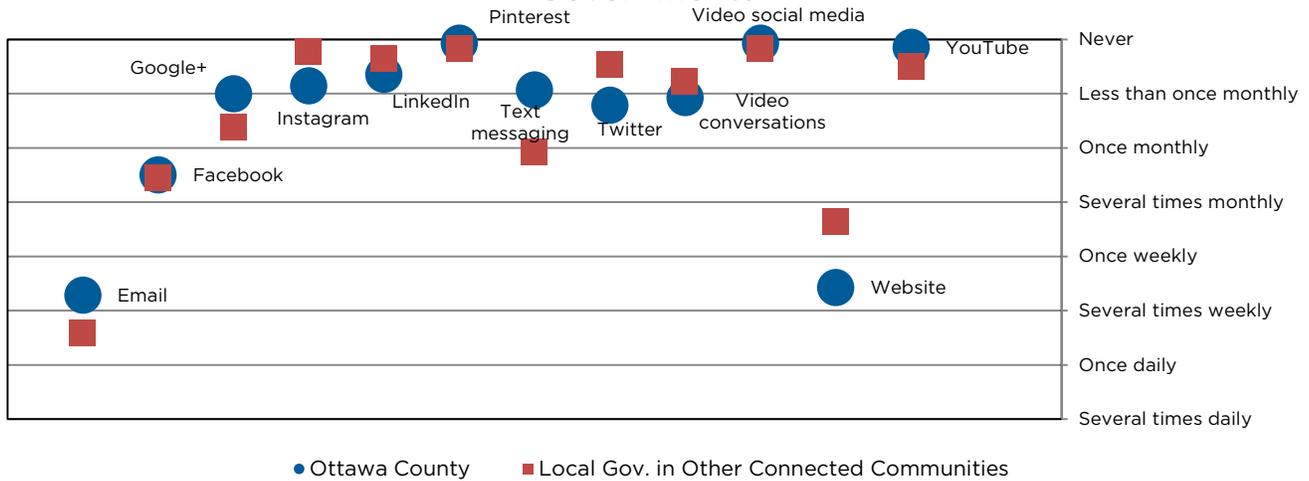
Government Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
Blendon Township	<a href="http://www.blendontownship-mi.gov">www.blendontownship-mi.gov</a>	5.8	3.2	2.9	2.9	4.2	<a href="http://bit.ly/2iFTga6">http://bit.ly/2iFTga6</a>
City of Coopersville	<a href="http://www.cityofcoopersville.com">www.cityofcoopersville.com</a>	5.8	6.3	7.2	4.6	6.3	<a href="http://bit.ly/2AtBGxO">http://bit.ly/2AtBGxO</a>
City of Ferrysburg	<a href="http://www.ferrysburg.org">www.ferrysburg.org</a>	6.1	4.2	5.2	5.3	5.9	<a href="http://bit.ly/2yh2y2D">http://bit.ly/2yh2y2D</a>
City of Grand Haven	<a href="http://www.grandhaven.org">www.grandhaven.org</a>	8.8	7.1	5.8	5.8	7.5	<a href="http://bit.ly/2yi9AnM">http://bit.ly/2yi9AnM</a>
City of Zeeland	<a href="http://www.ci.zeeland.mi.us">www.ci.zeeland.mi.us</a>	9.0	6.7	5.2	6.2	7.8	<a href="http://bit.ly/2hfCRJ6">http://bit.ly/2hfCRJ6</a>
Holland Area Community Swimming Pool Authority	<a href="http://www.hollandaquaticcenter.org">www.hollandaquaticcenter.org</a>	8.3	7.5	6.8	5.9	6.6	<a href="http://bit.ly/2zo1s9i">http://bit.ly/2zo1s9i</a>
Holland Charter Township	<a href="http://www.hct.holland.mi.us">www.hct.holland.mi.us</a>	7.0	4.2	4.6	4.5	5.7	<a href="http://bit.ly/2iDLFbK">http://bit.ly/2iDLFbK</a>
Jamestown Charter Township	<a href="http://www.twp.jamestown.mi.us">www.twp.jamestown.mi.us</a>	8.7	6.1	3.2	5.9	6.7	<a href="http://bit.ly/2zoZHbE">http://bit.ly/2zoZHbE</a>
Olive Township	<a href="http://www.olivetownship.com">www.olivetownship.com</a>	8.6	7.3	6.7	5.5	7.6	<a href="http://bit.ly/2m6soVk">http://bit.ly/2m6soVk</a>
Ottawa County	<a href="http://www.miottawa.org">www.miottawa.org</a>	8.4	7.4	7.9	5.3	7.7	<a href="http://bit.ly/2ArWO7E">http://bit.ly/2ArWO7E</a>
Ottawa County Road Commission	<a href="http://www.ottawacor.com">www.ottawacor.com</a>	8.1	7.3	7.0	5.2	6.9	<a href="http://bit.ly/2AihJcn">http://bit.ly/2AihJcn</a>
Polkton Charter Township	<a href="http://www.polktontownship.com">www.polktontownship.com</a>	4.7	4.9	5.1	4.4	5.1	<a href="http://bit.ly/2ja2cs8">http://bit.ly/2ja2cs8</a>
Port Sheldon Township	<a href="http://www.Portsheldontwp.org">www.Portsheldontwp.org</a>	8.5	5.6	4.6	5.4	6.6	<a href="http://bit.ly/2yibHj">http://bit.ly/2yibHj</a>
Robinson Township	<a href="http://www.robinson-twp.org">www.robinson-twp.org</a>	6.6	3.9	4.7	5.8	5.8	<a href="http://bit.ly/2m3uoxL">http://bit.ly/2m3uoxL</a>
Spring Lake Township	<a href="http://www.springlaketwp.org">www.springlaketwp.org</a>	8.3	7.4	7.7	5.5	7.6	<a href="http://bit.ly/2hcPKUf">http://bit.ly/2hcPKUf</a>
Tallmadge Charter Township	<a href="http://www.Tallmadge.com">www.Tallmadge.com</a>	8.7	5.7	4.6	5.4	6.3	<a href="http://bit.ly/2m1nhWs">http://bit.ly/2m1nhWs</a>
Zeeland Charter Township	<a href="http://www.zeelandtwp.org">www.zeelandtwp.org</a>	7.4	5.6	4.9	5.4	6.1	<a href="http://bit.ly/2jaDOBG">http://bit.ly/2jaDOBG</a>

## Use

### Digital Communications

Digital communications tools are critical for municipalities to communicate with the public and encourage public participation in all matters of community development. From public safety updates on social media to live video streaming of public meetings, there are a number of ways in which municipalities can digitally communicate with their citizens. This metric examines the use of digital communications tools by each municipality.

## Average Use of Digital Communications Tools Among Local Governments



The chart provides the average frequency with which municipalities use various digital communications platforms. The chart also provides a comparison to the average use of these same tools among municipalities from other Connected participating communities.

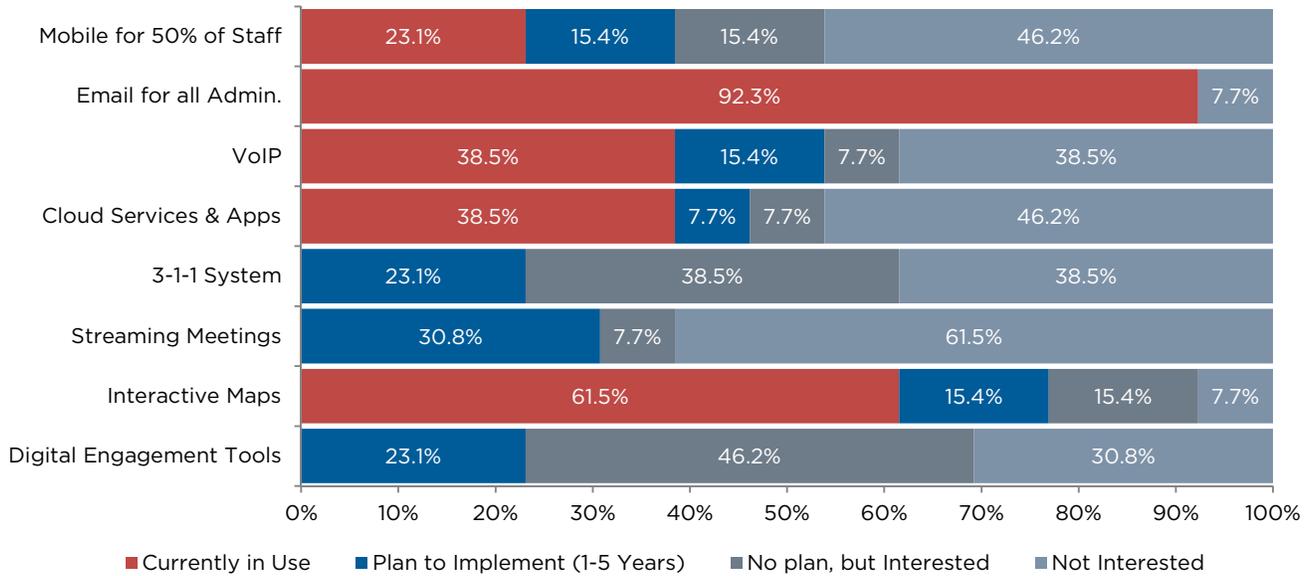
Digital communications tools vary widely in their use and applicability for municipalities. Among the responding municipalities, e-mail, website updates, and Facebook are the most commonly and frequently used tools. Many of the other communications tools are used rarely, if ever, by most municipalities. Compared to the use of these tools by municipalities in other Connected communities, those in Ottawa County use them with approximately the same frequency.

### Advanced Applications

Beyond a website and beyond the many forms of digital communications, there are more advanced ways in which a municipality can leverage technology to improve civic participation and the provision of services to residents, businesses, and institutions. The Government Survey asked participants to identify the current or planned implementation status of eight advanced applications including: 1) digital tools for community engagement; 2) interactive maps/GIS on the municipal website; 3) streaming of public meetings on the internet; 4) 3-1-1 System (or similar) for citizens to report non-emergency issues; 5) cloud-based services for software, data hosting, etc.; 6) VoIP phone service; 7) e-mail service for 100% of administrative staff; and 8) government-issued mobile devices for at least 50% of staff.

Respondents were asked to identify the advanced applications of technology they are currently using or plan to implement in the community. In Ottawa County, 35.5% of municipalities either currently use or plan to implement one or more of the advanced applications within one year. By comparison, 36% of municipalities in other Connected communities say they have currently implemented, or plan to implement within one year, one or more of the advanced applications. The chart shows the state of use or planned implementation for municipalities across the community.

### State of Advanced Application Implementation Among Government Organizations



Nearly all municipalities have e-mail service for their administrative staff. Additionally, nearly two-thirds of municipalities provide online interactive community maps. Slightly more than one-third of entities utilize a VoIP telephone service and the same percentage use cloud-based services and applications. Currently, no responding municipalities stream their meetings online, but 31% plan to do so in the next five years. Finally, 38.5% of municipalities are interested in a 3-1-1 system, and more than one-third (46.2%) are interested in employing more digital public engagement tools.

## Healthcare

Access to quality healthcare is essential for quality of life in any community. From access to emergency services and family practitioners, to specialists, laboratories, and mental health services, access to healthcare provides opportunities for all to live healthy, fulfilling lives.

New healthcare technology developments offer not only new treatments and methods of diagnosis, but also greater access to healthcare providers via the

Internet. This is especially critical for two primary groups: 1) those living in rural communities that may not have a local presence for various specialty healthcare providers, and 2) those unable to physically visit a doctor's office due to medical conditions or other issues.

The Healthcare section comprises four different metrics. Data for these metrics is derived from the Healthcare Survey that was distributed to healthcare facilities throughout the community. Results from the Residential Technology Survey are also used. In Ottawa County, survey responses were received from fourteen healthcare facilities: City on a Hill Health Clinic, Coopersville Vision Center, David's House Ministries, Griswold Chiropractic Clinic, Heart's Journey Wellness Center, Holland Free Health Clinic, Holland Hospital, Hudsonville Family Dentistry, Lakeshore Health Partners, Metron of Lamont, MOKA Corporation, Pine Ridge Assisted Living Facility, Preferred Employment and Living Supports, and Smile Grand Haven.

The Healthcare Use metrics include technology applications, frequency of telehealth use, website analysis, and digital communication.

## Highlights

Monthly

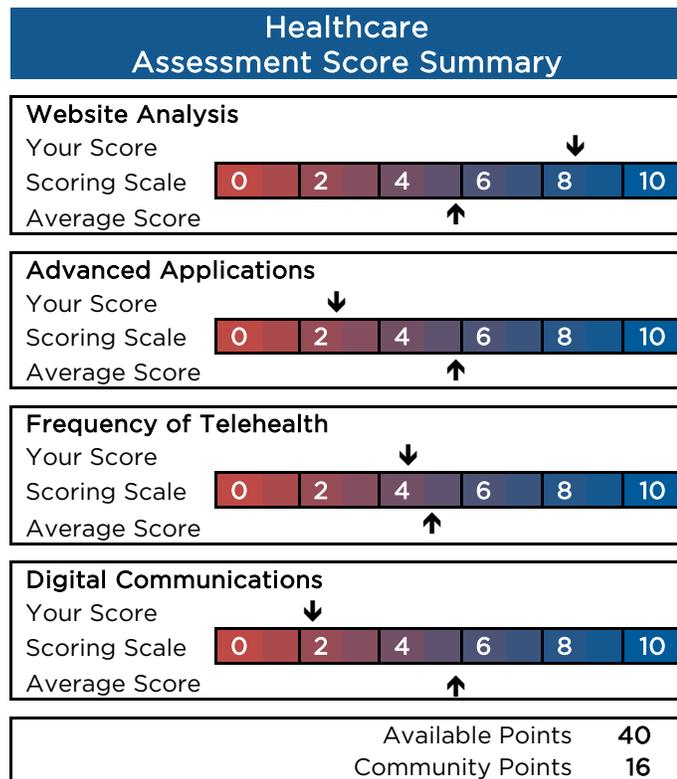
64%

76%

Average use of telehealth applications

Healthcare facilities using electronic medical records

Facilities with a social media presence



## Access

Just as an Internet connection is critical for other businesses, a broadband connection for healthcare is equally important. The table provides information on the connectivity among Healthcare Survey respondents. Healthcare facilities in other Connected participating communities have an average download connection speed of 179 Mbps.

Additionally, City on a Hill, David's House, Heart's Journey, Holland Hospital, Lakeshore Health Partners, Metron of Lamont, MOKA Corporation, Preferred Employment, and Smile Grand Haven indicate that they offer free Wi-Fi connectivity to the public at their location. Nearly two-thirds (64%) of healthcare facilities in other Connected communities offer free Wi-Fi to the public.

Healthcare Connectivity		
Facility	Connection Type	Connection Download Speed
City on a Hill Health Clinic	Cable	Unsure
Coopersville Vision Center	Cable	50 to 100 Mbps
David's House Ministries	Cable	50 to 100 Mbps
Griswold Chiropractic Clinic	Cable	3 to 10 Mbps
Heart's Journey Wellness Center	Cable	50 to 100 Mbps
Holland Free Health Clinic	Fixed Wireless	Unsure
Holland Hospital	Fiber	100 to 500 Mbps
Hudsonville Family Dentistry	DSL	3 to 10 Mbps
Lakeshore Health Partners	Fiber	500 Mbps or Faster
Metron of Lamont	Cable	Less than 3 Mbps
MOKA Corporation - Community Supports	Cable	3 to 10 Mbps
Pine Ridge Assisted Living Facility	DSL	Unsure
Preferred Employment and Living Supports	Cable	3 to 10 Mbps
Smile Grand Haven	Fiber	500 Mbps or Faster

## Adoption

### Facility Websites

The website of a healthcare facility may be the first point of contact a member of the public may have when an issue arises or information is required. The websites of these institutions, therefore, should provide relevant information in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's facilities. This analysis is conducted using an online website analysis tool. The Healthcare Website Analysis table contains a link to the full website analysis report for each school responding to the survey. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

Healthcare Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
City on a Hill Health Clinic	<a href="http://www.coahm.org">www.coahm.org</a>	8.1	6.8	5.7	5.5	6.7	<a href="http://bit.ly/2zmYkdB">http://bit.ly/2zmYkdB</a>
Coopersville Vision Center	<a href="http://www.coopersvillevision.com">www.coopersvillevision.com</a>	7.2	6.1	4.6	6.0	6.2	<a href="http://bit.ly/2jaTmu0">http://bit.ly/2jaTmu0</a>
David's House Ministries	<a href="http://www.dhmin.org">www.dhmin.org</a>	8.9	7.5	5.9	5.6	7.4	<a href="http://bit.ly/2jbdSKU">http://bit.ly/2jbdSKU</a>
Griswold Chiropractic Clinic	No Website						
Heart's Journey Wellness Center	<a href="http://www.heartsjourneywellness.com">www.heartsjourneywellness.com</a>	9.1	6.3	3.6	6.3	7.1	<a href="http://bit.ly/2m5uO6H">http://bit.ly/2m5uO6H</a>
Holland Free Health Clinic	<a href="http://www.hfhclinic.org">www.hfhclinic.org</a>	6.0	5.8	5.5	4.9	5.9	<a href="http://bit.ly/2zsSmHZ">http://bit.ly/2zsSmHZ</a>
Holland Hospital	<a href="http://www.hollandhospital.org">www.hollandhospital.org</a>	7.9	7.9	8.1	5.6	7.8	<a href="http://bit.ly/2hTAcFo">http://bit.ly/2hTAcFo</a>
Hudsonville Family Dentistry	<a href="http://www.HudsonvilleFamilyDentistry.com">www.HudsonvilleFamilyDentistry.com</a>	7.8	6.8	5.9	5.6	7.5	<a href="http://bit.ly/2zsMrjU">http://bit.ly/2zsMrjU</a>
Lakeshore Health Partners	<a href="http://www.lakeshorehealthpartners.com">www.lakeshorehealthpartners.com</a>	6.9	6.2	6.1	5.0	6.7	<a href="http://bit.ly/2hecGT3">http://bit.ly/2hecGT3</a>
Metron of Lamont	<a href="http://www.metronhealth.com">www.metronhealth.com</a>	8.5	5.0	5.5	5.7	6.9	<a href="http://bit.ly/2zrT8ol">http://bit.ly/2zrT8ol</a>
MOKA Corporation - Community Supports	<a href="http://www.moka.org">www.moka.org</a>	7.2	6.8	7.8	6.3	6.9	<a href="http://bit.ly/2zucece">http://bit.ly/2zucece</a>
Pine Ridge Assisted Living Facility	No Website						
Preferred Employment and Living Supports	<a href="http://www.preferredsupports.com">www.preferredsupports.com</a>	7.2	4.8	2.9	5.2	5.5	<a href="http://bit.ly/2ztRkcy">http://bit.ly/2ztRkcy</a>
Smile Grand Haven	<a href="http://www.Smiledentalpartners.com">www.Smiledentalpartners.com</a>	6.6	6.3	6.8	5.7	6.6	<a href="http://bit.ly/2zGfGTz">http://bit.ly/2zGfGTz</a>

## Use

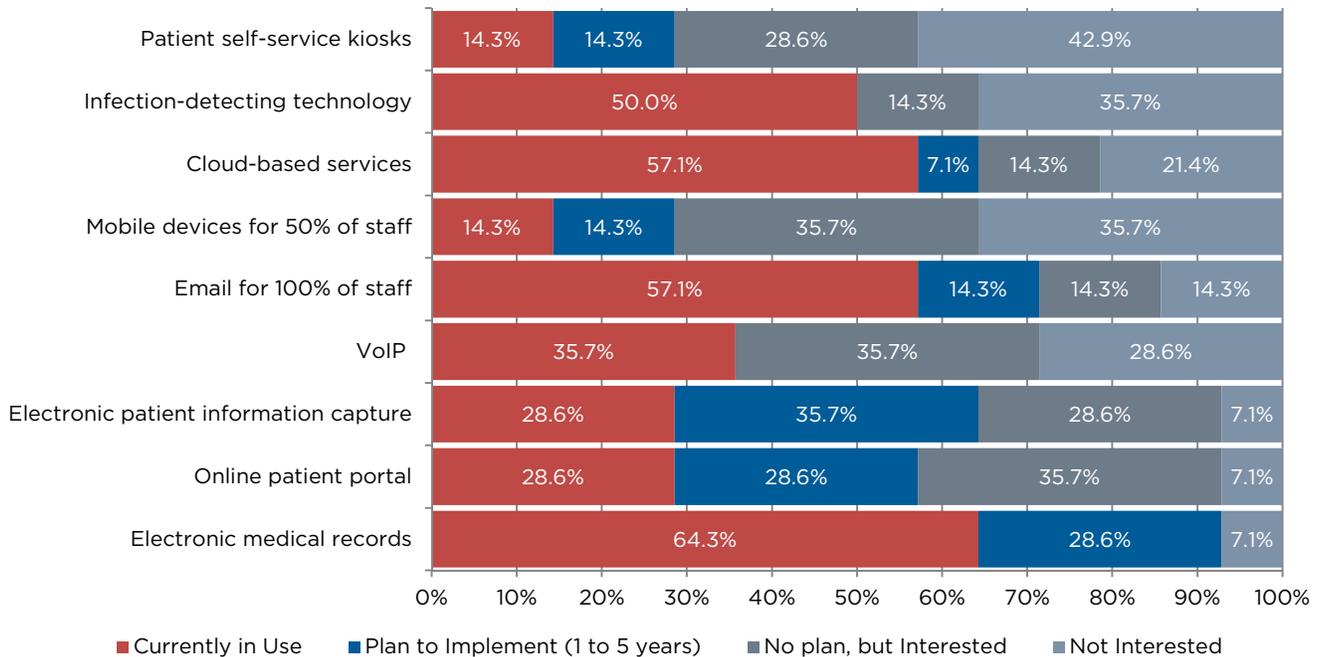
### Technology Applications

Broadband-enabled technology offers a number of ways in which healthcare facilities can more efficiently treat and care for patients. An important component of technology-facilitated care is the ability to expeditiously access patient records, provide test results to patients, schedule appointments, and more.

The Healthcare Survey asked respondents to indicate the current state of implementation for nine applications designed to improve the interface between patients and caregivers:

- Electronic medical records;
- Online patient information portal (allows patients to access records and schedule appointments, etc.);
- Electronic patient information capture (allows patients to sign-in for visits, enter insurance information, etc.);
- VoIP telephone service;
- E-mail service for 100% of staff;
- Employer-issued mobile device for 50% of staff;
- Cloud-based services for software, data hosting, etc.;
- Infection-detecting technology; and
- Patient self-service kiosks.

### State of Advanced Application Implementation Among Healthcare Facilities



The table provides the current, planned, or interested status of each application for each of the responding healthcare facilities. Nearly half (44%) of healthcare facilities have implemented or plan to implement within one year one or more of the advanced applications. Nearly two-thirds of facilities have adopted electronic medical records and 28% plan to do so in the next five years. Additionally, more than half of facilities have email for all of their staff, use infection-detecting technology, and subscribe to or utilize cloud-based services or applications. There is room in the community to more fully utilize technology for improving health, and those opportunities lie with the facilities indicating that they have no formal plan for one or more of the advanced applications, but are interested in the technology. For example, 35.7% of facilities are interested in developing an online patient portal and 28.6% are interested in installing patient self-service kiosks.

## Telehealth

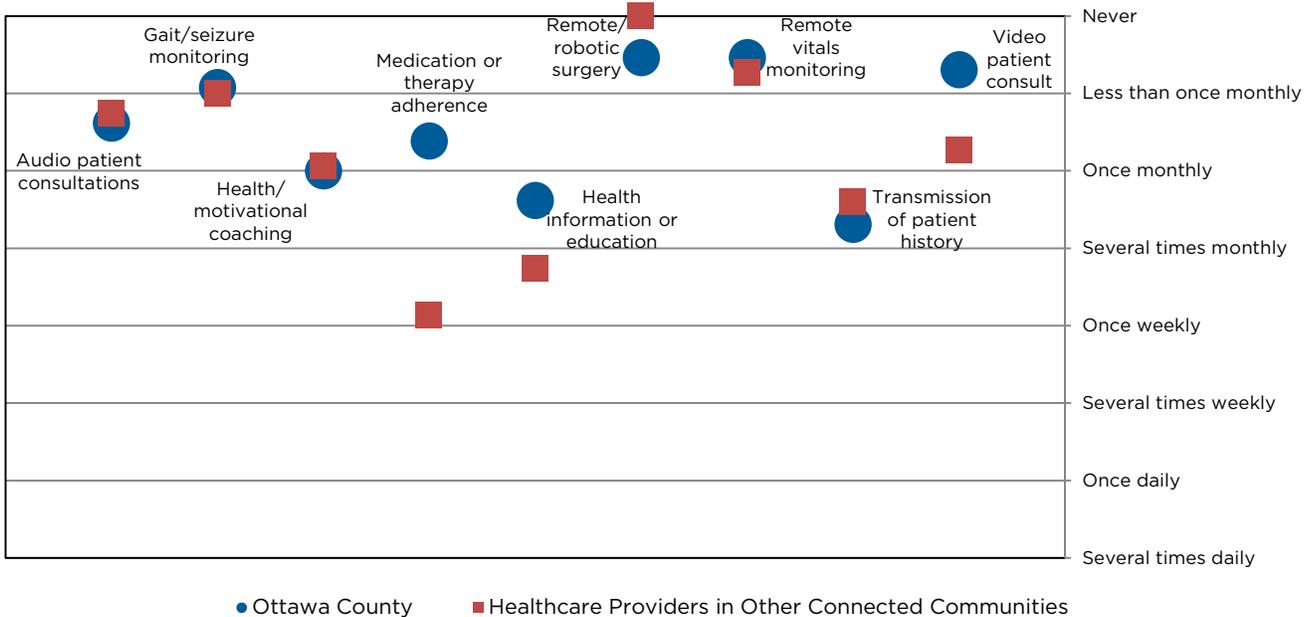
Telehealth refers to a collection of means and methods for enhancing healthcare, public health, and health education delivery and support using telecommunications technologies. The ability to remotely access healthcare can help improve the quality of life in rural communities that may not have physical access to state-of-the-art facilities. Additionally, telehealth applications provide new opportunities for community residents to “age in place.” Aging in place is the ability to live in one’s own home and community safely, independently, and comfortably, regardless of age, income, or ability level.

The Telehealth metric examines the frequency with which the community’s healthcare facilities use or access nine different telehealth services:

- Audio-only remote patient consultations;
- Gait, seizure, and fall monitoring;
- Health and motivational coaching;
- Prompting for medication or therapy adherence;
- Provision of health information or education;
- Remote/robotic surgery;
- Remote vitals monitoring;
- Transmission of patient health history; and
- Video remote patient consultation.

The chart provides the frequency with which healthcare facilities in the community use various telehealth services, as well as the average frequency with which these applications are used by healthcare facilities in other Connected participating communities. As shown, with the exception of medication/therapy adherence, health information/education, and video patient consultation, telehealth activities in Ottawa County are performed with the same relative frequency as in other Connected participating communities.

**Frequency of Telehealth Use Among Healthcare Facilities**



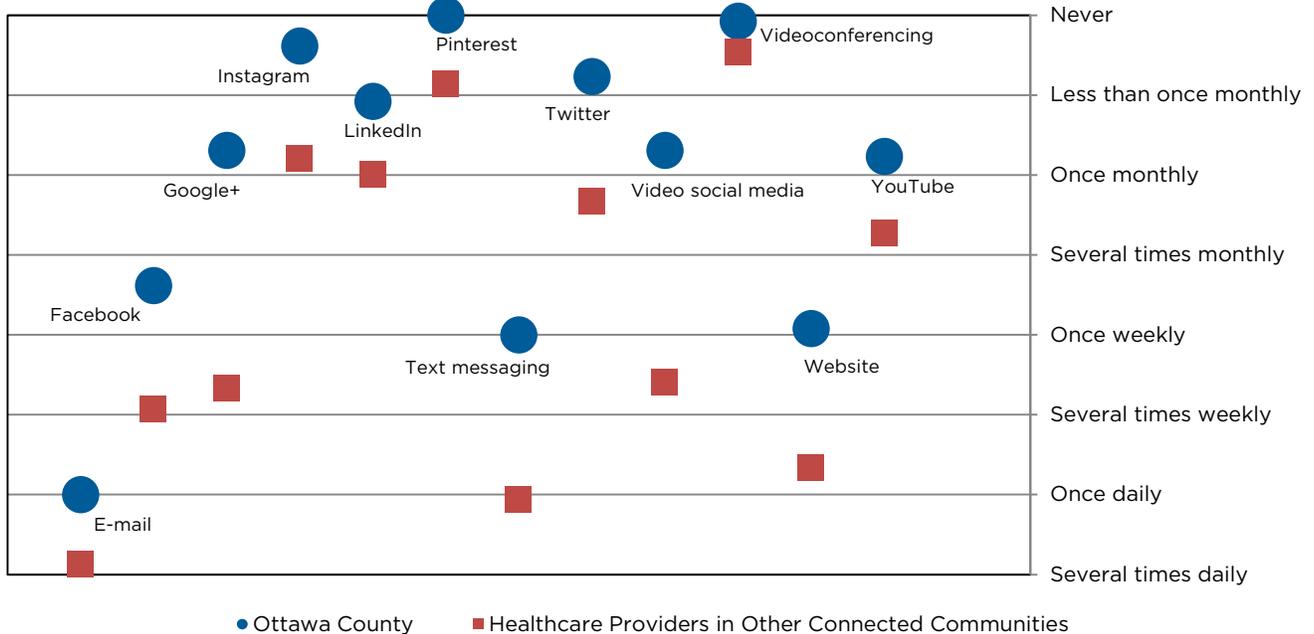
## Digital Communications

Technology coupled with an Internet connection provides a myriad of ways to digitally interact with the world or even those in one's own community. The Frequency of Digital Communication metric examines how often healthcare facilities are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from the community in which they operate.

The chart provides the frequency with which healthcare facilities in Ottawa County use various digital tools to communicate with the public, as well as the average frequency with which these tools are used by other healthcare facilities in other Connected participating communities.

E-mail, Facebook, website updates, and text messaging are the most frequently used tools by community healthcare establishments. Other social media and video-based platforms are rarely, if ever, used. Overall, healthcare facilities in Ottawa County use various digital communications tools far less frequently than healthcare establishments in other Connected participating communities.

**Frequency of Digital Communications Among Healthcare Facilities**



## Higher Education

Post-secondary education contributes significantly to the talent and workforce development of a community. While the structure of K-12 education is relatively similar from one community to the next, higher education can take many forms. From community colleges and traditional universities to trade schools, higher education offers a variety of educational programs and content to meet the needs of the community. Higher education can also be an attractor for the community, drawing students and faculty from abroad. Similar to K-12 institutions, higher education has many opportunities to leverage Internet-enabled technologies to facilitate a more robust learning environment.

The Higher Education section comprises five different metrics. Data for these metrics is derived from the Higher Education Technology Survey that was distributed to institutions throughout the community. In Ottawa County, survey responses were received from Grand Rapids Community College, Grand Valley State University, and Hope College.

The Higher Education metrics include: electronic content delivery, advanced website use, digital communication, wireless availability, and online degrees.

## Highlights

93.3%

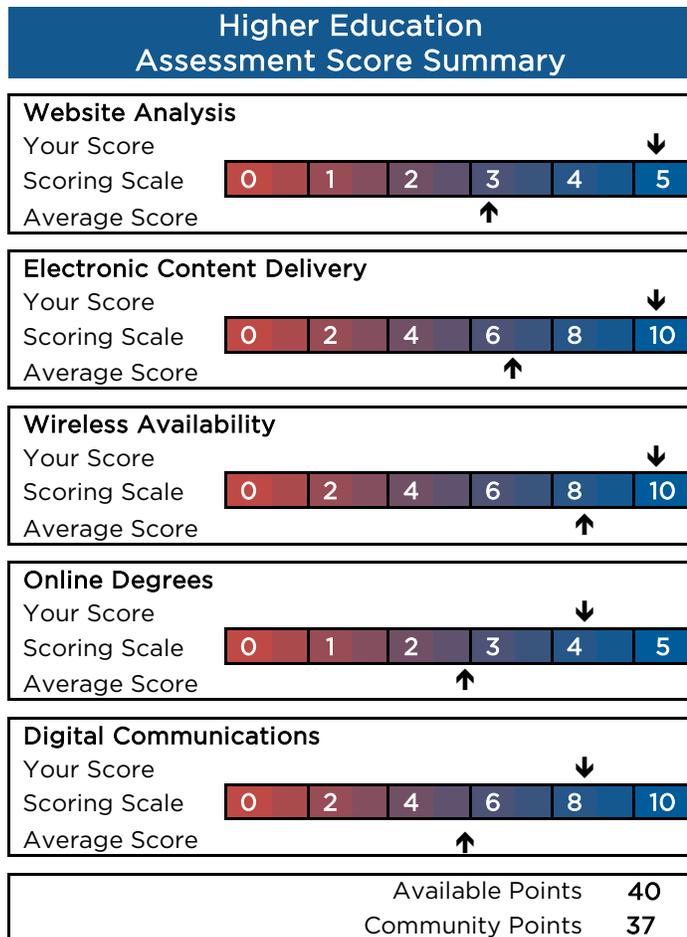
Courses delivered using web-enabled technology

100%

Classrooms covered by Wi-Fi

2/3

Institutions offering online degrees



## Access

### Connections for Higher Education

Just as with other institutions, the broadband connectivity available to and adopted by the higher education community allows or limits the ability of that entity to offer educational opportunities to the community and beyond. The table provides information on the connectivity among Healthcare Survey respondents. Healthcare

Higher Education Connectivity		
Institution	Connection Type	Connection Download Speed
Grand Rapids Community College	Fiber	1 to 5 Gbps
Grand Valley State University	Fiber	Greater than 5 Gbps
Hope College	Fiber	Greater than 5 Gbps

facilities in other Connected participating communities have an average download connection speed of 179 Mbps. All three institutions are connected to a high capacity fiber-optic network.

### Wireless Availability

Wireless connectivity allows for a wide range of devices to be connected to the institution's network. While Wi-Fi is important in public and common areas, it is also important for Wi-Fi signals to penetrate into classrooms throughout campus.

The Wireless Availability metric measures the average classroom availability of Wi-Fi across the community's higher education institutions for student and faculty use. All schools indicate that Wi-Fi is available in 100% of classrooms. Additionally, only Grand Valley State University offers free Wi-Fi to the public on their campus.

## Adoption

The website of a higher education institution may be the first point of contact a parent, student, or member of the public may have when an issue arises or information is required. The websites of these institutions, therefore, should provide relevant information in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's institutions. This analysis is conducted using an online website analysis tool. The Higher Education Website Analysis table contains a link to the full website analysis report for each school responding to the survey. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

Higher Education Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
Grand Rapids Community College	<a href="http://www.grcc.edu">www.grcc.edu</a>	9.0	8.5	7.0	5.8	7.5	<a href="http://bit.ly/2yI8sOK">http://bit.ly/2yI8sOK</a>
Grand Valley State University	<a href="http://www.gvsu.edu">www.gvsu.edu</a>	7.8	5.6	7.2	4.9	6.3	<a href="http://bit.ly/2iHjFnJ">http://bit.ly/2iHjFnJ</a>
Hope College	<a href="http://www.hope.edu">www.hope.edu</a>	8.8	8.1	8.2	5.8	8.3	<a href="http://bit.ly/2Au9c7e">http://bit.ly/2Au9c7e</a>

## Use

### Electronic Content Delivery

Technology enables new forms of educational content delivery. Between traditional classroom instruction and online-only classes lies a spectrum of web and technology-enabled methods of learning. The Higher Education Survey gathered data from community institutions on the mixture of various intensities of technology-enabled

instructional environments. Electronic Content Delivery measures the mixture of technology-facilitated instruction and content. Examining all institutions in the community, only a small percentage of courses are delivered without using some sort of web-enabled technology.

Distribution of Technology-Enabled Course Styles by Institution				
Institution Name	Traditional	Web-Facilitated	Blended	Online
Grand Rapids Community College	0%	60%	20%	20%
Grand Valley State University	10%	60%	20%	10%
Hope College	10%	60%	20%	10%

Another method of delivering curriculum in an online environment is through the development of massive open online courses (MOOCs). A MOOC is a course of study made available over the Internet without charge to a very large number of people. MOOCs have gained popularity in higher education as a way to provide educational content to a global audience. Currently, none of the responding institutions offer MOOCs.

### Online Degrees

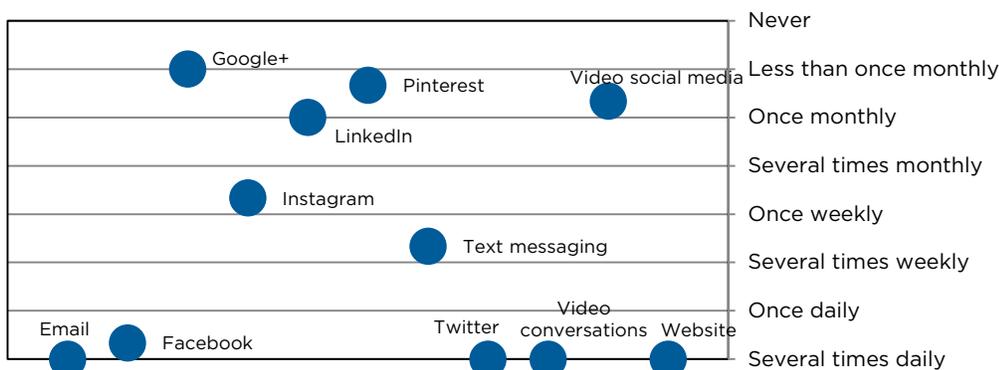
While the traditional higher education environment has stood the test of time as a format conducive to improving the knowledge, talent, and skills of students, a fluctuating global economy rooted in the production and transmission of information built on the backbone of the Internet requires more and flexible options for students to expand their skillsets. Occupations in the technology field, including even those outside the field that rely heavily on the use of technology, often require new and updated skills. To gain these skills, the workforce needs access to educational opportunities and credentialing that may or may not be located in their community. Online degrees and online educational programs offer this flexibility to local students and those from around the globe.

The Online Degrees metric examines the percent of the community’s higher education institutions that offer degree programs entirely in an online environment without students ever being required to physically attend or visit the campus. The Electronic Content Delivery metric measured the availability of courses delivered online, while this metric examines the availability of earning an entire degree in an online environment. Currently, Grand Rapids Community College and Grand Valley State University offer degrees entirely online, while Hope College does not.

### Digital Communications

Technology coupled with an Internet connection provides a variety of ways to digitally interact with the world or even those in one’s own community. The Digital Communication metric examines how often higher education institutions are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from students, and the community. The chart shows the frequency with which higher education institutions in Ottawa County use each of the digital communications tools included in the survey. Email, Facebook, Twitter, website updates, and video social media are used constantly by the responding institutions.

### Average Use of Digital Communications Tools Among Higher Education Institutions



## K-12 Education

K-12 institutions are the cornerstone of a community's educational system. K-12 education provides students with the knowledge and opportunity to become productive members of the next generation workforce. Schools, along with libraries, have traditionally been early adopters of new technologies, not only as the subject of education, but also as the tools. For this analysis, the Connected assessment is focused on the way in which internet-enabled devices and applications are tools for enhancing the learning environment and providing students with opportunities beyond the classroom. Additionally, the assessment examines the use of technology that allows schools to more effectively communicate with parents, students, and the community at large.

The K-12 Education section comprises six different metrics. Data for these metrics is derived from the K-12 Education Survey that was distributed to institutions throughout the community. The following institutions provided partial or full responses to the K-12 Education survey: Alward Elementary School, Baldwin Street Middle School, Bauer Elementary School, Central High School, Forest Grove Elementary School, Georgetown Elementary School, Holland Christian High School, Holland Christian Middle School, Hudsonville High School, Jamestown Lower Elementary School, Jamestown Upper Elementary School, Ottawa Area Intermediate School District, Park Elementary School, Pine Ridge Elementary, Riley Street Middle School, Rose Park Elementary School, Southside Elementary School, and Unity Christian High School.

The K-12 Education Use metrics include: electronic content delivery, website analysis, digital communication, student/parent engagement, one-to-one device implementation, and device-to-student ratio.

## Highlights

49.3%

K-12 curriculum delivered with web-enabled technology

100%

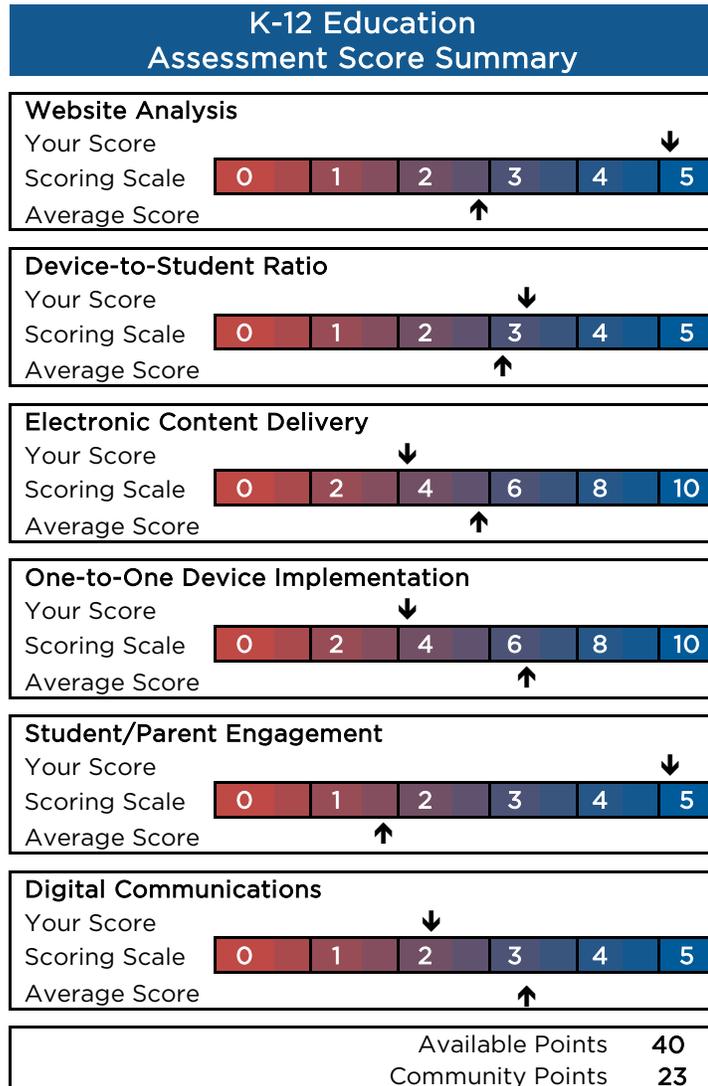
K-12 schools with connections faster than 1 Gbps

0.81

internet-enabled devices per student

88%

Schools with a social media presence



## Access

### Connections for K-12

The internet connectivity for K-12 buildings is critical to support technology-enabled curriculum delivery, one-to-one device programs, and the other myriad of technology needs of institutions. The K-12 Connectivity Table provides information on the connections for responding K-12 schools in the community. Among K-12 schools in other Connected communities, the median connection speed is 375 Mbps. All of the responding schools achieve their connectivity through the Ottawa Area ISD network and have high bandwidth capacity.

Additionally, most responding schools access the FCC's E-rate program to help offset school connectivity costs.

K-12 Connectivity		
School	Connection Type	Connection Download Speed
Alward Elementary School	Fiber-optic	1 to 5 Gbps
Baldwin Street Middle School	Fiber-optic	More than 5 Gbps
Bauer Elementary School	Fiber-optic	More than 5 Gbps
Central High School	Fiber-optic	More than 5 Gbps
Forest Grove Elementary School	Fiber-optic	More than 5 Gbps
Georgetown Elementary School	Fiber-optic	More than 5 Gbps
Holland Christian High School	Fiber-optic	1 to 5 Gbps
Holland Christian Middle School	Fiber-optic	1 to 5 Gbps
Hudsonville High School	Fiber-optic	More than 5 Gbps
Jamestown Lower Elementary School	Fiber-optic	More than 5 Gbps
Jamestown Upper Elementary School	Fiber-optic	More than 5 Gbps
Ottawa Area ISD	Fiber-optic	More than 5 Gbps
Park Elementary School	Fiber-optic	More than 5 Gbps
Pine Ridge Elementary	Fiber-optic	1 to 5 Gbps
Riley Street Middle School	Fiber-optic	More than 5 Gbps
Rose Park Elementary School	Fiber-optic	1 to 5 Gbps
South Elementary School	Fiber-optic	More than 5 Gbps
South Side Elementary	Fiber-optic	1 to 5 Gbps
Unity Christian High School	Fiber-optic	1 to 5 Gbps

### Wireless Availability

Public and classroom Wi-Fi is important for providing students, faculty, staff, and visitors with robust connectivity anywhere on school grounds. All responding schools indicate that Wi-Fi connectivity is available in 100% of classrooms. Among K-12 schools in other Connected communities, 92% of classrooms have Wi-Fi available to students and staff. Additionally, only Central High School indicates that they do not offer free Wi-Fi connectivity to the public. In K-12 schools in other Connected communities, 58% offer free public Wi-Fi.

## Adoption

### Website Analysis

The website of a K-12 school may be the first point of contact a parent, student, or member of the public may have when an issue arises or information is required. The websites of K-12 schools, therefore, should provide relevant information in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's K-12 schools. This analysis is conducted using an online website analysis tool. The K-12 Website Analysis table contains a link to the full website analysis report for each school responding to the survey. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

K-12 Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
Allendale Public Schools	<a href="http://www.allendale.k12.mi.us">www.allendale.k12.mi.us</a>	8.7	8.1	7.2	5.6	7.8	<a href="http://bit.ly/2yvyNKX">http://bit.ly/2yvyNKX</a>
Grand Haven Area Public Schools	<a href="http://www.ghaps.org">www.ghaps.org</a>	7.2	5.3	5.8	4.0	6.1	<a href="http://bit.ly/2zUH9AR">http://bit.ly/2zUH9AR</a>
Holland Public Schools	<a href="http://www.hollandpublicschools.org">www.hollandpublicschools.org</a>	8.7	8.5	7.0	5.6	7.4	<a href="http://bit.ly/2zxZCme">http://bit.ly/2zxZCme</a>
Hudsonville Public Schools	<a href="http://www.hudsonvillepublicschools.org">www.hudsonvillepublicschools.org</a>	8.9	8.4	7.4	5.0	7.7	<a href="http://bit.ly/2zFPAGh">http://bit.ly/2zFPAGh</a>
Ottawa Area Intermediate School District	<a href="http://www.oaisd.org">www.oaisd.org</a>	9.0	8.5	7.9	6.2	8.2	<a href="http://bit.ly/2iUcvwB">http://bit.ly/2iUcvwB</a>
Unity Christian High School	<a href="http://www.unitychristian.org">www.unitychristian.org</a>	9.3	6.8	6.9	6.2	7.1	<a href="http://bit.ly/2zGNxst">http://bit.ly/2zGNxst</a>
Many responding schools share a website with their district. Results here are presented at the district level where appropriate.							

## Student/Parent Engagement

One way to digitally engage parents and students is through an online portal where participants can access individualized information regarding school performance, homework, activities, financial accounts, and much more.

The Student/Parent Engagement metric measures the presence of online student and/or parent portals across schools in the community. Schools responding to the K-12 Education Technology Survey responded to the following two questions: 1) *Does the school have an online portal for students to access homework, educational content, and other information?* and 2) *Does the school have an online portal for parents to access grades, pay bills, register for activities, etc.?* The Student/Parent Engagement metric is included in the Adoption section for K-12 schools, similar to the website metric, as it represents a basic means by which schools can leverage their connectivity.

Most responding schools have both a student and parent online portal. Only Unity Christian High School does not have an online portal for parents to accompany their portal for students. Among K-12 schools in other Connected communities, 61% have an online student portal, 79% have an online parent portal, and 58% have both.

## Use

### Electronic Content Delivery

Technology enables new forms of educational content delivery. Between traditional classroom instruction and online-only classes lies a spectrum of web and technology-enabled methods of learning. The K-12 Education Survey gathered data from schools on the mixture of various intensities of technology-enabled instructional environments. Electronic Content Delivery measures the mixture of technology-facilitated instruction and content.

Across the community, most schools tend to rely on more traditional methods of curriculum delivery. Less web-enabled technology is used in K-12 courses in Ottawa County compared to K-12 schools in other Connected participating communities.

Web-enabled K-12 course delivery offers new opportunities for learning as well as access to educational content outside of the classroom. However, this method of delivery also relies heavily on students' ability to connect to the internet outside of school.

## Devices

Many schools across the country are putting advanced computing power into the hands of every student. From tablets to laptops, Android to Apple, schools are examining opportunities for leveraging technology to expand opportunities for learning within and outside the classroom.

Average Percent of Courses Delivered by Technology Type Across all School Districts		
Course Type	Ottawa County Schools	K-12 Schools Across other Connected Communities
Traditional - No online technology used	50.7%	48.7%
Web-facilitated - uses web-based tech to facilitate a face-to-face course	47.3%	25.7%
Blended - online and face-to-face delivery but with few physical meetings	2.0%	19.5%
Online - all content delivered online, no face-to-face meetings	0.0%	6.1%

The One-to-One Device Implementation metric measures the implementation status of one-device-per-student initiatives across the community. Schools responding to the K-12 Education Technology Survey were asked the question, “Does the school have a one-to-one device initiative or allow students to bring their own devices to school to access school-related and organized content and applications?” Respondents were asked to answer in a way that indicates their current stage of implementing a one-to-one program.

Six of the responding schools, Central High School, Holland Christian Middle School, Holland Christian High School, Pine Ridge Elementary, South Side Elementary, and Rose Park Elementary School, indicate that they have successfully implemented a one-to-one device program. Alward Elementary School reports that they are in the exploratory phase of implementing such a device program. All other responding schools indicate that they have no one-to-one program and no plan to implement a device initiative. Among K-12 schools in other Connected communities, 34% have successfully implemented a one-to-one device program, 15% have an official plan or are piloting such a program, and 28% have no one-to-one device program or plan to implement one.

One-to-one device programs allow all students to have equal and individual access to technology, content, and resources; however, in communities without one-to-one device initiatives, technology is often shared in labs or individual classrooms among all students.

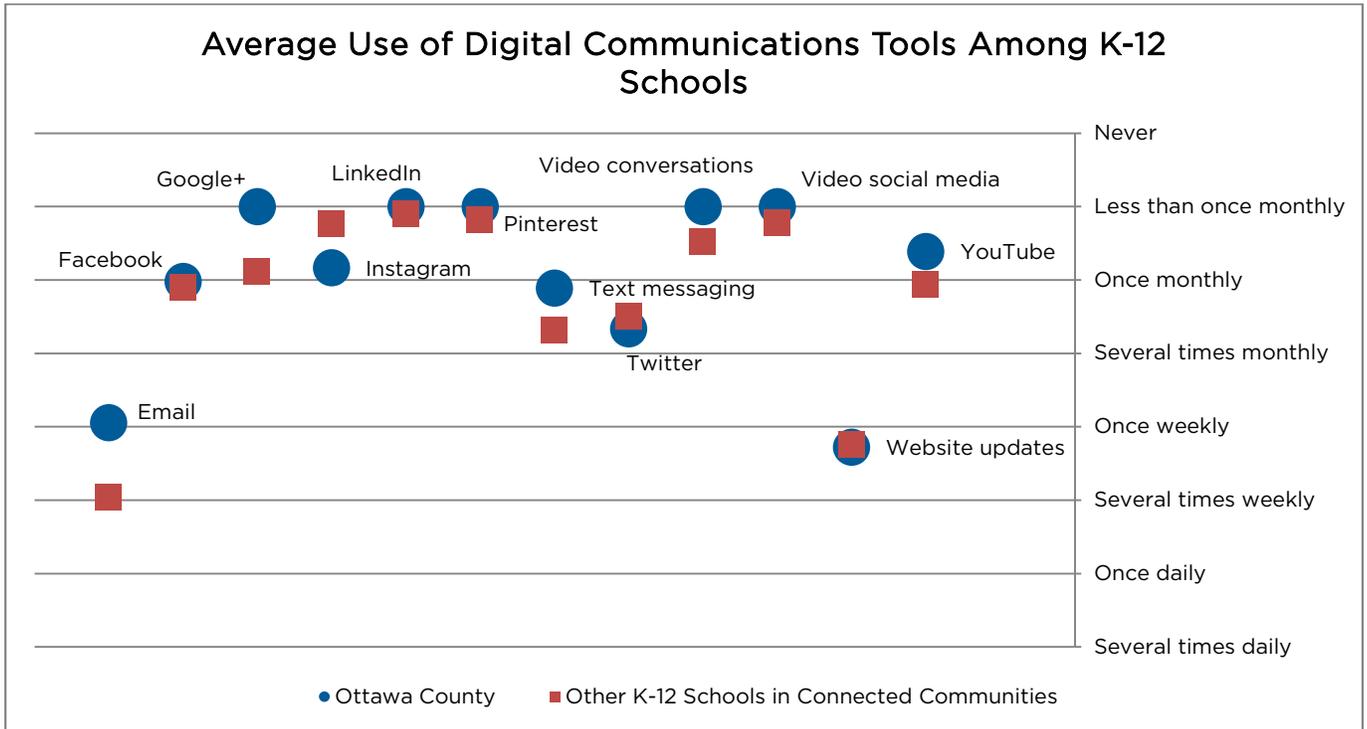
In order to examine student device access across communities, the K-12 section also examines the overall ratio of devices to students. The device-to-student ratio is calculated by collecting the total number of devices and students from schools responding to the K-12 Survey. Survey respondents indicate a total of 12,188 students along with a total of 9,902 devices for a device-to-student ratio of 0.81. This indicates that, overall, there are approximately four devices, (e.g., laptop, desktop, or tablet) available for every five students in the community, (not all responding schools completed this section of the K-12 survey. Data is only representative of schools who provided a count of both students and devices). Other Connected communities have an average device-to-student ratio of 0.85.

## Digital Communications

Technology coupled with an internet connection provides a myriad of ways to digitally interact with the world or even those in one's own community. The Digital Communication metric examines how often K-12 institutions are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from parents, students, and the community.

The chart shows the average frequency of use for each of the digital communications tools included in the survey. The chart also shows the average frequency with which schools across other Connected communities use the various communications tools.

As shown, some tools are used more frequently than others. E-mail, Twitter, Facebook, and website updates are the most popular tools for communicating with parents and the public, while video-based platforms are used less frequently. Schools in Ottawa County tend to digitally communicate with parents and the public slightly less frequently compared to K-12 schools in other Connected communities.



## Libraries and Community Organizations

Libraries and other community organizations serve a vital role in providing access to information and technology for the entire community. Libraries often host public computers with internet access for those without a device or connection at home, and also provide various types of technology training to develop a more digitally literate community.

The Libraries and Community Organizations section comprises six different metrics. Data for these metrics are derived from the Libraries and Community Organizations Survey that was distributed to entities throughout the community. In Ottawa County, partial or complete survey responses were received from fourteen libraries and community organizations including Allendale Township Library, Children's Advocacy Center, Gary Byker Memorial Library of Hudsonville, Georgetown Township Public Library, Grand Haven Community Center, Herrick District Library, Howard Miller Public Library, Jamestown Reformed Church, Loutit District Library, Maatman Center, Park Township Community Center, Robinson Grace Church, Spring Lake District Library, and The Commons of Evergreen.

The Libraries and Community Organizations metrics include website analysis, public Wi-Fi availability public computers, training, advanced technology use, and digital communication.

13%

Adults without home internet accessing the web at libraries

164

Internet-enabled public computers

7

Average number of tech. training programs offered at libraries

75%

Libraries and organizations using or planning to implement more advanced technologies

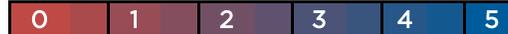
## Highlights

### Libraries & Community Organizations Assessment Score Summary

#### Website Analysis

Your Score

Scoring Scale



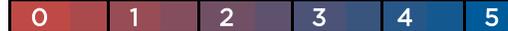
Average Score



#### Advanced Use

Your Score

Scoring Scale



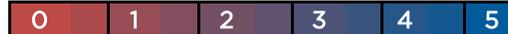
Average Score



#### Public Wi-Fi

Your Score

Scoring Scale



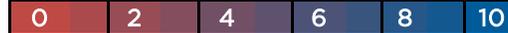
Average Score



#### Training

Your Score

Scoring Scale



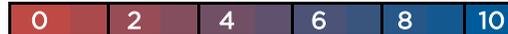
Average Score



#### Public Computers

Your Score

Scoring Scale



Average Score



#### Digital Communications

Your Score

Scoring Scale



Average Score



Available Points	40
Community Points	35

## Access

### Connections for Libraries/Community Organizations

The internet connectivity for libraries and community organizations is critical to supporting the purpose of each entity in the community. The Libraries/Community Organizations Connectivity Table provides information on the connections for responding entities in the community. Among libraries and community organizations in other Connected communities, the median connection speed is 75 Mbps.

Libraries/Community Organizations Connectivity		
Library/Organization	Connection Type	Connection Download Speed
Allendale Township Library	Fiber	100 to 500 Mbps
Children's Advocacy Center	DSL	10 to 25 Mbps
Gary Byker Memorial Library	Cable	25 to 50 Mbps
Georgetown Township Public Library	Cable	100 to 500 Mbps
Grand Haven Community Center	Fiber	Unsure
Herrick District Library	Fiber	100 to 500 Mbps
Howard Miller Public Library	Cable	50 to 100 Mbps
Jamestown Reformed Church	Cable	50 to 100 Mbps
Loutit District Library	Cable	100 to 500 Mbps
Maatman Center	No internet connection, no computers	
Park Township Community Center	No internet connection, no computers	
Robinson Grace Church	No internet connection, too expensive	
Spring Lake District Library	Not provided	
The Commons of Evergreen	Cable	50 to 100 Mbps

Additionally, only the Howard Miller Public Library indicates that they do not use the federal E-rate program to help offset the cost of broadband service.

While every library in the community has an internet connection, no library currently meets the goal of 1 gigabit per second broadband established by the Federal Communications Commission in the National Broadband Plan.

### Public Wi-Fi

The availability of a public Wi-Fi connection is important for helping to connect those who may have an internet-enabled device, but who cannot afford or do not have access to a broadband connection at home.

According to survey responses, 100% of responding libraries and community organizations offer free Wi-Fi to the public.

## Adoption

### Website Analysis

The website of a library or community organization may be the first point of contact a citizen may have when an issue arises or information is required. The websites of these entities, therefore, should provide relevant information in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's libraries and organizations. This analysis is conducted using an online website analysis tool. The Libraries/Community Organizations Website Analysis table contains a link to the full website analysis report for each organization responding to the survey. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

Libraries/Community Organizations Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
Allendale Township Library	<a href="http://www.allendalelibrary.org">www.allendalelibrary.org</a>	7.3	5.4	8.2	5.0	7.0	<a href="http://bit.ly/2AEPiWg">http://bit.ly/2AEPiWg</a>
Children's Advocacy Center	<a href="http://www.cac-ottawa.org">www.cac-ottawa.org</a>	8.6	7.1	6.6	6.4	7.8	<a href="http://bit.ly/2zVEy9K">http://bit.ly/2zVEy9K</a>
Gary Byker Memorial Library	<a href="http://www.hudsonville.org">www.hudsonville.org</a>	7.2	5.5	4.2	6.8	6.1	<a href="http://bit.ly/2hsESBQ">http://bit.ly/2hsESBQ</a>
Georgetown Township Public Library	<a href="http://www.gtpl.org">www.gtpl.org</a>	7.6	6.0	4.6	5.1	6.6	<a href="http://bit.ly/2zlgDb1">http://bit.ly/2zlgDb1</a>
Grand Haven Community Center	<a href="http://www.grandhaven.org">www.grandhaven.org</a>	8.8	7.1	5.8	5.8	7.5	<a href="http://bit.ly/2AFnLUQ">http://bit.ly/2AFnLUQ</a>
Herrick District Library	<a href="http://www.herrickdl.org">www.herrickdl.org</a>	8.4	8.2	7.7	5.3	7.6	<a href="http://bit.ly/2zAcPuO">http://bit.ly/2zAcPuO</a>
Howard Miller Public Library	<a href="http://www.hmpl.org">www.hmpl.org</a>	9.0	7.0	7.0	6.4	8.2	<a href="http://bit.ly/2yD4KSx">http://bit.ly/2yD4KSx</a>
Jamestown Reformed Church	<a href="http://www.jamestownrc.org">www.jamestownrc.org</a>	7.3	6.4	5.9	5.2	6.6	<a href="http://bit.ly/2zCJyQi">http://bit.ly/2zCJyQi</a>
Loutit District Library	<a href="http://www.loutitlibrary.org">www.loutitlibrary.org</a>	7.8	8.0	7.6	5.3	7.3	<a href="http://bit.ly/2zOxsRt">http://bit.ly/2zOxsRt</a>
Maatman Center & Park Twp Community Center	<a href="http://www.parktownship.org">www.parktownship.org</a>	9.1	6.5	5.5	6.3	7.8	<a href="http://bit.ly/2mr3Y9u">http://bit.ly/2mr3Y9u</a>
Robinson Grace Church	<a href="http://www.robinsongracechurch.org">www.robinsongracechurch.org</a>	7.5	7.4	5.6	5.2	6.7	<a href="http://bit.ly/2ifMN6d">http://bit.ly/2ifMN6d</a>
Spring Lake District Library	<a href="http://www.sllib.org">www.sllib.org</a>	8.3	7.6	7.7	5.0	7.1	<a href="http://bit.ly/2zOdJB9">http://bit.ly/2zOdJB9</a>
The Commons of Evergreen	<a href="http://www.evergreencommons.org">www.evergreencommons.org</a>	8.9	6.4	4.8	6.4	7.1	<a href="http://bit.ly/2mn0cxP">http://bit.ly/2mn0cxP</a>

## Public Computers

The expense associated with home computer ownership represents a significant barrier to broadband adoption. For low-income residents without the ability to purchase a home computer (or other device), a public computer center may be their only opportunity to access the internet. Further, public access to technology is necessary for community members who have little or no communication technology available in the home, need assistance to effectively use technology, or need to supplement connectivity at home or in schools.

Public Computer Locations	
Location	# of Public Computers
Allendale Township Library	8
Gary Byker Memorial Library	15
Georgetown Township Public Library	20
Herrick District Library	60
Howard Miller Public Library	8
Loutit District Library	51
The Commons of Evergreen	2
<b>Total</b>	<b>164</b>

A community should have sufficient, free access to computers, internet, wireless networks, and other communication technologies to support the needs of residents. In addition, public computer centers should be located in safe facilities, with adequate levels of privacy, security, and accessibility for people with disabilities. Information regarding the availability and location of public computer centers should be widely disseminated.

The Public Computers metric examines the ratio of public computers per 1,000 people in the community. Data gathered from the Libraries and Community Organizations Survey identified 164 public computers for use within the community at seven locations. In 2016, the population in Ottawa County was 282,250. The ratio of public computers per 1,000 people in the community is 0.58.

The table provides a list of locations and the number of internet-enabled public computers available for use. Libraries also were asked to indicate the three groups that comprise the majority of public computer users. Adults of all ages were identified, but specifically, adults that are seeking jobs, are unemployed, or are low-income were identified more frequently. These groups are not mutually exclusive and may overlap.

Additionally, the Residential Technology Survey asks residents who don't have a home internet subscription the location where they access the internet. The table shows the locations from which non-adopting residents access the internet.

Approximately 13% of non-adopting residents access the internet from a public computer at a library. Places of employment are more popular places to access the web for those without a connection at home. One-fifth of non-adopting adults access the web from a coffee shop or restaurant. Libraries are used less by non-adopters than in other Connected participating communities. While libraries and places of employment often supply an internet-connected device, accessing the web at a coffee shop or restaurant requires the user to have their own device.

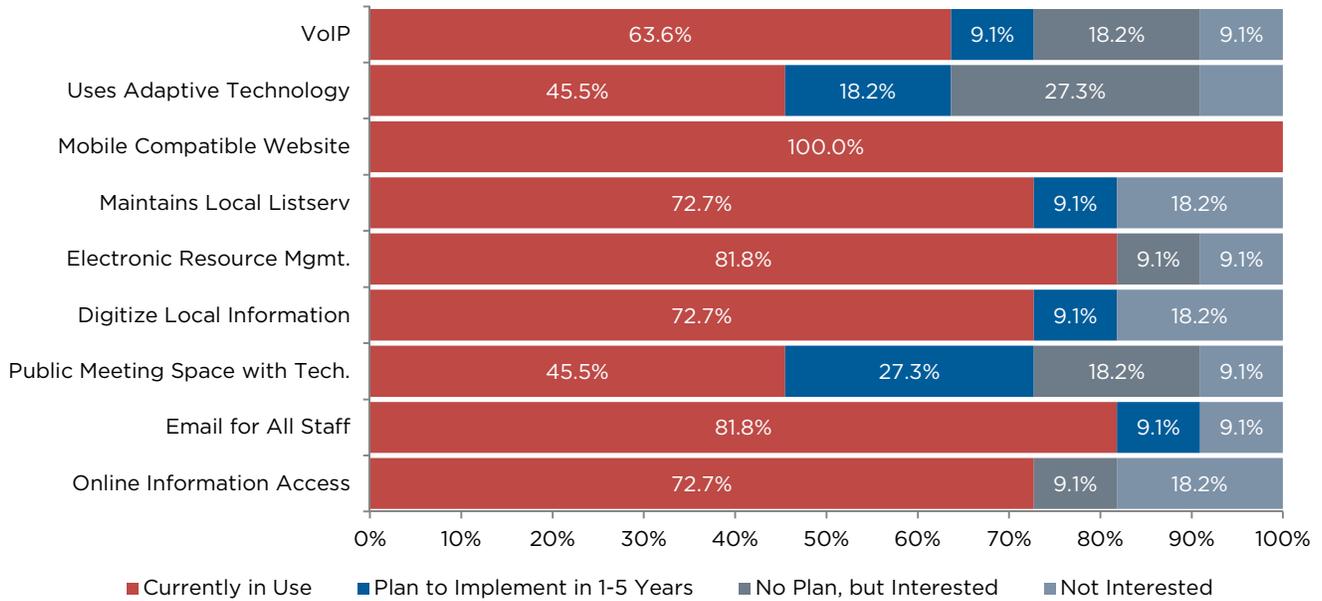
## Use

### Advanced Applications

The Advanced Use metric examines the implementation, or planned implementation, of several more advanced uses of technology within the community's libraries or organizations. The chart describes each of the advanced uses along with the current stage of implementation among libraries and organizations. As shown in the table, there is a mix of current implementation, those planning to do so, and those not interested in the various technologies. Most (75%) libraries and organizations have implemented or plan to implement these technologies within one year. More than three-quarters (76%) of libraries and organizations in other Connected communities currently use or plan to implement one or more advanced technologies in the next year.

Locations Non-Adopters Access the Internet		
Location	Non-Adopting Residents in Ottawa County	Non-Adopting Residents in other Connected Communities
Place of Employment	78%	33.2%
Library	13%	21.0%
Coffee Shop or Restaurant	20%	16.0%
School	5%	7.9%
Other	2%	2.3%
Religious Facility	5%	1.7%
<i>Respondents could choose more than one location</i>		

## State of Advanced Technology Use among Libraries and Community Organizations



## Training

Libraries provide opportunities for digital literacy training outside of a traditional classroom setting within a facility dedicated to accessing information. On average, libraries or organizations in the community that offer training offer seven different types. Comparatively, libraries and organizations across other Connected communities typically offer five different types of digital skills training, on average. As shown, a diverse array of training opportunities is offered at libraries across the community.

An examination of the self-reported digital literacy skills of specific applications and devices provides guidance for expanding technology training programs in the community. The applications and devices included in the analysis of digital literacy can be translated into the types of training programs offered at community libraries. The chart provides a glimpse into the skill needs of the community's residents.

The far left column in the table shows the percent of residents responding to the survey that indicated they "need to learn" or "know little about" the selected technologies. As shown, respondents were least familiar with multimedia applications (53%) and cybersecurity (36%), while most were comfortable with basic computer skills and browsing the internet. Nearly one-quarter (21%) of residents indicated that they need to learn or only know a little about office productivity software, applications that are often critical to on-the-job success in most occupations. These skill gaps can be aligned with the training currently offered within the libraries, and promotion and development can make these trainings more effective.

Digital Literacy Training and Learning												
Training Opportunities	Basic Computer Skills	Coding/App. Development	Cyber-safety	Device Orientation	Internet browsing	Advanced research	Mobile applications	Multimedia	Office Productivity	Social Media	Technology for Business	Website Development
Allendale Township Library	X			X	X	X		X	X	X		
Gary Byker Memorial Library		X		X					X	X		
Georgetown Township Public Library	X		X	X	X	X	X	X	X	X	X	
Herrick District Library	X	X		X			X	X		X		
Howard Miller Public Library	X		X	X	X		X	X	X	X		
Loutit District Library	X			X	X	X	X		X	X	X	
The Commons of Evergreen	X		X	X	X	X	X	X		X		
Percent of residents that "need to learn" or "know little about" subject	8%	-	36%	20%	2%	11%	19%	53%	21%	25%	-	-

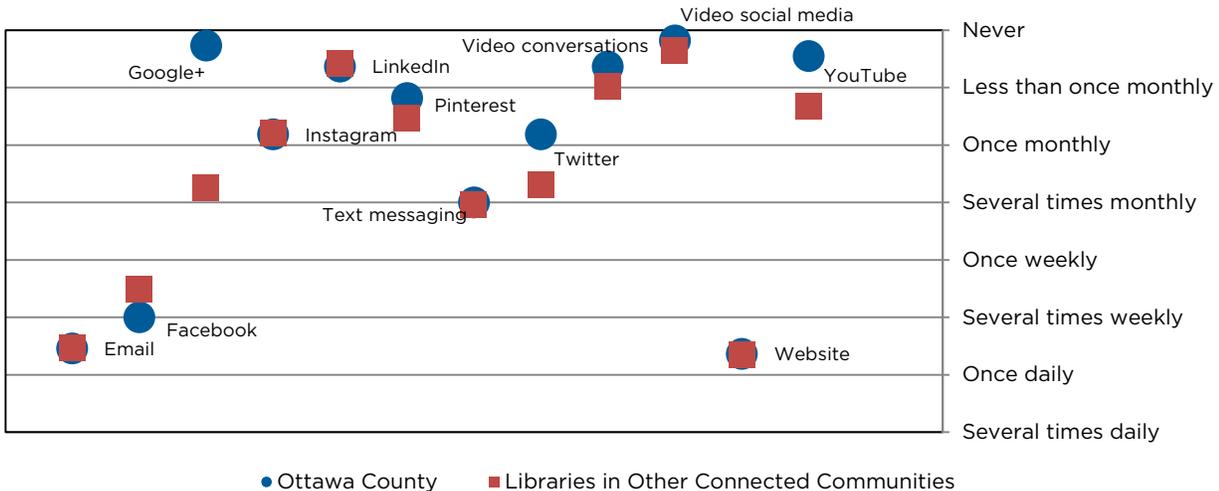
### Digital Communications

Technology coupled with an internet connection provides a myriad of ways to digitally interact with the world or even those in one’s own community. The Digital Communication metric examines how often libraries and community organizations are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from patrons/clients and the community.

The chart shows the average frequency of use for each of the digital communications tools included in the survey. The chart also shows how frequently libraries and community organizations across other Connected communities use the digital communications tools.

E-mail, Facebook, and website updates are the most frequently used forms of digital communication. Libraries and community organizations also tend to use text messaging, Twitter, and Instagram for communication. Video based applications are rarely, if ever, used. Ottawa County libraries and community organizations tend to use digital communications tools less frequently than those in other Connected participating communities.

**Average Use of Digital Communications Tools Among Libraries and Community Organizations**



## Public Safety

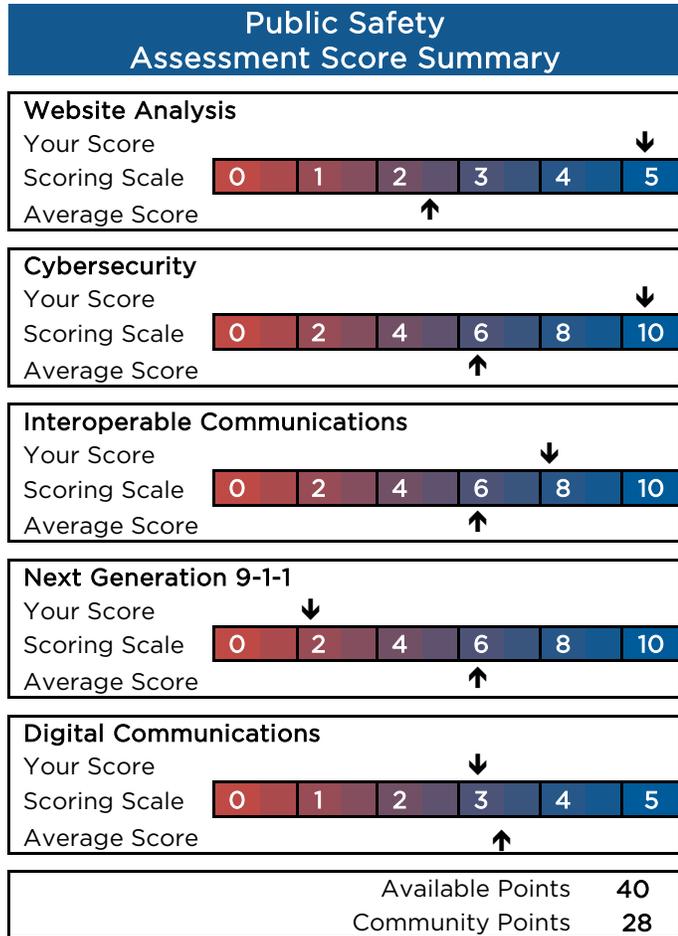
Police, fire, and emergency medical services, along with other supporting staff and organizations, are critical to the health, safety, and well-being of a community. As with the other critical sectors of a community, broadband-enabled technology has changed and improved the ways in which public safety entities serve and protect. Additionally, the internet has also brought about a new wave of criminal activity known as cybercrime. From fraud and identity theft, to hacking, spam, and ransomware, cybersecurity and prevention, and the swift investigation and response to cybercrime from local, state, and federal law enforcement can help keep a community safe from virtual threats.

The Public Safety section comprises five different metrics. Data for these metrics is derived from the Public Safety Survey that was distributed to public safety agencies throughout the community. In Ottawa County, partial or complete survey responses were received from the following public safety agencies: American Medical Response, Grand Haven Department of Public Safety, Grand Valley State University Department of Public Safety, Holland Department of Public Safety - Fire Services, Life EMS, North Ottawa Hospital EMS, Ottawa County Central Dispatch, Ottawa County Sheriff's Office, Park Township Fire Department, Spring Lake Fire Department, Zeeland Fire Rescue, and Zeeland Police.

The Public Safety metrics include interoperable communications, next generation 9-1-1, cybersecurity, website analysis, and digital communication.

## Highlights

- 11 Ways in which agencies are working to ensure cybersecurity
- 27% Public safety agencies using social media weekly
- 100% Agencies indicating that mobile broadband is critical to their operations



## Access

### Connections for Public Safety Agencies

A reliable and redundant broadband connection is critical to support the communications needs of a community's various public safety agencies. The Public Safety Connectivity table provides information on the connections for the responding public safety agencies. The average connection speed among public safety agencies in other Connected communities is 60 Mbps.

Public Safety Connectivity		
Agency	Connection Type	Connection Download Speed
American Medical Response	Cable	3 to 10 Mbps
Grand Haven Department of Public Safety	Cable	25 to 50 Mbps
GVSU Dept. of Public Safety	DSL	100 to 500 Mbps
Holland Department of Public Safety	Fiber	100 to 500 Mbps
Life EMS	Cable	50 to 100 Mbps
North Ottawa Hospital EMS	Fiber	25 to 50 Mbps
Ottawa County Central Dispatch	Fiber	100 to 500 Mbps
Ottawa County Sheriff's Office	Fiber	100 to 500 Mbps
Park Township Fire Department	Cable	100 to 500 Mbps
Spring Lake Fire Department	Fiber	100 to 500 Mbps
Zeeland Fire Rescue	Fixed Wireless	Unsure
Zeeland Police	Fiber	Unsure

Most public safety agencies connect to the internet at a speed of at least 100 Mbps. Most connections are made via a cable or fiber-optic network. Apart from the connection available to agencies at the office, mobile broadband connectivity is also important for staff in the field to quickly communicate needs in both emergency and non-emergency situations. All responding agencies indicate that mobile broadband service is either very or extremely important to their agency's daily operations. When asked to describe the mobile broadband service availability in the community, all responding agencies indicate that mobile broadband service was either good or very good. Some agencies provide mobile broadband connected devices for field staff including vehicular modems, air cards (or computers with integrated wireless modems), and smart phones. These devices, and their connectivity, are critical for the safety of community residents.

### Interoperable Communications

Communication between the various public safety agencies serving a community is critical during not only day-to-day operations, but in emergency situations as well. Police, fire, emergency medical services, and 9-1-1 should all be able to communicate via a single interoperable voice and data communications network.

The public safety survey reveals that five agencies participate in both a data and voice interoperable network and five agencies participate in a voice-only interoperable communications network. One additional agency is unsure if they use interoperable communications. Nearly 80% of public safety agencies across other Connected communities participate in an interoperable voice or data network.

## Adoption

### Website Analysis

The website of a public safety agency may be the first point of contact a citizen may have when an issue arises or information is required. The websites of these entities, therefore, should provide relevant information in an easily accessible and flexible digital environment.

The Website Analysis metric examines the accessibility, experience, marketing, and technology aspects of the websites of the community's public safety agencies. This analysis is conducted using an online website analysis tool. The Public Safety Website Analysis table contains a link to the full website analysis report for each agency responding to the survey. Each report features details on the various aspects of the website with recommendations for improving the site's appearance, accessibility, and function.

Public Safety Website Analysis							
Organization	URL	Accessibility	Experience	Marketing	Technology	Overall Score	Full Report
American Medical Response	<a href="http://www.amr.net">www.amr.net</a>	8.1	7.7	7.7	5.4	6.8	<a href="http://bit.ly/2AaXFFJ">http://bit.ly/2AaXFFJ</a>
Grand Haven Dept. of Public Safety	<a href="http://www.grandhaven.org">www.grandhaven.org</a>	8.8	7.1	5.8	5.8	7.5	<a href="http://bit.ly/2AFnLUQ">http://bit.ly/2AFnLUQ</a>
GVSU Dept. of Public Safety	<a href="http://www.gvsu.edu">www.gvsu.edu</a>	7.8	5.6	7.2	4.9	6.3	<a href="http://bit.ly/2iawACF">http://bit.ly/2iawACF</a>
Holland Department of Public Safety	<a href="http://www.cityofholland.com">www.cityofholland.com</a>	9.2	8.4	7.8	6.1	8.2	<a href="http://bit.ly/2iWE215">http://bit.ly/2iWE215</a>
Life EMS	<a href="http://www.lifeems.com">www.lifeems.com</a>	8.8	6.3	7.5	5.7	7.3	<a href="http://bit.ly/2i7DqIT">http://bit.ly/2i7DqIT</a>
North Ottawa Hospital EMS	<a href="http://www.noch.org">www.noch.org</a>	7.2	5.0	7.3	6.0	7.0	<a href="http://bit.ly/2zt58Dj">http://bit.ly/2zt58Dj</a>
Ottawa County Central Dispatch	<a href="http://www.ocda.org">www.ocda.org</a>	6.3	3.2	4.6	4.9	5.0	<a href="http://bit.ly/2BqQkXr">http://bit.ly/2BqQkXr</a>
Ottawa County Sheriff's Office	<a href="http://www.miottawa.org">www.miottawa.org</a>	8.4	7.4	7.9	5.3	7.7	<a href="http://bit.ly/2ArWO7E">http://bit.ly/2ArWO7E</a>
Park Township Fire Department	<a href="http://www.parktownship.org">www.parktownship.org</a>	9.1	6.5	5.5	6.3	7.8	<a href="http://bit.ly/2mr3Y9u">http://bit.ly/2mr3Y9u</a>
Spring Lake Fire Department	<a href="http://www.springlaketwp.org">www.springlaketwp.org</a>	8.3	7.4	7.7	5.5	7.6	<a href="http://bit.ly/2hcPKUf">http://bit.ly/2hcPKUf</a>
Zeeland Fire Rescue & Police	<a href="http://www.ci.zeeland.mi.us">www.ci.zeeland.mi.us</a>	9.0	6.7	5.2	6.2	7.8	<a href="http://bit.ly/2hfCRJ6">http://bit.ly/2hfCRJ6</a>

### Next Generation 9-1-1

Next Generation 9-1-1 (NG911) provides public safety agencies with all new tools and techniques for protecting the health, safety, and welfare of a community. Emergency texting, streaming two-way video to the field, transmission of data-intensive files, biometric data monitoring, advanced communication with neighboring public safety agencies, and information sharing are only a few examples of how NG911 can positively impact a community. There can be a steep transition to NG911 for a community, but the benefits are many. Ottawa County Central Dispatch indicates that a legacy 911 system is still in place. Only 5% of other Connected communities have fully converted to a NG911 system, while 75% are currently planning for or making the transition to NG911.

## Use

### Cybersecurity

While the proliferation of the internet has brought about a multitude of improvements in the lives of many, it has also precipitated new forms of criminal activity. Fraud, identity theft, and hacking are just a few ways in which criminals can use the internet to take advantage of residents, businesses, and institutions. Both a strong proactive and reactive strategy to address cybercrime and staying safe online are best to keep communities safe.

The cybersecurity metric examines the ways in which law enforcement entities in the community are addressing cybercrime. The table lists the various methods used by public safety agencies in the community. Across other Connected communities, public safety agencies employ seven of the twelve methods for dealing with cybersecurity and cyber-crime.

Six agencies indicate that they handle various aspects of cybersecurity and cybercrime prevention and response: American Medical Response, Grand Haven Department of Public Safety, Grand Valley State University Department of Public Safety, Life EMS, Ottawa County Central Dispatch, and Ottawa County Sheriff's Office. The Ottawa County Sheriff's Department appears to be the most active agency, indicating the use of twelve of the fifteen measures included in the survey.

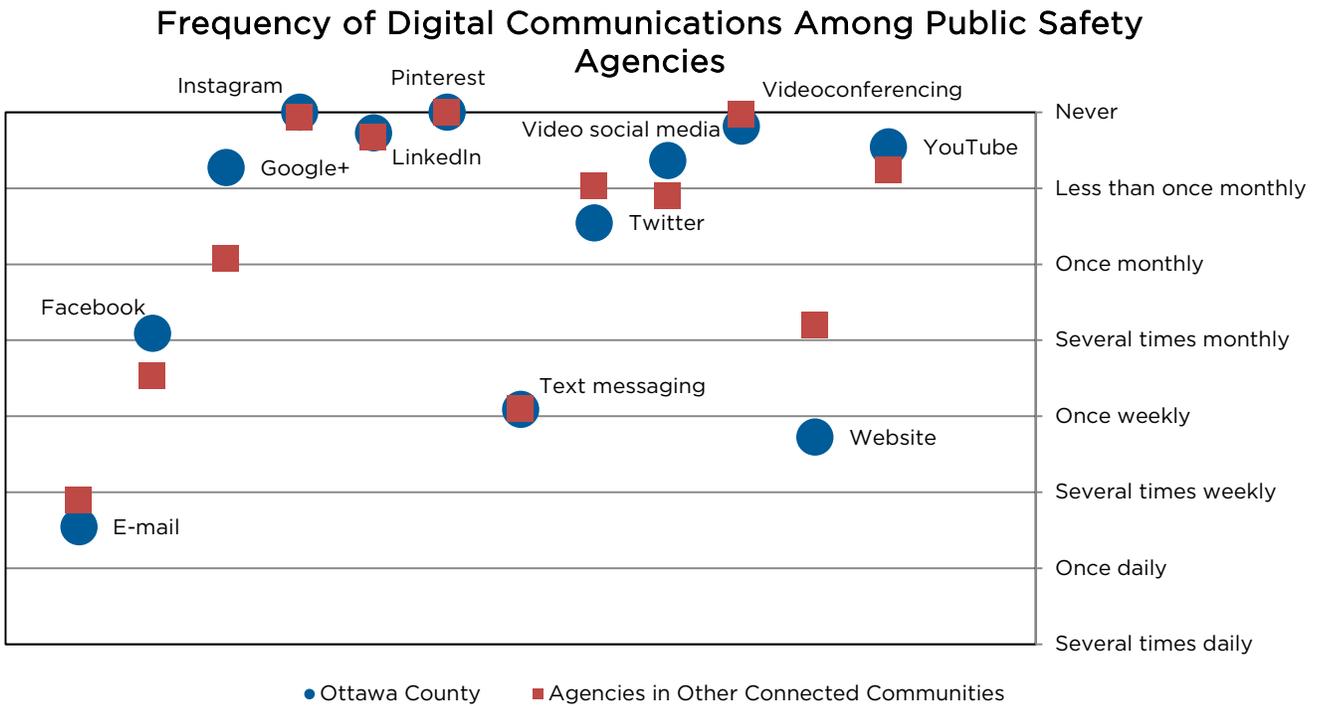
Cybersecurity Detection, Prevention, and Investigation						
Method	American Medical Response	Grand Haven Department of Public Safety	GVSU - Dept. of Public Safety	Life EMS	Ottawa County Central Dispatch	Ottawa County Sheriff's Office
Collaborate with internet service providers and other private sector companies	X	X	X	X		X
Collaborate with non-public safety and non-industry community groups to gather and/or provide information	X	X	X		X	X
Cooperate and share information with other agencies	X	X	X		X	X
Develop or participate in cyber-security and cyber-crime education sessions for the public		X		X	X	X
Host cyber-security or cyber-crime educational materials on agency website and social media		X				
Identify experts already employed by agency	X	X	X			X
Participate in cyber-security or cyber-crime task force	X					X
Participate in education and training in computer forensics with local students	X					X
Partner with related university or higher education resources	X		X			
Promote and participate in the FBI's Internet Crime Complaint Center (IC3)			X		X	X
Provide cyber-crime or cyber-security related alerts to the public via social media	X	X	X			
Provide training to employees on the safe use of technology	X	X	X	X	X	X
Seek and participate in training from outside experts, (e.g., National White Collar Crime Center, U.S. Secret Service, FBI, National Cyber Security Alliance, etc.)	X		X	X		X
Train all staff on the basics of cyber-security and cyber-crime	X			X		X
Use the FBI Regional Computer Forensics Labs						X

## Digital Communications

Technology coupled with an internet connection provides a myriad of ways to digitally interact with the world or even those in one's own community. The Digital Communication metric examines how often public safety agencies are leveraging digital tools and social media to inform, interact with, serve, and receive feedback from the community they serve.

The chart shows the average frequency of use for each of the digital communications tools included in the survey. The chart also shows how frequently public safety agencies across other Connected communities use the digital communications tools.

E-mail, Facebook, website updates, and text messaging are the most popular and most frequently used digital communication tools. Other social media and video-based platforms are rarely, if ever, used. In general, public safety agencies in Ottawa County tend to use digital communications tools slightly more frequently than agencies in other Connected communities.



## Talent and Workforce Development

The workforce, talent, and human capital ecosystem in a community is often an informal cooperation between employers, K-12 and higher education, and various supporting organizations. While some communities have formal facilities and structures to support these elements, this amalgam of entities contributes to the overall workforce development of a community in largely an ad hoc fashion. Internet connectivity and web-enabled technology contribute to talent and human capital development and can facilitate entrepreneurship. As technology advances and is increasingly used in the public and private sectors, the skills of the workforce must also advance.

The Talent and Workforce Development section comprises five different metrics. Data for these metrics is derived from several sources including the Business Technology Survey, K-12 Education Technology Survey, Libraries/Community Organizations Technology Survey, Higher Education Survey, and the Residential Technology Survey. Because the workforce development landscape in a community encompasses a number of different institutions and organizations, this section does not follow the traditional access, adoption, and use paradigm of other sections analyzed in this plan.

The Talent and Workforce Development metrics include: technology skill alignment, technology training, continuing education, youth STEM+C activities, and occupational technology digital literacy skills.

49%

75%

28%

13

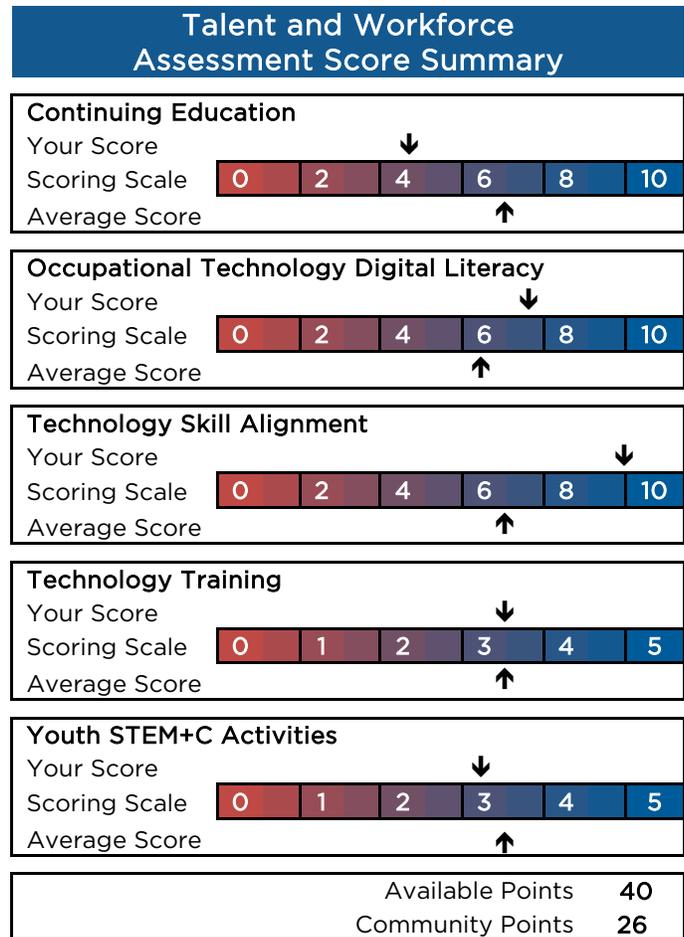
## Highlights

Employers who feel employee tech. skills match business needs

Percent of businesses who require or encourage continuing education for employees

Percent of community employees with advanced technology skills

Community organizations offering STEM+C opportunities for youth



## Technology Skill Alignment and Skill Mix

The technology-related skills necessary to be successful on the job are changing to keep pace with new innovations, tools, and applications that make production and services more efficient. The skills of the workforce should match the needed skills of the employer in order for establishments to take advantage of new technologies.

The Technology Skill Alignment metric measures the current technology skill alignment between employers and their employees. Respondents to the Business Technology Survey were asked how well the technology

skills of their employees matched the technology needs of their business. According to survey results, the skills of the majority of the Ottawa County employees match the skills of their employers Well or Very Well. The chart shows the distribution of responses across all businesses in the community, as well as the responses from employers in other Connected communities.

Among all responding businesses, 12% stated that the technology skills of their employees only poorly or fairly met the technology needs of their business. While these responses were spread among businesses of all types, a few clusters stand out. Smaller businesses, those with fewer than 20 employees, tend to say their employee skills meet the needs of the business very well or excellently, (53% of smaller businesses) more frequently than businesses with more employees, (42% of larger establishments).

Additionally, businesses were asked to indicate the technology skill mix of their staff. They were asked to indicate the percent of their staff comprising the following four categories of technology skills:

- Non-Users: Employees that do not need any technology-related skills.
- Basic Users: Employees that use basic office software, internet browsers, e-mail, or other primary technologies in their job.
- Moderate Users: Employees that are required to use more advanced software/hardware in their job that may be sector/industry/task-specific.
- Advanced Users: Employees that develop, operate, maintain, modify, and manipulate technology systems, software, or hardware.

The table provides the mix of employee technology skill types as reported by businesses responding to the survey. Also, the table provides the mix of technology skill types as identified by employers across other Connected communities. Employers report that the technology skills of their employees are more advanced than those in other Connected participating communities.

<i>How well do the tech. skills of employees match the tech. needs of the business? (All Establishments)</i>	Ottawa County	Employers in other Connected Communities
Poor	2%	2.3%
Fair	10%	27.0%
Well	39%	31.7%
Very Well	33%	27.9%
Excellent	16%	11.0%

<i>Employee Tech. User Type</i>	Ottawa County	Other Connected Communities
Non-Users	4.8%	7.6%
Basic Users	17.8%	34.6%
Moderate Users	49.3%	37.4%
Advanced Users	28.1%	20.4%

## Technology Training

If technology is ever-changing, and employee technology skills are important to meeting the needs of local businesses, then technology-related training is essential for ensuring employees keep up with the latest technology tools, devices, and applications.

The Technology Training metric examines the importance of technology-related training for employees among local businesses. Respondents to the Business Technology Survey were asked to rate the importance of technology-related training, continuing education, or professional development.

<i>How important is tech-related training and continuing education?</i>	Ottawa County	Other Connected Communities
Not Important	4.7%	2.3%
Slightly Important	15.6%	11.6%
Neutral	12.5%	14.7%
Moderately Important	29.7%	25.5%
Very Important	37.5%	45.9%

According to survey results, responding local businesses in the community feel that technology-related training and continuing education is Moderately or Very Important. The chart shows the distribution of responses across all businesses, as well as the distribution of responses among employers in other Connected communities.

## Continuing Education

The first two metrics, Technology Skill Alignment and Technology Training, examine the current state of technology knowledge of employees and the needs of employers, and the importance of training to boost the technology skills of the workforce. This metric explores the various ways in which employers contribute to and encourage technology-related training and continuing education for employees.

Continuing Education Framework	Ottawa County	Other Connected Communities
Employees are REQUIRED to pursue continuing education	25%	29.4%
Employees are ENCOURAGED, BUT NOT REQUIRED to pursue continuing education.	50%	51.3%
Employees are NEITHER ENCOURAGED NOR REQUIRED to pursue continuing education	25%	19.3%

Active Continuing Education Policies	Ottawa County	Other Connected Communities
Time Off Work	27.6%	39.2%
Financial Support	33.3%	34.8%
On-Site Training	12.6%	26.8%
On-the-Job Training	36.8%	53.1%

*Participants could choose more than one response*

Respondents to the Business

Technology Survey were asked to indicate two things: 1) their overall continuing education framework, and 2) the specific policies they have in place to support their framework. The continuing education framework establishes whether employees are required or encouraged to pursue continuing education. The table provides the breakdown for businesses in the community that support each framework, and the same breakdown for businesses across other Connected communities.

Additionally, employers were asked about the policies they have in place to support continuing education among their employees. The four policies included in the survey are:

- Allowing time off work to pursue training;
- Providing financial support for continuing education;
- Regularly offering on-site training by outside experts; and
- Offering on-the-job training by in-house experts.

The survey results show that, on average, businesses in the community have one policy in place.

One-quarter of businesses require continuing education among their employees, while 50% encourage the practice, but it is not required. The remaining quarter neither encourage nor require continuing education for their employees. Some businesses (11.5%), have no policies in place to support continuing education.

On-the-job training is the most commonly adopted continuing education policy, followed closely by financial support and time-off work for professional development and training.

Among businesses that require continuing education of their employees, 50% report that their employee skills match the needs of their business very well or excellently. For businesses that neither encourage nor require continuing education, only one-third report that the skills of their employees very well or excellently match the needs of their business.

## Youth STEM+C Activities

While the technology skills, training, and continuing education of the current workforce are critical for meeting the needs of new and existing businesses, the cultivation of technology-related skills, interest, and entrepreneurial spirit in the next generation of talent is equally important.

The Youth STEM+C Activities metric examines the prevalence of STEM+C (Science, Technology, Engineering, Mathematics, and Computing) activities available to the community's youth outside of the traditional educational environment. Educational institutions, libraries, and other organizations are typically the facilitators

and hosts of such programming. Respondents to the K-12 Education and Libraries and Community Organizations Surveys were asked if they offer STEM+C programming to youth.

Thirty organizations provided a response to this question from their respective surveys. Of these entities, thirteen (43%), provide opportunities for children and youth to explore STEM+C content, techniques, or careers. Example programs include:

- Allendale Twp. Library: Several STEM-based programs including Tinker Tuesday.
- Gary Byker Library: Maker Space Mondays for children to learn about robotics, circuits, etc.
- Herrick District Library: Partnered with 4H and Lakeshore Makers to provide STEM programming for teens, tweens, and adults.
- Baldwin and Riley Street Middle Schools: After school programs such as robotics and Science Olympiad.
- Grand Rapids Community College: Science and computer camps
- Grand Valley State University: Hosts the Regional Math and Science Center for events.
- Hope College: Offers summer camps and after-school programs.

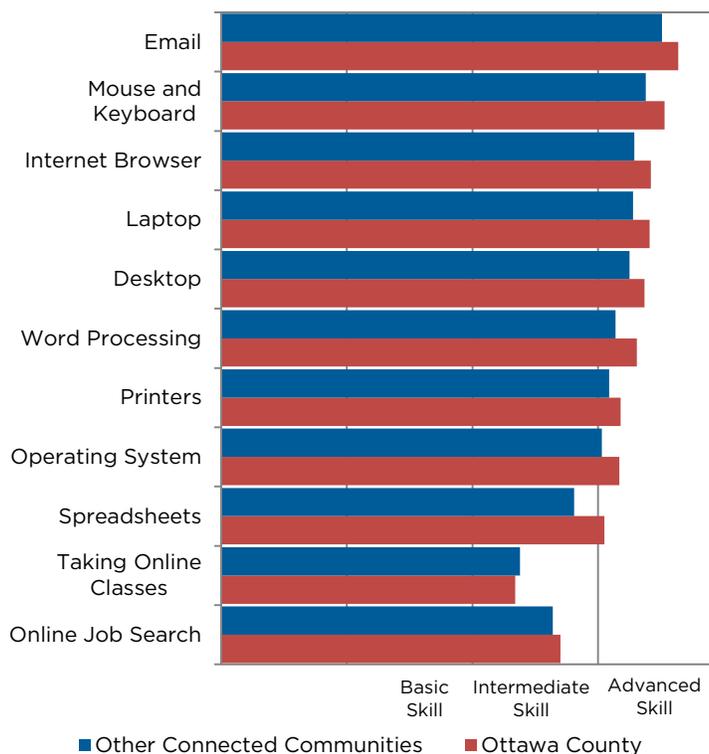
## Occupational Technology Digital Literacy Skills

The technology skills of the workforce will need to keep pace as basic and advanced technologies continue to permeate nearly all occupations and industries. The Occupational Information Network (O\*NET), curates occupational data as it relates to knowledge, skills, and abilities needed to perform a variety of activities and tasks and be successful on the job. Part of O\*NET's database includes information on tools and technology used for each defined occupation. The tools and technology database attempts to identify the universe of machines, equipment, tools, software, and information technology that workers may use for optimal functioning in a high performance workplace. O\*NET's database includes four types of tools and technology found in most occupations that require basic digital literacy skills: personal computer (desktop or laptop), e-mail, internet browser, and office suite (productivity) software. A personal computer is an essential tool for more than 95% of occupations. E-mail and an internet browser are required for 52% and 51% of occupations, respectively, and 46.5% of occupations require the use of office productivity software.

The Occupational Technology Digital Literacy Skills metric examines the digital literacy of the community's residents for the specific devices and applications identified for occupational success. Respondents to the Residential Technology Survey were asked to rate their own digital literacy for the following nine most commonly used devices and applications in many occupations: desktop computer, laptop computer, mouse and keyboard, printers, operating system, word processing, spreadsheets, internet browser, and e-mail. The measurement of digital literacy among a variety of devices, applications, and activities also allows for an analysis of residents' ability to conduct an online job search or take classes online (also included in the chart).

According to survey results, on average, residents in the community are comfortable using the nine occupational technologies. Ottawa County residents, overall, are more proficient with the various occupational digital literacies compared to residents of other Connected communities, (as shown in the chart).

## Digital Literacy Across Common Occupational Technologies



Among all residents, approximately 67% are comfortable with or have mastered the ability to conduct an online job search, (compared to 65% of residents in other Connected communities). Similarly, 53% of residents report being proficient at taking online classes, (compared to 54% of residents in other Connected communities).

# Challenges and Recommendations

While Ottawa County exhibits great progress in broadband and technology advancement, this technology plan offers recommended actions that will help assist and enable the community to fill the technology gaps identified via the Connected assessment.

Building on the foundation set by this group, Connected Nation believes it is important to empower those who are most passionate and focused about the sustained education and growth of broadband and technology access adoption and use in the community. By joining a group or developing a regional Technology Access Committee (501(c)(3) or similar), immediately the group becomes empowered to take actions that they deem necessary to the sustainability of their community regarding broadband and technology.

The focus of a team like this is to take the recommended actions proposed further in the document and to create an independent entity by which funding and leadership can be developed in a sustainable way for Ottawa County.

Ideally this team would:

- Promote broadband and technology access, adoption, and use
- Serve as the defacto voice related to broadband and technology for Ottawa County.
- Seek ways to educate and empower the region regarding broadband and technology
- Unify the region on broadband and technology, in order to better understand and communicate broadband and technology opportunities.
- Take action on recommendations from this plan as well as others that they may find necessary or interesting and beneficial to the growth of the region.

Connected Nation recommends a set of steps by which a group like this might form; however it recognizes that there may be ways to partner with an already established group who is interested in assisting Ottawa County

1. Determine an interim board that will be able to provide the initial leadership and direction, to set bylaws, structure, and apply for nonprofit status.
2. Work with a local lawyer, at a reduced rate where possible, to finalize the organization and get non-profit status applications completed.
3. Begin regularly scheduled meetings, and recruit businesses and individuals to the TAC.
4. Go to work in Ottawa County.

These recommended actions for project implementation are subject to evolution as implementers assimilate various local organizational goals and objectives.

## Priority Projects

- Extend Broadband
- Promote Broadband

## Challenges

The following table summarizes the broadband technology gaps and challenges in Ottawa County identified during the assessment.

Area	Challenge
Households	Digital interaction with: agriculture, community organizations, higher education, libraries, local government, and public safety.
	Digital literacy
	Fixed home broadband adoption
Agriculture	Use of technology-enabled equipment
Business/Economic Development	Advanced technology applications
	Business digital communications
Government	Advanced technology applications
	Digital communications
Healthcare	Digital communication
	Telehealth
	Advanced technology applications
K-12 Education	Student devices, one-to-one computing
	Electronic content delivery
	Digital communications
Libraries/Community Orgs.	Digital communications
Public Safety	Next Generation 9-1-1
Talent and Workforce	Continuing education policies

## Recommendations

The following pages contain recommended projects with details on their implementation that address the identified challenges. Projects are divided into those addressing access, adoption, and use.

### Extend Broadband

**GOAL:** Increase broadband availability to underserved communities throughout the County.

**DESCRIPTION:** By taking the following actions to further extend broadband to County residents and businesses, there will be additional opportunities for advancing residents' quality of life and an increasing the level of connectedness throughout the region.

**Primary ACTIONS for extend:**

1. Seek grant opportunities to extend broadband to underserved areas
2. Collaborate with schools to identify students who do not have access to broadband at home
3. Collaborate with local units of government in Ottawa County to obtain localized survey data regarding broadband needs among residents and businesses
4. Conduct pilot program with willing provider to extend service to residents and businesses
5. Explore opportunities to co-locate broadband equipment on existing cellular communication towers in the County

6. Facilitate digital literacy (e.g. create partnerships between libraries, schools, senior centers, broadband providers, and other community organizations to offer training on topics like online safety and cybersecurity)
7. Continue to pursue next generation 911 upgrades for public safety
8. Review local policies related to broadband installation and construction to remove potential barriers (e.g. cost)
9. Expand regional telehealth initiatives (e.g. deliver improved healthcare services to rural residents by using video-based technologies in homes and in partnership with local clinics, libraries, etc.)
10. Explore opportunities to construct new cellular communication towers in underserved areas in collaboration with willing provider(s)
11. Collaborate with local units of government to improve their online resources

**Secondary ACTIONS for extend:**

1. Conduct pilot program with a local school district to install wifi on school busses so students can complete homework on their rides to and from school
2. Explore 1:1 device programs for K-12 education (e.g. providing each student with their own internet-enabled device to create opportunities for student engagement and learning)
3. Develop a technology mentorship program (e.g. high school and college students assist in technology training, technical support, and outreach efforts in their communities)
4. Consider establishing a community technology academy (e.g. libraries, community centers, schools, community colleges, universities offer training on using computers, related applications, the internet, social networking, etc.)
5. Explore web-enabled formats for course delivery for K-12 education
6. Consider creating legislation to serve areas without broadband
7. Consider constructing community-owned broadband infrastructure
8. Develop private partnerships with businesses to host hotspots
9. Develop incentives to broadband providers to help underserved areas
10. Explore transportation options for students who need school labs for homework

**RESPONSIBLE PARTIES:**

- Broadband providers
- Local businesses
- Schools
- Libraries
- Community centers
- Hospitals and healthcare professionals
- Local units of government
- Ottawa County Broadband Advisory Committee

**BENEFITS:**

- Increases broadband accessibility for students, residents, and businesses (especially in rural communities)
- Improves broadband affordability for residents and businesses (especially in rural communities)
- Improves online safety, health services, and public safety

## Promote Broadband

**GOAL:** Raise and maintain awareness of broadband availability and resources available to acquire and use internet at home and at school.

**DESCRIPTION:** By taking the following actions to further promote broadband to County residents and businesses, individuals and groups will be more inclined to use broadband at home, at school, and at other public and private locations throughout the region.

### **Primary ACTIONS for promote:**

1. Promote libraries as “broadband hubs” in the community
2. Create/promote school “broadband labs” where students can complete online homework assignments
3. Launch a digital equity initiative (e.g. developing a community-based technology awareness program, promoting low-cost broadband service offerings, facilitating digital literacy training, making low-cost devices available, and identifying and expanding wireless hotspots in the community)
4. Identify customers who could subscribe to existing broadband service without major installation cost in collaboration with providers
5. Promote library online resources

### **Secondary ACTIONS for promote:**

1. Develop countywide marketing tool to promote available broadband services
2. Continue to facilitate a community technology summit
3. Consider providing website and social media classes for local businesses
4. Develop informational guides and educational events on what broadband is useful for, which providers are available, and how to connect

### **RESPONSIBLE PARTIES:**

- Broadband providers
- Schools
- Libraries
- Community Centers
- Local units of government
- Ottawa County Broadband Advisory Committee

### **BENEFITS:**

- Increases awareness for digital resources and tools among students and residents
- Expands learning opportunities for students and residents

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