

# Iosco County

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## Technology Action Plan

*Prepared by*



## Develop Iosco Technology Team and Connect Michigan

July 2016



ACCESS



ADOPTION



USE

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## INTRODUCTION

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The purpose of this report is to summarize the community's assessment of local broadband access, adoption, and use, as well as the best next steps for addressing any deficiencies or opportunities for improving the local technology ecosystem.

### Background

Today, technology plays a pivotal role in how businesses operate, the type of service consumers expect, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has also become dependent on how broadly and deeply the community adopts technology resources, which includes access to reliable high-speed networks, 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.”<sup>1</sup>

Despite the growing dependence on technology, the United States Census reports that 27% of Americans do not have a high-speed connection at home.<sup>2</sup> 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.<sup>3</sup>

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.<sup>4</sup>

Deploying broadband infrastructure, services, and application, as well as supporting the universal adoption and meaningful use of broadband, are challenging—but required—building blocks of a twenty-first century community. To assist communities, Connected Nation developed the Connected Community Engagement Program to help your community identify

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<sup>1</sup> *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010, <http://www.broadband.gov/download-plan/>.

<sup>2</sup> United States Census Bureau's American Community Survey Report, “Computer and Internet Use in the United States: 2013.” <http://www.census.gov/content/dam/Census/library/publications/2014/acs/acs-28.pdf>.

<sup>3</sup> National estimates calculated using Connected Nation's 2014 Residential Technology Assessments.

<sup>4</sup> Estimates based on Connected Nation's *2014 Business Technology Assessment* (<http://www.connectednation.org/survey-results/business>) and 2013 County Business Pattern data from the United States Census Bureau (<http://www.census.gov/econ/cbp/>).

local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.<sup>5</sup>

To fulfill Congress's mandate, the National Broadband Plan, makes recommendations to the FCC, the Executive Branch, Congress, and state and local governments that positively influence the broadband ecosystem—networks, devices, content, and applications—in four ways:

1. Provides entrepreneurial support.
2. Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
3. Promotes business growth and workforce development.
4. Empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets.

## Iosco County Background

**Northeast Michigan Council of Governments.** One of Northeast Michigan Council of Governments' (NEMCOG) strategic goals is to “Provide for Economic Growth and Prosperity in the Northeast Region” by maintaining critical infrastructure such as high-speed Internet access, sewer, water, and transportation that is necessary for all aspects of the traditional economy, as well as the new economy.

In addition, NEMCOG is working to improve the access of broadband throughout all counties in the Northeast Michigan region through the Regional Prosperity Initiative (RPI). Part of the RPI grant is being used to develop a vertical asset inventory for the entire region, provide grants for counties offering social media workshops, and assist counties in expanding broadband access to rural areas that currently lack high speed Internet availability.

Currently, access to affordable broadband is severely lacking in many parts of the region and, in many areas, is non-existent beyond dial-up. Infrastructure development has been an ongoing priority in the region. Due to long-term economic distress infrastructure capacity has lagged behind in many parts of the state. High-speed Internet access has now become an essential piece of infrastructure necessary to attract or retain individuals desiring to live in this area and/or create a business or industry in the region. In order to assess this issue NEMCOG is working to develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas. The vertical assets inventory will provide data for private and public investment decisions, lowering

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<sup>5</sup> Connected Nation, parent company of Connect Michigan, is a national non-profit 501(c)(3) organization that works in multiple states to engage community stakeholders, state leaders, and technology providers to develop and implement technology expansion programs with core competencies centered around the mission to improve digital inclusion for people and places previously underserved or overlooked.

the initial cost of efforts needed to identify potential mounting locations for infrastructure. In addition, the inventory can be used to encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time. Providing grants for counties offering social media workshops will allow for higher businesses adoption and use of broadband-enabled applications, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions. Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. It also provides entrepreneurial support, eliminates the knowledge gap about how best to utilize broadband tools, thereby increasing productivity, and promotes business growth and workforce development.

The Northeast Michigan Council of Governments will also be assisting counties in expanding broadband access to rural areas that currently lack high-speed Internet availability and validate the business case for network build out and capacity investment. This project will allow NEMCOG to provide assistance to teams in order to conduct research surveys and market analyses to validate a business case. This market analysis includes research on the existing and potential service offerings and the respective rates to determine the levels of interest in the services and rate plans offered by the client and to understand existing and potential markets for broadband subscribers (both residential and business).

## Methodology

By actively participating in the Connected Community Engagement Program, Iosco County is boosting the community's capabilities in education, healthcare, and public safety, and stimulating economic growth and spurring job creation. The Develop Iosco Technology Team has collaborated with multiple community organizations and residents to:

1. Empower a community team leader (local champion) and create 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.
2. Identify the community's technology assets, including local infrastructure, providers, facilities, websites, and innovative uses employed by institutions.
3. Complete the Connected Assessment, a measurement of the community's access, adoption, and use of broadband based on the recommendations of the National Broadband Plan.
4. Match gaps in the local broadband ecosystem to solutions and best practices being utilized by communities across the nation.
5. Pursue Connected certification, a nationally recognized platform for spotlighting communities that excel in the access, adoption, and use of broadband.

## What Is Connected Certification?

Connected certification recognizes that a community has measurably demonstrated proficiency for effective access, adoption, and use of broadband and broadband supported technologies. 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 Technology Action Plan and the beginning of a community's journey to continually improve its broadband landscape. 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 share 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.

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## CONNECTED ASSESSMENT

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The Connected assessment framework is broken into 3 areas: **ACCESS**, **ADOPTION**, and **USE**. Each area has a maximum of 40 points. To achieve Connected certification, the community must have at least 32 points in each section and 100 points out of 120 points overall.

The **ACCESS** focus area checks to see whether the broadband and technology foundation exists for a community. The criteria within the **ACCESS** focus area endeavor to identify gaps that could affect a local community broadband ecosystem including last and middle mile issues, cost issues, and competition issues. As noted in the National Broadband Plan, broadband **ACCESS** “is a foundation for economic growth, job creation, global competitiveness and a better way of life.”

Broadband **ADOPTION** is important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The **ADOPTION** component of the Connected Assessment seeks to ensure the ability of all individuals to access and use broadband.

Broadband **USE** is the most important component of **ACCESS**, **ADOPTION**, and **USE** because it is where the value of broadband can finally be realized. However, without **ACCESS** to broadband and **ADOPTION** of broadband, meaningful **USE** of broadband wouldn't be possible. As defined by the National Broadband Plan, meaningful **USE** of broadband includes those areas of economic opportunity, education, government, and healthcare where values to individuals, organizations, and communities can be realized.

### Analysis of Connected Assessment

The Community Technology Scorecard provides a summary of the community's Connected Assessment. The Connected Assessment's criteria are reflective of the recommendations made by the Federal Communications Commission's National Broadband Plan. While the results indicate that the community has made tremendous strides and investments in technology, this Technology Action Plan will provide insight and solutions that will help the community continue to achieve success. Lower scores do not necessarily signify a complete lack of access to broadband service but instead reflect that the broadband infrastructure in the community has not met these national goals and benchmarks.

### **Community Technology Scorecard Brief**

The Community Technology Scorecard provides a summary of the community's Connected Assessment.

- The community scored 38 out of a possible 40 points in broadband access primarily because 76% of the households in Iosco County had access to 100 Mbps download speeds.
- The community scored 30 out of a possible 40 points in broadband adoption. This score indicates an opportunity for Iosco County to increase efforts to overcome the local barriers to home broadband subscription.
- The community scored 35 out of a possible 40 points in broadband use. This score indicates that the Iosco County has effectively employed broadband to deliver online services and applications to help improve overall quality of life for local residents and businesses.
- Iosco County did not meet the 32 points in each focus area that are required for certification and has not qualified for Connected certification.

## Community Technology Scorecard

<b>Community Technology Scorecard</b> Community Champions: Arnold Leriche/Mark Miller Community Advisor: Tom Stephenson				
FOCUS AREA	ASSESSMENT CRITERIA	DESCRIPTION	SCORE	MAXIMUM POSSIBLE SCORE
ACCESS	Broadband Availability	98.23% of homes have access to 3 Mbps	10	10
	Broadband Speeds	78.23% of households with access to at least 50 Mbps	5	5
	Broadband Competition	84.64% of households with access to more than 1 broadband provider	3	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from more than 8 providers/Availability of broadband at speeds of at least 50 Mbps download	10	10
	Mobile Broadband Availability	99.83% of households have access to mobile broadband	10	10
	<b>ACCESS SCORE</b>			<b>38</b>
ADOPTION	Digital Literacy	Program grads are greater than 4 per 1,000 residents over the past year	6	10
	Public Computer Centers	281 computer hours per 1,000 low-income residents per week	4	10
	Broadband Awareness	Campaigns reach 100% of the community	10	10
	Vulnerable Population Focus	7 groups	10	10
	<b>ADOPTION SCORE</b>			<b>30</b>
USE	Economic Opportunity	2 advanced, 6 basic uses	10	10
	Education	13 advanced, 7 basic uses	10	10
	Government	2 advanced, 1 basic use	5	10
	Healthcare	7 advanced, 3 basic uses	10	10
	<b>USE SCORE</b>			<b>35</b>
<b>COMMUNITY ASSESSMENT SCORE</b>			<b>103</b>	<b>120</b>

## Itemized Key Findings

Iosco County identified the following key findings (in addition to findings illustrated in the community scorecard) through its technology assessment:

### ACCESS

- 7 last mile broadband providers currently provide service in Iosco County:
  - 98.23% of households have access to 3 Mbps
  - 78.23% of households have access to at least 50 Mbps
  - 84.64% of households have access to more than 1 broadband provider
- Availability of middle mile fiber infrastructure from 8 providers
- 99.83% of households with access to mobile wireless

### ADOPTION

- 3 Digital Literacy Programs exist in the community resulting in 127 Program grads over the past year
- 5 Public Computer Centers (PCC) with a total of 31 computers available to the public
- 3 Broadband Awareness Campaigns are reaching 100% of Iosco County
- 2 organizations are working with vulnerable populations

### USE

- At least 8 uses of broadband were identified in the area of economic opportunity including 2 advanced uses and 6 basic uses
- At least 20 uses of broadband were identified in the area of education including 13 advanced uses and 7 basic uses
- At least 3 uses of broadband were identified in the area of government including 2 advanced uses and 1 basic use
- At least 10 uses of broadband were identified in the area of healthcare including 7 advanced uses and 3 basic uses

In addition to the items identified above, the Iosco County identified the following technology resources in the community:

### **Technology Providers**

11 broadband providers were identified in Iosco County

- 2 hardware providers were identified in Iosco County
- 1 network developer was identified in Iosco County
- 3 web developers were identified in Iosco County

**Technology Facilities**

- 5 public computer centers
- 8 wireless hotspots

**Community Websites**

- 5 Business-related websites (excluding private businesses)
- 7 Education-related websites
- 11 Government-related websites
- 4 Healthcare-related websites
- 5 Library-related websites
- 3 Tourism-related websites
- 4 Community-based-related websites

**Iosco County Priority Projects**

The Connected Assessment has culminated in the outlining of projects designed to empower the community to accelerate broadband access, adoption, and use. There are 6 projects that the community has identified as priority projects.

**Priority Projects Identified by the Develop Iosco Technology Team**

- 1. Identify, Map, and Validate Broadband Demand**
- 2. Perform an Analysis of Local Policies and Ordinances**
- 3. Facilitate Internet Safety Classes**
- 4. Facilitate a Technology Summit**
- 5. Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses**
- 6. Perform a Municipal Information Technology Assessment**

## Iosco County Additional Projects

The table below shows the complete list of the 15 recommended projects by the Connected Michigan team and the Develop Iosco Technology Team propose to undertake in order to accelerate broadband access, adoption, and use in Iosco County. Detailed descriptions of each solution proposed by Connect Michigan can be found in the *Action Plan* section of this report.

<b>Additional Projects Identified by the Develop Iosco Technology Team</b>	
<b>ACCESS</b>	
<b>Broadband Competition</b>	Develop Public-Private Partnerships to Deploy Broadband Service
	Study and Possibly Reassess Major Telecom Purchase Contracts
<b>Mobile Broadband Availability</b>	Complete a Vertical Assets Inventory
<b>ADOPTION</b>	
<b>Digital Literacy</b>	Distribute Digital Literacy Content
	Develop a Technology Mentorship Program
<b>Public Computer Centers</b>	Initiate a Community Computer Refurbishment or Recycling Program
	Provide Incentives to Encourage Computer Purchases Among Students
<b>USE</b>	
<b>Economic Opportunity</b>	Create Local Jobs Via Teleworking Opportunities
<b>Education</b>	Improve Education Through Digital Learning
<b>Government</b>	Improve Public Safety Communications
	Improve the Online Presence of Government
	Improve Online Business Services Offered by the Government
	Support Healthcare Providers Serving Rural Communities
	Pursue Next General 911 Upgrades
<b>Healthcare</b>	Promote Telemedicine in Remote Areas

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## DETAILED FINDINGS

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### Current Community Technology Developments in Iosco County

The US 23 Heritage Route program is funded by the Michigan Department of Transportation. Technical assistance is provided by the Northeast Michigan Council of Governments (NEMCOG). Volunteer teams from all 6 counties provide countless hours of effort to promote the Sunrise Coast of Michigan. For more information on the US 23 Heritage Route program go to the website. [www.us23heritageroute.org](http://www.us23heritageroute.org).

Develop Iosco saw the need and developed the Develop Iosco Technology Team (DITT) in 2014 to lead the effort toward improving broadband capabilities for residents and businesses throughout Iosco County. Develop Iosco's Mission statement is: *To promote community and economic development and the growth of Iosco County and/or the multi-county area surrounding Iosco County in the State of Michigan*. Recognizing the inseparability of healthy community, environment and economy, the corporation will support and conduct economic development activities in furtherance of sound community and environmental policies. <http://www.developiosco.org>.

In the summer of 2014, DITT partnered with Connect Michigan to begin the process. With advice from Connect Michigan, DITT decided in the fall of 2015 to conduct an abbreviated survey to augment the 2014 responses due to its relatively low response rate. This additional survey increased overall responses by 33% for individuals and nearly doubled the number of businesses. The 2014 team comprised the Oscoda-AuSable Chamber of Commerce, Michigan State University Extension, and Develop Iosco, while the 2015 survey was conducted by Develop Iosco. Iosco County also wants to recognize the mapping efforts provided by the staff of NEMCOG. The team recognizes the importance of high-quality Internet connectivity in the lives of students, families, and businesses, not only in East Tawas, Oscoda, and Tawas City, but possibly more importantly, in the rural areas of our communities and Iosco County as a whole.

**Survey Summary:** The summer 2014 surveys were available at Chambers of Commerce, libraries, and Michigan Works. In addition the *Oscoda Press* and *Iosco County News-Herald* both featured an article with a copy of the survey questions for mail-ins. The fall 2015 surveys were distributed primarily to lake and property associations in the county. The 10-question survey asked about the use, satisfaction, cost, type of service, and desire to bundle services (Internet, phone and television). An online version of the survey was conducted through Survey Monkey in both surveys. There were 551 documentable responses that were received (total of both surveys) and later plotted in GIS maps with the aid of Amalgam LLC. Surveys were collected at the local libraries, Michigan Works, and Chamber offices. Participants also had the option to mail their responses to Develop Iosco.

Sunrise Side Lifelong Learning (SSLL) is a member-directed, 501(c)3, nonprofit organization that plans and offers informal educational programs and activities to enrich the daily lives of its members and others through mini-courses, day trips, outdoor activities and social events. Each trimester (fall, winter, and spring/summer) new sets of courses and day trips are offered to people in Alcona, Iosco, Arenac, and Ogemaw Counties who are 45 years old and over. People are asked to pre-register for all programs and events and to evaluate all events in which they participate. It is SLL's mission to provide participants with the highest quality, lowest cost programs to foster continual learning and enrich lives. Sunrise Lifelong Learning offers unique learning classes, but without tests, grades, and papers, that will meet 2-4 times in two-hour sessions. Some day-long workshops are also available. High school graduation and/or college attendance are not required—just have an interest in continuous learning. Classes in computers and technology are offered in the following subjects: Power Point Presentations, Computers and Windows 101: The Basics, Introduction to Windows 10, and Don't Be Scammed on Your Computer.

Sunrise Lifelong Learning also offers a tutoring segment in Individualized Computer Tutoring whereby a members or non-member can sign-up for private lessons on their computer to take them to the next step in their computer or tablet use. Sunrise Lifelong Learning has instructors who are willing to work with beginners through advanced levels with a variety of computer programs. For example, if a person has basic Excel skills but wants to learn formulas, charts or graphs, or perhaps the trainee is wondering, "OK, I now have a new computer, what can I do with it?" the person can select the topic and help will be provided to them in General Introduction, Windows 7, Windows 8, Word, Excel, Search, PowerPoint, Email, or Online Shopping. As a time convenience, this individual tutoring can be given at The IRESA or at Alpena Community College, Huron Shores Campus in Oscoda. Sessions are 90 minutes long.

## Iosco County Assessment Findings

Today, residents in Iosco County (or sections of the community) are served by 11 providers. At the time of broadband assessment, broadband was defined as Internet service with advertised speeds of at least 768 Kbps downstream and 200 Kbps upstream. According to Connect Michigan's latest broadband mapping update, the following providers have a service footprint in Iosco County.

Broadband Providers	Website	Technology Type
Charter Communications Inc.	<a href="http://www.charter.com">http://www.charter.com</a>	Cable/Fiber
AT&T Michigan	<a href="http://www.wireless.att.com">http://www.wireless.att.com</a>	DSL
CenturyLink	<a href="http://www.centurylink.com">http://www.centurylink.com</a>	DSL
Iserv	<a href="http://www.iserv.net">http://www.iserv.net</a>	DSL
Pigeon Telephone Company	<a href="http://www.pigeontelephone.com">http://www.pigeontelephone.com</a>	DSL
Frontier North, Inc.	<a href="http://www.frontier.com">http://www.frontier.com</a>	DSL/Fiber
Ideal Wireless, Inc.	<a href="http://www.idealwifi.net">http://www.idealwifi.net</a>	Fixed Wireless
M33 Access	<a href="http://www.m33access.com">http://www.m33access.com</a>	Fixed Wireless
AT&T Mobility LLC	<a href="http://www.wireless.att.com">http://www.wireless.att.com</a>	Mobile Wireless
Sprint	<a href="http://www.sprint.com">http://www.sprint.com</a>	Mobile Wireless
Verizon Wireless	<a href="http://www.verizonwireless.com">http://www.verizonwireless.com</a>	Mobile Wireless

Below is a list of organizations that are making technological resources available to the community. These resources may include videoconferencing, public computing, and/or wireless hotspots.

Organization Name	Website	Resource Type
Iosco-Arenac District Library Plainfield Township Library	<a href="http://ioscoarenaclibrary.org/plainfield.htm">http://ioscoarenaclibrary.org/plainfield.htm</a>	Public Computer Facility
Iosco-Arenac District Library, Whittemore Library	<a href="http://ioscoarenaclibrary.org/whittemore.htm">http://ioscoarenaclibrary.org/whittemore.htm</a>	Public Computer Facility
Iosco-Arenac District Library, Tawas City Library	<a href="http://ioscoarenaclibrary.org/tawas%20city.htm">http://ioscoarenaclibrary.org/tawas%20city.htm</a>	Public Computer Facility
Iosco-Arenac District Library, Robert J Parks Library	<a href="http://ioscoarenaclibrary.org/oscoda.htm">http://ioscoarenaclibrary.org/oscoda.htm</a>	Public Computer Facility
Iosco-Arenac District Library, East Tawas Library	<a href="http://www.ioscoarenaslibrary.org/east%20tawas.htm">www.ioscoarenaslibrary.org/east%20tawas.htm</a>	Public Computer Facility
Diversions Tea House	<a href="http://theteahouse.wix.com/theteahouse">http://theteahouse.wix.com/theteahouse</a>	Wireless Hotspot
Tim Horton's	<a href="http://www.timhortons.com">www.timhortons.com</a>	Wireless Hotspot
Burger King	<a href="http://www.bk.com/">http://www.bk.com/</a>	Wireless Hotspot
McDonald's	<a href="https://mylocalmcds.com/tawas-bay-mcdonalds/">https://mylocalmcds.com/tawas-bay-mcdonalds/</a>	Wireless Hotspot
Augie's on the Bay	<a href="http://youngsgotaway.com/">http://youngsgotaway.com/</a>	Wireless Hotspot
Long Lake Bar & Grill	<a href="http://www.longlakebar.com">www.longlakebar.com</a>	Wireless Hotspot
McDonald's	<a href="http://www.mcmichigan.com/3892">www.mcmichigan.com/3892</a>	Wireless Hotspot
Office Lounge & Grill	<a href="http://officeloungeandgrill.com/">http://officeloungeandgrill.com/</a>	Wireless Hotspot

Below is a list of community websites (sorted by category) designed to share and promote local resources.

Organization Name	Website	Category
Develop Iosco	<a href="http://www.developiosco.org/">http://www.developiosco.org/</a>	Business
Michigan Economic Development Corporation	<a href="http://www.michiganbusiness.org">www.michiganbusiness.org</a>	Business
Michigan Small Business Development Center	<a href="http://www.sbdcmichigan.org/about-us/">http://www.sbdcmichigan.org/about-us/</a>	Business
Region 7B Michigan Works!	<a href="http://www.michworks4u.org/index.html">http://www.michworks4u.org/index.html</a>	Business
Tawas Area Chamber of Commerce	<a href="http://www.tawasbay.com/">http://www.tawasbay.com/</a>	Business
Hale Area Association	<a href="http://www.halemi.com/">http://www.halemi.com/</a>	Community Based
Iosco County Airport	<a href="http://airnav.com/airport/6D9">http://airnav.com/airport/6D9</a>	Community Based
Iosco County Commission on Aging	<a href="http://www.ioscocoa.org/">http://www.ioscocoa.org/</a>	Community Based
Oscoda-Wurtsmith Airport Authority	<a href="http://oscairport.com/">http://oscairport.com/</a>	Community Based
Alternative Educational Academy Of Iosco County	<a href="http://www.ioscoaea.net/">http://www.ioscoaea.net/</a>	Education
Hale Area Schools	<a href="http://www.haleschools.net/">http://www.haleschools.net/</a>	Education
Iosco RESA	<a href="https://www.ioscoresa.net/">https://www.ioscoresa.net/</a>	Education
Oscoda Area Schools	<a href="http://www.oscodaschools.org/">http://www.oscodaschools.org/</a>	Education
Tawas Area Schools	<a href="http://www.tawas.net/">http://www.tawas.net/</a>	Education
Whittemore-Prescott Area School	<a href="http://www.wpas.net/">http://www.wpas.net/</a>	Education
Baldwin Township	<a href="http://www.baldwintownship.net/">http://www.baldwintownship.net/</a>	Government
Charter Township of AuSable	<a href="http://www.ausabletownship.net/">http://www.ausabletownship.net/</a>	Government
City of East Tawas	<a href="http://www.easttawas.publishpath.com/city-government">http://www.easttawas.publishpath.com/city-government</a>	Government
Iosco County	<a href="http://www.iosco.net/">http://www.iosco.net/</a>	Government
Iosco County Road Commission	<a href="http://www.ioscoroads.org/">http://www.ioscoroads.org/</a>	Government
Iosco County Sheriff	<a href="http://www.iosco.net/government/sheriff-department/">http://www.iosco.net/government/sheriff-department/</a>	Government
North East Michigan Council of Governments	<a href="http://www.nemcog.org">www.nemcog.org</a>	Government
Oscoda Township	<a href="http://www.oscodatownshipmi.gov/1/322/index.asp">http://www.oscodatownshipmi.gov/1/322/index.asp</a>	Government
Plainfield Township	<a href="http://www.halemichigan.net/township.html">http://www.halemichigan.net/township.html</a>	Government
Tawas City	<a href="http://www.tawascity.org/">http://www.tawascity.org/</a>	Government
Tawas Township	<a href="http://www.tawastownship.com/">http://www.tawastownship.com/</a>	Government
Alcona Health Centers	<a href="http://www.alconahealthcenters.org/oscoda-clinic">http://www.alconahealthcenters.org/oscoda-clinic</a>	Healthcare
AuSable Valley Community Mental Health	<a href="http://www.avcmh.org/">http://www.avcmh.org/</a>	Healthcare

Authority		
St. Joseph Health System-Tawas City	<a href="http://www.sjhsys.org/">http://www.sjhsys.org/</a>	Healthcare
Veterans Administration Oscoda Clinic	<a href="http://www.saginaw.va.gov/locations/oscoda.asp">http://www.saginaw.va.gov/locations/oscoda.asp</a>	Healthcare
Iosco-Arenac District Library East Tawas Branch Library	<a href="http://www.easttawas.com/library">www.easttawas.com/library</a>	Libraries
Iosco-Arenac District Library Plainfield Township Library	<a href="http://www.ioscoarenaclibrary.org/plainfield.htm">http://www.ioscoarenaclibrary.org/plainfield.htm</a>	Libraries
Iosco-Arenac District Library Robert J Parks Library	<a href="http://www.ioscoarenaclibrary.org/oscoda.htm">http://www.ioscoarenaclibrary.org/oscoda.htm</a>	Libraries
Iosco-Arenac District Library Tawas City Library	<a href="http://www.ioscoarenaclibrary.org/tawas%20city.htm">http://www.ioscoarenaclibrary.org/tawas%20city.htm</a>	Libraries
Iosco-Arenac District Library, Whittemore Library	<a href="http://www.ioscoarenaclibrary.org/whittemore.htm">http://www.ioscoarenaclibrary.org/whittemore.htm</a>	Libraries
Oscoda Area Convention and Visitors Bureau	<a href="http://www.oscoda.com/">http://www.oscoda.com/</a>	Tourism
Oscoda-AuSable Chamber	<a href="http://www.oscodachamber.com/">http://www.oscodachamber.com/</a>	Tourism
Tawas Bay Tourist & Convention Bureau	<a href="http://www.tawasbay.com/">http://www.tawasbay.com/</a>	Tourism

Below is a list of local technology companies that are providing technical services or distributing/selling technical resources.

Company Name	Website	Provider Category
Michigan Express	<a href="https://www.michiganx.net/">https://www.michiganx.net/</a>	Hardware Provider
Tawas Computers	<a href="http://www.tawascomputers.com/">http://www.tawascomputers.com/</a>	Hardware Provider/Web Developer
Simtronics	<a href="http://www.simtron.com/">http://www.simtron.com/</a>	Network Integrator/Web Developer
Full Throttle Web	<a href="http://www.fullthrottleweb.com/">http://www.fullthrottleweb.com/</a>	Web Developer

## Connected Assessment Analysis



### Access Score Explanation

**Broadband Availability** (10 out of 10 Possible Points). Broadband Availability is measured by analyzing provider availability of 3 Mbps broadband service gathered by Connected Nation's

broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the February 2016 data collected by Connect Michigan, 99.04% of Iosco County residents had access to broadband speeds of 3 Mbps or greater.**

**Broadband Speeds** (5 out of 5 Possible Points). Broadband Speeds are measured by analyzing the speed tiers available within a community. Data are collected by Connected Nation's broadband mapping program. The Connected Assessment analyzes broadband coverage by the highest speed tier with at least 75% of households covered. If broadband data is missing, the community team was able to improve the quality of data to ensure all providers are included.

- **According to the February 2016 data collected by Connect Michigan, 78.23% of Iosco County residents had access to broadband speeds of 50 Mbps.**

**Broadband Competition** (3 out of 5 Possible Points). Broadband Competition is measured by analyzing the number of broadband providers available in the community and the percentage of that community's residents with more than one broadband provider available. Connected Nation performed this analysis by reviewing the data collected through its broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the February 2016 data collected by Connect Michigan, 84.64% of Iosco County residents had access to more than one broadband provider.**

**Middle Mile Access** (10 out of 10 Possible Points). Middle Mile Access is measured based on a community's availability to fiber. Three aspects of availability exist: proximity to fiber middle mile points of presence (POPs), number of POPs available, and available bandwidth. The community, in collaboration with Connected Nation, collected and analyzed middle mile access data.

- **Iosco County is served by 8 or more middle mile fiber providers.**

**Mobile Broadband Availability** (10 out of 10 Possible Points). Mobile Broadband Availability is measured by analyzing provider availability of mobile broadband service gathered by Connected Nation's broadband mapping program. In communities that may have mobile broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the February 2016 data collected by Connect Michigan, 99.83% of Iosco County residents had access to mobile broadband service.**



## Adoption Score Explanation

**Digital Literacy** (6 out of 10 Possible Points). Digital Literacy is measured by first identifying all digital literacy programs in the community. Once the programs are identified, a calculation of program graduates will be made on a per capita basis. A digital literacy program includes any digital literacy course offered for free or at very low cost through a library, seniors center, community college, K-12 school, or other group serving the local community. A graduate is a person who has completed the curriculum offered by any organization within the community. The duration of individual courses may vary. A listing of identified digital literacy offerings is below.

Organization Name	Program Description	Number of Grads
Sunrise Side Lifelong Learning	Computer and Social Media Training	37
Oscoda-Ausable Chamber of Commerce	Constant Contact - Social Media and e-marketing training program	30
Tawas Chamber of Commerce	Google Workshops - Grow Your Business Online Program	60

**Public Computer Centers** (4 out of 10 Possible Points). Public Computer Centers is measured based on the number of hours computers are available each week per 1,000 low-income residents. Available computer hours are calculated by taking the overall number of computers multiplied by the number of hours open to a community during the course of the week. A listing of public computer centers available in Iosco County is below.

Organization Name	Number of Open Hours Per Week	Number of Computers	Available Computer Hours Per Week
Plainfield Township Library	45.5	6	273
Whittemore Library	42	4	168
Tawas City Library	30	4	120
Robert J Parks Library	54	12	648
East Tawas Library	30	5	150

**Broadband Awareness** (10 out of 10 Possible Points). Broadband Awareness is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and then each program's community reach is compiled and combined with other campaigns. A listing of broadband awareness programs in Iosco County is below.

Organization Name	Campaign Description	Community Reach
Iosco County Libraries	using radio, print, web, and email	100%
Oscoda Area Schools	Oscoda Schools has a Facebook page, website, Google and a school website to promote digital education	30%
Tawas Area Schools	Facebook page, website, Google and a school website to promote digital education	30%

**Vulnerable Population Focus** (10 out of 10 Possible Points). A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc. Programs that focus on vulnerable populations in Iosco County are listed below.

Organization Name	Program Description	Vulnerable Group
MI Works	Online job search assistance	Unemployed adults and seniors
MI Works Youth Services	Youth job skills training	Youth and at-risk youth
MI Works Adult Learning	Adult Learning Labs GED or High School diploma, prepare for college, or improve their reading, writing, math, and keyboarding skills	Low income adults
Iosco County Libraries	Early Literacy Programs and Michigan Electronic Library	Youth, parents, low-income, unemployed and seniors



## Use Score Explanation

**Economic Opportunity** (10 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced, or interactive, use of broadband. Categories within economic opportunity include: economic development, business development, tourism, and agriculture. Identified uses of broadband in the area of economic opportunity are listed below and identified as basic or advanced.

Application Provider	Description	Basic/ Advanced
Develop Iosco	Initiative to spur innovation and commercialization within the community	Advanced
MI Works	Presence of program to provide virtual employment assistance programs and individualized job training	Advanced
Develop Iosco	Availability of free online banking for consumers and businesses	Basic
Develop Iosco	1 free, publicly accessible wireless hotspot available per 5,000 residents	Basic
MI Works	Computer lab with 8 business training classes.	Basic
MSU Extension	Availability of agriculture and farming information online	Basic
Tawas Area Chamber of Commerce	Presence of an online tourism portal for the promotion of local tourism attractions and events	Basic
Tawas Area Chamber of Commerce	75% of local attractions online	Basic

**Education** (10 out of 10 Possible Points) A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within education include K-12, higher education, and libraries. Identified uses of broadband in the area of education are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
Hale Area Schools, Oscoda Area Schools	Initiatives focused on elevating STEM (Science, Technology, Engineering, & Mathematics) literacy	Advanced
Hale Area Schools, Oscoda Area Schools	Student and teacher training programs focused on improving STEM (Science, Technology, Engineering, & Mathematics) education	Advanced
Hale Area Schools, Oscoda Area Schools	Presence of smartboards and supporting technology installed in every classroom	Advanced
Oscoda Area Schools	Students have access to online school curricula and grades through such programs as Skyward Student Management, Google Classroom	Advanced
Oscoda Area Schools	Use Skyward Student Management for emailing parents of students via the Gradebook or the SIS. Also use School Messenger to call parents	Advanced
Oscoda Area Schools	Offering online courses through GenNET and Michigan Virtual School	Advanced
Oscoda Area Schools	Oscoda Area Schools students have a one-to-one environment with Acer Laptops. Working on a grant that would bring Oscoda Area Schools to a one-to-one initiative	Advanced
Tawas Area Schools	Initiatives focused on elevating STEM (Science, Technology, Engineering, & Mathematics) literacy	Advanced
Tawas Area Schools, Hale Area Schools	Presence of a one-on-one initiative	Advanced
Tawas Area Schools, Hale Area Schools	Availability of online courses for K-12 students	Advanced
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools	100% of 12th graders with digital literacy skills	Advanced
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools	100% of K-12 classes with online access to curricula, homework, and grades	Advanced
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools	100% of schools with online interaction with parents	Advanced

Hale Area Schools, Oscoda Area Schools	100% of school campus has access to Wi-Fi	Basic
Tawas Area Schools	Presence of campus Wi-Fi	Basic
Tawas Area Schools	Presence of advance digital technology	Basic
Tawas Area Schools	Program to promote digital education via newsletter and social media	Basic
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools, Oscoda Area	100% of classrooms are connected to Internet via broadband	Basic
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools	100% of school libraries are connected to Internet via broadband	Basic
Whittemore-Prescott Area Schools, Iosco Regional Educational Service Agency, Tawas Area Schools, Hale Area Schools	100% of school libraries have automated library systems	Basic

**Government** (5 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within government include general government, public safety, energy, and the environment. Identified uses of broadband in the area of government are listed below and identified as basic or advanced.

Application Provider	Description	Basic/Advanced
Iosco County	Availability of ubiquitous, interoperable wireless public safety network	Advanced
Iosco County, Oscoda Township	50% of essential government services online	Advanced
Iosco County	Majority of local governments with websites	Basic

**Healthcare** (10 out of 10 Possible Points). A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies. Identified uses of broadband in the area of healthcare are listed below and identified as basic or advanced.

Application Name	Description	Basic/ Advanced
Mid-Michigan Health- Alpena	Oncology Nurse Navigator-translates medical information and helps patients and their families understand the plan of care	Advanced
Mid-Michigan Health- Alpena	Availability of telemedicine (send or receive)	Advanced
Mid-Michigan Health- Alpena	Availability of remote patient monitoring	Advanced
Mid-Michigan Health- Alpena	100% of doctors with adequate bandwidth (based on NBP standard)	Advanced
Mid-Michigan Health- Alpena	MyHealth - online patient portal to pay bills and access records	Advanced
Mid-Michigan Health- Alpena	Tele-Radiology - remote reading of tests and studies	Advanced
St. Joseph Health Systems	Availability of telemedicine (send or receive)	Advanced
Mid-Michigan Health- Alpena	Patient/Guest Internet access	Basic
St. Joseph Health System	Online listing of Healthcare professionals	Basic
St. Joseph Health System	Patient Portal - FollowMyHealth	Basic

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## ACTION PLAN

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### Complete List of Iosco County Projects

The following is a comprehensive list of the priority projects and additional projects the Develop Iosco Technology Team proposes to accelerate broadband access, adoption, and use in Iosco County. Detailed descriptions of each solution are provided.



### ACCESS

#### Broadband Availability

#### Identify, Map, and Validate Broadband Demand

##### Goal

To understand existing and potential markets for broadband subscribers (both residential and business)

##### Project Description

Develop a team to conduct research surveys and market analyses to validate a business case. A market analysis includes research on the existing and potential service offerings and the respective rates to determine the levels of interest in the services and rate plans offered by the client. The team should provide accurate, timely, and thorough solutions, accompanied by personalized service to meet the needs of communities or broadband providers.

##### Benefits

1. Enables the ability to better understand the key drivers of the broadband market.
2. Validates the business case for network build-out and capacity investment.

##### Action Items

1. The project team should be prepared to provide research, project design, data collection services, data analysis and reporting, and presentation development and delivery.

Example: HARBOR Inc. is a citizen-based, non-profit Michigan Corporation founded in 2001 and located in the City of Harbor Springs. The organization's broadband committee developed and mailed a broadband demand survey in July 2012 to approximately 6,300 addresses, comprising all of the local property owners/residents in the community. A copy

of the survey can be reviewed here:

<http://is0.gaslightmedia.com/wwwharborincorg/ ORIGINAL /fs72-1369322556-20386.pdf>

### Implementation

The Develop Iosco Technology Team has implemented a broadband survey, the NEMCOG GIS department mapped the results, and the team created an executive summary which was then sent out to all the service providers.

## **Perform an Analysis of Local Policies and Ordinances**

### **Goal**

Ensure that local policies are conducive to broadband build-out.

### **Project Description**

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, negatively impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights-of-way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way is one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ratio of poles to households goes off the charts. Furthermore, the process is time consuming. "Make ready" work, which involves moving wires and other equipment attached to a pole to ensure proper spacing between equipment and compliance with electric and safety codes, can take months to complete.

Community and provider collaboration to problem solve around local pole attachment and other right-of-way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure.

### **Benefits**

1. Lowers cost barriers to improve the business case for broadband deployment.
2. Encourages good public policy and provider relations.

### **Action Items**

1. Review local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, rights-of-way) that are conducive to broadband build-out.
2. Develop an awareness campaign targeted toward community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources.

## Broadband Competition

### Develop Public-Private Partnerships to Deploy Broadband Service

#### Goal

Fund broadband network deployment

#### Project Description

Public-private partnerships take many forms, limited only by the imagination and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network, which they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

A public-private partnership should not be simply seen as a method of financing. The strength of these partnerships is that each party brings something important to the table that the other doesn't have or can't easily acquire. The community can offer infrastructure (publicly owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed anchor tenants. Private-sector partners bring network-building and operations experience.

#### Benefits

1. The public sector transfers much of the risk for private investment. For example, the public sector has many funding tools available, including incentivizing continued investment through tax credits, encouraging greater availability of private capital through government guaranteed loans, or government being a direct source of capital through loans or grants.
2. The partnership can aggregate demand and reduce barriers to deployment. By working together, public and private parties can educate and build awareness needed for the public to better integrate the use of broadband into their lives, thereby improving the business case for broadband deployment.
3. A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

#### Action Items

1. Decide on the technology (e.g., cable, DSL, fiber, etc.).
2. Issue an RFP.
3. Develop a finance and ownership model.

## Study and Possibly Reassess Major Telecom Purchase Contracts

### Goal

Leverage the demand for broadband across community institutions to promote competition and investment in broadband services.

### Project Description

Demand for broadband capacity across community institutions represents a key segment of the overall demand for broadband in many communities. The purchasing power of this collective should be leveraged to help promote greater competition in the broadband market and drive increased investment in backhaul and last mile broadband capacity.

### Benefits

1. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community.
2. The increased backhaul capacity can in turn benefit the whole community.

### Action Items

Develop partnerships between local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, hospital or clinics, and schools, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service.

## Mobile Broadband Availability

### Complete a Vertical Assets Inventory

#### Goal

Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

#### Project Description

Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. “Vertical assets” are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

### **Benefits**

1. The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.
2. The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

### **Action Items**

1. Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.
2. Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.
3. Identify and map elevated structures utilizing your community's GIS resources. The resulting database should be open ended; localities should be encouraged to continuously map assets as they are made available.

### **Implementation**

The NEMCOG GIS department has performed an inventory of all the vertical assets in the region that needs verification by local organizations.



## ADOPTION

### Digital Literacy

#### Distribute Digital Literacy Content

##### Goal

Facilitate partnerships in order to provide digital literacy training.

##### Project Description

Leverage the abundant digital literacy content available online to distribute to local trainers. Currently, numerous non-profit organizations and for-profit corporations provide curriculum that can be adapted for classroom or self-paced study. Some organizations also provide additional resources for instructor use, including classroom setup information, teaching tips for each course, additional practice, test item files, and answers to frequently asked questions. Digital literacy content can be deployed via local websites (a community portal), print material, podcasts, blogs, and videos.

Additionally, your community could create a partnership between libraries, school systems, computer suppliers, and broadband providers to provide free training and discounted computers and broadband service to low-income community members who are not participating in the digital age. An example of such a program is Connected Nation's Every Community Online program. This is an innovative program that is providing free digital literacy training, access to low-cost computers, and discounted broadband access to communities across the country.

##### Benefits

Increasing the community's digital literacy facilitates widespread online access to education and other public and government services, provides equal access to opportunities such as jobs and workforce training, enables people to find information about their health, and offers the opportunity to increase levels of social interaction and civic involvement.

##### Action Items

1. Develop partnerships with local organizations and equip them with digital literacy content
2. Train staff to deliver the curriculum to potential adopters
3. Promote local organizations as a source of broadband access and training
4. Engage non-adopters with a comprehensive public outreach campaign, helping them understand the benefits of broadband service and inviting them to experience the value at their libraries

5. Provide curriculum to teach computer and Internet use, as well as the skills required to utilize the Internet effectively for essential services, education, employment, civic engagement, and cultural participation
6. Offer compelling promotion to participants, giving them the opportunity to adopt the technology for everyday use in their homes

## Facilitate Internet Safety Classes

### Goal

Ensure that community members are aware of how to navigate the Internet safely.

### Project Description

Create a program designed to help community members who are using the Internet to identify and avoid situations that could threaten their safety, threaten business or government networks, compromise confidential information, compromise the safety of children, compromise their identities and financial information, or destroy their reputations.

### Benefits

1. This project helps ensure that community members have a solid understanding of cyber threats.
2. There are many risks, some more serious than others. Among these dangers are viruses erasing entire systems, a hacker breaking into a system and altering files, someone using someone else's computer to attack others, someone stealing credit card information, sexual predators making advances at children, and criminals making unauthorized purchases. Unfortunately, there's no 100% guarantee that even with the best precautions some of these things won't happen, but there are steps that can be taken to minimize the chances.

### Action Items

1. Partner with a local library or community center to offer security awareness training initiatives that include classroom style training sessions and security awareness websites and information booklets.
2. Awareness training can also be used to alleviate anxiety for community members who are not using the Internet because of fear of cyber threats.

### Implementation

The Iosco-Arenac District Library is scheduled to launch free Internet safety classes in the fall of 2016.

## Develop a Technology Mentorship Program

### Goal

Utilize student technology knowledge to implement community programs.

### **Project Description**

Initiate a program designed to recruit local high school or college students who excel in school and exhibit advanced leadership and technology skills to assist in technology training, technical support, and outreach efforts in their communities. Recognizing students as a powerful resource for local outreach efforts, the program will tap into the technology knowledge base that exists among students and will challenge students to extend their teaching and learning experiences beyond the classroom.

### **Benefits**

1. The program helps students develop self-confidence and technical competencies as they work with their families, leaders, peers, neighbors, seniors, and other members of their communities. In addition to empowering these students with real world experience, it helps enhance their skills as they mature into productive and highly competent citizens.
2. It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.
3. The program will engage students who are creative, knowledgeable, and interested in technology as a great resource for planning, implementation, support, and using technology at a local level. With guidance and support, they will help to provide a missing, and important, link between the members of the community who have experience with broadband technology and those who are currently not using it.
4. The program will expose students to potential career paths and provide a basis to determine if they want to further their educations in a technology field. It could also potentially provide a beginning client base from the relationships he or she has built within the community as a student.

### **Action Items**

1. Identify the program format and offerings. Similar technology mentorship programs are organized as student-run help desks or student-led classes.
2. The program can be hosted at a local school or community anchor institution such as a library or community center, and could be run during the school day as part of the regular curriculum, during study hall or as an afterschool activity.
3. The curriculum could be borrowed from an existing technology mentorship program, or could be student-driven. Similar programs offer digital literacy training to seniors, provide computer refurbishing, build websites, and other forms of tech support to local residents.

## Public Computer Centers

### Initiate a Community Computer Refurbishment or Recycling Program

#### Goal

Initiate a computer refurbishment program designed to help recycle computers donated by local businesses, government, schools and other organizations, and then distribute them to low-income households and other households who face affordability barriers to computer ownership. Alternatively, develop a community recycling program to reduce the amount of hazardous materials that may enter the environment.

#### Project Description

Recruit community members to sanitize old computers and install new software. There are several target groups for performing refurbishments: community volunteers, high school and college students, and prison inmates. Community computer refurbishing provides an opportunity for volunteers and students to gain valuable new skills and training that can be used for career enhancement, and in some cases earn credits for high school or college, while reinvesting in their communities. Communities also have the option of using prison inmates to refurbish computers so that they leave prison with valuable job skills. Alternatively, if the computers are beyond refurbishment, the community can develop a computer recycling program. Recycling and reusing electronic equipment reduces the amount of hazardous materials that may enter the environment. Recycling and reuse programs also reduce the quantities of electronic scrap being landfilled in the state.

#### Benefits

1. Computer refurbishing programs have proven to be an excellent workforce training tool for correctional facilities, young adults, and the mentally and physically challenged. The correctional facility program trains inmates with computer skills that should help them find jobs upon their release.
2. Demanufacturing (the process by which computers and other electronic equipment are refurbished or broken down to their basic parts) helps conserve energy and raw materials needed to manufacture new computers and electronic equipment. These parts are then reused in upgrading other computers.

#### Action Items

1. Develop a model for computer refurbishing or recycling. A basic framework might include:
  - a. Step 1: Project Planning
    - i. Determination of minimum computer specifications
    - ii. Acquisition and storage of donated computers
    - iii. Determination and installation of appropriate computer operating system
    - iv. Calculation of costs needed to carry out the program

- b. Step 2: Inventory Management
  - i. Examine how equipment and software will be sorted and managed; manage inventory by identifying computers that are ready to be refurbished from those that are non-functioning
- c. Step 3: Volunteer Training
  - i. Review established residential refurbishment and recycling programs that the community can take advantage of:
    1. [Dell's Reconnect program](#) is a residential computer recycling program that offers a convenient way to recycle used computer equipment. Drop off any brand of used equipment at participating Goodwill donation centers in your area. It's free, and participants receive a receipt for tax purposes. To view a full list of acceptable products and locations, visit the [Dell Reconnect](#) website.
    2. [Earth 911](#) Earth 911 is a comprehensive communication medium for the environment. Earth 911 has taken environmental hotlines, websites, and other information sources nationwide and consolidated them into one network which can be searched for community-specific information.
    3. [E-Cycling Central](#) The Telecommunication Industry Association's E-Cycling Central website helps you find reuse, recycling, and donation programs for electronics products in your state.

## Provide Incentives to Encourage Computer Purchases Among Students

### Goal

Provide equal access to computers and enable digital learning.

### Project Description

Develop a program that will enable students to obtain computers. Programs could include refurbished computers or new laptops or tablets. Consider a group-purchasing program, which would allow:

- Special discount pricing
- Warranty availability
- Wired and wireless usage throughout school and home
- On-campus access to tech support
- Loaner computer access while devices are being repaired

### Benefits

1. Provides equal computer access, regardless of ability to purchase.
2. Supports school-wide online education initiatives.
3. Enables the adoption of e-books.

**Action Items**

1. Research grants and private funding opportunities.
2. Assess whether developing a leasing or purchasing program is more appropriate for your school.

## Broadband Awareness

### Facilitate a Technology Summit

**Goal**

A technology summit should bring together community stakeholders to develop a dialogue about how public and private stakeholders can collectively improve broadband access, adoption, and use.

**Project Description**

Develop and host a technology summit for residents and businesses to increase awareness of broadband value, service options, and the potential impact on quality of life. The technology summit should facilitate community partnerships between leaders in local government and the private sector, including non-profits and private businesses in the education, healthcare, and agriculture sectors, with the goal of ensuring that residents have at least one place in the community to use powerful new broadband technologies, and that this asset will be sustained over time. Further, the technology summit should highlight success stories as evidence of the impact of technology.

**Benefits**

1. Highlights successes, opportunities, and challenges regarding community technology planning.
2. Develops ongoing dialogue around improving broadband access, adoption, and use.
3. Unifies community stakeholders under one vision.

**Action Items**

1. Create community partnerships.
2. Identify funding sources and hosts.
3. Identify suitable speakers.
4. Develop relevant content.



## USE

### Economic Opportunity

#### Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses

##### Goal

Businesses adopt and use broadband-enabled applications, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.

##### Project Description

Methods of implementing a small and medium business broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and releasing public service announcements. It is also important to educate local businesses about Internet tools that are available at minimum or no cost to them.

A training program, or entry-level “Broadband 101” course, could be utilized to give small and medium businesses an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, training should include resources for non-IT staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization. Additional training might include:

- “How-to” training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.
- Technical and professional support for hardware, software, and business operations.
- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.
- Website development and registration.
- Basic communications equipment, such as low-cost personal computers and wireless routers.

### Benefits

1. Provides entrepreneurial support.
2. Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
3. Promotes business growth and workforce development.
4. Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation's 2014 Business Technology Assessment, online sales represented \$2.3 trillion in sales revenues for U.S. businesses in 2013.

### Action Items

1. Identify federally or state sponsored business support programs (e.g., Chamber of Commerce, SBA, EDA, Agriculture, or Manufacturing extension) that include assistance with broadband or IT content.
2. Identify or develop a business awareness and training program.
3. Identify or develop online training modules for businesses. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National E-Commerce Extension Initiative. As the sole outlet nationally for e-commerce educational offerings geared at Extension programming, the National E-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to E-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile E-Commerce. To see some examples, click here: [http://srdc.msstate.edu/ebeat/small\\_business.html#](http://srdc.msstate.edu/ebeat/small_business.html#).

### Implementation

Both the Oscoda-AuSable Chamber of Commerce and the Tawas Area Chamber of Commerce have launched social media and e-marketing training programs for the local businesses and non-profits.

## Create Local Jobs Via Teleworking Opportunities

### Goal

Connect IT training and education with remote employment opportunities.

### Project Description

Connected Nation's Digital Works program is a hybrid between an employment agency and a co-working facility that connects residents with online training courses and connections with companies that lack a physical presence in the community. The Digital Works program creates jobs in areas facing high unemployment by leveraging broadband technology for call center and

IT outsourcing. Extended training is available for HTML programming and other technical positions as well. The program is providing an avenue for communities to create a job incubator, retaining workers in the area and attracting corporate jobs while providing a pathway for improving a worker's competitive advantage in the twenty-first century workforce with specified coursework and training.

At the end of training, workers are placed in available positions that match their skills and interests. All jobs pay above minimum wage and the training provides opportunities for placement at levels for upward mobility. This is work that can be done from home or at the Digital Works center, which is provided through a partnership with the community.

### **Benefits**

1. This type of project can educate, train, employ, and has the potential to ultimately increase the productivity and economic competitiveness of your community's workforce.
2. The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.
3. Through training and work, participants will rely heavily on local ISPs, broadband technology, and emerging IT technologies to provide services to a global marketplace, in turn fostering the demand-driven strengthening of the community's physical Internet infrastructure.

### **Action Items**

1. The Digital Works program requires a site suitable for establishing office infrastructure, educational partners to develop the workforce, and business relationships with enterprises willing to hire workers through the digital factory.
2. Identify the physical, financial, and technological resources needed to establish a digital factory.
3. Space to house workspace and training and support offices will be needed, as well as the equipment, such as computers and monitors for videoconferencing and training.
4. Develop partnerships with companies who would provide contractual employment to program graduates.
5. Visit <http://www.digitalworksjobs.com/> to learn more.

## Education

### Improve Education Through Digital Learning

#### Goal

Increase student attention and engagement; encourage students to take ownership of their learning and make it easier for teachers to differentiate instruction without embarrassing students.

#### Project Description

Several digital learning platforms are available for K-12 implementation. For example, [CFY](#) is a national education nonprofit that helps students in low-income communities, together with their teachers and families, harness the power of digital learning to improve educational outcomes. The organization is unique in that it operates both “in the cloud” (through [PowerMyLearning.com](#), a free K-12 online learning platform) and “on the ground” (through its Digital Learning Program, a whole school initiative that works hands-on with all three of the constituents that impact student achievement: teachers, parents, and students).

[PowerMyLearning.com](#) is a free online educational tool that helps students, teachers and parents locate and access over 1,000 high-quality online digital learning activities – videos, simulations, and other educational software – to propel student achievement in subjects including math, English, science, and social studies. The platform features a kid-friendly design. There is a playpoint/badge feature to help motivate students. In addition, students can rate digital learning activities and share them with friends via e-mail, Facebook, and Twitter. CFY also provides onsite training to instruct teachers how to integrate PowerMyLearning into their classrooms.

#### Benefits

1. Increase learning time by extending learning beyond the classroom walls.
2. Individualize learning and increase student engagement in school.
3. Encourage self-directed learning.
4. Enable parents to more effectively support their children at home.

#### Action Items

1. Launch a program to promote digital education via newsletter and social media to all the residents within the school districts. Many of the successful school districts launched this digital education program two years prior to their request of a technology bond issue that would support a digital learning program.
2. Coordinate this effort with the local libraries which will need to adjust their services to support this program.

## Government

### Improve Public Safety Communications

#### Goal

Leverage broadband technologies to enhance emergency communications to and from the public.

#### Project Description

Broadband offers a unique opportunity to achieve a comprehensive vision for enhancing the safety and security of your community's residents. Broadband can help public safety personnel prevent emergencies and respond swiftly when they occur. Broadband can also provide your community with new ways of calling for help and receiving emergency information.

For example, first responders from different jurisdictions and agencies often cannot communicate during emergencies due to disparate communication systems and the lack of integration between these systems. However, wireless broadband supports the interoperability of communications systems that would allow first responders anywhere in the nation to communicate with each other and send and receive critical voice and data to save lives, reduce injuries, and prevent acts of crime and terror.

Furthermore, with broadband, 911 call centers (also known as public safety answering points or PSAPs) could receive texts, pictures, and videos from the public and relay them to first responders. Similarly, the government could use broadband networks to disseminate vital information to the public during emergencies in multiple formats and languages.

To overcome the challenges posed by disparate communication systems and dated technology, your community's public safety agencies should collaborate with state and federal agencies in order to improve communication across organizational and jurisdictional boundaries. This is one of the priorities of the First Responder Network Authority (FirstNet). Created by the Middle Tax Relief and Job Creation Act of 2012, FirstNet was established as an independent authority within the National Telecommunications and Information Administration (NTIA) in order to establish a single nationwide, interoperable public safety broadband network.

To find out more information on FirstNet and the Nationwide Public Safety Network, visit <http://www.ntia.doc.gov/category/firstnet>.

To find out more information regarding your state's efforts and point of contact for FirstNet planning, check with your Governor's office and/or statewide interoperability coordinator.

Other relevant initiatives include:

[Assistance to Firefighters Grants \(AFG\)](#): The primary goal of the AFG Program is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency

medical service organizations. AFG funds have helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.

[Community Connect Grant Program](#): The Community Connect Grant Program provides financial assistance to furnish broadband service in unserved, often isolated, rural communities. The grants are used to establish broadband service for critical facilities such as fire or police stations, while also providing service to residents and businesses.

### **Benefits**

1. Provide enhanced 911 services and support of wireless device technologies and video in addition to traditional land-line calling. This will allow callers to use personal devices such as smart phones and tablets to not only text but also send actual video, thereby giving the responders a visual of the emergency situation.
2. Development of a “Next Generation 911 Call Management” system that will allow call centers to work together and be connected via a broadband network.

## **Perform a Municipal Information Technology Assessment**

### **Goal**

Determine overall IT operational efficiency and establish an informed process for strategic IT decisions.

### **Project Description**

Conduct a Community IT Assessment of current environment performed through an interview process (onsite, videoconferencing, e-mail/web-based) to determine overall IT operational efficiency. Once complete, an end deliverable provides detailed assessment results including a relative “grade” in each area as well as suggested action plans for any areas that are found to be below standards.

### **Benefits**

1. Eliminates performance gaps, redundancies, inefficiencies, and unintended information silos.
2. Assists in providing a clear, repeatable, streamlined, and informed process for making strategic IT decisions.

### **Action Items**

1. Identify a complete list of all IT equipment including age, condition, and capacity/specifications currently in use.
2. Assess server infrastructure (hardware, operating systems, and storage) and network topology (design, cable plant, and Internet connectivity).
3. Identify all currently used applications/uses and backup procedures.

4. Identify and assess security measures (firewall, perimeter, physical and wireless security).
5. Identify “Best Practices” for each office as appropriate.

## Improve the Online Presence of Government

### Goal

The goal should be to make the website relevant, useful, convenient, and the go-to for local information and services.

### Project Description

The government’s website must meet the needs of the citizen; should equal or exceed the standards of private company websites; design must be uncluttered, informative, and easy to navigate; and website best practices must be continuously monitored and implemented. Further, website administrators should be funded and required to follow the latest best practices in design and web search optimization. They should have a process for archiving content that is no longer in frequent use and no longer required to be posted on the website. In addition, the local government should regularly solicit public opinion and analyze citizens’ online preferences before making changes to their website or before launching a new website.

### Benefits

1. Makes government more efficient, resulting in greater public convenience and cost effectiveness.
2. Improves the quality and accessibility of government information, and helps agencies deliver the services most requested by their customers.

### Action Items

1. Review the current e-government applications to identify gap areas. Compare current applications to other comparable government websites of like size from around the state to identify potential improvement areas.
2. Conduct an assessment of the usability of current applications.
3. Use current and draft survey instruments to identify applications of public interest. Use this survey to examine potential e-government applications.
4. Identify high-volume services to target for online automation. Emergency and first responder applications will be included.
5. Identify partners and entities to assist in implementation.
6. Develop and launch applications.

## Improve Online Business Services Offered by the Government

### Goal

Build an e-government solution that improves the ability of businesses to conduct business with the government over the Internet.

### Project Description

Developing more e-government applications not only provides value to businesses, but also allows the government to realize cost savings and achieve greater efficiency and effectiveness. Examples of activities include paying for permits and licensing, paying taxes, providing services to the government, and other such transactions.

### Benefits

1. Facilitates business interaction with government, especially for urban planning, real estate development, and economic development.
2. E-government lowers the cost to a business conducting all of its interaction with government. Further, as more businesses conduct their business with government online, their transaction costs will be lowered. The cost to a business for any interaction decreases as more technology and fewer staff resources are needed.
3. E-government provides a greater amount of information to businesses and provides it in a more organized and accessible manner.

### Action Items

1. The first step in the process of providing e-government services to constituents is developing a functional web portal that allows businesses to have access to resources easily. Such a portal can enable outside businesses looking for new opportunities to make informed decisions about working in a certain community.
2. In addition, often overlooked in e-government deployment are the issues of audiences and needs. Local governments must determine who will visit the website and what sort of information and services they will typically seek. A first step toward meeting general needs of constituents is to provide online access to as broad a swath of governmental information and data as is possible. The sort of information that should be included is:
  - a. Hours of operation and location of facilities.
  - b. Contact information of key staff and departments.
  - c. An intuitive search engine.
  - d. Access to documents (ideally a centralized repository of online documents and forms).
  - e. Local ordinances, codes, policies, and regulations.
  - f. Minutes of official meetings and hearings.
  - g. News and events.

## Support Healthcare Providers Serving Rural Communities

### Goal

Ensure that rural healthcare providers in the community have access to the robust telecommunications infrastructure required for the provision of healthcare services.

### Project Description

Review the Universal Service Administration Company's (USAC) Universal Service Rural Health Care Program. The Rural Health Care Program supports healthcare providers serving rural communities by funding telecommunications services necessary for the provision of healthcare. The program is intended to ensure that rural healthcare providers pay no more for telecommunications in the provision of healthcare services than their urban counterparts.

The Healthcare Connect Fund (HCF) Program is the newest component of the Rural Health Care Program. The HCF Program will provide a 65 percent discount on eligible expenses related to broadband connectivity to both individual rural healthcare providers (HCPs) and consortia, which can include non-rural HCPs (if the consortium has a majority of rural sites).

### Eligibility

There are three initial criteria a healthcare provider must meet to participate in the Rural Health Care Program.

1. HCPs must be one of the following types of entities:
  - a. Post-secondary educational institutions offering healthcare instruction, such as teaching hospitals and medical schools,
  - b. Community health centers or health centers providing healthcare to migrants,
  - c. Local health departments or agencies,
  - d. Community mental health centers,
  - e. Not-for-profit hospitals,
  - f. Rural health clinics,
  - g. Consortia of HCPs consisting of one or more of the above entities,
  - h. Dedicated emergency departments of rural for-profit hospitals, or
  - i. Part-time eligible entities located in facilities that are ineligible.
2. HCPs must be a not-for-profit entity or a public entity.
3. HCPs must be located in an FCC-approved rural location.

Once your HCP has been established as eligible, you should ensure that the services you request are [eligible for support](#).

### Contact Information:

Telephone: (800) 229-5476; (800) 229-5476

E-mail: [rhc-admin@usac.org](mailto:rhc-admin@usac.org)

Website: <http://www.universalservice.org/rhc/default.aspx>

## Pursue Next Generation 911 Upgrades

### Goal

Design a system that enables the transmission of voice, data, or video from different types of communication devices to Public Safety Answering Points (PSAPs) and onto emergency responder networks.

### Project Description

The overall system architecture of PSAPs has essentially not changed since the first 911 call was made in 1968. These 911 systems are voice-only networks based on original wireline, analog, circuit-switched infrastructure that prevents easy transmission of data and critical sharing of information that can significantly enhance the decision-making ability, response, and quality of service provided to emergency callers. To meet growing public expectations of 911-system functionality (capable of voice, data, and video transmission from different types of communication devices), that framework should be replaced. This would require replacing analog phone systems with an Internet Protocol (IP)-based system. This system would provide an enabling platform for current technology, as well as future upgrades.

For example, in January 2013, the Federal Communications Commission proposed to amend its rules by requiring all wireless carriers and providers of “interconnected” text messaging applications to support the ability of consumers to send text messages to 911 in all areas throughout the nation where 911 PSAPs are also prepared to receive the texts (which requires an IP-based system). Text-to-911 will provide consumers with enhanced access to emergency communications in situations where a voice call could endanger the caller, or a person with disabilities is unable to make a voice call. In the near term, text-to-911 is generally supported as the first step in the transition to a Next Generation 911.

### Benefits

1. Transitioning to a “Next Generation” IP-based network will enable the public to make voice, text, or video emergency calls from any communications device. With Next Generation 911, responders and PSAPs will gain greater situational awareness, which will enable better-informed decisions, resulting in better outcomes and, ultimately, a safer community. By capitalizing on advances in technologies, you are enabling:
  - a. Quicker and more accurate information to responders;
  - b. Better and more useful forms of information;
  - c. More flexible, secure and robust PSAP operations; and
  - d. Lower capital and operating costs.

### Action Items

If you're involved in PSAP decision making and are faced with replacing aging systems or purchasing new technology for the very first time, consider what your most immediate requirements are and where your community needs to be 10 years from now. Your community can take a measured and practical approach that spreads the operational impact and costs of a Next Generation 911 transition over time. Your local agency should choose a starting point that

makes the most sense and provides immediate benefits for their PSAP, responders, and communities they serve. For example, according to [Intrado, Inc.](#), a provider of 911 and emergency communications infrastructure to over 3,000 public safety agencies, local public-safety agencies can implement any of the following next-generation 911 components today, and provide immediate benefits with little to no disruption of current operations:

1. A public-safety-class, IP-based network
2. IP-based call processing equipment (CPE) in PSAPs
3. Geographic information system (GIS) data enhancements
4. Advanced 911 data capabilities and applications

### **Implementation**

Iosco County is currently working on upgrading its 911 network and is moving toward advanced 911 data capabilities and applications.

## **Healthcare**

### **Promote Telemedicine in Remote Areas**

#### **Goal**

Deliver improved healthcare services to rural residents.

#### **Project Description**

Promote the delivery of healthcare services from a distance using video-based technologies. Telemedicine can help to address challenges associated with living in sparsely populated areas and having to travel long distances to seek medical care – particularly for patients with chronic illnesses. It also addresses the issue of the lack of medical specialists in remote areas by awarding access to specialists in major hospitals situated in other cities, states, or countries. While telemedicine can be delivered to patient homes, it can also be implemented in partnership with local clinics, libraries, churches, schools, or businesses that have the appropriate equipment and staff to manage it. The most critical steps in promoting telemedicine are ensuring that patients and medical professionals have access to broadband service, understanding the main features of telemedicine, being aware of the technologies required for telemedicine, and understanding how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes [Distance Learning and Telemedicine Loans and Grants Program](#). USDA provides loans and grants to rural community facilities (e.g., schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan.

## APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND

### Statewide Infrastructure

As part of the Michigan State Broadband Initiative (SBI), and in partnership and at the direction of the Michigan Public Service Commission (MPSC), Connect Michigan produced an inaugural map of broadband availability in spring 2010. The key goal of the map was to highlight communities and households that remain unserved or underserved by broadband service; this information was essential to estimating the broadband availability gap in the state and understanding the scope and scale of challenges in providing universal broadband service to all citizens across the state. Since the initial map's release, Connect Michigan has collected and released new data every six months, with updates in April and October annually, until the fall of 2014.

The most current statewide and county- specific broadband inventory maps released in February 2016 depict a geographic representation of provider-based broadband data represented by cable, DSL, fiber, fixed wireless and mobile wireless. These maps also incorporate data such as political boundaries and major transportation networks in the state. A statewide map is found at [www.connectmi.org/mapping/state](http://www.connectmi.org/mapping/state). The county maps are found at [http://www.connectmi.org/community\\_profile/find\\_your\\_county/michigan/iosco](http://www.connectmi.org/community_profile/find_your_county/michigan/iosco).

**Table 1: Estimate of Broadband Service Availability in the State of Michigan By Speed Tier Among Fixed Platforms**

SBI Download/Upload Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent of Served Households by Speed Tier
<b>At Least 768 Kbps/200 Kbps</b>	32	3,840	99.17
<b>At Least 1.5 Mbps/200 Kbps</b>	35	3,837	99.09
<b>At Least 3 Mbps/768 Kbps</b>	41	3,831	98.94
<b>At Least 6 Mbps/1.5 Mbps</b>	151	3,721	96.10
<b>At Least 10 Mbps/1.5 Mbps</b>	188	3,685	95.15
<b>At Least 25 Mbps/1.5 Mbps</b>	462	3,410	88.07
<b>At Least 50 Mbps/1.5 Mbps</b>	483	3,389	87.52
<b>At Least 100 Mbps/1.5 Mbps</b>	665	3,208	82.84
<b>At Least 1 Gbps/1.5 Mbps</b>	3,842	31	0.8

Source: Connect Michigan, February 2016.

Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband

service inventory (excluding mobile and satellite service) across the state of Michigan; it presents the number and percentage of unserved and served households by speed tiers. The total number of households in Michigan in 2010 was 3,872,508, for a total population of 9.88 million people. Table 1 indicates that 99.17% of households are able to connect to broadband at download speeds of at least 768 Kbps download and 200 Kbps upload. This implies that the number of households originally estimated by Connect Michigan to be unserved has dropped from 121,701 households in the fall of 2010 to 32,000 households in the fall of 2014. Further, approximately 3,831,000 households across Michigan have broadband available of at least 3 Mbps download speeds and 768 Kbps upload speeds. The percentage of Michigan households having fixed broadband access available of at least 6 Mbps download and 1.5 Mbps upload speeds is estimated at 96.1%.

As differences in broadband availability estimates between the fall of 2010 and February 2016 show, additional participating broadband providers can have a large impact upon Michigan broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise that should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders identify areas where the displayed coverage is underestimated or overestimated. Connect Michigan welcomes such feedback to be analyzed in collaboration with broadband providers to correct errors identified in the maps.

In addition, the broadband availability data collected, processed, and aggregated by Connect Michigan has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Michigan's broadband availability estimates reported by the NTIA and the FCC in the National Broadband Map. The National Broadband Map can be found here: <http://www.broadbandmap.gov> and the Map's specific page for Michigan can be found here: <http://www.broadbandmap.gov/summarize/state/michigan>.

### **Interactive Map**

Connect Michigan provides My ConnectView™, an online interactive map developed and maintained by Connected Nation, intended to allow users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Michigan's citizens to take an active role in seeking service, upgrading service, or simply becoming increasingly aware of what broadband capabilities and possibilities exist in their area, city, county, or state.

<http://www.connectmi.org/interactive-map>

For additional maps and other related information, visit:  
<http://www.connectmi.org/broadband-landscape>.

## Business and Residential Technology Assessments

To complement the broadband inventory and mapping data, Connect Michigan periodically conducts statewide residential and business technology assessments to understand broadband demand and trends across the state. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the broadband adoption gap across the state of Michigan. Key questions the data address are: who, where, and how are households in Michigan using broadband technology? How is this technology impacting Michigan households and residents? Who is not adopting broadband service and why? What are the barriers that prevent citizens from embracing this empowering technology?

Through Connect Michigan's research, many insights are able to be collected. The most recent residential technology revealed the following key findings:

- Statewide, 71% of Michigan residents subscribe to home broadband service. Even though this represents a 10 percentage point gain from 2011, it means that more than 2.1 million Michigan adults still do not subscribe to home broadband service.
- The cost of broadband is becoming a smaller barrier among Michigan residents who do not subscribe to broadband; fewer Michiganders who do not subscribe to broadband cite cost as the main reason for not subscribing, while a larger share say they don't see home broadband service as relevant or useful.
- Broadband empowers Michigan workers to search for jobs or find better jobs. Statewide, 40% of Michigan Internet users search for jobs online, including 55% of low-income Internet users.

Additionally, an assessment on technology in businesses released in May 2012 in a report titled *Technology Adoption Among Michigan Businesses* revealed the following key findings:

- Across Michigan, 69% of businesses subscribe to broadband service, representing approximately 70,000 Michigan businesses that still do not use or benefit from broadband.
- Michigan business establishments that use broadband report median annual revenues that are approximately \$300,000 higher than businesses that do not use broadband.
- Online sales in Michigan account for approximately \$9.2 billion in annual sales revenue, including nearly \$1.8 billion for small businesses with fewer than five employees and more than \$1.9 billion for rural Michigan businesses.

For more information on the statewide information described, visit the Connect Michigan website at <http://www.connectmi.org/>.

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## APPENDIX 2: PARTNER AND SPONSORS

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**Connect Michigan**, in partnership with the Michigan Public Service Commission (MPSC) and the Michigan Department of Agriculture and Rural Development (MDARD) supports Michigan's reinvention and technological transformation through innovation, job creation, and entrepreneurship via the expansion of broadband technology and increased usage by Michigan residents. In 2009, Connect Michigan partnered with the Michigan Public Service Commission to engage in a comprehensive broadband planning and technology initiative as part of the national effort to map and expand broadband. The program began by gathering provider data to form a statewide broadband map and has progressed to the planning and development stage. At this point, the program has expanded to include community engagement in local technology planning, identification of opportunities with existing programs, and implementation of technology projects designed to address digital literacy, improve education, give residents access to global Internet resources, and stimulate economic development.  
[www.connectmi.org](http://www.connectmi.org)

The **Michigan Public Service Commission** (MPSC) is the lead Michigan agency for the State Broadband Initiative that was responsible for working with Connect Michigan, overseeing the Michigan initiative, and providing direction of the project. The MPSC facilitated interactions with other state government entities, broadband providers, and other Michigan stakeholders. They viewed promoting Connect Michigan broadband activities as complementary to their mission to "grow Michigan's economy and enhance the quality of life of its communities by assuring safe and reliable energy, telecommunications, and transportation services at reasonable rates."  
<http://www.michigan.gov/mpsc>

The **Michigan Department of Agriculture and Rural Development** (MDARD) comprises seven divisions that use a customer-driven, solution-oriented approach to 1) cultivate and expand new economic opportunities for the food and agricultural sector; 2) safeguard the public's food supply; 3) inspect and enforce sound animal health practices; 4) control and eradicate plant pests and diseases threatening the \$101.2 billion food and agriculture system; 5) preserve the environment by which the farming community makes its living and feeds consumers; and 6) protect consumers by enforcing laws relating to weights and measures.

**Connected Nation** (Connect Michigan's parent organization) is a leading technology organization committed to bringing affordable high-speed Internet and broadband-enabled resources to all.. Connected Nation effectively raises the awareness of the value of broadband and related technologies by developing coalitions of influencers and enablers for improving technology access, adoption, and use. Connected Nation works with consumers, community leaders, states, technology providers, and foundations, including the Bill & Melinda Gates Foundation, to develop and implement technology expansion programs with core

competencies centered on a mission to improve digital inclusion for people and places previously underserved or overlooked. <http://www.connectednation.org>



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## APPENDIX 3: THE NATIONAL BROADBAND PLAN

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The National Broadband Plan, released in 2010 by the Federal Communications Commission, has the express mission of creating a high-performance America – a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications. The plan seeks to ensure that the entire broadband ecosystem – networks, devices, content, and applications – is healthy. The plan recommends that the country adopt and track the following six goals to serve as a compass over the next decade:

- **GOAL No. 1:** At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.
- **GOAL No. 2:** The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
- **GOAL No. 3:** Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.
- **GOAL No. 4:** Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.
- **GOAL No. 5:** To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
- **GOAL No. 6:** To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

To learn more, visit: [www.broadband.gov](http://www.broadband.gov).

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## APPENDIX 4: WHAT IS CONNECTED?

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The goal of : Connect Michigan’s Connected program is to empower locally informed and collaborative technology planning that addresses each community's need for improved access, adoption, and use of technology:

- **ACCESS:** Does your community have access to affordable and reliable broadband service?
- **ADOPTION:** Is your community addressing the barriers to broadband adoption?
- **USE:** Are residents using technology to improve their quality of life?

Connected Nation leverages state-based, public-private partnerships to engage residents at the local level. Regionally based staff provides “train-the-trainer” activities to local leaders, such as librarians, school administrators, economic development professionals, and public officials and helps them to organize multi-sector technology planning teams, inventory local technology resources and initiatives, assess local technology access, adoption, and use, and develop local strategies that target specific technology gaps in the community.

Connected's community technology planning framework is cyclical. As with other forms of community planning—and especially so with technology planning—change is the only constant. At the community level, changing technology requirements, shifting demographics, economic drivers, and workforce requirements may expose or create new digital divides. Connected's community technology planning framework supports a sustained effort. More information can be found on the program’s website at [www.connectmycommunity.org](http://www.connectmycommunity.org).

### **Connected Planning Process**

Connected's community technology planning framework provides a clear path for the sustainable acceleration of broadband access, adoption, and use.



**Step 1: Engage.** Successful strategies to bridge the local digital divide and increase broadband access, adoption, and use are predicated on broad and sustained stakeholder participation. A successful local technology planning team should include people from multiple sectors, including:

- State and Local Government
- Public Safety
- Education (K-12, Higher Ed)
- Library
- Business & Industry, Agriculture, Recreation and Tourism
- Healthcare
- Community Organizations
- Technology Providers

**Step 2: Assess.** The Connected planning process guides the local technology planning team through an assessment of community technology resources, strengths, assets, needs, and gaps in order to identify and develop strategies to address specific technology gaps and opportunities in the community. Bolstered by benchmarking data that had been gathered through: Connect Michigan’s mapping and market research, the local technology planning team works with community members to benchmark local broadband access, adoption, and use via the Connected Assessment, which measures:

Access	Adoption	Use
<ol style="list-style-type: none"> <li>1. Broadband Availability</li> <li>2. Broadband Speeds</li> <li>3. Broadband Competition</li> <li>4. Middle Mile Access</li> <li>5. Mobile Broadband Availability</li> </ol>	<ol style="list-style-type: none"> <li>6. Digital Literacy</li> <li>7. Public Computer Centers</li> <li>8. Broadband Awareness</li> <li>9. Vulnerable Population Focus</li> </ol>	<ol style="list-style-type: none"> <li>10. Economic Opportunity</li> <li>11. Education</li> <li>12. Government</li> <li>13. Healthcare</li> </ol>

**Step 3: Plan.** Once community resources and needs are identified, the community planning team begins to identify local priorities and policies, programs, and technical solutions that will accelerate broadband access, adoption, and use. Connected Nation provides recommended actions based on best practices from communities across the United States.

**Step 4: Act.** The technology planning team works together to ensure that selected policies, programs, and technical solutions are adopted, implemented, improved, and maintained. The Connected program provides a platform for collaboration and the sharing of best practices between communities. Connected Nation also provides communications support to raise awareness of your community’s efforts. For communities that measurably demonstrate proficiency in broadband access, adoption, and use in the Connected Assessment, Connected Nation offers Connected certification, a nationally recognized certification that provides an avenue for pursuing opportunities as a recognized, technologically advanced community.

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## APPENDIX 5: GLOSSARY OF TERMS

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**3G Wireless - Third Generation** - Refers to the third generation of wireless cellular technology. It has been succeeded by 4G wireless. Typical speeds reach about 3 Mbps.

**4G Wireless - Fourth Generation** - Refers to the fourth generation of wireless cellular technology. It is the successor to 2G and 3G. Typical implementations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

### A

**ARRA** - American Recovery and Reinvestment Act.

**ADSL - Asymmetric Digital Subscriber Line** - DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically thought of as a residential service.

**ATM - Asynchronous Transfer Mode** - A data service offering by ASI that can be used for interconnection of customers' LAN. ATM provides service from 1 Mbps to 145 Mbps utilizing Cell Relay Packets.

### B

**Bandwidth** - The amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.

**BIP - Broadband Infrastructure Program** - Part of the American Recovery and Reinvestment Act (ARRA), BIP is the program created by the U.S. Department of Agriculture focused on expanding last mile broadband access.

**Bit** - A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approximately 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.

**BPL - Broadband Over Powerline** - An evolving theoretical technology that provides broadband service over existing electrical power lines.

**BPON - Broadband Passive Optical Network** - A point-to-multipoint fiber-lean architecture network system which uses passive splitters to deliver signals to multiple users. Instead of running a separate strand of fiber from the CO to every customer, BPON uses a single strand of fiber to serve up to 32 subscribers.

**Broadband** - A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g., DSL, cable Internet).

**BTOP - Broadband Technology Opportunities Program** - Part of the American Recovery and Reinvestment Act (ARRA), BTOP is the program created by the U.S. Department of Commerce focused on expanding broadband access, expanding access to public computer centers, and improving broadband adoption.

## C

**Cable Modem** - A modem that allows a user to connect a computer to the local cable system to transmit data rather than video. It allows broadband services at speeds of five Mbps or higher.

**CAP - Competitive Access Provider** - (or "Bypass Carrier") A company that provides network links between the customer and the Inter-Exchange Carrier or even directly to the Internet Service Provider. CAPs operate private networks independent of Local Exchange Carriers.

**Cellular** - A mobile communications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communications to and from mobile users within a specified area.

**CLEC - Competitive Local Exchange Carrier** - Wireline service provider that is authorized under state and federal rules to compete with ILECs to provide local telephone and Internet service. CLECs provide telephone services in one of three ways or a combination thereof: a) by building or rebuilding telecommunications facilities of their own, b) by leasing capacity from another local telephone company (typically an ILEC) and reselling it, or c) by leasing discreet parts of the ILEC network referred to as UNEs.

**CMTS - Cable Modem Termination System** - A component (usually located at the local office or head end of a cable system) that exchanges digital signals with cable modems on a cable network, allowing for broadband use of the cable system.

**CO - Central Office** - A circuit switch where the phone and DSL lines in a geographical area come together, usually housed in a small building.

**Coaxial Cable** - A type of cable that can carry large amounts of bandwidth over long distances. Cable TV and cable modem broadband service both utilize this technology.

**Community Anchor Institutions (CAI)** - Institutions that are based in a community and larger user of broadband. Examples include schools, libraries, healthcare facilities, and government institutions.

**CWDM - Coarse Wavelength Division Multiplexing** - Multiplexing (more commonly referred to as WDM) with less than 8 active wavelengths per fiber.

## D

**Dial-Up** - A technology that provides customers with access to the Internet over an existing telephone line. Dial-up is much slower than broadband.

**DLEC - Data Local Exchange Carrier** - DLECs deliver high-speed access to the Internet, not voice. DLECs include Covad, Northpoint, and Rhythms.

**Downstream** - Data flowing from the Internet to a computer (surfing the net, getting e-mail, downloading a file).

**DSL - Digital Subscriber Line** - The use of a copper telephone line to deliver "always on" broadband Internet service.

**DSLAM - Digital Subscriber Line Access Multiplier** - A piece of technology installed at a telephone company's CO that connects the carrier to the subscriber loop (and ultimately the customer's PC).

**DWDM - Dense Wavelength Division Multiplexing** - A SONET term which is the means of increasing the capacity of Sonet fiber-optic transmission systems.

## E

**E-rate** - A federal program that provides subsidy for voice and data lines to qualified schools, hospitals, Community-Based Organization (CBOs), and other qualified institutions. The subsidy is based on a percentage designated by the FCC.

**Ethernet** - A local area network (LAN) standard developed for the exchange data with a single network. It allows for speeds from 10 Mbps to 10 Gbps.

**EON - Ethernet Optical Network** - The use of Ethernet LAN packets running over a fiber network.

**EvDO - Evolution Data Only** - A new wireless technology that provides data connections that are 10 times faster than a regular modem.

## F

**FCC - Federal Communications Commission** - A federal regulatory agency that is responsible for, among other things, regulating VoIP.

**Fixed Wireless Broadband** - The operation of wireless devices or systems for broadband use at fixed locations such as homes or offices.

**Franchise Agreement** - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

**Franchise Agreement** - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

**FTTH - Fiber To The Home** - Another name for fiber to the premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds.

**FTTN - Fiber To The Neighborhood** - A hybrid network architecture involving optical fiber from the carrier network, terminating in a neighborhood cabinet that converts the signal from optical to electrical.

**FTTP - Fiber To The Premise (Or FTTB - Fiber To The Building)** - A fiber optic system that connects directly from the carrier network to the user premises.

## G

**Gbps - Gigabits per second** - 1,000,000,000 bits per second or 1,000 Mbps. A measure of how fast data can be transmitted.

**GPON - Gigabyte-Capable Passive Optical Network** - Uses a different, faster approach (up to 2.5 Gbps in current products) than BPON.

**GPS - Global Positioning System** - A system using satellite technology that allows an equipped user to know exactly where he is anywhere on earth.

**GSM - Global System for Mobile Communications** - This is the current radio/telephone standard in Europe and many other countries except Japan and the United States.

## H

**HFC - Hybrid Fiber Coaxial Network** - An outside plant distribution cabling concept employing both fiber optic and coaxial cable.

**Hotspot** - See Wireless Hotspot.

## I

**IEEE** - Institute of Electrical and Electronics Engineers (pronounced "Eye-triple-E.").

**ILEC - Incumbent Local Exchange Carrier** - The traditional wireline telephone service providers within defined geographic areas. They typically provide broadband Internet service via DSL technology in their area. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs.

**IP-VPN - Internet Protocol - Virtual Private Network** - A software-defined network offering the appearance, functionality, and usefulness of a dedicated private network.

**ISDN - Integrated Services Digital Network** - An alternative method to simultaneously carry voice, data, and other traffic, using the switched telephone network.

**ISP - Internet Service Provider** - A company providing Internet access to consumers and businesses, acting as a bridge between customer (end-user) and infrastructure owners for dial-up, cable modem, and DSL services.

## K

**Kbps - Kilobits per second** - 1,000 bits per second. A measure of how fast data can be transmitted.

## L

**LAN - Local Area Network** - A geographically localized network consisting of both hardware and software. The network can link workstations within a building or multiple computers with a single wireless Internet connection.

**LATA - Local Access and Transport Areas** - A geographic area within a divested Regional Bell Operating Company is permitted to offer exchange telecommunications and exchange access service. Calls between LATAs are often thought of as long-distance service. Calls within a LATA (IntraLATA) typically include local and local toll telephone services.

**Local Loop** - A generic term for the connection between the customer's premises (home, office, etc.) and the provider's serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.

**Low Income** - Low income is defined by using the poverty level as defined by the U.S. Census Bureau. A community's low-income percentage can be found at [www.census.gov](http://www.census.gov).

## M

**MAN - Metropolitan Area Network** - A high-speed data intra-city network that links multiple locations with a campus, city, or LATA. A MAN typically extends as far as 50 kilometers (or 31 miles).

**Mbps - Megabits per second** - 1,000,000 bits per second. A measure of how fast data can be transmitted.

**Metro Ethernet** - An Ethernet technology-based network in a metropolitan area that is used for connectivity to the Internet.

**Multiplexing** - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time. Multiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

## N

**NTIA** - National Telecommunications and Information Administration, which is housed within the United State Department of Commerce.

**NIST** - National Institute of Standards and Technology.

## O

**Overbuilders** - Building excess capacity. In this context, it involves investment in additional infrastructure projects to provide competition.

**OVS - Open Video Systems** - A new option for those looking to offer cable television service outside the current framework of traditional regulation. It would allow more flexibility in providing service by reducing the build-out requirements of new carriers.

## P

**PON - Passive Optical Network** - A Passive Optical Network consists of an optical line terminator located at the Central Office and a set of associated optical network terminals located at the customer's premises. Between them lies the optical distribution network comprised of fibers and passive splitters or couplers.

## R

**Right-of-Way** - A legal right of passage over land owned by another. Carriers and service providers must obtain right-of-way to dig trenches or plant poles for cable and telephone systems and to place wireless antennae.

**RPR - Resilient Packet Ring** - Uses Ethernet switching and a dual counter-rotating ring topology to provide SONET-like network resiliency and optimized bandwidth usage, while delivering multi-point Ethernet/IP services.

**RUS - Rural Utility Service** - A division of the United States Department of Agriculture that promotes universal service in unserved and underserved areas of the country through grants, loans, and financing.

## S

**Satellite** - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be

served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

**SBI** - State Broadband Initiatives, formerly known as the State Broadband Data & Development (SBDD) Program.

**SONET - Synchronous Optical Network** - A family of fiber-optic transmission rates.

**Streaming** - A Netscape innovation that downloads low-bit text data first, then the higher bit graphics. This allows users to read the text of an Internet document first, rather than waiting for the entire file to load.

**Subscribership** - Subscribership is the number of customers that have subscribed for a particular telecommunications service.

**Switched Network** - A domestic telecommunications network usually accessed by telephones, key telephone systems, private branch exchange trunks, and data arrangements.

## T

**T-1 - Trunk Level 1** - A digital transmission link with a total signaling speed of 1.544 Mbps. It is a standard for digital transmission in North America.

**T-3 - Trunk Level 3** - 28 T1 lines or 44.736 Mbps.

## U

**UNE - Unbundled Network Elements** - Leased portions of a carrier's (typically an ILEC's) network used by another carrier to provide service to customers.

**Universal Service** - The idea of providing every home in the United States with basic telephone service.

**Upstream** - Data flowing from your computer to the Internet (sending e-mail, uploading a file).

## V

**VDSL (or VHDSL) - Very High Data Rate Digital Subscriber Line** - A developing technology that employs an asymmetric form of ADSL with projected speeds of up to 155 Mbps.

**Video On Demand** - A service that allows users to remotely choose a movie from a digital library and be able to pause, fast-forward, or even rewind their selection.

**VLAN - Virtual Local Area Network** - A network of computers that behave as if they were connected to the same wire even though they may be physically located on different segments of a LAN.

**VoIP - Voice over Internet Protocol** - A new technology that employs a data network (such as a broadband connection) to transmit voice conversations.

**VPN - Virtual Private Network** - A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable one to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

**Vulnerable Groups** - Vulnerable groups will vary by community, but typically include low-income, minority, senior, children, etc.

## **W**

**WAN - Wide Area Network** - A communications system that utilizes cable systems, telephone lines, wireless, and other means to connect multiple locations together for the exchange of data, voice, and video.

**Wi-Fi - Wireless Fidelity** - A term for certain types of wireless local networks (WLANs) that uses specifications in the IEEE 802.11 family.

**WiMax** - A wireless technology that provides high-throughput broadband connections over long distances. WiMax can be used for a number of applications, including last mile broadband connections, hotspots, and cellular backhaul and high-speed enterprise connectivity for businesses.

**Wireless Hotspot** - A public location where Wi-Fi Internet access is available for free or for a small fee. These could include airports, restaurants, hotels, coffee shops, parks, and more.

**Wireless Internet** - 1) Internet applications and access using mobile devices such as cell phones and palm devices. 2) Broadband Internet service provided via wireless connection, such as satellite or tower transmitters.

**Wireline** - Service based on infrastructure on or near the ground, such as copper telephone wires or coaxial cable underground, or on telephone poles.