Gogebic County

Technology Action Plan

Prepared by

Gogebic Range Broadband Committee and Connect Michigan

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ACCESS ADOPTION USE

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INTRODUCTION

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."[1]

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

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.[4]

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

[1] *Connecting America: The National Broadband Plan,* Federal Communications Commission, April 2010, http://www.broadband.gov/download-plan/.
[2] 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.
[3] National estimates calculated using Connected Nation's 2014 Residential Technology Assessments.
[4] 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.[5]

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. 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.

Methodology

By actively participating in the Connected Community Engagement Program, the Gogebic Range Broadband Committee is boosting the community's capabilities in education, healthcare, and public safety, and stimulating economic growth and spurring job creation. The Gogebic Range Broadband Committee 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.

[5] 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.

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.

CONNECTED ASSESSMENT

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 Gogebic County has made tremendous strides and investments in technology, this Technology Action Plan will provide insight and solutions that will help Gogebic County 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 26 out of a possible 40 points in broadband access primarily because of some gaps in broadband availability. While 89.28% of households have access to 3 Mbps download speeds, only 82.2% of households have access to 25 Mbps download speeds.
- The community scored 38 out of a possible 40 points in broadband adoption. This score indicates that Gogebic County has sufficient and valuable assets and programs to support continued adoption by its residents and small businesses.
- The community scored 40 out of a possible 40 points in broadband use. This score indicates that Gogebic County has effectively employed broadband to deliver productive online services and applications to help improve the overall quality of life for local residents.
- Gogebic County achieved a score of 104 points out of 120 for overall broadband and technology readiness, exhibiting strong support of technology access, adoption, and use
- Gogebic County did not meet the 32 points in each focus area that are required for certification and has not qualified for full certification.

Community Technology Scorecard

Community Technology Scorecard Community Champions: James Lorenson Community Advisor(s): Tom Stephenson				
FOCUS AREA	**ASSESSMENT CRITERIA**	**DESCRIPTION**	**SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	89.28% of homes have access to 3 Mbps	4	10
	Broadband Speeds	82.50 % of households with access to at least 50 Mbps	5	5
	Broadband Competition	61.35% of households with access to more than 1 broadband provider	1	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from only 1 provider	6	10
	Mobile Broadband Availability	99.90% of households have access to mobile broadband	10	10
	ACCESS SCORE		26	**40**
ADOPTION	Digital Literacy	Program grads are greater than 7 per 1,000 residents over the past year	8	10
	Public Computer Centers	500 computer hours per 1,000 low-income residents per week	10	10
	Broadband Awareness	Campaigns reach 100% of the community	10	10
	Vulnerable Population Focus	At least 5 groups	10	10
	ADOPTION SCORE		38	**40**
USE	Economic Opportunity	5 advanced, 5 basic uses	10	10
	Education	12 advanced, 8 basic uses	10	10
	Government	4 advanced, 2 basic uses	10	10
	Healthcare	4 advanced, 4 basic uses	10	10
	USE SCORE		40	**40**
	COMMUNITY ASSESSMENT SCORE		104	**120**

Itemized Key Findings

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

ACCESS

- 11 last mile broadband providers currently provide service in Gogebic County:
  - 89.28% of households have access to 3 Mbps
  - 82.50% of households have access to at least 50 Mbps
  - 61.35% of households have access to more than 1 broadband provider
- Availability of middle mile fiber infrastructure from only 1 provider
- 99.90% of households with access to mobile wireless

ADOPTION

- 3 Digital Literacy Programs exists in the community resulting in 110 Program grads over the past year
- 4 Public Computer Centers (PCC) with a total of 45 computers available to the public
- 2 Broadband Awareness Campaigns are reaching 100% of Gogebic County
- 6 organizations are working with vulnerable populations

USE

- At least 10 uses of broadband were identified in the area of economic opportunity including 5 advanced uses and 5 basic uses
- At least 20 uses of broadband were identified in the area of education including 12 advanced uses and 8 basic uses
- At least 6 uses of broadband were identified in the area of government including 4 advanced uses and 2 basic uses
- At least 8 uses of broadband were identified in the area of healthcare including 4 advanced uses and 4 basic uses

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

Technology Providers

- 15 broadband providers were identified in Gogebic County
- 1 hardware provider was identified in Gogebic County
- 1 network developer was identified in Gogebic County
- 1 web developer was identified in Gogebic County

Technology Facilities

- 4 public computer centers
- 7 wireless hotspots
- 0 videoconference facilities

Community Websites

- 6 Business-related websites (excluding private businesses)
- 3 Education-related websites
- 9 Government-related websites
- 3 Healthcare-related websites
- 3 Library-related websites
- 5 Tourism-related websites
- 0 Agriculture-related websites
- 0 Community-based-related websites

Gogebic 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 4 projects that the community has identified as priority projects.

Priority Projects Identified by the Gogebic County
Access
1.Perform an Analysis of Local Policies and Ordinances
2.Identify, Map, and Validate Broadband Demand
3.Pursue Next Generation 911 Upgrades
4.Complete a Vertical Assets Inventory

Gogebic County Additional Projects

The table below shows the complete list of the 11 projects the Gogebic County proposes to undertake in order to accelerate broadband access, adoption, and use in Gogebic County. Detailed descriptions of each solution proposed by Gogebic Range Broadband Committee can be found in the *Action Plan* section of this report.

Additional Projects Identified by the Gogebic County Team	
ACCESS	
Broadband Availability	Apply to USDA for Funding Support to Build Out Broadband in Community
Middle Mile Access	Develop Public-Private Partnerships to Deploy Broadband Service
	Study and Possibly Reassess Major Telecom Purchase Contracts
ADOPTION	
Digital Literacy	Distribute Digital Literacy Content
	Facilitate Internet Safety Classes
Broadband Awareness	Facilitate a Technology Summit
Economic Opportunity	Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses
	Create Local Jobs Via Teleworking Opportunities
USE	
Education	Improve Education Through Digital Learning
Government	Improve Online Business Services Offered by the Government
Healthcare	Promote Telemedicine in Remote Areas

DETAILED FINDINGS

Current Community Technology Developments in Gogebic County

Western UP Regional Technology Developments

U.P. Food Exchange

The recently created U.P. Food Exchange (UPFE) connects local food activity within each of the Upper Peninsula's three distinct regions (eastern, central, and western), and coordinates local food efforts between the regions. This project aims to establish both online and physical aggregation sites for farm products, improve local food storage capacity, and educate consumers, farmers, and institutional purchasers about the resources and benefits available to them via this network.

The resources required for the project fall into three categories: infrastructure improvement costs, technology integration, and personnel. The results of this project will affect local agriculture throughout the U.P., as evidenced by an increase in the number of farmers listing their products through the online network, an increase in the number of farmers listing their farms in the U.P. Food & Farm Directory, and an increase in the farm products moving between the regions.

UPFE will create and/or formally designate a food aggregation site in each of the three regions of the U.P in order to provide each region with the resources needed to establish operational activities that will respond to the developing food needs of each region, as well as create an umbrella entity to tie each of the three regions' activities together in a synergistic network.

The U.P. Food Exchange's Online Marketplace recently opened for business. The Online Marketplace was created to provide farmers with access to wholesale markets and institutions (restaurants, hospitals, schools, etc.) with a system to easily purchase local food from U.P. farmers. It is anticipated that most buying and selling will occur within the regional markets (eastern, central, and western) for the first couple of years and expand beyond regional boundaries once production increases and aggregation and distribution systems develop, thereby allowing the marketplace to grow more robust with each passing year.

Upper Peninsula 911 Authority

The Upper Peninsula 911 Authority (UPA 911) was created through an agreement entered into under Michigan's Urban Cooperation Act (Enabling Agreement). This legal entity includes all fifteen counties in the Upper Peninsula. The UPA 911 is responsible for coordinating and providing a variety of services with respect to 911 emergency call answering and service dispatching across Michigan's Upper Peninsula (http://www.upcap.org/). Under the UPA 911, call centers work together and are/will be connected via a broadband network. The Upper Peninsula 911 Authority and Peninsula Fiber Network, LLC announced on October 22, 2014, that they have successfully begun routing 911 traffic on an entirely new, Next Generation 911 call management system that will provide enhanced 911 service and will also support wireless device technologies and video in addition to traditional land-line calling for all 15 counties in the Upper Peninsula of Michigan. The system deployment is expected to be completed within 60 days.

Regional Education Media Center #1

The Regional Educational Media Center #1 (REMC1) has launched a program with numerous one-on-one educational initiatives across the region, primarily with iPads and Chromebooks, and is currently in various stages of rollout. In concurrence, the REMC1 has also launched a program to promote digital education via newsletter and social media to all the residents within its region. Gogebic Community College is connected to the MERIT Network and is currently considering connecting all its off-campus sites to the MERIT Network. Gogebic Community College has launched several programs to leverage social media: a new marketing strategy that makes extensive use of social media, social media training for the staff to facilitate effective use of social media to improve communicate between the students and staff, and using social media and chat rooms to facilitate student group work.

Western Upper Peninsula Planning and Development Region

The Western Upper Peninsula Planning and Development Region (WUPPDR) is working to improve the access of broadband throughout all counties in the Western U.P. through Governor Snyder's Regional Prosperity Initiative (RPI). The RPI's aim is to encourage local private, public, and non-profit partners to create vibrant regional economies to help eliminate redundancies and gaps that are often present with the current structure. By gathering and engaging private, public, and non-profit representatives from adult education, workforce development, economic development, transportation, and higher education organizations during the RPI process of FY 2014, several issues and areas of need were identified. In 2015, WUPPDR began working on alleviating these issues by undertaking four priority projects.

WUPPDR's mission is to foster stable and diversified economies in the Western Upper Peninsula. In order to do so, essential infrastructure like water, sewer, transportation, and high-speed Internet access are all necessary to develop aspects of the traditional and new economy.

Improved broadband Internet access in the Western U.P. is both an everyday need and an economic opportunity. Residents need service to participate in modern daily life, existing businesses need service to stay competitive, and remotely operating businesses would be more viable with availability of faster, more reliable service.

In some areas of the Western U.P., only dial-up Internet is available. High-speed Internet access has become an essential piece of infrastructure to attract or retain individuals desiring to live here and/or start a business or industry in the region. Cable and occasionally fiber-optic broadband are available in several urban areas, but others have broadband access only to slower digital subscriber line (DSL) or fixed wireless, as well as satellite service that is less reliable and much more expensive. Broadband providers are reluctant to expand service due to high infrastructure cost and lack of information about customer use and demand. By conducting residential surveys, WUPPDR will help make a business case for service providers to expand out into underserved areas. This will be a benefit to both providers and the residents and will help increase access, adoption, and use rates across the Western U.P.

Gogebic County Assessment Findings

Today, residents in Gogebic County (or sections of the community) are served by 15 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 Gogebic County.

Broadband Providers	Website	Technology Type
AT&T Mobility LLC	http://www.wireless.att.com	Mobile Wireless
Verizon Wireless	http://www.verizonwireless.com	Mobile Wireless
Charter Communications Inc.	http://www.charter.com	Cable
Hughes Network Systems, LLC	http://www.hughesnet.com	Satellite
AT&T Michigan	http://www.att.com	DSL
Jamadots	http://www.jamadots.com	DSL
Skycasters	http://www.skycasters.com	Satellite
StarBand Communications	http://www.starband.com	Satellite
Alphacomm.net	http://alphacomm.net	DSL
ViaSat, Inc.	http://www.exede.com	Satellite
GogebicRange.net	www.http://gogebicrange.net/	Fixed Wireless
Great Lakes Comnet	www.glcom.net	Fiber-Middle Mile
Peninsula Fiber Network	www.pfnllc.net	Fiber-Middle Mile
LYNX Network Group	www.lynxnetworkgroup.com	Fiber-Middle Mile
MERIT Network	http://www.merit.edu/	Fiber-Middle Mile

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
Ironwood Carnegie Library	http://joomla.uproc.lib.mi.us/Ironwood/	Public Computer Facility
Gogebic Community College	www.gogebic.edu	Public Computer Facility
Bessemer Public Library	http://library.public-libraries.org/county/MI/GogebicCounty.html	Public Computer Facility
Wakefield Public Library	http://library.public-libraries.org/Michigan/Wakefield/WakefieldPublicLibrary.html	Public Computer Facility
Maplewood Steakhouse	http://maplewoodsteakhouse.com/	Wireless Hotspot
McDonald's	www.mcmichigan.com/5208	Wireless Hotspot
Downtown Lounge and Depot	https://downtownlounge.wordpress.com/	Wireless Hotspot
Larry's Good Time Saloon	https://www.facebook.com/pages/Larrys-Good-Time-Saloon-and-Restaurant/450037591708300?rf=113817508648804	Wireless Hotspot
Steep Creek Cafe	http://www.whitecapkayak.com/cafe.php	Wireless Hotspot
Buon Appetito	https://www.facebook.com/pages/Buon-Appetito/583840725023898	Wireless Hotspot
Northwoods General Store & Coffeehouse	http://northwoodsgeneralstore.com/	Wireless Hotspot

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

Organization Name	Website	Category
Bessemer Chamber of Commerce	http://www.bessemerchamber.org/	Business
Ironwood Chamber of Commerce	http://www.ironwoodchamber.org	Business
Michigan Economic Development Corporation	www.michiganbusiness.org	Business
Michigan Small Business Development Center	www.sbdcmichigan.org	Business
Michigan Works! Western Upper Peninsula	www.wupmwa.org/	Business
Western Upper Peninsula Planning & Development Region	www.wuppdr.org	Business
Gogebic Community College	http://www.gogebic.edu/	Education
Gogebic-Ontonagon Intermediate School District	www.goisd.org	Education
Regional Educational Media Center #1	www.remc1.org	Education
Charter Township of Ironwood	http://www.ironwoodtownship.org	Government
City of Bessemer	http://cityofbessemer.org/	Government
City of Ironwood	http://www.cityofironwood.org/	Government
City of Wakefield	http://www.cityofwakefield.org/	Government
Erwin Township	http://www.mattsonworks.com/1928/1928ErwinTWP.htm	Government
Gogebic County	http://www.gogebic.org/	Government
Marenisco Township	http://www.marenisco.org/	Government
Wakefield Township	http://www.wakefieldtownship.com/	Government
Watersmeet Township	http://www.watersmeet.us/	Government
Aspirus Grand View Hospital	http://www.aspirusgrandview.org/Main/Home.aspx	Healthcare
Gogebic Medical Care Facility	http://www.gogebicmedicalcare.com/	Healthcare
Western U.P. Health Department	www.westernuphealth.org	Healthcare
Bessemer Public Library	http://joomla.uproc.lib.mi.us/bessemer/	Libraries
Ironwood Carnegie Library	http://joomla.uproc.lib.mi.us/Ironwood/	Libraries
Wakefield Public Library	http://cityofwakefield.org/index.php/local-organizations/public-library	Libraries

Ironwood Lodging and Tourism Council	http://www.ironwoodtourismcouncil.com/hotels.html	Tourism
Porcupine Mountains Ontonagon Area Convention and Visitors Bureau	http://www.porcupinemountains.com/	Tourism
The Wilds of Michigan	http://www.thewildsofmichigan.com/	Tourism
Wakefield Chamber of Commerce	www.wakefield-chamber.com/	Tourism
Western U.P. Convention & Visitor Bureau	http://www.explorewesternup.com/	Tourism

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

Company Name	Website	Provider Category
Elyon Web Design	http://elyontech.com/	Web Developer
Northstar Electronics	www.northstarelectronicsmi.com	Hardware Provider
The Computer Doctors	http://www.thecomputerdocs.com/	Network Integrator

Connected Assessment Analysis

Access Score Explanation

Broadband Availability (4 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 October 2014 data collected by Connect Michigan, 89.28% of Gogebic County residents had access to broadband speeds of 3 Mbps or greater.**

Providers identified by the Gogebic County Team, but not currently mapped, include:

Broadband Providers	Technology Type	Website Reference
GogebicRange.net	Fixed Wireless	www.http://gogebicrange.net/

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 October 2014 data collected by Connect Michigan, 82.50% of Gogebic County residents had access to broadband speeds of 50 Mbps.**

Broadband Competition (1 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 October 2014 data collected by Connect Michigan, 61.35% of Gogebic County residents had access to more than one broadband provider.**

Middle Mile Access (6 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.

- **Gogebic County is served by 1 middle mile fiber provider.**

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 October 2014 data collected by Connect Michigan, 99.90% of Gogebic County residents had access to mobile broadband service.**

Adoption Score Explanation

Digital Literacy (8 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
Gogebic Community College	Basic Computer skills training courses offered to the community twice a year	75
Bessemer Public Library	One-on-One computer training	10
Gogebic Community College	One-on-One digital literacy training	25

Public Computer Centers (10 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 Gogebic County is below.

Organization Name	Number of Open Hours Per Week	Number of Computers	Available Computer Hours Per Week
Ironwood Carnegie Library	36	11	396
Bessemer Public Library	38	5	40
Wakefield Public Library	31.5	5	157.5
Gogebic Community College	46	24	1104

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 Gogebic County is below.

Organization Name	Campaign Description	Community Reach
Gogebic-Ontonagon ISD	Wisdomwhere- manages registrations for traditional courses, on-line courses, conferences, teleconferences, webinars, outside events, meetings, unstructured events, customizable approval processes, pre- and post-activity assessments	100%
Gogebic Community College	Use of all media, including social media to promote community based computer training courses offer twice a year	100%

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 Gogebic County are listed below.

Organization Name	Program Description	Vulnerable Group
MI Works	Job finding assistance	Unemployed adults and seniors
MiWorks- Adult Learning Labs.	Adult Learning Labs - GED, GED or high school diploma, prepare for college, or improve their reading, writing, math, and keyboarding skills	Low-income adults
MiWorks-Youth services	Youth skills training	Youth and high-risk youth
Gogebic Community College	Digital literacy training offer twice a year	Low-income adults and seniors
Gogebic Community College	One-on-One digital literacy training	Low-income adults and seniors
Gogebic Community College	Programs to work with 40-45% of the college's incoming students that require developmental training in order to prepare them to take regular college courses	Low-income students, first-generation students and students with documented disabilities

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
MiWorks-virtual employment	Virtual employment assistance programs and individualized job training	Advanced
Ironwood Chamber of Commerce	Availability of free online banking for consumers and businesses	Basic
Michigan Small Business Technology and Development	Google online - program to help small & medium businesses with technology	Advanced
Ironwood Chamber of Commerce	1 free publicly accessible wireless hotspot available per 5,000 residents	Basic
City of Ironwood	Community - Business assistance, programs, and funding.	Advanced
Ironwood Chamber of Commerce	Presence of an online tourism portal for the promotion of local tourism attractions and events	Basic
Mich. Small Business and Development Center	Social Media workshops to help local businesses plan for e-marketing	Advanced
Mich. Small Business and Development Center	Program to help small and medium businesses with technology	Advanced
Bessemer Chamber of Commerce	75% of local attractions online	Basic
Wakefield 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
Regional Educational Media Center #1	100% of classrooms are connected to Internet via broadband	Basic
Regional Educational Media Center #1	100% of school libraries are connected to Internet via broadband	Basic

Regional Educational Media Center #1	100% of school libraries have automated library systems	Basic
Regional Educational Media Center #1	100% of K12 schools have online access to Student Information Systems, including grades. Many have online homework and curriculum	Advanced
Regional Educational Media Center #1	100% of K12 schools have online interaction via e-mail. Some teachers use texting communication tools as well.	Advanced
Regional Educational Media Center #1	100% of K12 schools have online courses available, via Odysseyware, Moodle, MVHS, Accelerated Reader, and others	Advanced
Regional Educational Media Center #1	100% of K12 school campuses have Wi-Fi	Basic
Regional Educational Media Center #1	Projectors in nearly every room. Document cameras installed in most rooms. Smartboards and supporting technology installed in	Advanced
Regional Educational Media Center #1	Numerous initiatives across the region, primarily with iPads and Chromebooks, in various stages of rollout	Advanced
Western UP Math Science Center	Student and teacher training programs focused on improving STEM	Advanced
Western UP Math Science Center	Initiatives focused on elevating STEM	Advanced
Gogebic Community College	100% of classrooms are connected to Internet via broadband	Basic
Gogebic Community College	School library is connected to Internet via broadband	Basic
Gogebic Community College	School libraries have automated library system	Advanced
Gogebic Community College	Online access to school curricula, homework, and grades	Advanced
Gogebic Community College	Online interaction via text messaging and e-mail between staff and students	Advanced
Gogebic Community College	Availability of online courses	Advanced
Gogebic Community College	Initiatives focused on elevating STEM	Advanced
Gogebic Community College	Presence of campus Wi-Fi	Basic
Gogebic Community College	Staff training in social media to facilitate effective communication with students	Basic

Government (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 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
Gogebic County	Majority of local governments with websites	Basic
Gogebic County	50% of essential government services online	Advanced
Gogebic County Sheriff	Availability of ubiquitous, interoperable wireless public safety network	Advanced
Gogebic County Emergency Service/911 Office	Presence of next generation 911 system	Advanced
Gogebic County Emergency Service/911 Office	Nixle-alerts and emergency messages by e-mail and text; public safety answering points with broadband	Advanced
City of Bessemer	City of Bessemer now accepts credit and debit card payments through GovPayNet	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
Aspirus Grand View Hospital	Online listing of healthcare professionals within community	Basic
Aspirus Grand View Hospital	Availability of telemedicine (send or receive	Advanced
Aspirus Grand View Hospital	Patient Portal- online service	Advanced
Western UP Health Department	Availability of restaurant health inspection scores online	Basic
Gogebic Medical Care Facility	Free Internet Access	Basic
Aspirus Grand View Hospital	Availability of e-prescriptions	Basic
Aspirus Grand View Hospital	Over 75% of doctors using e-health	Advanced
Aspirus Grand View Hospital	100% of doctors with adequate bandwidth (based on NBP standard)	Advanced

ACTION PLAN

Complete List of Gogebic County Projects

The following is a comprehensive list of the priority projects and additional projects the Gogebic Range Broadband Committee proposes to accelerate broadband access, adoption, and use in Gogebic 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
Working in partnership with the Western Upper Peninsula Planning and Development Region (WUPPDR), local leaders to date have formed teams to launch broadband survey teams in both Watersmeet Township and Wakefield Township. The data from the respondents will be tabulated summarized by the local teams and mapped by the WUPPDR GIS team.
That summary and map will then be supplied to local providers in order to develop a business case for expansion of broadband service.

Other townships within Gogebic Township will soon be forming their survey team to launch their survey within their township in order to develop a business case broadband expansion within their township.

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.

Implementation

Working with the planning team of the Western Upper Peninsula Planning and Development Region, the community leaders will examine the local policies and ordinances to ensure that they are conducive to the broadband build-out.

Apply to USDA for Funding Support to Build-Out Broadband in Community

The USDA, through its Rural Development mission area, administers and manages housing, business, and community infrastructure and facility programs through a national network of state and local offices. Rural Development has an active portfolio of more than $165 billion in loans and loan guarantees. These programs are designed to improve the economic stability of rural communities, businesses, residents, farmers, and ranchers and improve the quality of life in rural areas.

Farm Bill Loan Program – USDA

This program is designed to provide loans for funding, on a technology neutral basis, for the costs of construction, improvement, and acquisition of facilities and equipment to provide broadband service to eligible rural communities. For more information: http://www.rurdev.usda.gov/supportdocuments/BBLoanProgramBrochure_8-11.pdf

Additional Information

Direct loans are in the form of a cost-of-money loan, a 4-percent loan, or a combination of the two.

Eligibility

Application guide: http://www.rurdev.usda.gov/supportdocuments/Broadband%20Application%20Guide%203.14.11.pdf

Contact Information
Point of Contact: Ken Kuchno
Telephone: (202) 690-4673; (202) 690-4673
E-mail: kenneth.kuchno@wdc.usda.gov
Website: http://www.rurdev.usda.gov/utp_farmbill.html

Community Connect Program – USDA
Provides community access to broadband services in unserved areas through a one-time grant to such organizations as tribes, cooperatives, private companies, and universities and uses the infrastructure built by the grant to create opportunities for continued improvement.

Additional Information
The funding will support construction, acquisition, or lease of facilities, including spectrum, to deploy broadband transmission services to all critical community facilities and to offer such services to all residential and business customers located within the proposed service area.

The funding can be put toward the improvement, expansion, construction, acquisition, or leasing of a community center that furnishes free access to broadband Internet service, providing that the community center is open and accessible to area residents before, during, and after normal working hours and on Saturday or Sunday.

All equipment purchases with grant and/or matching funds must be new or non-depreciated.

Eligibility
- The following entities are eligible for funding:
- Incorporated Organizations;
- Indian Tribes or Tribal Organizations, as defined by 25 U.S.C. 450b(e);
- State or local units of government; or
- Cooperatives, private corporations, or limited liability companies organized on a for-profit or not-for-profit basis.

NOFA is available
here: http://www.rurdev.usda.gov/SupportDocuments/utp2013CommConnectNOFA.pdf

Application guide is available
here: http://www.rurdev.usda.gov/SupportDocuments/utp2013CommConnectAppGuide.pdf

Contact Information
Point of Contact: Thera Swersky or Steven Levine
Telephone: (202) 690-4673; (202) 690-4673
E-mail: community.connect@wdc.usda.gov
Website: http://www.rurdev.usda.gov/utp_commconnect.html

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.

Additional Information

The Distance Learning and Telemedicine Loans and Grant Program (DLT Program) provides three kinds of financial assistance: a full grant, grant-loan combination, and a full loan.

Eligibility

To be eligible for a grant, your organization must:

- Currently deliver or propose to deliver distance learning or telemedicine services for the term of the grant. To receive a grant, the purposes must meet the grant definition of distance learning and telemedicine. The DLT program is focused on sustainability. Planning studies, research projects, and short-term demonstration projects of less than two years will not be considered.

- Be legally organized as an incorporated organization or partnership; an Indian tribe or tribal organization; a state or local unit of government; a consortium; or other legal entity, including a private corporation organized on a for-profit or not-for-profit basis with the legal capacity to contract with the United States Government.

- Operate a rural community facility or deliver distance learning or telemedicine services to entities that operate a rural community facility or to residents of rural areas at rates calculated to ensure that the benefit of the financial assistance passes through to such entities or to residents of rural areas.

Contact Information

Point of Contact: Sam Morgan
Telephone: (202) 720-0665; (202) 720-0665
E-mail: dltinfo@wdc.usda.gov
Website: http://www.rurdev.usda.gov/UTP_DLT.html

Universal Service Rural Health Care Program – Universal Service Administration Company

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.

Contact Information:
Telephone: (800) 229-5476
E-mail: rhc-admin@usac.org
http://www.universalservice.org/rhc/telecommunications/default.aspx

Middle Mile Access

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

This action item will be implemented by the planning and GIS teams of the Western Upper Peninsula Planning and Development Region.

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

Implementation
The staff of Gogebic Community College through it community outreach program currently provides the majority of the basic digital literacy training in the community. In addition, the staff provides one-on-one training upon request.

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.

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#.

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
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.

The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.

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 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.

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:

a. A public-safety-class, IP-based network
b. IP-based call processing equipment (CPE) in PSAPs
c. Geographic information system (GIS) data enhancements
d. 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.

The most current statewide and county- specific broadband inventory maps released in the fall of 2014 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. The county maps are found at http://www.connectmi.org/community_profile/find_your_county/michigan/alcona.

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
At Least 768 Kbps/200 Kbps	31	3,841	99.19
At Least 1.5 Mbps/200 Kbps	**38**	**3,834**	**99.01**
At Least 3 Mbps/768 Kbps	63	3,810	98.38
At Least 6 Mbps/1.5 Mbps	**194**	**3,678**	**94.98**
At Least 10 Mbps/1.5 Mbps	282	3,591	92.73
At Least 25 Mbps/1.5 Mbps	**438**	**3,435**	**88.70**
At Least 50 Mbps/1.5 Mbps	513	3,360	86.76
At Least 100 Mbps/1.5 Mbps	**654**	**3,219**	**83.12**
At Least 1 Gbps/1.5 Mbps	3,860	12	0.32

Source: Connect Michigan, November 2014.

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 99.19% 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 31,244 households in the fall of 2014. Further, approximately 3,809,777 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 94.98%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.99% of Michigan households have broadband available from at least one provider at download speeds of 768 Kbps or higher and upload speeds of 200 Kbps or higher. This leaves 577 households in the state completely unserved by any form of terrestrial broadband (including mobile, but excluding satellite services).

As differences in broadband availability estimates between the fall of 2010 and the fall of 2014 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/.

APPENDIX 2: PARTNER AND SPONSORS

Connect Michigan, in partnership with the Michigan Public Service Commission (MPSC), 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 is expanding 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

The **Michigan Public Service Commission** (MPSC) is the lead Michigan agency for the State Broadband Initiative that is responsible for working with Connect Michigan, overseeing the Michigan initiative, and providing direction of the project. The MPSC facilitates interactions with other state government entities, broadband providers, and other Michigan stakeholders. They view promoting broadband view Connect Michigan 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

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 Americans. 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

The **National Telecommunications and Information Administration** (**NTIA**) is an agency of the United States Department of Commerce that is serving as the lead agency in running the State Broadband Initiative (SBI). Launched in 2009, the NTIA's State Broadband Initiative implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which

envisioned a comprehensive program led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and healthcare rely not only on broadband infrastructure but also on the knowledge and tools to leverage that infrastructure.

The NTIA has awarded a total of $293 million for the SBI program to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. Grantees such as Connect Michigan are using this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, developing research to investigate barriers to broadband adoption, searching out and creating innovative applications that increase access to government services and information, and developing state and local task forces to expand broadband access and adoption.

Since accurate data is critical for broadband planning, another purpose of the SBI program has been to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services used by community institutions such as schools, libraries, and hospitals. This data is used by the NTIA to update the National Broadband Map, the first public, searchable nationwide map of broadband availability launched February 17, 2011.

APPENDIX 3: THE NATIONAL BROADBAND PLAN

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.

APPENDIX 4: WHAT IS CONNECTED?

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 provide "train-the-trainer" activities to local leaders, such as librarians, school administrators, economic development professionals, and public officials and help them 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.

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
1. Broadband Availability	6. Digital Literacy	10. Economic Opportunity
2. Broadband Speeds	7. Public Computer Centers	11. Education
3. Broadband Competition	8. Broadband Awareness	12. Government
4. Middle Mile Access	9. Vulnerable Population Focus	13. Healthcare
5. Mobile Broadband Availability		

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.

APPENDIX 5: GLOSSARY OF TERMS

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 implantations 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.

M

MAN - Metropolitan Area Network - A high-speed date 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. Mutiplexing, 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.