CONNECTED℠

CASS COUNTY

TECHNOLOGY ACTION PLAN

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AND THE
CASS COUNTY BROADBAND COMMITTEE

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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 – this 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, 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, as of 2013, 30% of Americans did not have a high-speed connection at home.[2] Connected Nation's studies also show that 17 million families with children do not have broadband at home – and 7.6 million of these children live in low-income households. In 2014, Connected Nation also surveyed 4,206 businesses in 7 states. Based on this data, Connected Nation estimates that nearly 1.5 million businesses - 20% - in the United States do not utilize broadband technology today.[3]

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 local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.[4]

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

2 *Pew Research Internet Project – Broadband Technology Fact Sheet*

3 Connected Nation, *2014 Business Technology Assessment,* http://www.connectednation.org/survey-results/business

4 Connected Nation, parent company for 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.

Methodology

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

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 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 endeavors 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 (NBP), 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. Lower scores indicate weaknesses in the community's broadband ecosystem, but do not necessarily signify a lack of service.

- Cass County achieved a score of 83 points out of 120 for overall broadband and technology readiness which indicates that the community is exhibiting good support of technology access, adoption, and use but has not surpassed the score of 100 required for Connected certification.
- The community scored 28 out of a possible 40 points in broadband access primarily because of some gaps in overall broadband infrastructure and need for more providers. With 96.8% of households having access to 3 Mbps, Cass County is below the state average of 98.4%.
- The community also scored 28 out of a possible 40 points in broadband adoption, indicating

that Cass County has some valuable assets and programs to support continued adoption by its residents and small businesses, but more help may be needed.

- The community also scored 27 out of a possible 40 points in broadband use, indicating that Cass County has effectively employed broadband to deliver some productive online services and applications to help improve the overall quality of life for local residents. Cass County did not exceed the 32 points in each focus area that are required for certification and has not yet qualified as a Certified Connected Community.

While the results indicate that the community has made some strides and investments in technology, this technology plan will provide some insight and recommendations that will help the community continue to achieve success.

Community Technology Scorecard Community Champions: Gautam Mani Community Advisor: Dan Manning				
FOCUS AREA	**ASSESSMENT CRITERIA**	**DESCRIPTION**	**SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	96.8% of homes have access to 3 Mbps	8	10
	Broadband Speeds	73.3% of households with access to at least 6 Mbps	1	5
	Broadband Competition	82.3 % of households with access to more than 1 broadband provider	3	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from 1 provider	6	10
	Mobile Broadband Availability	99% to 100% of households with access to mobile broadband	10	10
	ACCESS SCORE		**28**	**40**
ADOPTION	Digital Literacy	Program grads are greater than 4 per 1,000 residents over the past year	6	10
	Public Computer Centers	450 computer hours per 1,000 low-income residents per week	8	10
	Broadband Awareness	Campaigns reach 60% of the community	6	10
	Vulnerable Population Focus	At least 4 groups	8	10
	ADOPTION SCORE		**28**	**40**
USE	Economic Opportunity	2 advanced, 4 basic uses	8	10
	Education	1 advanced, 7 basic uses	9	10
	Government	0 advanced, 5 basic uses	5	10
	Healthcare	1 advanced, 3 basic uses	5	10
	USE SCORE		**27**	**40**
	COMMUNITY ASSESSMENT SCORE		**83**	**120**

Itemized Key Findings

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

ACCESS

- 16 last-mile broadband providers currently provide service in Cass County:
  - 96.8% of households have access to 3 Mbps.
  - 73.3% of Cass County homes have access to at least 6 Mbps service.
  - 82.3% of Cass County households have access to more than 1 provider.
- Middle mile fiber infrastructure is available from only 1 provider in Cass County.
- 99% to 100% of Cass County households have access to mobile wireless.

ADOPTION

- 2 Digital Literacy Programs exist in the community resulting in 100 graduates over the past year.
- 9 Public Computer Centers (PCC) with a total of 74 computers are open to the public.
- 2 Broadband Awareness Campaigns are reaching 60% of Cass County.
- 3 organizations are working with vulnerable populations.

USE

- At least 6 uses of broadband were identified in the area of economic opportunity including 2 advanced uses and 4 basic uses.
- At least 8 uses of broadband were identified in the area of education including 1 advanced use and 7 basic uses.
- At least 5 uses of broadband were identified in the area of government including 0 advanced use and 5 basic uses.
- At least 4 uses of broadband were identified in the area of healthcare including 1 advanced use and 3 basic uses.

In addition to the items identified above, the Cass County Broadband Committee identified the following technology resources in the community:

Technology Providers

- 19 broadband providers were identified in Cass County
- 0 hardware providers
- 0 network developers
- 0 web developers

Technology Facilities

- 9 public computer centers

- 0 wireless hotspots
- 0 videoconference facilities

Community Websites

- 3 Business-related websites (excluding private businesses)
- 4 Education-related websites
- 1 Government-related website
- 0 Healthcare-related websites
- 0 Library-related websites
- 1 Tourism-related website
- 0 Other websites

Community Priority Projects

The Connected Assessment has culminated in the outlining of projects designed to empower the community to accelerate broadband access, adoption, and use. Below are 15 priority projects that comprise the broadband action plan for the Southwest Michigan Region, which includes Cass County.

1. Develop Public-Private Partnerships to Deploy Broadband Service
2. Perform an Analysis of Local Policies and Ordinances
3. Identify, Map, and Validate Broadband Demand
4. Perform a Broadband Build-out Analysis in Unserved Areas
5. Complete a Vertical Assets Inventory
6. Develop a Technology Mentorship Program
7. Improve Education through Digital Learning
8. Distribute Digital Literacy Content and Include Internet Safety Content
9. Inventory Local/Regional Programs and Services Provided by Public and Private Groups
10. Facilitate a Technology Summit and Incorporate Community-Based Technology Awareness Program; Partner with Area Agency on Aging
11. Initiate a Community Computer Refurbishment or Recycling Program or Partner/Promote Organizations Providing These Services
12. Develop a Comprehensive Broadband Training Program for Small/Medium Businesses That Includes Web and Social Media Classes
13. Develop a Farmers' Network
14. Develop a Comprehensive Municipal Broadband Strategy
15. Online Identification of Broadband Services at Key Economic Sites

DETAILED FINDINGS

Cass County Assessment Findings

Today, residents in the Cass County (or sections of the community) are served by 19 providers. Currently, broadband is 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 the Cass County Community:

Broadband Providers	Website	Technology Type
ACD.net	http://www.acd.net/	DSL
AT&T Mobility	http://www.wireless.att.com	Mobile
Comcast	http://www.comcast.com/	Cable
Fourway	http://www.fourway.net/	Fixed Wireless
Frontier	http://frontier.com/	DSL
HughesNet	http://www.hughesnet.com/	Satellite
I-2000	http://www.i2k.net/	DSL, Fixed Wireless
AT&T	http://www.att.com/	DSL
Sister Lakes Cable	http://www.sisterlakescable.com	Cable
Skycasters	http://www.skycasters.com/	Satellite
Michiana Supernet	http://www.michianasupernet.com/	Fixed Wireless
Sprint	http://www.sprint.com/	Mobile
Iserv	http://www.iserv.net/	DSL
T-mobile	http://www.t-mobile.com/	Mobile
ViaSat	http://www.exede.com/	Satellite
Verizon	http://www.verizonwireless.com/	Mobile
Cricket Wireless	https://www.cricketwireless.com/	Mobile
Midwest Connections	http://teammidwest.com/	Fiber
Starband Communications	http://starband.com/	Satellite

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

Organization Name	Website	Resource Type
Cass County District Library	http://cass.lib.mi.us/	Public Computer Facility

Edwardsburg Library	http://cass.lib.mi.us/content/edwardsburg-branch/	Public Computer Facility
Howard Library	http://cass.lib.mi.us/content/howard-branch/	Public Computer Facility
Mason/Union Library	http://cass.lib.mi.us/content/mason-union-branch-0/	Public Computer Facility
Dowagiac District Library	http://www.dowagiacdl.org/	Public Computer Facility
Marcellus Township Library	http://www.marcellus.michlibrary.org/	Public Computer Facility
Council on Aging - Cassopolis	http://www.casscoa.org/	Public Computer Facility
Council on Aging - Dowagiac	http://www.casscoa.org/	Public Computer Facility
Pokegon Band Library - Dowagiac	http://www.pokagon.com/departments/education/library-and-computer-services	Public Computer Facility

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

Organization Name	Website	Website Category
Cass County Economic Development	www.casscountymi.org/EconomicDevelopment	Business
Southwest Michigan First	www.southwestmichiganfirst.com	Business
Edwardsburg Chamber of Commerce	www.edwardsburgchamber.org	Business
Southwest Michigan Tourist Council	www.swmichigan.org	Tourism
Cassopolis Schools	www.cassopolis.k12.mi.us	Education
Dowagiac Union Schools	www.dowagiacschools.org	Education
Edwardsburg Public Schools	www.edwardsburgpublicschools.org	Education
Marcellus Community Schools	www.marcelluscs.org	Education
Cass County	www.casscountymi.org	Government
Borgess-Lee Memorial Hospital	www.borgess.com/default.aspx?pId=83	Healthcare
Cass County Medical Care	www.ccmcf.org	Healthcare

Connected Assessment Analysis

Access Score Explanation

Broadband Availability (8 out of 10 Possible Points) – 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, 96.8% of Cass County residents had access to broadband speeds of 3 Mbps or greater.**

Broadband Speeds (1 out of 5 Possible Points) – is measured by analyzing the speed tiers available within a community. Connected Nation will analyze broadband data submitted through its broadband mapping program. Specifically, Connected Nation will break down the coverage by the highest speed tier with at least 75% of households covered. 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, 73.3% of Cass County residents had access to broadband speeds of at least 6 Mbps.**

Broadband Competition (3 out of 5 Possible Points) – is measured by analyzing the number of broadband providers available in a particular 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 the 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, 82.3% of Cass County residents had access to more than one broadband provider.**

Middle Mile Access (6 out of 10 Possible Points) – is measured based on a community's availability to fiber. Three aspects of availability exist: proximity to middle mile points of presence (POPs), number of POPs available, and available bandwidth. Data was collected by the community in coordination with Connected Nation.

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

Mobile Broadband Availability (10 out of 10 Possible Points) – 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, 99.9% to 100% of Cass County residents had access to mobile broadband service.**

Adoption Score Explanation

Digital Literacy (6 out of 10 Possible Points) – is measured by first identifying all digital literacy programs in the community. Once the programs are determined, 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
Cass County Council on Aging	SeniorNet: Computer Assistance Workshops	50
Lincoln Charter Township Library	Computer and internet classes	50
Total Graduates [2013-2014]		100

Public Computer Centers (8 out of 10 Possible Points) – is measured based on the number of hours computers are available each week per 1,000 low-income residents. Available computer hours is 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 Cass County is below.

Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
Cass County District Library – Main Branch	59	16	944

Edwardsburg Library	59	8	472
Howard Library	36	9	324
Mason/Union Library	36	9	324
Dowagiac District Library	53.5	12	642
Marcellus Township Library	47	6	282
Council on Aging - Cassopolis	58	4	232
Council on Aging - Dowagiac	50	4	200
Pokegon Band Library - Dowagiac	40	6	240

Broadband Awareness (X out of 10 Possible Points) – 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 Cass County is below.

Organization Name	Campaign Description	Community Reach %
Cass County District Library	Library newsletter	60%
Cass County Council on Aging	Computer awareness/training for seniors	40%

Vulnerable Population Focus (8 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. A listing of programs focusing on vulnerable populations in Cass County is listed below.

Organization Name	Program Description	Vulnerable Group
Cass County Council on Aging	SeniorNet Computer Learning Center: Awareness and training on computers	Seniors
Pokagon Band Library	GED workshops, computer training	Native Americans
Cass County District Library	Learn4Life online education	Low-income, unemployed

Use Score Explanation

Economic Opportunity (8 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 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
www.cityofdowagiac.com	Dowagiac Chamber of Commerce/ED website	Basic
www.edwardsburgchamber.org	Edwardsburg Chamber of Commerce website	Basic
http://casscountymi.org/EconomicDevelopment.aspx	Cass County Economic Development website	Basic
www.marcellusmichigan.org	Village of Marcellus website	Basic
http://www.southwestmichiganfirst.com	Southwest Michigan First - regional ED info and services	Advanced
www.swmichigan.org	Southwest Michigan Tourist Council	Advanced

Education (9 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
http://cassopolis.k12.mi.us/	Cassopolis Schools website	Basic
http://www.dowagiacschools.org	Dowagiac Union Schools website	Basic
http://www.edwardsburgpublicschools.org	Edwardsburg Public Schools website	Basic
http://www.lewiscassisd.org	Lewis Cass ISD website	Basic
http://www.marcelluscs.org	Marcellus Community Schools website	Basic
K-12 Broadband connectivity	All schools connected to the internet via broadband	Basic

Library broadband connectivity	All libraries connected to the internet via broadband	Basic
MiCase (Michigan Collaborative Administrative Solutions for Education)	Online student information and administration system	Advanced

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

Application Provider	Description	Basic/ Advanced
Local municipality websites	Township and village websites exist and provide information and services	Basic
Online access to government information	Tax info, ordinances, meeting minutes, etc.	Basic
Online Property Search	Ability to search county property records online	Basic
Qualified Voter File (QVF)	Online Voter Registration	Basic
www.casscountymi.org	Cass County government website	Basic

Healthcare (5 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
http://www.borgess.com/default.aspx?pId=83#.Up-C7eIx6Lx	Borgess Lee Memorial Hospital website	Basic
Online Physician Search	Find a physician by specialty, location, etc.	Basic
www.ccmcf.org	Cass County Medical Care (Cassopolis) website	Basic
MyBorgessHealth	Online access to personal medical records, prescription renewals, bill payment, etc.	Advanced

ACTION PLAN

Community Priority Projects

This exercise has culminated in the outlining of projects to allow the community to continue its recognized excellence in technology and broadband planning across the community. Below are 15 priority projects, each describing a project plan with suggested steps.

Develop Public-Private Partnerships to Deploy Broadband Service

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.

Goal

Fund broadband network deployment

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.

Implementation Team

To be determined.

Perform an Analysis of Local Policies and Ordinances

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 are one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ration 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.

Goal

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

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, right-of-way) that are conducive to broadband build-out.

2. Develop an awareness campaign targeted towards community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources that outweigh the need for some policies.

Identify, Map, and Validate Broadband Demand

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.

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

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

Perform a Broadband Build-out Analysis in Unserved Areas

Conduct an onsite visual assessment of the defined geographic area seeking broadband coverage. The assessment determines the feasibility of deploying various Internet systems in a defined area. You should gather site specific information required for determining use of existing infrastructure, designing wired and wireless Internet system using these assets, and expanding the broadband coverage in the defined area. Wireless may be the best likely solution. To assist with that, you should conduct a visual assessment of the vertical assets (broadcast towers and water tanks) to determine the feasibility of deploying a fixed wireless broadband Internet system in the unserved community and to gather site-specific information required for that purpose.

Goal
Determine which areas lack the necessary technological structure and determine the feasibility of deploying various Internet systems in the defined area.

Benefits
1. Determine project feasibility and provides information to develop a business case for build-out.
2. First step in providing unserved community residents with adequate broadband access.

Action Items
1. Conduct a wireless assessment to include:
    - Determining the functionality of all potential transmit locations;
    - Surveying the availability of adequate power sources at each location;
    - Identifying any issues regarding ingress and egress at each location;
    - Designing a wireless broadband system using these potential transmit locations; and
    - Creating a methodology for the expansion of wireless broadband coverage into the unserved areas of the community.

Complete a Vertical Assets Inventory

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.

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.

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.

Develop a Technology Mentorship Program

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

Goal

Utilize student technology knowledge to implement community programs.

Benefits

1. The program helps students develop self-confidence and technical competencies as they work with their families, leaders, peers, neighbors, seniors, and other members of their communities. In addition to empowering these students with real world experience, it helps enhance their skills as they mature into productive and highly competent citizens.
2. It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.
3. The program will engage students who are creative, knowledgeable, and interested in technology as a great resource for planning, implementation, support, and using technology at a local level. With guidance and support, they will help to provide a missing, and

important, link between the members of community that have experience with broadband technology and those who are currently not using it.

4. The program will expose students to potential career paths and provide a basis to determine if they want to further their educations in a technology field. It could also potentially provide a beginning client base from the relationships he or she has built within the community as a student.

Action Items

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

Improve Education through Digital Learning

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 teach teachers how to integrate PowerMyLearning into their classrooms.

Goal

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

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.

Distribute Digital Literacy Content and Include Internet Safety Content

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.

Goal

Facilitate partnerships in order to provide digital literacy training.

Benefits

1. 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

Inventory Local/Regional Programs and Services Provided by Public and Private Groups

Launch a region-wide effort to identify and inventory existing resources (facilities, training programs, educational offerings, sources of expertise, small business experts, etc.) that can help increase broadband adoption and use.

Goal
Better understand, document and communicate existing programs and offerings in the county/region that may support broadband adoption.

Benefits
1. Connect residents and business owners with support resources.
2. Help improve overall broadband adoption rate across the region.
3. Improve local economy by getting more businesses and residents online.

Action Items
1. Conduct working session to identify known major offerings/services.
2. Identify team members/focal points across the region to participate.
3. Develop survey to gather required information.
4. Deploy survey.
5. Compile and summarize results.
6. Develop communication plan to share results and incorporate in overall broadband plan.

Facilitate a Technology Summit and Incorporate Community-Based Technology Awareness Program; Partner with Area Agency on Aging

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.

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.

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.

Initiate a Community Computer Refurbishment or Recycling Program or Partner/Promote Organizations Providing These Services

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

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

Benefits

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

Action Items

1. Develop a model for computer refurbishing or recycling. A basic framework might include:
    - Step 1: Project Planning
        - Determination of minimum computer specifications
        - Acquisition and storage of donated computers
        - Determination and installation of appropriate computer operating system
        - Calculation of costs needed to carry out the program
    - Step 2: Inventory Management
        - Examine how equipment and software will be sorted and managed. Manage your inventor by identifying computers that are ready to be refurbished from those that are non-functioning.
    - Step 3: Volunteer Training
2. Review established residential refurbishment and recycling programs that your community can take advantage of:
    - Dell's Reconnect program is a residential computer recycling program that offers a convenient way to recycle your used computer equipment. You can drop off any brand of used equipment at participating Goodwill donation centers in your area. It's free, and participants receive a receipt for tax purposes. To view a full list of acceptable products and locations, visit the Dell Reconnect website.
    - Earth 911 Earth 911 is a comprehensive communication medium for the environment. Earth 911 has taken environmental hotlines, websites, and other information sources nationwide, and consolidated them into one network. Once you contact the Earth 911 network, you will find community-specific information on e-cycling and much more.
    - Electronic Industries Alliance's Consumer Education Initiative The Electronic Industries Alliance's e-Cycling Central website helps you find reuse, recycling, and donation programs for electronics products in your state.

Develop a Comprehensive Broadband Training Program for Small/Medium Businesses That Includes Web and Social Media Classes

For small businesses, an online presence and the use of social media are vital to stay competitive in the twenty-first century. A website and social media use are not just for companies that have the experience, staff, or budget; any small business can tap into these resources. Training should be provided to small businesses regarding the use of websites and social media within that small business. Website topics should range from starting a basic website to more advanced topics such as e-commerce. Social media topics should include a variety of social media outlets including Facebook, Twitter, YouTube, Pinterest, and LinkedIn.

Goal
To encourage small local businesses to develop websites and to use social media and e-commerce

Action Items
1. Work with the local chamber and/or the libraries to expand on existing programs that promote e-commerce, such as free websites and social media development within the small businesses of the community including those involved in agriculture.
2. Partner with providers to sponsor workshops. (Providers may be willing to sponsor events since small business workshops will likely lead to increases broadband adoption and use).
3. Identify regional and community partners with resources and expertise to assist the community in producing “free” website and social media workshops.
4. Schedule workshops and advertise classes via local media.

Develop a Farmers' Network

Create a local agricultural portal to connect farmers with buyers and technical experts in agriculture including United States Department of Agriculture (USDA), researchers, university and extension offices, state department of agriculture, the State or National Farm Bureau, etc. This portal will enable local farmers to share the latest techniques in farming such as using technological tools and data to make decisions. Tools can include GPS, yield monitors, variable rate technology, and remote sensing. Farmers can also share how to be successful in maximizing production and reducing costs. Beyond information sharing, a local agricultural portal could also be utilized to provide online “booth space” for growers, producers, and artisans selling direct to the consumer. Set up much like an open-air farmers' market where vendors offer food, crafts, gifts, supplies, garden tools and more, the purpose would be to provide a space where local and regional consumers can meet, correspond, and purchase products directly from the farm. This online farmers market could be a feature in the local agricultural portal or a Main Street Portal. Either way, an online farmers market should be

feature-rich, enabling virtual farm tours, discussion forums, video and image galleries, and real time ordering and payment.

Goal
Create a portal to keep the agricultural community connected and to facilitate advanced information sharing, news, and marketing of products.

Benefits
1. Connects agricultural community.
2. Connects agricultural producers and consumers.
3. Facilitates knowledge-share.
4. Could be used for e-commerce.

Action Items
1. Identify an appropriate host for the agricultural portal.
2. Some of the major requirements of the portal include a good content management system, simple yet flexible interface, and interactive tools.
3. The community portal should be continually updated to reflect the agricultural community's needs and technological expertise.

Develop a Comprehensive Municipal Broadband Strategy

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

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

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

Action Items

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

Online Identification of Broadband Services at Key Economic Sites

Develop an inventory of the broadband and telecommunication services available at community industrial parks, business parks, and other key business locations. Gathered information could include the highest speeds, technology platform, and number of fiber providers available. If not available, the closest provider and distance should be identified. All information should be shared with regional and state economic development planners, as well as listed on the area economic development websites (e.g. Chamber of Commerce or area development districts).

Goal

Develop an inventory of the broadband and telecommunication services available at community industrial parks, business parks, and other key business locations to share with regional and state economic development planners.

Benefits

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

Action Items

1. Collaborate with commercial building owners, providers, and other stakeholders to develop an inventory of broadband services available at key economic sites.

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 October and April annually.

The most current Statewide and County Specific Broadband Inventory Maps released in the spring of 2014 depict a geographic representation of provider-based broadband data represented by cable, DSL, wireless, fiber, etc. These maps also incorporate data such as political boundaries and major transportation networks in the state. Vertical assets that can be utilized for broadband network facilitation or transmission will be added to the interactive mapping application in October 2012. 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/.

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

SBI Download Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent Households by Speed Tier
At Least 768 Kbps/200 Kbps	37	3,836	99.05
At Least 1.5 Mbps/200 Kbps	46	3,826	98.80
At Least 3 Mbps/768 Kbps	103	3,769	97.33
At Least 6 Mbps/1.5 Mbps	**251**	**3,621**	**93.52**
At Least 10 Mbps/1.5 Mbps	279	3,594	92.80
At Least 25 Mbps/1.5 Mbps	515	3,357	86.70
At Least 50 Mbps/1.5 mbps	646	3,227	83.33
At Least 100 Mbps/1.5 Mbps	**647**	**3,226**	**83.30**
At Least 1 Gbps/1.5 Mbps	3,867	5	0.14

Source: Connect Michigan, April 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 99.05% of households are able to connect to broadband at download speeds of at least 768 Kbps. 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 36,603 households in the spring of 2014. Further, approximately 3,769,134 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 speeds is estimated at 93.52%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.92% 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 3,100 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 spring of 2013 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 tool 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 is 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 also 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.
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. Multiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

NTIA - National Telecommunications and Information Administration, which is housed within the United State Department of Commerce.
NIST - National Institute of Standards and Technology.

O

Overbuilders - Building excess capacity. In this context, it involves investment in additional infrastructure projects to provide competition.
OVS - Open Video Systems - A new option for those looking to offer cable television service outside the current framework of traditional regulation. It would allow more flexibility in providing service by reducing the build-out requirements of new carriers.

P

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

R

Right-of-Way - A legal right of passage over land owned by another. Carriers and service providers must obtain right-of-way to dig trenches or plant poles for cable and telephone systems and to place wireless antennae.
RPR - Resilient Packet Ring - Uses Ethernet switching and a dual counter-rotating ring topology to provide SONET-like network resiliency and optimized bandwidth usage, while delivering multi-point Ethernet/IP services.
RUS - Rural Utility Service - A division of the United States Department of Agriculture that promotes universal service in unserved and underserved areas of the country through grants, loans, and financing.

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.
SBI - State Broadband Initiatives, formerly known as the State Broadband Data & Development (SBDD) Program.
SONET - Synchronous Optical Network - A family of fiber-optic transmission rates.
Streaming - A Netscape innovation that downloads low-bit text data first, then the higher bit graphics. This allows users to read the text of an Internet document first, rather than waiting for the entire file to load.
Subscribership - Subscribership is the number of customers that have subscribed for a particular telecommunications service.
Switched Network - A domestic telecommunications network usually accessed by telephones, key telephone systems, private branch exchange trunks, and data arrangements.

T

T-1 - Trunk Level 1 - A digital transmission link with a total signaling speed of 1.544 Mbps. It is a standard for digital transmission in North America.
T-3 - Trunk Level 3 - 28 T1 lines or 44.736 Mbps.

U

UNE - Unbundled Network Elements - Leased portions of a carrier's (typically an ILEC's) network used by another carrier to provide service to customers.
Universal Service - The idea of providing every home in the United States with basic telephone service.
Upstream - Data flowing from your computer to the Internet (sending e-mail, uploading a file).

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.