

LIVINGSTON COUNTY

TECHNOLOGY ACTION PLAN

PREPARED BY **CONNECT MICHIGAN**
AND THE
LIVINGSTON COUNTY BROADBAND COMMITTEE



SEPTEMBER 2013



ACCESS



ADOPTION



USE

TABLE OF CONTENTS

INTRODUCTION	3
BACKGROUND	3
METHODOLOGY.....	5
CONNECTED ASSESSMENT	6
CONNECTED ASSESSMENT CRITERIA	6
COMMUNITY TECHNOLOGY SCORECARD.....	7
COMMUNITY TECHNOLOGY SCORECARD BRIEF	8
ITEMIZED KEY FINDINGS	10
COMMUNITY PRIORITY PROJECTS.....	11
PROPOSED PROJECTS.....	11
DETAILED FINDINGS	13
CURRENT COMMUNITY TECHNOLOGY DEVELOPMENTS IN LIVINGSTON COUNTY	13
LIVINGSTON COUNTY ASSESSMENT FINDINGS	13
CONNECTED ASSESSMENT ANALYSIS	16
ACTION PLAN	24
COMMUNITY PRIORITY PROJECTS.....	24
ALL PROPOSED PROJECTS	30
APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND	40
STATEWIDE INFRASTRUCTURE.....	40
BUSINESS AND RESIDENTIAL TECHNOLOGY ASSESSMENTS	42
APPENDIX 2: PARTNER AND SPONSORS	43
APPENDIX 3: WHAT IS CONNECTED?	45
APPENDIX 4: GLOSSARY OF TERMS	47

INTRODUCTION

The purpose of this report is to summarize the community's assessment of local broadband access, adoption, and use, and to provide an action plan for broadband acceleration.

Background

Deploying broadband infrastructure, services, and applications, as well as supporting the universal adoption and meaningful use of broadband, are challenging - but required - building blocks of a twenty-first century community. The success of a community has 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. Due in large part to private investment and market-driven innovation, broadband in America has improved considerably in the last decade. More Americans are online at faster speeds than ever before.

Despite the progress, there are still critical problems that slow the progress of the access, adoption, and use of broadband. Connected Nation estimates that approximately 70 million, or 30% of, Americans do not subscribe to home broadband service, and adoption varies significantly across socioeconomic lines.¹ 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. Connected Nation also estimates that at least 1.8 million businesses - 24% - in the United States do not utilize broadband technology today.²

In early 2009, Congress directed the Federal Communications Commission (FCC) to develop a National Broadband Plan (NBP) to ensure every American has “access to broadband capability.”³ Congress also required that the plan include a detailed strategy for achieving affordability and maximizing use of broadband to advance “consumer welfare, civic participation, public safety and homeland security, community development, healthcare delivery, energy independence, and efficiency, education, employee training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes.”⁴

¹ *Consumer Broadband Adoption Trends*, Connected Nation, Inc., March 2013, <http://www.connectednation.org/survey-results/residential>

² Connected Nation, *Broadband and Business: Leveraging Technology to Stimulate Economic Growth*, <http://www.connectednation.org/survey-results/business>

³ *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010, <http://www.broadband.gov/download-plan/>

⁴ Ibid.



To fulfill Congress's mandate, the National Broadband Plan, released in 2010, makes recommendations to the FCC, the Executive Branch, Congress, and state and local governments that influence the broadband ecosystem – networks, devices, content, and applications – in four ways:

1. Design policies to ensure robust competition and, as a result, maximize consumer welfare, innovation, and investment.
2. Ensure efficient allocation and management of assets and government controls or influences, such as spectrum, poles, and rights-of-way, to encourage network upgrades and competitive entry.
3. Reform current universal service mechanisms to support deployment of broadband and voice in high-cost areas; and ensure that low-income Americans can afford broadband; and in addition, support efforts to boost adoption and utilization.
4. Reform laws, policies, standards, and incentives to maximize the benefits of broadband in sectors that government influences significantly, such as public education, healthcare and government operations.⁵

In addition to these recommendations, the plan recommended that the country set the following six goals for 2020 to serve as a compass over the 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. Meeting these six goals will help achieve the Congressional mandate of using broadband to

⁵ Ibid.

achieve national purposes, while improving the economics of deployment and adoption. While the National Broadband Plan recommends significant action by the FCC, the Executive Branch, and Congress, it requires a strong partnership among all broadband stakeholders. Federal action is necessary, but state, local, and Tribal governments, corporations, and community-based organizations must all do their part to build a high-performance America.

To assist communities in localizing the goals and recommendations made by the National Broadband Plan, Connected Nation developed the Connected Community Engagement Program.⁶ The program is designed to help communities identify local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for accelerating broadband's integration into the community's priorities.

Methodology

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

⁶ Connected Nation, parent company for Connect Michigan, is a national non-profit 501(c)(3) organization that expands access to and use of broadband Internet and the related technologies that are enabled when individuals and communities have the opportunity and desire to connect. Connected Nation 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.

CONNECTED ASSESSMENT

The Connected Assessment framework is comprised of three elements: access, adoption, and use. Each sub-assessment has a maximum of 40 points. To achieve Connected certification, the community must have 32 points in each sub-assessment and 100 points out of 120 points overall.

- The access assessment reviews whether an adequate broadband foundation exists for the community. The criteria within the access sub-assessment endeavors to identify gaps that could affect a local community broadband ecosystem including: last mile 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.”⁷
- Broadband adoption is important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The adoption sub-assessment seeks to ensure the ability of all individuals to access and achieve meaningful use of broadband service by measuring the community’s capability and commitment to eliminating the major barriers that keep non-adopters from getting broadband.
- Broadband use is the most important component of the framework 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 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.

Connected Assessment Criteria

The criteria for the Connected Assessment stems from the Federal Communications Commission’s National Broadband Plan, as well as the broadband speed tiers used under the National Telecommunications and Information Administration’s State Broadband Initiative Grant Program. The Connected Assessment’s thirteen questions are as follows:

ACCESS

- **Broadband Availability:** What percentage of homes in the community has access to fixed broadband speeds of 3 Mbps or higher?⁸

⁷ *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010, <http://www.broadband.gov/download-plan/>

⁸ The Broadband Availability criterion is based on the speed tiers required by the National Telecommunications and Information Administration’s State Broadband Initiative Grant Program. The closest combination of speeds for which NTIA collects data that would allow a consumer, according to the Federal Communications Commission’s



- **Broadband Speeds:** What is the highest speed level available to at least 75% of the households in your community?
- **Broadband Competition:** What percentage of homes in the community has access to more than one broadband provider?
- **Middle Mile Access:** What is the availability of middle mile access to the community?
- **Mobile Broadband Availability:** What is the mobile broadband availability in your community?

ADOPTION

- **Digital Literacy:** What is the number of digital literacy program graduates over the past year in the community?
- **Public Computer Centers:** What is the number of public computer hours available per low-income resident per week?
- **Broadband Awareness:** What percentage of the community is reached by broadband awareness campaigns?
- **Vulnerable Population Focus:** How many vulnerable population groups are being targeted within the community?

USE

- **Economic Opportunity:** What economic opportunity applications are currently in place utilizing broadband technology?
- **Education:** What broadband-enabled applications are currently being utilized by the education sector?
- **Government:** What broadband-enabled applications are currently being utilized by the government sector?
- **Healthcare:** What broadband-enabled applications are currently being utilized by the Healthcare sector?

Community Technology Scorecard

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. These scores reflect the community's progress to meeting these national benchmarks to universal fixed broadband service, ubiquitous mobile service, and growing access to higher speed next-generation services. Lower scores do not necessarily signify a complete lack of access to broadband service

National Broadband Plan, to "access a basic set of applications that include sending and receiving e-mail, downloading web pages, photos and video, and using simple video conferencing" is 3 Mbps downstream and 768 kbps upstream. Downstream speed measures the rate at which a user can download data from the Internet, including viewing Web pages, receiving e-mails, or downloading music. Upstream speed measures the rate at which a user can upload data to the Internet, including sending e-mail messages and files. For more information, go to: http://www.ntia.doc.gov/files/ntia/publications/usbb_avail_report_05102013.pdf.

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 39 out of a possible 40 points in broadband access, reflecting a high degree of connectivity and strong broadband infrastructure to support local residents and businesses. Access to additional Internet service providers would further benefit the community.
- The community scored 38 out of a possible 40 points in broadband adoption. This score recognizes the effectiveness of local organizations (such as libraries, community centers, Chamber of Commerce, etc.) that support and promote the use of broadband to benefit the community. Providing greater opportunities for our more vulnerable populations to become more digitally literate and acquire broadband access would also increase this benefit and the resulting score.
- The community scored 36 out of a possible 40 points in broadband use, indicating that public institutions and private businesses have embraced broadband and are productively realizing its benefits, particularly in the areas of Economic Development and Education. Based on information gathered during this initial assessment, the Government and Healthcare sectors could realize even more efficient service delivery/increased economic growth by pursuing enhanced broadband-enabled applications.
- Livingston County achieved a score of 113 points out of 120 for overall broadband and technology readiness, which indicates that the community is exhibiting great success in technology access, adoption, and use and has surpassed the score of 100 required for Connected certification.
- Livingston County has also exceeded the 32 points in each focus area that are required for certification and has qualified for full certification as a "Connected Community."

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



Community Technology Scorecard Community Champions: Ceci Marlow Community Advisor: Dan Manning				
FOCUS AREA	ASSESSMENT CRITERIA	DESCRIPTION	SCORE	MAXIMUM POSSIBLE SCORE
ACCESS	Broadband Availability	98% to 100% of households have access to 3 Mbps	10	10
	Broadband Speeds	75% of households with access to at least 50 Mbps	5	5
	Broadband Competition	90% to 94.9% of households with access to more than 1 broadband provider	4	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from more than 1 provider	10	10
	Mobile Broadband Availability	99% to 100% of households with access to mobile wireless	10	10
	ACCESS SCORE			39
ADOPTION	Digital Literacy	Program grads are greater than 10 per 1,000 residents over the past year	10	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	4 groups	8	10
	ADOPTION SCORE			38
USE	Economic Opportunity	4 advanced, 4 basic uses	10	10
	Education	2 advanced, 8 basic uses	10	10
	Government	2 advanced, 4 basic uses	8	10
	Healthcare	1 advanced, 6 basic uses	8	10
	USE SCORE			36
COMMUNITY ASSESSMENT SCORE			113	120

Itemized Key Findings

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

ACCESS

- 19 last mile broadband providers currently provide service in Livingston County:
 - 99.74% of households have access to 3 Mbps.
 - More than 84.9% of Livingston County homes have access to 100 Mbps service.
 - 92.1% of Livingston County households have access to more than 1 provider.
- Middle mile fiber infrastructure is available from multiple providers in Livingston County.
- 100% of Livingston County households have access to mobile broadband.

ADOPTION

- 9 Digital Literacy Programs exist in the community resulting in 1,850 graduates over the past year.
- 10 Public Computer Centers (PCC) with a total of 193 computers are open to the public.
- 12 Broadband Awareness Campaigns are reaching 100% of Livingston County.
- 6 organizations are working with vulnerable populations.

USE

- At least 8 uses of broadband were identified in the area of economic opportunity including 4 advanced uses and 4 basic uses.
- At least 10 uses of broadband were identified in the area of education including 2 advanced uses and 8 basic uses.
- At least 6 uses of broadband were identified in the area of government including 2 advanced uses and 4 basic uses.
- At least 7 uses of broadband were identified in the area of healthcare including 1 advanced use and 6 basic uses.

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

Technology Providers

- 19 broadband providers were identified in Livingston County

Technology Facilities

- 10 public computing centers

Community Websites

- 8 Business-related websites (excluding private businesses)
- 6 Education-related websites



- 21 Government-related websites
- 3 Healthcare-related websites
- 6 Library-related websites
- 1 Tourism-related website

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 five priority projects. Detailed descriptions of each project can be found in the *Action Plan* section later in this report.

Complete a Vertical Assets Inventory

Perform a Broadband Build-out Analysis in Unserved Areas

Perform an Analysis of Local Policies and Ordinances

Develop Public-Private Partnerships to Deploy Broadband Service

Assess the Need for a Broadband Training and Awareness Program for Small Businesses

Proposed Projects

Below is a complete list of proposed projects. Detailed descriptions of each project can be found in the *Action Plan* section later in this report.

ACCESS

Broadband Availability

1. Complete a Vertical Assets Inventory
2. Perform a Broadband Build-out Analysis in Unserved Areas

Broadband Speeds – No proposed projects

Broadband Competition

3. Perform an Analysis of Local Policies and Ordinances
4. Develop Public-Private Partnerships to Deploy Broadband Service
5. Study and Possibly Reassess Major Telecom Purchase Contracts

Middle Mile Access – No proposed projects



Mobile Broadband Availability – No proposed projects

ADOPTION

Digital Literacy – No proposed projects

Public Computer Centers – No proposed projects

Broadband Awareness – No proposed projects

Vulnerable Population Focus

6. Initiate a Community Computer Refurbishment Program
7. Develop a Technology Mentorship Program

USE

Economic Opportunity

8. Assess the Need for a Broadband Training and Awareness Program for Small Businesses

Education – No proposed projects

Government

9. Improve Online Business Services Offered by the Government

Healthcare

10. Promote Telemedicine in Remote Areas

DETAILED FINDINGS

Current Community Technology Developments in Livingston County

During the Connected assessment, the community team identified projects that are currently in development or being implemented. These projects are helping to enhance technology in Livingston County:

- Livingston County has implemented a county-wide fiber project with the Livingston County Service Agency (LESA) and various school districts to connect the County with local governmental units and schools. This effort provides excellent broadband speed and bandwidth to support cross-functional communications and effective access across all public organizations, making people and organizations more productive and responsive to community needs.
- Air Advantage, a fixed-wireless service provider primarily focused on Michigan's thumb area, has identified Livingston County as one of the 13 counties in which they plan to expand their service using their own investment dollars and \$64 million in grants and loans they received from the federal government in 2010. A representative from Air Advantage has participated in the Livingston County Broadband Team meetings and expects to help address some of the current broadband access gaps that exist today, primarily in the northern and western sections of the county.
- FreedomNet Solutions has recently expanded its service to the Iosco Township area of Livingston County and continues to work with other more rural areas in the county to add new and improved service.
- Livingston County has also recently deployed an enhanced county government website to provide a more comprehensive source of information and additional online services to county residents and businesses. Launched in April 2013, this new website has been developed through a partnership with Oakland County, which is providing the software and hardware foundation for this site. The site is built on SharePoint 2010 CMS (Content Management System), which enables individual departments to post their information in a timely manner. The overarching goal was to develop a website that is current and easy to navigate, provided more online services, and involved help from educational institutions such as Cleary University and Pinckney "New Tech" High School.

Livingston County Assessment Findings

Residents in Livingston 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.⁹ According to Connect Michigan’s latest broadband mapping update, the following providers have a service footprint in the Livingston County Community:

Broadband Providers	Technology Type	Website Reference
ACD.net	DSL	www.acd.net
AT&T	DSL	www.att.com
AT&T Wireless	Mobile	www.wireless.att.comrg1467@att.com
Cavalier Telephone	DSL	www.support.cavtel.com/internet
Charter	Cable	www.charter.com
Comcast	Cable	www.comcast.com
FreedomNet	Fixed Wireless	www.fnw.us
Frontier	DSL	www.frontier.com
Hidden Lake Wireless	Fixed Wireless	www.hiddenlakewireless.com
Invisalink	Fixed Wireless	www.invisalink.net
Iserv	DSL	www.iserv.net
MegaPath	DSL	www.megapath.com
MetroPCS	Mobile	www.metropcs.com
Sprint	Mobile	www.sprint.com
TDS Telecom	DSL	www.tdstelecom.com
T-Mobile	Mobile	www.t-mobile.com
Tri-County Wireless	Fixed Wireless	www.tewireless.us
Verizon	Mobile	www.verizonwireless.com
WOW	Cable	www.wowway.com

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

Organization Name	Website	Website Category
Advantage Livingston	www.advantagelivingston.com	Business
Greater Brighton Area Chamber of Commerce	www.brightoncoc.org	Business
Howell Area Chamber of Commerce	www.howell.org	Business
Brighton Downtown Development	www.downtownbrighton.com	Business

⁹ Organizations define broadband in different ways. For information to be included on the National Telecommunications and Information Administration’s National Broadband Map, the technology must provide a two-way data transmission (to and from the Internet) with advertised speeds of at least 768 kilobits per second (Kbps) downstream and at least 200 Kbps upstream to end users. The Connected Community Engagement Program defines basic broadband as 768 Kbps downstream and 200 Kbps upstream.



Authority		
Howell Downtown Development Authority	www.downtownhowell.org	Business
Hartland Chamber of Commerce	www.hartlandchamber.org	Business
Pinckney Putnam Hamburg Hell Chamber of Commerce	www.brightoncoc.org/pphhcoc	Business
Small Business Technology & Development Center	www.livingstonsbtdc.org	Business
Livingston Educational Service Agency (LESA)	www.livingstonesa.org	Education
Brighton Area Schools	www.bas.k12.mi.us	Education
Howell Public School District	www.howellschools.com	Education
Hartland Consolidated Schools	www.hartlandschools.us	Education
Fowlerville Community Schools	www.fvl.k12.mi.us	Education
Pinckney Community Schools	www.pinckneyschools.org	Education
Livingston County Government	www.livgov.com	Government
City of Brighton	www.brightoncity.org	Government
City of Howell	www.cityofhowell.org	Government
Brighton Township	www.brightontwp.com	Government
Cohoctah Township	www.cohoctahtownship.org	Government
Conway Township	www.conwaytownship.com	Government
Deerfield Township	www.deerfieldtpw.org	Government
Genoa Township	www.genoa.org	Government
Green Oak Township	www.greenoaktwp.com	Government
Hamburg Township	www.hamburg.mi.us	Government
Handy Township	www.handytownship.com	Government
Hartland Township	www.hartlandtwp.com	Government
Howell Township	www.howell-mi-twp.org	Government
Iosco Township	www.co.livingston.mi.us/municipalities/iosco.htm	Government
Marion Township	www.mariontownship.com	Government
Oceola Township	www.oceolatwp.org	Government
Putnam Township	www.putnamtwp.us	Government
Tyrone Township	www.tyronetownship.us	Government
Unadilla Township	www.twp.unadilla.mi.us	Government
Village of Fowlerville	www.fowlerville.org	Government
Village of Pinckney	www.villageofpinckney.org	Government
St. Joseph Mercy Hospital	www.stjoeslivingston.org	Healthcare
St. Joseph Mercy Health Center	www.stjoeshealth.org/brighton	Healthcare
Brighton Center for Recovery	www.brightonrecovery.org	Healthcare
Brighton District Library	www.brightonlibrary.info	Libraries
Howell Carnegie Library	www.howelllibrary.org	Libraries
Cromaine Library	www.cromaine.org	Libraries

Fowlerville District Library	www.fowlervillelibrary.org	Libraries
Pinckney Community Library	www.pinckneylibrary.org	Libraries
Hamburg Public Library	www.hamburglibrary.org	Libraries
Livingston County Convention & Visitors Bureau	www.lccvb.org/index.html	Tourism

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
Brighton District Library	www.brightonlibrary.info	Public Computer Facility
Cromaine District Library	www.cromaine.org	Public Computer Facility
Fowlerville District Library	www.fowlervillelibrary.org	Public Computer Facility
Hamburg Township Library	www.hamburglibrary.org	Public Computer Facility
Howell Carnegie Library	www.howelllibrary.org	Public Computer Facility
Pinckney Public Library	www.pinckneylibrary.org	Public Computer Facility
Barnard Teen Center	www.howellrecreation.org/barnard.html	Public Computer Facility
Howell Senior Center	www.howellrecreation.org/seniors.html	Public Computer Facility
Brighton Senior Center	www.brightoncommunityed.com	Public Computer Facility
Hamburg Township Senior Center	www.hamburg.mi.us/senior/index.htm	Public Computer Facility

Connected Assessment Analysis



ACCESS SCORE EXPLANATION

Broadband Availability (10 out of 10 Points Possible) – is measured by analyzing the percentage of households in the community with access to fixed broadband speeds of 3 Mbps or higher. Data is collected by Connected Nation’s broadband mapping program.¹⁰ If broadband data is

¹⁰ Connected Nation is working across states and with the federal government to implement the State Broadband Initiative (SBI) program created by the Broadband Data Improvement Act of 2008 and managed by the National Telecommunications and Information Administration (NTIA) within the Department of Commerce. One of the main components of the SBI program is the creation of a detailed, nationwide map of broadband coverage in order to accurately pinpoint remaining gaps in broadband availability across the nation. Connected Nation is the largest mapping agent across the nation supporting the SBI program, and has worked in thirteen jurisdictions to collect, process, integrate, and validate provider data, and map the broadband inventory across these jurisdictions.

missing, the community team was able to improve the quality of data to ensure all providers are included.

- **According to the April 2013 data collected by Connect Michigan, 99.7% of Livingston County residents had access to broadband speeds of 3 Mbps or greater.**

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

Broadband Providers	Technology Type	Website Reference
Air Advantage	Fixed Wireless	http://www.airadvantage.net

Air Advantage has plans to begin deployment of their fixed wireless broadband service to the Livingston County area beginning later this year.

Broadband Speeds (5 out of 5 Points Possible) – is 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 April 2013 data collected by Connect Michigan, 84.9% of Livingston County residents had access to broadband speeds of 100 Mbps.**

Broadband Competition (4 out of 5 Points Possible) – 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 April 2013 data collected by Connect Michigan, 92.1% of Livingston County residents had access to more than one broadband provider.**

Middle Mile Access (10 out of 10 Points Possible) – 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. The community, in collaboration with Connected Nation, collected and analyzed middle mile access data.

- **Livingston County is served by 2 or more middle mile fiber providers.**

Connected Nation has received, processed, and submitted records to the NTIA from over 1,400 service providers.

Mobile Broadband Availability (10 out of 10 Points Possible) – 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 April 2013 data collected by Connect Michigan, 100% of Livingston County residents had access to mobile broadband service.



ADOPTION SCORE EXPLANATION

Digital Literacy (10 out of 10 Points Possible) – 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
Brighton District Library	Open computer labs for individualized instruction	300
Brighton District Library	Internet e-mail and social media courses	200
Brighton District Library	Microsoft Office courses	100
Brighton District Library	e-Reader instruction and labs	100
Pinckney Public Library	Internet instruction and labs	250
Hamburg Public Library	Internet instruction and labs	200
Fowlerville Public Library	Internet instruction and labs	250
Howell Carnegie Library	Internet instruction and labs	400
Livingston Applied Technology Education Consortium	Digital Media & Web Design courses	50
Total Graduates		1,850

Public Computer Centers (10 out of 10 Points Possible) – 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 Livingston County is below.



Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
Brighton District Library	51	48	2,448
Howell Carnegie Library	58	30	1,740
Pinckney Public Library	48	17	816
Fowlerville Public Library	49.5	10	495
Cromaine Library	64	54	3,456
Hamburg Public Library	57	14	798
Barnard Teen Center	17.5	5	87.5
Howell Senior Center	43	4	172
Brighton Senior Center	28	7	196
Hamburg Senior Center	40	4	160

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

Organization Name	Campaign Description	Community Reach
Howell Carnegie Library	Digital newsletter	30%
Brighton District Library	Digital newsletter	40%
Cromaine Library	Digital newsletter	20%
Pinckney Community Library	Digital newsletter	20%
Fowlerville Public Library	Digital newsletter	20%
Hamburg Public Library	Digital newsletter	20%
Brighton Area Schools	Home e-mail and social media communication	40%
Howell School District	Home e-mail and social media communication	30%
Hartland Schools	Home e-mail and social media communication	20%
Pinckney Public Schools	Home e-mail and social media communication	20%
Michigan Technology Network (MITN)	Networking community of technology-related businesses to share experiences	10%
Livingston Entrepreneurial Group United for Prosperity (LEG UP!)	Organization supporting local entrepreneurs	10%

Vulnerable Population Focus (8 out of 10 Points Possible) – 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 Livingston County is listed below.

Organization Name	Program Description	Vulnerable Group
Workforce Development Agency	Online job finding and counseling support	Veterans
Michigan Works	Job finding and workforce development assistance	Low-income, unemployed
Ross IES	Work First program - career counseling and placement	Low-income, disadvantaged youth
Cromaine Library	AWE Early Learning Center	Children - computer use and training
Pinckney Public Library	AWE children's software lab	Children - computer use and training
Brighton Senior Center	Computer labs and services	Seniors



USE SCORE EXPLANATION

Economic Opportunity (10 out of 10 Points Possible) – 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
Advantage Livingston	Web application that highlights the attractiveness of Livingston County to new residents and businesses	Basic
Greater Brighton Chamber of Commerce	Website to support new and existing businesses in the greater Brighton area	Basic



Howell Chamber of Commerce	Website to support new and existing businesses in the greater Howell area	Basic
LEG-UP Facebook page	Livingston Entrepreneurs Group United for Prosperity (LEG-UP) social media site supporting entrepreneurs	Advanced
Frontal Lobe	Website and Facebook page supporting entrepreneurs with workspace, shared services in Howell	Advanced
AXIS Young Entrepreneur's Group - Facebook page	Social media site supporting young entrepreneurs in the Brighton area	Advanced
Community Video Network	Creation of videos by local businesses/organizations to promote Livingston County economic development	Advanced
Venture Plan - SBTDC	Blog articles to support the Venture Plan entrepreneurial training session - summer 2013	Basic

Education (10 out of 10 Points Possible) – 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
Schools connected by broadband	100% of classrooms in the public school districts located in Livingston County are connected to the Internet via a county-wide public fiber network.	Basic
Online library catalogs	100% of the public libraries in Livingston County have automated library systems.	Basic
Zangle student information system	100% of K-12 classes in the public school districts provide parents secure online access to curriculum, grades and more.	Advanced
Brighton Area Schools	Website supporting Brighton Area Schools, parents, students and services.	Basic
Howell Public Schools	Website supporting Howell Public Schools, parents, students and services.	Basic
Libraries connected by broadband	100% of libraries in Livingston County are connected to the Internet via a county-wide public fiber network	Basic
Social media communication with parents	Several schools in the county use Twitter and/or Facebook to alert parents on school closings, key events and important info.	Advanced
Hartland Consolidated Schools	Website supporting Hartland Schools, parents, students and services	Basic
Pinckney Community Schools	Website supporting Pinckney Schools, parents, students and services	Basic
Fowlerville Community	Website supporting Fowlerville Schools, parents,	Basic

Schools	students, and services	
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Government (8 out of 10 Points Possible) – 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
New Livingston County website - www.livgov.com	Online services and information regarding Livingston County	Advanced
Municipality websites	All townships, villages, cities with dedicated websites for online information and services	Basic
Public Safety Network	All public safety organizations connected by high-speed broadband network	Advanced
Fiber network to connect government and public facilities	County-wide fiber broadband network connecting government, schools, public safety, libraries, etc.	Basic
Online Traffic Ticket payment	Ability to pay traffic tickets online via www.livgov.com website	Basic
Deed and Property Record Search	Online search of county properties and deeds via www.livgov.com	Basic

Healthcare (8 out of 10 Points Possible) – 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
e-Health News	Online registration for e-Health news through St. Joseph Mercy Hospital	Basic
St. Joseph Mercy Hospital - www.stjoeslivingston.org	Website of online information and services at St. Joseph Mercy Hospital in Howell	Basic
Brighton Center for Recovery website - www.brightonrecovery.org	Alcohol and drug treatment center information and services	Basic
Remote patient	Remote care and monitoring via St. Joseph Mercy and	Advanced



monitoring	University of Michigan hospitals	
e-Health services by at least 75% of healthcare providers	Hospitals and individual physicians using e-Health services via broadband	Basic
Telemedicine	Active use of Telemedicine by local healthcare providers	Basic
Well and Septic online	The Environmental Health Division of the Health Department provides online public access to onsite water supply, onsite sewage disposal and other associated files of individual residences and businesses.	Basic

ACTION PLAN

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 five priority projects that should be addressed first. This is followed by a complete list of all proposed solutions.

Complete a Vertical Assets Inventory

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 condition, 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

- 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.
- The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.



Action Items

- 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.
- Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.
- 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 Team

To be determined.

Perform a Broadband Build-out Analysis in Unserved Areas

Project Description

Conduct an onsite visual assessment of the defined geographic areas seeking broadband coverage, which are primarily in the northern and western sections of Livingston County. The assessment determines the feasibility of deploying various broadband technologies (cable, DSL, fixed wireless) in a defined area. The team should gather site specific information required for (i) determining use of existing infrastructure, (ii) designing wired and wireless broadband technologies using these assets, and (iii) 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 technology in the unserved areas and to gather site-specific information required for that purpose.

Goal

Determine which specific areas within Livingston County lack the necessary technological structure and determine the feasibility of deploying various broadband technologies in the defined area.

Benefits

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

Action Items

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
- Creating a methodology for the expansion of wireless broadband coverage into the unserved areas of the community

Implementation Team

To be determined, but should include appropriate local Internet service providers.

Perform an Analysis of Local Policies and Ordinances

Project Description

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, negatively impacts 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

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

Action Items

- 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.
- 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.



Implementation Team

To be determined, but should include local townships and villages.

Develop Public-Private Partnerships to Deploy Broadband Service

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.

Goal

Fund and expand broadband network deployment.

Benefits

- 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.
- 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.
- A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items

- Identify potential partners.
- Assess scope and potential projects to discuss as partnering opportunities.
- Develop a finance and ownership model to support partnership activities.

Implementation Team

To be determined.

Assess the Need for a Broadband Training and Awareness Program for Small Businesses

Project Description

Work with existing organizations in Livingston County that provide support for small businesses to determine if additional education or training is needed to help businesses get online and grow. Organizations such as the local Chambers of Commerce, Small Business Technology and Development Center (SMTDC), Livingston Entrepreneurial Group for United Prosperity (LEG-UP!) should be contacted to identify any additional needs for small business broadband education. Potential broadband awareness topics could include facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and 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 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, cyber-security, 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.

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.

Benefits

- Provides entrepreneurial support.
- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- 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 2012 Jobs and Broadband Report](#), businesses that are using the Internet bring in approximately \$300,000 more in median annual revenues than their unconnected counterparts.

Action Items

- Establish a dialogue with related small business support organizations across Livingston County.
- Identify other 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.
- Identify or develop a business awareness and training program.
- Identify additional online training modules for businesses, as appropriate. 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#.

Implementation Team

To be determined.

All Proposed Projects

ACCESS

Broadband Availability

1. 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 condition, 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

- 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.
- The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items

- 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.
- Data to collect would include vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.

- 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 Team

To be determined.

2. Perform a Broadband Build-out Analysis in Unserved Areas

Conduct an onsite visual assessment of the defined geographic areas seeking broadband coverage, which are primarily in the northern and western sections of Livingston County. The assessment determines the feasibility of deploying various broadband technologies (cable, DSL, fixed wireless) in a defined area. The team should gather site specific information required for (i) determining use of existing infrastructure, (ii) designing wired and wireless broadband technologies using these assets, and (iii) 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 technology in the unserved areas and to gather site-specific information required for that purpose.

Goal

Determine which specific areas within Livingston County lack the necessary technological structure and determine the feasibility of deploying various broadband technologies in the defined area.

Benefits

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

Action Items

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
- Creating a methodology for the expansion of wireless broadband coverage into the unserved areas of the community

Implementation Team

To be determined, but should include appropriate local Internet service providers.

Broadband Speeds – No proposed projects

Broadband Competition

3. 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 some 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

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

Action Items

- 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.
- 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.

Implementation Team

To be determined, but should include local townships and villages.

4. 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 and expand broadband network deployment.

Benefits

- 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.
- 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.
- A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items

- Identify potential partners
- Assess scope and potential projects to discuss as partnering opportunities
- Develop a finance and ownership model to support partnership activities

5. Study and Possibly Reassess Major Telecom Purchase Contracts

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.

Goal

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

Benefits



- By aggregating demand within a local community, these institutions will be able to demonstrate existing pent-up demand to interested broadband providers and help justify private investments to bring greater capacity backhaul service to that community.
- 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.

Middle Mile Access – No proposed projects

Mobile Broadband Availability – No proposed projects

ADOPTION

Digital Literacy – No proposed projects

Public Computer Access – No proposed projects

Broadband Awareness – No proposed projects

Vulnerable Population Focus

6. Initiate a Community Computer Refurbishment Program

The first step in establishing computer refurbishing is recruiting 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.

There are also established residential recycling programs that your community can take advantage of. For example, [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.

Computer recycling is also good for the environment. Explore these additional resources for computer recycling and refurbishment.

- [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.

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.

7. 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 challenge them to extend their technology experiences beyond the classroom. The program essentially taps into a technology knowledge base that exists through these exceptional students. Students will be required to develop programs such as training seniors to use computers, initiating a computer refurbishing program, offering basic computer training for local communities, building websites, etc.

Goal

Utilize student technology knowledge to implement community programs.

Benefits

- 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.
- It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.
- 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.



- 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.

USE

Economic Opportunity

8. Assess the Need for a Broadband Training and Awareness Program for Small Businesses

Work with existing organizations in Livingston County that provide support for small businesses to determine if additional education or training is needed to help businesses get online and grow. Organizations such as the local Chambers of Commerce, Small Business Technology and Development Center (SMTDC), Livingston Entrepreneurial Group for United Prosperity (LEG-UP!) should be contacted to identify any additional needs for small business broadband education. Potential broadband awareness topics could include facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and 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 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, cyber-security, 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.

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.

Benefits



- Provides entrepreneurial support.
- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- 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 2012 Jobs and Broadband Report](#), businesses that are using the Internet bring in approximately \$300,000 more in median annual revenues than their unconnected counterparts.

Action Items

- Establish a dialogue with related small business support organizations across Livingston County.
- Identify other 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.
- Identify or develop a business awareness and training program.
- Identify additional online training modules for businesses, as appropriate. 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#.

Implementation Team

To be determined.

Education – No proposed projects

Government

9. Improve Online Business Services Offered by the Government

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 operations. With the recent implementation of the new

Livingston County government website, local townships and villages (where applicable) should also consider enhancing their own websites for this purpose.

Goal

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

Benefits

- Facilitates business interaction with government, especially for urban planning, real estate development, and economic development.
- 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.
- e-Government provides a greater amount of information to businesses and provides it in a more organized and accessible manner.

Action Items

- 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.
- 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:
 - Hours of operation and location of facilities.
 - Contact information of key staff and departments.
 - An intuitive search engine.
 - Access to documents (ideally a centralized repository of online documents and forms).
 - Local ordinances, codes, policies, and regulations.
 - Minutes of official meetings and hearings.
 - News and events.

Healthcare

10. Promote Telemedicine in Remote Areas

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, understand the main features of telemedicine, are aware of the technologies required for telemedicine, and understand how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes the [Distance Learning and Telemedicine Loans and Grants Program](#). The 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.

Goal

Deliver improved healthcare services to community residents.

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 Central Upper Peninsula Planning Area District (CUPPAD), 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 2012 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 www.connectmi.org/community_profile/find_your_county/michigan/livingston.

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, May 2013.

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 un-served 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 2013. 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, which 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 ConnectViewTM, 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 trends and 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? And, 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, 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.

<http://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. It views promoting Connect Michigan activities as complementary to its 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 (SBI) 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: WHAT IS CONNECTED?

The goal of Connect Michigan’s Connected program is to certify that each community that participates in the program has, in some relevant manner, addressed their community’s need for improved Access, Adoption, and Use of technology by assessing community technological resources, identifying gaps, and working to fill those gaps:

- **ACCESS** – Is Broadband infrastructure available to all residents?
- **ADOPTION** – Do residents use the technologies?
- **USE** – Are residents using technology to improve their quality of life?

Connected Process



The Connected process consists of a 4-step process:

Step 1: Create a community technology team. Facilitate kickoff meetings and program orientation with regional leaders and community champions. Provide them with tools and resources to form a community team. This team will be represented by local leaders from key community sectors, including:

- Broadband Provider Community
- Government: General, Public Safety, Energy and Environment
- Economic Opportunity: Economic Development, Business Development, Tourism
- Agriculture
- Education: K-12, Higher Education
- Libraries
- Healthcare

Step 2: Perform a technology assessment. With support provided by a planning specialist, Connect Michigan will provide communities with tools (electronic or print depending on the community needs) to benchmark local community technology. Bolstered by benchmarking data that had been gathered through Connect Michigan’s mapping and market research, the Livingston County Broadband Committee will work with community members to determine their overall broadband and technology grade on a thirteen-point “community certification AAU” model:

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

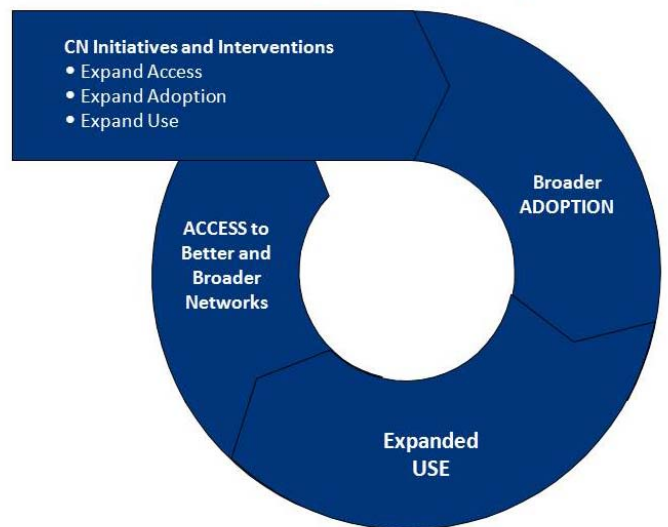
Step 3: Action Planning & Implementation.

Following Community Assessments, the data is analyzed, gaps will be determined, and recommended actions to help to fill gaps will be identified. After successful execution of projects the community will be certified as a Connected Community.

Step 4: Project Success and Expanded Local

Empowerment. Once a community is certified, the community will have an avenue to discuss its success and pursue opportunities as a recognized, technologically advanced community.

Broadband Catalysts for Change





APPENDIX 4: 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 implementations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

A

ARRA - American Recovery and Reinvestment Act.

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

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

B

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

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

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

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

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

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

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



C

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

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

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

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

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

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

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

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

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

D

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

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

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

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

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

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

E

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

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

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

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

F

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

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

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

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

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



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

Multiplexing - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time.

Multiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

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

NIST - National Institute of Standards and Technology.

O

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

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

P

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

R

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

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

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

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station)



and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

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

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

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

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

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

T

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

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

U

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

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

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

V

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

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

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

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



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

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

W

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

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

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

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

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

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