

CITY OF OGDEN

TECHNOLOGY ACTION PLAN

PREPARED BY **CONNECTED IOWA**
AND THE
CITY OF OGDEN BROADBAND COMMITTEE



FEBRUARY 18, 2015



ACCESS



ADOPTION



USE



TABLE OF CONTENTS

INTRODUCTION	3
BACKGROUND	3
METHODOLOGY.....	4
THE CITY OF OGDEN BROADBAND COMMITTEE	4
CONNECTED ASSESSMENT	5
ANALYSIS OF CONNECTED ASSESSMENT.....	5
ITEMIZED KEY FINDINGS	8
COMMUNITY PRIORITY PROJECTS.....	9
LIST OF ALL ACTION ITEMS.....	9
DETAILED FINDINGS	11
CURRENT COMMUNITY TECHNOLOGY DEVELOPMENTS IN THE CITY OF OGDEN	11
THE CITY OF OGDEN ASSESSMENT FINDINGS	11
CONNECTED ASSESSMENT ANALYSIS.....	13
ACTION PLAN	19
COMMUNITY PRIORITY PROJECTS.....	19
LIST OF ALL ACTION ITEMS.....	23
APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND	34
STATEWIDE INFRASTRUCTURE.....	34
BUSINESS AND RESIDENTIAL TECHNOLOGY ASSESSMENTS	36
APPENDIX 2: PARTNER AND SPONSORS	37
APPENDIX 3: THE NATIONAL BROADBAND PLAN	30
APPENDIX 4: WHAT IS CONNECTED?	40
APPENDIX 5: GLOSSARY OF TERMS	42

INTRODUCTION

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

Background

Today, technology plays a pivotal role in how businesses operate, the type of service consumers expect, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has also become dependent on how broadly and deeply the community adopts technology resources – this includes access to reliable high-speed networks, digital literacy of residents, and the use of online resources locally for business, government, and leisure. As noted in the National Broadband Plan, broadband Internet is “a foundation for economic growth, job creation, global competitiveness and a better way of life.”¹

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

Deploying broadband infrastructure, services, and application, as well as supporting the universal adoption and meaningful use of broadband, are challenging - but required - building blocks of a twenty-first century community. To assist communities, Connected Nation developed the Connected Community Engagement Program to help your community identify local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.⁴

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

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

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

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

Methodology

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

The City of Ogden Broadband Committee

The City of Ogden and Connect Iowa would like to recognize the following members of the Ogden Broadband Committee for their dedication and active involvement in completing the Connected Community Broadband Assessment and development of Ogden’s Technology Action Plan, which will help ensure continued progress and success with broadband in our community.

Technology Action Plan Team Leaders (Sectors)		
Debi Carlson, Digital Literacy and Public Computer Centers		
Roger Christensen, Broadband Awareness, Vulnerable Population Focus, and Healthcare		
Donovan Olson, Economic Opportunity and Government		
Jesse Sundell, Education		
Broadband Committee Members		
Debi Carlson	Dennis Good	Donovan Olson
Craig Christensen	Craig Heineman	Leanne Samuelson
Roger Christensen	Brad Jermeland	Jesse Sundell
Gary Clark	Joel Munson	Matt Van Sickle
Dan Manning, Advisor		Sally Good, Secretary

CONNECTED ASSESSMENT

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

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

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

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

Analysis of Connected Assessment

The Community Technology Scorecard provides a summary of the community's Connected Assessment. The Connected Assessment's criteria are reflective of the recommendations made by the Federal Communications Commission's National Broadband Plan. Lower scores indicate weaknesses in the community's broadband ecosystem, but do not necessarily signify a lack of service.

- The City of Ogden achieved a score of 106 points out of 120 for overall broadband and technology readiness which indicates that the community is exhibiting strong support of technology access, adoption, and use and has surpassed the score of 100 required for Connected certification.
- The community scored 33 out of a possible 40 points in broadband **access** primarily because of a recognized need for increases in broadband speeds. Still, with 100% of households having access to at least 3 Mbps, the City of Ogden's broadband availability is above the state average of 93.99%.



- The community also scored 36 out of a possible 40 points in broadband **adoption**, indicating that the City of Ogden has sufficient and valuable assets and programs to support continued adoption by its residents and small businesses.
- The community also scored 37 out of a possible 40 points in broadband **use**, indicating that the City of Ogden has effectively employed broadband to deliver productive online services and applications to help improve the overall quality of life for local residents.
- The City of Ogden exceeded the 32 points in each focus area that are required for certification and has qualified as a Certified Connected Community.

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



Community Technology Scorecard Community Champions: Roger Christensen Community Advisor: Dan Manning				
FOCUS AREA	ASSESSMENT CRITERIA	DESCRIPTION	SCORE	MAXIMUM POSSIBLE SCORE
ACCESS	Broadband Availability	100% of homes have access to 3 Mbps	10	10
	Broadband Speeds	75% of households with access to at least 6 Mbps	2	5
	Broadband Competition	100 % of households with access to more than 1 broadband provider	5	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from one provider	6	10
	Mobile Broadband Availability	100% of households with access to mobile wireless	10	10
	ACCESS SCORE			33
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 80% of the community	8	10
	Vulnerable Population Focus	At least 4 groups	8	10
	ADOPTION SCORE			36
USE	Economic Opportunity	4 advanced, 4 basic uses	10	10
	Education	5 advanced, 2 basic uses	10	10
	Government	3 advanced, 5 basic uses	10	10
	Healthcare	3 advanced, 1 basic use	7	10
	USE SCORE			37
COMMUNITY ASSESSMENT SCORE			106	120



Itemized Key Findings

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

ACCESS

- 2 last-mile fixed broadband providers currently provide service in the City of Ogden:
 - 100% of households in the City of Ogden have access to 3 Mbps.
 - 75% of households in City of Ogden have access to at least 6 Mbps service.
 - 100% of households in the City of Ogden have access to more than 1 provider.
- Middle mile fiber infrastructure is available from only 1 provider in the City of Ogden.
- 100% of households in the City of Ogden have access to mobile broadband.

ADOPTION

- 5 Digital Literacy Programs exist in the community resulting in 327 or more graduates over the past year.
- 2 Public Computer Centers (PCC) with a total of 26 computers are open to the public.
- 6 Broadband Awareness Campaigns are reaching 80% of the City of Ogden.
- 3 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 7 uses of broadband were identified in the area of education including 5 advanced uses and 2 basic uses.
- At least 8 uses of broadband were identified in the area of government including 3 advanced use and 5 basic uses.
- At least 4 uses of broadband were identified in the area of healthcare including 3 advanced uses and 1 basic use.

In addition to the items identified above, the City of Ogden Broadband Committee identified the following technology resources in the community:

Technology Providers

- 10 broadband providers were identified in the City of Ogden
- 0 hardware providers
- 0 network developers
- 0 web developers

Technology Facilities

- 2 public computer centers



- 2 wireless hotspots
- 0 videoconference facilities

Community Websites

- 1 Business-related website
- 1 Community-based website
- 1 Library website
- 2 Agriculture-related websites
- 1 Education-related website
- 1 Government-related website
- 2 Healthcare-related websites

Community Priority Projects

The Connected Assessment has culminated in the outlining of projects designed to empower the community to accelerate broadband access, adoption, and use. Below are 3 priority projects, followed by a list of all other action items.

1. Promote Telemedicine in Remote Areas
2. Implement a Community-Based Technology Awareness Program
3. Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses

List of All Action Items

Below is a list of 9 action items proposed by the City of Ogden Broadband Team to accelerate broadband access, adoption, and use. Detailed descriptions of each solution proposed by Connect Iowa can be found in the *Action Plan* section later in this report.

ACCESS

Broadband Availability

1. Complete Current Implementation of Fiber-to-the-Home Across Ogden (User Submitted)
2. Complete a Vertical Assets Inventory

Broadband Speeds

3. Update and Maintain Provider Network Profiles with Connected Nation to Reflect Current Capabilities and Offerings (User Submitted)

Broadband Competition – No Action Items.

Middle Mile Access - No Action Items.



Mobile Broadband Availability - No Action Items.

ADOPTION

Digital Literacy - No Action Items.

Public Computer Centers - No Action Items.

Broadband Awareness

4. Implement a Community-Based Technology Awareness Program
5. Facilitate a Technology Summit

Vulnerable Population Focus

6. Develop a Technology Mentorship Program

USE

Economic Opportunity

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

Education - No Action Items.

Government

8. Improve Online Business Services Offered by the Government

Healthcare

9. Promote Telemedicine in Remote Areas



DETAILED FINDINGS

Current Community Technology Developments in the City of Ogden

During the assessment process, the community team identified projects that are currently in development or implementation. These projects are helping to enhance technology in the City of Ogden.

Currently, the Ogden Telephone Company (OTC) is abandoning its coaxial copper lines that once delivered landline phone service and currently is installing a network of fiber optic cables in the City of Ogden and surrounding rural areas that will deliver cable television, Internet and phone service, according to Donovan Olson, Ogden City Administrator.

“They’re preparing for the future, which they believe will be high-speed Internet and cable television,” Olson said of the telephone company. “It’s all through fiber to the home. Most communities have copper (coaxial) lines that run in the ground to the house. This is eliminating the copper and putting fiber all the way to the homes.”

The company already has installed the network in “a big portion of the rural area. Now they’re coming back into town and they’re going to complete the town by the end of this year,” he said. OTC will have “individual lines” from its office to every home that it serves, Olson said, adding that “if there is trouble, they can trace that line and figure out the problem.”

OTC General Manager Gary Clark said the network is being installed in three phases. The first phase of installation in rural areas began in 2011, he said. They are currently in Phase 3, which is installing the network in the city and it should be completed by 2015, he said.

“The exciting thing about it is everyone home will have fiber optic,” Olson said. “They’ll have high-speed Internet. It dramatically improves the service and the capabilities of the system for people that are in that territory.”

The City of Ogden Assessment Findings

Today, residents in the City of Ogden (or sections of the community) are served by 10 providers. Currently, broadband is defined as Internet service with advertised speeds of at least 768 Kbps downstream and 200 Kbps upstream. According to Connect Iowa’s latest broadband mapping update, the following providers have a service footprint in the City of Ogden Community:



Broadband Providers	Website	Technology Type
Ogden Telephone	http://www.ogdentelephone.com	DSL / Fiber
ICS Advanced Technologies	http://www.ics-llc.net	Fixed Wireless
AT&T Mobile	http://www.wireless.att.com	Mobile
Sprint	http://www.sprint.com	Mobile
US Cellular	http://www.uscellular.com	Mobile
Verizon	http://www.verizonwireless.com	Mobile
Hughes Network	http://www.hughes.com	Satellite
Skycasters	http://www.skycasters.com	Satellite
Starband	http://www.starband.com	Satellite
ViaSat	http://www.wildblue.com	Satellite

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

Organization Name	Website	Resource Type
Leonard Good Community Library (Ogden Library)	http://www.ogden.lib.ia.us/	Public Computer Facility
Ericson Public Library (Boone County Library)	http://www.boone.lib.ia.us	Public Computer Facility
Ogden City Hall	http://www.ogdeniowa.net/government	Wireless Hotspot
Leonard Good Community Center	http://www.ogdeniowa.net/community-center	Wireless Hotspot

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

Organization Name	Website	Website Category
Ogden Telephone	http://www.ogdentelephone.com	Business
Muench AgriSolutions	http://www.muenchagrisolutions.com	Community-Based
Ogden Legacy	http://www.ogdeniowa.net	Community-Based
Ogden Reporter (News)	http://www.ogdenreporter.com	Community-Based
Ogden Community Schools	http://www.ogdenschools.org	Education
Boone Hospital	http://www.boonehospital.com	Healthcare



Ogden Farm & Feed	http://www.ogdenfarmfeed.com	Healthcare
Walnut Street Health & Wellness	http://www.walnutstreethealth.com	Healthcare
Leonard Good Library (Ogden Public Library)	http://www.ogden.lib.ia.us	Libraries

Connected Assessment Analysis



Access Score Explanation

Broadband Availability (10 out of 10 Possible Points) – is measured by analyzing provider availability of 3 Mbps broadband service gathered by Connected Nation’s broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connect Iowa, 100% of the City of Ogden residents had access to broadband speeds of 3 Mbps or greater.**

Broadband Speeds (2 out of 5 Possible Points) – is measured by analyzing the speed tiers available within a community. Connected Nation will analyze broadband data submitted through its broadband mapping program. Specifically, Connected Nation will break down the coverage by the highest speed tier with at least 75% of households covered. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

- **According to the October 2014 data collected by Connect Iowa, 75% of the City of Ogden residents had access to broadband speeds of 6 Mbps.**

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

- **According to the October 2014 data collected by Connect Iowa, 100% of City of Ogden residents had access to more than one broadband provider.**

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

- **The City of Ogden is served by 1 middle mile fiber provider.**

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

- **According to the October 2014 data collected by Connect Iowa, 100% of the City of Ogden residents had access to mobile broadband service.**



Adoption Score Explanation

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

Organization Name	Program Description	Number of Grads
Ogden Public Library	Learning Express - online workforce development training, practice exams, basic academic skills training	40
Ogden Public Library	WILBOR - an online collection of downloadable audio books and eBooks	20
Boone Public Library	Internet, computer basics and computer application classes; Tech Tutor one-on-one support	263
Des Moines Area Community College (DMACC)	Basic and advanced digital literacy courses	Varies
Des Moines Area Community College (DMACC)	Free student tutoring and computer labs	Varies
Total Graduates [2013-2014]		323

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

Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
Leonard Good Community Library (Ogden Public Library)	36	6	216
Ericson Public Library (Boone County Library)	55	20	1100

Broadband Awareness (8 out of 10 Possible Points) – is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and then each program’s community reach is compiled and combined with other campaigns. A listing of broadband awareness programs in the City of Ogden is below.

Organization Name	Campaign Description	Community Reach %
Ogden Reporter	Article on Open House for Broadband in Ogden Community, Technology announcement article	50%
Ogden Telephone	Monthly billing mailer advertising fiber availability	95%
Ogden Community School District	Promoting online access to student grades, assignments, attendance, high school class registration and scheduling	45%
Ogden Telephone	Community Technology Event - 4-7pm One-on-one Fiber to the Home education, displays and handouts	50%
MediaCom	Broadband service commercials on television, advertisements in local newspaper and direct mailers	95%
Ogden Community School District	Broadband awareness is enhanced through students/staff/faculty using broadband services in the course of schoolwork.	45%

Vulnerable Population Focus (8 out of 10 Possible Points) – A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use

among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc. A listing of programs focusing on vulnerable populations in the City of Ogden is listed below.

Organization Name	Program Description	Vulnerable Group
Ogden Community School District	E20-20 online course recovery	At-risk students
Ogden Public Library	WILBOR (wilbor.lib.overdrive.com) an online collection of downloadable audio books and eBooks.	Visually impaired
Ogden Public Library	Iowa Works Access Point - online skills development, testing, job placement	Low-income, minorities



Use Score Explanation

Economic Opportunity (4 out of 10 Possible Points) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within economic opportunity include: economic development, business development, tourism, and agriculture. Identified uses of broadband in the area of economic opportunity are listed below and identified as basic or advanced.

Application Provider	Description	Basic / Advanced
Ogden Legacy Economic Development website	Website listing of businesses and information	Basic
Ogden Reporter	Ogden newspaper with an online edition	Basic
Free Online Banking	Online banking by local community banks (Vision Bank and Peoples Bank)	Basic
Farm Service Agency (FSA)	Online agriculture and farming information	Basic
IowaMicroLoan - Iowa Foundation for Microenterprise & Community Vitality	Micro Enterprise Loan Program, which provides small and medium size businesses with access to low interest loans for technology	Advanced

Iowa Social Economic Development (ISED)	Program to help small businesses with technology and creating opportunities for low-income Iowans to build their assets.	Advanced
Source Link - Iowa Economic Development Authority Information Provider	Online databases for resources and funding opportunities for local businesses.	Advanced
Iowa Workforce Development (IWD)	Virtual access point and designated computers at Des Moines Area Community College - Boone Campus	Advanced

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

Application Provider	Description	Basic/ Advanced
Ogden Community School District	Classrooms are connected to the Internet via broadband	Basic
Social Media communication	School is connected to the community via Facebook and Twitter	Basic
Destiny	Online catalog for school library	Advanced
Infinite Campus	100% of grades K-12 students and parents have online access to lunch money accounts	Advanced
Infinite Campus	100% of grades 5-12 students and parents have online access to grades/homework	Advanced
Ogden Community School District	100% of grades 7-12 students have access to files, class work, and assignments via a school "Google" account	Advanced
Ogden Community School District Website	School has online interaction with parents via webpages	Advanced

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

Application Provider	Description	Basic/ Advanced
City of Ogden	City website with community information	Basic
City of Ogden	Online calendar for community room management	Basic
Ogden City Hall	Online filing of City Budget with the Department of Management, Annual Financial Report with the State	Basic



	Auditor, Street Finance Report	
Ogden Fire Department	Online reporting of fires to the State of Iowa	Basic
Ogden Sanitation Department	Online reporting for the sewer system to the DNR	Basic
Ogden City Hall	Hosted website for management information	Advanced
Ogden Municipal Utilities	Hosted website for Ogden Municipal Utilities accounting system	Advanced
Ogden Police Department	Electronic Data Management System for filing of police records; Department of Transportation filing of DOT reports	Advanced

Healthcare (7 out of 10 Possible Points) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies. Identified uses of broadband in the area of healthcare are listed below and identified as basic or advanced.

Application Name	Description	Basic/ Advanced
Walnut Street Health & Wellness	Patient forms are available on the website to expedite the registration process	Basic
Boone County Hospital and Ogden Clinic - Electronic Medical Records	Online access to patients' medical records by all physicians	Advanced
Meditech - EMR / LSS - Meditech Clinic	100% of doctors using e-health	Advanced
Telemedicine	Send and receive radiological images and other medical records and information	Advanced



ACTION PLAN

Community Priority Projects

This exercise has culminated in the outlining of projects to allow the community to continue its recognized excellence in technology and broadband planning across the community. Below are 3 priority projects, each describing a project plan with suggested steps. This is followed by a list of additional action items.

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 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.

Goals

Deliver improved healthcare services to rural residents.

The citizens of Ogden have dedicated a new medical clinic this year for two medical doctors. The clinic is located in the center of the city. The cost was one million dollars and has been fully funded by donations, gifts and grants. The clinic is staffed by employees of the Boone County Hospital which manages three clinics in Boone County. This particular clinic has a large rural area practice. There are over 4,000 files on clients at the Ogden Medical Clinic.

The Boone County Hospital (BCH) has upgraded the use of broadband for their information technology system at a cost of five million dollars. BCH has two full time people in information technology that provide support for all telemedicine services in Ogden and remote areas. All this technology has been installed at the Ogden Medical Clinic. Ogden is very fortunate that these services are a direct adoption and use of broadband.



The Ogden Telephone Company is providing the Ogden Medical Clinic with 10Mbps (soon to be 50Mbps). This provides the Ogden area with superfast broadband to provide Telemedicine in the remote area.

In addition to the clinic, Ogden also has Walnut Street Health and Wellness (owned and operated by an Advanced Registered Nurse Practitioner), One to One Physical Therapy with full-time physical therapy services, two dentists and two full-time chiropractors. Ogden has an unusual amount of healthcare services.

Benefits

1. Improved access - Telemedicine improves access to patients, but it also allows physicians and health facilities to expand their reach, beyond their own offices.
2. Cost effectiveness - Reducing or containing the cost of healthcare is one of the most important reasons for funding and adopting telehealth technologies.
3. Improved quality - Studies have consistently shown that the quality of healthcare services delivered via telemedicine are as good as those given in traditional in-person consultation.
4. Patient demand - The greatest impact of telemedicine is on the patient, their family and their community. Using telemedicine technologies reduces travel time and related stresses for the patient.

Action Items

1. Expand assessment of healthcare service.
2. Assess potential impact to existing broadband network at each healthcare business to ensure minimal cost and impact of adding telemedicine.
3. Communicate the availability of broadband services available to the healthcare professional as well as the clients in remote community.

Implementation Team:

- Boone County Hospital
- Boone County Family Medicine
- Ogden Medical Clinic

Implement a Community-based Technology Awareness Program

Conduct an extensive advertising campaign to raise awareness about the benefits of broadband and related technology. Develop a strategy to help the community become more aware of the benefits associated with Internet and computers adoption in their daily lives and activities. Methods of delivery include, but are not limited to, classroom style awareness sessions, press



conferences led by community leaders, having a speaker at a community event, posting community posters, handouts, and public service announcements.

Additionally, the campaign should specifically target technology non-adopters. By using established media, the campaign reaches non-adopters where they are. Public radio, broadcast and cable TV, utility bill stuffers, and print newspapers have been utilized to reach households of many types. The public awareness campaign should focus on helping residents, particularly those from underserved communities, understand the personal value they can derive from an investment in information technology.

There are also opportunities to leverage existing resources to expand and enhance workforce-training programs, encourage more post-secondary education, and create additional awareness within the community in regards to global resources. It is important to support the outcomes of awareness training with the development of technology training programs that will then teach community members how to use the technology.

Goal

Organize, promote, and deliver a technology awareness program that would increase utilization of technology resources in the community.

Benefit

1. Success is achieved when a community experiences increased usage of computers and the Internet, improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

Action Items

1. Determine the type of public awareness campaign that is appropriate for your community. Connect Ohio's statewide *Every Citizen Online* public awareness campaign provides an excellent case study of a professionally developed campaign.
<http://connectohio.org/public-awareness-campaigns>
2. Create a centralized technology portal/website that promotes local technology resources for use by residents. Resources would include calendars (promoting local tech events and showing available hours at public computing centers), online training resources, and local computer resources.

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

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

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

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

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

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

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

Implementation Team

- Ogden Broadband Planning Team
- Iowa State University Extension Service

List of All Action Items

Below is a complete list of 9 action items proposed by the City of Ogden Broadband Team to accelerate broadband access, adoption, and use.

ACCESS

Broadband Availability

1. Complete Current Implementation of Fiber-to-the-Home Across Ogden (User Submitted)

Ogden Telephone is actively implementing its fiber expansion across the City of Ogden during 2014.

Goal

Make very high-speed broadband service available to most or all households in the City of Ogden.

Benefits

1. Substantially higher speed and reliability of broadband service to all residents and local businesses



2. Expanded and easier access to online applications and services by all residents and businesses Use of best available technology to support longer term broadband needs by the community

Action Items

1. Complete the planning and execution of the current fiber implementation plan

Implementation Team

- Ogden Telephone
- Other community organizations as required

2. Complete a Vertical Assets Inventory

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

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

Goal

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

Benefits

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



Action Items

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

Implementation Team

- Ogden Broadband Planning Team

Broadband Speeds

3. Update and Maintain Provider Network Profiles with Connected Nation to Reflect Current Capabilities and Offerings (User Submitted)

Connected Nation maintains network information on nearly all broadband providers through the Connect Iowa mapping program, previously a part of the federal State Broadband Initiatives grant program. Connected Nation and Connect Iowa have contacted all providers in the state and requested regular updates to each provider's network. These updates include changes to types of technology used, the provider's coverage area and maximum download and upload speeds supported by their networks. Ogden's local provider(s) should strive to keep these profiles current; if they do not, the result will be inaccurate and disconnected representations of broadband service in the Ogden area. Update: effective in 2015, all broadband service providers will be required to submit their updates to the FCC using Form 477, rather than to Connected Nation.

Goal

Provide an accurate view of the current network infrastructure supporting the Ogden community to aid in broadband planning and local, state and national mapping of broadband service.

Benefits

1. Greater awareness of Ogden's true broadband capabilities and attractiveness to potential new residents and businesses
2. Greater recognition and adoption of Ogden area providers' services
3. Improved accuracy and integrity of broadband coverage maps
4. Enhanced cooperation and inclusion in the greater broadband provider community
5. Necessary to support Ogden's goal of Connected Community Certification



Action Items

1. Provider(s) to submit their network updates to Connect Iowa/Connected Nation via the CN_Provider_Information worksheet as soon as possible.
2. Connected Nation to formally review and validate updated provider information and include same in next update cycle.
3. Establish an ongoing communication process between provider(s) and Connected Nation to submit semi-annual updates to maintain currency.

Implementation Team

- Ogden Broadband Providers

Broadband Competition– No Action Items.

Middle Mile Access– No Action Items.

Mobile Broadband Availability– No Action Items.

ADOPTION

Digital Literacy– No Action Items.

Public Computer Centers– No Action Items.

Broadband Awareness

4. Implement a Community-based Technology Awareness Program

Conduct an extensive advertising campaign to raise awareness about the benefits of broadband and related technology. Develop a strategy to help the community become more aware of the benefits associated with Internet and computers adoption in their daily lives and activities. Methods of delivery include, but are not limited to, classroom style awareness sessions, press conferences led by community leaders, having a speaker at a community event, posting community posters, handouts, and public service announcements.

Additionally, the campaign should specifically target technology non-adopters. By using established media, the campaign reaches non-adopters where they are. Public radio, broadcast and cable TV, utility bill stuffers, and print newspapers have been utilized to reach households of many types. The public awareness campaign should focus on helping residents, particularly those from underserved communities, understand the personal value they can derive from an investment in information technology.



There are also opportunities to leverage existing resources to expand and enhance workforce-training programs, encourage more post-secondary education, and create additional awareness within the community in regards to global resources. It is important to support the outcomes of awareness training with the development of technology training programs that will then teach community members how to use the technology.

Goal

Organize, promote, and deliver a technology awareness program that would increase utilization of technology resources in the community.

Benefits

1. Success is achieved when a community experiences increased usage of computers and the Internet, improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

Action Items

1. Determine the type of public awareness campaign that is appropriate for your community. Connect Ohio's statewide *Every Citizen Online* public awareness campaign provides an excellent case study of a professionally developed campaign. <http://connectohio.org/public-awareness-campaigns>
2. Create a centralized technology portal/website that promotes local technology resources for use by residents. Resources would include calendars (promoting local tech events and showing available hours at public computing centers), online training resources, and local computer resources.

Implementation Team

- Ogden Broadband Planning Team
- Ogden Telephone Company

5. Facilitate a Technology Summit

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



Goal

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

Benefits

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

Action Items:

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

Implementation Team

- Ogden Broadband Planning Team

Vulnerable Population Focus– No Action Items.

6. Develop a Technology Mentorship Program

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

Goal

Utilize student technology knowledge to implement community programs.

Benefits

1. The program helps students develop self-confidence and technical competencies as they work with their families, leaders, peers, neighbors, seniors, and other members of their communities. In addition to empowering these students with real world experience, it helps enhance their skills as they mature into productive and highly competent citizens.
2. It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.



3. The program will engage students who are creative, knowledgeable, and interested in technology as a great resource for planning, implementation, support, and using technology at a local level. With guidance and support, they will help to provide a missing, and important, link between the members of community that have experience with broadband technology and those who are currently not using it.
4. The program will expose students to potential career paths and provide a basis to determine if they want to further their educations in a technology field. It could also potentially provide a beginning client base from the relationships he or she has built within the community as a student.

Action Items

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

Implementation Team

- Technology Director - Ogden Community School District

USE

Economic Opportunity

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

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

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



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

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

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

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



Implementation Team

- Ogden Broadband Planning Team
- Iowa State University Extension Service

Education – No Action Items.

Government

8. 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.

Goal

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

Benefits

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

Action Items:

1. The first step in the process of providing e-government services to constituents is developing a functional web portal that allows businesses to have access to resources easily. Such a portal can enable outside businesses looking for new opportunities to make informed decisions about working in a certain community.
2. In addition, often overlooked in e-government deployment are the issues of audiences and needs. Local governments must determine who will visit the website and what sort of information and services they will typically seek. A first step toward meeting general needs of constituents is to provide online access to as broad a swath of governmental information and data as is possible. The sort of information that should be included is:
 - 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.

Implementation Team

- City of Ogden – Administration

Healthcare

9. Promote Telemedicine in Remote Areas

The citizens of Ogden have dedicated a new medical clinic this year for two medical doctors. The clinic is located in the center of the city. The cost was one million dollars and has been fully funded by donations, gifts and grants. The clinic is staffed by employees of the Boone County Hospital which manages three clinics in Boone County. This particular clinic has a large rural area practice. There are over 4,000 files on clients at the Ogden Medical Clinic.

The Boone County Hospital (BCH) has upgraded the use of broadband for their information technology system at a cost of five million dollars. BCH has two full time people in information technology that provide support for all telemedicine services in Ogden and remote areas. All this technology has been installed at the Ogden Medical Clinic. Ogden is very fortunate that these services are a direct adoption and use of broadband.

The Ogden Telephone Company is providing the Ogden Medical Clinic with 10Mbps (soon to be 50Mbps). This provides the Ogden area with super-fast broadband to provide Telemedicine in the remote areas. In addition to the clinic, Ogden also has Walnut Street Health and Wellness (owned and operated by an Advanced Registered Nurse Practitioner), One to One Physical Therapy with full-time physical therapy services, two dentists and two full-time chiropractors. Ogden has an unusual amount of healthcare services.

Project Description

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



telemedicine are ensuring that patients and medical professionals have access to broadband service, 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.

Goal

Deliver improved healthcare services to rural residents.

Benefits

1. Improved access - Telemedicine improves access to patients, but it also allows physicians and health facilities to expand their reach, beyond their own offices.
2. Cost effectiveness - Reducing or containing the cost of healthcare is one of the most important reasons for funding and adopting telehealth technologies.
3. Improved quality - Studies have consistently shown that the quality of healthcare services delivered via telemedicine are as good as those given in traditional in-person consultation.
4. Patient demand - The greatest impact of telemedicine is on the patient, their family and their community. Using telemedicine technologies reduces travel time and related stresses for the patient.

Action Items

1. Expand assessment of healthcare service.
2. Assess potential impact to existing broadband network at each healthcare business to ensure minimal cost and impact of adding telemedicine.
3. Communicate the availability of broadband services available to the healthcare professional as well as the clients in remote community.

Implementation Team

- Boone County Hospital
- Boone County Family Medicine
- Ogden Medical Clinic

APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND

Statewide Infrastructure

As part of the Iowa State Broadband Initiative (SBI), and in partnership and at the direction of the Iowa Utilities Board, Connect Iowa produced an inaugural map of broadband availability in the spring of 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 Iowa has collected and released new data every six months, with updates in October and April annually.

The most current statewide and county-specific broadband inventory maps released in the spring of 2014 depict a geographic representation of provider-based broadband data represented by cable, DSL, wireless, fiber, etc. residential services. These maps also incorporate data such as political boundaries and major transportation networks in the state. A statewide map can be found at

http://www.connectiowa.org/connectednationftp/iowa/Statewide_Maps/IA_Statewide_Broadband.pdf. The county maps can be found at

http://www.connectiowa.org/community_profile/find_your_county/iowa.

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

SBI Download/Upload Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent Households by Speed Tier
At Least 768 Kbps/200 Kbps	22	1,200	98.19
At Least 1.5 Mbps/200 Kbps	43	1,179	96.52
At Least 3 Mbps/768 Kbps	78	1,144	93.64
At Least 6 Mbps/1.5 Mbps	228	993	81.30
At Least 10 Mbps/1.5 Mbps	251	970	79.44
At Least 25 Mbps/1.5 Mbps	332	889	72.78
At Least 50 Mbps/1.5 mbps	355	867	70.94
At Least 100 Mbps/1.5 Mbps	497	725	59.35
At Least 1 Gbps/1.5 Mbps	1,196	26	2.10

Source: Connect Iowa, April 2014.



Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband service inventory (excluding mobile and satellite service) across the state of Iowa; it presents the number and percentage of unserved and served households by speed tiers. The total number of households in Iowa in 2010 was 1,221,576, for a total population of 3 million people. Table 1 indicates that 98.196% of households are able to connect to broadband at download speeds of at least 768 Kbps and upload speeds of at least 200 Kbps. This implies that the number of households originally estimated by Connect Iowa to be unserved has dropped from 53,335 households in the fall of 2010 to 22,146 households in the spring of 2014. Further, approximately 1,143,847 households across Iowa have broadband available of at least 3 Mbps download and 768 Kbps upload speeds. The percentage of Iowa households having fixed broadband access available of at least 6 Mbps download and 1.5 Mbps upload speeds is estimated at 81.37%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.99% of Iowa 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 about 70 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 2014 show, additional participating broadband providers can have a large impact upon Iowa broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise that should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders identify areas where the displayed coverage is underestimated or overestimated. Connect Iowa 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 Iowa has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Iowa'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 Iowa can be found here: <http://www.broadbandmap.gov/summarize/state/iowa>.

Interactive Map

Connect Iowa provides My ConnectView™, an online tool developed and maintained by Connected Nation, which allows users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Iowa'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.connectiowa.org/interactive-map>

For additional maps and other related information, visit:

<http://www.connectiowa.org/broadband-landscape>

Business and Residential Technology Assessments

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

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

- Broadband adoption in Iowa increased by 5 percentage points between 2012 and 2013.
- More than 113,000 school-age children in Iowa still do not have broadband access at home.
- More than three out of ten (31%) or 90,830 non-adopters in Iowa cite relevance as their main barrier to broadband adoption, while nearly one-fifth (16%) or 46,880 cite cost as their biggest barrier.

Additionally, an assessment of technology use among Iowa businesses released in September 2014 on Connect Iowa's website revealed the following key findings:

- Across Iowa, 81% of businesses subscribe to broadband service, leaving approximately 16,000 Iowa businesses that still do not use or benefit from broadband.
- 31% of Iowa businesses that want faster Internet service cannot get it at their location.
- More than 1 in 8 Iowa businesses say it is "important" or "very important" for new employees to be able to create or edit mobile apps, while 1 in 11 say it is important for new employees to know at least one programming language.
- Online sales in Iowa accounted for approximately \$20 billion in sales revenue last year, including nearly \$7.7 billion for small businesses with fewer than twenty employees and more than \$7 billion for rural Iowa businesses.

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

APPENDIX 2: PARTNER AND SPONSORS

Connect Iowa, in partnership with the Iowa Economic Development Authority (IEDA), supports Iowa's reinvention and technological transformation through innovation, job creation, and entrepreneurship via the expansion of broadband technology and increased usage by Iowa residents. In 2009, Connect Iowa partnered with the Iowa Utilities Board 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.connectiowa.org/>

The **Iowa Economic Development Authority (IEDA)** offers a variety of programs and services to individuals, communities, and businesses to attract and grow business, employment, and workforce in Iowa. Groundbreaking economic growth strategies focusing on cultivating start-up companies and helping existing companies become more innovative complement the activities already underway to retain and attract companies that are creating jobs for Iowans. Developing sustainable, adaptable communities ready for this growth is also an essential part of our work at IEDA — providing programs and resources that help communities reinvest, recover, and revitalize to make each community's vision a reality.

<http://www.iowaeconomicdevelopment.com/>

Connected Nation (Connect Iowa'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>



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, NTIA’s State Broadband Initiative implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and healthcare rely not only on broadband infrastructure, but also on the knowledge and tools to leverage that infrastructure.

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 Iowa 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 NTIA to update the National Broadband Map, the first public, searchable nationwide map of broadband availability launched February 17, 2011.

APPENDIX 3: THE NATIONAL BROADBAND PLAN

The National Broadband Plan, released in 2010 by the Federal Communications Commission, has the express mission of creating a high-performance America—a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications. The plan seeks to ensure that the entire broadband ecosystem—networks, devices, content and applications— is healthy.

The plan recommends that the country adopt and track the following six goals to serve as a compass over the next decade:

GOAL No. 1: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.

GOAL No. 2: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

GOAL No. 3: Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.

GOAL No. 4: Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.

GOAL No. 5: To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

GOAL No. 6: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

To learn more, visit: www.broadband.gov

APPENDIX 4: WHAT IS CONNECTED?

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

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

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

Connected’s community technology-planning framework is cyclical. As with other forms of community planning – and especially so with technology planning – change is the only constant. At the community level, changing technology requirements, shifting demographics, economic drivers, and workforce requirements may expose or create new digital divides. Connected’s community technology-planning framework supports a sustained effort.

Connected Planning Process

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



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

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

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

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

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

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



APPENDIX 5: GLOSSARY OF TERMS

#

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

4G Wireless - Fourth Generation - Refers to the fourth generation of wireless cellular technology. It is the successor to 2G and 3G. Typical 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.