THE CITY OF GRINNELL

TECHNOLOGY ACTION PLAN

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AND THE
CITY OF GRINNELL BROADBAND COMMITTEE

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Table of Contents

INTRODUCTION

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

Background

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

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

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

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

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

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

4 Connected Nation, parent company for Connect 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 Grinnell Broadband Committee is boosting the community's capabilities in education, healthcare, and public safety, and stimulating economic growth and spurring job creation. The City of Grinnell Broadband Committee has collaborated with multiple community organizations and residents to:

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

CONNECTED ASSESSMENT

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

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

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

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

Analysis of Connected Assessment

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

- The City of Grinnell achieved a score of 114 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 City of Grinnell also exceeded the 32 points in each focus area that are required for certification and has qualified as a Certified Connected Community.
- The community scored 36 out of a possible 40 points in broadband access, which could be further improved with access to additional middle mile providers.

- The community also scored 40 out of a possible 40 points in broadband adoption, indicating that the City of Grinnell has sufficient and valuable assets and programs to support continued broadband adoption by its residents and small businesses.
- The community also scored 40 out of a possible 40 points in broadband use, indicating that the City of Grinnell has effectively employed broadband to deliver productive online services and applications to help improve the overall quality of life for local residents.

While the 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 Champion: Monique Shore Community Advisor: Dave Daack				
FOCUS AREA	**ASSESSMENT CRITERIA**	**DESCRIPTION**	**SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	98% to 100% of homes have access to 3 Mbps	10	10
	Broadband Speeds	75% of households with access to at least 50 Mbps	5	5
	Broadband Competition	95% to 100% of households with access to more than 1 broadband provider	5	5
	Middle Mile Access	Availability of middle mile fiber infrastructure from only 1 provider	6	10
	Mobile Broadband Availability	99% to 100% of households with access to mobile broadband	10	10
	ACCESS SCORE		**36**	**40**
ADOPTION	Digital Literacy	Program grads are greater than 10 per 1,000 residents over the past year	10	10
	Public Computer Centers	500 computer hours per 1,000 low income residents per week	10	10
	Broadband Awareness	Campaigns reach 100% of the community	10	10
	Vulnerable Population Focus	At least 5 groups	10	10
	ADOPTION SCORE		**40**	**40**
USE	Economic Opportunity	4 advanced, 2 basic uses	10	10
	Education	5 advanced, 0 basic uses	10	10
	Government	4 advanced, 1 basic uses	9	10
	Healthcare	4 advanced, 1 basic uses	9	10
	USE SCORE		**38**	**40**
	COMMUNITY ASSESSMENT SCORE		**114**	**120**

Itemized Key Findings

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

ACCESS

- 2 last-mile broadband providers currently provide service in the City of Grinnell:
  - 98% to 100% of households have access to 3 Mbps.
  - More than 75% of the City of Grinnell homes have access to at least 50 Mbps service.
  - 95% to 100% of the City of Grinnell households have access to more than 1 provider.
- Middle mile fiber infrastructure is available from only 1 provider in the City of Grinnell.
- 99% to 100% of the City of Grinnell households have access to mobile broadband.

ADOPTION

- 3 Digital Literacy Programs exist in the community resulting in 210 graduates over the past year.
- 1 Public Computer Center (PCC) with a total of 26 computers is open to the public.
- 4 Broadband Awareness Campaigns are reaching 17.5% of the City of Grinnell.
- 3 organizations are working with vulnerable populations.

USE

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

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

Technology Providers

- 12 broadband providers were identified in the City of Grinnell
- 1 hardware provider was identified in the City of Grinnell
- 1 network developer was identified in the City of Grinnell
- 1 web developer was identified in the City of Grinnell

Technology Facilities

- 3 public computing centers

- 19 wireless hotspots
- 0 video conference facilities

Community Websites

- 8 Business-related websites (excluding private businesses)
- 3 Education-related websites
- 5 Government-related websites
- 4 Healthcare-related websites
- 2 Library-related websites
- 1 Tourism-related website
- 15 Community-based 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 5 priority projects.

1. Collect Customer Use Information and Share with Service Providers.
2. Study and Possibly Reassess Major Telecom Purchase Contracts.
3. Perform an Analysis of Local Policies and Ordinances.
4. Complete a Vertical Assets Inventory.
5. Pursue Next Generation 911 Upgrades.

ACCESS

Broadband Availability

1. Perform an Analysis of Local Policies and Ordinances.
2. Collect Customer Use Information and Share with Service Providers.

Broadband Speeds – No Action Items

Broadband Competition – No Action Items

Middle Mile Access

3. Study and Possibly Reassess Major Telecom Purchase Contracts.

Mobile Broadband Availability

4. Complete a Vertical Assets Inventory.

ADOPTION

Digital Literacy – No Action Items

Public Computer Centers – No Action Items

Broadband Awareness– No Action Items

Vulnerable Population Focus – No Action Items

USE

Economic Opportunity– No Action Items

Education– No Action Items

Government

5. Pursue Next Generation 911 Upgrades

Healthcare– No Action Items

DETAILED FINDINGS

Current Community Technology Developments in the City of Grinnell

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 Grinnell:

One to One Schools - The Grinnell Newburg School District embraces technology. All students in 5th-12th grade are issued laptops and instruction is fully integrated with online tools and services. Students use Google services for individual and collaborative assignments. Teachers track student progress via online tools that allow parental access for monitoring of child progress. Elementary classes integrate technology into their instruction as well, using Smart Boards, tablets, etc. from kindergarten on up.

Hospital - The Grinnell Regional Medical Center has completed conversion to an electronic medical records system, providing enhanced access among partner providers and an online portal where individuals can access their medical records and test results. View the patient portal at www.grmc.us/patientportal.html.
The GRMC Emergency Room also partners with the University of Iowa Stroke Center to provide a wireless remote presence robot for diagnosis of stroke patients. The unit connects the ER patients to neurosurgeons at the U of I hospital for a full diagnostic exam. This technology allows better diagnosis and faster treatment for area residents, greatly improving chances of a recovery from stroke.

Digital Archive of Local History - A collaboration between the Drake Community Library (public) and the Grinnell College libraries, is creating a digital archive of local history through the Poweshiek History Preservation Project. Using the framework of the college Digital Grinnell online searchable database, the libraries are reaching out to area historical organizations, and to individuals, to encourage digital preservation of irreplaceable materials. They provide advice, access to scanning hardware, and in many cases, the labor to scan photographs and documents. Items then become part of the digital archive and are accessible online. Learn more about the project at www.grinnell.lib.ia.us/poweshiekhistory.

Easier Online Learning from the Library - The public library continues to work to make online access to materials easier and more accessible to members of the community. In addition to the list of resources that allow research, language instruction, and practice test/skills improvement services, the newest online catalog will provide easy, one-click download of eBooks & audiobooks making access to downloadable materials easier than ever.

City of Grinnell Assessment Findings

Today, residents in the City of Grinnell (or sections of the community) are served by 12 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 Grinnell Community:

Broadband Providers	Website	Technology Type
Windstream	http://www.windstream.com	DSL
Mediacom	http://www.mediacomcc.com	Cable
AT&T	http://www.wireless.att.com	Mobile Wireless
Sprint	http://www.sprint.com	Mobile Wireless
US Cellular	http://www.uscellular.com	Mobile Wireless
Verizon	http://www.verizonwireless.com	Mobile Wireless
ViaSat	http://www.wildblue.com	Satellite
Hughes Net Systems	http://www.hughes.com	Satellite
Skycasters	http://www.skycasters.com	Satellite
StarBand Communications	http://starband.com	Satellite
ICN - K-12 schools, higher education, hospitals, state and federal government, National Guard armories, and libraries	http://www.icn.iowa.gov/	Fiber
INS - Business broadband provider	http://iowanetworkservices.com/	Fiber

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

Organization Name	Website	Resource Type
B3 Technology	http://b3tech.com	Network Integrator
Walmart	http://www.walmart.com	Hardware Provider
Organic local social media	http://www.mccuedan.com	Web Developer

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	Website Category
Drake Community Library	www.grinnell.lib.ia.us	Public Computer Facility

College Libraries	www.grinnell.edu	Public Computer Facility
Grinnell Newburg School District	www.grinnell-k12.org	Public Computer Facility
Best Western		Wireless Hotspot
Chamber of Commerce		Wireless Hotspot
Comfort Inn		Wireless Hotspot
Country Inn & Suites		Wireless Hotspot
Drake Community Library	www.grinnell.lib.ia.us	Wireless Hotspot
Frontier Café		Wireless Hotspot
Grinnell Eagles Club		Wireless Hotspot
Grinnell Steakhouse		Wireless Hotspot
Hardees		Wireless Hotspot
Iowa Realty		Wireless Hotspot
Iowa Transportation Museum		Wireless Hotspot
Iowa Valley Community College		Wireless Hotspot
Maytag Laundry		Wireless Hotspot
McDonald's		Wireless Hotspot
McNallys		Wireless Hotspot
Quality Inn		Wireless Hotspot
Saints Rest Coffee House		Wireless Hotspot
Super 8		Wireless Hotspot
Taco Johns		Wireless Hotspot

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

Company Name	Website	Provider Type
Bikes to You	http://bikestoyou.com/	Business
Grinnell Chamber of Commerce	http://www.getintogrinnell.com/	Business
Grinnell Heritage Farm	http://www.grinnellheritagefarm.com/	Business
Grinnell Mutual Reinsurance	www.grinnellmutual.com	Business
Middleway Farm	http://www.middlewayfarm.com/	Business
Organic Local Social Media	http://www.mccuedan.com/	Business
Realtors Association	http://poweshiekmls.rapmls.com/	Business
Total Choice Shipping	http://www.grinnell.com/	Business
Ahrens Foundation	http://www.ahrensfamilyfoundation.org/	Community-based
First Presbyterian Church	http://fpcgrinnell.yolasite.com/	Community-based
Greater Poweshiek Community Foundation	http://www.greaterpcf.org/	Community-based
Greater Poweshiek Community Foundation	www.greaterpcf.org	Community-based

Grinnell Area Arts Council	www.grinnellarts.org	Community-based
Grinnell Christian Church	http://grinnell.cc	Community-based
Grinnell Church of Christ	www.grinnellcoc.com	Community-based
Grinnell Friends Church	www.grinnellfriends.org	Community-based
Grinnell Historical Museum	http://www.grinnellhistoricalmuseum.org/	Community-based
Grinnell United Church of Christ	www.meetgrinnellucc.org	Community-based
Grinnell United Methodist Church	www.grinnellumc.org	Community-based
Imagine Grinnell	www.grinnell.org	Community-based
Our Grinnell	http://ourgrinnell.com/	Community-based
Social Entrepreneurs of Grinnell	http://www.segrinnell.org/	Community-based
St. Mary's Catholic Church	www.stmarygrinnell.com	Community-based
Grinnell College	http://www.grinnell.edu	Education
Grinnell Newburg School District	http://www.grinnell-k12.org/	Education
Iowa Valley Community College	http://www.iavalley.edu/grinnell/	Education
City of Grinnell	httpp://www.grinnelliowa.gov	Government
City of Grinnell Fire Department	http://www.grinnellfd.com/	Government
City of Grinnell Police Department	www.grinnelliowa.gov/police	Government
County Treasurer- Grinnell Satellite Office	http://www.poweshiekcounty.org/	Government
SATUCI: Substance Abuse Treatment Unit of Central Iowa - Grinnell Office	httpp://www.satuci.com	Government
Grinnell Healthcare Center	http://www.grinnellhealthcarecenter.com/	Healthcare
Grinnell Regional Medical Center	http://www.grmc.us/	Healthcare
Mayflower Community	www.mayflowercommunity.org	Healthcare
St. Francis Manor & Seeland Park	http://www.stfrancismanor.com/	Healthcare
Digital Grinnell Archive	http://digital.grinnell.edu	Libraries
Drake Community Library	www.grinnell.lib.ia.us	Libraries
Grinnell Games	http://www.grinnellgames.com/	Tourism

Connected Assessment Analysis

Access Score Explanation

Broadband Availability (10 out of 10 Points Possible) – 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 April 2014 data collected by Connect Iowa, 98% to 100% of the City of Grinnell residents had access to broadband speeds of 3 Mbps or greater.**

Broadband Speeds (5 out of 5 Points Possible) – 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 April 2014 data collected by Connect Iowa, >75% of the City of Grinnell residents had access to broadband speeds of 50 Mbps.**

Broadband Competition (5 out of 5 Points Possible) – 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 April 2014 data collected by Connect Iowa, 95% to 100% of the City of Grinnell residents had access to more than one broadband provider.**

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

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

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

- **According to the April 2014 data collected by Connect Iowa, 99% to 100% of the City of**

Grinnell residents had access to mobile broadband service.

Adoption Score Explanation

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

Organization Name	Program Description	Number of Grads
Mayflower Retirement Community	Tekkie Tutors: Grinnell College students provides one on one computer assistance to members of the community	10
Iowa Valley Continuing Educations	Social and mobile classes - basic Excel and email, digital picture, and basic computer 101.	110
Drake Community Library	Basic computer skills, eReader assistance; how to download items from library ebook collection.	90
Total Graduates [2013-2014]		120

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

Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
Drake Community Library	49.5	26	1287

Broadband Awareness (10 out of 10 Points Possible) – is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and

then each program's community reach is compiled and combined with other campaigns. A listing of broadband awareness programs in the City of Grinnell is below.

Organization Name	Campaign Description	Community Reach
Drake Community Library	Monthly newsletter highlights online resources as part of awareness campaign.	2%
Grinnell Chamber of Commerce	Weekly email newsletter highlighting community information...jobs, events, online registration and more.	50%
Multiple Banks	Online bank use through advertisements/promotions.	100%
Multiple Providers	Broadband adoption and awareness campaigns focused on new clients and upgrading existing clients.	70%

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

Organization Name	Program Description	Vulnerable Group
Drake Community Library	Array of programs encouraging technology: English as second language, employment resources, disability focused program.	Unemployed, disabled, non-English speaking
Galaxy Youth Center	Free Wi-Fi for kids (many of whom have school-issued laptops).	Low income children
Iowa Valley Continuing Education Programs	Senior Computing Series. Classes are held at a local retirement community.	Seniors

Use Score Explanation

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

Application Provider	Description	Basic / Advanced
Chamber of Commerce - http://www.getintogrinnell.com/	Provides wide range of information for business and resident interest. Includes job listings, business directory, events calendar.	Basic
Our Grinnell - http://ourgrinnell.com/	Our Grinnell.com is a web based local news site. It runs feature stories and has an active social media presence.	Basic
Greater Poweshiek Community Foundation - http://www.greaterpcf.org/	Provides information on area nonprofit organizations under the GPCF umbrella.	Advanced
Grinnell Area Arts Council - http://www.grinnellarts.org/	Posts info about events and classes. Offers online registration for classes.	Advanced
Ordering food on-line (multiple) - http://www.grinnellheritagefarm.com/, http://localfood.cs.grinnell.edu/, http://www.middleway	Purchase food from local vendors.	Advanced
Social Entrepreneurs of Grinnell - http://www.segrinnell.org/	Offers emergency loans and offers a financial education course. Program was recognized with a White House "Champions of Change" award. Site provides online applications for recipients and online donation site for those who want to support the program financially.	Advanced

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

Application Provider	Description	Basic/ Advanced
AEA6 - http://www.iowaaeaonline.org/	Online research databases and learning tools for all area children.	Advanced

Drake Community Library - www.grinnell.lib.ia.us	E-books, genealogy resources, Learning Express services for skill enhancement and test taking. Online language learning tool.	Advanced
GN School District - http://www.grinnell-k12.org/	School is a one-to-one school, providing laptops for all students grades 5-12.	Advanced
Grinnell College - pioneerweb.grinnell.edu	Virtual classroom; online courses offered.	Advanced
Online Student Data Base - www.centraliowachristian.org and http://www.grinnell-k12.org/	Online student registration, monitoring of assignments/grades, calendar of events, staff communication options, etc.	Advanced

Government (9 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within government include general government, public safety, energy, and the environment. Identified uses of broadband in the area of government are listed below and identified as basic or advanced.

Application Provider	Description	Basic/ Advanced
SATUCI: Substance Abuse Treatment Unit of Central Iowa - Grinnell Office - www.satuci.com	Website with services and program information.	Basic
City of Grinnell - www.grinnelliowa.gov	City government info online, including all council agendas, minutes, city code, calendar, contact info, download permits.	Advanced
City of Grinnell Fire Department - http://www.grinnellfd.com/	Information on fire department staff, equipment, and job opportunities. Offers a secure portal for staff and volunteers.	Advanced
City of Grinnell Police Department - www.grinnelliowa.gov/police	Learn about & download various permits. Sign up for public safety alerts via text messaging or email.	Advanced
County Treasurer- Grinnell Satellite Office - http://www.poweshiekcounty.org/	Online payment for vehicle registration and property taxes.	Advanced

Healthcare (9 out of 10 Points Possible) – A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies. Identified uses of broadband in the area of healthcare are listed below and identified as basic or advanced.

Application Name	Description	Basic/ Advanced
Computer access	Computer access for seniors.	Basic
Communication/Virtual Information - Multiple sites	Virtual information and description of services at multiple nursing homes.	Advanced
Grinnell Regional Medical Center - [httpp://www.grmc.us/](http://www.grmc.us/)	Patient Portal access to medical records; provides overview of services, including hospital, public health clinic.	Advanced
Online prescription refills -- Multiple sites	Online prescription refills and account monitoring.	Advanced
Telemedicine -- [httpp://www.grmc.us/](http://www.grmc.us/)	Telemedicine in the ER to connect to U of I hospitals for advanced diagnostics with their specialists.	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 five priority projects, each describing a project plan with suggested steps.

Collect Customer Use Information and Share with Service Providers

There are concerns within the Grinnell community, especially among business owners, regarding the consistency and reliability of our current providers. Downtime is a regular occurrence leading to great concerns about interruption of business. Compilation of experiences and issues from a wide range of business and residential customers will provide an overview of issues and assist with assessment of problems and potential solutions. The information will be shared at meetings with regional service provider leaders to discuss the need for targeted action to provide improvements.

Goal

Compile list of concerns and ongoing issues related to service from current providers to be shared directly with company leaders.

Benefits

1. Compilation of a list of detailed information from multiple customers allows identification of widespread service issues. Documentation from a group of customers will show patterns of usage and downtime to allow troubleshooting of wide area problems.
2. Meetings between area business leaders with regional heads of service providers shows interest in improving service to the Grinnell community and encouragement to invest in this market.

Action Items

1. Identify businesses and residential customers willing to provide specific feedback related to their broadband service.
2. Create a survey and service tracking tool. The tool will need to track specifics of speed, slow service and downtime over a period of at least one week performed simultaneously by multiple customers. This way we can confirm if the problem is widespread in the area or occurs at different times for different customers.
3. Compile collected information into a report to be shared with company leaders.

4. Identify regional leaders for service providers. Have Grinnell business representatives meet with those individuals to share the survey results and discuss options for service improvements to this area.

Study and Possibly Reassess Major Telecom Purchase Contracts

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

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

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

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

Perform an Analysis of Local Policies and Ordinances

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

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

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

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

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

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.

Goals
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.

Pursue Next Generation 911 Upgrades

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

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

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

Benefits

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

Action Items

If you are involved in PSAP decision making and are faced with replacing aging systems or purchasing new technology for the very first time, you need to consider what your most immediate requirements are and where you need to be 10 years from now. Your community can take a measured and practical approach that spreads the operational impact and costs of a Next Generation 911 transition over time. Your local agency should choose a starting point that makes the most sense and provides immediate benefits for their PSAP, responders, and communities they serve. For example, according to Intrado, Inc., a provider of 911 and emergency communications infrastructure to over 3,000 public safety agencies, local public-safety agencies can implement any of the following next-generation 911 components today, and provide immediate benefits with little to no disruption of current operations:

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

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/Union.

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. Furthermore, 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 five 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 one in eight Iowa businesses say it is "important" or "very important" for new employees to be able to create or edit mobile apps, while one in eleven 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 20 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 implantations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

A

ARRA - American Recovery and Reinvestment Act.
ADSL - Asymmetric Digital Subscriber Line - DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically thought of as a residential service.
ATM - Asynchronous Transfer Mode - A data service offering by ASI that can be used for interconnection of customers' LAN. ATM provides service from 1 Mbps to 145 Mbps utilizing Cell Relay Packets.

B

Bandwidth - The amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.
BIP - Broadband Infrastructure Program - Part of the American Recovery and Reinvestment Act (ARRA), BIP is the program created by the U.S. Department of Agriculture focused on expanding last mile broadband access.
Bit - A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approximately 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.
BPL - Broadband Over Powerline - An evolving theoretical technology that provides broadband service over existing electrical power lines.
BPON - Broadband Passive Optical Network - A point-to-multipoint fiber-lean architecture network system which uses passive splitters to deliver signals to multiple users. Instead of running a separate strand of fiber from the CO to every customer, BPON uses a single strand of fiber to serve up to 32 subscribers.
Broadband - A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g. DSL, cable Internet).
BTOP - Broadband Technology Opportunities Program - Part of the American Recovery and Reinvestment Act (ARRA), BTOP is the program created by the U.S. Department of Commerce

focused on expanding broadband access, expanding access to public computer centers, and improving broadband adoption.

C

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

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

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

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

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

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

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

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

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

D

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

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

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

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

DSLAM - Digital Subscriber Line Access Multiplier - A piece of technology installed at a telephone company's CO that connects the carrier to the subscriber loop (and ultimately the customer's PC).
DWDM - Dense Wavelength Division Multiplexing - A SONET term which is the means of increasing the capacity of SONET fiber-optic transmission systems.

E

E-rate - A federal program that provides subsidy for voice and data lines to qualified schools, hospitals, Community-Based Organization (CBOs), and other qualified institutions. The subsidy is based on a percentage designated by the FCC.
Ethernet - A local area network (LAN) standard developed for the exchange data with a single network. It allows for speeds from 10 Mbps to 10 Gbps.
EON - Ethernet Optical Network - The use of Ethernet LAN packets running over a fiber network.
EvDO - Evolution Data Only - A new wireless technology that provides data connections that are 10 times faster than a regular modem.

F

FCC - Federal Communications Commission - A federal regulatory agency that is responsible for, among other things, regulating VoIP.
Fixed Wireless Broadband - The operation of wireless devices or systems for broadband use at fixed locations such as homes or offices.
Franchise Agreement - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.
FTTH - Fiber To The Home - Another name for fiber to the premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds.
FTTN - Fiber To The Neighborhood - A hybrid network architecture involving optical fiber from the carrier network, terminating in a neighborhood cabinet that converts the signal from optical to electrical.
FTTP - Fiber To The Premise (Or FTTB – Fiber To The Building) - A fiber optic system that connects directly from the carrier network to the user premises.

G

Gbps - Gigabits per second - 1,000,000,000 bits per second or 1,000 Mbps. A measure of how fast data can be transmitted.
GPON - Gigabyte-Capable Passive Optical Network - Uses a different, faster approach (up to 2.5 Gbps in current products) than BPON.
GPS - Global Positioning System - A system using satellite technology that allows an equipped user to know exactly where he is anywhere on earth.

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

H

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

I

IEEE - Institute of Electrical and Electronics Engineers (pronounced "Eye-triple-E.").
ILEC - Incumbent Local Exchange Carrier - The traditional wireline telephone service providers within defined geographic areas. They typically provide broadband Internet service via DSL technology in their area. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs.
IP-VPN - Internet Protocol - Virtual Private Network - A software-defined network offering the appearance, functionality, and usefulness of a dedicated private network.
ISDN - Integrated Services Digital Network - An alternative method to simultaneously carry voice, data, and other traffic, using the switched telephone network.
ISP - Internet Service Provider - A company providing Internet access to consumers and businesses, acting as a bridge between customer (end-user) and infrastructure owners for dial-up, cable modem, and DSL services.

K

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

L

LAN - Local Area Network - A geographically localized network consisting of both hardware and software. The network can link workstations within a building or multiple computers with a single wireless Internet connection.
LATA - Local Access and Transport Areas - A geographic area within a divested Regional Bell Operating Company is permitted to offer exchange telecommunications and exchange access service. Calls between LATAs are often thought of as long-distance service. Calls within a LATA (IntraLATA) typically include local and local toll telephone services.
Local Loop - A generic term for the connection between the customer's premises (home, office, etc.) and the provider's serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.
Low Income - Low income is defined by using the poverty level as defined by the U.S. Census Bureau. A community's low-income percentage can be found at www.census.gov.

M

MAN - Metropolitan Area Network - A high-speed date intra-city network that links multiple locations with a campus, city, or LATA. A MAN typically extends as far as 50 kilometers (or 31 miles).
Mbps - Megabits per second - 1,000,000 bits per second. A measure of how fast data can be transmitted.
Metro Ethernet - An Ethernet technology-based network in a metropolitan area that is used for connectivity to the Internet.
Multiplexing - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time. Multiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

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

O

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

P

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

R

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

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

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

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

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

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

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

T

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

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

U

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

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

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

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.