WHITE PINE COUNTY

TECHNOLOGY ACTION PLAN

PREPARED BY CONNECT NEVADA
AND THE
WHITE PINE COUNTY BROADBAND COMMITTEE

JUNE 25, 2013

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 2012, 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 2012, Connected Nation also surveyed 7,004 businesses in 9 states. Based on this data, Connected Nation estimates that at least 1.8 million businesses - 24% - 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 *Consumer Broadband Adoption Trends*, Connected Nation, Inc., March 2013, http://www.connectednation.org/survey-results/residential
3 Connected Nation, *Broadband and Business: Leveraging Technology to Stimulate Economic Growth,* http://www.connectednation.org/survey-results/business
4 Connected Nation, parent company for Connect Nevada, is a national non-profit 501(c)(3) organization that expands access to and use of broadband Internet and the related technologies that are enabled when individuals and communities have the opportunity and desire to connect. Connected Nation works in multiple states to engage community stakeholders, state leaders, and technology providers to develop and implement technology

Methodology

By actively participating in the Connected Community Engagement Program, the White Pine County Broadband Committee is boosting the community's capabilities in education, healthcare, and public safety, along with stimulating economic growth and spurring job creation. The White Pine County Broadband Committee has collaborated with multiple community organizations and residents to:

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

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expansion programs with core competencies centered around the mission to improve digital inclusion for people and places previously underserved or overlooked.

CONNECTED ASSESSMENT

The Connected assessment framework is 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.

- White Pine County achieved a score of 57 points out of 120 for overall broadband and technology readiness.
- The county scored 16 out of a possible 40 points in broadband access primarily because of a lack of access to appropriate broadband speeds as suggested by the National Broadband Plan. The county has approximately 26.86 % of households with access to 3 Mbps; this same data point impacted the score in the Broadband Speeds section.
- The county scored 2 out of a possible 40 points in broadband adoption which is an

indication of a strong need to develop digital literacy and awareness programs to promote the benefits of broadband.

- The county scored 39 out of a possible 40 points in broadband use, which reflects a meaningful use of broadband particularly in economic development, government, education, and healthcare services.

Community Technology Scorecard Community Champion: Jim Garza Community Advisor: Ariel Martinez			
FOCUS AREA	**ASSESSMENT CRITERIA**	**COMMUNITY SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	0	10
	Broadband Speeds	0	5
	Broadband Competition	2	5
	Middle Mile Access	6	10
	Mobile Broadband Availability	8	10
	TOTAL ACCESS SCORE	**16**	**40**
ADOPTION	Digital Literacy	0	10
	Public Computer Centers	2	10
	Broadband Awareness	0	10
	Vulnerable Population Focus	0	10
	TOTAL ADOPTION SCORE	**2**	**40**
USE	Economic Opportunity	10	10
	Education	10	10
	Government	9	10
	Healthcare	10	10
	TOTAL USE SCORE	**39**	**40**
COMMUNITY ASSESSMENT SCORE		**57**	**120**

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.

Itemized Key Findings

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

ACCESS
- 10 last-mile broadband providers currently provide service in White Pine County
  - 26.89% of households have access to 3 Mbps.
  - More than 2% of White Pine County homes have access to 6 Mbps service.
  - 74.23% of White Pine County households have access to more than 1 provider.
- Middle mile fiber infrastructure is available from one provider in White Pine County.
- 95.8% of White Pine County households have access to mobile broadband.

ADOPTION
- 6 Public Computer Centers (PCC) with a total of 25 computers are open to the public.

USE
- At least 9 uses of broadband were identified in the area of economic opportunity including 5 advanced uses and 4 basic uses.
- At least 9 uses of broadband were identified in the area of education including 6 advanced uses and 3 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 8 uses of broadband were identified in the area of healthcare including 6 advanced uses and 2 basic uses.

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

Technology Providers
- 10 broadband providers were identified in White Pine County

Technology Facilities
- 6 public computing centers
- 3 wireless hotspots
- 2 video conference facilities

Community Websites
- 4 Business-related websites (excluding private businesses)
- 3 Education-related websites
- 7 Government-related websites

- 1 Healthcare-related website
- 1 Library-related website
- 4 Tourism-related websites

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 4 priority projects, each describing a project plan with suggested steps. This is followed by a complete list of all recommended actions.

Lund, NV ANTC Broadband Project

White Pine County Website Redevelopment

Baker, NV Mobile Access Project

Eastern Nevada Food Bank (ENFB) Serving White Pine

Complete List of Recommended Actions

Below is a complete list of recommended actions. Numbered actions indicate those recommended by Connect Nevada, whereas non-numbered actions indicate those developed by the White Pine County Broadband Team. Detailed descriptions of each solution proposed by Connect Nevada can be found in the *Recommended Actions* section later in this report.

ACCESS

Broadband Availability
1. Improve Campus Connectivity
2. Apply to USDA for Funding to Support Broadband Build-out in Community
3. Perform an Analysis of Local Policies and Ordinances

Broadband Speeds – No recommended actions.

Broadband Competition – No recommended actions.

Middle Mile Access
4. Develop Public-Private Partnerships to Deploy Broadband Service
5. Develop & Issue an RFP for Build-out

6. Study and Possibly Reassess Major Telecom Purchase Contracts

Mobile Broadband Availability
7. Deploy Educational WiMAX
8. Identify, Map, and Validate Broadband Demand
9. Complete a Vertical Assets Inventory
10. Perform a Broadband Build-out Analysis in Unserved Areas

ADOPTION

Digital Literacy
11. Distribute Digital Literacy Content
12. Facilitate Internet Safety Classes

Public Computer Centers
13. Provide Incentives to Encourage Computer Purchases among Students
14. Establish a "Community Technology Academy"

Broadband Awareness
15. Implement a Community-Based Technology Awareness Program
16. Facilitate a Technology Summit

Vulnerable Population Focus
17. Initiate a Community Computer Refurbishment Program
18. Procure a Multipurpose Mobile Technology Center
19. Develop a Technology Mentorship Program

USE

Economic Opportunity
20. Develop or Identify a Broadband Training and Awareness Program for Small and Medium Businesses
21. Establish a "Digital Factory"

Education
22. Improve Education through Digital Learning
23. Connect all School Classrooms to the Internet

Government
24. Improve Online Business Services Offered by the Government
25. Pursue Next Generation 911 Upgrades

Healthcare

26. Promote Telemedicine in Remote Areas

Current Community Technology Developments in White Pine County

Geographic/Demographic Information

White Pine County is located in eastern Nevada. The county has a total area of 8,897 square miles, of which 8,876 square miles is land and only 21 square miles is water. The bordering counties are Elko County in the north, Eureka County in the west, Nye County in the southwest, Lincoln County in the south, Utah's Millard County in the east, and Tooele County in Utah in the northeast. The seat of the county is Ely, which, when combined with Ruth and McGill, accounts for almost 90% of the population of 10,098 people. Based on the 2010 U.S. Census, the county's population density is about 1.1 persons per square mile. About 84% of the population 25 years and older are high school graduates, and 13% have at least a bachelor's degree.   Employees' travel time to work averages 18.4 minutes.

The per capita income in the past 12 months is $21,615, while the median household income is at $48,545. In the 2011 Census estimates, about 16% of the population was said to have been living below the poverty level, 22% of those being under the age of 18 years, and 15% were persons 65 years of age and over.

Further, estimates showed that there were 4,483 housing units in the County, of which 77% are owned. The median value of owner occupied homes is about $117, 500. The average number of households in the county is estimated at 3,480, at an average of 2.75 persons per household.

U.S. Census QuickFacts	White Pine County	Nevada
People		
2011 Population Estimates	10,098	2,723,322
Persons under 5 years, percent 2011	6.6%	6.8%
Persons under 18 years, percent 2011	21.5%	24.4%
Persons 65 years and over, percent 2011	15.2%	12.5%
High School Graduate: 25+years old, percent (2006-2010)	83.8%	84.3%
Bachelor's Degree or higher, percent (2006-2010)	13.4%	21.8%
Mean Travel time to work, workers 16+ yrs minutes (2006-2010)	18.4	23.6
Housing Units 2011	4,483	1,183,873
Housing Ownership Rate (2006-2010)	76.6%	60.1%
Housing Units in multi-unit structures, percent (2006-2010)	6.0%	29.4%

Median value of owner-occupied housing units (2006-2010)	$117,500	$254,200
Living in same house 1 year & over percent (2006-2010)	87.4%	78.2%
Households (2006-2010)	3,480	979,621
Persons per household (2006-2010)	2.75	2.65
Per capita money income in past 12 months, dollars (2010)	$21,615	$27,589
Median household income, dollars (2006-2010)	$48,545	$55,726
Persons below poverty level, percent (2006-2010)	15.5%	11.9%
Business		
Private nonfarm establishments 2010	210	59,207
Private nonfarm employment 2010	2,506	1,002,956
Private nonfarm employment percent change (2006-2010)	39.6	11.1
Non employer establishments 2010	558	177,181
Building Permits 2011	1	6,163
Geography		
Land area in square miles 2010	8,875.65	109,781.18
Persons per square mile 2010	1.1	24.6

Source: U.S. Census Bureau State & County QuickFacts

Historical Information

Since the late 19th century and until nearly the 20th century, White Pine County's major industry was mining, specifically copper, silver, and gold. The most notable operations included a series of open-pit copper mines near the town of Ruth and the copper smelter in McGill.

Historically, White Pine County did not get its fair share of growth both in terms of population and employment. The County's population decreased by 9.3%, from 10,064 in 1969 to 9,112 in 2007, while both the U.S. and the State's population grew by almost 50% and 430% respectively. Similarly, employment growth during the same time period was significantly lower at 23.7%, while the State's growth was 583.7%, and the U.S. had grown by 98.7%. In real terms, (index: 1969=100), the County's per capita income from 1969-2007 has only grown at an average of 2.33% annually, while average earnings per job (in real terms) has only grown 0.72% from 1970-2007. (Source: University of Nevada Center for Economic Development Technical Report on White Pine County, UCED 2009/10-10)

Economic Development

The White Pine County Community & Economic Development Office shared its vision for the County, which includes industry diversification, job sustainability, and community service growth. Both their short term and strategic plans are working to develop a multiple-industry base and a healthy workforce supported by industry-related educational programs. Their goal is to deliver an economy that can maintain a high level of community services and quality of life.

Broadband Information

White Pine County leaders believe that increasing the availability and quality of broadband will allow for better opportunities to diversify its employment base and improve communications for businesses. Many companies within this county need to utilize social media to further enhance their businesses with noticeable results. Improving the broadband connectivity and Internet service will facilitate video conferencing, allow development of more complex websites, and provide improved database maintenance facilities. Ultimately, County leaders believe that increased broadband bandwidth will encourage its businesses to use social media and applications to expand their markets.

Mt. Wheeler Power Corporation, the major provider of telecom services in the County, continues to improve the level of services it provides to its customers. Most recently, it has completed negotiations to use AT&T's fiber backbone to improve its DSL services. This is a good turn of events, given the reported removal of AT&T DSL services in several rural communities that might include White Pine County.

White Pine County Assessment Findings

Today, residents in White Pine County (or sections of the community) are served by 11 providers. Currently, broadband is defined as Internet service with advertised speeds of at least 768 Kbps downstream and 200 Kbps upstream. According to Connect Nevada's latest broadband mapping update, the following providers have a service footprint in the White Pine County Community:

Broadband Providers	Technology Type	Website Reference
AT&T Mobility LLC	Mobile	www.wireless.att.com
AT&T Nevada	DSL	www.att.com
Beehive Telephone Co., Inc.-NV	DSL	www.wirelessbeehive.com
Express Internet	Fixed Wireless	www.expint.net
Hughes Network Systems	Satellite	www.hughesnet.com
Mt Wheeler Power	DSL, Fixed Wireless	www.mwpower.net
StarBand Communications	Satellite	http://starband.com
Verizon Wireless	Mobile	www.Verizonwireless.com
ViaSat, Inc.	Satellite	www.wildblue.com
Wireless Beehive	Fixed Wireless	www.wirelessbeehive.com

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

Organization Name	Website	Website Category
Rural Nevada Development Corp.	www.rndcnv.org	Business
Midway Gold	www.midwaygold.com	Business
Robinson Nevada Mining	www.kghminternational.com	Business
Barrick Mining	barrick.com	Business
Great Basin College	gbcnv.edu	Education
White Pine School District	whitepine.k12.nv.us	Education
UNR Extension Office	www.unce.unr.edu/about/	Education
Nevada DETR	nvdetr.org	Government
Nevada Job Connect	nevadajobconnect.com	Government
Silver State Works	silverstateworks.com	Government
JOIN, Inc.	join.org	Government
Ely Shoshone Tribe	elyshoshonetribe-nsn.gov	Government
Bureau of Land Management	www.blm.gov/nv/st/en/fo/ely_field_office.html	Government
U.S. Forest Service	http://www.fs.usda.gov/htnf	Government
William Bee Ririe Hospital	wbrhely.org	Healthcare
White Pine County Library	clan.lib.nv.us/polpac/library/clan/white/library.htm	Libraries
Chamber of Commerce	whitepinechamber.com	Tourism
Nevada Northern Railway Museum	nnry.com	Tourism
McGill Drug Store Museum	mcgilldrugstoremuseum.org	Tourism
White Pine County Tourism and Recreational Board	http://elynevada.net/	Tourism

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

Organization Name	Resource Type
White Pine County Library	Public Computer Facility
Join/Nevada Job Connect.	Public Computer Facility
Silver State Works	Public Computer Facility
UNCE 4-H Program	Public Computer Facility
McGill Community & Cultural Center	Public Computer Facility
Ely Shoshone Tribe Library/Ed Department	Public Computer Facility
Great Basin College	Video Conference Facility
UNR Cooperative Extension Office	Video Conference Facility
McDonald's	Wireless Hotspot

White Pine County Library	Wireless Hotspot
White Pine County Senior Center	Wireless Hotspot

Connected Assessment

Community Technology Scorecard			
Community Champion: Jim Garza			
Community Advisor: Ariel Martinez			
FOCUS AREA	**ASSESSMENT CRITERIA**	**COMMUNITY SCORE**	**MAXIMUM POSSIBLE SCORE**
ACCESS	Broadband Availability	0	10
	Broadband Speeds	0	5
	Broadband Competition	2	5
	Middle Mile Access	6	10
	Mobile Broadband Availability	8	10
	TOTAL ACCESS SCORE	**16**	**40**
ADOPTION	Digital Literacy	0	10
	Public Computer Centers	2	10
	Broadband Awareness	0	10
	Vulnerable Population Focus	0	10
	TOTAL ADOPTION SCORE	**2**	**40**
USE	Economic Opportunity	10	10
	Education	10	10
	Government	9	10
	Healthcare	10	10
	TOTAL USE SCORE	**39**	**40**
COMMUNITY ASSESSMENT SCORE		**57**	**120**

ACCESS Score Breakdown

Broadband Availability (0 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 October 2012 data collected by Connect Nevada, 26.89% of White Pine County residents had access to broadband speeds of 3 Mbps or greater.**

Broadband Speeds (0 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 October 2012 data collected by Connect Nevada, 2.31% of White Pine County residents had access to broadband speeds of 6 Mbps.**

Broadband Competition (2 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 October 2012 data collected by Connect Nevada, 74.23% of White Pine County 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.

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

Mobile Broadband Availability (<u>8 out of 10 Points Possible</u>) – 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 2012 data collected by Connect Nevada, 95.8% of White Pine County residents had access to mobile broadband service.**

A **ADOPTION Score Breakdown**

Digital Literacy (<u>0 out of 10 Points Possible</u>) – 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. White Pine County does not offer any digital literacy programs.

Public Computer Centers (2<u>out of 10 Points Possible</u>) – 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 White Pine County is below.

Organization Name	Number of Open Hours per Week	Number of Computers	Available Computer Hours per Week
Ely Shoshone Library	40	8	320
White Pine County Library	39	8	312
White Pine Senior Center	40	1	40
4-H Program	40	1	40
JOIN/Voc Rehab/Job Cont	40	4	160
McGill Cultural Center	7	3	21

Broadband Awareness (<u>0 out of 10 Points Possible</u>) – 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. White Pine County does not offer any broadband awareness programs.

Vulnerable Population Focus (0 out of 10 Points Possible) – A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc. White Pine County does not offer any programs focusing on vulnerable populations.

USE Score Breakdown

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
whitepinechamber.com	Chamber Website	Basic
nps.gov	Great Basin National Park Website	Advanced
blm.gov	Bureau of Land Management Website	Advanced
fs.fed.us	U.S. Forest Service Website	Advanced
parks.nv.gov	Cave Lake & Ward Charcoal Ovens State Park Website	Advanced
rndcnv.org	Rural Nevada Development Corporation Website	Advanced
elynevada.net	White Pine County Tourism & Recreation Board Website	Basic
wpmuseum.org	White Pine Public Museum Website	Basic
mcgilldrugstoremuseum.org	McGill Drug Store Museum Website	Basic

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

listed below and identified as basic or advanced.

Application Provider	Description	Basic/ Advanced
PowerSchool	WPSD Electronic Gradebook & Parent Portal	Advanced
Interactive White Board	WPSD Internet Enabled Boards	Advanced
Odyssey Ware	WPSD Online Classes	Advanced
whitepine.k12.nv.us	White Pine School District Website	Basic
gbcnv.edu	Great Basin College Website	Basic
Interactive Classes & Tutors	GBC Online Classes & Tutors	Advanced
Online Career Center	GBC Online Career Center	Advanced
State CLAN System	Library Book and Rental	Advanced
Catalog & Homework Resources	Online Library Resources	Basic

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
whitepinecounty.net	White Pine County Website	Advanced
elyshoshonetribe-nsn.gov	Ely Shoshone Tribe Website	Basic
Emergency Response Center	WP County Smart Building	Advanced
ADS / WP County Assessor	Assessment Data Online	Advanced
ADS / WP County Treasurer	Tax Data Online	Advanced

Healthcare (10 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
wbrhely.org	William Bee Ririe hospital/Clinic	Basic

health.nv.gov/BFHS_LocationsRural_Ely.htm	State Website Link to WP County Public Health	Basic
Telemedicine	Monitor Patients/Issue Prescriptions Public Health Nurse	Advanced
Office Communicator	Training/Policy/Remote Access for Public Health Office	Advanced
Remote Monitoring	Remote Patient Monitoring William Bee Ririe Hospital/Clinic	Advanced
Telemedicine	Remote Usage (Prescription, etc.) William Bee Ririe Hospital/Clinic	Advanced
e-Health	Over 75% Usage, William Bee Ririe Hospital/Clinic	Advanced
NBP Standard Bandwidth	Internal Only, William Bee Ririe Hospital/Clinic	Advanced

ACTION PLAN

Priority Projects

This exercise has culminated in the outlining of projects to allow White Pine County to continue its recognized excellence in technology and broadband planning across the community. Below are 4 priority projects, each describing a project plan with suggested steps. This is followed by a complete list of all recommended actions.

Lund, NV ANTC Broadband Project

Project Description:

Utilizing a new tower that is being constructed near the center of town along with fiber-fed TDM circuits available from the ILEC, ANTC - through its subsidiary, Atomsplash - will deliver high-speed access with download speeds up to 6 Mbps for every business and residence in the town of Lund. Leveraging the resources of the TAG and ANTC's proven track record for securing Community Connect Grant funding, ANTC will apply for (and expects to be awarded) the contract to support the deployment of FTW Internet to every home and business interested in subscribing to service. In addition, ANTC will construct and operate a PCC containing 10 computers for the community for no less than 24 months, providing, in addition to a free local Wi-Fi hotspot, free Internet access to those residents that do not elect to subscribe to the commercial service. Further, all local community anchor institutions will receive free basic Internet service during the same 24-month period.

Goals:
1. Provide high-speed broadband access to 100% of residences and businesses in Lund.
2. Provide free basic Internet service to 100% of CAIs in Lund.
3. Provide a PCC operated at no cost to the community for 24 months.

Action Items:
1. Confirm design elements of the entire project.
2. Get the blessing of the County and Town boards on ANTC proposal
3. Complete Engineering and Compliance and File Application
4. Obtain access to the new tower being constructed in Lund to fiber fed bandwidth (AT&T).
5. Implement project.

Implementation Team:
1. Jim Garza – WPCEDA
2. Blaze Griffin – Lund Town Board

3. Seth Urbanowitzs – UNCE ANTC Grant Team

White Pine County Website Redevelopment

Project Description:
Redesign of the White Pine County website. The new integrated website that was recently launched is a work in progress but now provides information from various departments of the county government.

Goals:
1. Creation of a fully integrated county website that will serve as the main source of information for services available and offered through the County Government.
   - Assessor – Explore the services provided by the assessor's office.
   - Clerk – Gain details about the county clerk's office.
   - EMS – Explore the county's emergency medical services.
   - Fire Department – Check out the activities of the Fire Department that help keep you and your family safe.
   - Job Postings – Browse current employment opportunities.
   - Library – Utilize the library's online resources.
   - Public Health – Find out about the programs offered by the Public Health Department.
   - Recorder – Utilize the online fee schedule and view records.
   - Sheriff – Learn about services offered by the Sheriff's Office.
   - Social Services – View programs offered to assist eligible citizens.
   - Treasurer – View helpful tax information.
2. Provide public access and facilities for online transactions specifically related to county transactions.

Implementation Team
1. Patrice Lytle – County Web Administrator
2. Chris Flannery – County Building Inspector

Baker, NV Mobile Access Project

Project Description:
Baker, a small community east of Ely, is lacking a robust network for mobile access. This lack of infrastructure impacts public safety as well as the economic vitality of a community reliant on tourism dollars (Great Basin National Park). Baker has been working tirelessly for some time to

identify a solution to this problem. The technology team, in collaboration with Connect Nevada, will identify a potential provider willing to expand both mobile broadband and fixed wireless through collocation.

Goals:
1. Expand mobile access to Baker, Nevada while at the same time providing for the development of a more robust fixed wireless network.

Implementation Team:
1. Baker Town Advisory Board
2. Connect Nevada
3. Lynne Hoffman
4. Abby Johnson
5. Terry Stedman

Eastern Nevada Food Bank (ENFB) serving White Pine

Project Description:
ENFB is a new organzation with the objective of achieving sustainability in rural communities that lack healthy food choices. As a Nevada non-profit, the organization has been established as a Community Development Corporation (CDC). As a CDC it will provide programs, offer services, and engage in activities that promote and support community development. The technology team should support the development of this organization, using technology as a catalyst for change to further develop the food network and assist in fundraising efforts.

Goals:
Support ENFB through the use of technology (where appropriate) to maximize the sourcing and distribution of healthy food resources. This includes support and collaboration in the following areas:
1. Humanitarian healthy food distribution.
2. New job creation for low-income veterans and families.
3. Youth and adult education in agricultural and business management practices.
4. Social disorder and judicial community service support.

Implementation Team:
1. Jim Garza – White Pine County Community & Economic Development
2. Irene Bustamante – Nevada Assemblywoman, District 2
3. Seth Urbanowitz – UNR Cooperative Extension – Ely, NV
4. Lori Romero – White Pine County Library/Senior Center
5. Chuck Stahl – Nevada Environmental Health Manager

Recommended Actions

Access: Recommended Actions

Broadband Availability

1. Improve Campus Connectivity

Improved access includes classroom access and better wireless coverage in common areas and student centers, as well as high-speed broadband access to student dorms. Before expanding access, a network assessment should be undertaken to ensure current coverage. Part of the expansion should include indirect requirements such as the potential need for increased tech support and power consumption due to increased usage of devices.

Goal:
Ensure that all higher education campuses (especially community colleges) have adequate access to broadband networks.

Benefits:
- Beyond the research and development tools, broadband enables higher education institutions to offer college credit for online courses for advanced high school students; offer specialized science and technology online learning experiences in subjects where there are too few specialized K-12 teachers; support adult students through personalized career and technical programs while working around the needs of their jobs and families; and extend continuing education programs by offering diverse, quality content to the public to foster job skills, community development, and personal growth.

Action Items:
- Utilize the national broadband availability map and assess your community's needs. The U.S. Department of Education developed this broadband availability map and search engine as part of a collaborative effort with the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC). This education-focused broadband map and database builds upon the NTIA State Broadband Initiative (SBI) Program that surveys bi-annually broadband availability and connectivity for the 50 United States, 5 territories, and the District of Columbia.
- Research federal and state funding sources.

2. Apply to USDA for Funding Support to Build out Broadband in Community

The USDA, through its Rural Development mission area, administers and manages housing, business, and community infrastructure and facility programs through a national network of state and local offices. Rural Development has an active portfolio of more than $165 billion in

loans and loan guarantees. These programs are designed to improve the economic stability of rural communities, businesses, residents, farmers and ranchers and improve the quality of life in rural areas.

Farm Bill Loan Program - USDA
This program is designed to provide loans for funding, on a technology neutral basis, for the costs of construction, improvement, and acquisition of facilities and equipment to provide broadband service to eligible rural communities.

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

Eligibility:
- Must be a rural area. Rural area means any area, as confirmed by the latest decennial census by the U.S. Census Bureau, which is not located within: (a) A city, town, or incorporated area that has a population of more than 20,000 people; or (b) An urbanized area contiguous and adjacent to a city or town with a population of more than 50,000 people. An urbanized area means a densely populated territory as defined in the latest decennial census.
- To be eligible for a broadband loan, an applicant may be either a nonprofit or for-profit organization, and must take one of the following forms: (1) Corporation; (2) Limited liability company (LLC); (3) Cooperative or mutual organization; (4) Federally recognized Indian tribe or tribal organization; or (5) State or local government, including any agency, subdivision, or one of their units.
- A service area may be eligible for a broadband loan if all of the following are true: (1) The service area is completely contained within a rural area; (2) At least 25 percent of the households in the service area are underserved households; (3) No part of the service area has three or more incumbent service providers; (4) No part of the funded service area overlaps with the service area of current RUS borrowers and grantees; (5) No part of the funded service area is included in a pending application before RUS seeking funding to provide broadband service.

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

Community Connect Program – USDA

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

Additional Information:
- The funding will support construction, acquisition, or lease of facilities, including spectrum, to deploy broadband transmission services to all critical community facilities and to offer such services to all residential and business customers located within the proposed service area.
- The funding can be put towards the improvement, expansion, construction, acquisition, or leasing of a community center that furnishes free access to broadband Internet service, providing that the community center is open and accessible to area residents before, during, and after normal working hours and on Saturday or Sunday.
- All equipment purchases with grant and/or matching funds must be new or non-depreciated.

Eligibility:
- Must be single community with a population of less than 20,000 that does not have Broadband Transmission Service.
- Applicants must be organized as an incorporated organization, an Indian tribe or tribal organization, a state or local unit of government, or other legal entity, including cooperatives or private corporations or limited liability companies organized on a for-profit or not-for-profit basis.
- The project must deploy Basic Broadband Transmission Service, free of all charges for at least 2 years, to all Critical Community Facilities located within the proposed Service Area. Additionally, it should offer Basic Broadband Transmission Service to residential and business customers within the proposed Service Area.

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

Distance Learning and Telemedicine Loans and Grants Program – USDA
Provides loans and grants to rural community facilities (e.g. schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide healthcare and educational benefits to rural areas.

Additional Information:

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

Eligibility:

To be eligible for a grant, your organization must:
- Currently deliver or propose to deliver distance learning or telemedicine services for the term of the grant. To receive a grant, the purposes must meet the grant definition of distance learning and telemedicine. The DLT program is focused on sustainability. Planning studies, research projects, and short-term demonstration projects of less than two years will not be considered.
- Be legally organized as an incorporated organization or partnership; an Indian tribe or tribal organization; a state or local unit of government; a consortium; or other legal entity, including a private corporation organized on a for-profit or not-for-profit basis with the legal capacity to contract with the United States Government.
- Operate a rural community facility or deliver distance learning or telemedicine services to entities that operate a rural community facility or to residents of rural areas at rates calculated to ensure that the benefit of the financial assistance passes through to such entities or to residents of rural areas.

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

Universal Service Rural Health Care Program – Universal Service Administration Company

The Rural Health Care program supports healthcare providers serving rural communities by funding telecommunications services necessary for the provision of healthcare. The program is intended to ensure that rural healthcare providers pay no more for telecommunications in the provision of healthcare services than their urban counterparts.

Additional Information:
- Public and non-profit healthcare providers in rural areas can receive discounts on installation and monthly charges for telecommunications and Internet access service used for the provision of healthcare by using one of two methods: a mileage-based calculation, or a calculation of the "urban rate" to receive support equal to the difference between what they pay and what they would pay if they were receiving the service in any city in their state with a population of 50,000 or more.
- The rural healthcare provider must submit a form requesting services to the Universal Service Administrative Company (USAC). Once the form is approved, it is posted on

USAC's website seeking bids from telecommunications companies interested in providing the requested services. After the rural healthcare provider selects a provider from qualified bidders and USAC has approved the funding request, the services may begin. Support from the USF is then used to help pay for eligible services provided to the rural healthcare provider.

Eligibility:
Eligible organizations include:
- post-secondary educational institutions offering healthcare instruction, including teaching hospitals and medical schools;
- community health centers or health centers providing healthcare to migrants;
- local health departments or agencies;
- community mental health centers;
- not-for-profit hospitals;
- dedicated emergency departments in rural for-profit hospitals;
- rural healthcare clinics;
- part-time eligible entities located in facilities that are ineligible; and
- groups of healthcare providers consisting of one or more entities described above.

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

3. Perform an Analysis of Local Policies and Ordinances

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

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

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

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

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

Broadband Speeds

No recommended actions.

Broadband Competition

No recommended actions.

Middle Mile Access

4. Develop Public-Private Partnerships to Deploy Broadband Service

Public-private partnerships take many forms, limited only by the imagination and legal framework in which the municipality operates. Some communities issue municipal bonds to fund construction of a network, which they lease to private carriers, with the lease payments covering the debt service. Others create non-profit organizations to develop networks in collaboration with private carriers or provide seed investment to jumpstart construction of networks that the private sector is unable to cost-justify on its own.

A public-private partnership should not be simply seen as a method of financing. The strength of these partnerships is that each party brings something important to the table that the other doesn't have or can't easily acquire. The community can offer infrastructure (publicly-owned building rooftops, light poles, towers, and other vertical assets for mounting infrastructure) for the deployment of the system, as well as committed anchor tenants. Private-sector partners bring network-building and operations experience.

Goal:
Fund broadband network deployment

Benefits:
- The public sector transfers much of the risk for private investment. For example, the public sector has many funding tools available, including incentivizing continued investment through tax credits, encouraging greater availability of private capital through government guaranteed loans, or government being a direct source of capital through loans or grants.
- The partnership can aggregate demand and reduce barriers to deployment. By working together, public and private parties can educate and build awareness needed for the public to better integrate the use of broadband into their lives, thereby improving the business case for broadband deployment.
- A good partnership concentrates investment on non-duplicative networks and aims to ensure that all residents have access to adequate broadband service.

Action Items:
- Decide on the technology (e.g. cable, DSL, fiber, etc.).
- Issue an RFP.
- Develop a finance and ownership model.

5. Develop & Issue an RFP for Build-out

An RFP (request for proposals) is a widely used technique for establishing a selection of qualified responses for which to choose when contracting for services. The RFP should provide a guidance and due diligence framework for interested broadband providers and vendors. Furthermore, the RFP should request that interested parties provide plans for cost-effective community broadband networks, including equipment lists, locations, and itemized engineering cost estimates. In addition, the completed design should also include what technology will be needed at customer premises, the performance that can be expected, and recurring costs associated with operating and maintaining the system once it is in place.

Goal:
To identify the most credible and reliable broadband provider to serve your region's households and businesses.

Benefits:
- After completing an RFP, your community will have a good handle on the potential project risks, as well as benefits, associated with build out.
- An RFP lets providers know that the situation will be competitive. The competitive bidding scenario is often the best method available for obtaining the best pricing and, if done correctly, the best value.

Action Items:
- Content: The RFP should include a project overview, background information, scope of work, and selection criteria. Additionally, the RFP should require that vendors provide a cover letter, a statement of project understanding, a business plan, a proposed project schedule, qualifications, references, and cost.
- Distribution: The RFP could be posted to the community's website. Alternatively, one method of efficiently distributing an RFP is to send out to a wide audience a one-page document announcing the availability of the full RFP. Vendors and consultants who are interested in your project can then contact you to obtain the full RFP.

6. Study and Possibly Reassess Major Telecom Purchase Contracts

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

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

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

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

Mobile Broadband Availability

7. Deploy Educational WiMAX

Deploy WiMAX to the community and provide students with WiMAX-enabled laptops to ensure equal access for all students regardless of socioeconomic status. WiMAX is primarily a wireless and highly cost effective means of extending the school district's intranet-based content and applications to the student body beyond the school campus and outside of school hours equating to anytime, anywhere instruction.

WiMAX is an IP-based, wireless broadband access technology that provides performance similar to Wi-Fi networks, but with the coverage and quality of service of cellular networks. WiMAX can provide broadband wireless access (BWA) up to 30 miles (50 km) for fixed stations, and 3 - 10 miles (5 - 15 km) for mobile stations. Developing a WiMAX network should be done in partnership with providers, technology organizations, and local government.

Community-wide WiMAX networks require significant infrastructure, including: towers (number and placement determined by a site survey conducted by the installation company); antennas; WiMAX transmitters and receivers; management server; Internet backhaul; and power. A one-to-one laptop and WiMAX program would include network and hardware maintenance costs. WiMAX infrastructure is a capital expense that can be amortized over many years. The typical infrastructure costs $5-20 per student per month, over a five-year period, depending on factors such as population density, terrain, and the size of the area to be covered.

Goal:
Extend school district's intranet-based content and ensure equal access to home Internet.

Benefits:
- Affordable. WiMAX is cheaper than DSL, Cable, Fiber to the Home, and 3G wireless. This low cost per home passes brings it into the realm of possibilities for a school district to build its own private access network independent of commercial operators.
- Empowers all students to access online educational material after school hours so that digital content is not restricted to school or library computer labs for low-income students who cannot afford laptops or internet access at home.
- Provides equal hardware and Internet access to all students.
- Supports curriculum updates and increased push for STEM education.

Action Items:
- Develop partnership with area providers, technology and education organizations, local government, and school district.
- Assess infrastructure needs.
- Contact local or national WiMAX service and equipment providers.

8. Identify, Map, and Validate Broadband Demand
Develop a team to conduct research surveys and market analyses to validate a business case for additional broadband deployment. A market analysis includes research on the existing and potential service offerings and the respective rates to determine the levels of interest in the services and rate plans offered by the client. The team should provide accurate, timely, and thorough solutions, accompanied by personalized service to meet the needs of communities or broadband providers.

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

Benefits:
- Enables the ability to better understand the key drivers of the broadband market.
- Validates the business case for network build out and capacity investment.

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

9. Complete a Vertical Assets Inventory

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

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

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

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

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

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

Conduct an onsite visual assessment of the defined geographic area seeking broadband coverage. The assessment determines the feasibility of deploying various Internet systems in a defined area. You should gather site-specific information required for (i) determining use of existing infrastructure, (ii) designing wired and wireless Internet systems using these assets, and (iii) expanding the broadband coverage in the defined area.

Wireless may be the best likely solution. To assist with that, you should conduct a visual assessment of the vertical assets (broadcast towers and water tanks) to determine the feasibility of deploying a fixed wireless broadband Internet system in the unserved community and to gather site-specific information required for that purpose.

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

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

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

ADOPTION: RECOMMENDED ACTIONS

Digital Literacy

11. Distribute Digital Literacy Content

Leverage the abundant digital literacy content available online to distribute to local trainers. Currently, numerous non-profit organizations and for-profit corporations provide curriculum that can be adapted for classroom or self-paced study. Some organizations also provide additional resources for instructor use, including classroom setup information, teaching tips for each course, additional practice, test item files, and answers to frequently asked questions. Digital literacy content can be deployed via local websites (a community portal), print material, podcasts, blogs, and videos.

Additionally, your community could create a partnership between libraries, school systems, computer suppliers, and broadband providers to provide free training and discounted computers and broadband service to low-income community members who are not participating in the digital age. An example of such a program is Connected Nation's Every Community Online program. This is an innovative program that is providing free digital literacy training, access to low-cost computers, and discounted broadband access to communities across the country.

Goal:
Facilitate partnerships in order to provide digital literacy training.

Benefits:
- Increasing the community's digital literacy facilitates widespread online access to education and other public and government services, provides equal access to opportunities such as jobs and workforce training, enables people to find information about their health, and offers the opportunity to increase levels of social interaction and civic involvement.

Action Items:
- Develop partnerships with local organizations and equip them with digital literacy content;
- Train staff to deliver the curriculum to potential adopters;
- Promote local organizations as a source of broadband access and training;
- Engage non-adopters with a comprehensive public outreach campaign, helping them understand the benefits of broadband service and inviting them to experience the value at their libraries;
- Provide curriculum to teach computer and Internet use, as well as the skills required to utilize the Internet effectively for essential services, education, employment, civic engagement, and cultural participation;

- Offer compelling promotion to participants, giving them the opportunity to adopt the technology for everyday use in their homes.

12. Facilitate Internet Safety Classes

Some of the best ways to make sure community members are aware of how to navigate the Internet safely include instituting security-awareness training initiatives that include, but are not limited to, classroom style training sessions, security awareness website(s), helpful hints via e-mail, or even posters. These methods can help ensure that community members have a solid understanding of cyber threats. There are many risks, some more serious than others.

Among these dangers are viruses erasing entire systems, a hacker breaking into a system and altering files, someone using someone else's computer to attack others, someone stealing credit card information, sexual predators making advances at children, and criminals making unauthorized purchases. Unfortunately, there's no 100% guarantee that even with the best precautions some of these things won't happen, but there are steps that can be taken to minimize the chances. Awareness training can also be used to alleviate anxiety for community members who are not using the Internet because of fear of cyber threats.

Goal:
Create a program designed to help community members who are using the Internet to identify and avoid situations that could threaten their safety, threaten business or government networks, compromise confidential information, compromise the safety of children, compromise their identities and financial information, or destroy their reputations.

Public Computer Access

13. Provide Incentives to Encourage Computer Purchases among Students

Develop a program that will enable students to obtain computers. Programs could include refurbished computers or new laptops or tablets.

Consider a group purchasing program, which would allow:
1. Special discount pricing
2. Warranty availability
3. Wired and Wireless usage throughout school and home
4. On campus access to tech support
5. Loaner computer access while devices are being repaired

Goal:
Provide equal access to computers and enable digital learning.

Benefits:
- Provides equal computer access, regardless of ability to purchase.
- Supports school wide online education initiatives.
- Enables the adoption of e-books.

Action Items:
- Research grants and private funding opportunities.
- Assess whether developing a leasing or purchasing program is more appropriate for your school.

14. Establish a "Community Technology Academy"

Develop partnership between libraries, community centers, churches (places with computer labs for public use) and schools, community colleges and universities (places with subject matter experts) to develop a "Community Technology Academy." Providers, local businesses and community volunteers may be included to provide financial and/or in-kind support for the program. Academy curriculum should include basic training in areas such as "Introduction to Computers," "Internet Basics," social networking, using communication technologies, and the use of applications such as Microsoft Office, OpenOffice or Google Docs.

Goal:
Create a partnership to underscore a community's commitment to developing a tech-savvy workforce.

Benefits:
- Creates a more digitally literate and competent populace.
- Develops community's human capital.

Action Items:
- Identify all organizations performing technology education and training services.
- Identify all the organizations that have computer labs.
- Compile a list of classes to be offered and develop content or leverage content that is currently available at minimum or no cost from organizations such as Microsoft.
- Determine what classes are currently being offered in the community.
- Develop a collaborative and cooperative approach for operating the "Community Technology Academy" between all organizations.

Broadband Awareness

15. 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:
- 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:
- 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
- Create a centralized technology portal/website which 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.

16. 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:
- Highlights successes, opportunities, and challenges regarding community technology planning.
- Develops ongoing dialogue around improving broadband access, adoption, and use.
- Unifies community stakeholders under one vision.

Action Items:
- Create community partnerships.
- Identify funding sources and hosts.
- Identify suitable speakers.
- Develop relevant content.

Vulnerable Population Focus

17. Initiate a Community Computer Refurbishment Program
The first step in establishing computer refurbishing is recruiting community members to sanitize old computers and install new software. There are several target groups for performing refurbishments: community volunteers, high school and college students, and prison inmates. Community computer refurbishing provides an opportunity for volunteers and students to gain valuable new skills and training that can be used for career enhancement, and in some cases earn credits for school or college, while reinvesting in their communities. Communities also have the option of using prison inmates to refurbish computers so that they leave prison with some valuable job skills.

There are also established residential recycling programs that your community can take advantage of. For example, Dell's Reconnect program is a residential computer recycling program that offers a convenient way to recycle your used computer equipment. You can drop off any brand of used equipment at participating Goodwill donation centers in your area. It's free, and participants receive a receipt for tax purposes. To view a full list of acceptable products and locations, visit the Dell Reconnect website.

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

- Earth 911
  Earth 911 is a comprehensive communication medium for the environment. Earth 911 has taken environmental hotlines, websites, and other information sources nationwide, and consolidated them into one network. Once you contact the Earth 911 network, you will find community-specific information on e-Cycling and much more.
- Electronic Industries Alliance's Consumer Education Initiative
  The Electronic Industries Alliance's e-Cycling Central website helps you find

Goal:
Initiate a computer refurbishment program designed to help recycle computers donated by local businesses, government, schools and other organizations, and then distribute them to low-income households and other households who face affordability barriers to computer ownership.

18. Procure a Multipurpose Mobile Technology Center

Partner with the public library or school system to acquire a bus (or equip a bookmobile) with laptop computers and wireless Internet service to deliver technology access and programs to unserved residents in remote areas in the community. Equipped with an instructor, the mobile technology center should provide digital literacy classes, job search assistance, e-learning programs, information during community events, and emergency assistance. Beyond training and education, the mobile technology center should be utilized to target and reach unserved or underserved members of the community and to provide them with a medium for participating in the community's technology-planning process.

Examples of existing mobile technology centers include:
- St. Louis Community College Mobile Tech Center
- El Paso Public Library Tech-Mobile
- State Library of Ohio Mobile Technology Training Center
- Pike County Public Library District Mobile Technology Center

Goal:
Provide unserved and underserved residents with computer and Internet access.

Benefits:
- Improves digital literacy skills of community.
- Provides outreach and awareness.
- Provides opportunity for residents to participate in community's technology-planning process.

Action items:
- Equip the vehicle with:
  - 10-20 laptops loaded with appropriate software.
  - A wireless modem that interfaces with a wireless relay station on the vehicle. Signals can be sent from any remote site in the community to partnering organization (e.g. public library) for deployment to the Web, television, or other medium.
  - Large screen TV.
  - Smart board for instruction.
  - Wheelchair accessible workstations.
  - Networked printer.
  - Full-time instructor(s).
- Develop schedule of mobile technology center visits.

19. Develop a Technology Mentorship Program

Develop a program designed to recruit local high school or college students who excel in school and exhibit advanced leadership and technology skills to assist in technology training, technical support, and outreach efforts in their communities. Recognizing students as a powerful resource for local outreach efforts, the program will challenge them to extend their technology experiences beyond the classroom. The program essentially taps into a technology knowledge base that exists through these exceptional students. Students will be required to develop programs such as training seniors to use computers, initiating a computer refurbishing program, offering basic computer training for local communities, building websites, etc.

Goal:
Utilize student technology knowledge to implement community programs.

Benefits:
- The program helps students develop self-confidence and technical competencies as they work with their families, leaders, peers, neighbors, seniors, and other members of their communities. In addition to empowering these students with real-world experience, it helps enhance their skills as they mature into productive and highly competent citizens.
- It helps to build character by awarding students opportunities to give back to their communities and embrace responsibilities associated with community service.
- The program will engage students who are creative, knowledgeable, and interested in technology as a great resource for planning, implementation, support, and using technology at a local level. With guidance and support, they will help to provide a missing, and important, link between the members of community that have experience with broadband technology and those who are currently not using it.

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

USE: RECOMMENDED ACTIONS

Economic Opportunity

20. 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 on 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:
- Provides entrepreneurial support.

- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation's 2012 Jobs and Broadband Report, businesses that are using the Internet bring in approximately $300,000 more in median annual revenues than their unconnected counterparts.

Action Items:
- 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.
- Identify or develop a business awareness and training program.
- 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. For more information, visit: http://srdc.msstate.edu/ebeat/small_business.html#

21. Establish a "Digital Factory"

A digital factory is a hybrid between an employment agency and a co-working facility that connects residents with online training courses and connections with companies that lack a physical presence in the community. Digital factories provide office space, computer and broadband access, and conference space, as well training, ranging from computer and digital literacy skills to computer programming.

"VisionPerry," located in Perry County, Tennessee, provides an ideal example of the digital factory concept. VisionPerry provides office space, high-speed Internet service, a conference room, and training/work rooms that all act as a hub for employees, remote employers, and online training courses. Training at VisionPerry currently follows two main courses: Customer Service Representative and Programmer Training.

VisionPerry currently partners with companies such as LiveOps, Salesforce.com, and Kodak, who desire customer service representatives and remote programmers. Just like a co-working

facility, workers who are employed and working at the digital factory pay, according to their salary and job levels, a small monthly fee for using the facilities and services of the digital factory, making the operation sustainable without ongoing government support.
For more information, visit http://www.visionperry.com.

Goal:
Connect IT training and education with remote employment opportunities

Benefits:
- This type of project can educate, train, employ, and has the potential to ultimately increase the productivity and economic competitiveness of your community's workforce.
- The physical infrastructure and training exposes a broad spectrum of residents to the benefits of telecommunications and productive uses of the Internet.
- Through training and work, participants will rely heavily on local ISPs, broadband technology, and emerging IT technologies to provide services to a global marketplace, in turn fostering the demand-driven strengthening of your community's physical Internet infrastructure.

Action Items:
- The digital factory concept requires a site suitable for establishing office infrastructure, educational partners to develop the workforce, and business relationships with enterprises willing to hire workers through the digital factory.
- Identify the physical, financial, and technological resources needed to establish a digital factory.
- Space to house workspace and training and support offices will be needed, as well as the equipment, such as computers and monitors for video conferencing and training.
- Develop partnerships with companies who would provide contractual employment to program graduates.
- This employment focused program can be coupled with a digital literacy program, such as Connected Nation's Every Community Online program, in order to provide basic computer and Internet skills. Connected Nation provides a discounted, turn-key training lab solution, including refurbished or new computers, presentation equipment, training curriculum, and broadband service.

Education

22. Improve Education through Digital Learning
Several digital learning platforms are available for K-12 implementation. For example, CFY is a national education nonprofit that helps students in low-income communities, together with their teachers and families, harness the power of digital learning to improve educational

outcomes. The organization is unique in that it operates both "in the cloud" (through PowerMyLearning.com, a free K-12 online learning platform) and "on the ground" (through its Digital Learning Program, a whole school initiative that works hands-on with all three of the constituents that impact student achievement: teachers, parents, and students). PowerMyLearning.com is a free online educational tool that helps students, teachers and parents locate and access over 1,000 high-quality online digital learning activities — videos, simulations, and other educational software — to propel student achievement in subjects including math, English, science, and social studies. The platform features a kid-friendly design. There is a playpoint/badge feature to help motivate students. In addition, students can rate digital learning activities and share them with friends via e-mail, Facebook, and Twitter. CFY also provides onsite training to instruct teachers how to integrate PowerMyLearning into their classrooms.

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

Benefits:
- Increase learning time by extending learning beyond the classroom walls.
- Individualize learning and increase student engagement in school.
- Encourage self-directed learning.
- Enable parents to more effectively support their children at home.

23. Connect all School Classrooms to the Internet

A K-12 broadband network should provide adequate performance and reach, including abundant wireless coverage in and out of school buildings. "Adequate" means enough bandwidth to support simultaneous use by all students and educators anywhere in the building and the surrounding campus to routinely use the Web, multimedia, and collaboration software. To reach the goal of sufficient broadband access for enhanced K-12 teaching and learning and improved school operations, the State Educational Technology Directors Association (SETDA) recommends that broadband speeds in schools should equate to a minimum of 100 Kbps per student/staff. However, given that bandwidth availability determines which online content, applications, and functionality students and educators will be able to use effectively in the classroom, additional bandwidth will be required in many, if not most, K-12 districts in the coming years.

In order to evolve with technology, school districts must continue to update local educational policies and curriculum, assess their broadband and classroom technology needs, evaluate the professional development requirements of teachers, and provide tech support.

Goal:
Facilitate the connection of all classrooms to broadband Internet so that teachers and students can take advantage of global educational resources.

Benefits:
- Students can actively utilize school computers to access rich, multimedia-enhanced educational content and the Internet.
- Students can post their content (including audio and video podcasts) to school learning management systems, access their e-textbooks and get their assignments online, and collaborate daily across the network with other students via wikis and other Internet-based applications.
- Teachers can videoconference or download streaming media to classrooms and take their students on virtual field trips to interact with subject area experts.
- School systems can utilize online courses.
- Teachers can actively participate in online professional learning communities to share lessons and to participate in professional development.

Action Items:
- Assess current and future bandwidth needs.
- Utilize E-Rate funding. E-Rate is the commonly used name for the Schools and Libraries Program of the Universal Service Fund, which is administered by the Universal Service Administrative Company (USAC) under the direction of the Federal Communications Commission (FCC). The program provides discounts to assist most schools and libraries to obtain affordable telecommunications and Internet access. Funding is requested under four categories of service: telecommunications services, Internet access, internal connections, and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20% to 90% of the costs of eligible services. Eligible schools, school districts and libraries may apply individually or as part of a consortium.
- If broadband capacity is lacking at the local level, seek partnerships with other local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, hospital or clinics, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service. 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. That increased backhaul capacity can in turn benefit the whole community.

Government

24. 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:
- Facilitates business interaction with government, especially for urban planning, real estate development, and economic development.
- e-Government lowers the cost to a business conducting all of its interaction with government. Further, as more businesses conduct their business with government online, their transaction costs will be lowered. The cost to a business for any interaction decreases as more technology and fewer staff resources are needed.
- e-Government provides a greater amount of information to businesses and provides it in a more organized and accessible manner.

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

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

25. 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-stystem functionality (capable of voice, data, and video transmission from different types of communication devices), that framework should be replaced. This would require replacing analog phone systems with an Internet Protocol (IP)-based system. This system would provide an enabling platform for current technology, as well as future upgrades.

For example, in January 2013, the Federal Communications Commission proposed to amend its rules by requiring all wireless carriers and providers of "interconnected" text messaging applications to support the ability of consumers to send text messages to 911 in all areas throughout the nation where 911 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.

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.

Benefits:
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:
* Quicker and more accurate information to responders
* Better and more useful forms of information
* More flexible, secure and robust PSAP operations
* Lower capital and operating costs

Action Items:
If you're involved in PSAP decision making and are faced with replacing aging systems or purchasing new technology for the very first time, 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:

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

Healthcare

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

One relevant funding opportunity includes Distance Learning and Telemedicine Loans and Grants Program. The USDA provides loans and grants to rural community facilities (e.g. schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan.

Goal:
Deliver improved healthcare services to rural residents.

APPENDIX 1: STATEWIDE PERSPECTIVE OF BROADBAND

Statewide Infrastructure

As part of the Nevada State Broadband Initiative (SBI) and in partnership and at the direction of the Nevada Broadband Task Force, Connect Nevada produced an inaugural map of broadband availability in spring 2010. The key goal of the map was to highlight communities and households that remain unserved or underserved by broadband service; this information was essential to estimating the broadband availability gap in the state and understanding the scope and scale of challenges in providing universal broadband service to all citizens across the state. Since the initial map's release, Connect Nevada 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 fall of 2012 depict a geographic representation of provider-based broadband data represented by cable, DSL, wireless, fiber, etc. These maps also incorporate data such as political boundaries and major transportation networks in the state. Vertical assets that can be utilized for broadband network facilitation or transmission were added to the interactive mapping application in October 2012. A statewide map is found at http://www.connectnv.org/mapping/state. The county maps are found at http://www.connectnv.org/community_profile/find_your_county/nevada/white-pine.

Table 1: Estimate of Broadband Service Availability in the State of Nevada By Speed Tier Among Fixed Platforms			
SBI Download Speed Tiers	Unserved Households ('000)	Served Households ('000)	Percent Households by Speed Tier
At Least 768 Kbps/200 Kbps	9	997	99.07
At Least 1.5 Mbps/200 Kbps	11	996	98.95
At Least 3 Mbps/768 Kbps	31	976	96.95
At Least 6 Mbps/1.5 Mbps	59	947	94.11
At Least 10 Mbps/1.5 Mbps	98	909	90.29
At Least 25 Mbps/1.5 Mbps	162	844	83.90
At Least 50 Mbps/1.5 mbps	164	843	83.73
At Least 100 Mbps/1.5 Mbps	782	224	22.31
At Least 1 Gbps/1.5 Mbps	0	0	0.00

Source: Connect Nevada, November 2012

Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband service inventory (excluding mobile and satellite service) across the state of Nevada; it presents the number and percentage of unserved and served households by speed tiers. The total number of households in Nevada in 2010 was 1,006,250, for a total population of 2.7 million people. Table 1 indicates that 99.07% of households are able to connect to broadband at speeds of at least 768 Kbps download and 200 Kbps upload. This implies that the number of households originally estimated by Connect Nevada to be unserved has dropped from 9,950 households in the fall of 2010 to 9,356 households in the fall of 2012. Further, approximately 975,500 households across Nevada have broadband available of at least 3 Mbps download and 768 Kbps upload speeds. The percentage of Nevada households having fixed broadband access available of at least 6 Mbps download and 1.5 Mbps upload speeds is estimated at 94.11%.

Taking into account both fixed and mobile broadband service platforms, an estimated 99.64% of Nevada households have broadband available from at least one provider at speeds of 768 Kbps download and 200 Kbps upload or higher. This implies that 0.36% of households remain unserved by a terrestrial broadband connection (including mobile).

As differences in broadband availability estimates between the fall of 2010 and the fall of 2012 show, additional participating broadband providers can have a large impact upon Nevada broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise, which should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders identify areas where the displayed coverage is underestimated or overestimated. Connect Nevada 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 Nevada has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Nevada'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 Nevada can be found here: http://www.broadbandmap.gov/summarize/state/nevada.

Interactive Map
Connect Nevada provides My ConnectView™, an online tool developed and maintained by Connected Nation, intended to allow users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Nevada'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. My ConnectView™ is available at http://www.connectnv.org/interactive-map.

Business and Residential Technology Assessments

To complement the broadband inventory and mapping data, Connect Nevada 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 Nevada. Key questions the data address are: who, where, and how are households in Nevada using broadband technology? How is this technology impacting Nevada households and residents? And, who is not adopting broadband service and why? What are the barriers that prevent citizens from embracing this empowering technology?

Through Connect Nevada's research, many insights are collected. The most recent residential technology assessment surveyed 3,032 residents across the state and revealed the following key findings:

- More than two-third of Nevadans (67%) subscribe to broadband service at home, while nearly one-half (46%) stay connected via their mobile broadband service.
- In rural areas of the state, 65% of adult heads of households have adopted broadband and 49% access the Internet via a mobile device.
- Almost half (45%) of Nevada adults who use the Internet are utilizing this technology to search or apply for jobs.
- Over 200,000 Nevadans with broadband (15%) cite the need to conduct business online as the main reason they decided to subscribe to the service.
- The number one barrier to adoption for Nevada adults who do not subscribe to broadband is cost – 31% of non-adopters cite the monthly subscription cost, cost of activation and installation fees, or the cost of the computer as the main reasons they do not subscribe to home Internet service.

For more information on the statewide information described, visit the Connect Nevada website at http://www.connectnv.org.

Additionally, a technology assessment of 804 businesses in the state released in the fall of 2012 revealed the following key findings:

- Across the state of Nevada, 77% of businesses have broadband service. In contrast, only 74% of businesses in rural Nevada subscribe to this service.
- Three out of four rural Nevada businesses (75%, or approximately 7,000 businesses) stimulate the economy by purchasing or placing orders online.

- Half (50%) of businesses in Nevada that do not have broadband service believe that they don't need it or are getting by without it.

Read more about the results of this business technology assessment at the Connect Nevada website http://www.connectnv.org/survey-results/business.

Analyzing Nevada's Broadband Infrastructure and Business and Technology Assessments

Nevada broadband availability and adoption estimates were analyzed and presented as part of an initial working report titled *Nevada Broadband: Preliminary Overview of Broadband Infrastructure & Adoption in Nevada* which was released in October 2010, with an update provided in October 2011. This report combines complementary demand- and supply-side research and explores external factors, such as the impact of the federal Universal Service Fund (USF) and the policy implications of the Federal Communication Commission's (FCC) National Broadband Plan (NBP). Following the spirit of the NBP and based on the broadband availability and adoption data collected by Connect Nevada, the report proposes a series of policy recommendations aimed to spur discussion and feedback among key stakeholders across Nevada. This report and its update are available at: http://www.connectnv.org/planning.

Other reports that have been compiled by Connect Nevada include:

Broadband & Business: Leveraging Technology to Stimulate Economic Growth, May 2011
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/NV_BizWhitePaper_FINAL.PDF

e-Health: Empowering Nevadans Across All Walks of Life, November 2011
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/nv_ehealth.pdf

Technology Adoption among Hispanics in Nevada, April 2012, available in English and Spanish
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_hispanic_adoption.pdf

http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_hispanic_adoption_sp.pdf

Teleworking and Broadband: Linking Nevadans to Jobs, June 2012
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_telework_final.pdf

The Power of Broadband: Boosting Nevada's Education System, November 2012

http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_elearning_final.pdf

Technology Use among Rural Nevada Businesses, February 2013
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_rural_biz_final.pdf

Mobile Broadband in Nevada: Access at Home or on the Go, March 2013
http://www.connectnv.org/sites/default/files/connected-nation/Nevada/files/nv_mobile_usage_final.pdf

APPENDIX 2: PARTNER AND SPONSORS

Connect Nevada, in partnership with the Nevada Broadband Task Force, supports Nevada's reinvention and technological transformation through innovation, job creation, and entrepreneurship via the expansion of broadband technology and increased usage by Nevada residents. In 2009, Connect Nevada partnered with the Nevada Broadband Task Force 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.connectnv.org

On July 15, 2009, the Nevada Broadband Task Force was created by executive order. Connect Nevada serves as a primary consultant to the Task Force as it carries out its mission.

Task Force Membership: According to the Executive Order, the Nevada Broadband Task Force shall consist of 11 members appointed by the Governor of Nevada. The Governor shall also appoint one member as chairman. Members of the task force will be appointed from the following areas: rural health and hospitals, rural K-12 school districts, rural libraries, distance education/higher education, public safety/Nevada Department of Transportation, the telecommunications industry, the cable industry, the wireless industry, local government, Nevada Commission on Economic Development, city/county organizations and Nevada Native Americans.

Task Force Members:

NAME	AFFILIATION	REPRESENTING
Daphne DeLeon, Chair	Nevada State Library and Archives	Rural Libraries
Randy Brown, Vice Chair	AT&T Nevada	Wireless Industry
Gerald Ackerman	Center for Education and Health Services Outreach	Rural Health and Hospitals
Ed Anderson	Nevada System of Higher Education	Distance and Higher Education
Jeff Fontaine	Nevada Association of Counties	City / County Organizations
Brad Lyon	Moapa Valley Telephone	Telecommunications Industry
Elmer Porter	Eureka County School District	Rural K-12 Schools
Sherry Rupert	Nevada Indian Commissions	Nevada Native Americans
Frank Woodbeck	Department of Employment Rehabilitation and Training	Economic Development
Terri Weldon	Charter Communications	Cable
James Garza	White Pine County Community & Economic Development	Local Government
Richard Nelson	Nevada Department of Transportation	Transportation/Public Safety

Task Force Responsibilities: According to the Executive Order, the Task Force will work to identify and remove barriers to broadband access and identify opportunities for increased broadband applications and adoption in unserved and underserved areas of Nevada. The Task Force shall also oversee all necessary duties and responsibilities to reach the goal to expand broadband technology, including the application of federal funding/grants, grant compliance, mapping, and data management.

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

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

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

APPENDIX 3: THE NATIONAL BROADBAND PLAN

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

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

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

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

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

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

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

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

To learn more, visit: www.broadband.gov.

APPENDIX 4: WHAT IS CONNECTED?

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

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

Connected Certification Process

The Connected certification process consists of a 4-step process to community certification:

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

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

Step 2: Perform a technology assessment.   With support provided by a planning specialist, Connect Nevada will provide communities with tools (electronic or print depending on the community needs) to benchmark local community technology. Bolstered by benchmarking data that had been gathered through Connect Nevada's mapping and market research, the White Pine County Broadband Committee will work with community members to determine their overall broadband and technology grade on a 13-point "community certification AAU" model:

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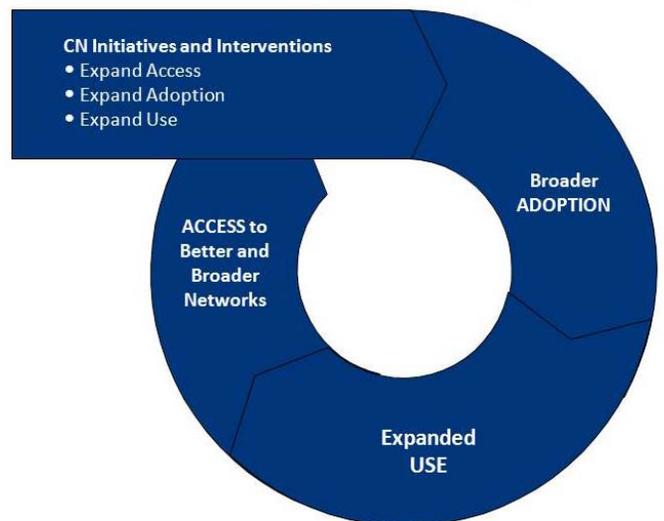12. Government
13. Healthcare

Step 3: Action Planning & Implementation.
Following Community Assessments, the data is analyzed, gaps will be determined, and recommended actions to help to fill gaps will be identified. After successful execution of projects the community will be certified as a Connected Community.

Step 4: Project Success and Expanded Local Empowerment. Once a community is certified, the community will have an avenue to discuss its success and pursue opportunities as a recognized, technologically advanced community.

Broadband Catalysts for Change

CN Initiatives and Interventions
- Expand Access
- Expand Adoption
- Expand Use

ACCESS to Better and Broader Networks

Broader ADOPTION

Expanded USE

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

N

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

NIST - National Institute of Standards and Technology.

O

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

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

P

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

R

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

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

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

S

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

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

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

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

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

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

T

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

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

U

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

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

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

V

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

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

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

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

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

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

W

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

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

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

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

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

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