2013

Region 8 Planning and
Development Council

REGIONAL BROADBAND STRATEGIC PLAN

”It is the mission of the Region 8 Planning and Development Council to obtain the maximum level of sustainable economic and community development in the Potomac Highlands of West Virginia through development, planning and by assisting local governments and businesses implement projects and programs.”

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November 21, 2013

Mr. Antonio J. Simental, MS
WV State GIS Coordinator
Office of Geographic Information Systems Coordination
1124 Smith Street, Suite LM-10
Charleston, WV 25301

RE: Subcontract Award: GEO41717
Region 8 PDC Broadband Strategic Plan

Dear Tony:

The purpose of this letter is to express endorsement on behalf of the Region 8 Planning and Development Council for the 2013 Regional Broadband Strategic Plan.

Broadband, or high speed Internet, is a critical infrastructure component and many areas are supporting its development to remain economically competitive. Broadband not only enhances the convenience of our everyday lives, but it also serves as a vital component to attracting businesses. While rural areas have often struggled to gain access to the highest level of education, health care, retail and other services, broadband has the ability to connect people and ideas that create new opportunities.

Region 8 as a whole has demonstrated population and job growth over the past decade, and we will continue to have solid opportunities for growth. Access to affordable and reliable broadband service is essential to sustaining these growth trends. It also plays a significant role in our region's attractiveness to residential and commercial developers as well as businesses looking to expand or relocate here.

For the Plan, a regional broadband planning team was established. The team assisted in preparing a needs assessment to understand the current broadband environment in our region. Residents and businesses were surveyed throughout the region. From this the region's strengths, weaknesses, opportunities, and challenges were identified. The Plan outlines nine strategic objectives in the areas of education and outreach, economic development and infrastructure to help improve broadband availability, reliability, and utilization throughout the region over a three-year timeline.

This Council gives its full endorsement to the Plan and supports its implementation.

Sincerely,

Daniel O. Hileman
Chairman

Table of Contents

Introduction

The Region 8 Planning and Development Council (Region 8 PDC) is a council, set up by the State of West Virginia, comprising of representatives (both elected and appointed) from five counties: Grant, Hampshire, Hardy, Mineral, and Pendleton and the municipalities of Bayard, Capon Bridge, Carpendale, Elk Garden, Franklin, Keyser, Moorefield, Petersburg, Piedmont, Ridgeley, Romney, and Wardensville. These counties and municipalities make up the Potomac Highlands of West Virginia.

The Region 8 PDC's mission statement—"It is the mission of the Region 8 Planning and Development Council to obtain the maximum level of sustainable economic and community development in the Potomac Highlands of West Virginia through development, planning and by assisting local governments and businesses implement projects and programs."

In keeping with the Council's mission, Region 8 PDC has facilitated the development of a regional broadband strategic plan. In order to develop the plan, a Regional Broadband Planning Team (RBPT) was created with representatives from government, healthcare, education, and the private sector. Region 8 expresses its gratitude to all team members who volunteered their time and resources to make this a successful project.

RBPT Members

· Joan Ashley, Private Citizen—Pendleton County
· Roger Ashley, Private Citizen—Pendleton County
· Derek Barr, Hardy Telecommunications
· Mary Beth Barr, CEO—Grant Memorial Hospital
· Gene Clem, Private Citizen—Mineral County
· Vickie Colaw, Director—Spruce Know Seneca Rocks Telephone
· Robert Cole, Member—Mineral County Development Authority
· Marlene Collins, Wardensville Community Library
· Mallie Combs, Director—Hardy County Rural Development Authority
· William Hentosh, Director—Mineral County Office of Emergency Services
· Carol Koontz, Hardy County Library
· Paul Lewis, Director—Hardy County Office of Emergency Services
· Chris Kyle, Vice President of Industry Relations & Regulatory - Shentel Service Company
· LeeAnn Shreve, Director—Future Generations Rural America
· Gene McConnell, Pendleton County Commissioner
· Rebecca McConnell, Pendleton County Library
· Neil McLaughlin, CEO—Hampshire Memorial Hospital
· Bruce Minor, Director—Pendleton County Office of Emergency Services
· Donnie Owen, MGW & Lingo Networks
· Anne Palmer, Director—Mineral County Chamber of Commerce
· Mona Ridder, Director—Mineral County Development Authority

· Kim Ruddle, Director—Pendleton County Economic & Community Development Authority
· Scott Sherman, Hardy Telecommunications
· Les Shoemaker, Director—Hampshire County Development Authority
· Beverly Steele, Mineral County Development Authority
· Connie Sutton, Mineral County Library
· Sherry Watts, Eastern West Virginia Community & Technical College
· Barbara Whitecotton, - Superintendent—Hardy County Board of Education

Region 8 PDC Staff
· Terry Lively, Executive Director
· Melissa Earle, Assistant Director
· Ralph Goolsby, Program Manager
· Stacey Heavner, Executive Assistant

Funding for this broadband strategic plan was provided by the West Virginia Geologic and Economic Survey, and the Office of GIS Coordination (WVOGC) through a grant the National Telecommunications and Information Administration (NTIA) in collaboration with Region 8 PDC.

Project Overview

The RBPT conducted a broadband sector survey to ensure that it had an understanding of the current broadband environment in Region 8. The RBPT surveyed residents and businesses throughout the region and reviewed existing studies (e.g., Federal Communications Commission (FCC) reports, state broadband maps, state speed test data, unserved and underserved areas, economic development plans, local government comprehensive plans and local broadband studies). With this knowledge, the RBPT outlined the region's strengths, weaknesses, opportunities, and challenges (SWOC). Next, the RBPT outlined broadband strategic objectives to help improve broadband availability, reliability, and utilization throughout the region. The strategic objectives are outlined in this plan and include the implementation strategy necessary to achieve each objective.

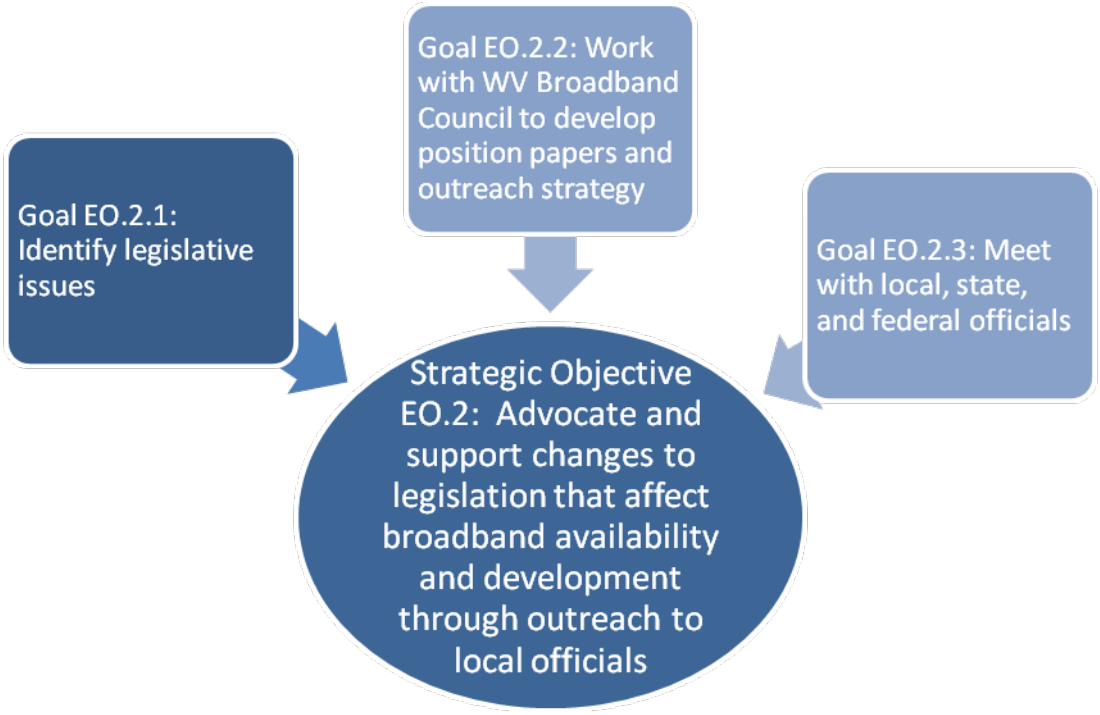
The RBPT strategic plan provides a three-prong approach which includes education and outreach, economic development, and infrastructure. If all three of these areas are brought into focus, it will help to improve the broadband infrastructure throughout the region. Education and outreach to individuals and businesses on the usefulness of broadband will help to increase demand. Incorporating broadband into the economic development planning process will ensure that necessary infrastructure is included and will help current businesses expand and attract new businesses. Both of these actions will increase the competitiveness of the local broadband market and help to justify the expansion of current infrastructure to meet the coverage and speed requirements outlined in the strategic plan.

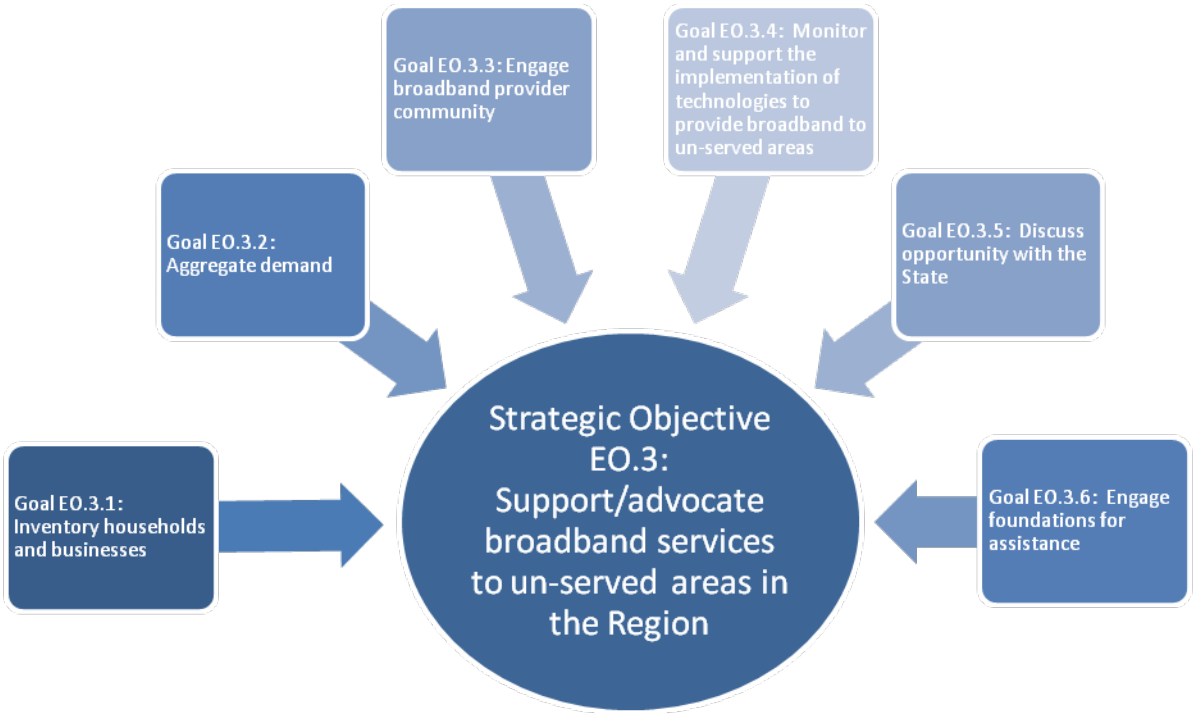
Executive Summary

The following illustrations provide an at-a-glance summary of the nine (9) strategic objectives and each of the corresponding goals defined during the strategic planning process. The summary provides a quick review of the overall objectives and the level of effort required to implement the objectives.

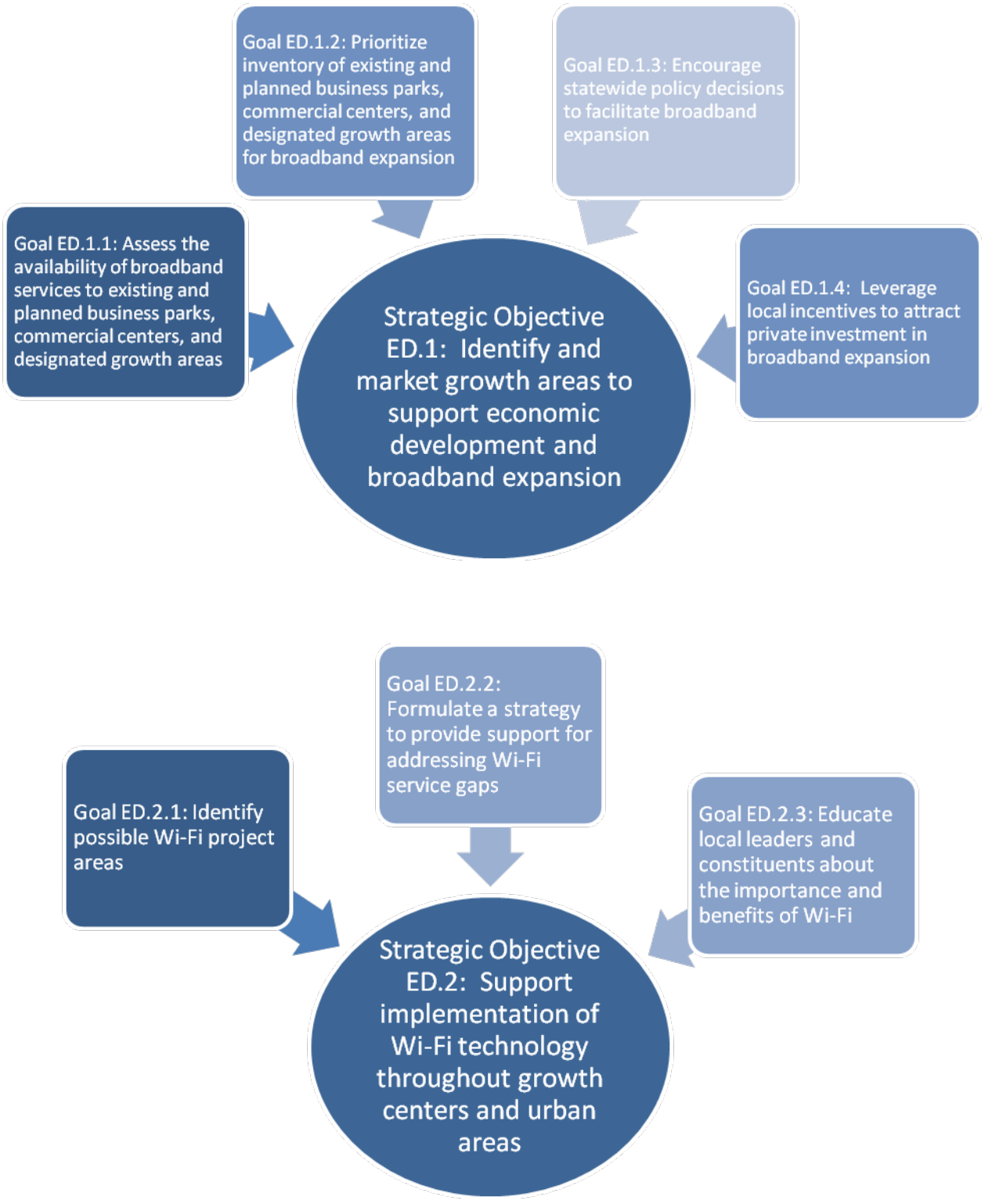
Strategic Objective: Education and Outreach

Strategic Objective: Education and Outreach Continued

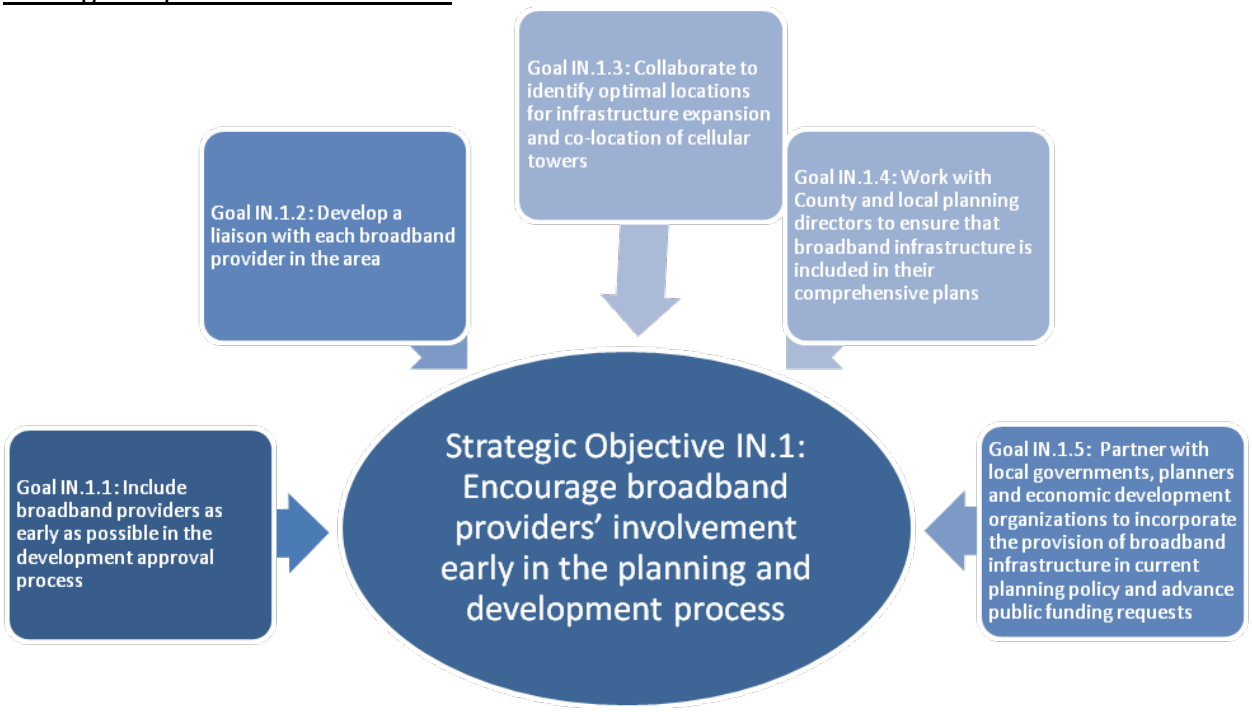


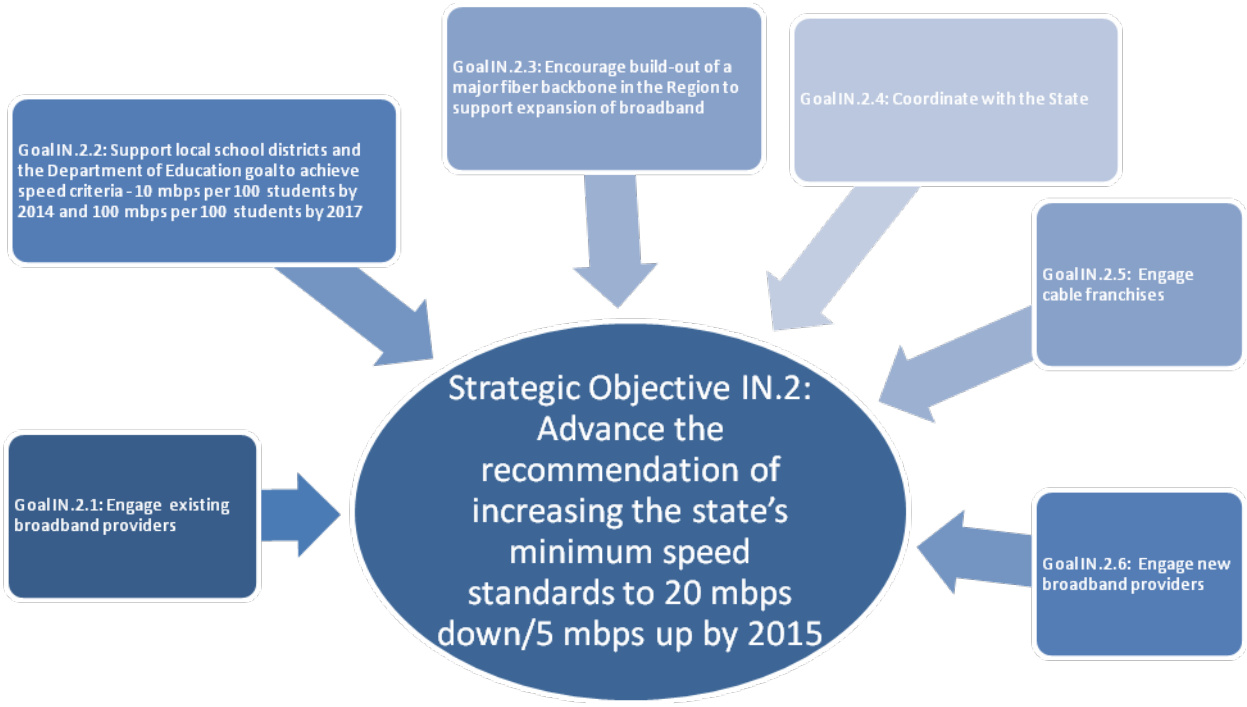


Strategic Objective: Education

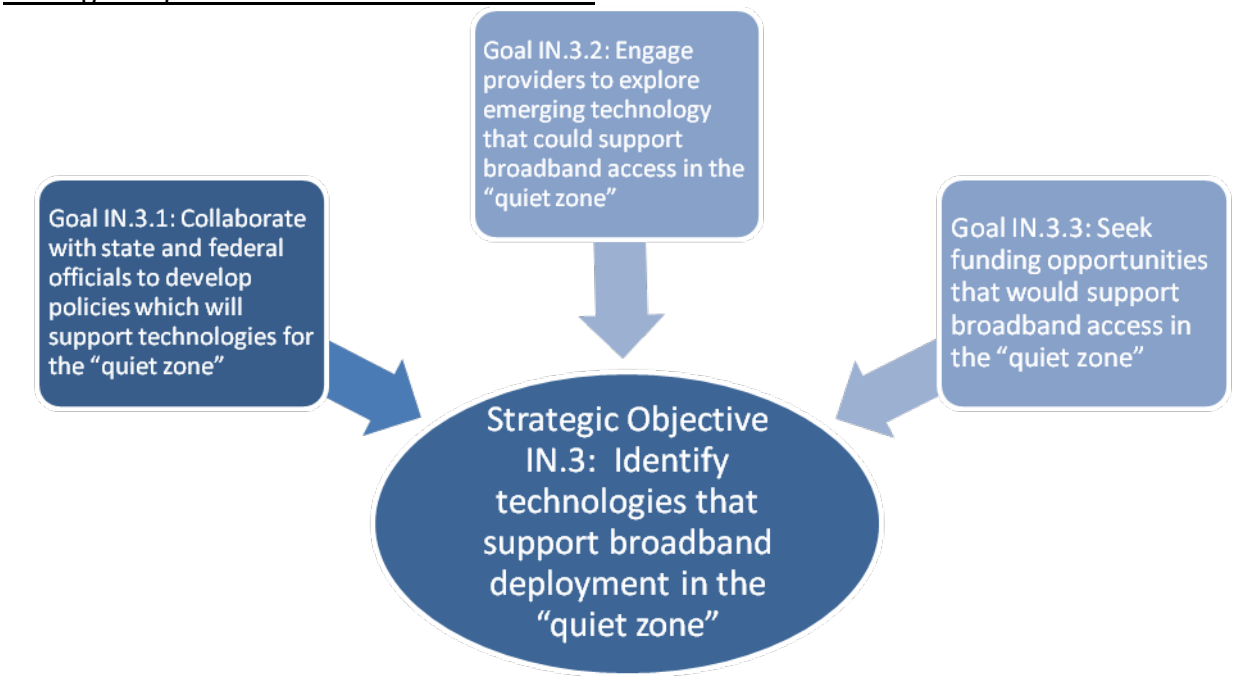


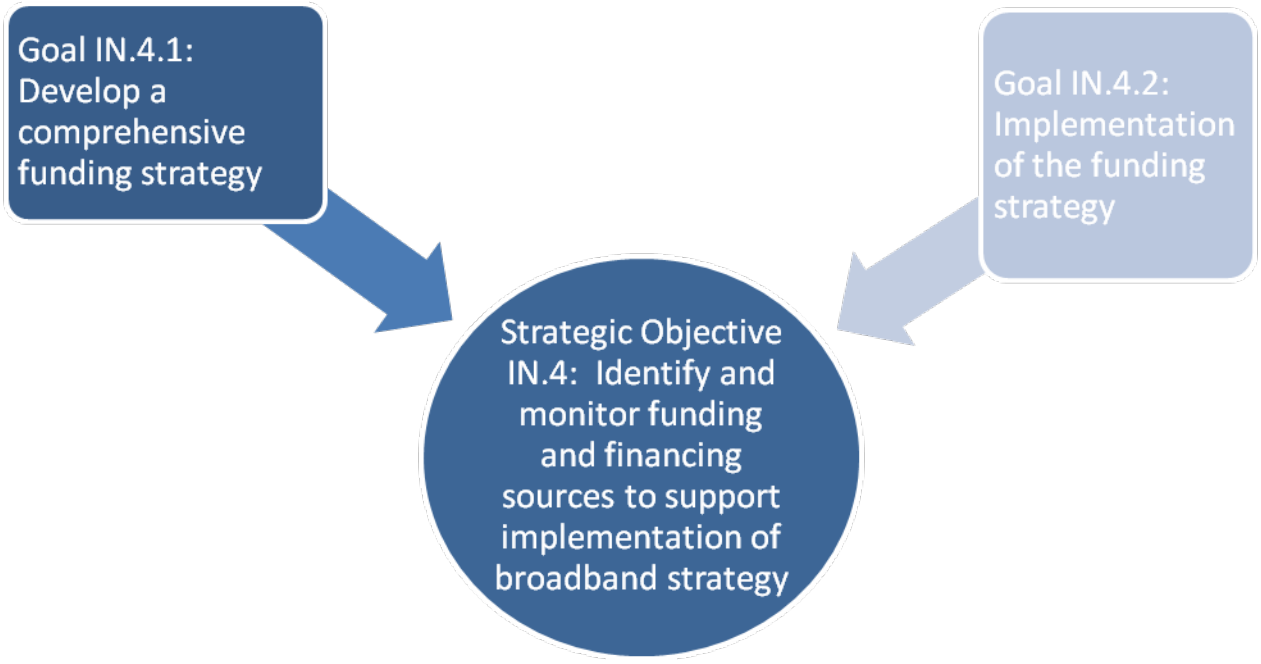
Strategic Objective: Infrastructure





Strategic Objective: Infrastructure Continued





Regional Overview

Socioeconomic Profile

The socioeconomic characteristics of a region provide some insight into the potential utilization rate and uses of broadband services. A recent study published by the U.S. Department of Commerce, Exploring the Digital Nation: Computer and Internet Use at Home, found that households in rural areas of the United States and household with lower incomes and less education are less likely to have computers and utilize broadband services than households in urban areas and those with higher incomes and higher education levels. It also found that households with young children are more likely to have computers and utilize broadband services. The following information presents a profile of each of the five Region 8 PDC counties in comparison to West Virginia and the continental United States.

Population

The Potomac Highlands is comprised of Grant, Hampshire, Hardy, Mineral and Pendleton Counties in West Virginia. The Potomac Highlands displayed a 2010 population count of 85,850 residents, with Mineral County demonstrating the largest population of any county in the region at 28,218 residents. The county with the lowest population in the region was Pendleton County with 7,693. Projected growth for the region by 2015 is 88,433 or 3% increase.

There are two metropolitan statistical areas (MSAs) with component counties in the Potomac Highlands. Mineral County is one of the component counties of the Cumberland MSA along with Allegany County in Maryland. The other MSA is the Winchester MSA, which is made up of Hampshire County and Frederick County and Winchester City in Virginia. The inclusion of Mineral and Hampshire counties in their respective MSAs indicates the high degree of commuting flows between these counties and the core counties in other states. In each case, the core county (and thus the core city) of the MSA is located outside of West Virginia. The continued potential for growth in the Potomac Highlands should be attractive to broadband providers, and the increased demand that it creates for broadband services can help to increase competitive broadband options and carriers.

Table 1—Population and Projections

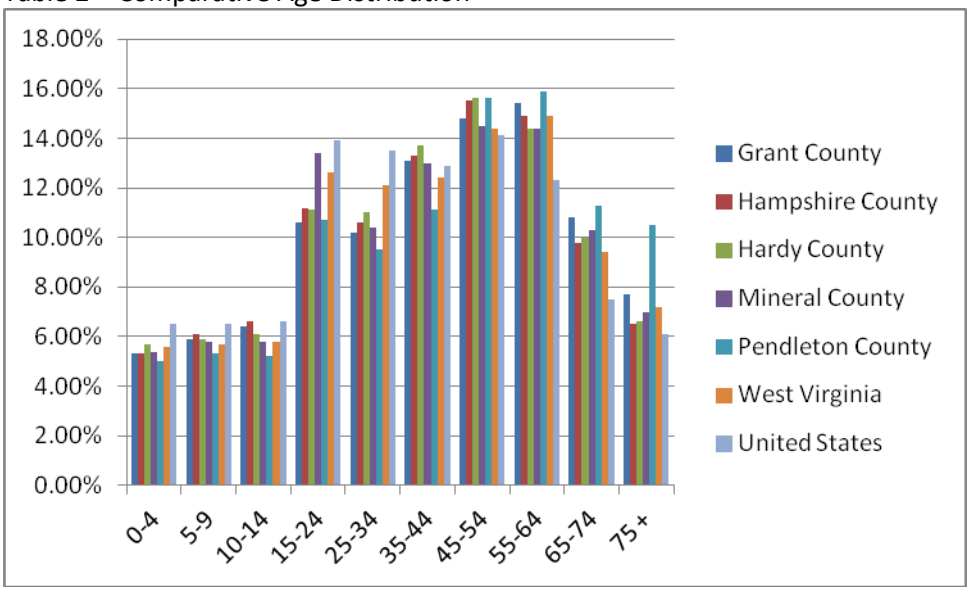
	July 2010	July 2015	July 2020	July 2025	July 2030	2010-2030 Growth
U. S	308,745,538	321,363,000	333,896,000	346,407,000	358,471,000	86%
WV	1,853,243	1,875,634	1,893,182	1,900,835	1,900,535	2.6%
Grant	11,937	12,141	12,256	12,220	12,027	.08%
Hampshire	23,968	25,297	26,404	27,188	27,621	15.2%
Hardy	14,034	14,768	15,465	16,012	16,372	16.7%
Mineral	28,218	28,743	29,107	29,264	29,123	3.2%
Pendleton	7,693	7,484	7,262	6,991	6,649	-13.6%

Source: U. S. Census Bureau and WVU Bureau of Business and Economic Research

Age

The concentration of residents between the ages of 45 and 54 is relatively consistent in Hampshire, Hardy, and Mineral Counties. Grant and Pendleton Counties lead the Potomac Highlands in the senior population, with a concentration of 40.3% of residents 65 and older. This may present a unique challenge for broadband deployment. In contrast Hampshire County has the lowest percentage of seniors, with a concentration of 16.3% who are 65 and older. The concentration of young people under the age of 25 and the higher than average concentration of people 25-65 in Region 8 is an indicator of potential and current demand for broadband services in the region. Table 2 presents the details of the age group concentrations.

Table 2 – Comparative Age Distribution



Source: U. S. Census Bureau

Income

The 2007-2011 American Community Survey 5-Year Estimates indicate households in Grant County have higher median incomes than those in other portions of Region 8 with an estimate of $40,008, as shown in Table 3. Median incomes in Mineral County are the second highest for the region with $34,691. Hardy County and Pendleton County have estimated median incomes of $32,989 and $33,060 respectively. Hampshire County's median income is estimated to decrease by $2,658. The concentration of households with lower-than-average incomes in Region 8 could have implications for future broadband demands.

Table 3 – Median Household Income Trends

	2000 Actual	2007-2011 Estimates
Grant	$28,916	$40,008
Hampshire	$31,666	$29,001
Hardy	$31,846	$33,060
Mineral	$31,419	$34,691
Pendleton	$30,429	$32,989
West Virginia	$29,696	$39,550
United States	$41,994	$52,762

Source: U. S. Census Bureau and 2007-2011 American Community Survey 5-Year Estimates

Education

The educational attainment for Bachelor's degrees in Pendleton County is higher than that in other Region 8 counties and lower than West Virginia and the United States (see Table 4). Eight and three-tenths percent of residents in Pendleton County have a Bachelor's degree. Mineral County's level of educational attainment is strongest in Region 8 for Associate's degrees with 8% (higher that West Virginia and the United States) and 5.8% Graduate or Professional Degrees. Hardy County also has a 6.5% educational attainment for Associate's degrees which is slightly higher than West Virginia. The concentration of individuals with higher levels of education attainment in Region 8 is also an indicator of potential increased demand for broadband services.

Table 4 – Educational Attainment (age 25 and older)

	Grant	Hampshire	Hardy	Mineral	Pendleton	WV	US
Population over 25	8,568	16,716	9,534	19,389	5,696	1,287,738	202,048,123
Less than 9th grade	10.0%	6.4%	8.6%	4.5%	10.0%	6.5%	6.1%
9-12 grade, no diploma	10.6%	16.1%	11.7%	6.6%	10.7%	10.9%	8.5%
High School Graduate (GED)	51.5%	53.4%	48.6%	50.6%	44.5%	41.0%	28.6%
Some college, no degree	10.8%	11.2%	15.4%	14.8%	17.6%	18.0%	21.0%
Associate's Degree	4.6%	4.2%	6.5%	8.0%	5.4%	6.0%	7.6%
Bachelor's Degree	7.0%	5.7%	5.7%	6.7%	8.3%	10.9%	17.7%
Graduate or Professional degree	5.5%	3.1%	3.6%	5.8%	3.6%	6.8%	10.5%

Source: 2007-2011 American Community Survey 5-Year Estimates

Employment

According to data collected from the U. S. Census Bureau there are 36,642 civilian employed population age 16 and older in Region 8, 31.7% in Mineral County, 26.4% in Hampshire County, 16.3% in Hardy County, 16% in Grant County, and 9.7% in Pendleton County. As shown in Table 5, manufacturing is the largest industry sector for all five counties. The second largest industry sector for all five counties is educational services, health care, and social assistance.

Table 5 - Comparative Industry Mix by County

	Grant	Hampshire	Hardy	Mineral	Pendleton
Civilian employed population age 16 & older	16.0%	26.4%	16.3%	31.7%	9.7%
Agriculture, forestry, fishing & hunting, mining	5.0%	4.4%	4.8%	2.2%	10.8%
Construction	11.6%	14.2%	10.9%	8.0%	11.1%
Manufacturing	19.0%	18.6%	32.0%	17.5%	13.8%
Wholesale trade	1.5%	1.9%	0.8%	1.3%	1.1%
Retail trade	9.4%	12.6%	11.0%	10.5%	11.2%
Transportation and warehousing and utilities	10.2%	3.8%	3.8%	6.0%	7.7%
Information	0.6%	1.0%	0.9%	2.8%	1.2%
Finance & insurance, real estate & rental & leasing	3.7%	2.5%	1.6%	3.2%	1.4%
Professional, scientific & management, administrative & waste management services	3.5%	6.4%	2.2%	6.1%	2.1%
Educational services, health care & social assistance	24.0%	21.5%	15.7%	23.5%	20.9%
Arts, entertainment and recreation, accommodation & food services	4.5%	4.8%	5.2%	5.6%	5.6%
Other services (except public administration)	3.7%	4.0%	3.8%	6.8%	3.7%
Public administration	2.5%	3.8%	6.2%	5.7%	8.7%

Source: 2007-2011 American Community Survey 5-Year Estimates

As compiled by the West Virginia Department of Commerce during March 2012, the top three employers for each county in the Potomac Highlands are as follows:

- Grant County:
  - Grant Memorial Hospital
  - Grant County Board of Education
  - Virginia Electric and Power Company
- Hampshire County:
  - Hampshire County Board of Education
  - West Virginia School for the Deaf and the Blind

  - Valley Health Systems
- Hardy County:
  - Pilgrim's Pride Corporation of West Virginia
  - American Woodmark Corporation
  - Hardy County Board of Education
- Mineral County:
  - Alliant Techsystems, Inc.
  - Mineral County Board of Education
  - Wal-Mart Stores, Inc.
- Pendleton County:
  - Pendleton County Board of Education
  - Pendleton Manor, Inc.
  - U.S. Department of Defense.

Inflow and Outflow of Workers

Region 8 has significant levels of workforce commuters. With a cost of living that is lower than areas in Washington, D.C., and the Northern Virginia area, and an attractive quality of life, the counties in Region 8 remain to be home to many commuters. As employers move toward more workplace flexibility, an increasing number of workers telecommute, increasing the demand for broadband services in residential neighborhoods throughout the region. Table 6 shows the inflow and outflow of workers in Grant, Hampshire, Hardy, Mineral, and Pendleton Counties in 2010.

Table 6 – Inflow and Outflow of Workers

	Inflow	Live/Work in County	Outflow
Grant	20%	46%	34%
Hampshire	9%	40%	51%
Hardy	32%	50%	18%
Mineral	17%	40%	43%
Pendleton	8%	59%	33%

Source: U.S. Census Bureau

Grant, Hampshire, Mineral, and Pendleton Counties have a high number of workers that travel outside the counties to work. Many of those workers travel outside the county to bordering states; Maryland, Pennsylvania, and Virginia. Hardy County leads the region with the highest percentage of workers traveling to the county for work (32%). Pendleton County has the highest percentage of workers within their county (59%) and the lowest percentage of workers traveling to the county for work (8%). Hampshire County has the highest percentage of workers traveling out of the county for work (51%). All percentages are based on the total number of workers for that particular county.

Priority Growth Areas in Region 8

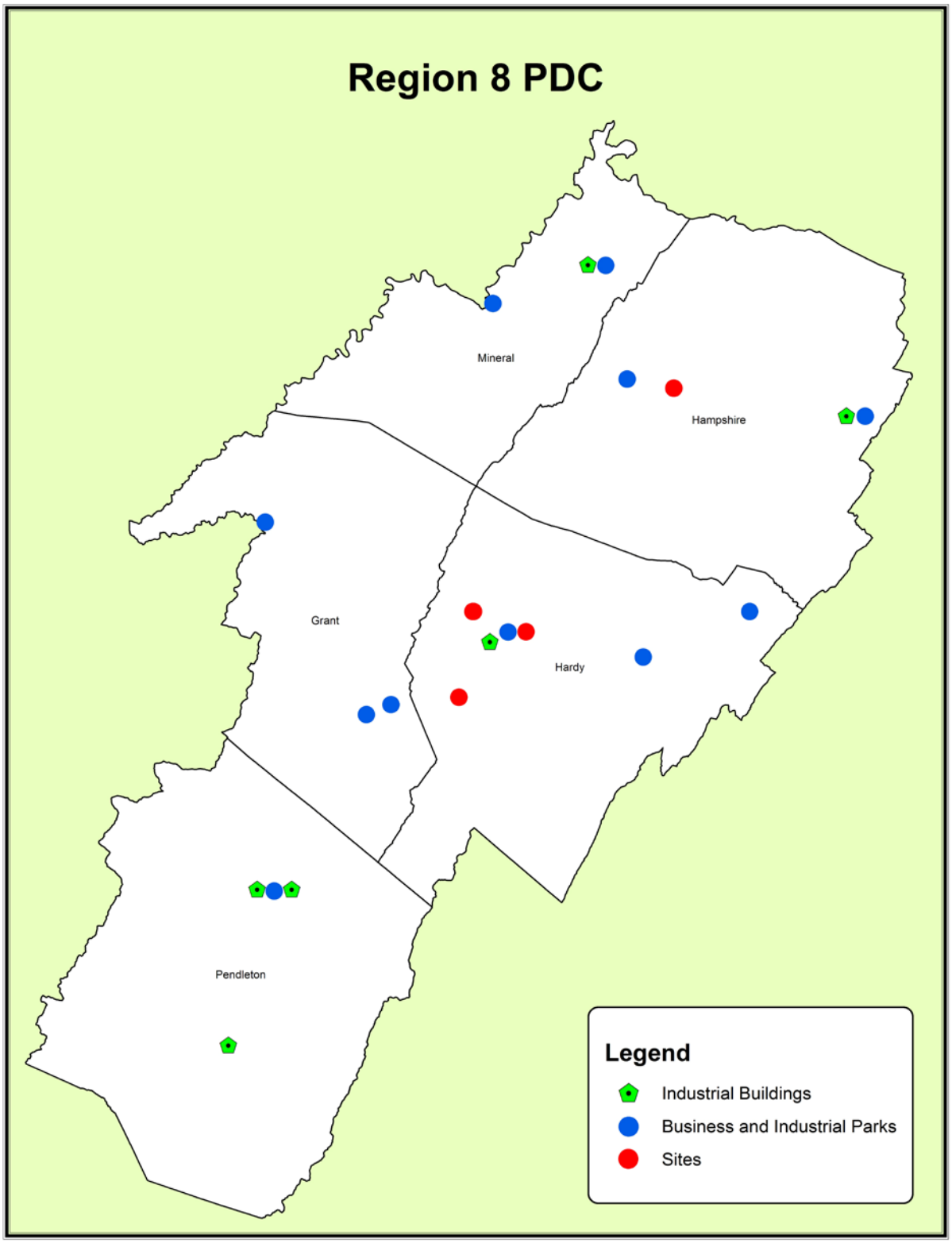
A key consideration in developing a regional broadband strategy is to gain an understanding of where economic growth is expected to occur in the region. This information can help to shape priorities in a broadband strategy and can also help broadband providers to prioritize their investments in broadband infrastructure to ensure that their investments are aligned with local growth priorities. The RBPT reviewed the comprehensive plans of each of Region 8's five counties, reviewed data from the West Virginia Development Office regarding business and industrial parks, sites, and buildings in each county, requested input from each county's development authority director. The following information provides an overview of growth priorities in Region 8.

Table 7 – Region 8 Business and Industrial Parks, Sites, and Buildings

County	Type	Name	Location	Broadband Provider
Grant	Park	Grant County Industrial Park	Petersburg	Frontier
	Park	Mountain Top Industrial Park	Mt Storm	
	Park	Grant County Business &Technology Park	Petersburg	Frontier
Hampshire	Park	Hampshire County – Romney Business Park	Romney	Frontier
	Park	Capon Bridge Tech Park	Capon Bridge	Frontier
	Site	Royce Saville Site	Romney	Frontier
	Building	Capon Bridge Tech Park Multi-Tenant Building	Capon Bridge	Frontier
Hardy	Park	Wardensville Industrial Park	Wardensville	Frontier
	Park	Robert C Byrd – Hardy County Industrial Park	Moorefield	Hardy Tel
			Baker	Hardy Tel
	Park	Baker Industrial Park	Moorefield	Hardy Tel
	Site	Fitzwater Business Site	Moorefield	Hardy Tel
	Site	Crites Site	Moorefield	Hardy Tel
	Building	American Woodmark Moorefield Plant – Moorefield Industrial Park	Moorefield	Hardy Tel
Mineral	Park	Keyser – Mineral County Industrial Park	Keyser	Frontier
	Park	Fort Ashby Business & Technology Park	Fort Ashby	Frontier
	Building	Mineral County Multi-Tenant Building	Fort Ashby	Frontier
Pendleton	Park	Upper Tract Industrial Park	Upper Tract	Frontier
	Building	Upper Tract Industrial Park Shell Building I	Upper Tract	Frontier
	Building	Upper Tract Industrial Park Shell Building II	Upper Tract	Frontier
	Building	Pendleton County Business Center	Franklin	Frontier

Source: West Virginia Development Office and County Development Authorities

Figure 1 - Region 8 Industrial Parks, Buildings and Sites



Produced by: West Virginia Development Office

Region 8 Planning and Development Council's Regional Development Plan Comprehensive Economic Development Strategy 2009-2013[1] identifies three growth centers: Keyser, Romney, and Moorefield/Petersburg. Previously, the City of Keyser has been designated a Redevelopment - Economic Center by the Economic Development Administration.

Keyser Growth Center

The City of Keyser is the county seat of Mineral County and is the largest city in Region 8. The City's 2010 population was 5,439 persons; this represents a 2.56% increase from the 2000 population of 5,303. More than balancing this loss is the strong growth in the New Creek Valley, south of Keyser. Evidence of this growth is found in a doubling of connections to the New Creek water system. Persons age 17 or younger account for 19.4% of Keyser's population; persons age 65 or older account for 17.14% of the population. Members of minority groups make up 10.7% of the City's population.

According to the 2007-2011 American Community Survey 5-Year Estimates, the City of Keyser had an internal labor force of 2,214 persons and a labor force participation rate of 51.7%. Median family and per capita incomes were $36,082 and $15,971 respectively. Unemployment was 6.5%.

Keyser has an excellent transportation network. It is on the main east/west line (New York to St. Louis) of the CSX Rail System. Passenger rail service is available at Cumberland, Maryland. The City is served by Route 46 and Routes 220 and 50. Additionally, Interstate Route 68 is within less than a half hour's driving time. The City is within a three hours drive of major international airports in Pittsburgh, PA, Baltimore, MD., and Washington, DC.

The Keyser Industrial Park contains 155 acres with approximately 26 acres immediately available for development. There are other industrial sites of various sizes in and around the City. Coal and commercial quantities of lumber and limestone are available within close proximity to the community. The City contains six financial institutions, a new hospital, and Potomac State College, a division of West Virginia University. The municipal wastewater treatment plant is being upgraded to meet Chesapeake Bay Watershed Implementation Plan requirements The City also has a water improvement project for its water treatment plant. The balance of the City's infrastructure, i.e., utilities, housing, education, recreation opportunities, and governmental services are of sufficient quantity and quality to allow development of Keyser and Mineral County's resources.

During the past decade three major employers have closed in Keyser resulting in the loss of about 400 jobs. The community contains a number of vacant industrial plants. Likewise, the City's Main Street has numerous vacant structures and surplus lots. On a more positive note, the commercial area south of Keyser has seen strong growth and a shopping plaza just west of

[1] Region 8 Planning and Development Council's Regional Development Plan CEDS 2009-2013, page 57-60, funded through grants from the Appalachian Regional Commission and Economic Development Administration

Main Street appears sound. The City of Keyser has the potential to have significant impact on the region's growth.

Moorefield/Petersburg Growth Center

The municipalities of Moorefield and Petersburg, the county seats of Hardy and Grant counties respectively, are nearby communities in the South Branch Valley. The economies of the two towns are closely linked and development in one community supports growth in the other. For these reasons, the communities have been jointly identified as a growth center. With combined population of 5,011, the Moorefield/Petersburg area has enjoyed population growth; the area's population has grown by 8.94% since 2000. Persons age 65 and older comprise 41.76% of the population and those 17 and younger comprise 39.47%. Minorities account for 38.06% of the municipalities' population.

According to the 2007-2011 American Community Survey 5-Year Estimates, the labor force of the municipalities was 2,721; the labor force participation rate was 59.8%. The median family income averaged $38,495 and per capita income was $19,134. The growth center had an unemployment rate of 7.1%.

The Moorefield/Petersburg growth center has only a fair transportation network. The South Branch Valley Railroad provides regular service to the main east/west line of the CSX rail system. US Route 220 and WV Routes 55, 28, and 42, are the center's primary highways. Construction of Appalachian Corridor H continues and approximately 33.6 miles of the four-lane highway connect Hardy County (Wardensville) and Grant County (Scherr). The completion of Corridor H will provide a tremendous highway access to the Moorefield/Petersburg growth center. The Grant County Airport, with a lighted runway of over 5,000 feet, serves the growth center.

Six major industrial plants are located in and around the two towns. These industries employ nearly 5,000 persons. The center has the region's greatest concentration of manufacturing employment and contains all the region's poultry processing facilities and most of its wood products employment. Within 50 miles of the growth center are abundant supplies of coal, limestone, timber and agricultural products.

Public water and sewer treatment have been upgraded or are currently being replaced. The City of Petersburg has completed an $11 million water system improvement project. The City is seeking funds for upgrades to the wastewater treatment plant to meet requirements of the Chesapeake Bay Watershed Implementation Plan. While the Town of Moorefield has completed a water improvement project that will allow its treatment plant to meet community needs. A new $40 million wastewater treatment plant is being constructed to meet current demand, future growth, and requirements of the Chesapeake Bay Watershed Implementation Plan. The growth center contains seven banks, a hospital, and Eastern West Virginia Community and Technical College. The area's infrastructure is capable of supporting additional

growth and development of the center's potential is central to growth in the Potomac Highlands.

Romney Growth Center

The City of Romney is the county seat of Hampshire County and is the third largest community in Region 8. The 2010 census indicates that the City's population declined by 4.74% since 2000 to 1,848 persons. However, this loss has been more than offset by strong growth in the areas immediately adjacent to the City. Persons age 65 and older comprised 23.65% of the population and persons age 17 and younger accounted for 23.6% of the population. Members of minority groups made up 4.4% of the City's population.

According to the 2007-2011 American Community Survey 5-Year Estimates, Romney had a labor force participation rate of 51% with a labor force of 705 persons. The median family income for 1999 was $34,271 and the 1999 per capita income was $15,765. Per capita income increased by 57.7% during the 90's and the census indicated an unemployment rate of .9%.

Romney has a good transportation network. It is served by the South Branch Valley Railroad, which provides regular service to the main east/west route of the CSX system. Romney is directly served by Route 50 and 28. The City is within 30 minutes driving time of Interstate 68. Passenger rail service is available at Cumberland, Maryland and Romney is within a three hours drive of major international airports in Pittsburgh, PA, Baltimore, MD., and Washington, DC.

There are several industrial sites in and around the community, including a 75-acre industrial park adjacent to the City. Within the 75-acre park, there are 21 acres available for development. The Hampshire County Development Authority owns a 25,000 square foot multi-tenant building. Lumber and agricultural products are available in commercial quantities. The City's infrastructure is sound and would allow for development resources. The City contains two banks and a hospital is just outside the City limits.

Broadband Planning Implications

Region 8 as a whole has demonstrated modest population and job growth over the past decade, and if trends continue it will likely continue to have solid opportunities for growth. Access to affordable and reliable broadband service is essential to sustaining these growth trends, and also plays a significant role in the attractiveness of the area to residential and commercial developers and to businesses looking to expand or relocate to the area. Based on feedback from the RBPT, factors such as the quality of life in the area and a comparatively low cost of living is a potential to increase a number of telecommuters, which is reflected in the high levels of worker outflow from the region. In addition, as higher education institutions transition from traditional classroom settings and increase their online education options, the demand for broadband coverage will increase to meet the needs of students in neighborhoods throughout the region.

Interviews and sector survey responses with local economic development organizations revealed that, because of its proximity to Washington, D.C., and its comparatively low energy costs, the region is attracting interest from companies looking to locate data centers, which would require the availability of significant bandwidth to support. Although some of the business and industrial parks, sites and buildings presented in the previous discussions may have broadband access, in reality the current broadband service is not sufficient to support businesses with heavy technology utilization. Ensuring that broadband infrastructure and redundancies are in place in priority areas with affordable, reliable broadband service is critical to the attractiveness of Region 8 for economic development.

Key Assessment Findings

Through the review and independent research conducted by RBPT, the following key assessment findings have been assembled from county, regional, state, and federal surveys, studies, data sources and reports. RBPT reviewed best practices for sustainable adoption and increased utilization of high-speed broadband that were successfully implemented in other states. In some cases, high-speed broadband initiatives were a priority consideration, paramount to critical infrastructure such as roads, electricity, and water. Through the research, it was discovered that in order to provide fast, reliable access to underserved and unserved rural communities, motivation must exist for broadband and telecommunication providers to invest large capital expenditures. In other words, demand must be present in order to supply the need.

The majority of consumers surveyed, both residents and businesses, indicated an overwhelming need to have robust broadband capabilities that are vital to the daily operation of their business and necessary to take advantage of online education and healthcare services. Online bill pay, entertainment, and communications were also noted as key factors for wanting access

to broadband Internet. Additionally, based on both the regional and state speed test results, broadband speeds as defined by the FCC are not being met with the current technology and infrastructure that exists in Region 8.

West Virginia Broadband Coverage

The West Virginia Broadband Mapping Program worked with broadband providers throughout the state to map broadband availability information. The following maps provide an overview of the number of Broadband Internet Providers and by technology servicing Region 8.

Figure 2 – Number of Broadband Internet Providers

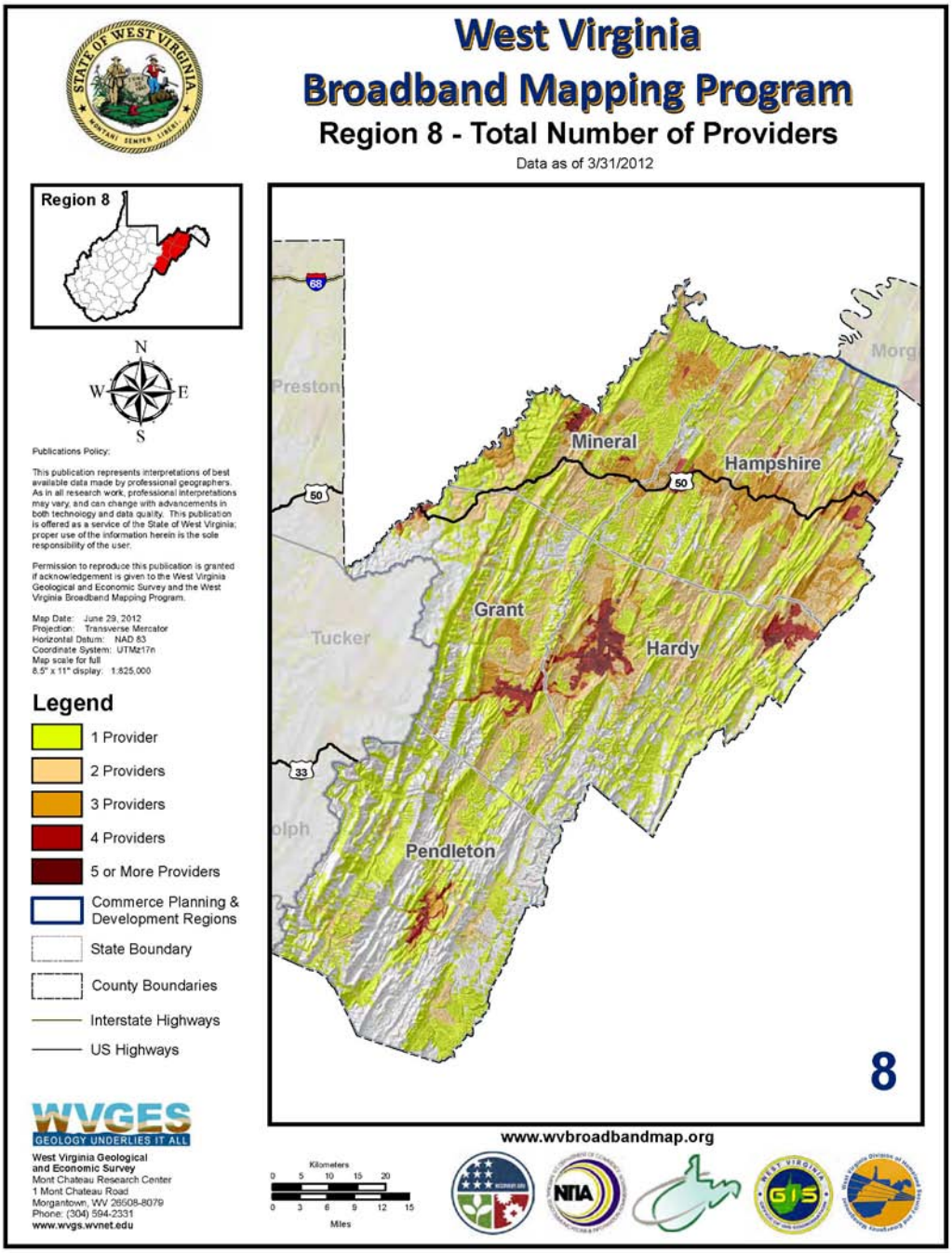


Figure 3 – Technology: xDSL, BPL, Other Copper

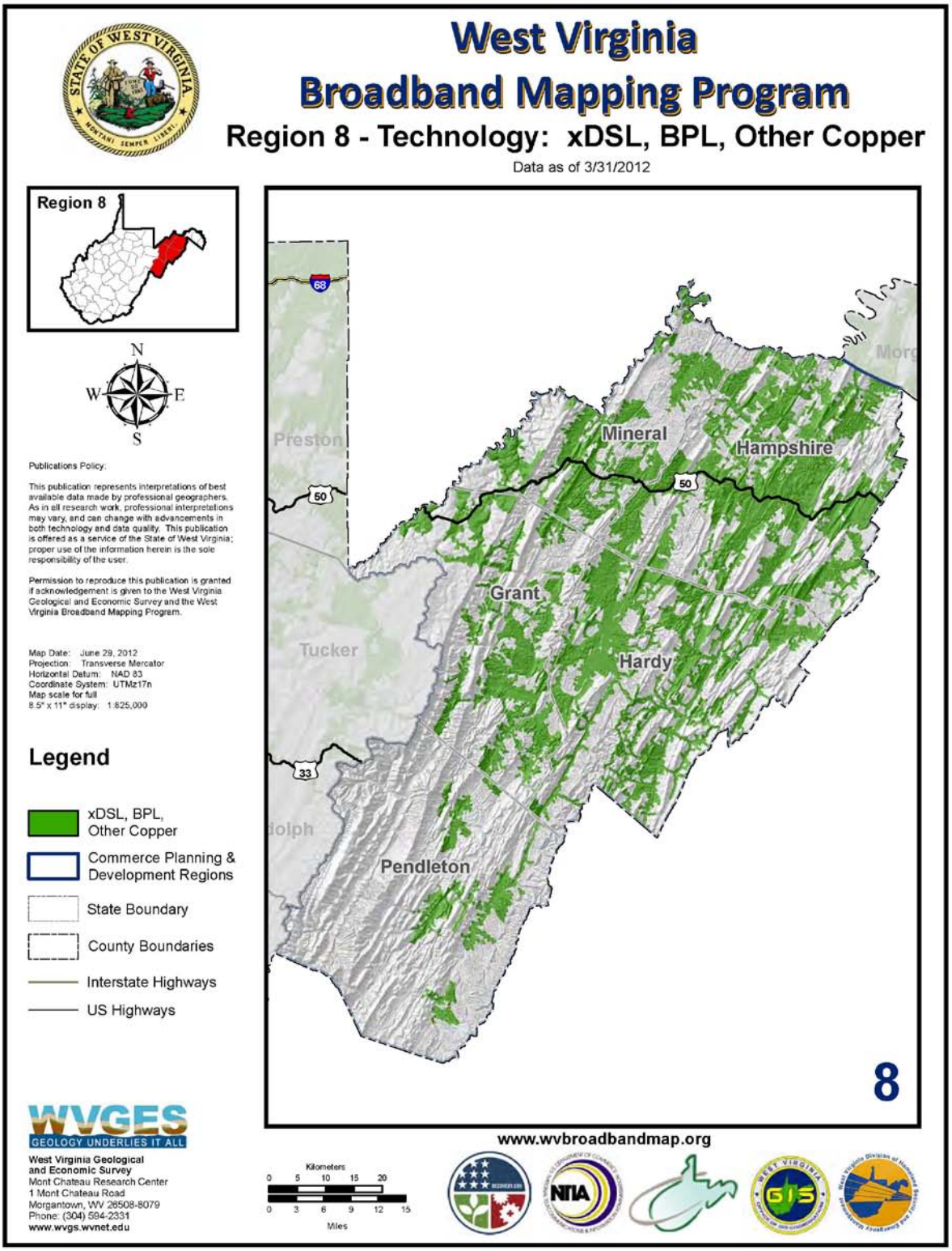


Figure 4 – Technology: Cable and FTTP

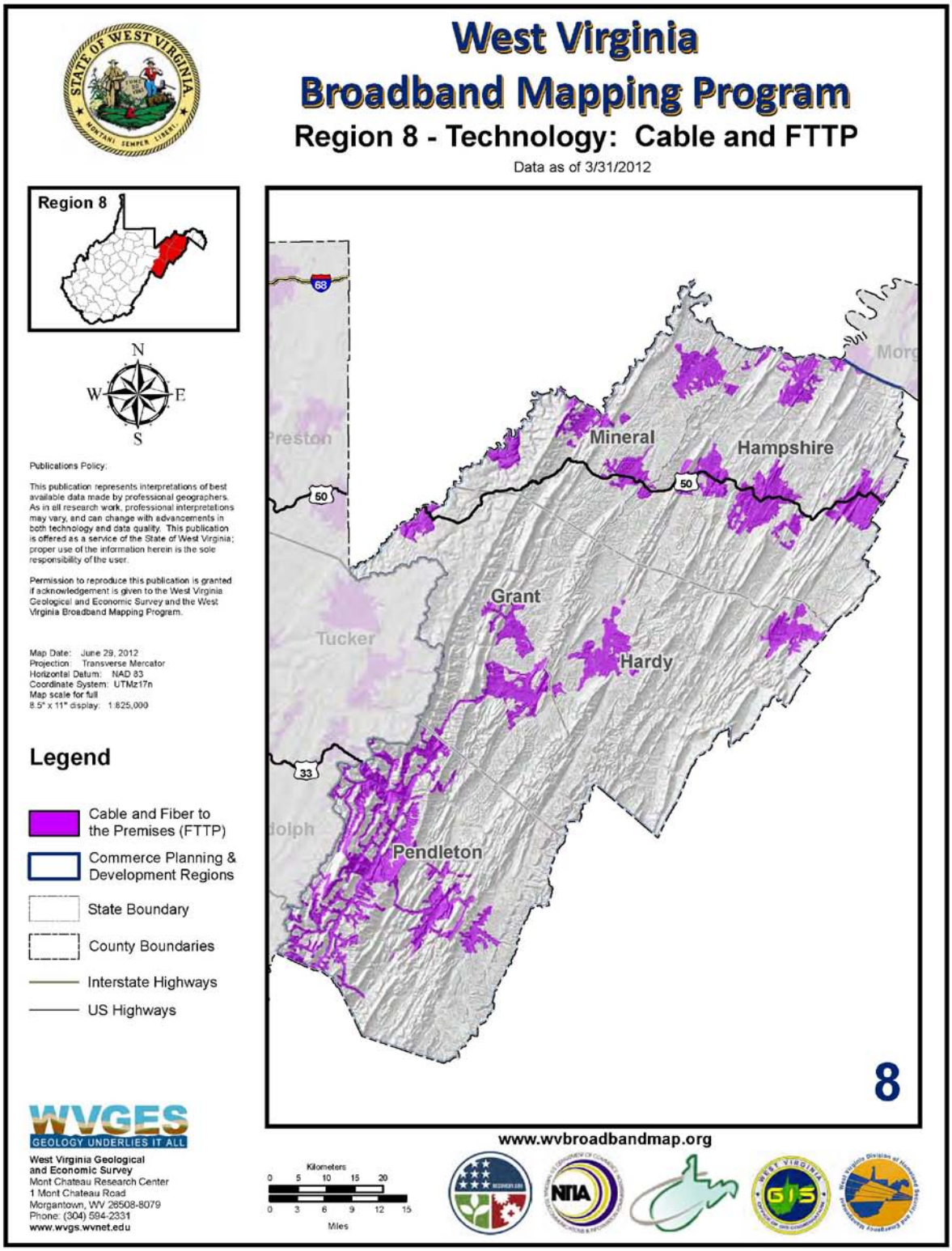


Figure 5 – Technology: Fixed Wireless

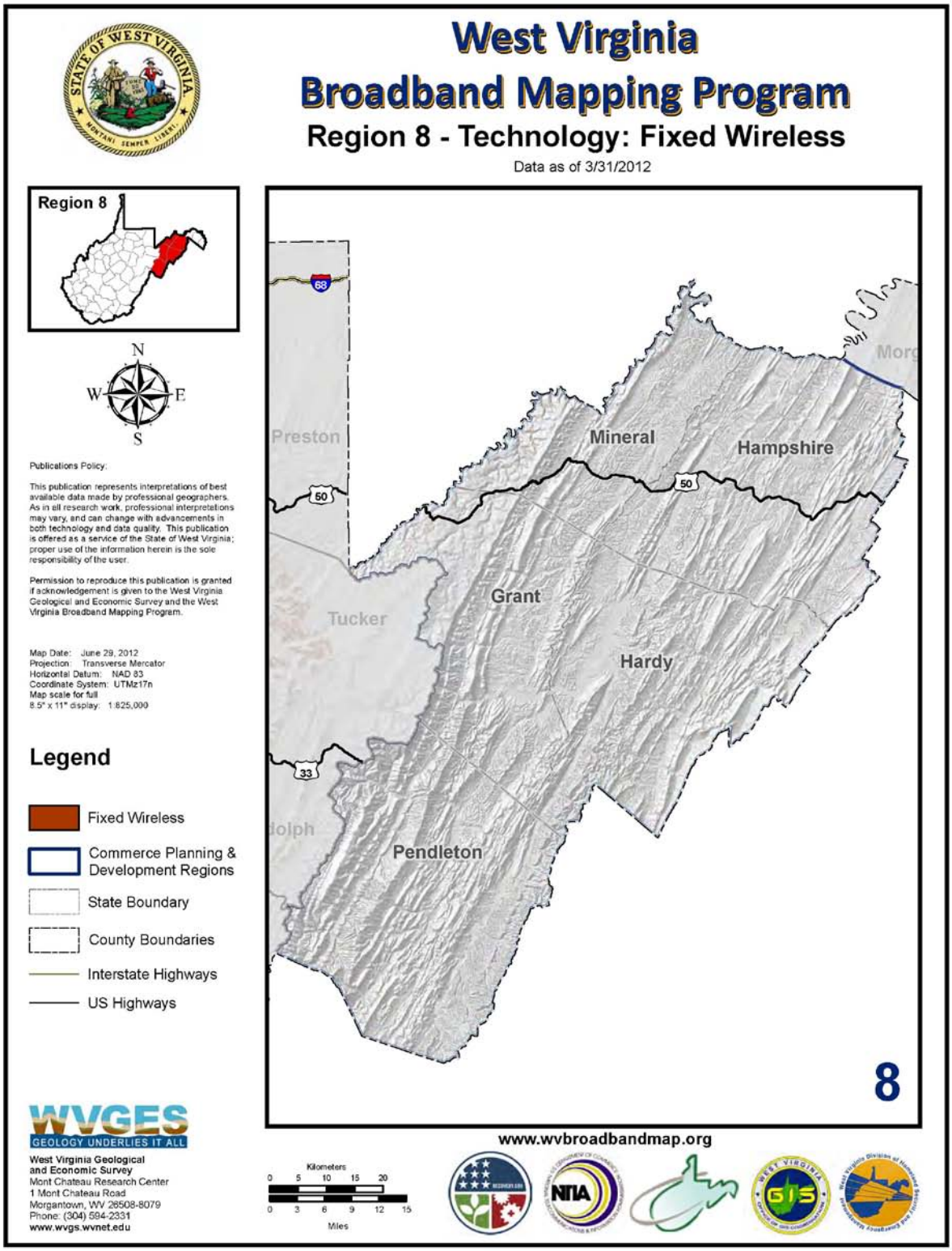


Figure 6 – Technology: Mobile Wireless

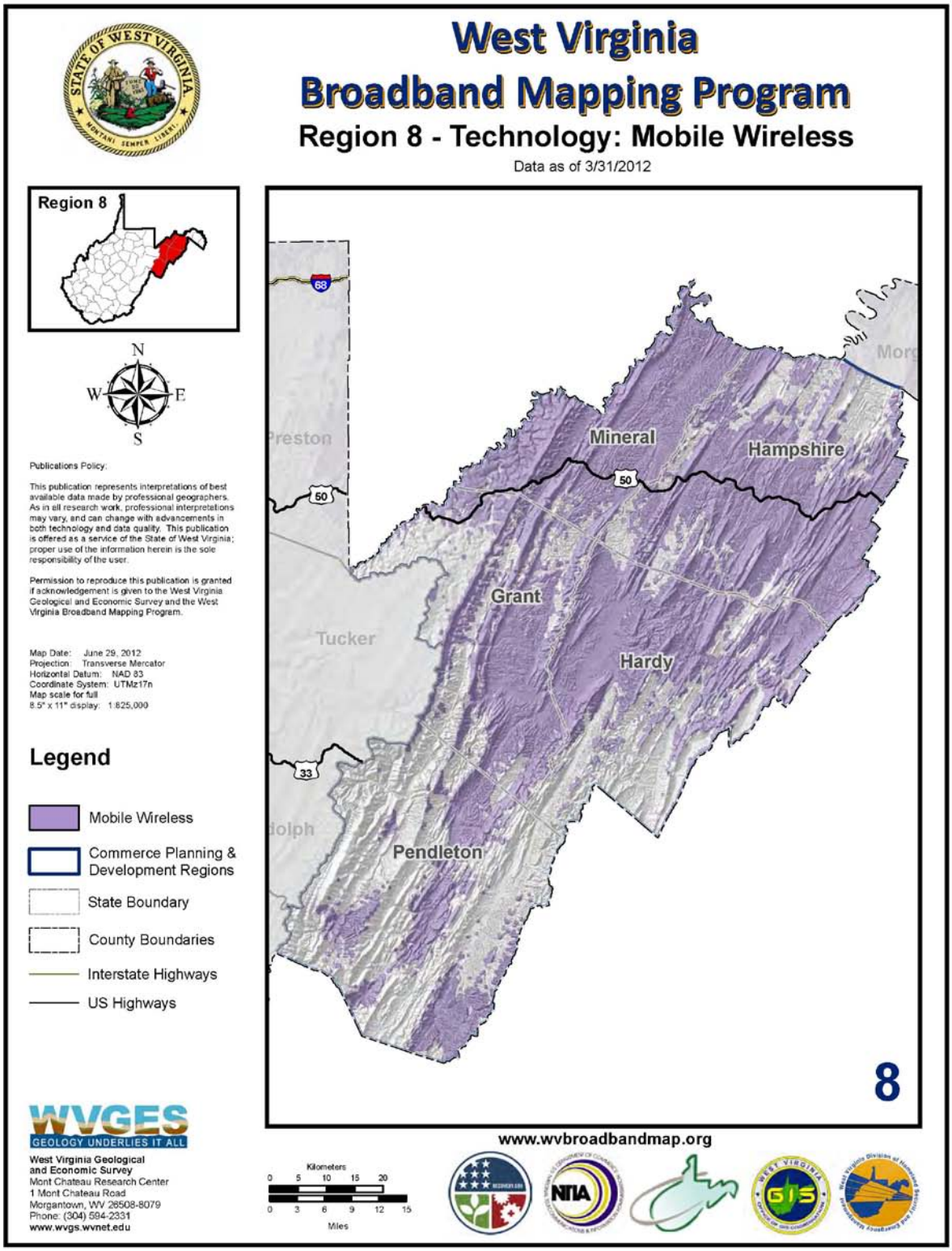
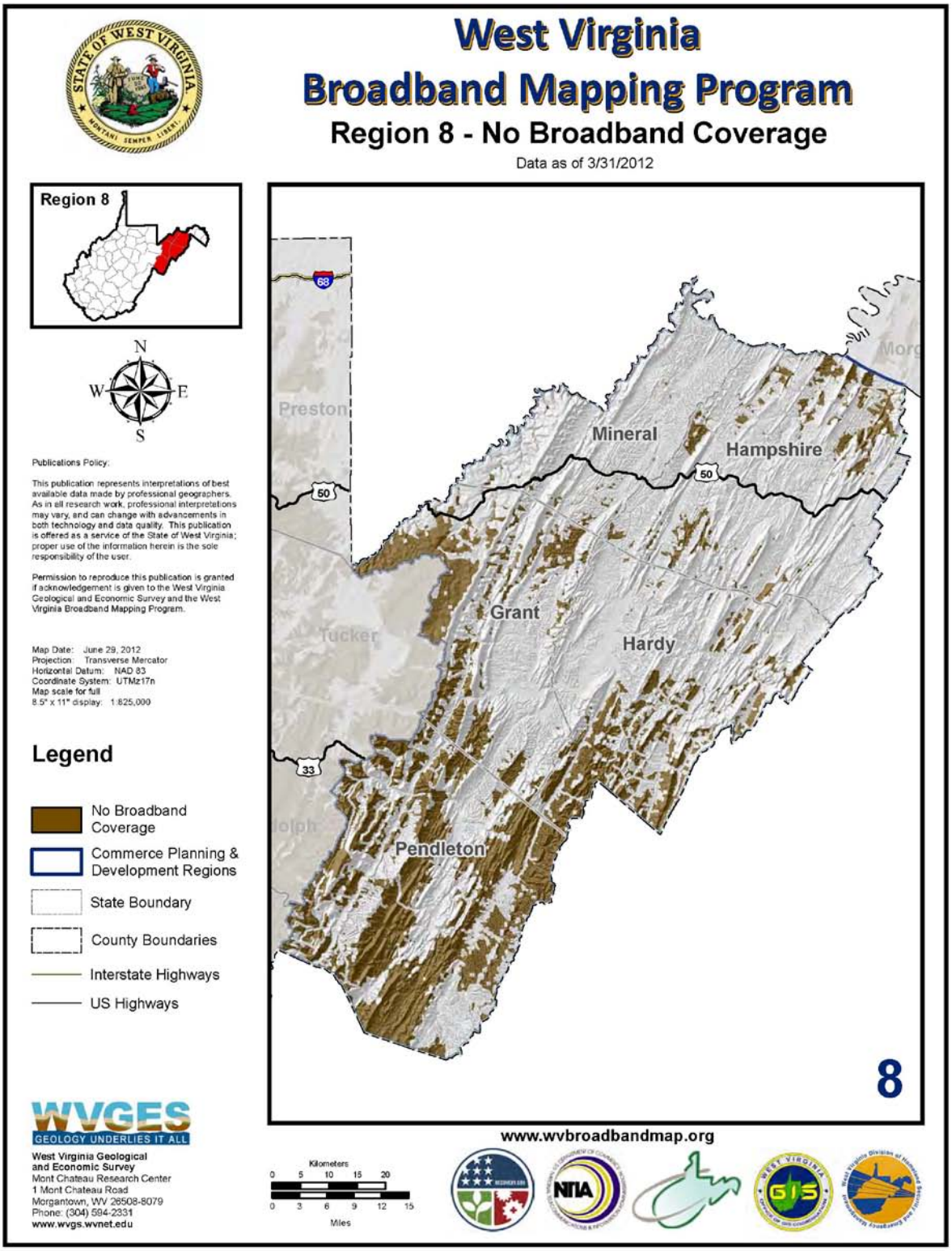


Figure 7 – No Broadband Coverage



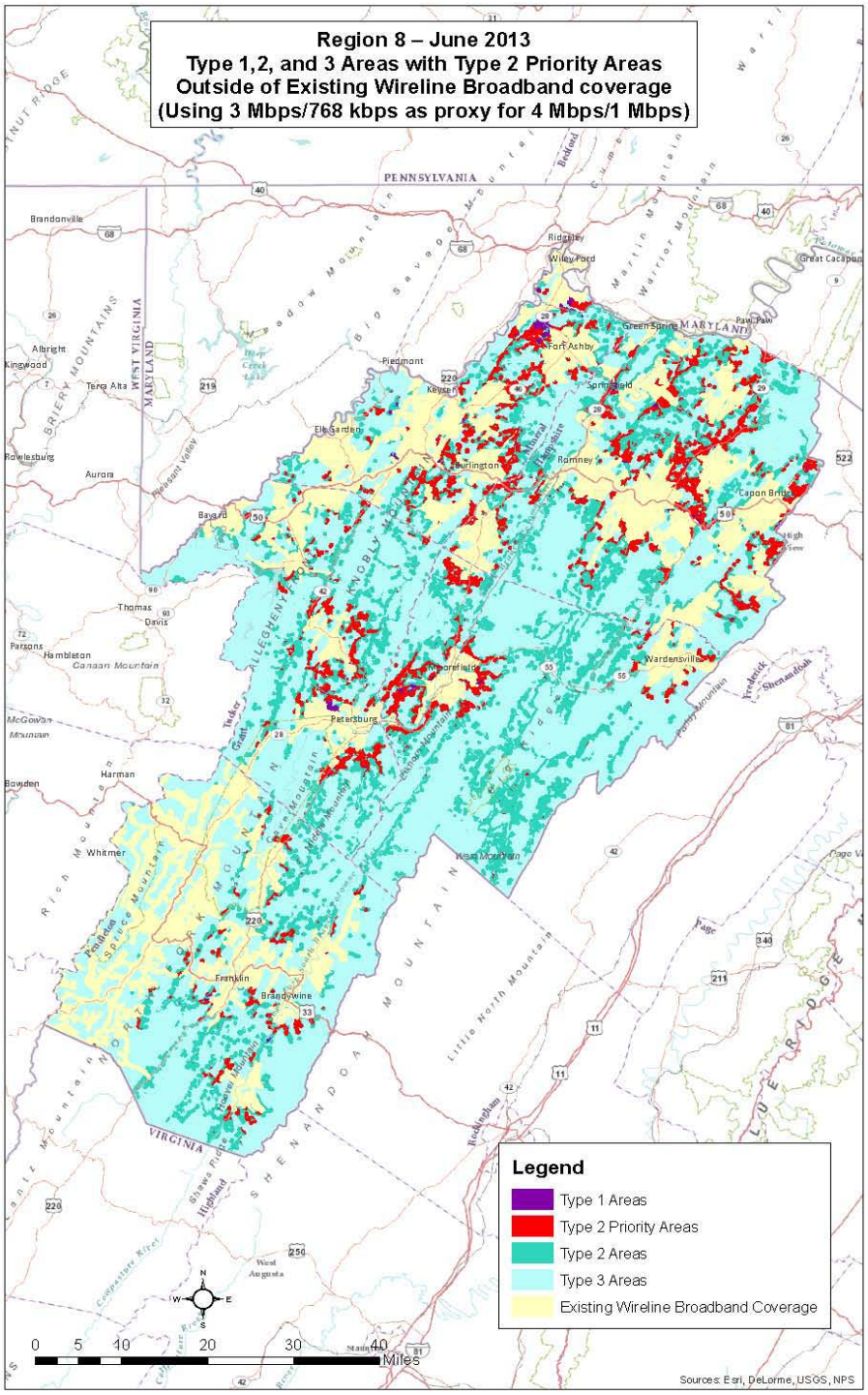
West Virginia Unserved Broadband Analysis

Based on its analysis of mapping, broadband demand, and other relevant data, the West Virginia Broadband Council shall designate unserved areas of the state as being one of three distinct types. These types are as follows:

> (1) Type 1 unserved area: an area in which broadband may be deployed by service providers in an economically feasible manner;
>
> 2) Type 2 unserved area: an unserved area in which broadband may be deployed by broadband service providers and other entities in an economically feasible manner, provided some form of public moneys is made available; and
>
> (3) Type 3 unserved area: an unserved area in which, at present, cable or wireline broadband cannot be deployed in an economically feasible manner and an intermodal approach employing other technologies, such as satellite and wireless, is required to provide that area with high-speed internet access.

Using the above definitions, the following maps are an analysis of the residential and business survey conducted by Region 8.

Figure 8 – Type Layer Overview of Analysis



Produced by: L.R. Kimball

Residential and Business Broadband Surveys

A regional survey was conducted between May 9, 2013 and July 8, 2013 with 601 residents and businesses in Grant, Hampshire, Hardy, Mineral, and Pendleton Counties participating. 492 residents and 109 businesses participated in the survey. The survey questions were aimed at seeking information about the characteristics of the Internet service, such as type, provider, connection speed, availability, reliability cost, and overall satisfaction with the service (see Appendix B for a copy of the survey). Table 8 shows the number of responses by county.

Table 8 – Region 8 Residential and Business Respondents by County

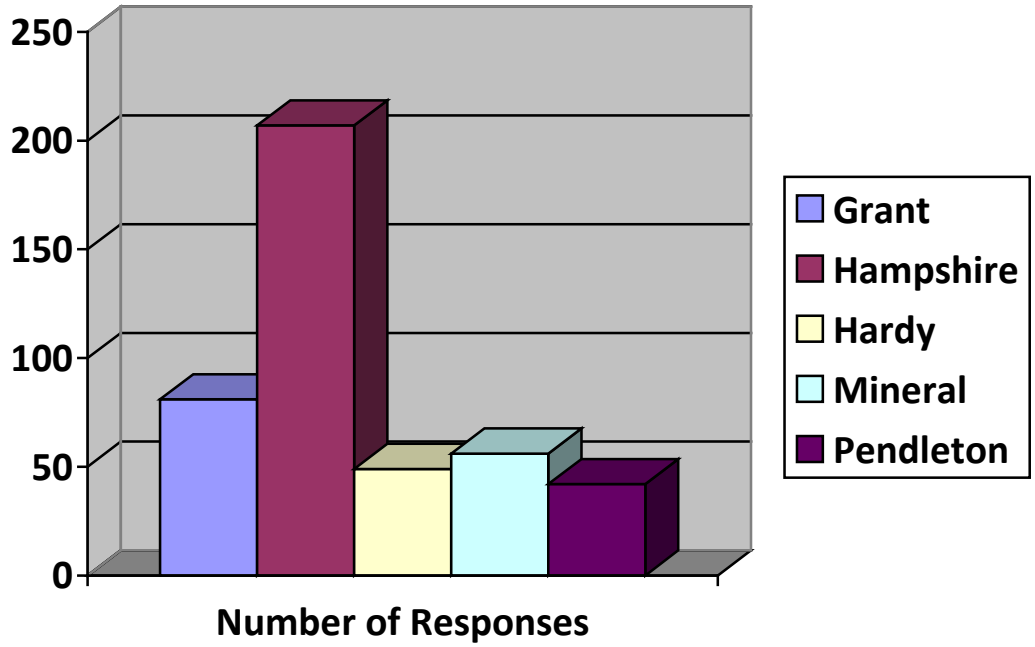
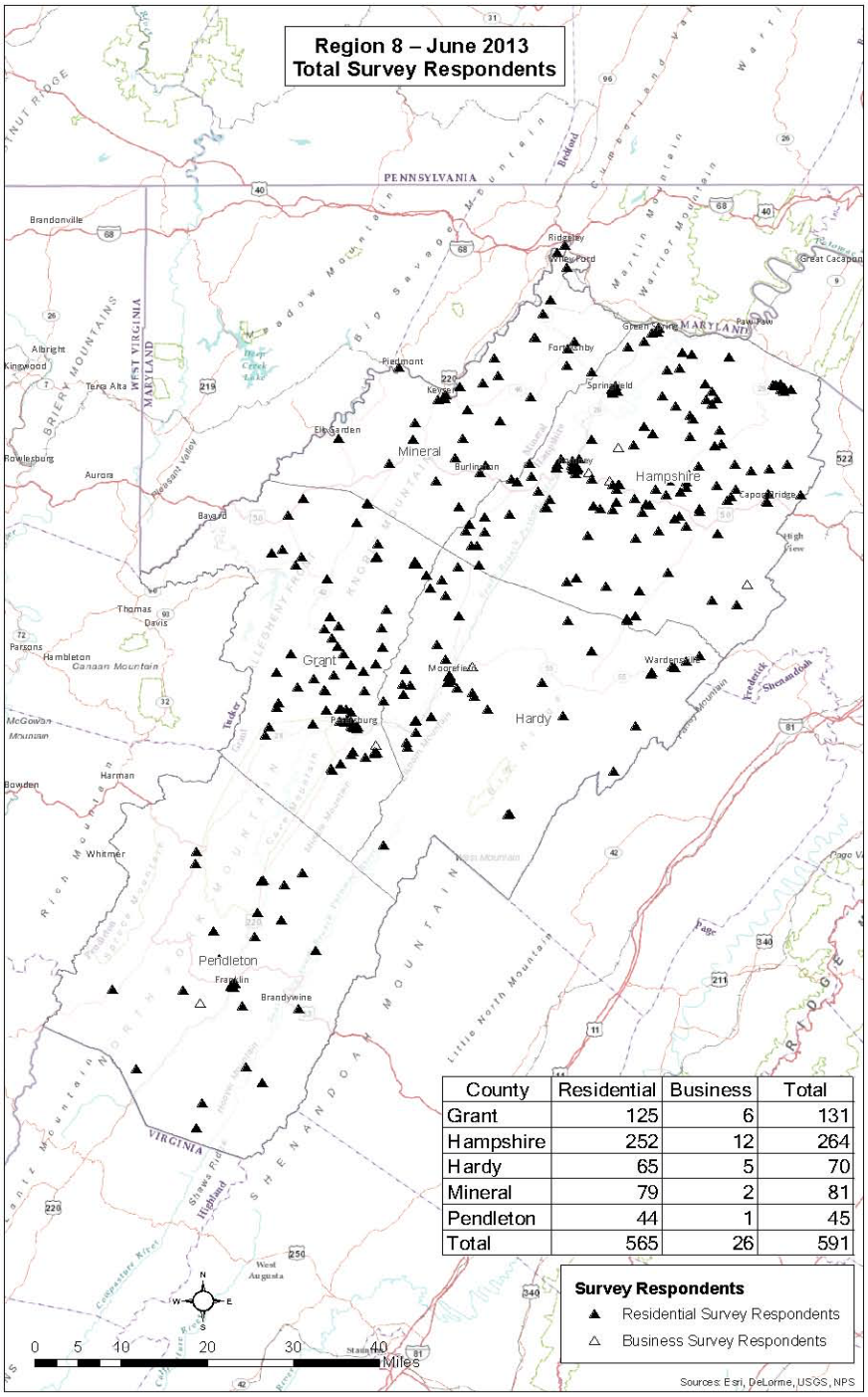


Figure 9 maps the residential and business survey respondents in Region 8. There were 601 survey respondents and 10 of those didn't respond their location information including county. Therefore, 591 respondents were mapped. The map can also be viewed in Appendix A.

Initially, the RBPT developed an outreach strategy that served as a guideline to effectively market and distribute the surveys to ensure the surveys were conducted successfully. The residential and business survey was available to the public in numerous formats that included online access through Region 8's website. Links from partnering organization's websites to the survey, and e-mail blasts with links to the surveys were also distributed. Paper copies were readily available at libraries, health departments, senior centers, Chambers of Commerce, development authorities, and some business establishments. The survey was also distributed to all K-9 students in the Hardy County School system. Grant County 4-H campers received flyers as well. Flyers were inserted into all local newspapers in the five county region with instructions for the electronic survey or to request a paper copy. The Hampshire Review published a news story based on an interview with Region 8 staff members involved with the broadband project. Local radio stations made announcements throughout the day with information about the survey. One of those stations aired an interview with Mr. Ralph Goolsby regarding the need for better broadband services in the Potomac Highlands. The survey questions were aimed at seeking information about the characteristics of the Internet service, such as type, provider, connection speed, availability, reliability, cost, and overall satisfaction with the service. Outreach efforts including website notices, flyer, news articles and other related information can be found in Appendix B.

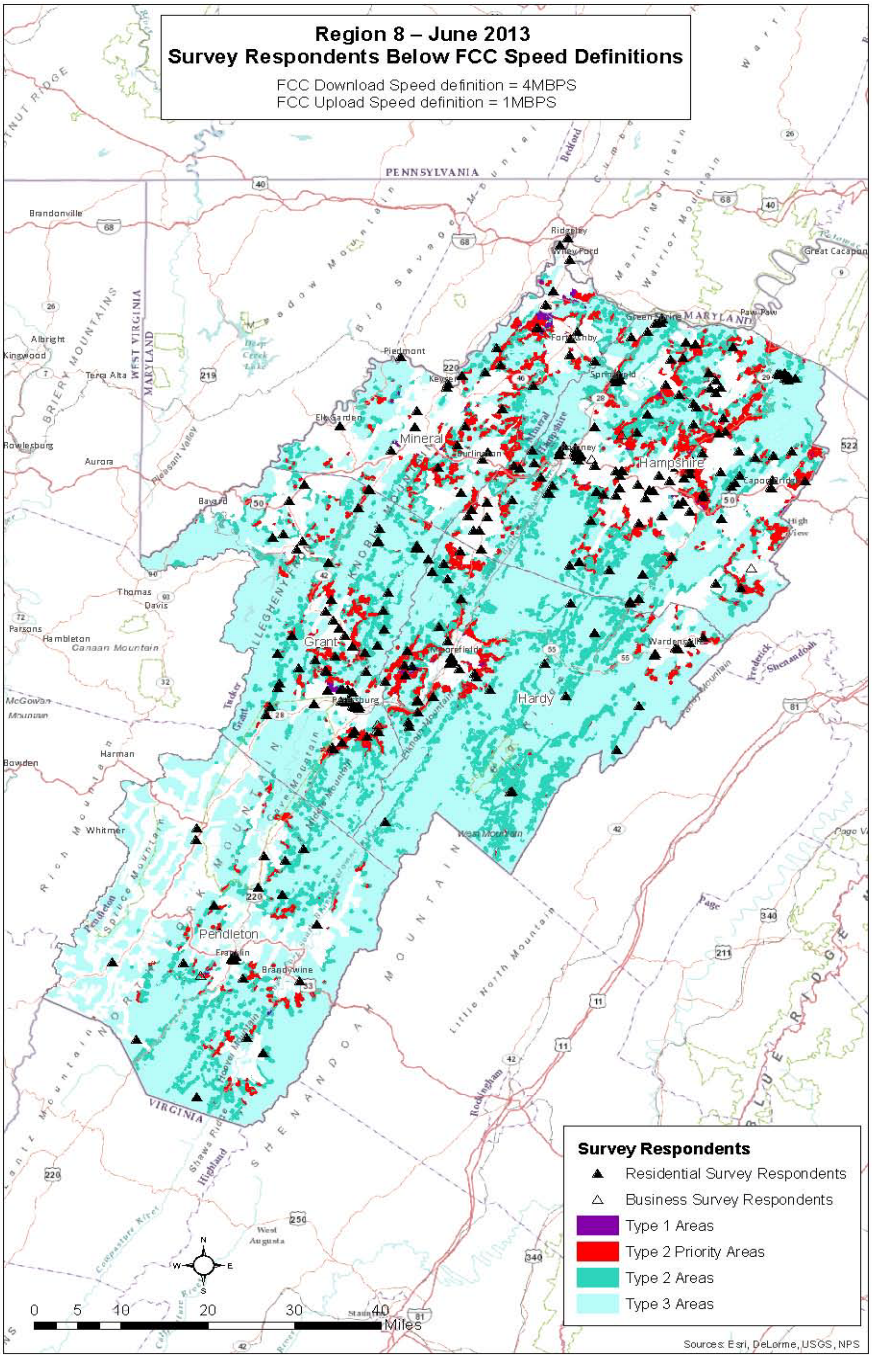
Figure 9 – Region 8 Survey Responses



County	Residential	Business	Total
Grant	125	6	131
Hampshire	252	12	264
Hardy	65	5	70
Mineral	79	2	81
Pendleton	44	1	45
Total	565	26	591

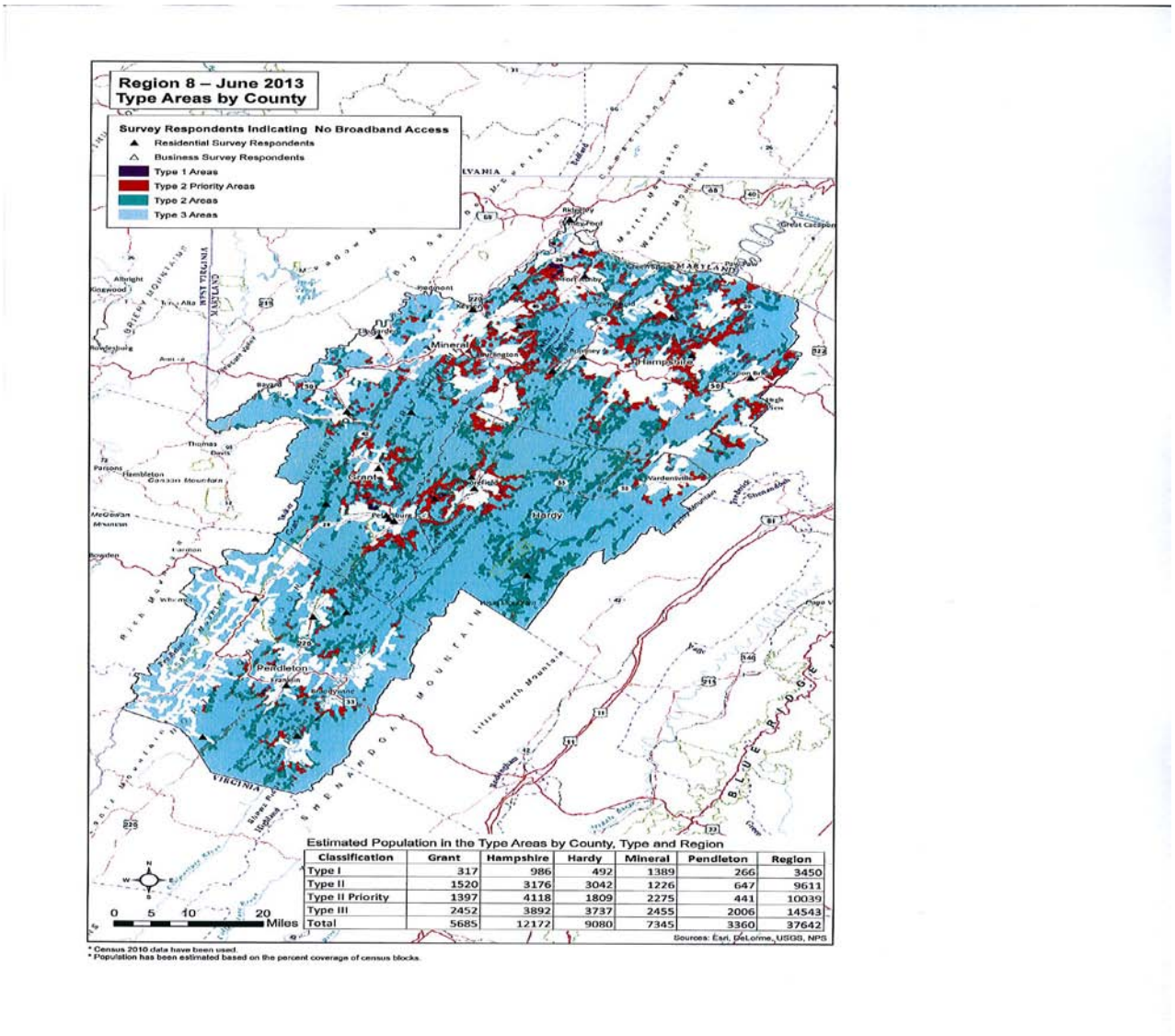
Produced by: L.R. Kimball

Figure 10 – Residential and Business Survey Respondents Below FCC Speed Definitions by Type Areas



Produced by: L.R. Kimball

Figure 11 - Estimated Population in the Type Areas by County, Type and Region



Estimated Population in the Type Areas by County, Type and Region

Classification	Grant	Hampshire	Hardy	Mineral	Pendleton	Region
Type I	317	986	492	1389	266	3450
Type II	1520	3176	3042	1226	647	9611
Type II Priority	1397	4118	1809	2275	441	10039
Type III	2452	3892	3737	2455	2006	14543
Total	5685	12172	9080	7345	3360	37642

Produced by: L.R. Kimball

Table 9 - Corresponding figures from the above map

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Type II Priority	1397	4118	1809	2275	441	10039
Type III	2452	3892	3737	2455	2006	14543
Total	5685	12172	9080	7345	3360	37642

The residential and business survey was released throughout Region 8 to gather critical information to help form the basis of a strategic broadband planning report. 601 residents and businesses responded to the survey. 99% of residents and 95% of businesses completing the survey have Internet access. The respondents most likely to answer the survey were between the age range of 55 to 64 years old. Total respondents were 49.5% female and 50.5% male.

In addition to questions about the general characteristics of their Internet service, key pieces of information were collected, including who uses the Internet in the household, if telecommuting is an option, and other places where Internet is used outside the home. Those who answered the survey were largely the users of the Internet. In the survey responses, 19.8% of residents say their employer allows employees to telecommute. Other than at home, 57% of respondents use the Internet at work, 49.4% access the Internet by cell phone, 38.7% access the Internet at a friend or relatives house, and 17.7% access the Internet at a retail shop with wireless Internet.

Respondents were asked to take a speed test to capture download and upload speeds. The resultant speed test data was integrated into the maps to achieve a more thorough picture of the areas where there is no broadband coverage and speeds do not meet the FCC definition (4Mbps down and 1 Mbps up). Only 8% of residents and 22% of businesses have broadband speed according to the FCC definition. One dominant provider serves 80% of residents and businesses.

Table 10 – Region 8 Residential and Business Respondents Speed Test Results

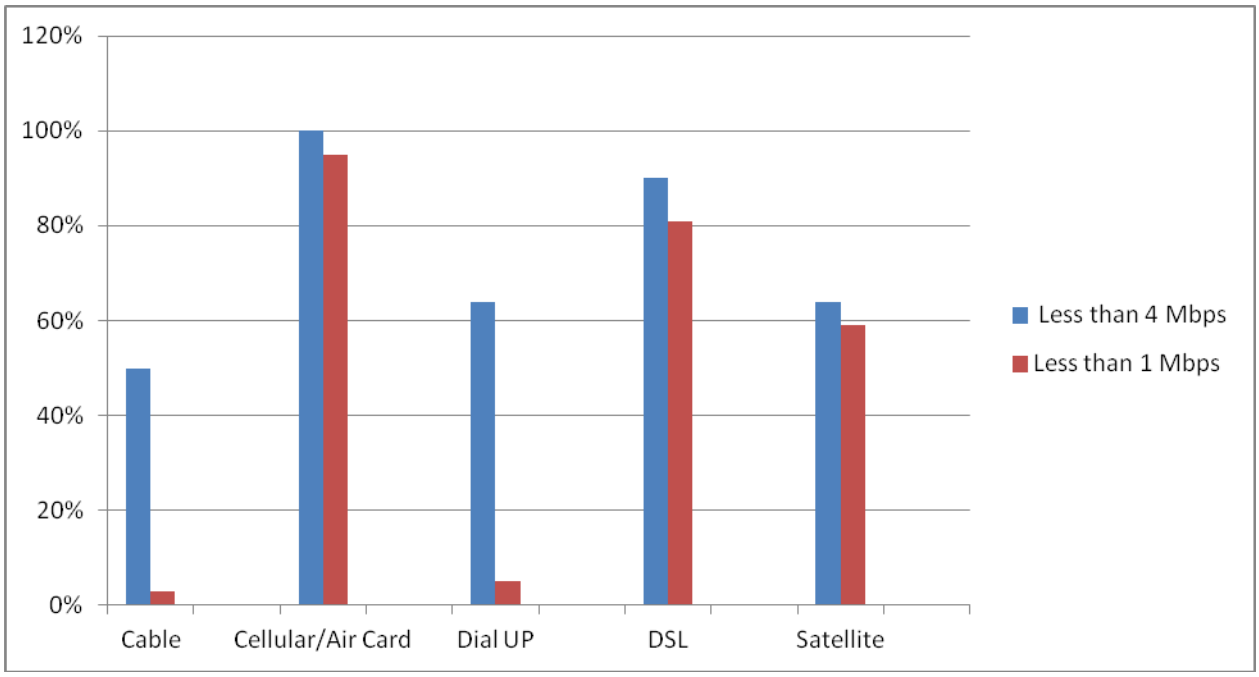


Table 11 – Region 8 Residential and Business Respondents Satisfaction Survey

Internet Characteristics	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Speed of Connection	6%	23%	32%	38%
Cost of Internet	3%	23%	40%	30%
Technical Support	10%	42%	22%	18%
Reliability of Access	7%	33%	30%	29%
Customer Service	10%	41%	23%	18%
Number of Providers	3%	9%	22%	52%

As the table indicates:

- 74% of the respondents are dissatisfied or very dissatisfied with the number of providers.
- 70% of respondents are dissatisfied or very dissatisfied with the speed of connection.
- 70% of respondents are dissatisfied or very dissatisfied with cost.
- 59% of respondents are dissatisfied or very dissatisfied with reliability of access.

Respondents who do not have broadband Internet service indicated the top three reasons are:

- 70% broadband service not available
- 33% cost/too expensive (approximate average cost $62.37)
- 4% don't own a computer

Furthermore, if these three factors were addressed 97% of respondents would utilize high-speed Internet access. Consequently, the survey responses clearly suggest that respondents feel it is very important to have access to affordable, more robust broadband service.

A thorough review of businesses responding to the survey revealed there is a profound need for faster, more robust, easily accessible, affordable, and highly available high speed Internet. Additionally, business survey findings show significant broadband service improvements are needed within the region in order to promote and ensure future economic growth and development.

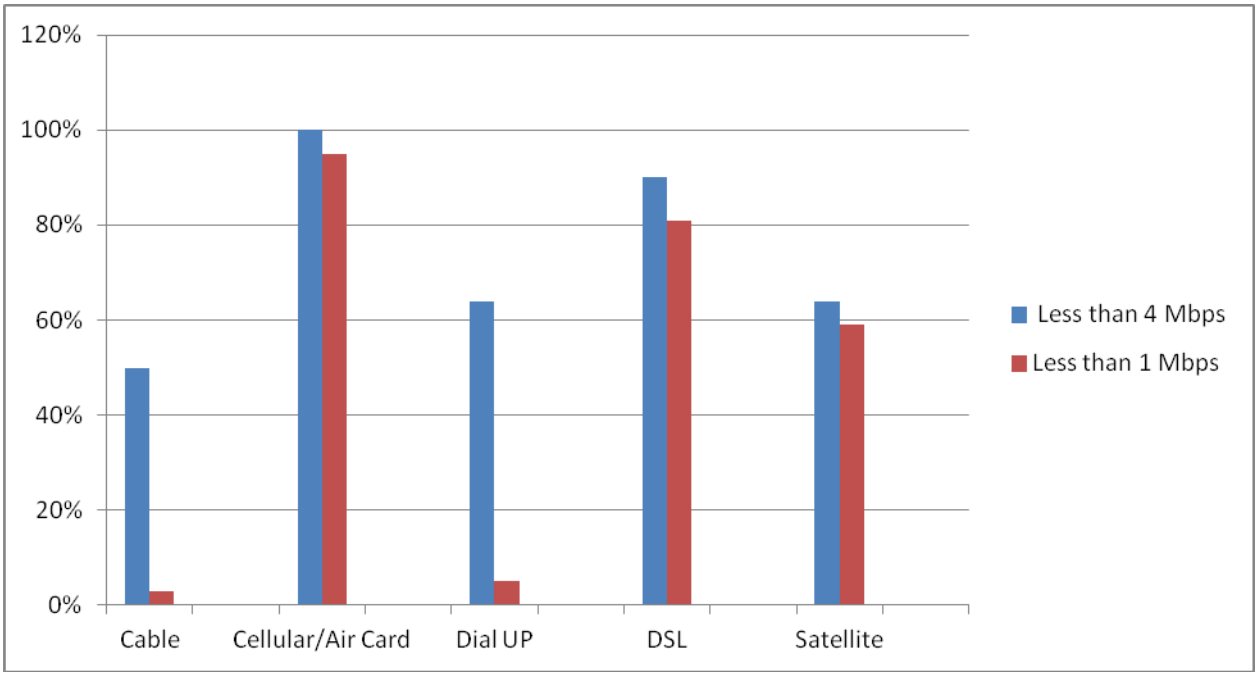
Businesses described the availability of multiple, competing broadband provider options as not competitive, with at best, only one or two providers to choose from. Businesses that responded to the survey indicated that robust high speed Internet connection is very important to the day-to-day operations of their business. Out of the 109 businesses that participated in the survey, 67% employed from 1 to 25 employees.

Key findings drawn from the businesses surveyed are highlighted below.

- 95% of businesses surveyed have Internet access
- 1 dominant provider service
- 95% connect to the Internet using cable, DSL, or fiber
- 67.2% do not allow their employees to telecommute

- 82% cited a robust broadband connection as very important to their day-to-day operations
- 94% agree that if the broadband environment is enhanced, it would benefit their customers and clients
- Only 22% of businesses have broadband speed according to the FCC definition (4Mbps/1Mbps)

Table 12 – Region 8 Residential and Business Respondents Speed Test Results



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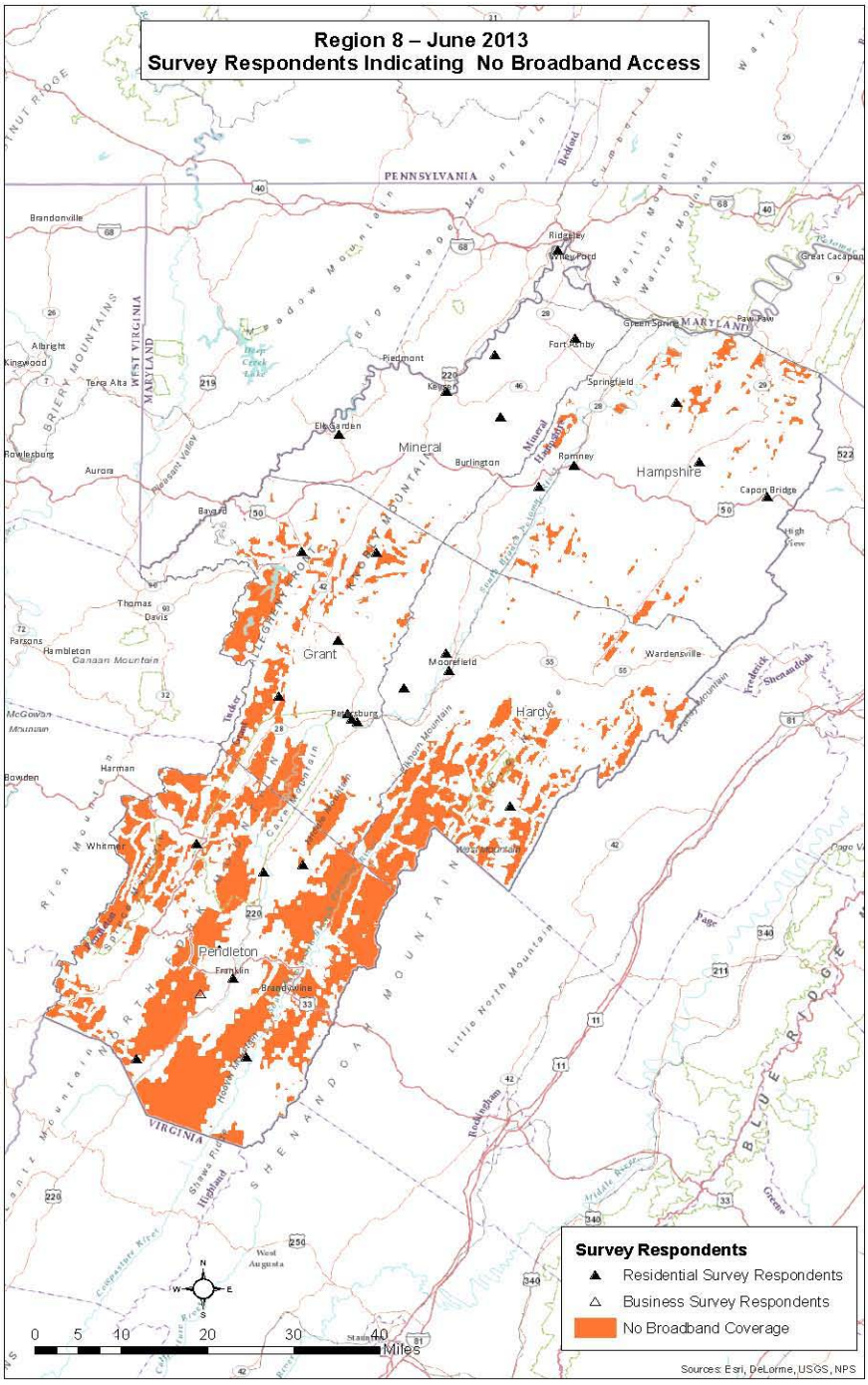
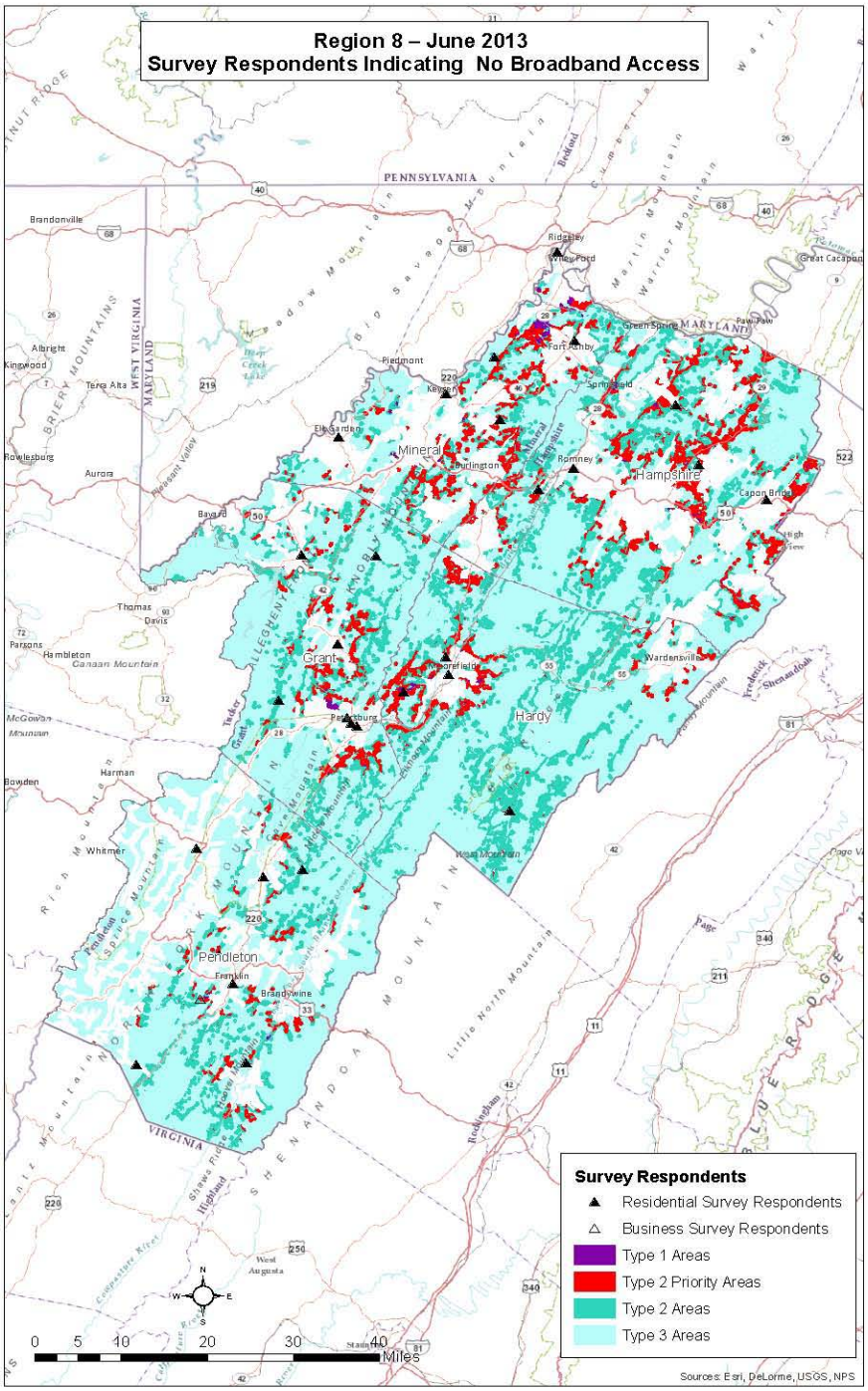
Number of Providers	3%	9%	22%	52%

Figure 12 – Survey Respondents Indicating No Broadband Access



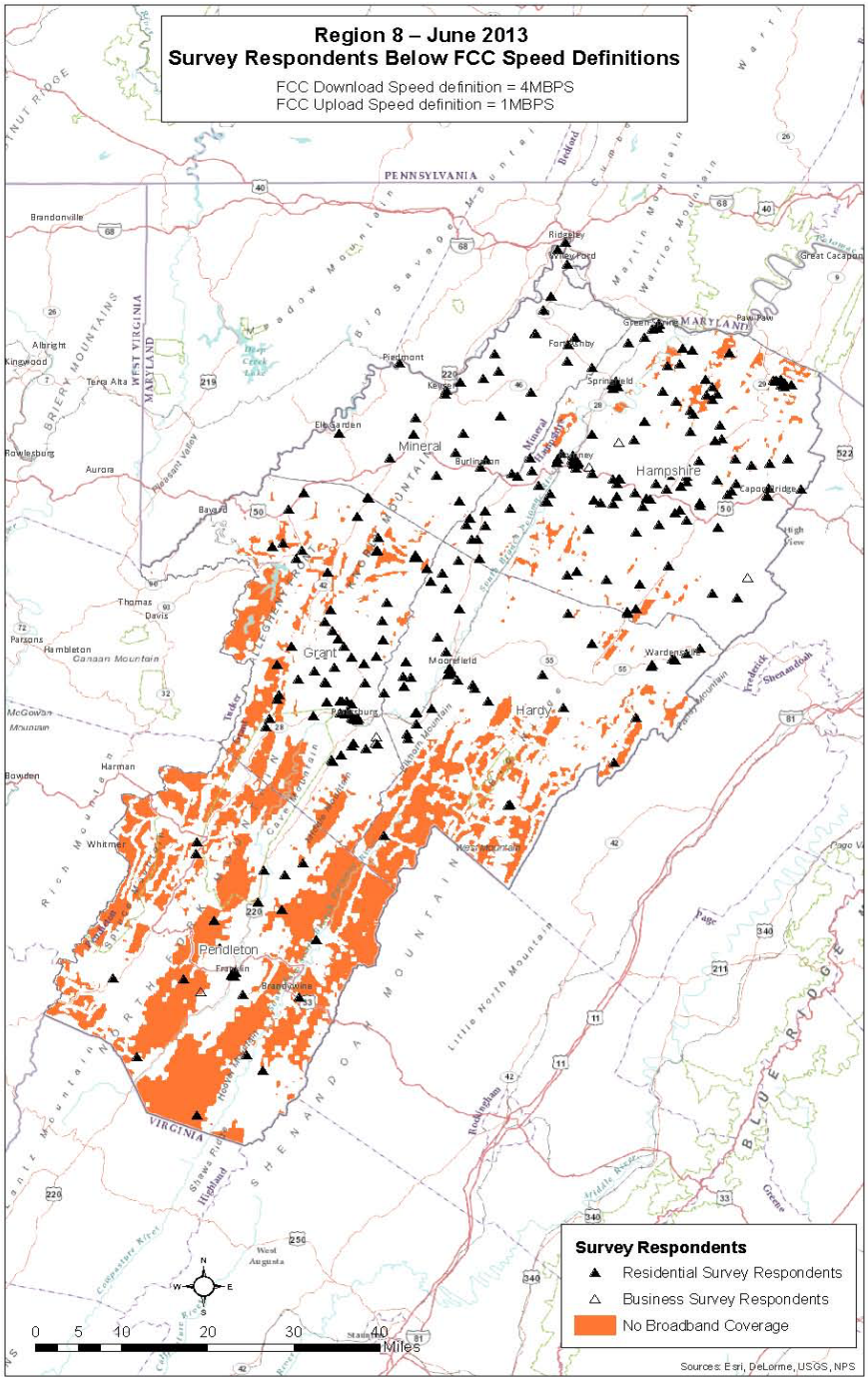
Produced by: L.R. Kimball

Figure 13 – Survey Respondents Indicating No Broadband Access by Type Area



Produced by: L.R. Kimball

Figure 14 – Survey Respondents Below FCC Speed Definitions



Produced by: L.R. Kimball

SWOC Analysis

After reviewing federal, state, and regional data, studies and surveys, combined with the RBPT's experience and knowledge, the RBPT conducted a SWOC analysis of the region's broadband capabilities. The following table provides an overview of the top priority items in each quadrant.

Table 14 – SWOC Analysis

S Strengths • Locally owned providers • Business expansion opportunities • Huge component for economic development • Locally owned providers • Essential infrastructure component	**W** Weaknesses • Limited number of providers/lack of competition • Resource commitment/funding, people • Political will/vision • Education system adjust to the direction of acquiring information
O Opportunities • Development for entrepreneurship • Job growth and telecommuting • Market existing and new businesses • Healthy appetite for services – high speed/limited concern about cost • Leverage new technologies	**C** Challenges • Political will/vision • Education system adjust to the direction of acquiring information • Quality of place vs state of the art technology • Quiet zones – effect communications/cell service, wireless, and microwave • Local providers face obstacles in expanding

The SWOC analysis was used to help identify the strategic objectives outlined in this plan.

Current Broadband Environment

The RBPT survey of residents and businesses indicated that 99% of responding residents and 95% of responding businesses have Internet access. However only 8% of responding residents and 22% of responding businesses have broadband speed according to the FCC definition (4Mbps/1Mbps). The region is dominated by one Internet provider serving 80% of the responding residents and businesses.

RBPT members including Frontier Communications, Hardy Telecommunications, Spruce Knob Seneca Rocks Telephone, and Shentel continue to make significant investments in the region.

Organization

Currently an organization(s) and/or funding resources have not been identified to implement the Broadband Strategic Plan. In the following sections, the words "regional team" refer to any organization or cooperative at the state or local level that decides to champion the implementation of one or all strategic objectives. The Council may assist its members, as needed, in project planning and preparing applications for funding.

Strategic Direction

The strategic direction section outlines the strategic objectives identified during the RBPT strategic planning process. The section is divided into three focus areas: (1) education and outreach, (2) economic development, and (3) infrastructure. Each focus area outlines the strategic objective and specific goals to accomplish the objective. This is followed by an implementation matrix that outlines the specific tasks and time frames for each strategic objective. The following table provides an overview of all the strategic objectives and their associated goals.

Table 15 – Strategic Objectives and Goals

EDUCATION AND OUTREACH (EO)	
Strategic Objective EO.1: Educate the region about the benefits and opportunities that broadband offers	Goal EO. 1.1: Conduct a gap analysis study on the existing programs
	Goal EO.1.2: Promote existing educational opportunities and services
	Goal EO.1.3: Collaborate with stakeholders to develop necessary courses that are not offered
	Goal EO.1.4: Promote discount programs and equipment

EDUCATION AND OUTREACH (EO) Continued	
Strategic Objective EO.2: Advocate and support changes to legislation that affect broadband availability and development through outreach to local officials	Goal EO.2.1: Identify legislative issues
	Goal EO.2.2: Work with WV Broadband Council to develop position papers and outreach strategy
	Goal EO.2.3: Meet with local, state, and federal officials
Strategic Objective EO.3: Support/advocate broadband services to un-served areas in the Region	Goal EO.3.1: Inventory households and businesses
	Goal EO.3.2: Aggregate demand
	Goal EO.3.3: Engage broadband provider community
	Goal EO.3.4: Monitor and support the implementation of technologies to provide broadband to unserved areas.
	Goal EO.3.5: Discuss opportunity with the State
	Goal EO.3.6: Engage foundations for assistance
ECONOMIC DEVELOPMENT (ED)	
Strategic Objective ED.1: Identify and market growth areas to support economic development and broadband expansion	Goal: ED.1.1: Assess the availability of broadband services to existing and planned business parks, commercial centers, and designated growth areas
	Goal ED.1.2: Prioritize inventory of existing and planned business parks, commercial centers, and designated growth areas for broadband expansion
	Goal ED.1.3: Encourage statewide policy decisions to facilitate broadband expansion
	Goal ED.1.4: Leverage local incentives to attract private investment in broadband expansion
Strategic Objective ED.2: Support implementation of Wi-Fi technology throughout growth centers and urban areas	Goal ED.2.1: Identify possible Wi-Fi project areas
	Goal ED.2.2: Formulate a strategy to provide support for addressing Wi-Fi service gaps
	Goal ED.2.3: Educate local leaders and constituents about the importance and benefits of Wi-Fi

INFRASTRUCTURE (IN)	
Strategic Objective IN.1: Encourage broadband providers' involvement early in the planning and development process	Goal IN.1.1: Include broadband providers as early as possible in the development approval process
	Goal IN.1.2: Develop a liaison with each broadband provider in the area
	Goal IN.1.3: Collaborate to identify optimal locations for infrastructure expansion and co-location of cellular towers
	Goal IN.1.4: Work with County and local planning directors to ensure that broadband infrastructure is included in their comprehensive plans
	Goal IN.1.5: Partner with local governments, planners and economic development organizations to incorporate the provision of broadband infrastructure in current planning policy and advance public funding requests
Strategic Objective IN.2: Advance the recommendation of increasing the state's minimum speed standards to 20 mbps down/5 mbps up by 2015	Goal IN.2.1: Engage existing broadband providers
	Goal IN.2.2: Support local school districts and the Department of Education goal to achieve the following recommended speed criteria: • 2014 – 10 mbps per 100 students • 2017 – 100 mbps per 100 students
	Goal IN.2.3: Encourage build-out of a major fiber backbone in the Region to support expansion of broadband
	Goal IN.2.4: Coordinate with the State
	Goal IN.2.5: Engage cable franchises
	Goal IN.2.6: Engage new broadband providers
Strategic Objective IN.3: Identify technologies that support broadband deployment in the "quiet zone"	Goal IN.3.1: Collaborate with state and federal officials to develop policies which will support technologies for the "quiet zone"
	Goal IN.3.2: Engage providers to explore emerging technologies that could support broadband access in the "quiet zone"
	Goal IN.3.3: Seek funding opportunities that would support broadband access in the "quiet zone"

INFRASTRUCTURE (IN) Continued	
Strategic Objective IN.4: Identify and monitor funding and financing sources to support implementation of broadband strategy	Goal IN.4.1: Develop a comprehensive funding strategy
	Goal IN.4.2: Implementation of the funding strategy

Strategic Objective EO.1: Educate the region about the benefits and opportunities that broadband offers

Broadband plays a significant role in our lives today. It exists in our homes, offices, schools, and businesses. Many opportunities avail themselves when broadband is present and accepted. In contrast, lack of information, education and resistance to new technologies are broadband adversaries and create challenges to widespread adoption. Bridging this "digital divide" is not an easy feat, especially in the United States today where nearly 100 million Americans do not have access to high-speed broadband. Any person who does not have Internet access is being left behind.

To help close the divide, the regional team may consider developing and implementing an education and outreach strategy to (1) address the benefits, increase use, and advance the procurement of broadband services, as well as aggregate customer demand in communities with little or no broadband service; and (2) approach ways to deliver more valuable, informative, time-saving, online services and content to the consumer, including finding resources to guide new ventures through the business process, and helping end users get the technical support they need, and get it quickly.

Universal adoption, implementation, and expansion of broadband will not only help close the digital divide for communities and neighborhoods in the region, but will ultimately help shift the gears forward in developing and advancing infrastructure and economically strengthen the state.

Goal EO.1.1: Conduct a gap analysis study on the existing programs

Widespread broadband penetration, adoption, and usage are paramount to the region's competiveness and economic growth. It is important to recognize the capabilities, opportunities, and potential power of having access to high-speed broadband. It is conceivable that communities will thrive and achieve greater success in every aspect of life if there is a reliable, accessible, and affordable broadband network to take advantage of education, healthcare, commerce, government, and business services.

And yet, a community will not flourish if they are not given the same chance as others to understand its benefits, and access and utilize high-speed Internet services. Educating users

about the advantages of technology, the options available to them, and setting a higher standard of what is acceptable, high-speed broadband will ultimately increase the acceptance and proliferation of this technology. We should embrace the notion that a broadband "user" understands the benefits that technology brings to their lives and is invested in exploring and expanding those benefits.

Providing affordable broadband options throughout the region must be a priority. Many consumers do not subscribe to high-speed Internet, citing the lack of affordability as one of the major obstacles. As part of this strategy, it will be demonstrated where there are programs available that leverage subsidized funding to help those who cannot afford the high costs of broadband services.

In order to accomplish this objective, the regional team may consider developing a targeted outreach and education strategy that will transform the way residents and businesses in local communities and neighborhoods utilize and adopt high-speed broadband.

Goal EO.1.2: Promote existing educational opportunities and services

The regional team may partner with key constituents to promote existing educational opportunities identified in the gap analysis designed to instruct individuals about the advantages of broadband access. For example, the regional team may collaborate with senior centers. To help with outreach and training, and to offer programs they currently use (i.e., teach older citizens about computers and how to safely get online) to parents, rural residents, vulnerable populations, the unemployed, and low-income families.

Goal EO.1.3: Collaborate with stakeholders to develop necessary courses that are not offered

The regional team may coordinate with stakeholders to develop the necessary programs that provide educational value about broadband services and are not currently offered. For example

- Teach basic Internet principles and computer skills
- How to connect to family and friends via social networks and e-mail
- Access resources (shopping, government communications and services etc.)

Goal EO.1.4: Promote discount programs and equipment

One of the challenges the regional team faces is increasing the broadband take rate in economically distressed areas and low-income households. This problem is not isolated to the region or even West Virginia. In fact, the nation has been faced with this issue for decades. Since 1985, the FCC has been administering a successfully recognized program called LifeLine[2].

[2] www.fcc.gov/guides/lifeline-and-link-affordable-telephone-service-income-eligible-consumers

LifeLine provides millions of low-income Americans access to basic telephone service. (Please refer to Appendix C for more information.)
According to the survey results, the top three reasons cited for not having broadband Internet service were (1) broadband service not available, (2) cost is too expensive, (3) don't own a computer. As part of the overarching goals of the education and outreach strategy, the regional team may consider taking the lead in researching, identifying, participating, and promoting existing programs designed to provide affordable, reduced-rate broadband services for struggling, low-income families. This may include Future Generations, Mission West Virginia and others. It was noted August 2013 the FCC released $385 million to support the Connect America Fund, for which Frontier Communications received $24 million.

By acting as a partner, the regional team can help spread the word about the program to constituents as well as the community. As a partner in this program, members receive the following benefits:

- program information and updates
- materials for back to school notices to parents
- flyers, articles, and other handouts
- complimentary brochures to pass on to people in the community

In addition the regional team may want to monitor the following program for future availability and funding opportunities:

- Connect2 Compete – is a national, nonprofit organization of public-private partnerships. The FCC announced the creation of this program in October 2011 and identified its mission of helping Americans improve their lives by becoming digitally literate. It began as a pilot project in California, but has expanded throughout the country in 2012, and will ultimately be available for all 50 states by late 2013. This program is designed to help organizations promote and advance the adoption of high speed Internet by making it accessible and affordable for low-income families. However, the low-cost Internet service and computer offer is not available in the Potomac Highlands at this time. The organization is working to make sure Connect2Compete reaches communities throughout the country in the coming year. To follow their progress periodic checks will be made on their website.
- Lifeline Broadband Pilot Program – is another FCC initiative that was created to help low-income families receive basic telephone service. Earlier this year, a number of ISPs were awarded funding to participate in the pilot program that is currently undergoing modernization reforms to extend LifeLine discounts to broadband services for certain subsidy amounts, end user charges, access to digital literacy, data usage limits, choices for broadband speed, access to equipment, and other important variables that affect broadband choices. This is a federally funded program that should be monitored closely for future funding opportunities and participation of local Internet service providers that may expand the program to the Region.[3]

[3] Federal Communications Commission Document, accessed at http://www.fcc.gov/document/14-projects-chosen-lifeline-broadband-pilot-program-competition

Strategic Objective EO.2: Advocate and support changes to legislation that affect broadband availability and development through outreach to local officials

The RBPT identified the need to support Broadband friendly legislation as a critical component to expanding broadband infrastructure and utilization. The regional team may support legislation that removes barriers to expanding infrastructure, increases the speed definition of broadband and provides funding for broadband expansion in accordance with the goal and objectives of this strategic plan.

Goal EO.2.1: Identify legislative issues

The regional team may identify issues that require legislative support to improve the deployment and availability of broadband throughout the region. Some of the issues identified during the planning process included the state definition of broadband speed, simplifying/streamlining the ability of utilities to use right-of-ways, and increase funding for broadband planning and implementation. The regional team may also monitor local and federal legislative opportunities.

Goal EO.2.2: Work with WV Broadband Council to develop position papers and outreach strategy

The regional team may collaborate to develop position papers on key issues. The papers will identify the issue, the necessary action and the benefits of the change in legislation or regulation. Position papers provide the foundation for the outreach strategy and ensure that all supports have the same base information. The outreach strategy should identify for each issue:

- Who should receive the messages/request for help (e.g., Congressional Member, State Legislatures, Agency Staff, County Commissioner)
- Who should deliver the message
- Timeline for action
- Collateral material needed

Goal EO.2.3: Meet with local, state, and federal officials

The regional team may meet with key decision makers and request support for identified legislative initiatives. The stakeholders could include, but would not be limited to, the following groups.

- Local officials
- State legislators
- Congressional representatives
- State agencies
- Lobbying groups
- WV Department of Commerce

Strategic Objective EO.3: Support/Advocate broadband services to un-served areas in the Region

Region 8 continues to have areas that are unable to receive Internet service other than through dial-up or satellite connectivity. This limitation can affect the quality of life (e.g., healthcare, education, business opportunities) for residents and the competitiveness of businesses in these areas. Therefore, the regional team may work to ensure broadband availability throughout the region.

Goal EO.3.1: Inventory households and businesses

The regional team may develop an inventory of households and businesses that are unable to receive broadband Internet services. In order to focus on unserved and underserved areas, the regional team may use multiple sources of data:

- The West Virginia statewide 911 addressing data point layers
- The State's Type I, II and III priority area maps
- FCC data layer to the mapping project that shows areas that are reported as unserved by fixed broadband, with advertised speeds of 3 mbps down and 768 Kbps up
- Address data for the RBPT survey of individuals and businesses that indicated they do not have broadband available in their area
- Areas identified in Strategic Objective ED.1

Utilizing the State's Priority Type data layers and the statewide 911 addressing data points, the RBPT has identified unserved cluster areas in each County. The regional team may target these areas for demand aggregation as outlined in Goal EO.3.2 below. The following table outlines the number of unserved and underserved addressed facilities by County.

Table 16 - Unserved Areas by County, Type, and Region

Classification	Grant	Hampshire	Hardy	Mineral	Pendleton	Region
Type I	132	360	258	209	74	1033
Type II	1845	2631	6269	934	1085	12764
Type II Priority	1202	2532	2237	1269	423	7663
Type III	416	391	1954	122	279	3162
Total	3595	5914	10718	2534	1861	24622

Goal EO.3.2: Aggregate demand

In order to demonstrate market demand, the regional team may survey the identified residents and businesses to determine their desire to purchase broadband. The outreach may include educational information to demonstrate the benefits of broadband. This task may be accomplished through phone calls or a mailing. Furthermore, residents and businesses could be encouraged to sign a letter of intent stating that if broadband is provided at a specified

service level for a specified price they will purchase the service. The information may be analyzed to determine if priority areas or regions exist.

Demand aggregation is an important step in increasing broadband availability. Broadband providers have informed the RBPT that when making network expansion decisions the key variables that are considered are: capital improvement costs, operation cost, number of likely users, and return on investment. Identifying early adopters and likely users will help the provider community make clear investment decisions.

The regional team may seek funding from the State Broadband Deployment Council to assist with demand aggregation. Demand aggregation in unserved and underserved areas in an eligible funding activity.

Goal EO.3.3: Engage broadband provider community

Once the total population and the initial level of interest have been assessed, the broadband provider community will be engaged to identify solutions. The regional team may present the providers with an overview of the opportunity and discuss their ability and willingness to provide services. This may be accomplished through a provider conference or a request for information process. If no provider is interested in committing to providing services in the identified area, the regional team may work with the provider community to identify barriers (e.g., capital expense, technical issues) to expanding broadband services.

Goal EO. 3.4: Monitor and support implementation of technologies to provide broadband to unserved areas

The regional team may monitor the progress of potential technologies that may have the ability to provide broadband to unserved areas. Some of the technologies that will be monitored include the use of white space spectrum currently utilized by broadcast companies, advancements in broadband over power lines and increased speed and reliability of broadband via satellite.

If these or new emerging technologies methods prove promising the regional team may support funding efforts and pilot programs in the region.

Goal EO.3.5: Discuss opportunity with the State

The regional team may engage the state government as a partner throughout this process and invite them to participate in the provider outreach program. Additionally, any barriers of entry identified by the providers may be shared with the state. The regional team may engage the state to identify resources, funding, and assistance in the implementation and support of potential projects in unserved and underserved areas. Furthermore, the regional team may work with the state to leverage its Broadband Technology Opportunities Program (BTOP)

investment in fiber to anchor institutions throughout the region to determine if the new resources can benefit the unserved and underserved areas.

Goal EO.3.6: Engage foundations for assistance

In addition to state and federal funding, many foundations provide assistance to bring broadband services to unserved and underserved areas. The regional team may present the foundations with an overview of the opportunity and discuss their ability and willingness to assist. Examples of potential partners include GigU, Google, Cisco, Bill and Melinda Gates Foundation and Claude Worthington Benedum Foundation.

Strategic Objective ED.1: Identify and market growth areas to support economic development and broadband expansion

A healthy, growing economy is heavily dependent upon the latest technologies and access to affordable and reliable broadband infrastructure is often a key criterion in business decisions when a company is looking to relocate to an area. In addition to serving the employment base already in the area, communities will be attractive to an emerging new group of business-people that typically are well-educated, own their own businesses, and are making choices about where they live based on family needs and interests and the availability of affordable, high performance broadband.

This new breed of entrepreneurs place a high value on the kinds of amenities that are already part of the region: mild climate, superb recreational activities, great small towns, good schools, and a sense of place.

Business people and their families make decisions to stay in a community or to relocate based on quality of life and the availability of abundant and affordable broadband, because broadband is the enabler of these new Knowledge Economy businesses. Our discussions with local businesses and leaders suggest strong business support for an improved access to broadband and more affordable telecom services. To ensure that implementation of the RBPT broadband strategy supports regional growth priorities, it is important that local priorities are considered in its implementation.

Goal ED.1.1: Assess the availability of broadband services to existing and planned business parks, commercial centers, and designated growth areas

The regional team may conduct a more thorough inventory of existing and planned business and industrial parks, sites, and buildings, as well as locally designated growth areas. These areas should include brownfield sites and post-mining sites. The background section of this report provides a foundation for this inventory with the identification of growth areas and the current priority economic development sites for infrastructure expansion and enhancements. The regional team may use this information as a starting point to engage partners as

appropriated and develop a regional inventory of growth area priorities. Partners for this task should include county and municipal administrators and economic development organizations.

Goal ED.1.2: Prioritize inventory of existing and planned business parks, commercial centers, and designated growth areas for broadband expansion

The regional team may develop criteria for prioritizing infrastructure development in areas without broadband access. While individual counties and municipalities each have priority growth areas and economic development sites, a regional strategy should collaboratively synthesize these priorities into an overall strategy for the region. As with the inventory referenced above, local planning departments and economic development organizations should play key roles in this process. Potential prioritization criteria could include things such as:

- Traffic counts
- Physical characteristics
- Zoning
- Property ownership
- Potential return on investment
- Foreign Trade Zone (FTZ) Site
- Economic impact
- Access to:
    - Water/sewer infrastructure
    - Technology infrastructure
    - Natural gas/energy
    - Utilities
- Proximity to:
    - Workforce retail amenities
    - Recreation amenities
    - Rail transportation
    - Air transportation
    - Major transportation corridors
    - Business & industry cluster

The regional team may use the criteria developed above to rate and prioritize broadband infrastructure investment. The regional prioritization of the growth areas and sites can guide the implementation of the broadband strategy to ensure the areas and sites that can have the greatest impact on the regional economy and are among the first efforts in the expansion of broadband infrastructure in the region.

Goal ED.1.3: Encourage statewide policy decisions to facilitate broadband expansion

The regional team may meet with the West Virginia Department of Transportation to encourage the “dig once” philosophy with future highway improvements.

Goal ED.1.4: Leverage local incentives to attract private investment in broadband expansion

The regional team may also collaborate with local governments and economic development organizations to identify potential private investors in broadband infrastructure. In a growing economy, incentives could potentially be offered to private companies who are considering locating or expanding in the Region. These private companies could potentially invest in broadband infrastructure with local incentives designed to subsidize development costs and encourage location in priority growth areas.

Strategic Objective ED.2: Support implementation of Wi-Fi technology throughout growth centers and urban areas

Wireless Internet (Wi-Fi) is a popular technology that allows electronic devices to connect to the Internet and exchange data wirelessly.[4] Wi-Fi connectivity is not only expected, but is paramount to the way today's consumers gain instantaneous access to the Internet wherever they go. Wi-Fi allows us to decentralize and expand, but stay even more connected to family, friends, and work. Wi-Fi can have a greater range outdoors – many square miles – than it does indoors. Not being tethered to computers, laptops, and other conventional devices and going beyond the inherent limitations of bricks and mortar is becoming the standard in our digital society.

One of the challenges the Region faces is breaking the WI-Fi barriers that impede the ability to connect anywhere, anytime. Uninterrupted, reliable, robust, and secure Wi-Fi service has significant implications to achieving greater economic diversification and growth, and will:

- benefit local businesses by encouraging consumers to patronize their services
- increase a consumer's buying power and enhance their overall experience
- enable a safer environment through better public safety and security efforts
- help promote cities and urban areas as destination places

Throughout the country, some cities recognize Wi-Fi's capacity to make location extremely relevant and increase the drive for a competitive advantage. These cities have begun setting up their own wireless networks – know as municipal Wi-Fi – either wholly government owned or through public-private arrangements with telecommunications companies. These types of networks go beyond the established practice of connecting to Wi-Fi at local coffee shops and libraries. Universal service that covers the city is more economical, enhances city services, and serves as a social service, providing connectivity to those who cannot afford private high speed Internet. Cities need to be Wi-Fi friendly to attract and encourage visitors and businesses to cluster into the downtown and urban areas.

In a recent study conducted by Design Nine for Mineral County Broadband Recommendations it is stated, "Wireless services will be important in Mineral County. And wireless is not going

[4] http://en.wikipedia.org/wiki/Wi-Fi

away; it will remain as an important component of a well-designed community broadband system – as a mobility solution. As we travel around the community, we want to be able to access the Web, check email, make phone calls, and do other sorts of things. Wireless services enable that, and in rural areas, wireless services are an important step up from dial-up."[5]

However, Wi-Fi deployment does have some unique challenges. For example, which downtown areas deserve the most focus and attention? Should the network be municipally owned and operated, or shall a public-partnership be formed to control it? What types of Wi-Fi networks are available – cloud solutions or zones, better known as "hot spots"? How feasible are they to deploy? Who should share the burden of the costs for wireless infrastructure, and how is such infrastructure maximized to its fullest potential? And finally, who are the key stakeholders that need to be engaged and educated about Wi-Fi technologies?

To support the implementation of Wi-Fi throughout the Region's cities, the RBPT defined several key goals to respond to these challenges and help shape the future of Wi-Fi.

Goal ED.2.1: Identify possible Wi-Fi project areas

The Region 8 Planning and Development Council's Regional Development Plan Comprehensive Economic Development Strategy 2009-2013 identifies Keyser, Romney and Moorefield/Petersburg as growth centers for the region. An inventory of need for those areas will be collected and priorities will be shaped and shared with broadband providers to prioritize their investments in broadband infrastructure to ensure that their investments are aligned with local growth priorities in the region. Once the inventory is developed, areas without Wi-Fi will be prioritized.

Goal ED.2.2: Formulate a strategy to provide support for addressing Wi-Fi service gaps

The regional team may study best practices where Wi-Fi has been successfully implemented and utilized and contact local wireless internet providers and networking companies to identify potential solutions and partners. Using this information, the regional team may develop a template to help facilitate Wi-Fi projects in targeted areas identified in Goal ED.2.1. The template may identify:

- Best practices in deploying Wi-Fi in small communities
- Potential network technologies/architectures
- Costs
- Potential funding opportunities

The template will define a model that can be adjusted and replicated by other cities and municipalities in the Region.

[5] Mineral County Broadband Recommendations, page 18 as prepared by Design Nine and funded by the Appalachian Regional Commission and the Mineral County Commission

Goal ED.2.3: Educate local leaders and constituents about the importance and benefits of Wi-Fi

The most effective way to garner support to expand city-wide Wi-Fi access is to educate local public officials, business leaders, and other key constituents about the benefits that Wi-Fi brings to the community. The regional team may present the benefits of Wi-Fi and the template module to an audience of public officials, local businesses, educators, and other community leaders. Key discussion areas may include:

- Wireless Internet is an asset not a liability
- Wi-Fi has improved the quality of life for residents and businesses
- The costs, technology, trends, and issues
- Funding sources to absorb the upfront costs
- Recruiting the cities' technology experts to assist with efforts

The regional team may help coordinate and support local Wi-Fi projects and planning efforts.

Strategic Objective IN.1: Encourage broadband providers' involvement early in the planning and development process

During the planning process, a number of opportunities where broadband infrastructure can be introduced into existing processes were identified. In most cases, essential infrastructure is critical to the marketability of sites in a residential or commercial subdivision. Developers meet early in the process with local planning departments, economic development groups, and utility providers to make sure that the infrastructure can be provided and to ensure that the needed infrastructure is included in economic development planning. While in the past, infrastructure needs were typically focused on water, sewer, and utilities, with advances in and increased utilization of technology in business and personal operations, broadband infrastructure should receive equal consideration during the planning process.

Goal IN.1.1: Include broadband providers as early as possible in the development approval process

One of the first steps required to achieve this goal is to clearly define the importance of including broadband providers in the development planning and approval process, the opportunities that can be created through their involvement for both the providers and for the local community. The regional team may meet with broadband providers to gain an understanding of their current involvement in the early stages of the development planning process and the value that including broadband providers can bring to the process. This information could be used by the regional team in developing talking points for subsequent meetings with economic development organizations and planners. During these meetings, the regional team may also identify a contact person from each provider organization who will serve as the liaison for future communication and involvement in local community and economic development planning processes and activities.

Understanding the coverage and capacity of each provider can be very helpful to the broadband planning process, as well as to economic development planning. Another objective of the meetings with broadband providers is to encourage each provider to share as much information as possible regarding the location of current infrastructure and its capacity. This information should include both lit and dark fiber.

With information compiled from meetings with broadband providers, the regional team may meet with local economic development organizations and planning officials to gain a clear understanding of their planning and approval processes and to communicate the importance of including broadband providers as early as possible in the processes.

The objectives of these meetings should be (1) identify specific times/milestones in the planning process where broadband providers should be included in the process; (2) agree upon how and when broadband providers will be invited to participate in the process; (3) provide the contact information for the liaison from each provider organization. In some situations, it may be appropriate to solicit provider interest in specific development projects through the use of Requests for Proposals (RFPs), or perhaps solicit letters of interest in very early stages of the development process.

Broadband providers, local planning departments, and economic development organizations will likely be key partners in the implementation of this portion of the broadband strategy; therefore, the above meetings can also be used to (1) introduce these groups to the strategy; (2) gain their buy-in and support for the strategy; (3) invite their participation as a partner in strategy implementation, and (4) identify collaborative ways for the groups to participate in the strategy implementation. Funding opportunities should be part of collaborative implementation strategies.

The regional team may also coordinate with staff members of planning departments and economic development organizations to provide briefings to their boards regarding the broadband strategy and its importance to the region. This can help to ensure a united commitment to support the strategy's implementation.

Goal IN.1.2: Develop a liaison with each broadband provider in the area

To maximize collaborative efforts in strategy implementation, it is important to establish primary points of contacts from each broadband provider who will act as liaisons to planning and economic development groups. This will ensure consistency and efficiency in the inclusionary process. The contact information can be circulated to all regional planning and economic development groups for reference.

Goal IN.1.3: Collaborate to identify optimal locations for infrastructure expansion and co-location of cellular towers

Broadband providers, local government officials, and planning and economic development organizations are all stakeholders in broadband infrastructure expansion. Since all of these groups will invest in some way in the expansion of broadband infrastructure, it is important that they collaborate in prioritizing the optimal locations for infrastructure expansion.

Goal IN.1.4: Work with county and local planning directors to ensure that broadband infrastructure is included in their comprehensive plans

A local comprehensive plan serves as a long-range "blueprint" for a community or region that identifies its vision and goals for the future, and lays a foundation for future land use and policy decisions. Including broadband in local comprehensive plans is critical to provide a basis for policy decisions associated with the regional broadband strategy. The inclusion of broadband infrastructure in a local comprehensive plan can also inform and enable prioritization decision, can ensure that investments in broadband infrastructure are made in specific areas where they will yield the greatest benefit, and demonstrate local commitment to the strategic development and expansion of broadband infrastructure.

West Virginia counties and municipalities are required to update their comprehensive plans every 10 years. Counties and municipalities that are in the process of updating their comprehensive plans can easily incorporate a broadband strategy into their updates. Counties that have recently completed updates to their comprehensive plans can adopt an amendment to their existing plan if needed that would include a broadband strategy.

The regional team may conduct meetings with county and municipal planning departments in Region 8 to gather information regarding existing comprehensive plans within the counties and their municipalities, and to discuss the importance of including a broadband strategy in their comprehensive plans.

The inclusion of broadband in a comprehensive plan can range from a simple mention of its importance to an assessment of current broadband infrastructure, identifying priority areas for future infrastructure and a strategy for its implementation. The strategies outlined in the RBPT Broadband Strategy can serve as the basis for the broadband section of county and municipal comprehensive plans. The regional team may make recommendations to local planning departments for comprehensive plan updates or amendments.

As local planners are developing broadband plans for inclusion in their comprehensive plans, they may require technical support to ensure that their plans are aligned with specific needs for broadband infrastructure. The regional team may provide input and technical assistance as needed regarding broadband infrastructure requirements to assist in the development of

comprehensive plan updates. The regional team may include partners who are subject-matter experts with the needed technical expertise.

Goal IN.1.5: Partner with local governments, planners and economic development organizations to incorporate the provision of broadband infrastructure in current planning policy and advance public funding requests

Local planning officials can help to ensure that broadband access is a consideration in subdivision planning for residential, commercial, and industrial development through the use of regulatory requirements for land development. Subdivision and land development ordinances, especially in designated growth areas, can ensure that developers provide adequate broadband infrastructure that will support the land uses targeted for specific areas. Adequate broadband infrastructure, coupled with the lower-than-average cost of doing business in the region, can also be a key factor in attracting targeted businesses to the region.

The regional team may encourage local planning officials to amend zoning and subdivision and land development ordinances to include broadband requirements. These amendments can include the following types of items:

- Requirements that cell towers allow for multiple users
- Inclusion of a "dig once" regulation requiring, at a minimum, infrastructure (conduit) is included in land development. Even if it is not feasible at the time of construction to run fiber, requiring the infrastructure at the time of development will minimize cost and inconvenience when fiber is feasible.
- Require the inclusion of dark fiber with transportation/streetscape improvements and new roadway construction.
- Require that eternal provider's investments conform to current local standards (e.g., visual impact, restrictions regarding types of antennas and towers, deployment of antennas to existing infrastructure such as light poles, etc.)
- Require, as a condition of approval, the removal of broadband and other advanced telecommunication towers and equipment when they are no longer needed.
- Require that new or renovated residential and commercial development projects include infrastructure components necessary to support broadband
- Require publicly subsidized developments to provide broadband connectivity and include infrastructure components necessary to support broadband.

As local planners consider regulatory amendments to support broadband infrastructure expansion and enhancement, they may require technical support in ensuring that ordinance revisions are aligned with locally specific broadband infrastructure, and that they are broad enough to anticipate and accommodate future technological advances. The regional team may provide technical assistance to planning officials as needed in developing ordinance amendments, and therefore, should include partners who are subject-matter experts with the technical expertise to assist in this process.

A united effort among local governments, economic development organizations, and broadband implementation organizations sends a message to funding agencies that local leaders have a common focus and can help to positively advance applications for funding. Partnerships that use public funds to leverage private investment can create a "win-win" opportunity for public funding agencies and can realize a higher return on their investment, and private entities can decrease development costs to positively impact their bottom line. Strategic, collaborative efforts can maximize the region's attractiveness for funding.

The regional team may set up regular meetings of a collaborative group to identify funding opportunities. The group could include local governments, economic development organizations, and private-sector entities as appropriate. It may seek to identify projects where collaborative efforts could maximize funding opportunities to advance projects.

As funding opportunities are identified, it is likely that grant application will require detailed information regarding the broadband infrastructure plan and requirements, the costs involved, etc. The regional team may assist with requirements of grant applications as related to broadband infrastructure development to ensure that the technical aspects of the project are adequately and accurately presented and that the project message is clear, concise, and compelling

Strategic Objective IN.2: Advance the recommendation of increasing the state's minimum speed standards to 20 mbps down/5 mbps up by 2015

The RBPT survey of residents and businesses indicated that 99%% of residents and 95% of businesses have Internet access. However, only 8% of residents and 22% of businesses have broadband speed according to the FCC definition (4Mbps/1Mbps). The state recently passed legislation that redefines broadband speeds consistent with the FCC. The RBPT believes that not only being connected but having enough bandwidth/speed to capitalize on the modern applications available over the Internet is crucial to the competitiveness and well being of the community. This is further suggested from discussions with local providers as well as identified in the sector surveys. Therefore, the RBPT team has suggested broadband minimum speed goals for the region.

Goal IN.2.1 Engage existing broadband providers

The regional team may engage broadband providers and outline the region's goals for broadband speed and share the results of the RBPT survey and the state speed test to demonstrate that current "broadband" offerings do not meet the state or FCC definition or the region's expectations. The regional team may stress that the goal is not to have these broadband speeds available in the region, but to have the speeds available as the basic/entry-level options for broadband services in the area. Once the provider community has an understanding of the goals and objectives, the regional team may seek commitments from the providers to meet the standards. The commitments and progress will be monitored through

continued speed testing and a review of publicly available Internet offerings (e.g., price and speed).

Providers who are unable to commit to meeting the broadband speed goals will be engaged to determine specific barriers to providing the desired service in the region.

Goal IN.2.2: Support local school districts and the Department of Education goal to achieve the following recommended speed criteria:

- *2014 – 10 Mbps per 100 students*
- *2017 – 100 Mbps per 100 students*

The regional team may coordinate with local school districts to support their efforts to meet Department of Education speed goals. The regional team may help identify and support potential funding opportunities to upgrade broadband services to local schools.

Goal IN.2.3: Encourage build-out of a major fiber backbone in the Region to support expansion of broadband

The RBPT has identified the need for a major fiber backbone as a critical resource to ensure multiple major internet connections, increase speed, reliability and competition. There have been multiple attempts in the past to encourage the development of a fiber backbone. The regional team may monitor potential project and partners and support education, outreach and funding opportunities to develop the backbone. Additionally, through strategic objective IN.1 the regional team may support legislation that removes impediments to the development of a major fiber backbone.

Goal IN.2.4: Coordinate with the State

The regional team may share potential projects with the state that would enable current providers to meet the speed objectives. With the state's assistance, the regional team may also identify any potential federal or state funding that could be used to support these projects. Additionally, the regional team may work with the state to leverage its BTOP investment in fiber to anchor institutions throughout the region to determine if the new resources can benefit speed levels in the region. The regional team may assist entities in pursuing funding opportunities.

Goal IN.2.5: Engage cable franchises

Cable companies hold franchise agreements with county and local municipalities granting them the right to provide service in the area. The regional team may encourage the government entities to incorporate the above-stated broadband speed goals in all future negotiations. The regional team may provide initial outreach to municipalities, highlighting the importance of broadband for their citizens. During this outreach, the implanters may benchmark current data

agreements (if available) and develop a list identifying renegotiation dates for each municipality.

Goal IN.2.6: Engage new broadband providers

If incumbent providers are unable or unwilling to improve their product offerings to meet the stated speed goals, encourage new broadband providers to enter the market and provide services in accordance with speed goals. The regional team may identify potential target providers that currently provide services in West Virginia or the surrounding out-of-state areas, but do not currently provide service in the region. The regional team may develop a regional profile that highlights the current economic and broadband environment to demonstrate the viability of the region. The regional team may meet with targeted providers, share the regional profile, and gauge their willingness to service the region. The regional team may assist in the development and support of federal and/or state funding opportunities, where appropriate, to help new providers enter the region.

Strategic Objective IN.3: Identify technologies that support broadband deployment in the "quiet zone"

The United States National Radio Quiet Zone is a large area of land centered between the National Radio Astronomy Observatory (NRAO) at Green Bank, West Virginia and the Sugar Grove Research Facility at Sugar Grove, West Virginia. The Radio Quiet Zone is a rectangle of land approximately 13,000 square miles (34,000 km²) in size that straddles the border area of Virginia and West Virginia.[6]

The National Radio Quiet Zone protects the telescopes of the NRAO facility and the antennas and receivers of the U.S. Navy Information Operations Command (NIOC) at Sugar Grove, West Virginia. The NIOC at Sugar Grove has long been the location of electronic intelligence-gathering systems, and is today said to be a key station in the ECHELON system operated by the National Security Agency (NSA).[7]

The Quiet Zone was created by the Federal Communications Commission (FCC) in 1958 to protect the radio telescopes at Green Bank and Sugar Grove from harmful interference.

[6] Official website, National Radio Quiet Zone (http://www.gb.nrao.edu/nrqz/nrqz.html)

[7] "Interception Capabilities 2000, Sugar Grove, Virginia – COMSAT interception at ECHELON site" (http://www.fas.org/irp/eprint/ic2000.htm#_Toc448565544) *Interception of Communications Section.* Leeds, UK: Cyber-Rights & Cyber-Liberties (UK). May 11, 1999. Archieved from the original (http: cyber-rights.org/interception/stoa/ic2kreport.htm#_Toc448565544) on May 2008. Retrieved September 14, 2011. "Interception Capabilities 2000 Report to the Director General for Research of the European Parliament (Scientific and Technical Options Assessment programme office) on the development of surveillance technology and risk of abuse of economic information."

Restrictions on transmission are tightest near these sites, where most omnidirectional and high-power transmissions are prohibited.

Not all transmissions are prohibited in the Radio Quiet Zone. For example, Citizen's Band radios, police and ambulance radios, and fire department radios are use there. However, large transmitter owners must typically coordinate their operations with representatives of the NRAO, which oversees the NRQZ in agreement with the Sugar Grove facility.[8]

Goal IN.3.1: Collaborate with state and federal officials to develop policies which will support technologies for the "quiet zone"

The "quiet zone" has an impact on the manner which broadband can be deployed in the Region. It is important for the providers and the Region to fully understand the value of the research occurring in the "quiet zone" as well as its impact on broadband opportunity. The RBPT may wish to host forums within the region with the providers and the NRAO to discuss and offer the public a better understand of the "quiet zone" and what alternative broadband delivery systems could be deployed. Any findings from the forum should be shared with state and federal officials.

Additionally, it is important to determine the number of citizens in the unserved areas that may be impacted the "quiet zone" restriction. This research could be carried out in conjunction with Strategic Objective EO.3, Goals EO.3.1, EO.3.2 and EO3.3.

Goal IN.3.2: Engage providers to explore emerging technology that could support broadband access in the "quiet zone"

The "quiet zone" does pose a unique opportunity for technology advancement. In discussing the "quiet zone" with one of the region's broadband providers it was understood that technology opportunities may exist to provide broadband service to rural sparsely populated. Much of the research into the "quiet zone" alternative delivery systems could be part of work suggested in Strategic Objective EO.3.4.

Goal IN.3.3 Seek funding opportunities that would support broadband access in the "quiet zone"

It is generally recognized that the area most impacted by the "quiet zone" is rural and sparsely populated and most likely a type 3 unserved area. Traditional financing methods will not support the deployment of broadband to this area. Therefore subsidies will be needed to support broadband for these areas. The regional team in conjunction with providers and other funders will need to collaborate in order for this area to be served. This research could be carried out in conjunction with Strategic Objective IN.4, Goals 4.1, and 4.2.

[8] http://en.wikipedia.org/wiki/United_States_National_Radio_Quiet_Zone

Strategic Objective IN.4: Identify and monitor funding and financing sources to support implementation of broadband strategy

A variety of funding and financing mechanisms are available at the local, state, and federal levels as well as Foundation support to assist with the advancement of strategic planning and capital improvements initiatives. These grant and loan programs can be pursued to support the broadband strategic objectives of the RBPT. State and federal funding can be used to advance a variety of projects, including providing public services, and assisting state and local governments in developing solutions within West Virginia communities. As funding and financing sources are identified, the regional team may monitor and vet specific funding sources for applicability and align them with the broadband strategic plan's priorities and initiatives, including provisions for broadband infrastructure.

Goal IN.4.1: Develop a comprehensive funding strategy

The overarching goals and objectives for the Broadband Strategic Plan may be successfully achieved if the proper funding strategy is developed and implemented. When initially approaching a funding strategy, costs associated with each targeted initiative must be evaluated and prioritized. Once eligible costs are aligned with applicable programs a comprehensive funding strategy, including a detailed accounting of sources and uses, should be developed.

A preliminary funding overview matrix was created during the broadband strategic planning process. It includes potential funding programs that are currently available and may be leveraged to help saturate broadband services throughout the Region (see Resource Section). The funding overview matrix highlights key characteristics of the programs:

- type of program (grants or loans)
- applicant's eligible requirements
- administering agency
- eligible use(s) for the funding
- matching fund requirements
- timeframe for submission and award

The regional team may review the funding overview matrix and determine which applicable programs shall be pursued.

Goal IN.4.2: Implementation of the funding strategy

Upon determining the appropriate, eligible program(s) to pursue, an application with all supporting documentation should be developed, including a concise Executive Summary. Outreach to elected officials and other stakeholders at the local, state, and federal levels is critical to ensuring stakeholder support for funding or financing requests.
Once applications are submitted, a collective effort must be orchestrated for stakeholders to proactively engage the administering agency, or source, to voice support for the request and encourage its approval. If approvals are secured, facilitation and monitoring of the funds draw-down process is required to ensure compliance and maximize the fiscal benefit of the award. An on-going dialogue with all elected officials and stakeholders must be maintained throughout the process to facilitate a true collaborative effort.

Implementation Matrix

The following matrix outlines the nine (9) strategic objectives and details the goals and action items necessary to implement. The matrix can be used as a management tool to assist in the implementation process and will be updated and amended as needed.

Strategic Objective EO.1: Educate the region about the benefits and opportunities that broadband offers	
Goal	*Action Item*
EO.1.1: Conduct a gap analysis study on the existing programs	1. Conduct a gap analysis to identify and inventory suitable broadband programs that are readily available, cost-effective, and pertinent
	2. Identify broadband programs with educational value that need to be created and developed
	3. Collaborate with key stakeholders (non-profit groups, public agencies, anchor institutions, etc.) to develop and support new programs
	4. Work with local facilities to serve as training venues
EO.1.2: Promote existing educational opportunities and services	1. Partner with key stakeholder and organizations to help • Senior Centers – provide outreach and training support to targeted audiences • Workforce WV – open access to computer labs for the public • School districts – host youth-based classes that provide an overview of the basics
	2. Host training events at anchor institutions/facilities (i.e., recreation centers) that have computers available for public use. The following is a list of possible training ideas: • Create a series of videos to help parents teach children to use computers • Demonstrate how to connect to family and friends, watch TV, and find entertainment through the Internet • Develop a basic, hands-on IT 101 class to: o Teach basic Internet principles and computer skills o Access the Internet safely o Learn general digital literacy terms o Access resources and why, for example: ▪ Shopping ▪ News and information ▪ Education ▪ Government communications and services ▪ Health care ▪ Entertainment and social media o Promote e-commerce classes to businesses to demonstrate how to: ▪ Conduct sales and services online ▪ Find buyers and/or suppliers
	3. Take advantage of online business applications

Strategic Objective EO.1: Educate the region about the benefits and opportunities that broadband offers - continued	
Goal	*Action Item*
EO.1.3: Collaborate with stakeholders to develop necessary courses that are not offered	1. Collaborate with stakeholders and other resources to develop broadband educational programs not currently offered
	2. Recommend that courses be practical, hand-on training, and focus on parents, students, and the older population
EO.1.4: Promote discount programs and equipment	1. Monitor federal programs and encourage provider involvement
	2. Evaluate, pursue, and promote programs that provide home computer subsidies, discounted equipment, and technical support
Strategic Objective EO.2: Advocate and support changes to legislation that affect broadband availability and development through outreach to local officials	
Goal	*Action Item*
Goal EO.2.1: Identify legislative issues	1. Identify issues that require legislative support to improve the deployment and availability of broadband throughout the region
	2. Monitor state and federal legislative opportunities
Goal EO.2.2: Work with WV Broadband Council to develop position papers and outreach strategy	1. Support position papers on key issues to identify the • necessary action and • benefits of the change in legislation or regulation
	2. Support outreach strategy to ensure all supports have identical information
Goal EO.2.3: Meet with local, state, and federal officials	1. Identify key stakeholders (i.e., local officials, state legislators, and agencies, congressional representatives, etc.)
	2. Meet with key decision makers and request support for identified legislative initiatives

Strategic Objective EO.3: Support/advocate broadband services to unserved areas in the Region	
Goal	*Action Item*
Goal EO.3.1: Inventory households and businesses	1. Utilize state address point data and Type I, II, and III and FCC maps to develop initial list
	2. Review list of individuals and businesses that reported no broadband availability on the survey
	3. Finalize the inventory
Goal EO.3.2: Aggregate demand	1. Develop a survey tool and Letter of Intent
	2. Survey individuals and businesses
	3. Develop profile of priority areas and level of interest
	4. Potentially seek funding from the State Broadband Deployment Council to assist with demand aggregation
Goal EO.3.3: Engage broadband provider community	1. Develop a list of current and potential providers
	2. Present the providers with an overview of the opportunity
	3. Gauge provider community ability and willingness to provide services
	4. Hold a provider conference or a request for information process
	5. Potentially work with provider community to identify barriers to expand services
Goal EO.3.4: Monitor and support the implementation of technologies to provide broadband to unserved areas	1. Monitor the progress of potential technologies that may potentially serve the identified areas • white space spectrum • power lines • satellite
	2. If proven to work, support funding efforts and pilot programs in the region
Goal EO.3.5: Discuss opportunity with the State	1. Meet with representatives from the State Broadband Deployment Council and Mapping project to discuss opportunities
	2. Share any barriers of entry identified by the providers with the state
	3. Catalog any potential state assistance, including timelines, eligible uses, and next steps
	4. Help eligible applicants apply for funding
	5. Track targeted communities that gain broadband access

Strategic Objective EO.3: Support/advocate broadband services to unserved areas in the Region - continued	
Goal	*Action Item*
Goal EO.3.6: Engage foundations for assistance	1. Develop a list of foundations that support broadband expansion efforts
	2. Draft a message statement that identifies potential opportunities and demand for the region
Strategic Objective ED.1: Identify and market growth areas to support economic development and broadband expansion	
Goal	*Action Item*
Goal ED.1.1: Assess the availability of broadband services to existing and planned business parks, commercial centers, and designated growth areas	1. Identify and engage partners for this task (i.e., county and municipal planners and economic development organizations)
	2. Leveraging and background section of the Plan as a foundation, conduct a thorough regional inventory of • existing and planned business and industrial parks, sites, and buildings • locally designated growth areas, including brownfield sites and post-mining sites
Goal ED.1.2: Prioritize inventory of existing and planned business parks, commercial centers, and designated growth areas for broadband expansion	1. Develop criteria for prioritizing infrastructure development in areas without broadband access
	2. Use the developed criteria to rate and prioritize broadband infrastructure investment
Goal ED.1.3: Encourage statewide policy decisions to facilitate broadband expansion	1. Meet with the West Virginia Department of Transportation to encourage the "dig once" philosophy/legislation with future highway improvements and/or expansions
	2. Include dark fiber as part of future highway infrastructure improvements
Goal ED.1.4: Leverage local incentives to attract private investment in broadband expansion	1. Collaborate with local governments and economic development organizations to identify potential private investors in broadband infrastructure
	2. Offer local incentives to attract private investment

Strategic Objective ED.2: Support implementation of Wi-Fi technology throughout growth centers and urban areas	
Goal	*Action Item*
Goal ED.2.1: Identify possible Wi-Fi project areas	1. Conduct a comprehensive review of Wi-Fi inventory/availability in small communities • Seek volunteers to help assess areas • Conduct outreach to local businesses to determine if free Wi-Fi is available • Clearly document where service is available and gaps exist
	2. Partner with the On Trac West Virginia State program • Reach out to the On Trac Coordinator to encourage participation and collaboration • Review and discuss current, successful implemented Wi-Fi projects
	3. Prioritize areas identified through the inventory
Goal: ED.2.2: Formulate a strategy to provide support for addressing Wi-Fi service gaps	1. Work with leaders in the region to gather information on best practices for implementing Wi-Fi
	2. Reach out to local wireless Internet providers and networking companies • For partnerships • To find potential solutions
	3. Develop a template to help facilitate Wi-Fi projects in targeted areas identified in ED.2.1 • The template would include: o Best practices in deploying local Wi-Fi o Recommended network technologies/architectures o Costs o Potential funding opportunities
	4. Employ best practices found in other community Wi-Fi implementation

Strategic Objective ED.2: Support implementation of Wi-Fi technology throughout growth centers and urban areas - continued	
Goal	*Action Item*
Goal ED.2.3: Educate local leaders and constituents about the importance and benefits of Wi-Fi	1. Demonstrate to an audience of public officials, local businesses, educators, and other community leaders the benefits of Wi-Fi
	2. Include key discussion areas: • Wireless Internet is an asset not a liability • Wi-Fi has improved the quality of life for residents and businesses • The costs, technology, trends, and issues • Funding sources to absorb the upfront costs • Recruiting the cities' technology experts to assist with efforts
	3. Help coordinate and support local Wi-Fi projects and planning efforts • Periodically review progress of projects
Strategic Objective IN.1: Encourage broadband providers' involvement early in the planning and development process	
Goal	*Action Item*
Goal IN.1.1: Include broadband providers as early as possible in the development approval process	1. Meet with broadband providers to: • Gain an understanding of their current involvement in the early stages of development planning process • Gain an understanding of specific value broadband providers can bring to the process • Gather as much information as possible regarding the location of current infrastructure and its capacity (both lit and dark fiber) • Identify a contact person/liaison with each provider for future communication
	2. Meet with local economic development organizations and planning officials to: • Introduce these groups to the broadband strategy • Gain their buy-in and support for the strategy • Invite their participation as a partner in strategy implementation • Identify collaborative ways for the groups to participate in the strategy implementation • Identify specific times/milestones in the planning process where broadband providers should be included in the process • Agree upon how and when broadband providers will be invited to participate • Provide the contact information for the liaison from each provider organization

Strategic Objective IN.1: Encourage broadband providers' involvement early in the planning and development process - continued	
Goal	*Action Item*
Goal IN.1.2: Develop a liaison with each broadband provider in the area	1. Establish primary points of contacts from each broadband provider to: • Maximize collaborative efforts in strategy implementation • Serve as liaisons to planning and economic development groups • Ensure consistency and efficiency in the inclusionary process
	2. Circulate contact information to all regional planning and economic development groups
Goal IN.1.3: Collaborate to identify optimal locations for infrastructure expansion and co-location of cellular towers	1. Use framework from Strategic Objective ED.1 to collaborate with providers, local government officials and other stakeholders to identify and prioritize optimal locations
Goal IN.1.4: Work with County and local planning directors to ensure that broadband infrastructure is included in their comprehensive plans	1. Conduct meetings with county and municipal planning departments to : • Gather information on comprehensive plans • Discuss the importance of including broadband strategies in the plans
	2. Make recommendations to local planning departments for comprehensive plan updates or amendments
	3. Provide input and technical assistance as needed regarding broadband infrastructure requirements
	4. Identify and engage partners who are subject-matter experts with the technical expertise to assist in the process
Goal IN.1.5: Partner with local governments, planners and economic development organizations to incorporate the provision of broadband infrastructure in current planning policy and advance public funding requests	1. Coordinate regular meetings of a collaborate group to identify funding opportunities
	2. Identify projects where collaborative effort could maximize funding opportunities to advance projects
	3. Assist with requirements of grant applications as related to broadband infrastructure development • Ensures that technical aspects of the project are adequate and accurate • Delivers a clear, concise, compelling message

Strategic Objective IN.2: Advance the recommendation of increasing the state's minimum speed standards to 20 mbps down /5 mbps up by 2015	
Goal	*Action Item*
Goal IN.2.1: Engage existing broadband providers	1. Develop a message statement to share with providers that includes the following: • RBPT survey results • State speed test • Region 8's speed objectives • Unserved and underserved aggregate demand results
	2. Meet with providers and identify commitment and time frame to reach goals
	3. Identify any barriers to meeting speed goals
	4. Seek commitments from the providers to meet the standards
	5. Monitor speed test on a periodic basis
Goal IN.2.2: Support local school districts and the Department of Education goal to achieve the following recommended speed criteria: • 2014 – 10 mbps per 100 students • 2017 – 100 mbps per 100 students	1. Coordinate a meeting with local school districts and Department of Education
	2. Help identify and support potential funding opportunities to upgrade broadband services to local schools
Goal IN.2.3: Encourage build-out of a major fiber backbone in the Region to support expansion of broadband	1. Monitor potential projects and partners, and support education, outreach, and funding opportunities to develop fiber backbone
	2. Support legislation that removes impediments to the development of a major fiber backbone
	3. Research the possibility of identifying an area in the region for a major fiber backbone connection
Goal IN.2.4: Coordinate with the State	1. Meet with representatives from the State Broadband Deployment Council and Mapping project to discuss opportunities and obstacles
	2. Catalog any potential state assistance, including timelines, eligible uses, and next steps
	3. Assist in the development of funding application

Strategic Objective IN.2: Advance the recommendation of increasing the state's minimum speed standards to 20 mbps down /5 mbps up by 2015 - continued	
Goal	*Action Item*
Goal IN.2.5: Engage cable franchises	1. Identify franchise holders
	2. Meet with local governments to discuss the importance of broadband and their willingness to negotiate for broadband speed rates
	3. Benchmark current data agreements
	4. Develop a list identifying renegotiation dates for each municipality
	5. Contact municipality before contract negotiations
	6. Track agreements negotiated with speed rates and implementation time frame
	7. Monitor cable franchise agreements for speed goal inclusion
Goal IN.2.6: Engage new broadband providers	1. Encourage new broadband providers to enter the market and provide services in accordance with speed goals (if incumbents are unable/unwilling)
	2. Identify potential target providers that currently provide services in WV, and surrounding out-of-state services
	3. Develop a regional profile highlighting the current economic and broadband environment
	4. Meet with targeted providers, share the regional profile, and gauge their willingness to service the region
	5. Assist in the development and support of federal and/or state funding opportunities to help new providers enter the region
Strategic Objective IN.3: Identify technologies that support broadband deployment in the "quiet zone"	
Goal	*Action Item*
Goal IN.3.1: Collaborate with state and federal officials to develop policies which will support technologies for the "quiet zone"	1. Identify areas most impacted by the "quiet zone" using the methodology in EO.3.1
	2. Determine the area types
	3. Determine demand for broadband services
	4. Share results with state and local officials
Goal IN.3.2: Engage providers to explore emerging technologies that could support broadband access in the "quiet zone"	1. Share results of IN.3.1.4 with providers to show there is an interest in service
	2. Encourage providers to collaborate with NRAO and FCC regarding new technologies
	3. Seek pilot project opportunities for new technology

Strategic Objective IN.3: Identify technologies that support broadband deployment in the "quiet zone" - continued	
Goals	*Action Items*
Goal IN.3.3: Seek funding opportunities that would support broadband access in the "quiet zone"	1. Meet with legislative leaders and key decision makers to seek funding
	2. Research federal funding opportunities
	3. Research foundation support for emerging technologies for the "quiet zone"
Strategic Objective IN.4: Identify and monitor funding and financing sources to support implementation of broadband strategy	
Goal	*Action Items*
Goal IN.4.1: Develop a comprehensive funding strategy	1. Evaluate and prioritize costs associated with each targeted initiative
	2. Develop a detailed accounting of sources and uses (see Resource Consideration page)
	3. Review, prioritize, and determine which applicable funding programs to pursue
Goal IN.4.2: Implementation of the funding strategy	1. Develop application(s) with all supporting documentation
	2. Include a concise Executive Summary
	3. Submit application(s) to the appropriate administering agency
	4. Conduct outreach to local officials and stakeholders to ensure support
	5. Engage the administering agency, or source, to voice support for the request and encourage its approval
	6. Facilitate and monitor the funds draw-down process to ensure compliance and maximize the fiscal benefit of the award
	7. Keep elected officials up to date and engaged in the RBPT's initiatives
	8. Assign a resource to facilitate and manage the application process. The funding resource would: • Monitor and identify various grant and loan opportunities • Conduct legislative outreach to stay abreast of relevant legislation • Periodically review and augment the funding matrix to include new, viable funding sources and remove obsolete programs • Distribute updated funding information among all RBPT members and stakeholders involved in the implementation of the plan

Resource Consideration

One of the biggest challenges facing the RBPT is identifying the necessary resources (e.g., people, funding, and materials) to successfully implement the broadband strategic plan. The following matrix outlines funding programs that may be used to support the implementation of a strategic plan. It provides program name, eligible uses, and potential timeframe for application.

Funding Overview		
Program	Uses	Window of Opportunity
Appalachian Regional Commission (ARC) – Area Development Program	Project activities must be consistent with ARC/State of West Virginia Goals, Objectives, and Strategies. Goals include the following: • Increase job opportunities and per capita income in Appalachia to reach parity with the nation • Strengthen the capacity of the people of Appalachia to compete in the global economy • Develop and improve Appalachia's infrastructure to make the region economically competitive The highest priorities for the ARC program are in water, sewer, and telecommunication projects that lead to job creation or address a critical community need (such as public health).	Submit application through the West Virginia Development Office. Applications for FY 2014 are due January 31, 2014.
USDA Rural Broadband Loan Program	Broadband loans provide funding for: the construction, improvement, and acquisition of all facilities required to provide service at the broadband lending speed to rural areas, including facilities required for providing other services over the same facilities; the cost of leasing facilities required to provide service at the broadband lending speed if such lease qualifies as a capital lease under Generally Accepted Accounting Principles (GAAP); and an acquisition, under certain circumstances, and with restrictions.	Applications can be submitted throughout the year and will be reviewed and processed on a first-come, first-served basis according to the time the application is received.

Funding Overview		
Program	Uses	Window of Opportunity
Distance Learning and Telemedicine (DLT) CFDA # - 10.855	Purposes eligible for 100% grant, combination loan/grant, and 100% loan: • Acquisition of eligible capital assets (interactive video equipment, audio and video equipment, terminal equipment, data terminal equipment, inside wiring, computer hardware and software, computer network components, and other facilities that further DLT services) • Acquisition of instructional programming that is a capital asses • Acquisition of technical assistance and instruction for using eligible equipment	The application window for 100% grants is announced annually (typically after the first of the year) through a Notice of Funds Availability (NOFA) in the Federal Register. DLT 100% loan and loan/grant combination application are accepted year-round and are noncompetitive.
Community Connect Grant Program CFDA # - 10.863	Funds may be used to build broadband infrastructure and establish a community center that offers free public access to broadband for two years.	Funding for the current year has closed as of July 2013. Funding for FY 2014 has not yet been announced.
Expansion of 911 Access Loan Program	This program will finance the construction of interoperable, integrated public safety communications networks in rural areas. The program will also finance wireless upgrades for public safety and security.	Applications are accepted through RUS Telecommunications Infrastructure Loan Program. Applications are accepted year-round.

Funding Overview		
Program	Uses	Window of Opportunity
Telecommunications Infrastructure Loan Program	Loan funds may be used to finance telecommunications services in rural areas for: Improvements – Expansions – Construction – Acquisitions (cost of acquisition must be incidental to cost of improvements in loan) – Refinancing (amount refinanced cannot exceed 40% of loan amount).	Applications are accepted year-round
Rural Health Care Program	**Telecommunications Services and Charges**: ATM, Centrex, DSL, Ethernet, Fiber, Fractional T1, Frame Relay, Internet Access Charges, ISDN, Mileage-related Charges, MPLS, NRS, OC-1, OC-3, Refundant Circuit, Satellite Service, Telephone Service, T1, T3, or DS3 **Internet Services and Charges**: Monthly Internet access charges • E-mail • Web hosting • DSL	Applications are accepted annually. The USAC funding year runs from July 1 through June 30. The RHC accepts the first form in the application process (FCC Form 465) for the upcoming funding year in the spring of each year and will accept them until June 30 of the following year. FCC Form 465 outlines the HCP's requested services and must be posted on requested services and USAC's website for a minimum of 28-day bidding period has expired, the HCP's choose a service provider and submit FCC For 466 and/or For 466A for each service requested. USAC reviews and approves each For 466/A and issues a funding commitment letter. The service provider then reduces the HCP's rate for the telecommunications/Internet services, and the service provider is issued a credit for the difference.

Funding Overview		
Program	Uses	Window of Opportunity
Schools and Libraries Program	Eligible services are organized in five sections that represent the five funding categories established by the FCC plus a miscellaneous section that is applicable to multiple categories: • Telecommunications services • Telecommunications • Internet Connections • Basic Maintenance • Miscellaneous Only eligible products or services that will be used for educational purposes can be considered for funding. See the Eligible Services List (ESL) for more information	Applications are accepted annually. The USAC funding year runs from July 1 through June 30. • Submit Form 470 at least 28 days before filing Form 471 • Submit Form 471 – This form will be available in early November to early February preceding the start of the Funding Year (exact dates for each funding year will be posted on the website). Must be received or postmarked no later than 11:59 p.m. EST on the last day of the Form 471 filing window. • Submit Form 486 – Received or postmarked no later than 120 days after the date of the Funding Commitment Decision Letter or 120 days after the Service Start Date, whichever is later. • Form 472/474 – Received or postmarked no later than 120 days after the date of the Form 486 Notification letter or 120 days after the last date to receive service, whichever is later. The program is currently being rolled out across the nation. Applications will be accepted on an ongoing basis.

Funding Overview		
Program	Uses	Window of Opportunity
Connect to Compete	**Internet**: $9.95 per month, high-speed Internet for free school lunch families (no deposit or contract required; no installation or equipment fees; price lock for two years) **Computers**: $150 laptop or desktop computer for free school lunch families **Free Training**: Free digital literacy training online	The program is currently being rolled out across the nation. Applications will be accepted on an ongoing basis.
HRSA Rural Health Grants	**Licensure Portability** is a competitive grant program that provides support for state professional licensing boards to carry out programs under which licensing boards of various states cooperate to develop and implement state policies that will reduce statutory and regulatory barriers to telemedicine. **Telehealth Network** is a competitive grant program that funds projects that demonstrate the use of telehealth networks to improve healthcare services for medically underserved populations in urban, rural, and frontier communities. **Telehealth Resource Center** is a competitive grant program that provides support for the establishment and development of Telehealth Resource Centers (TRCs). These centers are to assist healthcare organizations, healthcare networks, and healthcare providers in the implementation of cost-effective telehealth programs to serve rural and medically underserved areas and populations.	HRSA-13-166 ***Telehealth Network Grant Program*** • Apply at Grants.gov by February 13

Funding Overview		
Program	Uses	Window of Opportunity
Neighborhood Investment Program (NIP)	**Eligible activities:** Projects generally eligible for program participation include but are not limited to the following: • Health clinics • Homeless shelters • Educational programs • Housing programs • Preservation/revitalization activities • Domestic violence shelters • Children's shelters • Meal delivery programs • Senior citizens' centers • Community foundations • Scholarship programs • Hospice care • Transportation programs • Day care centers • Counseling services • Services for the disabled	Annual application process.
Community Development Block Grant (CDBG) Program	Projects must either assist in eliminating blight or primarily (51% or greater of service area) serve low-income individuals. Uses related to potential broadband service: • Acquisition of real property • Public facilities and improvements and privately owned utilities • Clearance, rehabilitation, reconstruction, and construction of buildings • Public services (must provide a new service or a quantifiable increase in existing service) • Public services can include computer training and education programs	Applications to the state are typically due by mid-March. Each entitlement city has its own projection and award process.

Funding Overview		
Program	Uses	Window of Opportunity
Tax Increment Financing (TIF)	• Infrastructure construction or repair (sewers, storm drainage, street construction/expansion, water supply access expansion, park improvements, bridge construction/repair, curb/sidewalk improvements, devices for traffic control, street lighting, etc.) • Land acquisition • Land improvements (building demolition, brownfield remediation, site improvements, etc.) • Community revitalization construction (landscaping, street lighting) • Development or redevelopment of an area for housing , housing developments, public facilities, or industrial or commercial development • New infrastructure for housing developments, housing, or industrial or commercial development • Other development that eliminates unsanitary or unsafe conditions; reduces overcrowding in the area, reduces traffic congestion, eliminates traffic hazards, or eliminates obsolete or detrimental uses to the area • Other capital improvements to the area • Any other projects deemed appropriate by the county/municipality	N/A
Sales Tax increment Financing (STIF)	Counties and municipalities may create economic opportunity development districts with state legislature approval and use state sales tax increment for up to 30 years to finance certain development costs, including transportation, infrastructure, property acquisition, utilities, etc.	N/A

Funding Overview		
Program	Uses	Window of Opportunity
Business Improvement District (BID)	• Beautification of the district (landscaping, benches, decorations, etc) • Provision of public services (sanitation, security, construction of public facilities) • Payment of principal or interest on bonds issued by the municipality for public improvements in the district • Financial support for public transportation and public parking facilities • Constructing, operating, and maintaining parking facilities • Developing plans for architectural design of public areas and developing plans for the future development of the district • Developing, supporting, and promoting community events • Providing administrative costs for a district management program • Providing any other services which the municipality or district board is authorized to perform	N/A
Claude Worthington Benedum Foundation	Community Development: Improving capabilities of leaders, organizations, and interested citizens to address challenges and opportunities will help communities be more prosperous through their own efforts. The Benedum Foundation promotes the economic well-being and quality of life of West Virginia communities. Specific areas of interest include: • Activities that engage diverse groups of citizens in the life of the community. • Efforts that help communities organize, plan, and implement ambitious but achievable improvement strategies. • Leadership development • Programs that improve the effectiveness and accountability of nonprofit and public organizations. • Efforts to expand technology access, affordability, and utilization.	Applications are accepted year-round.

Timeline and Benchmarks

The following table provides a high-level implementation schedule. Red represent initial implementation time and yellow represent ongoing support efforts.

Strategic Objective & Goals	Year 1 Qtr 1	Year 1 Qtr 2	Year 1 Qtr 3	Year 1 Qtr 4	Year 2 Qtr 1	Year 2 Qtr 2	Year 2 Qtr 3	Year 2 Qtr 4	Year 3 Qtr 1	Year 3 Qtr 2	Year 3 Qtr 3	Year 3 Qtr 4
Strategic Objective EO.1.												
Goal EO.1.1												
Goal EO.1.2												
Goal EO.1.3												
Goal EO.1.4												
Strategic Objective EO.2												
Goal EO.2.1												
Goal EO.2.2												
Goal EO.2.3												
Strategic Objective EO.3												
Goal EO.3.1												
Goal EO.3.2												
Goal EO.3.3												
Goal EO.3.4												
Goal EO.3.5												
Goal EO.3.6												
Strategic Objective ED.1												
Goal ED.1.1												
Goal ED.1.2												
Goal ED.1.3												
Goal ED.1.4												
Strategic Objective ED.2												
Goal ED.2.1												
Goal ED.2.2												
Goal ED.2.3												
Strategic Objective IN.1												
Goal IN.1.1												
Goal IN.1.2												
Goal IN.1.3												
Goal IN.1.4												
Goal IN.1.5												
Strategic Objective IN.2												
Goal IN.2.1												
Goal IN.2.2												
Goal IN.2.3												
Goal IN.2.4												
Goal IN.2.5												
Goal IN.2.6												
Strategic Objective IN.3												
Goal IN.3.1												
Goal IN.3.2												
Goal IN.3.3												
Strategic Objective IN.4												
Goal IN.4.1												
Goal IN.4.2												

Performance Metrics

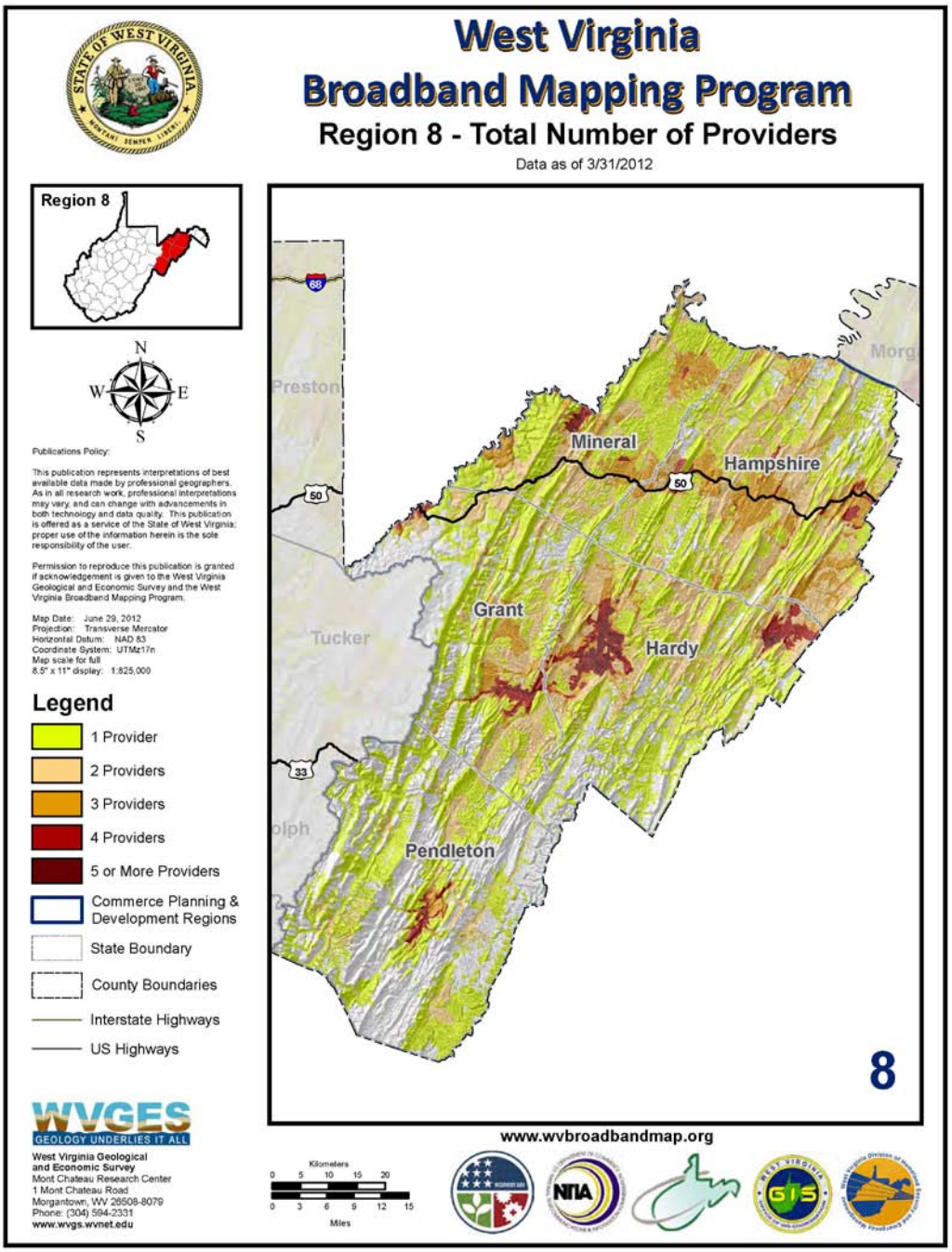
The RBPT has identified the following metrics to track the success of the broadband strategic plan:

Strategic Objective	Metrics
EO.1: Educate the region about the benefits and opportunities that broadband offers	- Number of courses provided - Number of participants - Increases in broadband utilization
EO.2: Advocate and support changes to legislation that affect broadband availability and development through outreach to local officials	- Number of legislative initiatives supported - Number of legislative initiatives implemented
EO.3: Support/advocate broadband services to unserved areas of the Region	- Targeted communities that gain broadband access
ED.1: Identify and market growth areas to support economic development and broadband expansion	- Increased number of business that gain access to competitive broadband services - The number of targeted growth areas and sites that gain access to adequate broadband services
ED.2: Support implementation of Wi-Fi technology throughout growth centers and urban areas	- Number of cities and urban areas that implement Wi-Fi services
IN.1: Encourage broadband providers' involvement early in the planning and development process	- The number of counties and municipalities that regularly include broadband providers in the development process - The number of new developments that provide broadband infrastructure as a standard amenity - The number of counties and municipalities that incorporate broadband in their comprehensive plans and regulatory ordinances - The frequency of and participation in meetings with local governments and economic development organizations to advance public funding requests - The amount of funding that is secured through collaborative efforts to support broadband infrastructure development

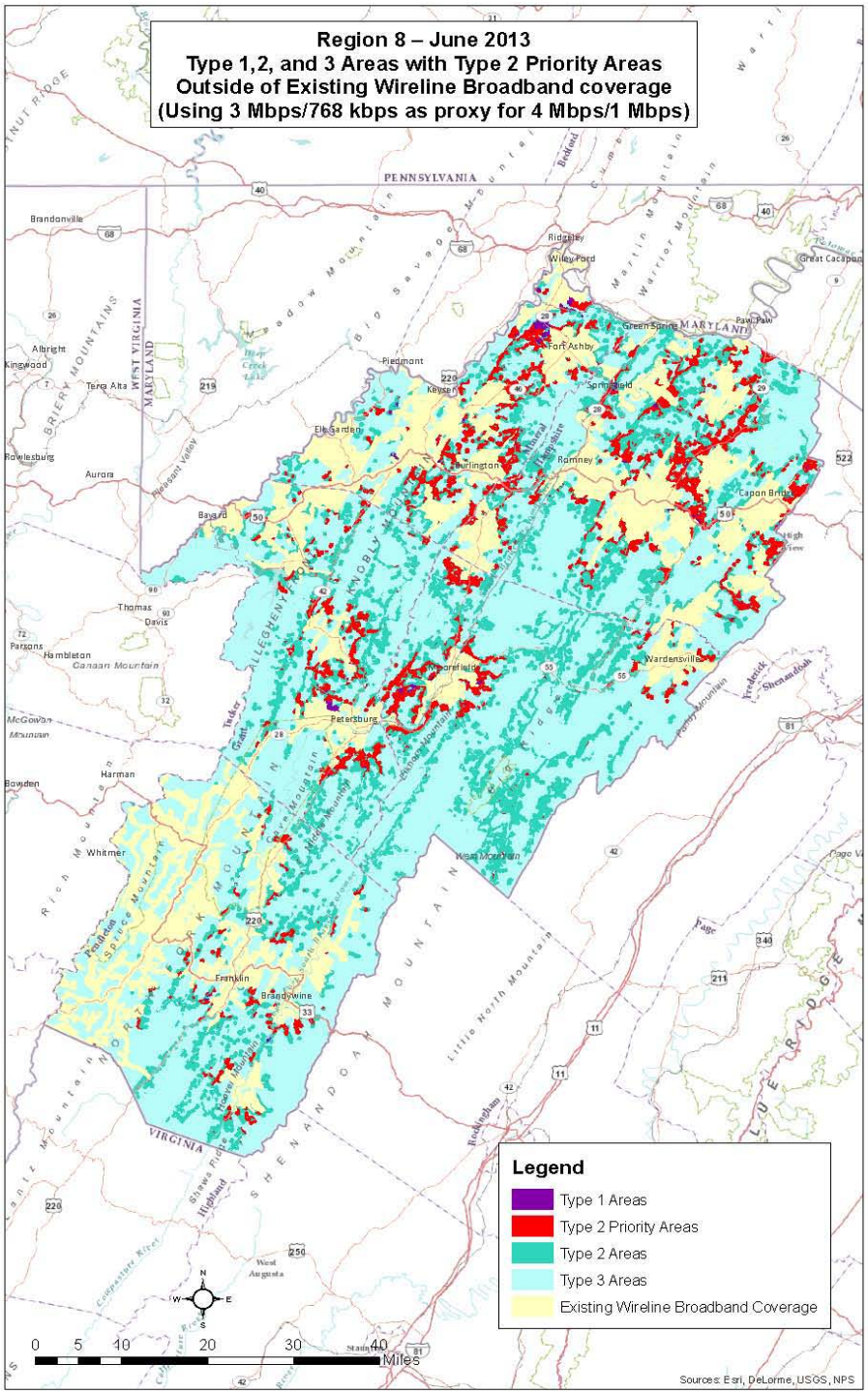
Strategic Objective	Metrics
IN.2: Advance the recommendation of increasing the state's minimum speed standards to 20 mbps down/5 mbps up by 2015	- Speed test data - Cable franchise agreements that meet speed objectives
IN.3: Identify technologies that support broadband deployment in the "quiet zone"	- Targeted communities in the "quiet zone" that gain access to broadband services
IN.4: Identify and monitor funding and financing sources to support implementation of broadband strategy	- The number of funding opportunities sought - The amount of funding secured

Appendix A: Broadband Maps

Number of Broadband Internet Providers

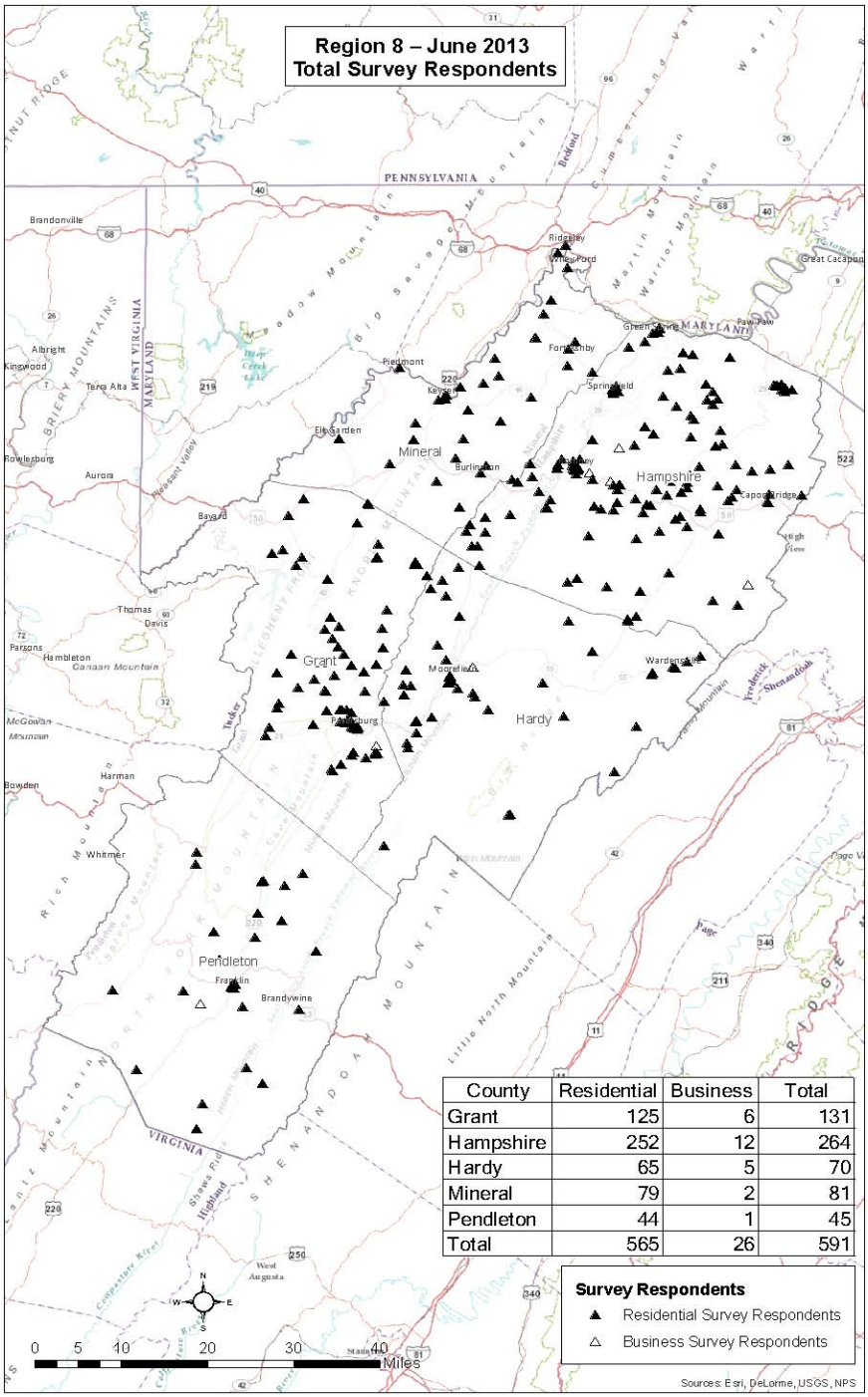


Type Layer Overview of Analysis



Produced by: L. R. Kimball

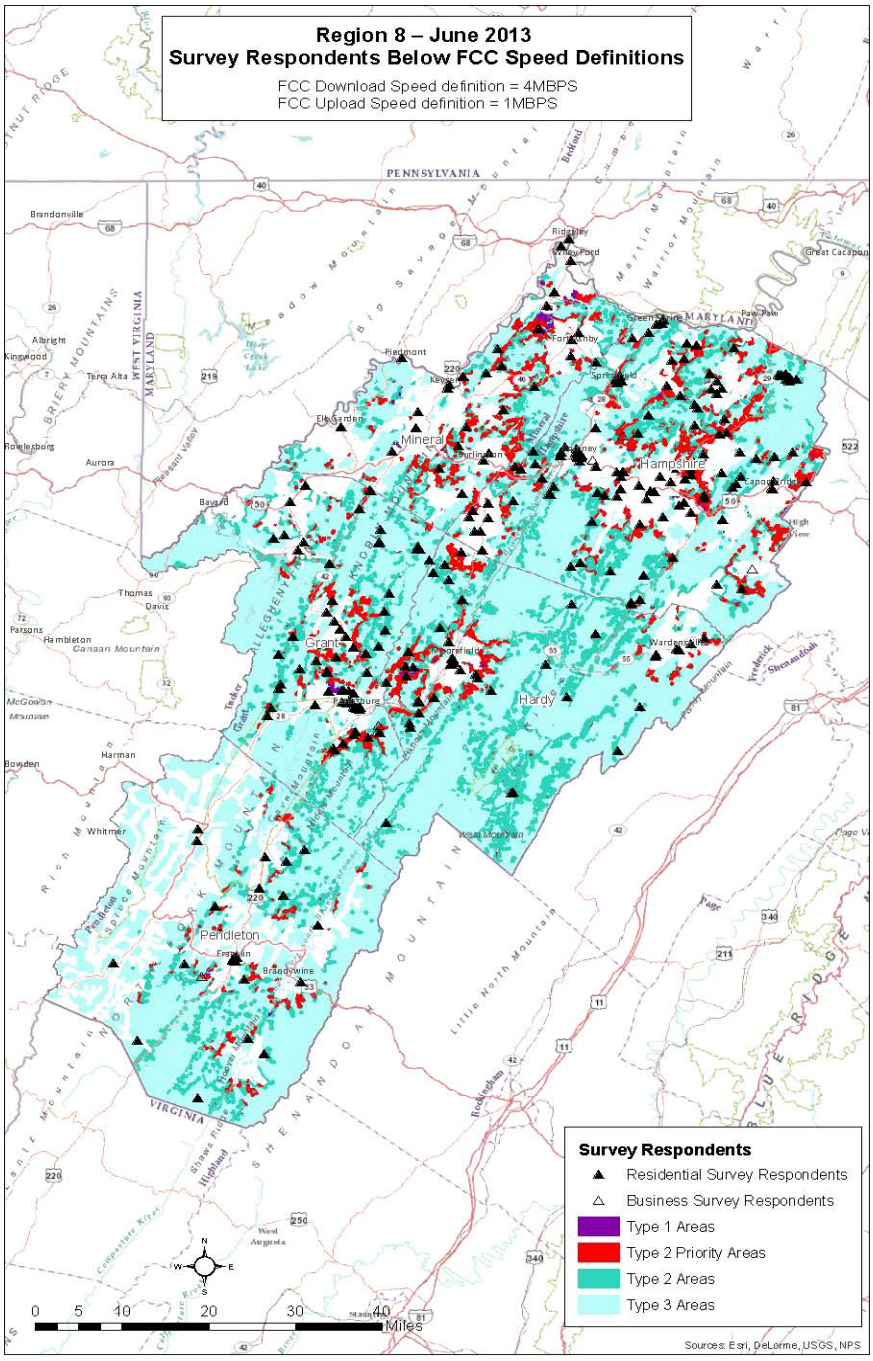
Region 8 Survey Responses



County	Residential	Business	Total
Grant	125	6	131
Hampshire	252	12	264
Hardy	65	5	70
Mineral	79	2	81
Pendleton	44	1	45
Total	565	26	591

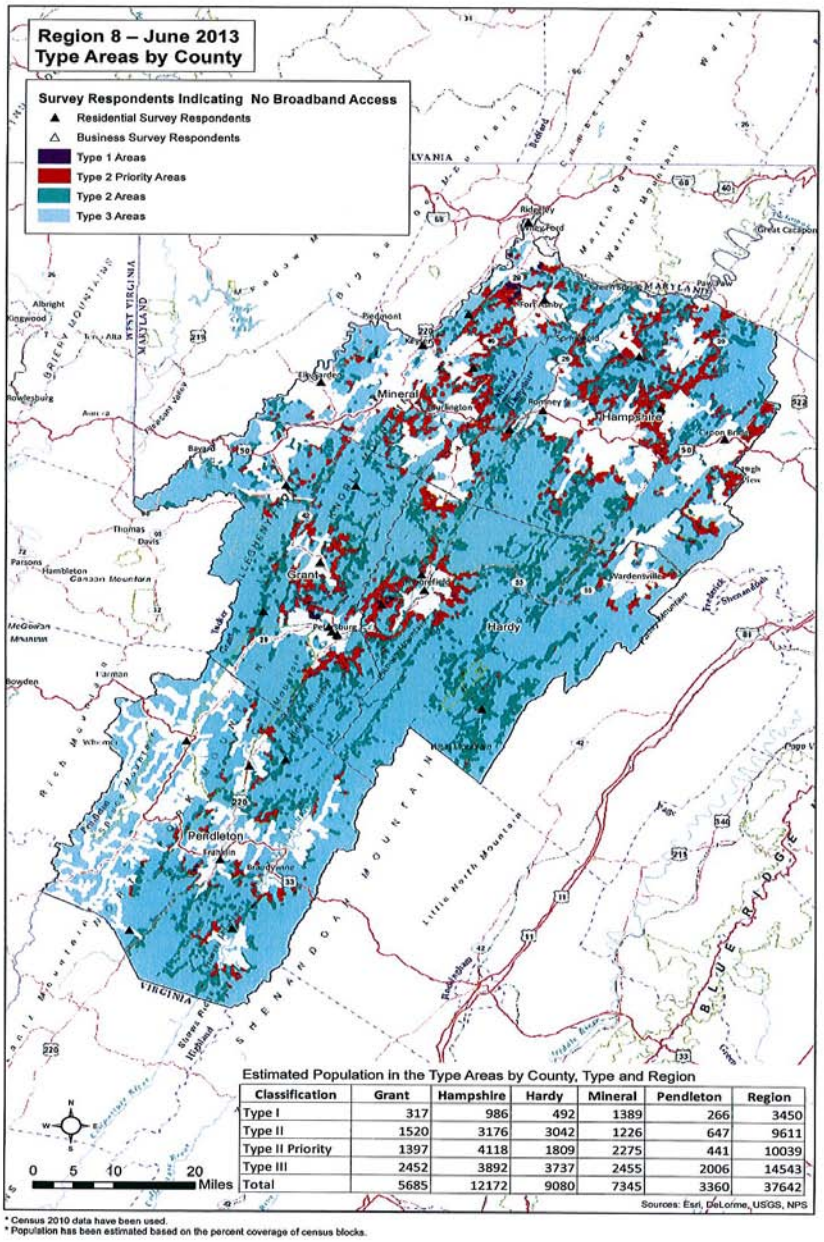
Produced by: L. R. Kimball

Residential and Business Survey Respondents Below FCC Speed Definitions by Type Areas



Produced by: L. R. Kimball

Estimated Population in the Type Areas by County, Type and Region



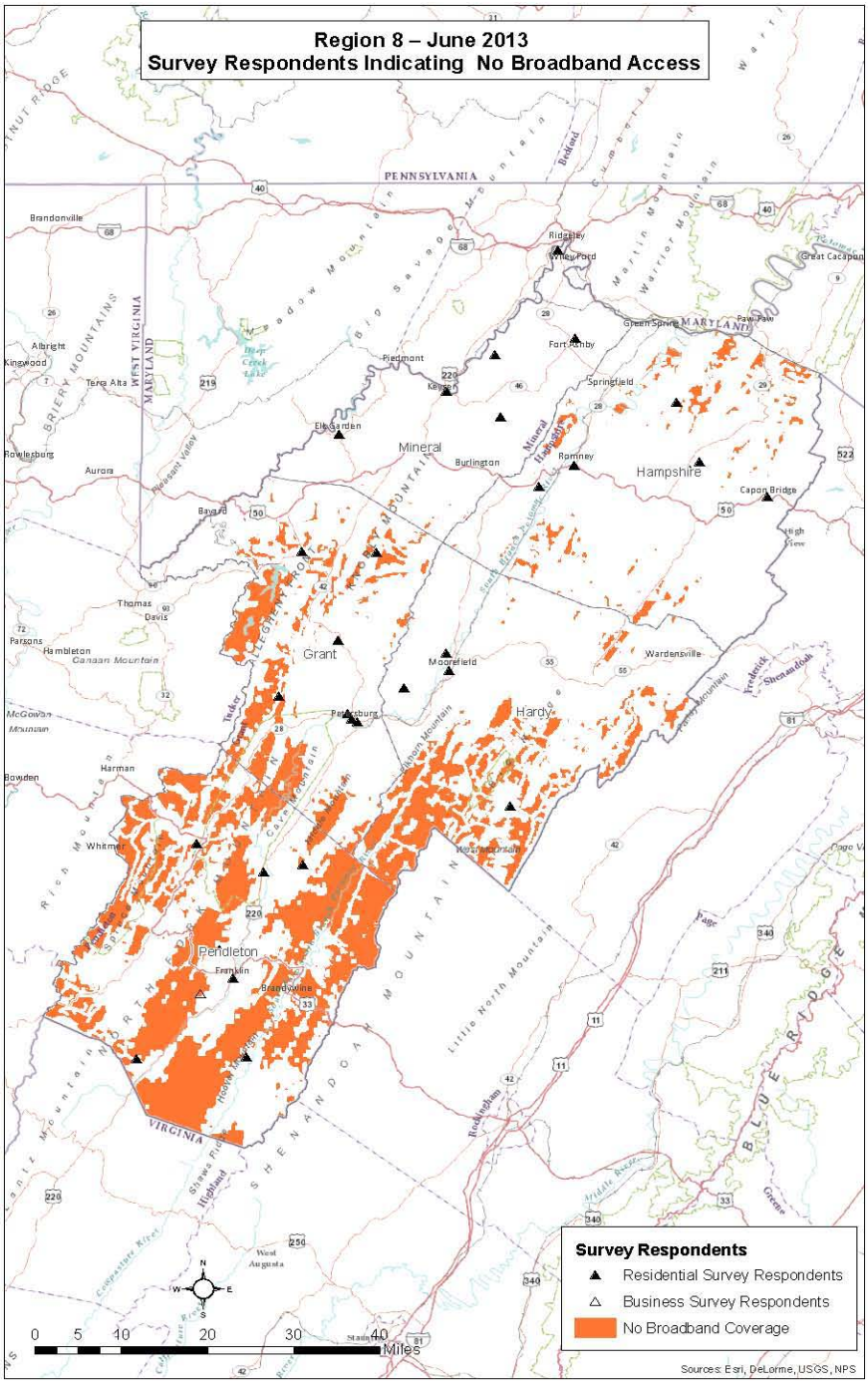
Estimated Population in the Type Areas by County, Type and Region

Classification	Grant	Hampshire	Hardy	Mineral	Pendleton	Region
Type I	317	986	492	1389	266	3450
Type II	1520	3176	3042	1226	647	9611
Type II Priority	1397	4118	1809	2275	441	10039
Type III	2452	3892	3737	2455	2006	14543
Total	5685	12172	9080	7345	3360	37642

* Census 2010 data have been used.
* Population has been estimated based on the percent coverage of census blocks.

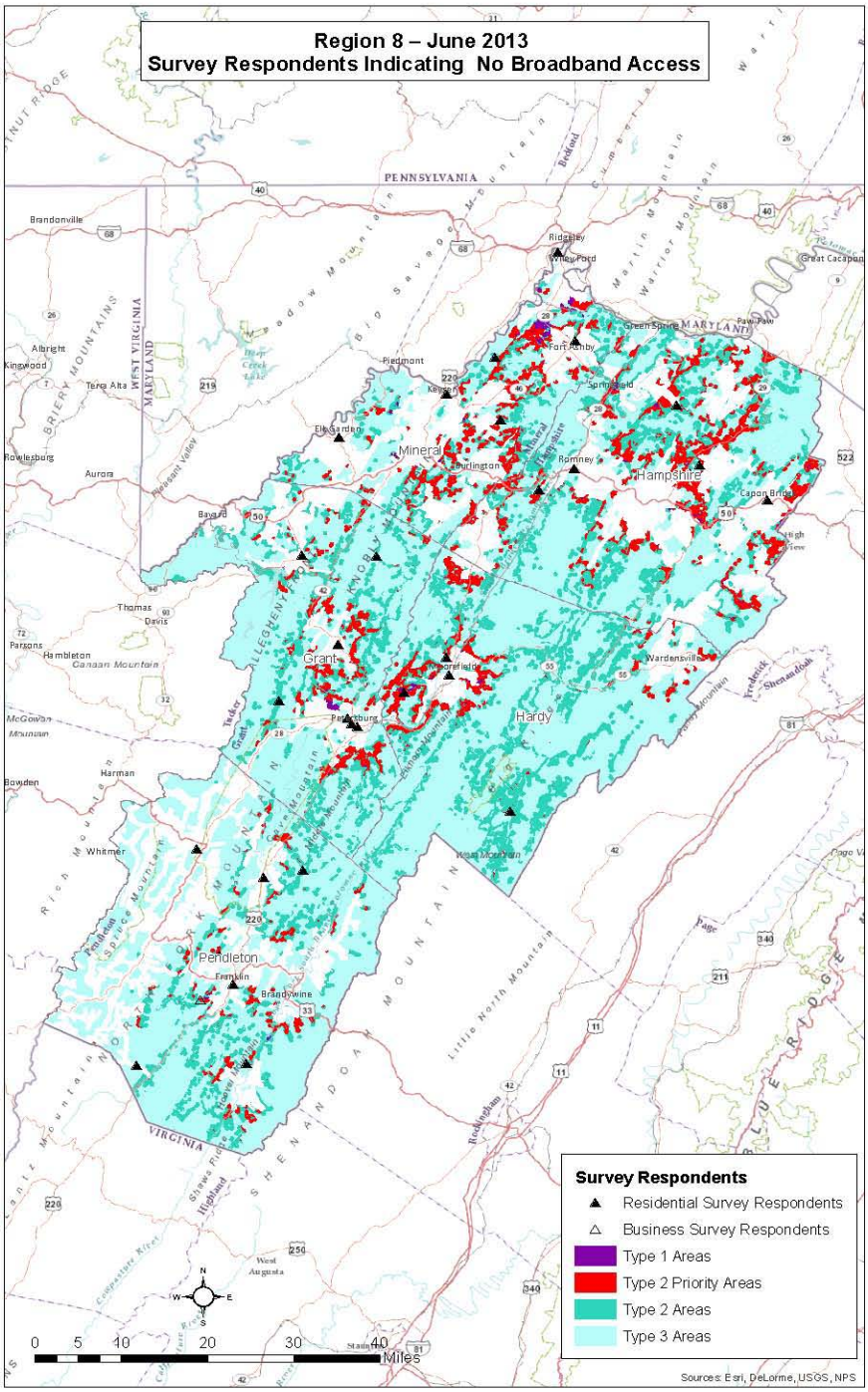
Produced by: L. R. Kimball

Survey Respondents Indicating No Broadband Access



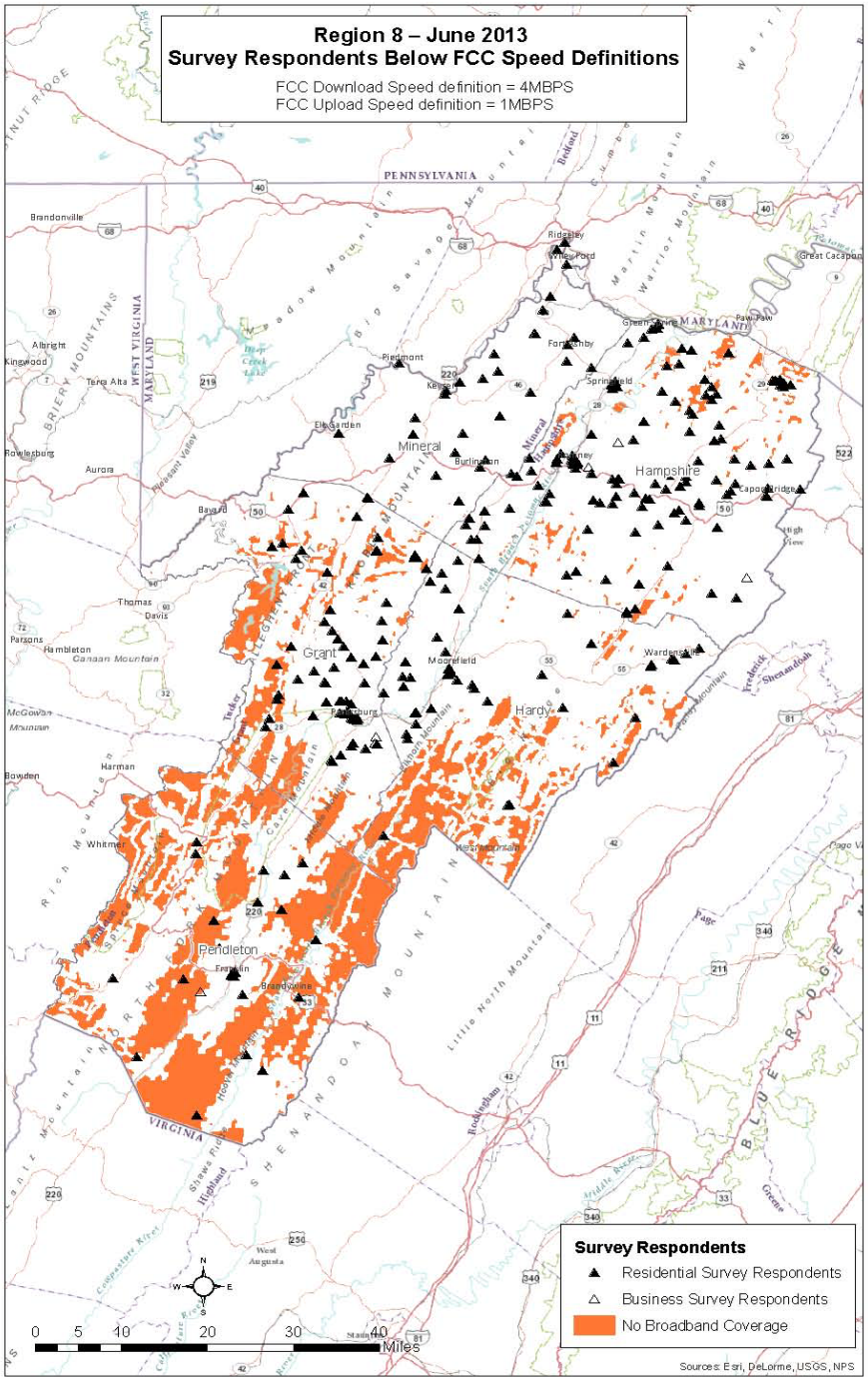
Produced by: L. R. Kimball

Survey Respondents Indicating No Broadband Access by Type Area



Produced by: L. R. Kimball

Survey Respondents Below FCC Speed Definitions



Produced by: L. R. Kimball

Appendix B: Blank Survey and Distribution Techniques

Region 8 Broadband Planning Team Project
Broadband/High-Speed Internet Survey

Dear Resident/Business in Grant, Hampshire, Hardy, Mineral, and Pendleton Counties of West Virginia:

The West Virginia Office of GIS Coordination, a division of the office of the West Virginia Geologic and Economic Survey, has partnered with the state's 11 regional planning & development councils to analyze and map West Virginia's broadband infrastructure. As a result, our regional planning and development council is working to better understand your high-speed Internet needs and create a strategic plan to meet these needs. As part of this process, we are gathering vital information from residents and businesses about their Internet access that can help us improve service. Broadband is typically defined as a service that enables high-speed Internet access as opposed to low speed services such as dial-up. Please have a person in your household who is 18 years or older (or the employee responsible for technology decisions if this location is a business) complete this survey. Please complete and return this survey by June 30, 2013. Your responses will remain anonymous and will only be reported as part of a larger statistical analysis to determine where the state could use federal grant funding to enhance Internet speed and availability. **We particularly urge you to TAKE THE INTERNET SPEED TEST (instructions in Question #6).**

If you have any questions, please feel free to contact the Region 8 Planning and Development Council by e-mail at mail@regioneight.org or by phone at 304.257.2448.

Thank you for your assistance!

If this location is a residence, please complete questions 1-20. If this location is a business, please complete questions 1-10 and then questions 21-25.

Both Residential and Business Questions

1. Does this location have internet access? ☐ Yes ☐ No ***(If "No," please go to question 8 of this survey.)***

2. Who is your Internet Service Provider?

☐ Access High Speed ☐ AT&T Mobility LLC ☐ Comcast ☐ Earthlink

☐ Frontier Communications Corporation ☐ Hardy Telecommunications ☐ HughesNet

☐ NTELOS ☐ Seneca Rocks/Spruce Knob Telephone Inc. ☐ Shentel

☐ Suddenlink Communications ☐ Verizon Wireless ☐ Visual Link

☐ U. S. Cellular ☐ Other (please specify): _____

3. What type of connection does this location use to access the Internet? (Check all that apply.)

☐ Cable ☐ DSL ☐ Fiber ☐ Satellite ☐ Dial-Up ☐ Cellular/Air Card

☐ Other (please specify): _____

4. Why did you choose this connection type? (Check all that apply.)

☐ Cost ☐ Speed ☐ Only available service ☐ Best reliability

5. How much do you pay per month for Internet service? (If you have indicated several services, indicate your total expense for these services.) _____

6. Broadband Speed Test

The West Virginia Broadband Mapping Program Speed Test measures the speed of your Internet connection up to a maximum of 20 Mbps. Your actual connection speed may be higher however this test will return a maximum speed result no greater than 20 Mbps.

Your bandwidth may be adversely affected with multiple devices accessing the Internet at the same time and could result in an inaccurate survey test. Please ensure that only the computer or device you are using is connected to your broadband/internet during the speed test. When running the speed test, please refrain from using any other devices to access your connection, such as mobile phones, computers, tablets, videogame consoles, and other Internet-streaming devices.

For all the types of connections you have, indicate the speed of your connection(s).
Please check your speed at this website
http://gis2.kimballdata.com/WVSpeedTest/WVSpeedTest.html?ld=speedtest. The Speed Test takes approximately 30 seconds.

TYPE OF CONNECTION	SPEED	
	Download	***Upload***

7. The following is a list of characteristics about your Internet service. Please indicate whether you are "very satisfied," "satisfied," "dissatisfied," or "very dissatisfied" with that aspect of your Internet service.

SERVICE ISSUE	VERY SATISFIED	SATISFIED	DISSATISFIED	VERY DISSATISFIED	DON'T KNOW/NA
Speed of connection	☐	☐	☐	☐	☐
Cost of Internet	☐	☐	☐	☐	☐
Technical support	☐	☐	☐	☐	☐
Reliability of access	☐	☐	☐	☐	☐
Customer service	☐	☐	☐	☐	☐
Number of providers	☐	☐	☐	☐	☐

8. If you indicated you **DO NOT** have Broadband (high-speed) Internet service (e.g., none or dial-up), please check all reasons for not having Internet service. (Check all that apply.)

☐ I don't own a computer ☐ Cost/Too expensive ☐ Broadband service not available

☐ Do not Need Broadband services ☐ Security reasons ☐ Do not know how to use Internet

☐ Other (please specify): _____

9. If concerns in question 8 were addressed, would you utilize a Broadband (high-speed) Internet service?

☐ Yes ☐ No

10. To assist in mapping, please provide the physical address, city, zip code, and County for this residence or business.

_____

_____

☐ Grant ☐ Hampshire ☐ Hardy ☐ Mineral ☐ Pendleton

Residential Questions Continued *(Businesses skip to question 21.)*

11. What is your age?

☐ 18 to 24 ☐ 25 to 34 ☐ 35 to 44 ☐ 45 to 54
☐ 55 to 64 ☐ 65 to 74 ☐ 75 or older

12. What is your gender?

☐ Male ☐ Female

13. Number of household occupants: _____

14. Who uses the Internet at your home? (Check all that apply.)

☐ I do ☐ Spouse/Partner ☐ Children ☐ Friend ☐ Grandparent ☐ Parent

☐ Housemate or Roommate ☐ Other (please specify) _____

15. Does your employer allow employees to telecommute (work from home)? ☐ Yes ☐ No ☐ N/A

Do you telecommute? ☐ Yes ☐ No

16. Are you self-employed? ☐ Yes ☐ No If so, do you work from home? ☐ Yes ☐ No

17. If you do use the Internet anywhere else other than your home, please indicate other places where you use the Internet. (Check all that apply.)

☐ Work ☐ School ☐ Public Library ☐ A relative or friend's house
☐ A retail shop with wireless Internet service ☐ Cell phone
☐ Other (please specify): _____

18. What is the highest level of school you have completed or the highest degree you have received?

- ☐ Less than a high school degree
- ☐ High school degree or equivalent (e.g. GED)
- ☐ Some college but no degree
- ☐ Associate degree
- ☐ Bachelor degree
- ☐ Graduate degree
- ☐ Other (please specify) _____

19. Which of the following categories best describes your employment status?

- ☐ Employed, working 1-39 hours per week
- ☐ Employed, working 40 hours or more hours per week
- ☐ Not employed, looking for work
- ☐ Not employed, NOT looking for work
- ☐ Retired
- ☐ Disabled, not able to work

20. What is your approximate average household income?

- ☐ $0-$24,999
- ☐ $25,000-$49,999
- ☐ $50,000-$74,999
- ☐ $75,000-$99,999
- ☐ $100,000-$124,999
- ☐ $125,000-$149,999
- ☐ $150,000-$174,999
- ☐ $175,000-$199,999
- ☐ $200,000 and up

Business Questions

21. How many employees work at your location?

☐ 1-4 ☐ 5-25 ☐ 26-100 ☐ 101-250 ☐ 251-500 ☐ 501 or more

22. Indicate what national business classification best describes your business:

- ☐ Accommodation and Food Services
- ☐ Agriculture, Forestry, Fishing/Hunting
- ☐ Construction
- ☐ Finance and Insurance
- ☐ Information
- ☐ Manufacturing
- ☐ Professional, Scientific, and Technical
- ☐ Real Estate and Rental and Leasing
- ☐ Transportation and Warehousing
- ☐ Waste Management and Remediation
- ☐ Administrative and Support Services
- ☐ Arts, Entertainment, and Recreation
- ☐ Educational Services
- ☐ Healthcare and Social Assistance
- ☐ Management of Companies and Enterprises
- ☐ Mining, Quarrying, and Oil and Gas Extraction
- ☐ Public Administration
- ☐ Retail Trade
- ☐ Utilities
- ☐ Wholesale Trade
- ☐ Other (please specify): _____

23. Does your business allow employees to telecommute (work from home)? ☐ Yes ☐ No

If yes, what percentage? _____%

24. How important is a robust Broadband (high-speed Internet access) connection to the day-to-day operations of your business? (Check one.)

☐ Very important ☐ Important ☐ Somewhat important ☐ Not at all important

25. Would it be beneficial to your customers/clients if the Broadband environment in your area was enhanced?

☐ Yes ☐ No Please explain:

_____

_____

_____

_____

_____

_____

_____

Thank you for responding to this survey. We know your time is valuable. Your response will remain anonymous. If you have any questions, please contact the Region 8 Planning & Development Council at mail@regioneight.org or by phone at 304.257.2448.

Mail this completed survey to:

Region 8 PDC
131 Providence Lane
Petersburg, WV 26847
or
fax this completed survey to: 304-257-4958.

Distribution:
E-mail blasts to RBPT members and other contacts within the region asking them to forward to their contacts also.
Flyer inserts in regional newspapers:

- Grant County Press
- Moorefield Examiner
- Hampshire Review
- Mineral Daily News Tribune
- Pendleton Times

Hard copy surveys with mini flyers distributed to Hardy County students in grades K-9.

- East Hardy Early Middle School
- Moorefield Elementary
- Moorefield Intermediate
- Moorefield Middle

Hard copies with mini flyers delivered to the following locations for distribution:

- Mineral County Library
- Pendleton County Library
- Pendleton County Health Department
- Pendleton County Chamber of Commerce
- Pendleton County Development Authority
- River Mart, Riverton
- Maxville Mart, Seneca
- Spruce Knob Seneca Rocks Telephone
- Harper's Store, Seneca
- TC's Restaurant, Seneca

Links from websites to www.regioneight.org were provided by:

- Spruce Knob Seneca Rocks Telephone
- Hardy Telecommunications
- Eastern WV Community and Technical College

Radio stations/community announcements:
WELD
WQWV
WQZK

Article in Hampshire Review, June 12, 2013.

Distribution: Personal delivery of flyers and hard copy surveys

Mountain Top Library	Elk Garden Library
Mineral Co Health Department	Piedmont Library
Fort Ashby Library	Hampshire County Library
Hampshire Co COA	Hampshire Memorial Hospital
Hampshire Co Health Dept	Capon Bridge Library
Wardensville Library	Hardy Co Senior Center
Hardy Co Health Dept	Hardy County Wellness Center
Hardy Co Library	Grant Co Library
Grant Memorial Hospital	Grant County Chamber of Commerce
Grant Co Health Dept	Burlington Library

Other means of distribution:

Eastern WV Community and Technical College distributed an e-mail to all students asking them to complete a survey.

Hardy County Chamber of Commerce provided space in their newsletter to promote the survey.

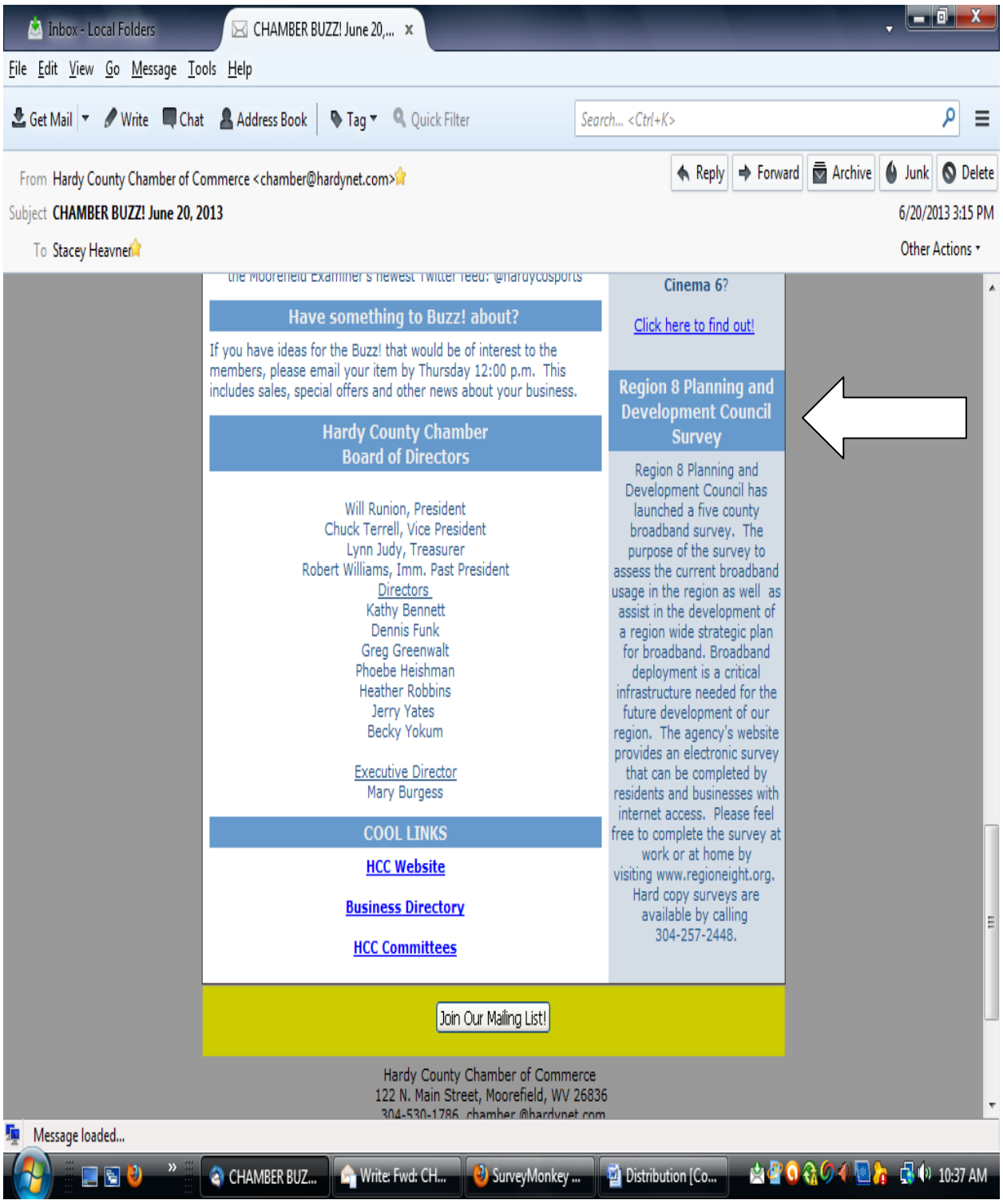
Slow Internet? No Internet?

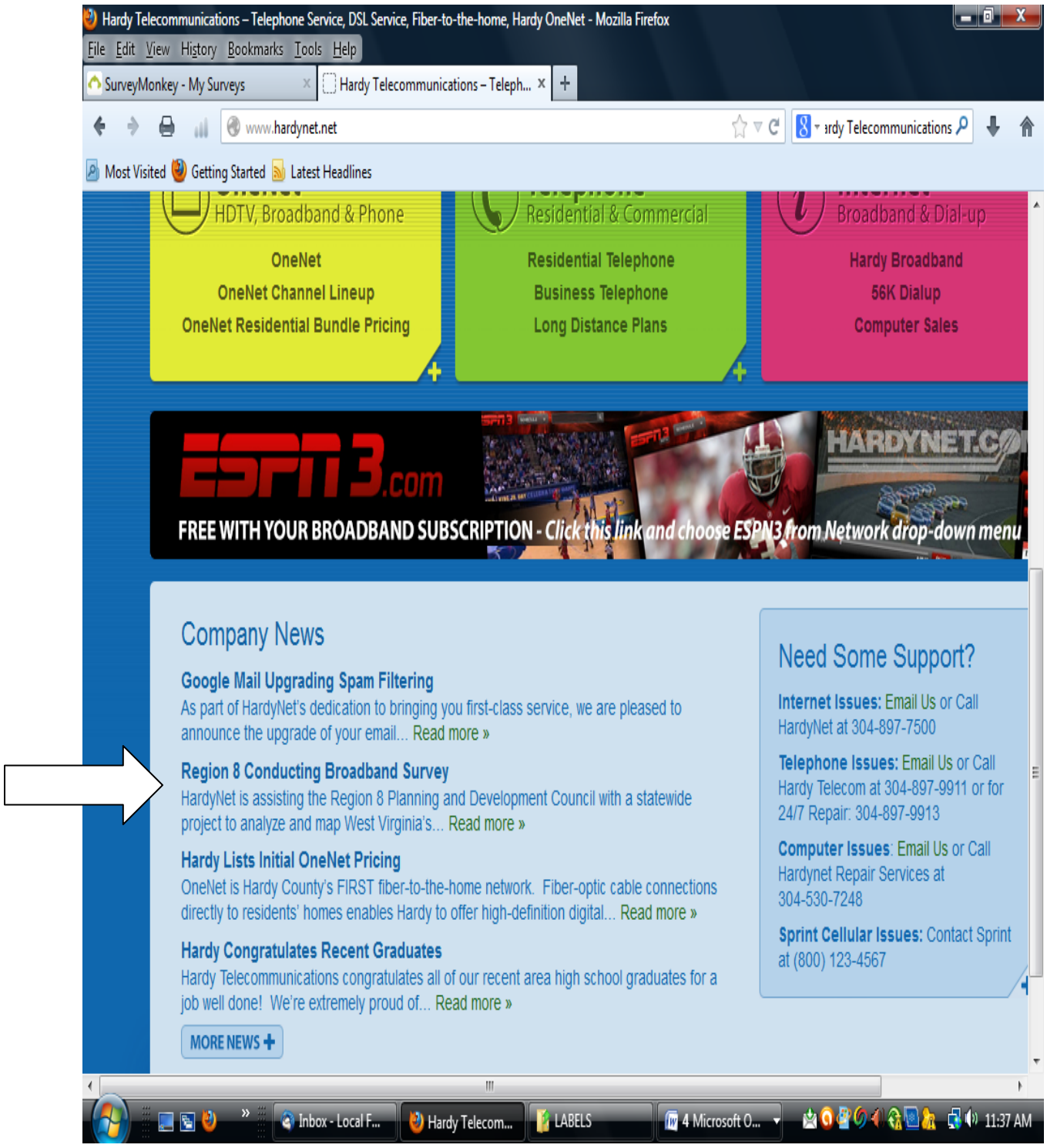
Attention Residents of Grant, Hampshire, Hardy, Mineral, and Pendleton Counties:

Your Planning and Development Council is working to better meet your high-speed Internet needs! Please participate in our online Broadband Survey and help us help you!

To take the survey please visit
http://www.regioneight.org

Region 8 Planning & Development Council


Inbox - Local Folders
CHAMBER BUZZ! June 20,...
File Edit View Go Message Tools Help
Get Mail Write Chat Address Book Tag Quick Filter
Search... <Ctrl+K>
From Hardy County Chamber of Commerce <chamber@hardynet.com>
Reply Forward Archive Junk Delete
Subject CHAMBER BUZZ! June 20, 2013
6/20/2013 3:15 PM
To Stacey Heavner
Other Actions
Cinema 6?
Click here to find out!
Have something to Buzz! about?
If you have ideas for the Buzz! that would be of interest to the members, please email your item by Thursday 12:00 p.m. This includes sales, special offers and other news about your business.
Region 8 Planning and Development Council Survey
Region 8 Planning and Development Council has launched a five county broadband survey. The purpose of the survey to assess the current broadband usage in the region as well as assist in the development of a region wide strategic plan for broadband. Broadband deployment is a critical infrastructure needed for the future development of our region. The agency's website provides an electronic survey that can be completed by residents and businesses with internet access. Please feel free to complete the survey at work or at home by visiting www.regioneight.org. Hard copy surveys are available by calling 304-257-2448.
Hardy County Chamber Board of Directors
Will Runion, President
Chuck Terrell, Vice President
Lynn Judy, Treasurer
Robert Williams, Imm. Past President
Directors
Kathy Bennett
Dennis Funk
Greg Greenwalt
Phoebe Heishman
Heather Robbins
Jerry Yates
Becky Yokum
Executive Director
Mary Burgess
COOL LINKS
HCC Website
Business Directory
HCC Committees
Join Our Mailing List!
Hardy County Chamber of Commerce
122 N. Main Street, Moorefield, WV 26836
Message loaded...
CHAMBER BUZ...
Write: Fwd: CH...
SurveyMonkey ...
Distribution [Co...
10:37 AM


Hardy Telecommunications – Telephone Service, DSL Service, Fiber-to-the-home, Hardy OneNet - Mozilla Firefox
File Edit View History Bookmarks Tools Help
SurveyMonkey - My Surveys
Hardy Telecommunications – Teleph...
www.hardynet.net
Most Visited
Getting Started
Latest Headlines
HDTV, Broadband & Phone
OneNet
OneNet Channel Lineup
OneNet Residential Bundle Pricing
Residential & Commercial
Residential Telephone
Business Telephone
Long Distance Plans
Broadband & Dial-up
Hardy Broadband
56K Dialup
Computer Sales
ESPN3.com
FREE WITH YOUR BROADBAND SUBSCRIPTION - Click this link and choose ESPN3 from Network drop-down menu
Company News
Google Mail Upgrading Spam Filtering
As part of HardyNet's dedication to bringing you first-class service, we are pleased to announce the upgrade of your email... Read more »
Region 8 Conducting Broadband Survey
HardyNet is assisting the Region 8 Planning and Development Council with a statewide project to analyze and map West Virginia's... Read more »
Hardy Lists Initial OneNet Pricing
OneNet is Hardy County's FIRST fiber-to-the-home network. Fiber-optic cable connections directly to residents' homes enables Hardy to offer high-definition digital... Read more »
Hardy Congratulates Recent Graduates
Hardy Telecommunications congratulates all of our recent area high school graduates for a job well done! We're extremely proud of... Read more »
MORE NEWS
Need Some Support?
Internet Issues: Email Us or Call HardyNet at 304-897-7500
Telephone Issues: Email Us or Call Hardy Telecom at 304-897-9911 or for 24/7 Repair: 304-897-9913
Computer Issues: Email Us or Call Hardynet Repair Services at 304-530-7248
Sprint Cellular Issues: Contact Sprint at (800) 123-4567
Inbox - Local F...
Hardy Telecom...
LABELS
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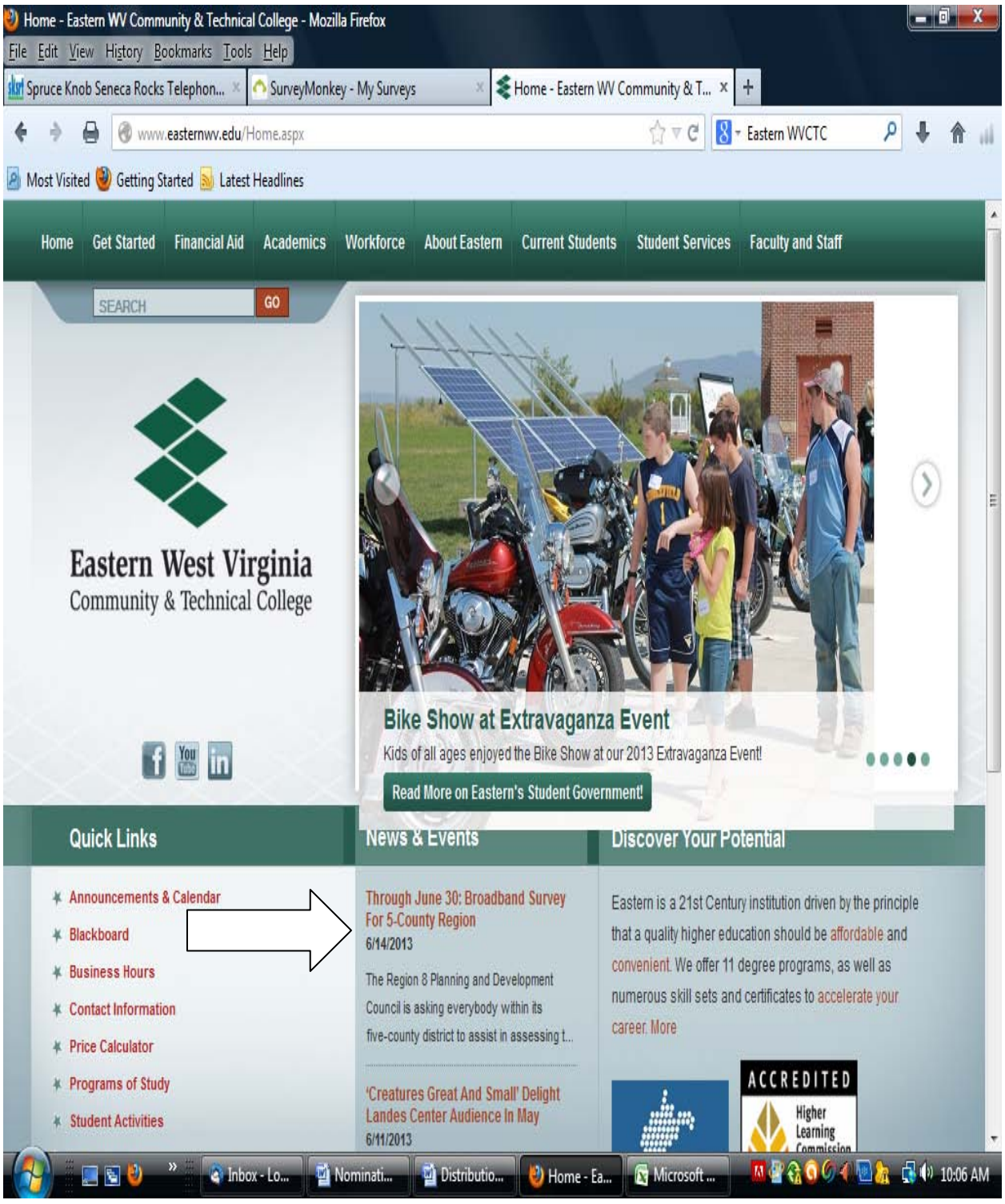
11:37 AM


Spruce Knob Seneca Rocks Telephone Inc - Mozilla Firefox
File Edit View History Bookmarks Tools Help
SurveyMonkey - My Surveys
Spruce Knob Seneca Rocks Telephon...
www.spruceknob.net
SKSRT
Most Visited
Getting Started
Latest Headlines
Spruce Knob Seneca Rocks Telephone Inc
SKSRT was incorporated July 1, 1972 and has been providing high quality telecommunications service to Pendleton County since 1977
"Combining Tradition with Technology"
Riverton, WY
63 °F / 17 °C
Light Rain
click for forecast
TELEPHONE
Telephone Packages, Features, and Services for Any Need
INTERNET
High Speed Internet, Web and Email Hosting Services, Website Design, and SKSRT Internet Policies
TELEVISION
Over 200 Channels of Programming, Movies, and Audio
CONTACT US
Contact Information and Location for Spruce Knob Seneca Rocks Telephone
ABOUT US
SKSRT History, Our Board, Our Newsletters, and our Community
NOW!--PAY ONLINE
Login and Pay Your Monthly Fees Online
facebook
Find us on facebook!
WEBMAIL LOGIN
If you have a SKSRT @spruceknob.net
Copyright © 2013 Spruce Knob
NEW!--Participate in the Region 8 Broadband Survey.
Inbox - Local Fol...
Spruce Knob Se...
LABELS
4 Microsoft Of...
11:43 AM


Home - Eastern WV Community & Technical College - Mozilla Firefox
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Spruce Knob Seneca Rocks Telephon...
SurveyMonkey - My Surveys
Home - Eastern WV Community & T...
www.easternwv.edu/Home.aspx
Eastern WVCTC
Most Visited
Getting Started
Latest Headlines
Home
Get Started
Financial Aid
Academics
Workforce
About Eastern
Current Students
Student Services
Faculty and Staff
SEARCH
GO
Eastern West Virginia
Community & Technical College
Bike Show at Extravaganza Event
Kids of all ages enjoyed the Bike Show at our 2013 Extravaganza Event!
Read More on Eastern's Student Government!
Quick Links
Announcements & Calendar
Blackboard
Business Hours
Contact Information
Price Calculator
Programs of Study
Student Activities
News & Events
Through June 30: Broadband Survey For 5-County Region
6/14/2013
The Region 8 Planning and Development Council is asking everybody within its five-county district to assist in assessing t...
'Creatures Great And Small' Delight Landes Center Audience In May
6/11/2013
Discover Your Potential
Eastern is a 21st Century institution driven by the principle that a quality higher education should be affordable and convenient. We offer 11 degree programs, as well as numerous skill sets and certificates to accelerate your career. More
ACCREDITED
Higher Learning Commission
Inbox - Lo...
Nominati...
Distributio...
Home - Ea...
Microsoft ...
10:06 AM

Subject: Survey

From: Eastern West Virginia Community & Technical College (goldizen@eastern.wvnet.edu)

To: sheavner@frontiernet.net;

Date: Wednesday, June 19, 2013 9:40 AM

Eastern West Virginia Community & Technical College

Eastern is participating on a Regional Broadband Planning Team organized through the Region 8 Planning and Development Council. The Region 8 Planning and Development Council has launched a five county broadband survey. The purpose of the survey is to assess the current broadband usage in the region as well as assist in the development of a region wide strategic plan for broadband. Broadband deployment is a critical infrastructure needed for the future development of our region. The agency's website provides an electronic survey that can be completed by residents and businesses with internet access.

As part of the planning team the College has agreed to support this effort by sending out an email to all students asking them to complete a survey and also posting a link on our website to Region 8 PDC's so the public can access the online version of the survey if needed.

Please take a few minutes to complete this survey. You can find it on our website or you may visit www.regioneight.org.

If you have questions please let me know. Thanks.

Eastern WVCTC
Eastern West Virginia Community & Technical College

Forward this email

with a parking ticket that was issued close to the 5 p.m. weekday cut-off point when there is no requirement to feed the meter.

"It's five minutes before five and they are getting a ticket. That happens more than what you might think. So, that could be why that team got that perspective from just discussion from within the community that

She said she believed it would be preferable for motorists to "stroll through town" and take advantage of businesses. But the present parking situation -- with the lack of Main Street spaces -- does not easily allow motorists passing through to pull over and stop when a business catches their attention.

"It hurts us tremendously as a city,"

officials to assist West Virginia communities in their efforts to boost economic and community growth. The goals of the program are to evaluate, educate and assist communities in these efforts and to prepare them for more advanced technical services through the Main Street program, according to the program's online site.

Region VIII survey tracking Internet service

JIM KING Review Staff

How good -- or bad -- is your Internet service? Is anything faster than dial-up available to you?

Those are the questions being asked on a new survey that will help the state map out where upgrades are needed most.

"Broadband for high-speed Internet has become as important as water and sewer in terms of economic development," said Ralph Goolsby, who is overseeing the survey in the Potomac Highlands.

The Region 8 Planning and Development Council, headquartered in Petersburg, is blanketing the five-county area of Hampshire, Mineral, Hardy, Grant and Pendleton, looking for responses.

"I'd like for everybody in this region who has a flyer in their hand to answer this survey and that's a lot," said Region 8 Executive Assistant Stacey Heavner. She has sent out more than 36,000 flyers and has ads in area newspapers, including this week's Review.

To take the survey, go to www.regioneight.org. The survey is the top item on the home page.

That's if your Internet access is good enough.

"Stacey told me some people who got the notice in Hampshire County didn't have fast enough Internet service to be able to complete the survey online," Goolsby said. "They had to call into the office and get help."

If you can't take the survey online, then you can call 304-257-2448.

Realistically, Heavner said, she would be delighted with a response from 10 percent of the households. About 200 surveys had been completed by Monday.

The results will be compiled with the other 10 planning regions in the state for a strategic plan. There's no pot of money existing to upgrade critical areas, Goolsby said, but this will allow the state to be ready when funds com available.

It's all being coordinated by the Geological and Economic Survey branch of the state's Department of Commerce.

"It's part of a statewide strategic plan to work and analyze where services are and where the gaps might be and how to plan to the future to close those gaps," Heavner said.

PITCH IN

To take the survey, click on
www.regioneight.org
or call 304-257-2448

Free school meals start June 24 in county

Review Staff

Hampshire County kids will have access to two healthy meals a day most of the summer thanks to the state Department of Edu-

"The Summer Food Service Program is designed to fill the nutrition gap and make sure our kids remain healthy and active."

Breakfast service runs from 8:30 to 9

the School Breakfast and National School Lunch programs, those meals end when school is out for the summer months. An average of 58 percent of West Virginia

Hampshire Review, June 12, 2013

Region 8 Planning and Development Council
Regional Broadband Planning Team
Kick-off Meeting
May 1, 2013

The meeting commenced at approximately 12:00 p.m. on May 1, 2013 with the following individuals present:

Mary Beth Barr, Grant Memorial Hospital
Vickie Colaw, Spruce Knob/Seneca Rocks Telephone Inc
Robert Cole, Mineral County Development Authority
Mallie Combs, Hardy County Rural Development Authority
William Hentosh, Mineral County Office of Emergency Services
Paul Lewis, Hardy County Office of Emergency Services
Rebecca McConnell, Pendleton County Library
Anne Palmer, Mineral County Chamber of Commerce
Mona Ridder, Mineral County Development Authority
Kim Ruddle, Pendleton County Economic and Community Development Authority
Les Shoemaker, Hampshire County Development Authority
Barbara Whitecotten, Hardy County Board of Education
Region 8 PDC staff members: Terry Lively, Melissa Earle, Ralph Goolsby, and Stacey Heavner

Terry Lively, Executive Director, thanked attendees for their participation and introduced Mr. Ralph Goolsby who is facilitating the meeting and compiling information for the broadband plan. Mr. Goolsby spoke to the group about the Regional Broadband Planning Team; how it was funded, what its purpose is and how the broadband planning process will be carried out. He then spoke of the overall goals of the State's broadband efforts as well and the current status of broadband availability within Region 8. He also spoke of the Regional Broadband Planning Teams role in meeting state and regional broadband goals.

The floor was then given to the group to discuss current broadband needs in their own specific sectors. Unreliable and unaffordable services were the two hot topics discussed. Speed in transmitting information is also a need for health care, emergency services, schools, libraries, and businesses. Types of internet service reported for the region included T1, DSL, fiber, and microwave.

It was also discussed that the task of distributing residential and business surveys by the team as it will be used as a tool for gathering information on Region 8's current broadband needs. Each member of the team was then given a sector tailored broadband assessment to complete.

Results of the residential and business surveys will be assessed before the next meeting to allow the team to further critique their planning methods successfully at that meeting which will tentatively occur in July.

With tasks in place the meeting adjourned.

Region 8 Planning and Development Council
Regional Broadband Planning Team
Kick-off Meeting
May 2, 2013

The meeting commenced at approximately 12:00 p.m. on May 2, 2013 with the following individuals present:

Joan Ashley, Pendleton County Economic & Community Development Authority
Roger Ashley, Pendleton County Chamber of Commerce
Derek Barr, Hardy Telecommunications
Marlene Collins, Wardensville Library
Carol Koontz, Hardy County Library
Neil McLaughlin, Hampshire Memorial Hospital
Bruce Minor, Pendleton County Office of Emergency Services
Donnie Owen, MGW and Lingo Networks
Scott Sherman, Hardy Telecommunications
Sherry Watts, Eastern WV Community and Technical College
Tony Simental, WV Geographic Information Systems
Region 8 PDC staff members: Terry Lively, Melissa Earle, Ralph Goolsby, and Stacey Heavner

Terry Lively, Executive Director, thanked attendees for their participation and introduced Mr. Ralph Goolsby who is facilitating the meeting and compiling information for the broadband plan. Mr. Goolsby spoke to the group about the Regional Broadband Planning Team; what its purpose is and how the broadband planning process will be carried out. He then spoke of the overall goals of the State's broadband efforts as well and the current status of broadband availability within Region 8. Tony Simental, State GIS Coordinator, elaborated on the topics Mr. Goolsby discussed. They also spoke of the Regional Broadband Planning Teams role in meeting state and regional broadband goals.

Mr. Simental explained the government's role in the broadband plan. He noted that funding for a statewide broadband plan is the second round of funding in which the state's regional councils were included to assist with regional plans. Those plans will be used to create a state plan. The regional plan is owned by everyone in the region. It is necessary to have a plan in place when applying for state and federal funding or talking with legislators regarding a project. It verifies needs. This may also provide an opportunity during the planning process to benefit from the unused routers or connections purchased by previous funds. All regional plans will be similar in format and methodology but will contain different information.

The floor was then given to the group to discuss current broadband needs in their own specific sectors. Again, unreliable and unaffordable services were the two hot topics discussed. Speed in transmitting information is also a continuing need for health care, emergency services, schools, libraries, and businesses. Internet service appears to be dominated by one provider. There was a lengthy discussion regarding the limited competition and the regulatory environment which hampered the opportunity for local broadband providers to expand their services in the region. Additional discussion centered around the controversy surrounding the State's Broadband Technology Opportunities Program (BTOP).

The task of distributing residential and business surveys was discussed by the team as it will be used as a tool for gathering information on Region 8's current broadband needs. Suggestions were made to place a survey into the hands of every patient visiting healthcare facilities as well as distribution at libraries and schools. Each member of the team was then given a sector tailored broadband assessment to complete.

Results of the residential and business surveys will be assessed before the next meeting to allow the team to further critique their planning methods successfully at that meeting which will tentatively occur in July.

With tasks in place the meeting adjourned.

Region 8 Planning and Development Council
Regional Broadband Planning Team
August 6, 2013

The meeting commenced at approximately 11:45 a.m. on August 6, 2013 with the following individuals present:

Anne Palmer, Mineral County Chamber of Commerce
Mona Ridder, Mineral County Development Authority
Barbara Whitecotten, Hardy County Board of Education
Beverly Steele, Mineral County Development Authority
Connie Sutton, Mineral County Library
Gene Clem, Mineral County
Region 8 PDC staff members: Ralph Goolsby, and Stacey Heavner

Mr. Goolsby opened the meeting by thanking participants for their continued support with the regional broadband survey. He reviewed the project overview. Regional Broadband Planning Teams (RBPTs) are part of the State's broadband planning project funded through Federal ARRA grants. The project goals are 1) conduct a broadband needs assessment and 2) develop a broadband strategic plan. The project objectives 1) focuses on Region 8 2) leverage existing projects and investment and 3) develop an implementable and sustainable plan.

Ralph reviewed the survey and assessment data. 492 residents and 109 businesses participated in the survey. 99% of residents and 95% of businesses surveyed have internet services. However, only 8% of residents and 22% of businesses have broadband speed according to the FCC definition (4Mbps/1Mbps). DSL, Satellite and Cellular fail to provide the defined broadband speed. One dominant provider services 80% of the regional residents and businesses. Satisfaction survey results were provided:

Internet Characteristics	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Speed of Connection	6%	23%	32%	38%
Cost of Internet	3%	23%	40%	30%
Technical Support	10%	42%	22%	18%
Reliability of Access	7%	33%	30%	29%
Customer Service	10%	41%	23%	18%
Number of Providers	3%	9%	22%	52%

74% of the respondents were dissatisfied and very dissatisfied respondents with the number of providers. 70% of the respondents were dissatisfied and very dissatisfied respondents with the speed of connection and cost. 59% of the respondents were dissatisfied and very dissatisfied respondents with the reliability of access. Keep in mind that not all respondents answered every question on the survey.

Respondents that do not have high-speed internet access indicated the top three reasons:

70% broadband service not available
33% cost/too expensive
4% don't own a computer

97% of respondents indicated that if these concerns were addressed, they would utilize broadband services.

Ralph initiated an exercise to point out strengths, weaknesses, opportunities, and challenges for broadband in the region. Once the list was complete, participants were asked to choose the top three most important in each category. A list of those results with the top three for each category numbered follows.

STRENGTHS

1. Locally owned providers
2. Business expansion opportunities
3. Essential for economic development

- School coverage is good.
- Libraries have "almost adequate" service.
- Technical support is good.
- More online services
- Business start-ups
- Avenue for change

WEAKNESSES

1. Lack of competition
2. Cost of services
3. Low population density

- Geography of region
- Inadequate speeds/bandwidth
- Reliability
- Demand/desire for service
- Age of population/age culture

OPPORTUNITIES

1. Development for entrepreneurship
2. Motivation to be the "squeaky wheel"
3. Leverage new technologies

- Deploy services to the region
- Enrollment for government services (job search, social security, filing taxes etc.)
- More mobility with diversity of services
- Improved economic development
- Additional online purchasing/selling

CHALLENGES

1. Resource commitment/funding, people
2. Political will/vision
3. Education system adjust to the direction of acquiring information

- Quality of place vs state of the art technology
- Tools to grow independent and self directed learners
- Real cooperation with providers
- Marketing

Ralph noted to participants that the timeline was narrowing. The next step, once the second RBPT meeting has concluded, will be to set goals and objectives for the region. He conveyed to the group that he would like for them to meet again in a few weeks for another work session. Notices will be distributed as soon as possible.

Region 8 Planning and Development Council
Regional Broadband Planning Team
August 8, 2013

The meeting commenced at approximately 11:45 a.m. on August 8, 2013 with the following individuals present:

Becky McConnell, Pendleton County Library
Marlene Collins, Wardensville Community Library
Paul R. Lewis, Hardy County OEM/9-11
Vickie Colaw, Spruce Knob/Seneca Rocks Telephone
Kim Ruddle, Pendleton County EDA
Sherry Watts, Eastern WV Community and Technical College
Gene McConnell, Pendleton County Commission
Region 8 PDC staff members: Ralph Goolsby, and Stacey Heavner

Mr. Goolsby opened the meeting by thanking participants for their continued support with the regional broadband survey. He reviewed the project overview. Regional Broadband Planning Teams (RBPTs) are part of the State's broadband planning project funded through Federal ARRA grants. The project goals are 1) conduct a broadband needs assessment and 2) develop a broadband strategic plan. The project objectives 1) focuses on Region 8 2) leverage existing projects and investment and 3) develop an implementable and sustainable plan.

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74% of the respondents were dissatisfied and very dissatisfied respondents with the number of providers. 70% of the respondents were dissatisfied and very dissatisfied respondents with the speed of connection and cost. 59% of the respondents were dissatisfied and very dissatisfied respondents with the reliability of access. Keep in mind that not all respondents answered every question on the survey.

Respondents that do not have high-speed internet access indicated the top three reasons:

70% broadband service not available
33% cost/too expensive
4% don't own a computer

97% of respondents indicated that if these concerns were addressed, they would utilize broadband services.

Ralph initiated an exercise to point out strengths, weaknesses, opportunities, and challenges for broadband in the region. Once the list was complete, participants were asked to choose the top three most important in each category. A list of those results with the top three for each category numbered follows.

STRENGTHS

4. Essential infrastructure component
5. Huge component for economic development (3 way tie)
6. Expansion of local providers (3 way tie)
7. Demand for reliable service (3 way tie)

- One avenue of communication
- Education/cost saving opportunity
- Healthcare/cost saving opportunity
- Upgrading services

WEAKNESSES

4. Current speeds (low)
5. Unreliable service – rain/no service, download speed (3 way tie)
6. Limited number of providers/lack of competition (3 way tie)
7. Cost of service (3 way tie)

- Regulations limit number of providers – state and federal
- Costs associated with regulations
- Investment not visible in the region
- Outdated infrastructure
- Population density affects cost

OPPORTUNITIES

4. Healthy appetite for services – high speed/limited concern about cost
5. Job growth, telecommuting
6. Market existing and new businesses (2 way tie)
7. Improve in-route medical treatment (2 way tie)

- Increase public/private partnerships
- New technologies
- Reduce response time during emergencies
- Increased on-line sales/purchases

CHALLENGES

4. Quiet zones – effect communications/cell service, wireless, and microwave
5. Resource commitment/funding, people
6. Education of users (2 way tie)

7. Local providers face obstacles in expanding (2 way tie)
- Broadband service providers providing up front pricing for economic development
- Acceptance of change

Ralph noted to participants that the timeline was narrowing. The next step will be to set goals and objectives for the region. He conveyed to the group that he would like for them to meet again in a few weeks for another work session. Notices will be distributed as soon as possible.

Appendix C: Broadband Providers

BROADBAND PROVIDERS

Please Note: The speed of Internet service and pricing can depend on the availability within your area.

AT&T Mobility LLC Residential				
Monthly rates starting at:	**DSL Lite 768 kbps**	**DSL Ultra 768 kbps**	**DSL Xtreme 3 mbps**	**DSL Extreme 6.0 6 mbps**
	$19.95	**$24.95**	**$29.95**	**$34.95**
AT&T Mobility LLC Business				
Monthly rates starting at: (same as above)	**DSL Lite 768 kbps**	**DSL Ultra 768 kbps**	**DSL Xtreme 3 mbps**	**DSL Extreme 6.0 6 mbps**
	$19.95	**$24.95**	**$29.95**	**$34.95**
Comcast Residential				
Monthly rates starting at:	**Economy Plus 3 mbps**	**Performance Starter 6 mbps**	**Performance 20 mbps**	**Blast 50 mbps**
	$39.95	**$49.95**	**$64.95**	**$74.95**
Comcast Business				
Monthly rates starting at:	**Starter 12 mbps**	**Premium 27 mbps**	**Deluxe 50 mbps**	
	$59.95	**$99.95**	**$189.95**	
Frontier Communications Residential				
Monthly rates starting at:	**Simply Broadband 1.3 mbps**	**12 mbps**	**24 mbps**	
	$29.99	**$39.99**	**$49.99**	
Frontier Communications Business				
Monthly rates starting at:	**7 mbps**	**15 mbps**	**20 mbps**	**30 mbps**
	$49.99	**$79.99**	**$109.99**	**$139.99**

Hardy Telecommunications Residential				
Monthly rates starting at:	**Economy 768 kbps**	**1.5 mbps**	**3 mbps**	**6 mbps**
	$29.95	**$43.95**	**$69.95**	**$89.95**
Hardy Telecommunications Business				
Monthly rates starting at:	**Economy 768 kbps**	**1.5 mbps**	**3 mbps**	**6 mbps**
	$39.95	**$53.95**	**$69.95**	**$89.95**
Hughes Net Residential				
Monthly rates starting at:	**Power 10 mbps/1 upload speed**	**Power Pro 10 mbps/2 upload speed**	**Power Max 15 mbps/2 upload speed**	
	$59.95	**$79.99**	**$99.99**	
Hughes Net Business				
Monthly rates starting at:	**200 10mbps/1 upload speed**	**300 10 mbps/2 upload speed**	**400 15 mbps/2 upload speed**	
	$79.99	**$99.99**	**$129.99**	

Seneca Rocks/Spruce Knob Telephone Inc. Residential				
Monthly rates starting at:	**768 kbps**	**1.5 mbps**	**3.0 mbps**	**6.0 mbps**
	$39.95	**$49.95**	**$59.95**	**$79.95**
Seneca Rocks/Spruce Knob Telephone Inc. Business				
Monthly rates starting at:	**768 kbps**	**1.5 mbps**	**3.0**	**6.0**
	$59.95	**$69.95**	**$79.95**	**$99.95**
Shentel Residential				
Monthly rates starting at:	**15 mbps**	**25 mbps**	**50 mbps**	
	$69.95	**$89.95**	**$129.95**	
Shentel Business				
Monthly rates starting at:	**15 mbps**	**25 mbps**	**50 mbps**	
	$69.95	**$89.95**	**$129.95**	
US Cellular Residential				
Monthly rates starting at:	**2 GB**	**5 GB**	**10 GB**	
	$25.00	**$50.00**	**$90.00**	
US Cellular Business				
Monthly rates starting at	**2 GB**	**5 GB**	**10 GB**	
	$25.00	**$50.00**	**$90.00**	

Appendix D: Research

could raise anti-poultry growth sentiments as occurred in nearby Virginia counties.

- Environmental issues such as odors from processing plants and wastewater disposal limitations. These may result in regulations that severely limit the production capacity of processing plants.

Many of the threats can be addressed by infrastructure improvements and planning activity. Planning is critical in addressing environmental issues.

Defense Equipment

Alliant Techsystems operates the Allegany Ballistics Laboratory under contract from the Naval Sea Systems Command. The facility is West Virginia's largest defense contractor employing nearly 1,200 individuals producing advanced component structures for military aircraft, components for munitions, and legacy rocket motors. The firm has projected employment growing at the facility to over 2,000 workers. Much of the growth is expected in the composites and electronic integration areas. With the continuing need to defend the nation from a wide array of threats, strong growth at the facility seems reasonable.

While the operation is a relatively self contained facility, its growth requires substantial community improvement. Shortages of quality housing have particularly challenged the firm's ability to grow by discouraging individuals with critical skills from locating to the region. The Potomac Highlands diminished medical, cultural, and commercial resources have reinforced this problem. The limited availability of development sites with adequate public infrastructure have hindered the region's ability to address these problems and have discouraged investors wishing to serve the facility's growth potential.

Growth Centers

Region 8 contains three growth centers, Keyser, Romney, and Moorefield/Petersburg. Previously, the City of Keyser has been designated a Redevelopment - Economic Center by the Economic Development Administration.

Keyser Growth Center

The City of Keyser is the county seat of Mineral County and is the largest city in Region 8. The City's 2000 population was 5,303 persons; this represents a 10% loss from the 1990 population of 5,870. More than balancing this loss is the strong growth in the New Creek Valley, south of Keyser. Evidence of this growth is found in a doubling of connections to the New Creek water system. Persons age 17 or younger account for 20% of Keyser's population; persons age 65 or older account for 21% of the population. Members of minority groups make up 8.2% of the City's population and 18.9% of the population lived in poverty.

In 1999, the City of Keyser had an internal labor force of 2,158 persons and a labor force participation rate of 51.6%. Median family and per capita incomes for 1999 were $32,708 and $13,813 respectively. Per capita income grew by 26% during the 90's. Unemployment was 7.9% according to the 2000 census.

Keyser has an excellent transportation network. It is on the main east/west line (New York to St. Louis) of the CSX Rail System. Passenger rail service is available at Cumberland, Maryland. The City is served by Route 46 and Routes 220 and 50. Additionally, Interstate Route 68 is within less than a half hour's driving time. The City is within a three hours drive of major international airports in Pittsburgh, PA, Baltimore, MD., and Washington, DC.

The Keyser Industrial Park contains 211 acres with approximately 26 acres immediately available for development. There are other industrial sites of various sizes in and around the City. Coal and commercial quantities of lumber and limestone are available within close proximity to the community. The City contains six financial institutions, a new hospital, and Potomac State College. The municipal wastewater treatment plant has been upgraded, but needs further improvement to meet the Potomac Tributary strategy. The City is working to implement a project to replace its failing water treatment plant. The balance of the City's infrastructure, i.e., utilities, housing, education, recreation opportunities, and governmental services are of sufficient quantity and quality to allow development of Keyser and Mineral County's resources.

Keyser has been plagued by decline in manufacturing. During the past decade three major employers have closed resulting in the loss of about 400 jobs. The community contains a number of vacant industrial plants. Likewise, the City's Main Street has numerous vacant structures and empty lots. On a more positive note, the commercial area south of Keyser has seen strong growth and a shopping plaza just west of Main Street appears sound.

The City of Keyser has the potential to have significant impact on the region's growth. Community leaders are working to resolve infrastructure deficiencies.

Moorefield/Petersburg Growth Center

The municipalities of Moorefield and Petersburg, the county seats of Hardy and Grant counties respectively, are nearby communities in the South Branch Valley. The economies of the two towns are closely linked and development in one community supports growth in the other. For these reasons, the communities have been jointly identified as a growth center. With combined population of 4,798, the Moorefield/Petersburg area has enjoyed population growth; the area's population has grown by 36.6% since 1960. Persons age 65 and older comprise 21.5% of the population and those 17 and younger comprise 20.5%. Minorities account for 5.5% of the municipalities' population and 18.7% of the residents live in poverty.

The 1999 labor force of the municipalities was 2,260; the labor force participation rate was 58.5%. The median family income for 1999 was $30,880 and per capita income was $17,052. Per capita income grew by 45.3% during the 1990's. The 2000 census indicated that the growth center had an unemployment rate of 5.3%.

The Moorefield/Petersburg growth center has only a fair transportation network. The South Branch Valley Railroad provides regular service to the main east/west line of the CSX rail system. US Route 220 and WV Routes 55, 28, and 42, are the center's primary highways. The nearest interstate highway is more than an hour distant. However, construction of Appalachian Corridor H continues and approximately 20 miles of the four-lane highway connect Moorefield and Wardensville, WV. The completion of Corridor H will provide a tremendous highway access to the Moorefield/Petersburg growth center. The Grant County Airport, with a lighted runway of over 5,000 feet, serves the growth center.

Eight major industrial plants are located in and around the two towns. These industries employ nearly 5,000 persons. The center has the region's greatest concentration of manufacturing employment and contains all the region's poultry processing facilities and most of its wood products employment. Within 50 miles of the growth center are abundant supplies of coal, limestone, timber and agricultural products.

Public water and sewer treatment currently limits both communities. The Petersburg water treatment plant is at capacity and must be replaced. The Petersburg wastewater treatment plant must be improved if the community is to meet Potomac Tributary Strategy. While the Town of Moorefield is completing a water project that will allow its treatment plant to meet community needs, the municipal wastewater treatment plant must be replaced to meet current demand and future standards. Both communities are addressing noted needs. The City of Petersburg will initiate construction of a new water treatment plant in 2009. The City has employed an engineering consultant to plan a wastewater treatment improvement project. The Town of Moorefield continues to pursue a major wastewater treatment project that will consolidate public and private industry plants to allow the entire community to meet developing discharge standards. The City is undertaking studies to address this key community facility. The growth center contains seven banks, a hospital, and Eastern West Virginia Community and Technical College. The area's infrastructure is capable of supporting additional growth and development of the center's potential is central to growth in the Potomac Highlands.

Romney Growth Center

The City of Romney is the county seat of Hampshire County and is the third largest community in Region 8. The City's population was relatively stable between 1960 and 1980. The 2000 census indicates that the City's population declined by 11.9% since 1960 to 1,940 persons. However, this loss has been more than offset by strong growth in the areas immediately adjacent to the City. Persons age 65 and older comprised 26.0% of the population in 1990 and persons age 17 and younger accounted for 25.2% of the

population. Members of minority groups made up 3.0% of the City's population. Approximately 24.6% of the City's residents live in poverty.

Romney had a 2000 labor force participation rate of 47.4% with a labor force of 705 persons. The median family income for 1999 was $34,271 and the 1999 per capita income was $15,765. Per capita income increased by 57.7% during the 90's and the census indicated an unemployment rate of .9%.

Romney has a good transportation network. It is served by the South Branch Valley Railroad, which provides regular service to the main east/west route of the CSX system. Romney is directly served by Route 50 and 28. The City is within 30 minutes driving time of Interstate 68. Passenger rail service is available at Cumberland, Maryland and Romney is within a three hours drive of major international airports in Pittsburgh, PA, Baltimore, MD., and Washington, DC.

There are several industrial sites in and around the community, including a 57.9-acre industrial park adjacent to the City. Within the 57.9-acre park, there are 38 acres available for development. The County Development Authority owns a 25,000 square foot multi-tenant. Lumber and agricultural products are available in commercial quantities. The City's infrastructure is sound and would allow for development resources. The City contains two banks and a hospital.

Economic Distress and Growth Constraints

Economic Distress

The Region 8 district is economically distressed. The following summary of previously presented information, illustrates major issues:

- The region's 2006 unemployment rate of 4.6% was below the state average of 4.9% and on par with the national rate.
- The median household income of the region's counties range from $28,916 to $31,946. These figures represent from 69 -- 76% of the national median household income of $41,944.
- The region's 2005 personal per capita income was $23,437.
- During 1999, 17.9% of the region's residents live in poverty as compared to 12.4% nationally.
- The region grew by .9% during the 1990's as compared to a national growth rate of 1.2% during the 1990's.

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Lifeline Program for Low-Income Consumers

Lifeline Information

- Clyburn Remarks on Lifeline at the New America Foundation (September 12, 2013) [1]
- Acting FCC Chairwoman Clyburn Statement On Lifeline Awareness Week (September 9, 2013) [2]
- Savings Report (January 31, 2013) [3]
- Lifeline Reforms Save Over $210 Million; 14 Broadband Pilots Launched (December 19, 2012) [4]
- FCC Reforms, Modernizes Lifeline (January 31, 2012 - Press Release) [5]
- Lifeline Reform Report & Order and Further Notice of Proposed Rulemaking [6]
- Lifeline Duplicative Payments Order (June 21, 2011) [7]
- Chairman Genachowski Lifeline Letter (December 12, 2011) [8]
- Lifeline (LL) Fraud Tip Line: **1-855-4LL-TIPS (or 1-855-455-8477) or Lifeline@fcc.gov** [9]. Please provide as much detail as possible, including your name and contact information and the company you are using to receive Lifeline-supported phone service.

Since 1985, the Lifeline program has provided a discount on phone service for qualifying low-income consumers to ensure that all Americans have the opportunities and security that phone service brings, including being able to connect to jobs, family and emergency services. In 2005, Lifeline discounts were made available to qualifying low-income consumers on pre-paid wireless service plans in addition to traditional landline service. Lifeline is part of the Universal Service Fund.

The Lifeline program is available to eligible low-income consumers in every state, territory, commonwealth, and on Tribal lands. Consumers with proper proof of eligibility may be qualified to enroll. To participate in the program, consumers must have an income that is at or below 135% of the federal Poverty Guidelines [11] or participate in a qualifying state, federal or Tribal assistance program.

To participate in the program, consumers must either have an income that is at or below 135% of the federal Poverty Guidelines [11] or participate in one of the following assistance programs:

- Medicaid [12];
- Supplemental Nutrition Assistance Program [13] (Food Stamps or SNAP);

- Supplemental Security Income [14] (SSI);
- Federal Public House Assistance [15] (Section 8);
- Low-Income Home Energy Assistance Program [16] (LIHEAP);
- Temporary Assistance to Needy Families [17] (TANF);
- National School Lunch Program's [18] Free Lunch Program;
- Bureau of Indian Affairs General Assistance [19];
- Tribally-Administered Temporary Assistance for Needy Families [20] (TTANF);
- Food Distribution Program on Indian Reservations [21] (FDPIR);
- Head Start [22] (if income eligibility criteria are met); or
- State assistance programs (if applicable).

Federal rules prohibit eligible low-income consumers from receiving more than one Lifeline discount per household. An eligible consumer may receive a discount on either a wireline or wireless service, but not both. A consumer whose household currently is receiving more than one Lifeline service must select a single Lifeline provider and contact the other provider to de-enroll from their program. Consumers violating this rule may also be subject to criminal and/or civil penalties.

The Lifeline program is administered by the Universal Service Administrative Company (USAC). USAC is responsible for data collection and maintenance, support calculation, and disbursement for the low-income program. USAC's website [23] provides information regarding administrative aspects of the low-income program, as well as program requirements.

On January 31, 2012, the Commission adopted comprehensive reform and modernization of the Lifeline program. As a universal service program that fulfills Congress's mandate to ensure the availability of communications to all Americans, Lifeline for the past 25 years has helped tens of millions of low-income Americans afford basic phone service. Access to telephone service is essential for finding a job, connecting with family, or getting help in an emergency, and the percentage of low-income households with phone service has increased from 80% in 1985, when Lifeline began, to nearly 92% last year.

Highlights of FCC's Lifeline reforms :

Changes to eliminate waste, fraud, and abuse, saving up to $2 billion over 3 years

- Setting a savings target of $200 million for 2012, and putting the Commission in a position to adopt an appropriate budget for the program in early 2013 after review of a six-month report and one-year report on the effects of the Order.
- Creation of a National Lifeline Accountability Database to prevent multiple carriers from receiving support for the same subscriber. The database will build on FCC efforts in 2011 that eliminated nearly 270,000 duplicate subscriptions in 12 states following review of over 3.6 million subscriber records, saving $33 million.
- Creation of eligibility databases from governmental data sources, enabling fully automated verification of consumers' initial and ongoing Lifeline eligibility. This would reduce the potential for fraud while cutting red tape for consumers and providers. A database based on the three most common federal benefit programs through which consumers qualify for Lifeline will be created no later than the end of 2013.
- Establishing a one-per-household rule applicable to all providers in the program, defining household as an "economic unit" so that separate low-income families living at

the same address can get connected.

- Establishing clear goals and metrics to measure program performance and effectiveness.
- Phasing out support for services such as Toll Limitation – subsidies to carriers for blocking or restricting long-distance service—and ending Link Up – subsidies to carriers for initial connection charges. Link Up will continue in Tribal lands.
- Reducing burdens on carriers by establishing a uniform, interim flat rate of reimbursement, allowing carriers to obtain a subscriber's signature electronically, and streamlining enrollment through uniform, nationwide eligibility criteria.

Modernizing Lifeline

- Adopting an express goal for the program of ensuring availability of broadband for all low-income Americans.
- Establish a Broadband Adoption Pilot Program using up to $25 million in savings from other reforms to test and determine how Lifeline can best be used to increase broadband adoption among Lifeline-eligible consumers. Starting this year, the program will solicit applications from broadband providers and will select a number of projects to fund. Lifeline will help reduce the monthly cost of broadband service, but applicants will be expected to help address other challenges to broadband adoption, including the cost of devices and digital literacy.
- Proposes increasing digital literacy training at libraries and schools. A Further Notice of Proposed Rulemaking seeks comment on using savings from other Universal Service Fund reforms to increase digital literacy training at libraries and schools, a key step in increasing broadband adoption.
- Build on FCC efforts to close the broadband adoption gap and address digital literacy, including the Connect-to-Compete initiative, which enlists government, non-profit, and private sector leaders to address broadband adoption barriers through digital literacy training and low-cost broadband availability.
- Allow Lifeline support for bundled services plans combining voice and broadband or packages including optional calling features.

Daily Releases

2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 and Earlier

2013

- **Sage Telecom, Blue Wireless and I-Wireless Public Notice:** 9/16/2013
  WCB seeks comment on petitions filed by Sage Telecom Communications, LLC, Buffalo-Lake Erie Wireless Systems Co., LLC d/b/a Blue Wireless, and i-wireless, LLC for limited designation as an ETC for the provision of Lifeline service.
  Word [24] PDF [25]
- **Lifeline Track 2 Letter:** 9/11/2013
  Directed the Universal Service Administrative Company (USAC) to conduct a pilot program in Michigan to determine the best process for resolving Lifeline inter-company household duplicates.

Federal Communications Commission

Home / The FCC / FCC Encyclopedia / Lifeline Broadband Pilot Program

FCC Encyclopedia

Lifeline Broadband Pilot Program

Lifeline Broadband Pilot Program

As part of the modernization of Lifeline, the Commission is using $13.8 million in savings from Lifeline reforms, to launch a pilot program to collect data on how the Lifeline program can be structured to increase broadband adoption (Lifeline Broadband Pilot Program) among low-income Americans. Through a competitive selection process, the Wireline Competition Bureau has selected 14 high-quality pilot projects, covering 21 states and Puerto Rico, that provide various broadband service offerings to eligible low-income consumers using wireline or wireless technology. The Lifeline Broadband Pilot Program, currently underway, began February 1, 2013. Each of the 14 projects has different service terms with respect to subsidy amount, end-user charges, access to digital literacy training, equipment type, speed ranges and data usage limits. Low-income consumers who already subscribe to broadband at home or a mobile hotspot service are not eligible to participate in the Pilot Program.

The 14 projects are currently enrolling eligible subscribers. Enrollment for all 14 projects ends November 1, 2013.

Broadband Adoption Lifeline Pilot Program Map

For eligible low-income consumers: Click on **YOUR STATE** below to find projects that may be offered in your area:

Alabama
Arizona
California
Florida
Illinois
Iowa
Louisiana
Maryland
Massachusetts
Michigan
Mississippi
Nevada
New Jersey
New Mexico
New York
Ohio
Puerto Rico
Texas
Vermont
Washington
West Virginia
Wisconsin

Updated: July 26, 2013

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Wi-Fi

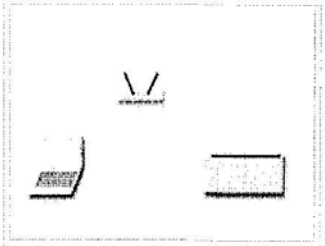
From Wikipedia, the free encyclopedia

Wi-Fi, also spelled **Wifi** or **WiFi**, is a popular technology that allows an electronic device to exchange data or connect to the internet wirelessly using radio waves. The Wi-Fi Alliance defines Wi-Fi as any "wireless local area network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards".[1] However, since most modern WLANs are based on these standards, the term "Wi-Fi" is used in general English as a synonym for "WLAN". Only Wi-Fi products that complete Wi-Fi Alliance interoperability certification testing successfully may use the "Wi-Fi CERTIFIED" trademark.

The Wi-Fi logo used by the Wi-Fi Alliance.

Many devices can use Wi-Fi, e.g. personal computers, video-game consoles, smartphones, some digital cameras, tablet computers and digital audio players. These can connect to a network resource such as the Internet via a wireless network access point. Such an access point (or hotspot) has a range of about 20 meters (65 feet) indoors and a greater range outdoors. Hotspot coverage can comprise an area as small as a single room with walls that block radio waves, or as large as many square miles achieved by using multiple overlapping access points.

Wi-Fi can be less secure than wired connections (such as Ethernet) because an intruder does not need a physical connection. Web pages that use SSL are secure but unencrypted internet access can easily be detected by intruders. Because of this, Wi-Fi has adopted various encryption technologies. The early encryption WEP, proved easy to break. Higher quality protocols (WPA, WPA2) were added later. An optional feature added in 2007, called Wi-Fi Protected Setup (WPS), had a serious flaw that allowed an attacker to recover the router's password.[2] The Wi-Fi Alliance has since updated its test plan and certification program to ensure all newly certified devices resist attacks.



Schematic of a device sending information wirelessly to another device, both connected to the local network, in order to print a document.

Contents

History

Main article: History of IEEE 802.11

802.11 technology has its origins in a 1985 ruling by the US Federal Communications Commission that released the ISM band for unlicensed use.[3] In 1991, NCR Corporation with AT&T Corporation invented the precursor to 802.11 intended for use in cashier systems. The first wireless products were under the name WaveLAN.

A large number of patents by many companies are used in 802.11 standard.[4]

Vic Hayes has been called the "father of Wi-Fi" by some, due to his involvement in negotiating the initial standards within the IEEE while chairing the workgroup.[5][6]

A key patent used in Wi-Fi was developed by the Australian radioastronomer John O'Sullivan as a by-product in a CSIRO research project, "a failed experiment to detect exploding mini black holes the size of an atomic particle".[7] In 1992 and 1996, Australian organization CSIRO obtained patents[8] for a method later used in Wi-Fi to "unsmear" the signal.[9]

In 1999, the Wi-Fi Alliance was formed as a trade association to hold the Wi-Fi trademark under which most products are sold.[10]

In April 2009, 14 tech companies agreed to pay CSIRO $250 million for infringements on CSIRO patents.[11] This led to Wi-Fi being attributed in Australia as an Australian invention,[12] though this has been the subject of some controversy.[13][14] CSIRO won a further $220 million settlement for Wi-Fi patent infringements in 2012 with global firms in the United States required to pay the CSIRO licensing rights estimated to be worth an additional $1 billion in royalties.[11][15][16]

The name

The term *Wi-Fi*, commercially used at least as early as August 2000,[17] was coined by a brand-consulting firm called Interbrand Corporation. The Wi-Fi Alliance had hired Interbrand to determine a name that was "a little catchier than 'IEEE 802.11b Direct Sequence'".[18][19][20] Phil Belanger, a founding member of the Wi-Fi Alliance who presided over the selection of the name "Wi-Fi," also stated that Interbrand invented *Wi-Fi* as a play on words with *Hi-Fi* (high fidelity), and also created the Wi-Fi logo.

The Wi-Fi Alliance initially used the advertising slogan, "The Standard for Wireless Fidelity",[18] for Wi-Fi but later removed the phrase from their marketing. Despite this, some documents from the Alliance dated 2003 and 2004 still contain the term *Wireless Fidelity*.[21][22] There was no official statement related to the dropping of the term.

The yin-yang Wi-Fi logo indicates the certification of a product for interoperability.[21]

Non-Wi-Fi technologies intended for fixed points such as Motorola Canopy are usually described as fixed wireless. Alternative wireless technologies include mobile phone standards such as 2G, 3G or 4G.

Wi-Fi certification

See also: Wi-Fi Alliance

The IEEE does not test equipment for compliance with their standards. The non-profit Wi-Fi Alliance was formed in 1999 to fill this void — to establish and enforce standards for interoperability and backward compatibility, and to promote wireless local-area-network technology. As of 2010, the Wi-Fi Alliance consisted of more than 375 companies from around the world.[23][24] The Wi-Fi Alliance enforces the use of the Wi-Fi brand to technologies based on the IEEE 802.11 standards from the IEEE. This includes wireless local area network (WLAN) connections, device to device connectivity (such as Wi-Fi Peer to Peer aka Wi-Fi Direct), Personal area network (PAN), local area network (LAN) and even some limited wide area network (WAN) connections. Manufacturers with membership in the Wi-Fi Alliance, whose products pass the certification process, gain the right to mark those products with the Wi-Fi logo.

Specifically, the certification process requires conformance to the IEEE 802.11 radio standards, the WPA and WPA2 security standards, and the EAP authentication standard. Certification may optionally include tests of IEEE 802.11 draft standards, interaction with cellular-phone technology in converged devices, and features relating to security set-up, multimedia, and power-saving.[25]

Not every Wi-Fi device is submitted for certification. The lack of Wi-Fi certification does not necessarily imply that a device is incompatible with other Wi-Fi devices. If it is compliant or partly compatible, the Wi-Fi Alliance may not object to its description as a Wi-Fi device[*citation needed*] though technically only certified devices are approved. Derivative terms, such as Super Wi-Fi, coined by the US Federal Communications Commission (FCC) to describe proposed networking in the UHF TV band in the US, may or may not be sanctioned.

Uses

To connect to a Wi-Fi LAN, a computer has to be equipped with a wireless network interface controller. The combination of computer and interface controller is called a *station*. All stations share a single radio frequency communication channel. Transmissions on this channel are received by all stations within range.

The hardware does not signal the user that the transmission was delivered and is therefore called a best-effort delivery mechanism. A carrier wave is used to transmit the data in packets, referred to as "Ethernet frames". Each station is constantly tuned in on the radio frequency communication channel to pick up available transmissions.

A sticker indicating to the public that a location is within range of a Wi-Fi network. A dot with curved lines radiating from it is a common symbol for Wi-Fi, representing a point transmitting a signal.[26]

Internet access

A Wi-Fi-enabled device can connect to the Internet when within range of a wireless network which is configured to permit this. The coverage of one or more (interconnected) access points — called hotspots — can extend from an area as small as a few rooms to as large as many square miles. Coverage in the larger area may require a group of access points with overlapping coverage. Outdoor public Wi-Fi technology has been used successfully in wireless mesh networks in London, UK.

Wi-Fi provides service in private homes, high street chains and independent businesses, as well as in public spaces at Wi-Fi hotspots set up either free-of-charge or commercially, often using a Captive portal webpage for access. Organizations and businesses, such as airports, hotels, and restaurants, often provide free-use hotspots to attract customers. Enthusiasts or authorities who wish to provide services or even to promote business in selected areas sometimes provide free Wi-Fi access.

Routers that incorporate a digital subscriber line modem or a cable modem and a Wi-Fi access point, often set up in homes and other buildings, provide Internet access and internetworking to all devices connected to them, wirelessly or via cable.

Similarly, there are battery-powered routers that include a cellular mobile Internet radiomodem and Wi-Fi access point. When subscribed to a cellular phone carrier, they allow nearby Wi-Fi stations to access the Internet over 2G, 3G, or 4G networks. Many smartphones have a built-in capability of this sort, including those based on Android, BlackBerry, Bada, iOS (iPhone), Windows Phone and Symbian, though carriers often disable the feature, or charge a separate fee to enable it, especially for customers with unlimited data plans. "Internet packs" provide standalone facilities of this type as well, without use of a smartphone; examples include the MiFi- and WiBro-branded devices. Some laptops that have a cellular modem card can also act as mobile Internet Wi-Fi access points.

Wi-Fi also connects places that normally don't have network access, such as kitchens and garden sheds.

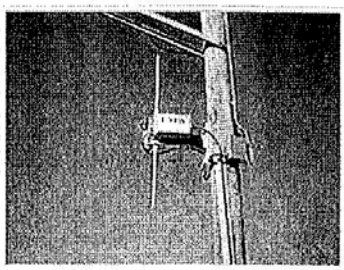
City-wide Wi-Fi

Further information: Municipal wireless network

In the early 2000s, many cities around the world announced plans to construct city-wide Wi-Fi networks. There are many successful examples; in 2004, Mysore became India's first Wi-Fi-enabled city and second in the world after Jerusalem. A company called WiFiyNet has set up hotspots in Mysore, covering the complete city and a few nearby villages.[27]

In 2005, Sunnyvale, California, became the first city in the United States to offer city-wide free Wi-Fi.[28] Minneapolis has generated $1.2 million in profit annually for its provider.[29]

In May 2010, London, UK, Mayor Boris Johnson pledged to have London-wide Wi-Fi by 2012.[30] Several boroughs including Westminster and Islington[31][32] already have extensive outdoor Wi-Fi coverage.



An outdoor Wi-Fi access point

Officials in South Korea's capital are moving to provide free Internet access at more than 10,000 locations around the city, including outdoor public spaces, major streets and densely populated residential areas. Seoul will grant leases to KT, LG Telecom and SK Telecom. The companies will invest $44 million in the project, which will be completed in 2015.[33]

Campus-wide Wi-Fi

Many traditional college campuses in the United States provide at least partial wireless Wi-Fi Internet coverage. Carnegie Mellon University built the first campus-wide wireless Internet network, called Wireless Andrew, at its Pittsburgh campus in 1993 before Wi-Fi branding originated.[34][35][36] In Europe many universities collaborate in providing Wi-Fi access to students and staff through the eduroam international authentication infrastructure.

In 2000, Drexel University in Philadelphia became the United States' first major university to offer completely wireless Internet access across its entire campus.[37] The Far Eastern University in Manila is the first university in the Philippines to implement a campus-wide Wi-Fi coverage.

Direct computer-to-computer communications

Wi-Fi also allows communications directly from one computer to another without an access point intermediary. This is called *ad hoc* Wi-Fi transmission. This wireless ad hoc network mode has proven popular with multiplayer handheld game consoles, such as the Nintendo DS, PlayStation Portable, digital cameras, and other consumer electronics devices. Some devices can also share their Internet connection using ad hoc, becoming hotspots or "virtual routers".[38]

Similarly, the Wi-Fi Alliance promotes a specification called *Wi-Fi Direct* for file transfers and media sharing through a new discovery- and security-methodology.[39] Wi-Fi Direct launched in October 2010.[40]

Advantages and limitations

Advantages

Wi-Fi allows cheaper deployment of local area networks (LANs). Also spaces where cables cannot be run, such as outdoor areas and historical buildings, can host wireless LANs.

Manufacturers are building wireless network adapters into most laptops. The price of chipsets for Wi-Fi continues to drop, making it an economical networking option included in even more devices. [*citation needed*]

A keychain-size Wi-Fi detector

Different competitive brands of access points and client network-interfaces can inter-operate at a basic level of service. Products designated as "Wi-Fi Certified" by the Wi-Fi Alliance are backwards compatible. Unlike mobile phones, any standard Wi-Fi device will work anywhere in the world.

Wi-Fi Protected Access encryption (WPA2) is considered secure, provided a strong passphrase is used. New protocols for quality-of-service (WMM) make Wi-Fi more suitable for latency-sensitive applications (such as voice and video). Power saving mechanisms (WMM Power Save) extend battery life.

Limitations

Spectrum assignments and operational limitations are not consistent worldwide: Australia and Europe allow for an additional two channels beyond those permitted in the US for the 2.4 GHz band (1–13 vs. 1–11), while Japan has one more on top of that (1–14).

A Wi-Fi signal occupies five channels in the 2.4 GHz band. Any two channel numbers that differ by five or more, such as 2 and 7, do not overlap. The oft-repeated adage that channels 1, 6, and 11 are the *only* non-overlapping channels is, therefore, not accurate. Channels 1, 6, and 11 are the only *group of three* non-overlapping channels in the U.S. In Europe and Japan using Channels 1, 5, 9, and 13 for 802.11g and 802.11n is recommended.[*citation needed*]

Equivalent isotropically radiated power (EIRP) in the EU is limited to 20 dBm (100 mW).

The current 'fastest' norm, 802.11n, uses double the radio spectrum/bandwidth (40 MHz) compared to 802.11a or 802.11g (20 MHz).[*citation needed*] This means there can be only one 802.11n network on the 2.4 GHz band at a given location, without interference to/from other WLAN traffic. 802.11n can also be set to use 20 MHz bandwidth only to prevent interference in dense community.[*citation needed*]

Range

See also: Long-range Wi-Fi

Wi-Fi networks have limited range. A typical wireless access point using 802.11b or 802.11g with a stock antenna might have a range of 35 m (120 ft) indoors and 100 m (300 ft) outdoors. IEEE 802.11n, however, can more than double the range.[41] Range also varies with frequency band. Wi-Fi in the 2.4 GHz frequency block has slightly better range than Wi-Fi in the 5 GHz frequency block which is used by 802.11a and optionally by 802.11n. On wireless routers with detachable antennas, it is possible to improve range by fitting upgraded antennas which have higher gain in particular directions. Outdoor ranges can be improved to many kilometers through the use of high gain directional antennas at the router and remote device(s). In general, the maximum amount of power that a Wi-Fi device can transmit is limited by local regulations, such as FCC Part 15 in the US.

Due to reach requirements for wireless LAN applications, Wi-Fi has fairly high power consumption compared to some other standards. Technologies such as Bluetooth (designed to support wireless PAN applications) provide a much shorter propagation range between 1 and 100m[42] and so in general have a lower power consumption. Other low-power technologies such as ZigBee have fairly long range, but much lower data rate. The high power consumption of Wi-Fi makes battery life in mobile devices a concern.

Researchers have developed a number of "no new wires" technologies to provide alternatives to Wi-Fi for applications in which Wi-Fi's indoor range is not adequate and where installing new wires (such as CAT-6) is not possible or cost-effective. For example, the ITU-T G.hn standard for high speed Local area networks uses existing home wiring (coaxial cables, phone lines and power lines). Although G.hn does not provide some of the advantages of Wi-Fi (such as mobility or outdoor use), it's designed for applications (such as IPTV distribution) where indoor range is more important than mobility.

Due to the complex nature of radio propagation at typical Wi-Fi frequencies, particularly the effects of signal reflection off trees and buildings, algorithms can only approximately predict Wi-Fi signal strength for any given area in relation to a transmitter.[43] This effect does not apply equally to long-range Wi-Fi, since longer links typically operate from towers that transmit above the surrounding foliage.

The practical range of Wi-Fi essentially confines mobile use to such applications as inventory-taking machines in warehouses or in retail spaces, barcode-reading devices at check-out stands, or receiving/shipping stations. Mobile use of Wi-Fi over wider ranges is limited, for instance, to uses such as in an automobile moving from one hotspot to another. Other wireless technologies are more suitable for communicating with moving vehicles.

Data security risks

The most common wireless encryption-standard, Wired Equivalent Privacy (WEP), has been shown to be easily breakable even when correctly configured. Wi-Fi Protected Access (WPA and WPA2) encryption, which became available in devices in 2003, aimed to solve this problem. Wi-Fi access points typically default to an encryption-free (*open*) mode. Novice users benefit from a zero-configuration device that works out-of-the-box, but this default does not enable any wireless security, providing open wireless access to a LAN. To turn security on requires the user to configure the device, usually via a software graphical user interface (GUI). On unencrypted Wi-Fi networks connecting devices can monitor and record data (including personal information). Such networks can only be secured by using other means of protection, such as a VPN or secure Hypertext Transfer Protocol (HTTPS) over Transport Layer Security.

Interference

For more details on this topic, see Electromagnetic interference at 2.4 GHz.

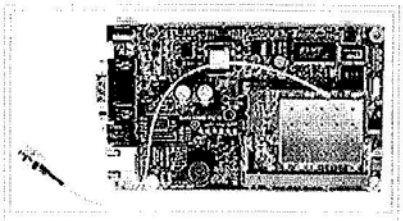
Wi-Fi connections can be disrupted or the internet speed lowered by having other devices in the same area. Many 2.4 GHz 802.11b and 802.11g access-points default to the same channel on initial startup, contributing to congestion on certain channels. Wi-Fi pollution, or an excessive number of access points in the area, especially on the neighboring channel, can prevent access and interfere with other devices' use of other access points, caused by overlapping channels in the 802.11g/b spectrum, as well as with decreased signal-to-noise ratio (SNR) between access points. This can become a problem in high-density areas, such as large apartment complexes or office buildings with many Wi-Fi access points.

Additionally, other devices use the 2.4 GHz band: microwave ovens, ISM band devices, security cameras, ZigBee devices, Bluetooth devices, video senders, cordless phones, baby monitors, and (in some countries) Amateur radio all of which can cause significant additional interference. It is also an issue when municipalities[44] or other large entities (such as universities) seek to provide large area coverage.

Hardware

Standard devices

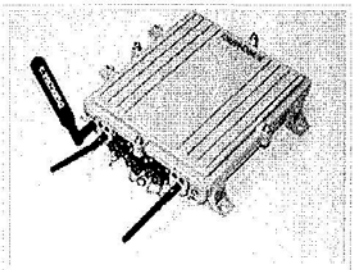
A wireless access point (WAP) connects a group of wireless devices to an adjacent wired LAN. An access point resembles a network hub, relaying data between connected wireless devices in addition to a (usually) single connected wired device, most often an Ethernet hub or switch, allowing wireless devices to communicate with other wired devices.



An embedded RouterBoard 112 with U.FL-RSMA pigtail and R52 mini PCI Wi-Fi card widely used by wireless Internet service providers (WISPs) in the Czech Republic

Wireless adapters allow devices to connect to a wireless network. These adapters connect to devices using various external or internal interconnects such as PCI, miniPCI, USB, ExpressCard, Cardbus and PC Card. As of 2010, most newer laptop computers come equipped with built in internal adapters.

Wireless routers integrate a Wireless Access Point, Ethernet switch, and internal router firmware application that provides IP routing, NAT, and DNS forwarding through an integrated WAN-interface. A wireless router allows wired and wireless Ethernet LAN devices to connect to a (usually) single WAN device such as a cable modem or a DSL modem. A wireless router allows all three devices, mainly the access point and router, to be configured through one central utility. This utility is usually an integrated web server that is accessible to wired and wireless LAN clients and often optionally to WAN clients. This utility may also be an application that is run on a computer, as is the case with as Apple's AirPort, which is managed with the AirPort Utility on Mac OS X and iOS.[45]

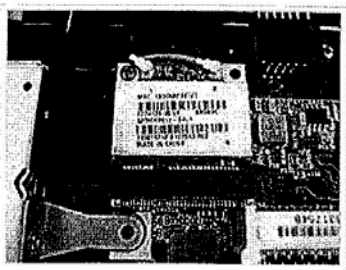


OSBRiDGE 3GN – 802.11n Access Point and UMTS/GSM Gateway in one device

Wireless network bridges connect a wired network to a wireless network. A bridge differs from an access point: an access point connects wireless devices to a wired network at the data-link layer. Two wireless bridges may be used to connect two wired networks over a wireless link, useful in situations where a wired connection may be unavailable, such as between two separate homes.

Wireless range-extenders or wireless repeaters can extend the range of an existing wireless network. Strategically placed range-extenders can elongate a signal area or allow for the signal area to reach around barriers such as those pertaining in L-shaped corridors. Wireless devices connected through repeaters will suffer from an increased latency for each hop, as well as from a reduction in the maximum data throughput that is available. In addition, the effect of additional users using a network employing wireless range-extenders is to consume the available bandwidth faster than would be the case where but a single user

migrates around a network employing extenders. For this reason, wireless range-extenders work best in networks supporting very low traffic throughput requirements, such as for cases where but a single user with a Wi-Fi equipped tablet migrates around the combined extended and non-extended portions of the total connected network. Additionally, a wireless device connected to any of the repeaters in the chain will have a data throughput that is also limited by the "weakest link" existing in the chain between where the connection originates and where the connection ends. Networks employing wireless extenders are also more prone to degradation from interference from neighboring access points that border portions of the extended network and that happen to occupy the same channel as the extended network.



An Atheros Wi-Fi N draft adaptor with built in Bluetooth on a Sony Vaio E series laptop

The security standard, Wi-Fi Protected Setup, allows embedded devices with limited graphical user interface to connect to the Internet with ease. Wi-Fi Protected Setup has 2 configurations: The Push Button configuration and the PIN configuration. These embedded devices are also called The Internet of Things and are low-power, battery-operated embedded systems. A number of Wi-Fi manufacturers design chips and modules for embedded Wi-Fi, such as GainSpan.[46]

USB wireless adapter

Distance records

Distance records (using non-standard devices) include 382 km (237 mi) in June 2007, held by Ermanno Pietrosemoli and EsLaRed of Venezuela, transferring about 3 MB of data between the mountain-tops of El Águila and Platillon.[47][48] The Swedish Space Agency transferred data 420 km (260 mi), using 6 watt amplifiers to reach an overhead stratospheric balloon.[49]

Embedded systems

Increasingly in the last few years (particularly as of 2007), embedded Wi-Fi modules have become available that incorporate a real-time operating system and provide a simple means of wirelessly enabling any device which has and communicates via a serial port.[50] This allows the design of simple monitoring devices. An example is a portable ECG device monitoring a patient at home. This Wi-Fi-enabled device can communicate via the Internet.[51]

Embedded serial-to-Wi-Fi module

These Wi-Fi modules are designed by OEMs so that implementers need only minimal Wi-Fi knowledge to provide Wi-Fi connectivity for their products.

Multiple access points

Increasing the number of Wi-Fi access points provides network redundancy, support for fast roaming and

increased overall network-capacity by using more channels or by defining smaller cells. Except for the smallest implementations (such as home or small office networks), Wi-Fi implementations have moved toward "thin" access points, with more of the network intelligence housed in a centralized network appliance, relegating individual access points to the role of "dumb" transceivers. Outdoor applications may use mesh topologies.

Network security

Main article: Wireless security

The main issue with wireless network security is its simplified access to the network compared to traditional wired networks such as Ethernet, with wired networking one must either gain access to a building (physically connecting into the internal network) or break through an external firewall. To enable Wi-Fi, one merely needs to be within the wireless range of the Wi-Fi network. Most business networks protect sensitive data and systems by attempting to disallow external access. Enabling wireless connectivity reduces security if the network uses inadequate or no encryption.[52][53]

An attacker who has gained access to a Wi-Fi network router can initiate a DNS spoofing attack against any other user of the network by forging a response before the queried DNS server has a chance to reply.[54]

Securing methods

A common measure to deter unauthorized users involves hiding the access point's name by disabling the SSID broadcast. While effective against the casual user, it is ineffective as a security method because the SSID is broadcast in the clear in response to a client SSID query. Another method is to only allow computers with known MAC addresses to join the network,[55] but determined eavesdroppers may be able to join the network by spoofing an authorized address.

Wired Equivalent Privacy (WEP) encryption was designed to protect against casual snooping but it is no longer considered secure. Tools such as AirSnort or Aircrack-ng can quickly recover WEP encryption keys.[56] Because of WEP's weakness the Wi-Fi Alliance approved Wi-Fi Protected Access (WPA) which uses TKIP. WPA was specifically designed to work with older equipment usually through a firmware upgrade. Though more secure than WEP, WPA has known vulnerabilities.

The more secure WPA2 using Advanced Encryption Standard was introduced in 2004 and is supported by most new Wi-Fi devices. WPA2 is fully compatible with WPA.[57]

A flaw in a feature added to Wi-Fi in 2007, called Wi-Fi Protected Setup, allows WPA and WPA2 security to be bypassed and effectively broken in many situations. The only remedy as of late 2011 is to turn off Wi-Fi Protected Setup,[58] which is not always possible.

Piggybacking

Main article: Piggybacking (Internet access)

Further information: Legality of piggybacking

Piggybacking refers to access to a wireless Internet connection by bringing one's own computer within the

range of another's wireless connection, and using that service without the subscriber's explicit permission or knowledge.

During the early popular adoption of 802.11, providing open access points for anyone within range to use was encouraged to cultivate wireless community networks,[59] particularly since people on average use only a fraction of their downstream bandwidth at any given time.

Recreational logging and mapping of other people's access points has become known as wardriving. Indeed, many access points are intentionally installed without security turned on so that they can be used as a free service. Providing access to one's Internet connection in this fashion may breach the Terms of Service or contract with the ISP. These activities do not result in sanctions in most jurisdictions; however, legislation and case law differ considerably across the world. A proposal to leave graffiti describing available services was called warchalking.[60] A Florida court case determined that owner laziness was not to be a valid excuse.[*citation needed*]

Piggybacking often occurs unintentionally, since most access points are configured without encryption by default[*citation needed*] and operating systems can be configured to connect automatically to any available wireless network. A user who happens to start up a laptop in the vicinity of an access point may find the computer has joined the network without any visible indication. Moreover, a user intending to join one network may instead end up on another one if the latter has a stronger signal. In combination with automatic discovery of other network resources (see DHCP and Zeroconf) this could possibly lead wireless users to send sensitive data to the wrong middle-man when seeking a destination (*see Man-in-the-middle attack*). For example, a user could inadvertently use an unsecure network to log into a website, thereby making the login credentials available to anyone listening, if the website uses an unsecure protocol such as HTTP.

Safety

Further information: Wireless electronic devices and health

The World Health Organization (WHO) says "there is no risk from low level, long-term exposure to wi-fi networks" and the United Kingdom's Health Protection Agency reports that exposure to Wi-Fi for a year results in the "same amount of radiation from a 20-minute mobile phone call." [61][62]

A small percentage of Wi-Fi users have reported adverse health issues after repeat exposure and use of Wi-Fi,[63] though there has been no publication of any effects being observable in double-blind studies. A review of studies involving 725 people that claimed electromagnetic hypersensitivity found no evidence for their claims.[64]

See also

- List of WLAN channels
- San Francisco Digital Inclusion Strategy
- Wi-Fi operating system support
- WiMAX, longer range (>1 km) alternative to DSL
- Super Wi-Fi, IEEE 802.22 proposal to use TV bands
- Li-Fi

Notes

References

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Further reading

- *Wireless Networking in the Developing World* (PDF book)

External links

- The Wi-Fi Alliance (http://wi-fi.org/)
- List of Wi-Fi certified products (http://www.wi-fi.org/search_products.php?search=1&advanced=1&lang=en&filter_company_id=&filter_category_id=&filter_subcategory=&filter_cid=&date_from=&date_to=&selected_certifications%5B%5D=50&x=44&y=15/)
- The Wireless Broadband Alliance (http://www.wballiance.com/)

Retrieved from "http://en.wikipedia.org/w/index.php?title=Wi-Fi&oldid=578216489"
Categories: Wi-Fi | Wireless networking | Internet access | IEEE 802.11 | Networking standards | 1999 introductions

foliage. Bandwidth of several megabits will be possible, and will compare very favorably with copper-based systems like DSL. But even these systems will have a very limited ability to handle TV programming, interactive videoconferencing, and other business class services.

Wireless services will be important in Mineral County. And wireless is not going away; it will remain as an important component of a well-designed community broadband system--as a mobility solution. As we travel around the community, we want to be able to access the Web, check email, make phone calls, and do other sorts of things. Wireless services enable that, and in rural areas, wireless services are an important step up from dial-up.

Communities need to regard telecom as essential public infrastructure, critical to community and economic development. And that well-designed community infrastructure includes both wireless access and eventually fiber to every home and business. With the right business and financial planning, such systems can pay for themselves and provide new revenue streams to local government, while lowering the cost of telecom services.

Fixed Point Access Wireless

Fixed point wireless Internet access via some private sector providers is already available in Mineral County. Community investments should be limited to tower sites and towers, which can be leased to the private sector. It appears that Verizon Wireless may be planning a substantial expansion of cellular service in the county, which would include cellular data access. In late 2009, the Communications Committee indicated that several new cellular towers were being constructed. Cellular data service is a substantial improvement over dial up, and while prices are not cheap (typical monthly fee is about $40), it is likely many residents and businesses would be happy to pay more to get off dial up.

This kind of service can introduce additional competition for Internet access customers, which can lower prices and create incentives to offer better customer service from the providers. Over time, most fixed point Internet users (five to seven years out) will want to migrate to fiber connections which will have the capacity to provide a much wider range of services, including HD TV, telemedicine, and tele-health, among other applications.

Fixed point wireless infrastructure investments (e.g. locations for towers, towers, fiber and duct backhaul connections) can be re-used over time to support mobile wireless services and long term public safety voice and data services. If the county makes investments, it should be in close coordination with public safety and rescue services to ensure that public safety voice communications benefit as well.

Mobile Access Wireless

Wireless access to the Internet and other mobile services like cellular telephone providers is a long term need that will not be replaced by fiber access. In fact, over the next five to seven years, the most common use for wireless Internet access will be for mobility--casual business, personal, and government access away from the home or office.

National Radio Astronomy Observatory

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NRAO Home > Green Bank > NRQZ GB Quick Links

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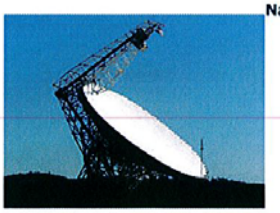
Last updated 12 August 2013 by Paulette Woody



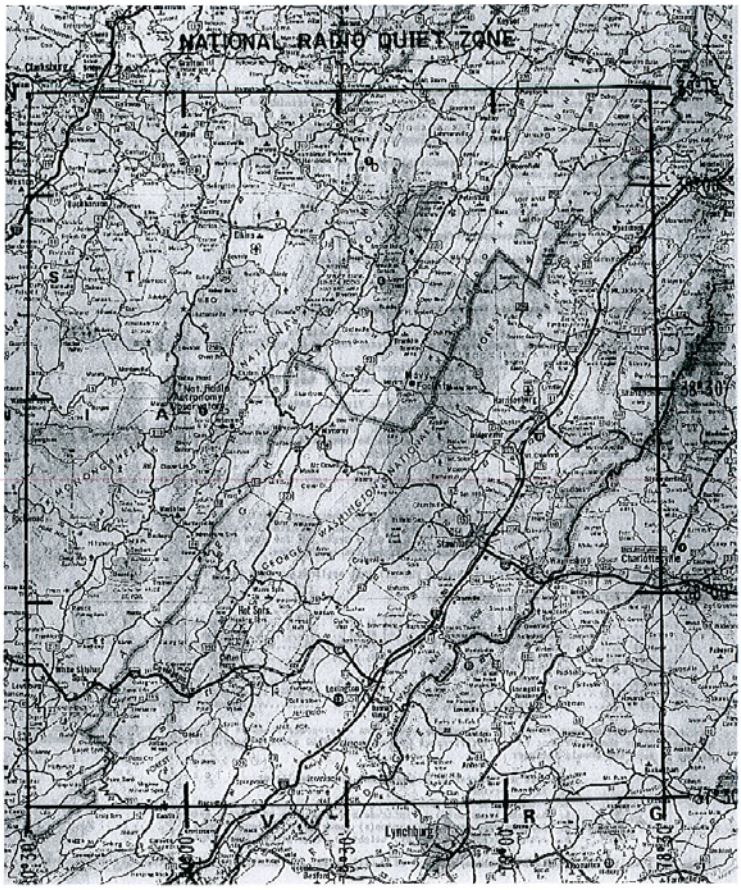
National Radio Quiet Zone

Description

The National Radio Quiet Zone (NRQZ) was established by the Federal Communications Commission (FCC) in Docket No. 11745 (November 19, 1958) and by the Interdepartment Radio Advisory Committee (IRAC) in Document 3867/2 (March 26, 1958) to minimize possible harmful interference to the National Radio Astronomy Observatory (NRAO) in Green Bank, WV and the radio receiving facilities for the United States Navy in Sugar Grove, WV. The NRQZ is bounded by NAD-83 meridians of longitude at 78d 29m 59.0s W and 80d 29m 59.2s W and latitudes of 37d 30m 0.4s N and 39d 15m 0.4s N, and encloses a land area of approximately 13,000 square miles near the state border between Virginia and West Virginia.

The following black and white map is from the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (Redbook).

To view a color map, click here.



Coordination Requirement

NRQZ coordination is required for all new or modifed, permanent, fixed, licensed transmitters inside the NRQZ, as specified for federal transmitters by NTIA manual section 8.3.9 and for non-federal transmitters by the FCC in 47 CFR section 1.924.

The applicable radio services include but are not limited to: Public Mobile, Wireless Communications, Maritime, Aviation, Private Land Mobile, Personal Radio, Fixed Microwave, International Fixed Public, Satellite Communications, Radio Broadcast, Experimental Radio, Auxiliary and Special Broadcast, Cable Television Relay, Amateur Radio, Personal Communications Service, General Wireless Communications Service. Geographic Area Licensed Services are NOT exempt from NRQZ coordination. Applicants for some radio services are required to file their applications through independent frequency coordinators (e.g. APCO, AASHTO, PCIA, and IMSA). The coordinators assume the responsibility of notifying the Interference Office that an FCC application has been filed and hold the application until the Interference Office responds with its evaluation.

Preliminary Evaluations

As a service to applicants who are planning to install transmitters within the NRQZ, our NRQZ Office can evaluate proposed transmitter installations long before an applicant decides upon a final transmitter location or equipment configuration. These preliminary evaluations can help the applicant determine the best location for a transmitter while keeping NRQZ interests in mind and can ultimately expedite the application process. The result produced by the preliminary evaluation is the maximum power that can be radiated by the proposed transmitter towards Green Bank. Requests for preliminary evaluations should be submitted to the NRQZ Office and should contain the following information:

- Name and address.

- Radio service.
- For each proposed transmitter:
  - Frequency or frequencies
  - Signal Bandwidth (if unknown, this information can be gathered from the technology type or the emission designator)
  - Antenna location in latitude and longitude to nearest second.
  - Antenna site ground elevation above mean sea level (AMSL).
  - Antenna height above ground level (AGL).

Coordination Process

In order to minimize harmful interference to the operations of the NRAO in Green Bank and the Navy Informations Operation Command (NIOC) at Sugar Grove, all requests for new or modified, permanent, fixed, assigned or licensed transmitters within the NRQZ shall be coordinated by the applicant, prior to submission to the FCC or NTIA, with:

NRQZ Administration Office
National Radio Astronomy Observatory
P. O. Box 2
Green Bank
WV 24944

Email: NRQZ Administrator

PREFERRED METHOD OF NRQZ COORDINATION - Using the nrqzApplicationMaker

As a convenience to NRQZ applicants, and to **expedite the coordination process**, you may download nrqzApplicationMaker software, courtesy of AKP Consulting Engineers. The nrqzApplicationMaker software has detailed instructions to guide you through the application process, resulting in a complete application file.

Please read and follow all instructions carefully!

Send your completed, zipped file to *the NRQZ Administrator* for evaluation.

ALTERNATIVE METHODS OF NRQZ COORDINATION

The applicant may use the NRQZ Application Technical Data - Supplemental Information document or provide the following information:

- Name and address of applicant.
- Radio service and Call Sign.
- FCC File or NTIA Assignment Number.
- For each proposed transmitter:
  - Frequency or frequencies
  - Signal Bandwidth (if unknown, this information can be gathered from the technology type or the emission designator)
  - Antenna location in latitude and longitude to nearest tenth of a second.
  - Antenna site ground elevation above mean sea level (AMSL).
  - Antenna height above ground level (AGL).
  - Antenna make, model number, and maximum antenna gain in dBd or dBi.
  - Maximum transmit power (dBW or W)

COORDINATION RESULTS

If your proposed system meets the NRAO protection criteria, you will receive a coordination letter suitable to attach to an FCC application or NTIA assignment.

However, should the Effective Radiated Power (ERP) of your transmitter exceed what is allowable under the limit,

the following information may be additionally requested:

- A detailed system configuration that includes all system gains and losses.
- Antenna gain with horizontal and vertical patterns in one degree increments (in Planet or TIA-804-B Antenna File Format).
- Antenna azimuth (degrees true) and elevation.

Transmitter Evaluation

The NRQZ Office reviews all applications to ensure that the computed power flux density at the reference point does not exceed frequency-dependent thresholds.

In some instances, the transmitter power requested by an applicant exceeds the level that is harmful to observations in Green Bank or Sugar Grove. When this occurs, applicants should discuss possible modifications to their transmitters (e.g. using a directional antenna, relocating the antenna to an area that provides additional terrain shielding, or selecting a different frequency where the power density limits are different) with the Interference Office. In our experience, a technical solution can almost always be found to provide the area coverage desired by the applicant while simultaneously minimizing the impact of the interference upon Green Bank or Sugar Grove. In the extremely rare case when differences between the applicant's desires and the Interference Office's evaluation cannot be resolved, both the applicant and the Interference Office should forward comments on the transmitter installation to the FCC or IRAC for a final resolution.

We emphasize that the Interference Office has no authority in the granting of an FCC license or a Federal Government frequency assignment. The Interference Office only has the privilege of submitting its comments on a particular transmitter installation to the FCC or IRAC.

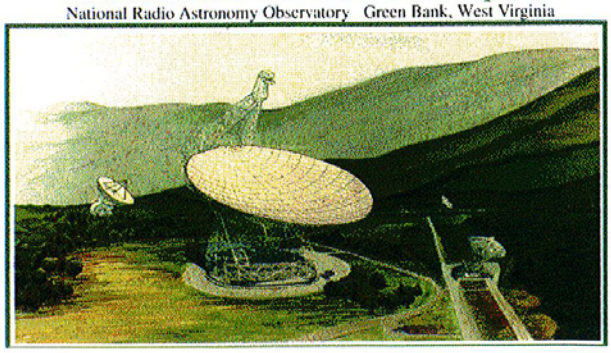
Applicants who feel that their applications have been evaluated unfairly or inadequately can contact the office of the Green Bank Site Director for a review of their circumstances.

Reference Point

The reference point for calculations of transmitter power density is the prime focus of the Green Bank Telescope (GBT). The location of the GBT prime focus is:

Latitude: 38d 25m 59.2s N (NAD83)
Longitude: 79d 50m 23.4s W (NAD83)
Ground Elevation: 806 Meters or 2644 Feet AMSL (NAVD88)
Height: 139.6 Meters or 458 Feet AGL

The Green Bank Telescope
National Radio Astronomy Observatory Green Bank, West Virginia



Power Density Thresholds

Based on a 20 kHz measurement bandwidth, the calculated power density of the transmitter at the reference point should be less than:

- 1×10^{-8} W/m^2 for frequencies below 54 MHz
- 1×10^{-12} W/m^2 for frequencies from 54 MHz to 108 MHz
- 1×10^{-14} W/m^2 for frequencies from 108 MHz to 470 MHz

- 1×10^{-17} W/m^2 for frequencies from 470 MHz to 1000 MHz
- freq^2 (in GHz) $\times 10^{-17}$ W/m^2 for frequencies above 1000 MHz

except for frequencies that reside in the radio astronomy observing bands listed in the US Table of Frequency Allocations, in which case the power densities listed in Table 1 of Recommendation ITU-R RA.769 shall apply. For a comprehensive list, click here.

For more information about the NRQZ please contact:

Paulette Woody

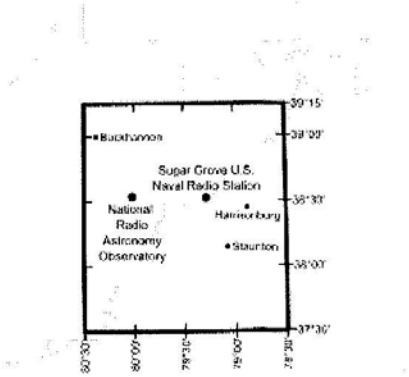
Phone: 304-456-2107, Fax: 304-456-2276, Email: NRQZ Administration

United States National Radio Quiet Zone

Coordinates: 38.375°N 79.5°W

From Wikipedia, the free encyclopedia

The **United States National Radio Quiet Zone** is a large area of land centered between the National Radio Astronomy Observatory at Green Bank, West Virginia and the Sugar Grove Research Facility at Sugar Grove, West Virginia. The Radio Quiet Zone is a rectangle of land approximately 13,000 square miles (34,000 km^2) in size that straddles the border area of Virginia and West Virginia. It includes all land with latitudes between 37° 30′ 0.4″ N and 39° 15′ 0.4″ N and longitudes between 78° 29′ 59.0″ W and 80° 29′ 59.2″ W.[1]



The National Radio Quiet Zone spans West Virginia, Virginia, and a small part of Maryland.

The National Radio Quiet Zone protects the telescopes of the NRAO facility and the antennas and receivers of the U.S. Navy Information Operations Command (NIOC) at Sugar Grove, West Virginia. The NIOC at Sugar Grove has long been the location of electronic intelligence-gathering systems, and is today said to be a key station in the ECHELON system operated by the National Security Agency (NSA).[2]

The Quiet Zone was created by the Federal Communications Commission (FCC) in 1958 to protect the radio telescopes at Green Bank and Sugar Grove from harmful interference. Restrictions on transmission are tightest within ten miles of these sites,[3] where most omnidirectional and high-power transmissions are prohibited.

Not all radio transmissions are prohibited in the Radio Quiet Zone. For example Citizen's Band radios, police and ambulance radios, and fire department radios are used there. However, large transmitter owners must typically coordinate their operations with representatives of the NRAO, which oversees the NRQZ in agreement with the Sugar Grove facility. The only broadcast radio stations in the inner core of the Quiet Zone are part of the Allegheny Mountain Radio network—with just one station in the AM band, and several low-power FM stations. Exceptions to the Radio Quiet Zone restrictions are usually determined on a case-by-case basis, with preference given to public safety concerns, such as remote alarm systems, repeaters for first responders, and NOAA Weather Radio. Due to the restrictions, the area has attracted people who believe they suffer from electromagnetic hypersensitivity.[4]

Most broadcast transmitters in the Quiet Zone are forced to operate at reduced power and use highly directional antennas. This makes cable and satellite all but essential for acceptable television in much of the region.

Chapter 37A of the West Virginia Code strictly regulates radio transmitters within 10 miles of the Green Bank NRAO facility.[3] Staff of the NRAO routinely patrol radio transmissions within a 20-mile radius of the Green Bank Telescope.[5]

Contents

Counties inside the Zone

Maryland counties

- Extreme southern Garrett County

Virginia counties

See also, List of radio stations in Virginia which includes several AM and FM stations within the zone.

- Western Albemarle County
- Alleghany County
- Amherst County, except for the southern quarter
- Extreme northern Appomattox County
- Augusta County
- Bath County
- Extreme northern Bedford County
- Northern Botetourt County
- Northwestern Buckingham County
- Northern Craig County
- Western Greene County
- Highland County
- Nelson County
- Western Page County
- Rockbridge County
- Rockingham County, except for a small area in the extreme eastern part
- Western Shenandoah County

West Virginia counties

See also, List of radio stations in West Virginia which includes several AM and FM stations within the zone.

- Barbour County, except for a small area in the north
- Extreme eastern Braxton County

- Grant County, except for an area in the north
- Eastern Greenbrier County
- Southwestern Hampshire County
- Hardy County
- Southeastern Harrison County
- Eastern Lewis County
- Extreme southern Mineral County
- Northeastern and east central Monroe County
- Extreme eastern Nicholas County
- Pendleton County
- Pocahontas County
- Two areas in extreme southwestern and southeastern Preston County
- Randolph County
- Extreme southern Taylor County
- Tucker County, except for an area in the extreme northern part
- Upshur County
- Central and eastern Webster County

Cities inside the Zone

Virginia cities

- Buena Vista
- The western half of Charlottesville, including much of the University of Virginia Grounds
- Covington
- Harrisonburg
- Lexington
- Staunton
- Waynesboro

West Virginia cities

- Buckhannon
- Elkins
- Weston

Clarksburg, West Virginia, and Lynchburg, Virginia are just outside the Quiet Zone.

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3. ^ [a] [b] "West Virginia Code, Chapter 37A" (http://www.gb.nrao.edu/~cniday/chapter-37a.html). NRAO. Retrieved 2013-10-08.
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External links

- Official website (http://www.gb.nrao.edu/nrqz/nrqz.html)
- *Wired Magazine* coverage, Feb. 2004 (http://www.wired.com/wired/archive/12.02/quiet.html)
- Wired Science video: What's inside The Quiet Zone (http://www.pbs.org/kcet/wiredscience/video/308-the_quiet_zone.html) (December 26, 2007) (Outdated link)
- NPR's *On The Media* interview of BBC journalist Matt Danzico about his recent trip to the National Radio Quiet Zone (September 16, 2011) (http://www.onthemedia.org/2011/sep/16/escape-wifi-national-quiet-zone/)
- *Slate Magazine* coverage, Apr. 2013 (http://www.slate.com/articles/technology/future_tense/2013/04/green_bank_w_v_where_the_electrosensitive_can_escape_the_modern_world.single.html)
- "Enter The Quiet Zone: Where Cell Service, Wi-Fi Are Banned" (http://www.npr.org/blogs/alltechconsidered/2013/10/08/218976699/enter-the-quiet-zone-where-cell-service-wi-fi-are-banned). NPR. 2013-10-08.

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