

Morgan County Economic
Development Authority
Telecommunications Task
Force Report: July 19, 2009

By:

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Introduction/Overview Telecom Project

In June 2008, the Morgan County Economic Development Authority held an economic development summit with business and community leaders at Cacapon State Park. At that summit, the participant leaders resolved that improving telecommunications service was the #1 infrastructure priority of Morgan County.

In response, the Morgan County Economic Authority created a Task Force on Telecommunications in January 2009. This Task Force, headed by Jerry Berman and Ken Dabkowski* was established to make an assessment of Morgan County telecommunications needs and explore strategies for bringing better telecommunications service (high-speed Internet, cell phone and 9-1-1) to Morgan County residents and businesses. The project commenced in January 2009 and was completed in June 2009. This report sets forth the work of the project and a summary of its findings, impact on broadband and cell deployment, and recommendations for making progress going forward.

Needs Assessment:

In order to determine our telecommunications needs and build a case for further deployment, we had to document: (1) what services are currently available where and to whom; (2) where in the county services are deficient; and (3) whether residents in underserved areas wanted improved service. In other words, we set out to determine telecommunications supply and demand in Morgan County. We established a goal of increasing coverage to 85% of residents and businesses in our county and to examine ways to cover more difficult to reach areas in the near future.

Our methodology was threefold: (1) conduct a survey of Morgan County residents using an on-line and paper questionnaire; (2) seek data from service providers in Morgan relating to their provision of service and current deployment plans, and (3) conduct a study of cell phone reception. Over the course of the study and based on the data we collected, we:

- Gathered and mapped data on what infrastructure already existed.
- Gathered and mapped data on what was going to be built.

** Jerry Berman, Task Force Chair, is a resident of Morgan County with a long career in telecommunications and Internet Policy Issues. Ken Dabkowski was hired as a consultant by the EDA, for his expertise in telecommunications research and applications.

- Determined standards for grant making and focused on possible avenues for funding.
- Determined demand data needed for provider expansion.
- Shared data with providers and engaged in a cooperative and successful effort with providers to persuade them to expand their coverage in Morgan County.

The Survey:

Beginning in February 2009, the Task Force published a Telecommunications Survey¹ for Morgan County residents. This survey was published in the Morgan Messenger newspaper three times. It was also available and accepting entries online at the website <http://www.wiremorgan.com> from March 9, 2009 until May 9th, 2009. The survey was printed and made available at the Morgan County Library and County Commission office. Lastly, we met with the Superintendent and the Director of Technology of Schools in Morgan County and gained their cooperation in having the survey filled in by a significant percentage of students.

In total, 1600 people responded by filling in the survey. In a county of 16,000, this represented 10% of the total population and an even higher percentage of households. Approximately 1300 of the 1600 used the online form through a public office or home computer showing the importance of using the Internet to acquire more Internet deployment. The turnout showed that our community is dedicated to improving countywide telecommunications. Many public leaders, businesses, homeowners associations and individuals promoted the survey. The results demonstrate that community involvement can lead to success.

Meeting with Service Providers:

Parallel with the survey, we started meeting with and interviewing service providers. We met with representatives from Verizon, Comcast, Fibernet, Frontier Communications, Skyweb, Visual Link/World Airwaves, Verizon Wireless, Sprint, U.S. Cellular, and AT&T.

We sought to learn: (1) where they provided broadband or cell, (2) current scheduled deployment plans for service in the County; and most significantly, (3) to encourage the providers to expand service if requisite demand was demonstrated in the survey to justify capital expenditures.

¹ Copy of survey can be found in the appendix.

Meeting with Officials:

We also met with several Regional (Region 9, Gateway New Economy Council), State (Department of Commerce, West Virginia Governor's Office) and National (NTIA, USDA, Congressional Internet Caucus, Honorable Rick Boucher - D-VA) to promote the region and bring visibility to the area. During each meeting we recorded updates to application strategy, informed officials of progress and educated them as to our process.

Mapping Broadband and Cell Service:

We took all the data from the survey and data from the service providers and created ten maps (in appendix).

- Map 1 - 4 - Current Cell Phone Coverage (by provider)
- Map 5 - 8 - Current Cell Phone Coverage (mapped during drive test)
- Map 9 - Current high-speed Internet Coverage (Wi-Fi/DSL/Fiber)
- Map 10 - Current high-speed Internet Demand (Dial-up/Satellite)

Broadband Expansion Results from Survey and Dialogue with Providers:

The lists of demand and maps of locations requesting improved service were sent to service providers for verification purposes only.² Providers such as Verizon analyzed the data set and identified particular locations of high demand. If significant demand was present, Verizon agreed to cover those areas with service. This strategy of identifying demand and working with the carriers was very successful and has paid off in expanding broadband coverage in Morgan County.

As mentioned in numerous press releases and articles, Verizon stated, "More consumers and businesses in Morgan County will have access to Verizon High Speed Internet in the coming months, as the company installs digital subscriber line (DSL) technology in 10 facilities in the county, several more than originally planned. Verizon, which currently offers High Speed Internet (HSI) service in Berkeley Springs and surrounding areas, expects to expand HSI availability by the end of the year to more than 1,800 additional lines in parts of the following areas:

Route 522, near the Morgan County Business Park; Route 9 East in the River Road and Clone Run Road areas; the Johnsons Mill Road area that

² To protect the privacy of our residents; data was shared for verification purposes only. There was a restriction on the use of data for commercial purposes.

includes parts of Highland Ridge, Duckwall, Spriggs and Rupenthal roads; Great Cacapon, including the Maidstone and Cacapon River Meadows communities; Spruce Pine Hollow area, including Chestnut Grove and Spruce Pine Hollow communities, plus parts of Burnt Mill, Potter, Michael's Chapel and Victory Lane roads; the River Road area, including Sleepy Creek Farms community and parts of Rover, Householder, Crone Lane and Poole roads; parts of Pious Ridge, Culp and River roads; Mountain Run Road area, including New Hope Acres and Deer Run Woods communities, and parts of Mountain Run, Shades Lane, Swaim Lane and Duckwall roads; Winchester Grade Road in the area of Sleepy Creek Forest community and parts of Virginia Line, Highland Ridge, Posey Hollow and Barnes Lane roads; and Spohrs Cross Road area, including areas along Route 9 and parts of Spohrs and Potomac roads."

Verizon's expansion was the most impactful development during our project. However, the survey and dialogue had additional positive impacts:

- Skyweb, the local Wi-Fi provider, completed an engineering map and budget for near 100% deployment and coverage in Morgan County.
- Fibernet has decided to move forward with a Wi-Max deployment based on demand areas and will provide a second lower rate access to Verizon's new lines.
- Sprint went ahead with plans and turned on EVDO (high-speed Internet) service on all its current cell towers so that cell phones and air cards can receive access for a monthly fee.
- Likewise, U.S. Cellular has committed to turn on EVDO service to all its county sites by August 3rd, 2009.
- Verizon Wireless is considering additions, but has not made a final commitment to a plan to roll out as many as five wireless sites in 2010 which may operate with PCS or 3G (similar to EVDO) service.

This survey, information sharing, and dialogue strategy will accomplish our goal of expanding broadband coverage to 85% of institutions and consumers in Morgan County in 2009. It is our determination that a percentage of the remaining 15% of households may be reached by provider investments in 2010 or can be covered by Wi-Fi service through federal stimulus grants or other governmental sources.

Broadband in Context:

Broadband or high-speed Internet offers greatly increased speeds compared to dial-up.

Faster speeds allow for newer applications to connect and run such as Voice Over IP (VOIP), Video/Video conferencing, audio streaming, collaboration, gaming, social networking and many others. Broadband's current federal definition is a speed of 768K down and 200K up. State and regional definitions approximate broadband definition speeds of up to 3Mbs down and 768K up. "Down" is simply described as data that travels from the Internet to your computer (such as content from a website). Up, is simply described as data that travels from your computer to a location on the Internet. Without consistent connections at certain speeds, many applications cannot run. Many different varieties and speeds of service are offered in Morgan County ranging from dial-up speeds of 56K down, to business class cable service which provides up to 50Mbs down and 3Mbs up.

If we define broadband using the federal definition, minimum speeds are met in a large percentage of Western Morgan County (Frontier ILEC - Incumbent Legacy Exchange Carrier). On the Eastern side of Morgan County, broadband access is concentrated in population centers such as Berkeley Springs and business corridors such as routes 522 and 9 East. Many residential areas are covered through DSL or Wi-Fi service and can be identified on maps located in the appendices.

Barriers

During our interview and discovery process, we uncovered barriers to deployment of cell, Wi-Fi and wired service in Morgan County:

Terrain:

Morgan County has a hilly and varied terrain. It is very difficult to serve residential and business customers with such varied terrain because some areas are not able to support wires and some areas are poorly located to receive wireless signals due to blocked line of sight.

Lack of bond infrastructure funding:

In the last few years the Morgan County Courthouse burned down and the Town of Bath/Berkeley Springs has spent a considerable amount of money on water and sewer infrastructure. For these reasons, it is politically difficult to offer public bonds or other debt to support new infrastructure projects. Because of the economic downturn, the tax base in the county is strained and telecommunications must find support from other sources.

Other engineering:

Technology impediments make it difficult to expand in some areas. Wired high-speed Internet services are set up to bring in a large cable from the outer trunk. From each of the terminals copper wire is run to individual houses. At each step of the process the signal reduces in strength and the technology supports lower speeds. The final terminals present one other technological hurdle. As the signal travels from the terminal to a distant point on copper wire, at about the third mile mark the signal drops off. Therefore each terminal only has an approximate three mile coverage zone and potentially less if the terrain is hilly, etc.

High-Speed Internet Goals/Priorities

After surveying demand and supply and projecting into the future we have determined the following needs and priorities:

Last mile business/residential expansion:

Many residents and home based businesses demand Internet. In our county, while 85% or more demanding service will be covered through Verizon's expansion, there are still residents requiring service. Reaching most of these residents with wired service will be cost prohibitive using current technology. Wi-Fi or Wi-Max coverage makes more sense as it can cover up to 99% at a much lower cost. However installation costs to residents is still high. To bring this cost down, we must include reduction in installation costs as a government funding request objective. Public funding and possibly public/private partnerships must be fostered in order to achieve maximum broadband penetration in Morgan County.

Cheaper transport costs:

When Internet Service Providers (ISP's) provide service on competitor networks, they are charged a fee to use the communications lines. Similar to renting a space or charging a utility usage fee, these transport costs are a significant cost to ISP's and are a barrier to deployment. Some transport providers mark up cost as much as 40% which increases cost to consumers as much as 50%. It is for this reason we would recommend doing as much as possible to promote transport competition.

Competition will decrease prices and provide alternate options for transport. This will allow small ISP's to transition from dial-up to broadband deployment, and decrease costs to ISP's and consumers. Decreasing transport costs may eventually provide more deployment due to increased ISP service expansion.

Peering Point Connection:

One of the largest peering points in the world is located less than 100 miles from Berkeley Springs. A peering point is simply a very large hub of Internet activity. This hub allows for faster connection to more sites and is considered high value real estate. Physical location of facilities near this point is ideal for data centers or large data users who require enormous storage capability as it provides superior connection speeds and minimum transport cost. A direct fiber connection to the peering point would open many possibilities for data warehousing in Morgan County. This would create new high-speed infrastructure which can be shared by ISPs and also create new high-tech jobs in our area to manage and operate such data centers.

Energy/electricity costs:

WV electricity prices are close to the cheapest in the nation. Data centers are in need of abundant cheap energy. As a consequence, Morgan County is (geographically) perfectly situated between the east coast peering point and the lowest energy production facilities in the nation to attract such facilities.

This project does have roadblocks. There is a high infrastructure cost involved with implementation of a fiber line from the peering point. Also, the construction of such an immense project requires a high data usage facility(ies) to locate and purchase service on the tail end. These roadblocks can be overcome, but it is a highly leveraged business proposition that will require business interest and significant local government investment of time and expertise. Potential sites for such a data storage facility include the Morgan County and Paw Paw Business and Industrial Park respectively.

Education/Adoption/Training:

It became obvious during our survey process that certain common and complex technical terms needed explanation because broadband technologies are new and rapidly evolving. Education, adoption, uptake and training are all vital components of residential and business Internet participation. Existence of infrastructure does not automatically mean that people will use it. Basic computer facilities, training/guide programs would significantly increase adoption as well as understanding of needs and technologies. There is federal funding available for such education centers but we have not identified an institution or business positioned to develop these capabilities in Morgan County.

Strategies in Broadband

To achieve the aforementioned goals, individual Morgan County citizens and the MCEDA can both advance the public interest. It is well known that customers drive expansion. The best strategy to increase broadband service is to identify and map new demand clusters for providers. Verizon and Frontier (which will soon acquire Verizon's wire line telephone and broadband facilities in West Virginia) are especially receptive if identifiable groups want service in any given area. Petitions are available through Verizon and can be communicated to any carrier through the MCEDA or directly by citizen groups. The county government, particularly the EDA, will work with the carriers to encourage them to add more broadband infrastructure for Morgan County in their capital budgets to cover areas in need of service for critical business or residential use.

Due to the high cost of covering remote areas using wired service, another technology solution for rural areas is to use wireless technology also known as Wi-Fi. Wi-Fi solutions presented to the EDA outside this report are far more cost effective and in some cases are the only ways to reach some remote areas. Partnerships and capital raising strategies to support private expansion is a positive strategy here. The MCEDA has identified three Wi-Fi and Wi-Max providers willing to expand in Morgan County and all are willing to work with the MCEDA should grant funding become available.

Our Case

Demand for service is only one component or reason that a provider will bring service to an area. Other reasons can persuade carriers to locate service to a location. When applying for grant money or provider expansion, the following reasons are strongly aligned with many goals of the government and individual ISPs.

1) Retirees/medical:

Morgan County has a high percentage of retirees. These retirees and other elderly residents will need medical coverage and monitoring. While Morgan County is building a small hospital, most complex medical procedures are only available in larger cities. Therefore, remote diagnostics and even medical procedures may be possible if available to local medical institutions and doctors. In addition, improved infrastructure would facilitate the national effort to move towards computerized medical records as a major cost savings and medical efficiency measure.

2) Education:

Our schools are acquiring better service. However, Internet education needs extend beyond the school facilities. Educators are increasingly making homework assignments available online as well as research projects, student collaboration opportunities, and education related communications. In addition, on-line education opportunities are expanding for students as well as adults, all of which would be facilitated by better broadband infrastructure.

3) Home based business:

Morgan County has many home based businesses. The Internet offers even the smallest producer access to a world-wide market. Many residents can use this opportunity to build successful small businesses.

4) Location - close to DC:

Morgan County is a rural county within two hours of the Washington D.C. metropolitan area. Many high income, educated, and technology savvy people move to this area for vacation and retirement. The availability of high-speed Internet service for Morgan County is critical if we are to continue attracting these individuals. Providing better service is paramount.

5) Ideal for small service office staff:

As companies look to reduce costs, Morgan County is a great place to relocate. Costs of living are relatively low and potential employees are abundant. High-speed service offered in populated areas can support the needs of a small to medium sized business. This is an ideal option for companies thinking of moving outward from the D.C. metro area.

6) Construction jobs:

Over the past three years, Morgan County has lost over 100 construction jobs. This industry provides a large segment of the population with employment and is how many residents are trained. While new home starts are down, the remodeling market is still heavily supported here by D.C. residents with second homes. This presents an opportunity. Local workers can increase competitiveness by lowering their cost and offering higher value products. For example, energy efficiency through demand side metering would be facilitated by broadband infrastructure.

7) Local business efficiency:

The Internet helps local businesses operate more effectively. Internet access allows them advantages as they can now efficiently order parts, widen selections, compete with box stores and deliver and install parts locally. Access needs to be widely distributed so that this new service can reach into every home and to every customer.

Next Steps: High-speed Internet

We recommend that the MCEDA take the following steps:

- Identify grant writers to help in grant application processes (particularly Stimulus) - identify staff, advisory committee members or other community member to help write grant applications.
- Apply for Stimulus Funding - Use reports and data gathered to apply for Federal Stimulus funding.
- Update maps as appropriate - Bill Clark has possession of paper versions of data maps. Update with new provider information and planned expansions.
- Conduct political calls and visits
 - Organize constituencies in demographic and physical areas
 - Get each constituent and political figure to write letters of support for USF and Stimulus projects
 - Write letters to key businesses and political figures

Maintain the wiremorgan.com website with new information and articles - the Website has been updated as of July 15th, 2009. Place further articles, news, data and reports on this site.

Conclusion

We have all worked together to improve our telecommunications infrastructure. More work needs to be done as we pursue options for persuading providers to expand coverage and explore government funding sources. As we complete the study, the

federal government has established broadband stimulus programs pursuant to the Recovery and Reinvestment Act. The program requirements are complex and make it difficult for rural counties such as Morgan to meet them. The failure to provide technical assistance to states and localities to make it possible for rural counties to qualify or provide requisite data is a fundamental flaw in the program. Nevertheless, we need to pursue this option and persuade federal and state agencies to work with the EDA and broadband providers to make the program work for rural America and counties such as ours.

Cell

Overview Cell/911:

Cell phone coverage quality in Morgan County is limited but improving. There are four major service providers located in the county: Verizon, U.S. Cellular, AT&T and Sprint. Our goal during this project was to determine how to provide service to 85% of Morgan County residents. The following information will detail the necessary steps to achieve this goal.

Through a combination of our survey and provider data, we determined the general service areas (see included maps). To get a more specific reading, we set out to drive the major roads in the county (maps in appendix) to map service coverage.

Process:

All in one car, our group of five people set out with four cell phones (one from each major carrier). As we drove, we monitored the number of service bars each phone displayed. If a phone had enough service to make a call, we considered the area served. Every few minutes we would test call each phone to make sure the service bars corresponded with the actual ability to get a call through. On the maps to be found in the appendices, red represents an un-served road and green represents a served road.

Expansion:

Most cell expansion is driven by road traffic counts. Some expansion is determined by a high population center. In either case, if there is not sufficient customer base, infrastructure is too costly to maintain. Since Morgan County has a rural population and relatively small customer base, we are reliant on traffic counts to produce results. Highways such as US 522 and route 9 East are well served because of the heavy traffic volume (and heavy driver phone usage); however many of our smaller roads, including Route 9 West do not show significant enough customer uptake to warrant carrier financed expansion. Service coverage to Route 9 West is a significant component of the strategic plan to cover 85% of the county. Without this expansion, over 40% of the county will not have service. Due to ever increasing urbanization, carriers will continue to upgrade service in eastern Morgan County. Due to economic demographics, Route 9 West does not show the same promise in the short term. Many cell service providers told us directly that they are not willing to develop networks on Route 9 West due to insufficient demand and traffic. However, U.S. Cellular indicated an interest in providing service to the area if funding were available through the Universal Service Fund (USF).

Our first strategy objective, then, is to approach the USF with our plans and work to build private sector and government support. High priority coverage sites in the county have been determined and we can now apply and seek to be put on the USF priority list.

To become a priority project, the State government and Public Service Commission needs to hear from our local government leaders and citizens. The EDA must organize high priority areas of demand into a coalition of support.

It is our hope that population density and traffic patterns should not be the sole determining factors in communications expansion. As emergency services modernize, requirements for improved communications equipment, service and devices will be paramount. Similarly, businesses rely upon this infrastructure and lack of modern telecommunications will be seen as a huge barrier to entry. Cell phone service can no longer be considered a voice only service. Device integration and converging technologies now allow smart phones to access the Internet. Governments, emergency services, businesses and citizens will increasingly rely upon this infrastructure.

Cell Barriers

No dropped calls rule:

Cell phone companies do not like to set up service 'island' sites. An island is a service area that does not connect to the rest of a provider's network. Between an island and the main network, there must be service or a carrier is considered inferior by its users. Minimization of dropped calls is a principal test of a carrier worth and capability. Therefore, while some areas may have traffic or population in quantities that support coverage, they will not get coverage if the surrounding areas are too remote. For this reason, the Town of Paw Paw has no cell coverage because there are no cell towers between Paw Paw and Berkeley Springs. In order to wire remote 'outposts' it requires the network to build a service area to the outpost or island. Costs for doing this outweigh benefits for providers in remote or low population areas. Federal, state, or county investments in cell towers are necessary to encourage cell infrastructure investments in sparsely populated or low-traffic areas such as Route 9 West.

Terrain:

Similar to wireless broadband, cell phone coverage does not proliferate well in hilly terrain. Certain cell frequencies are better at reaching such areas and some are

better at penetrating through trees and buildings. Due to technological improvements however, cell towers must be in reasonably close proximity to handle complicated hand-offs between towers particularly in the case of high-speed data transfers.

Cell Requirements:

Our cell phone coverage goal is to provide service to 85% of Morgan County residents. This requires cell tower construction at a cost of between \$250K and \$500K per tower and the partnership of a cell service provider to locate equipment on each tower:

Continuous towers from Panorama to Paw Paw:

Approximate site coordinates (7 towers, 8th optional):

- 1) 39°36'52.85"N, 78°15'47.17"W (Panorama Site)
- 2) 39°35'45.94"N, 78°18'28.73"W (Tonoloway Ridge)
- 3) 39°33'28.73"N, 78°20'52.78"W (Dividing Ridge)
- 4) 39°31'29.22"N, 78°21'28.11"W (Fisher's Bridge)
- 5) 39°28'58.94"N, 78°22'26.97"W (Largent)
- 6) 39°30'27.71"N, 78°24'37.78"W (Sideling Hill)
- 7) 39°31'23.75"N, 78°26'29.58"W (Paw Paw)
- 8) 39°33'04.67"N, 78°23'54.82"W (Valley High Timber Farms)

South East Morgan County lower areas (Two to Three towers):

- 1) 39°29'32.57"N, 78°13'13.74"W (Winchester Grade Rd. near Oakdale Rd.)
- 2) 39°33'54.58"N, 78°14'00.83"W (Near Smith Crossroads)
- 3) TBA

North East Morgan County/Cherry Run (One tower):

- 1) 39°37'32.35"N, 78°05'51.50"W (Near Rt. 9 E and Short Mt. Rd.)

This approximate arrangement of technology and budget would accomplish a cell phone service area in line with our goals.

Cell Strategies/Next Steps:

- 1) USF - U.S. Cellular partnership
 - a. Define which projects in Morgan County are on USF list
 - b. Determine eligibility for list
 - c. Identify all need areas, locations, technology and engineering specifics
 - d. Using this needs assessment, apply to USF for necessary projects
 - e. Lobby to move projects up list
 - f. Organize constituencies to write letters, etc.
- 2) Determine partnership agreement with Skyweb, U.S. Cellular, USF, Stimulus and other state or federal grants.
 - a. The strategy to pursue cell phone coverage on Route 9 West to Paw Paw is a costly venture. This project will take four to seven towers and at minimum, \$3.5 million of up front installation funding plus a continuing service funding requirement. Partnership is paramount! Due to low demand, no one company or government will jump at the chance to serve this area. Therefore, we need a combination strategy to serve the area.
 - b. Skyweb, Visual Link and all land line high-speed providers are eligible to receive Stimulus funding. Approach them to partner for co-location on towers along Route 9 West. Their tower will be able to support cell phone co-location later and can provide a necessary infrastructure piece.
 - c. Exploring the possibility of USF funding as previously mentioned is also suggested. Co-location agreements and new funding will help us develop sufficient cell towers to cover this route.
 - d. After determining the previous three sources, Morgan County may still need some funding to complete the service link to Paw Paw. As part of the plan, the EDA should persuade federal officials to provide additional funding to complete the goal.
- 3) Work to Persuade Verizon Wireless to turn on 2010 sites early

- a. Verizon has planned, but not committed to turn on as many as six cell sites in Morgan County. While we have identified general expansion plans, we have not persuaded Verizon Wireless (separate from Verizon) successfully to speed deployment because the economic case has not been established yet. The county can work to persuade Verizon Wireless or other carriers that expansion is in the public interest or can be achieved through a combination of private and public investments.

4) Promote Sprint Airave

While we do not make a point of promoting any specific product, we feel that the new technology offered by Sprint and similar offerings by other carriers in the future is an exception. The "Airave" allows users who have 'naked' broadband (meaning carriers allow for product usage), to hook up a box to their broadband line which converts a broadband signal to cell phone signal and covers an approximate 5000 square foot area. Many of our survey respondents wanted better in-home cell phone coverage and this type of device is a perfect way to increase signal in isolated or remote areas. It is particularly useful in areas with broadband service but no cell phone service such as along Route 9 West. Residents should contact their cell providers to explore the availability of this technology in their underserved cell areas.

5) Organize Route 9 and Cacapon constituencies.

- a. Write letters
- b. Attract political support

For further information regarding this report, please feel free to contact:

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Appendix: Overview of Dial-Up and Need to Migrate to Broadband

Dial up technology is widely used in Morgan County. Our goal is to help interested businesses and citizens in migrating from dial-up to high-speed Internet. This will provide them access to many more applications.

Benefit: Provides very low cost access to the Internet.

Drawbacks: Extremely slow speeds. Does not support many applications. Designates that a phone line in use (cannot make phone calls).

Overview Broadband Internet (high-speed):

Benefits: (generally speaking) fastest and most reliable connection to the Internet at the lowest price, low visible impact.

Drawbacks: Infrastructure cost is high making it expensive to install in many areas.

Broadband Internet is defined in many ways. The term generally denotes data transmission speeds of over 56K (a dial-up modem speed), 256K (generally agreed upon minimum broadband speed) or over 1 Mbps (becoming the new general standard for a broadband service area). Our task force believes that the minimum speed should support VOIP (Voice over Internet Protocol) functionality which generally translates to a consistent 512K up/down rate. It is because of this definition that we do not believe that satellite Internet service should be included in our service definition (other reasons will follow in the satellite section). Therefore, when we speak of Broadband, high-speed Internet, we are defining it as either a Wi-Fi or DSL, Cable, Fiber, or Copper constant connection signal transmitting at least 512K.

Overview Wireless (Wi-Fi):

Benefits: Cheaper infrastructure cost to provider, easy to cover large sections of remote areas, reasonably low visible impact, easier/cheaper to upgrade technology.

Drawbacks: High upfront cost to consumer, currently a max speed of 1.5 Mbps (slower than Broadband wire offerings), unreliable in bad weather.

As defined ³,

Wi-Fi is a trademark of the Wi-Fi Alliance for certified products based on the [IEEE 802.11](#) standards (also called [Wireless LAN](#) (WLAN) and Wi-Fi). This certification warrants interoperability between different wireless devices.

³ <http://en.wikipedia.org/wiki/WiFi>

The term Wi-Fi often is used by the public as a synonym for wireless Internet (WLAN); but not every wireless Internet product has a Wi-Fi certification, which may be because of certification costs that must be paid for each certified device type.

Wi-Fi is supported by most personal computer operating systems, many game consoles, laptops, smartphones, printers, and other peripherals.

Why Wireless Internet?

Wireless networks have been designed to eliminate the bottlenecks found in other broadband services. Surveys indicate that over 90% of Internet usage is web browsing, e-mail, newsgroups and chat. Our network delivers these most-used Internet services at speeds of up to 1.5Mbps.⁴

Mbps - Mbps stands for millions of bits per second or megabits per second and is a measure of [bandwidth](#) (the total information flow over a given time) on a telecommunications medium. Depending on the medium and the transmission method, bandwidth is also sometimes measured in the Kbps (thousands of bits or kilobits per second) range or the Gbps (billions of bits or gigabits per second) range.⁵

Wireless Internet Access uses high-frequency radio technology to transmit and receive data to and from your home or business. There's no telephone line and no dialing; you're always connected. A small antenna/radio transceiver is mounted on your home or office building which establishes the connection with our broadcast location. Because the radios require a clear line of site between the transmitting and receiving antennas, the antenna/radio transceiver is typically mounted either on the roof or chimney or, if one exists, on an existing television antenna mast. In addition, in the interest of ensuring that broadband Internet access is made available to the masses, the Federal Communications Commission (FCC) has passed a ruling which allows wireless Internet access antennas to be installed even in areas where homeowners association's rules prevent other types of antennas. A copy of the FCC document detailing this ruling is available at <http://www.fcc.gov/mb/facts/otard.html>.

Overview Broadband (high-speed):

Broadband Internet access, often shortened to just [broadband](#), is high data rate Internet access—typically contrasted with dial-up access over a 56k modem.

Dial-up modems are limited to a [bitrate](#) of less than 56 kbit/s ([kilobits](#) per second) and require the full use of a telephone line—whereas broadband technologies supply more than double this rate and generally without disrupting telephone use.

⁴ <http://www.skywebinc.net/whywireless.htm>

⁵ http://searchnetworking.techtarget.com/sDefinition/0,,sid7_gci212534,00.html

Although various minimum bandwidths have been used in definitions of broadband, ranging up from 64 kbit/s up to 1.0 Mbit/s, the 2006 [OECD](#) report is typical by defining broadband as having download data transfer rates equal to or faster than 256 kbit/s, while the United States [FCC](#), as of 2008, defines broadband as anything above 768 kbit/s. The trend is to raise the threshold of the broadband definition as the marketplace rolls out faster services.

Data rates are defined in terms of maximum download because several common consumer broadband technologies such as [ADSL](#) are "asymmetric"—supporting much slower maximum upload data rate than download.

"Broadband penetration" is now treated as a key economic indicator.⁶

Overview Satellite:

As mentioned previously we do not consider satellite high-speed broadband Internet service. Satellite is currently used by many Morgan County residents. The satellite providers listed below provide quality service that many customers are happy with. Depending on location, line of sight, terrain, etc., satellite may be the only Internet or television option available to certain residents. While we appreciate the service being provided, satellite has many drawbacks. Constant connection (required for VOIP) is not guaranteed as weather greatly affects connections. While it is arguable that Wi-Fi has similar problems, Wi-Fi broadcasts a faster (1.5 Mbps), more robust signal, and has equipment/infrastructure which can be reached and repaired in a small amount of time.

The second major drawback for satellite service is cost. Many of these services charge cost much more than do wired and Wi-Fi broadband systems. This cost is prohibitive for many residents. People with clear line of sight to the southern sky and enough money already have the ability to purchase satellite service. If no line of sight or funding source exists on a property, the property will never be able to receive service. Therefore, no amount of planning or fundraising by the Task Force would produce a better result than what already exists. It should also be noted that the federal legislation on broadband deployment does not count the availability of satellite service as broadband service. Therefore, areas receiving satellite service are considered unserved and can apply for funding.

⁶ <http://en.wikipedia.org/wiki/Broadband>

Appendix: Morgan County Telecommunications Survey

By filling out this survey, you are identifying that you would like high-speed Internet service, cell phone service, or both. The Morgan County Economic Development Authority will collect all responses and work with service providers, and local and state government officials to show areas with high demand, which will bring better service to Morgan County.

Please fill out this survey and drop it off at a drop box at the Morgan County Commission Office or The Morgan Messenger. The survey can also be mailed to: P.O. Box 1136, Berkeley Springs, WV, 25411, or filled out online at <http://www.wiremorgan.com>. The information will only be used for survey and verification purposes only.

Thank you for your help! Jerry Berman and Ken Dabkowski, EDA Task Force

Questions (please check, or fill in blanks):

(Required) Landline phone number: Home: _____ Work: _____

(Required) Address: _____

(Optional) Email Address: _____

Do you have a cell phone? Yes ___ No ___ Who is your cell provider? _____

If you do not get cell service, would you purchase it if available? Yes ___ No ___

Where do you get good cell phone service in Morgan County (522, Route 9, home, work, etc.)

Where would you like better service in Morgan County (Route 522, Route 9, home, work, etc.)

Is high speed internet service available in your area? (Yes ___ No ___) If yes, through what sources? _____

Do you subscribe to Internet service today at home (Yes ___ No ___) or at work (Yes ___ No ___)?
If yes, what kind of service?

- Dialup Home ___ Work ___ Both ___
- DSL through a telephone provider Home ___ Work ___ Both ___
- Cable modem service through a cable TV provider Home ___ Work ___ Both ___
- Satellite-based broadband Home ___ Work ___ Both ___
- Wireless broadband, wireless telephone provider Home ___ Work ___ Both ___
- Wireless broadband through a WiFi provider Home ___ Work ___ Both ___

My ISP/provider company is: Home: _____ Work: _____

If broadband is available where you live but you choose not to subscribe, why not? (check all that apply)

Cost ___ Have no need for it ___ Unfamiliar with the technology ___

What do you pay for your current Internet service? \$ _____/month

If you do not get broadband, do you want it? Yes ___ No ___

Would you be willing to pay more for it? Yes ___ No ___

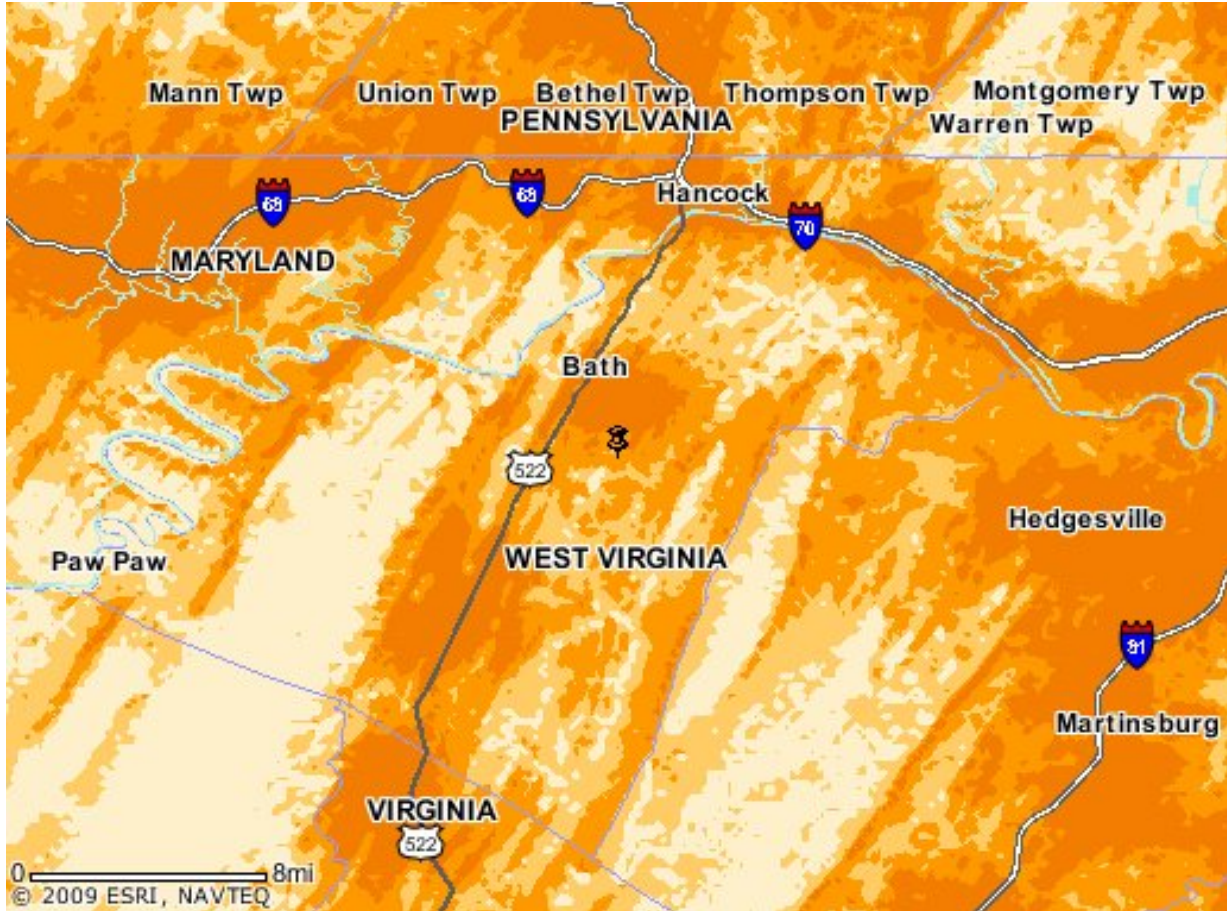
Is your computer equipped for broadband service? Yes ___ No ___ Don't know ___ Will upgrade ___

Would you pursue online schooling if broadband were available to you? Yes ___ No ___

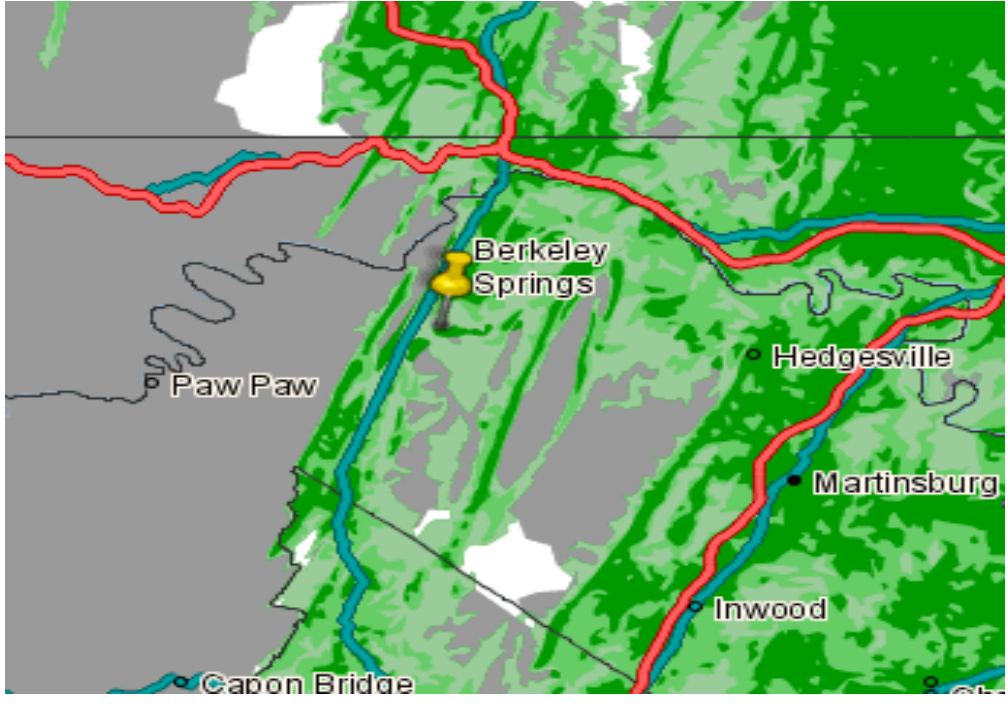
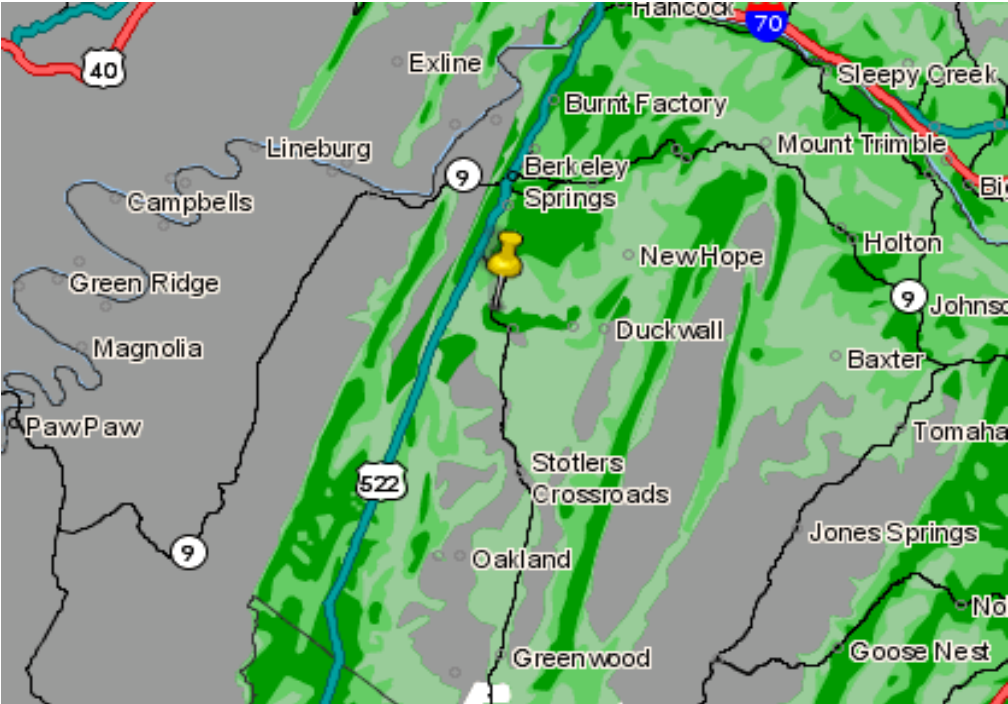
Would you work from home if high speed Internet were available to you? Yes ___ No ___

Maps

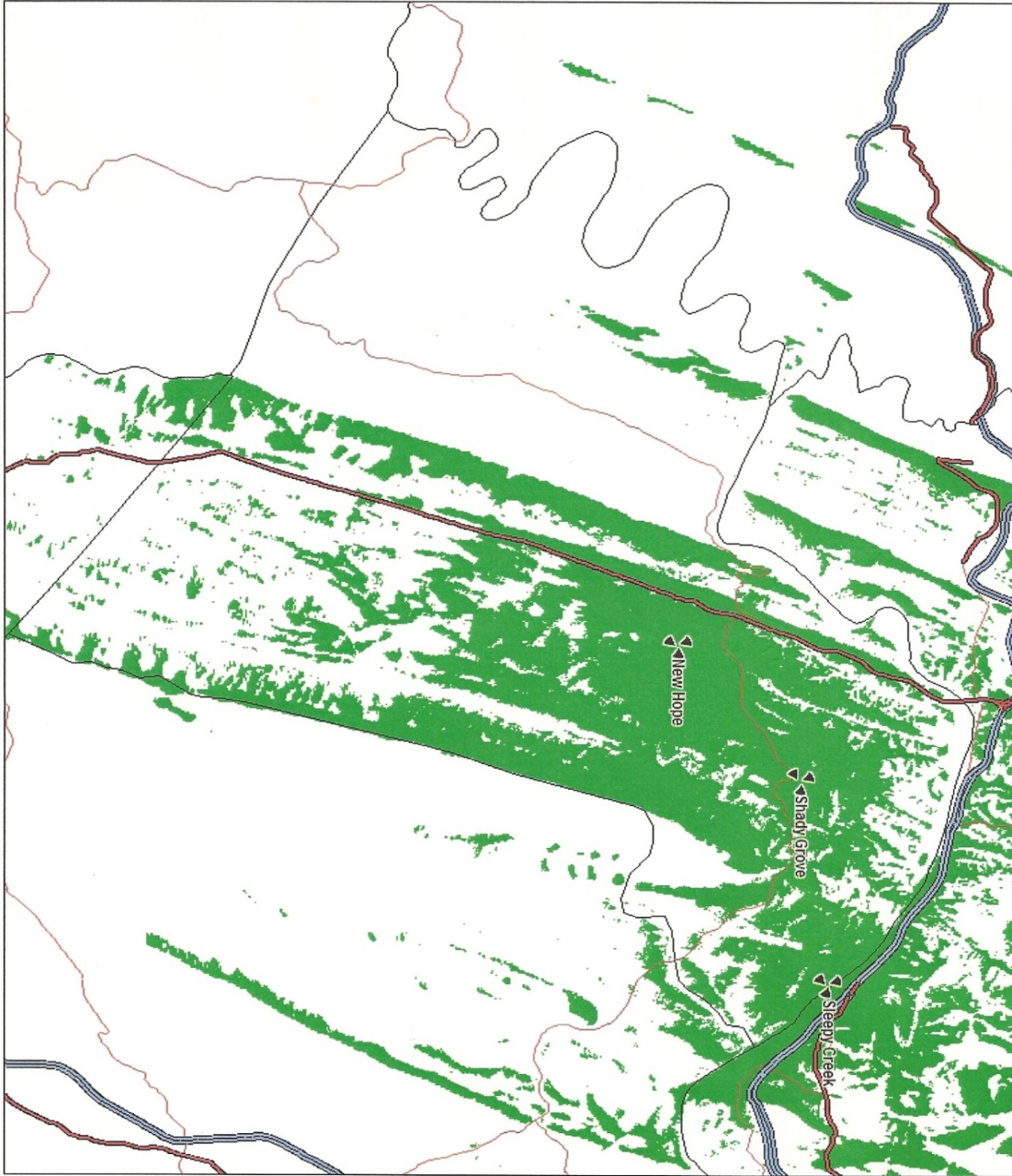
Map1: Current Cell Phone AT&T Provider Map



Map 2: Current Cell Phone Sprint Provider Map



Map 3: Current Cell Phone U.S. Cellular Provider Map



Morgan County coverage and existing sites

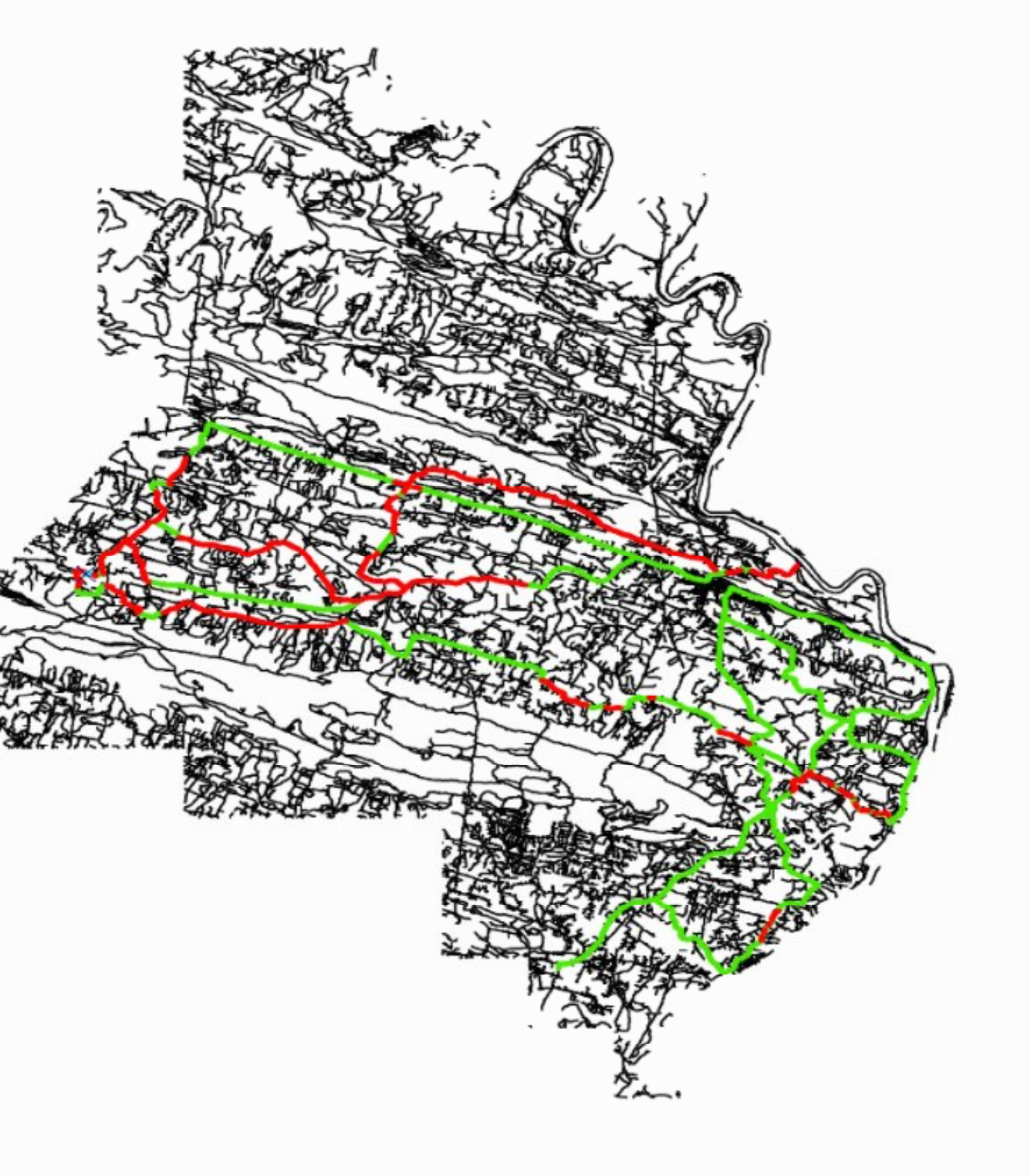
Map 4: Current Cell Phone Verizon Provider Map



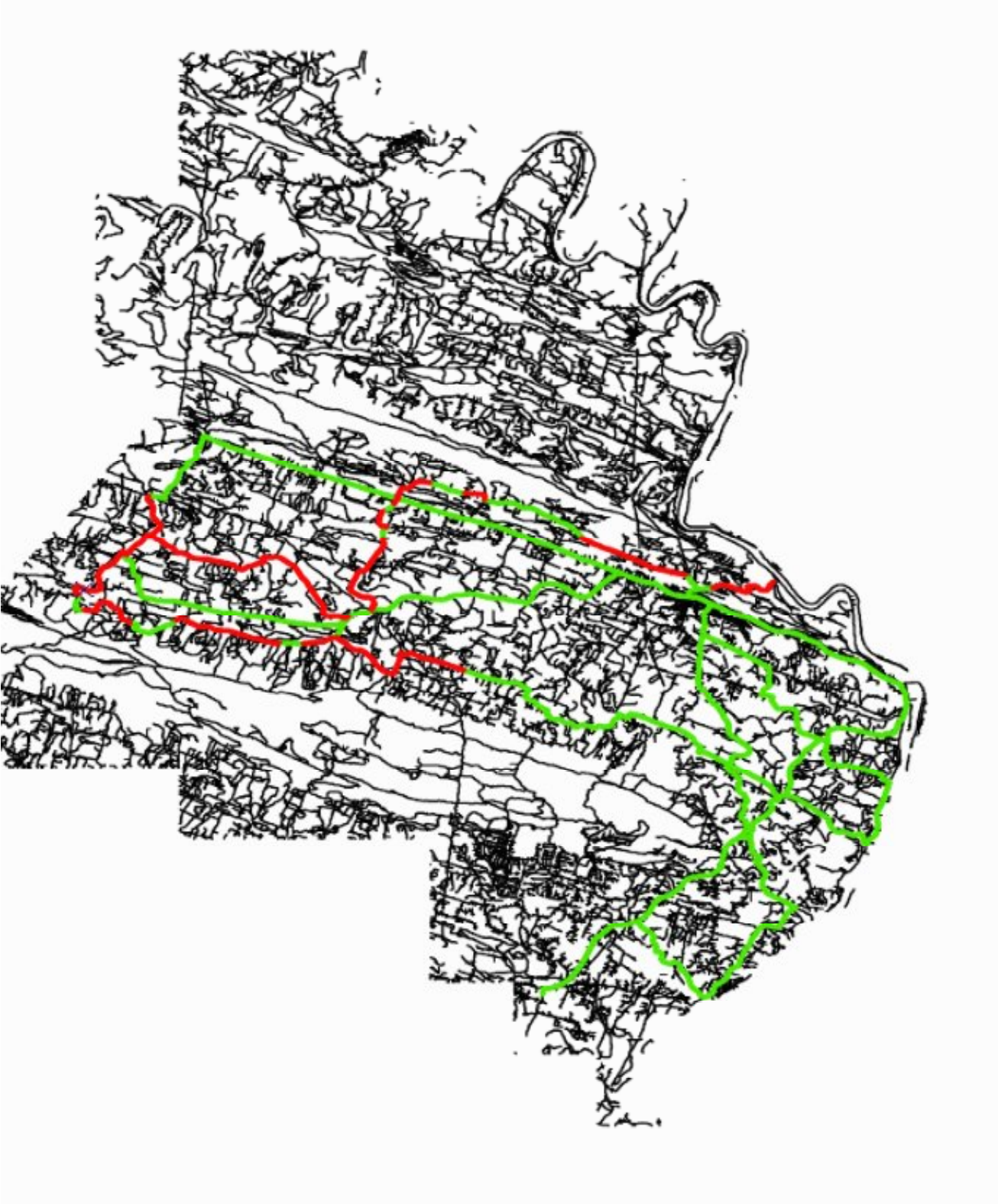
Map 5: Current Cell Phone AT&T Provider Map



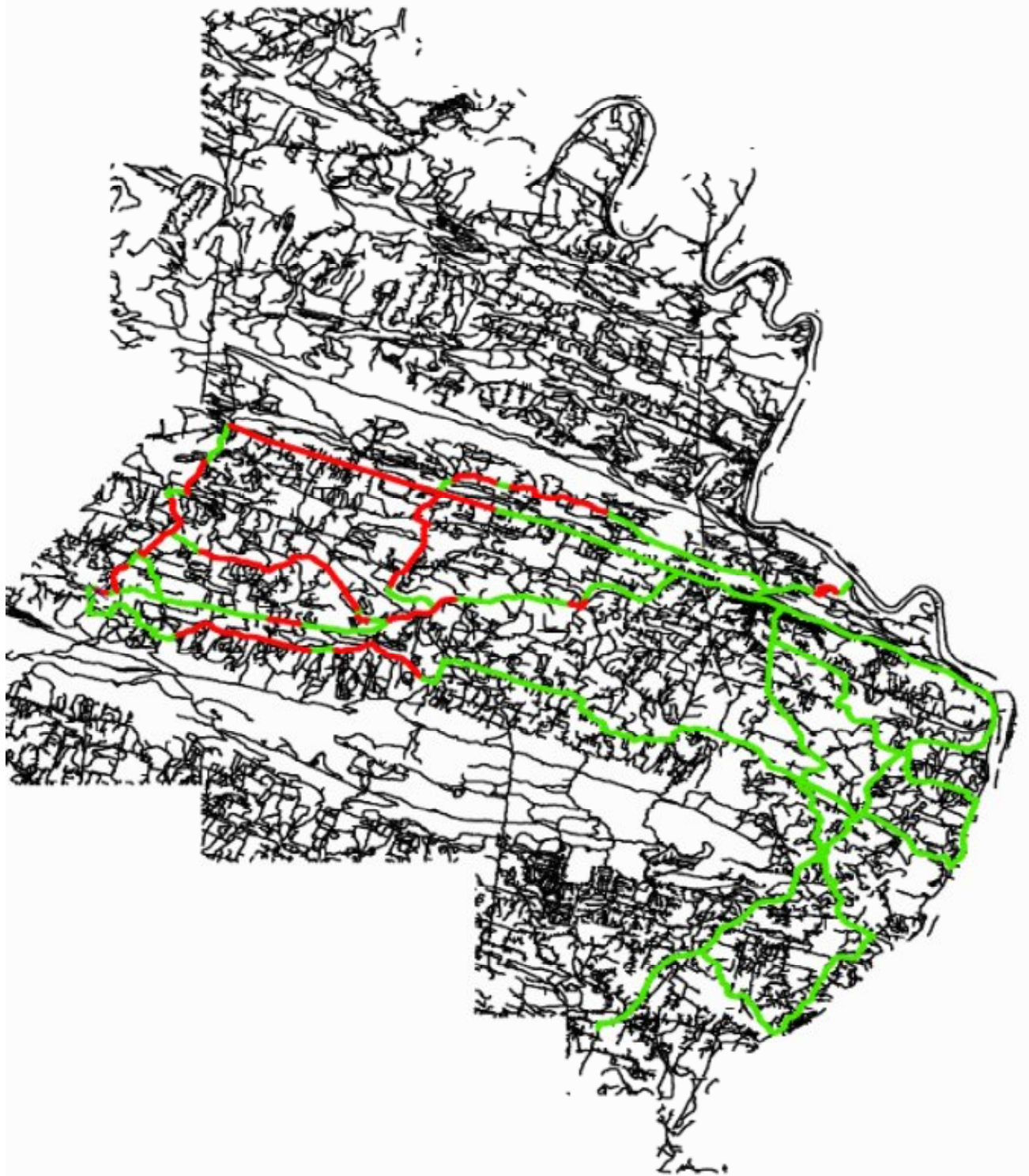
Map 6: Current Cell Phone Sprint Provider Map



Map 7: Current Cell Phone U.S. Cellular Provider Map



Map 8: Current Cell Phone Verizon Provider Map



Map 9: Current high-speed Internet Coverage

(Black/Blue – DSL/Cable, Pink – Wi-Fi)



Map 10: Current high-speed Demand (Black - Dial up, Blue - Satellite, Pink - no service)



Verizon to Expand Fast, Affordable High Speed Internet Service in Morgan County, W. Va.

Company to Equip 10 Facilities in County With DSL Technology Over the Coming Months, Bringing Broadband Access to More Than 1,800 Additional Lines

News Release [ShareThis](#)

BERKELEY SPRINGS, W. Va. - July 1, 2009 -

More consumers and businesses in Morgan County will have access to Verizon High Speed Internet in the coming months, as the company installs digital subscriber line (DSL) technology in 10 facilities in the county.

Verizon, which currently offers High Speed Internet (HSI) service in Berkeley Springs and surrounding areas, expects to expand HSI availability by the end of the year to more than 1,800 additional lines in parts of the following areas: Route 522, near the Morgan County Business Park; Route 9 East in the River Road and Clone Run Road areas; the Johnsons Mill Road area that includes parts of Highland Ridge, Duckwall, Spriggs and Rupenthal roads; Great Cacapon, including the Maidstone and Cacapon River Meadows communities; Spruce Pine Hollow area, including Chestnut Grove and Spruce Pine Hollow communities, plus parts of Burnt Mill, Potter, Michael's Chapel and Victory Lane roads; the River Road area, including Sleepy Creek Farms community and parts of Rover, Householder, Crone Lane and Poole roads; parts of Pious Ridge, Culp and River roads; Mountain Run Road area, including New Hope Acres and Deer Run Woods communities, and parts of Mountain Run, Shades Lane, Swaim Lane and Duckwall roads; Winchester Grade Road in the area of Sleepy Creek Forest community and parts of Virginia Line, Highland Ridge, Posey Hollow and Barnes Lane roads; and Spohrs Cross Road area, including areas along Route 9 and parts of Spohrs and Potomac roads.

Verizon High Speed Internet service is delivered on a dedicated line from Verizon's central switching office to the customer's home or business and is backed by live, 24 x 7 customer service and technical support. The service typically is available to residents and businesses that are located within approximately three miles of the company's central switching offices or remote facilities.

"Verizon is enabling more residents and businesses across West Virginia to make the high-speed connections that are important to them," said B. Keith Fulton, president of Verizon West Virginia. "Our added investment in Morgan County will offer many more customers access to affordable High Speed Internet service, backed by the reliability and security of Verizon's network."

Bill Clark, director of the Morgan County Economic Development Authority (EDA) and Morgan County administrator, said, "Verizon is a vital component in bringing high-

speed Internet service to rural West Virginia. We appreciate the company's willingness to invest in upgrades and improvements to bring this vital infrastructure to more unserved areas of our county."

Jerry Berman, founder and chair of the board of the Center for Democracy and Technology and head of the Morgan County EDA's Telecommunications Task Force Advisory Committee, said, "Verizon informed us early in the year of its plans to expand High Speed Internet service in Morgan County in 2009. When our extensive resident survey showed even greater demand, Verizon added more sites. We are pleased that the survey made a difference and applaud Verizon for moving forward in this way."

Verizon's entry-level High Speed Internet service offers speeds of up to 1 Mbps (megabits per second) downstream and 384 Kbps (kilobits per second) upstream. Consumers who want faster speed can order Verizon's offering of up to 3 Mbps downstream and 768 Kbps upstream. The up-to-3 Mbps service delivers download speeds 50 times faster than dial-up. The company also offers an up-to-7.1 Mbps service in parts of its service area.

Verizon High Speed Internet subscribers have access to an extensive collection of features and services, including online protection with Verizon Internet Security Suite; Verizon Enhanced Email; Verizon Premium Tech Support; online gaming; free news from ABC News Now; free sports from ESPN360; and more.

Residential consumers can call 1-800-483-4000 or visit <http://www22.verizon.com/residential/highspeedinternet/> to check their eligibility or to find information about the latest promotional offers.

Verizon High Speed Internet for Business packages offer a choice of speeds, static IP addresses, remote dial-up access, networking and domain name e-mails. Area businesses can get more information about service availability and pricing by calling 888-649-9500 or visiting <http://smallbusiness.verizon.com>.

Verizon Communications Inc. (NYSE:VZ), headquartered in New York, is a global leader in delivering broadband and other wireless and wireline communications services to mass market, business, government and wholesale customers. Verizon Wireless operates America's most reliable wireless network, serving more than 86 million customers nationwide. Verizon's Wireline operations provide converged communications, information and entertainment services over the nation's most advanced fiber-optic network. Wireline also includes Verizon Business, which delivers innovative and seamless business solutions to customers around the world. A Dow 30 company, Verizon employs a diverse workforce of more than 237,000 and last year generated consolidated operating revenues of more than \$97 billion. For more information, visit www.verizon.com.

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Hughesnet
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West Virginia State Secretary of Commerce, Kelley Goes

WV Chief Technology Officer, Kyle Schaffer

Chair of Internet Caucus, Honorable Rick Boucher D-VA

NTIA - Tom Kalil

USDA - Richard Jenkins

Department of Energy Planning - Jimmy Jinetto

Senator Rockefeller staff

Senator Leahy staff

Cell Phone Coverage Statistics from Survey

Provider Statistics:

AT&T 26%

US Cellular 24%

Verizon 22%

Sprint 17%

TracPhone 7%

TMobile 3%

Cellular One, Net10, Alltel, Trumpetphone or nTelos 1%

ISP's Count and Popularity

Through our survey instrument, we have determined that AT LEAST this many ISP's are operating in the county. Numbers represent actual survey respondents only and is not representative of actual uptake numbers.

78 Verizon

32 Earthlink

31 AOL

30 Frontier

26 Skyweb

22 Hughesnet

20 Wild Blue

8 People PC

6 AT&T

4 MSN

4 Pennswoods

4 Localnet

3 Comcast

3 Citynet

2 Netzero

2 Sprint

2 Juno

1 (each) Fibernet, ISP.com, Powernet Global Communications, mykcwireless, Lighghost.com, Dedicated.net, Starband, Dish, Crosslink, Spacenet, Primarynet, Citynet