



**2009**  
**Broadband Assessment Study**

**Campbell County**  
**Departments of Economic Development and**  
**Information Technology**

**June 2009**

## **Introduction**

Broadband connectivity is now recognized as a necessary infrastructure just as important and essential as electricity, water, and sewer.

One of the priority and initiatives approved by the Campbell County Board of Supervisors for fiscal year 2009 was a broadband assessment to be done by the Departments of Economic Development and Information Technology. The assessment, using research obtained during the evaluation of the Brookneal 501 Corridor Wireless Internet Broadband Internet system, will provide the breadth and depth of broadband service in the County, the providers involved, and the prices and service packages available. In addition to the 501 Corridor Wireless study. The Region 2000 Local Government Council conducted a Broadband study of the Region 2000 jurisdictions. Results of that study relating to Campbell County are incorporated in this report.

This report contains information on Broadband including the types of service available in Campbell County, a list of providers, coverage areas, and service plan pricing.

## **Executive Summary**

Broadband, sometimes referred to as a high-speed internet, is an always on fast connection to the internet that offers speeds up to ten times faster than dial-up. There are a wide variety of broadband technologies available in most areas; two of the more commonly found and used are cable and DSL broadband.

The term broadband is synonymous with high-speed internet generally greater than 200 kilobits per second (kbps), significantly higher speeds than can be reached on dial-up modems. Broadband speeds vary significantly, depending on the type, and level, of service ordered.

Broadband is critical for communities to attract new development and businesses, and for supporting the growth of existing business with appropriate technology infrastructure. It is quickly becoming considered a utility, the same as electricity and telephone service. The leadership of Campbell County recognizes the potential of broadband to serve as a transformative technology to ensure that the community is economically well-positioned and socially well-served into the future. Viewed as an economic and community development tool, broadband has the evolving and ever-increasing capacity to transmit voice, data and video communications in ways that can favorably, and often profoundly, change lives. It is not broadband in and of itself that is transformative, but rather the applications enabled by broadband technology that can exert an increasingly positive influence in the community.

There are many broadband service providers serving Campbell County. The purpose of this assessment was to document the current state of broadband service across Campbell County and provide the breath and depth of broadband services, service providers involved, cost information and service packages available.

The benefit of the completed assessment to Campbell County is the resource it serves in providing existing technology infrastructure information needed to develop an implementation strategy for underserved areas.

Special thanks to Campbell County Geographical Information Systems staff for obtaining and providing cell tower locations and to the Information Technology staff for creating the brochure and subsite on the county website.

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## **Broadband Assessment**

Broadband is presently available in one form or another to large portions of the county. Traditional sources of broadband, including DSL, cable, and wireless, are concentrated in major population centers and along major highways throughout the county. Newer and less conventional sources of broadband, including cellular and satellite, are widely available throughout areas of the county where more traditional technologies are not available. Despite broad coverage areas, sections of southern and eastern Campbell County still lack reliable broadband coverage. Coverage is also spotty in western and central parts of the county as well.

Many citizens of Campbell County are unaware of the types of broadband and coverage areas that are available. In many cases, while a citizen cannot access DSL or cable, they are able to access cellular or wireless Internet. Cost of service plans is a major inhibitor in getting broadband into additional homes and businesses throughout the county. While DSL and cable generally cost from \$20-\$40 per month, cellular and satellite can easily cost more than \$60 per month; many citizens are not willing to pay these higher prices for broadband connectivity.

## **Types of Broadband Service**

Eight different types of broadband technology are presently available in the United States. Please note that not all eight technologies are accessible to every resident of Campbell County.

- **BPL:** Broadband-over-Powerline is an emerging technology that distributes broadband over existing low and medium voltage electric power distribution networks. BPL has tremendous potential to expand broadband coverage in rural areas due to the extensive existing electrical grid. Transmission speeds tend to be less than cable or DSL, but the technology is constantly improving and faster speeds are anticipated in the future. BPL does not presently exist in Campbell County.
- **Cable:** This is a form of high speed Internet that utilizes coaxial cable networks already established by cable operators. Users of this service must connect their computer to a cable modem, obtained from a cable provider, in order to access the Internet. Users may watch television without interruption while accessing the Internet. Transmission speeds may vary depending on the service plan, traffic load, and type of cable modem and network are available. It can provide speeds of around 1.5 Mbps or greater.
- **DSL/HSI:** Digital Subscriber Line (High Speed Internet) allows Internet signals to be transported over already established copper telephone lines at speeds significantly faster than dial-up. The availability and speed depends on the distance of the structure from a telephone company facility (typically 18,000 feet). DSL allows you to simultaneously talk on the telephone while utilizing the Internet whereas dial-up only allows for use of one feature at a time. Transmission speeds run from several hundred Kbps to several Mbps.

- **Fiber:** Fiber optic technology transmits data, converted into light electrical signals, through flexible glass fibers about the diameter of a human hair. Coverage of fiber is presently limited due to costs associated with laying and splicing the fibers; oftentimes it is only available to businesses with need for high transmission speeds. Fiber provides the fastest Internet, with speeds ranging upwards into the gigabits per second (gpbs) range. Distance from the fiber and how service is configured affect transmission speeds.
- **Satellite:** This is a form of wireless Internet, beamed from satellites orbiting the Earth, which is ideal for remote and sparsely populated regions; a user needs only a clear view of the southern sky to access the signal. Transmission speeds can be affected due to positioning of the signal receiver, unfavorable weather conditions (ice, rain), and the service package purchased. Speeds tend to be lower than other forms of broadband, reaching up to 1 Mbps; however, this is significantly faster than dial-up Internet.
- **Wireless:** Wireless Internet is broadcast using radio signals from antenna using long-range directional equipment. This form of technology is ideal for remote or sparsely populated areas where other forms of broadband are too costly to provide. Transmission speeds are similar to DSL; however, the closer one is to a transmission tower the faster the speed. Line of sight is required to access wireless Internet; terrain, structures, and dense woodlands can block the signals.
- **Wi-MAXX:** Similar to wireless Internet, Wi-MAXX (Worldwide Interoperability for Microwave Access) operates on a licensed spectrum. While its broadcast range from a tower is more limited than traditional wireless, it is at a much higher frequency and is able to provide faster transmission speeds. Distribution of Wi-MAXX coverage is limited but is an evolving technology that is being closely monitored by rural communities across the nation as a "last mile" bridge. This technology is not presently available in Campbell County.
- **3G/EVDO/Cellular Wireless:** Another evolving technology, cellular wireless is broadcast from cellular towers and is provided by cell phone companies. A wireless card plugged into a computer is necessary to access this technology and a home or business must be located where it can receive a clear cellular signal. Transmission speeds tend to be lower than cable or DSL; however, many providers are either introducing or will soon introduce the fourth generation (4G) of cellular wireless.

\*Source: Federal Communications Commission, Broadband Facts (2008).

## **Broadband Providers**

Twelve broadband providers supply service to various parts of Campbell County. Including cellular companies, these providers are Alltel, Applewood, AT&T, B2X Online, Comcast, Embarq, GNS Solutions, Jet Broadband, nTelos, Pure, Sprint/Nextel, and Verizon. A variety of broadband technologies are provided by these companies, including cable, cellular, DSL, fiber, and wireless. Please note that Alltel has merged with Verizon; this will affect the number of

number of providers in the region yet coverage should remain the same or improve. For a detailed chart listing providers, available technologies, and communities served, please see page 18. In addition to the aforementioned providers and technologies, three companies (HughesNet, Starband, and WildBlue) offer satellite broadband to all areas of the county providing the home or business has a clear view of the southern sky.

### **Broadband Coverage Areas**

Approximately 80% of Campbell County is covered with at least one form of broadband Internet technology. More densely populated areas (Timberlake, Altavista, Rustburg, and Brookneal) have a variety of providers and technologies from which to choose. Rural southeastern Campbell County (areas between Altavista and Brookneal up to Red House) has few if any options for broadband service. The best options for broadband in this crescent area are cellular, which offers spotty coverage in some communities, and satellite. Please see the maps on pages 13 thru 17 for more detailed information on specific coverage areas within Campbell County. Additional coverage maps are available on the county's website.

### **Prices and Service Packages**

Most providers offer a variety of service packages for residential and business users. These monthly packages range in price depending on the transmission speeds, availability, and technology that is requested. DSL and wireless are typically the least expensive broadband technologies in the region, while satellite and fiber tend to be the most costly. Service plans can run from around \$20 to over \$150 per month depending on several factors, including bandwidth speeds, term of service, and whether it is for home or business use. In addition to a monthly fee, many providers charge additional set-up and/or equipment fees that can range from free up to \$900. Both monthly service plans and additional fees are higher in many cases for business users than for residents. Please see the charts on pages 23 and 24 for more information on pricing and service packages.

### **Mid-Atlantic Broadband**

Mid-Atlantic Broadband Cooperative was created in 2003 by local and regional leaders as a way to revitalize Virginia's tobacco producing localities. The goal was to create a telecommunications "highway" throughout Southside Virginia to improve economic development by creating opportunities for research/development and to enhance the region's broadband network. Initial funding was provided by grants from the U.S. Department of Commerce Economic Development Administration and the Virginia Tobacco Commission.

MBC has connected all 20 Southside communities, along with over 60 business and industrial parks, to the network (see map on page 12). Additionally, MBC has purchased fiber from Washington D.C. to Atlanta. In 2008, MBC dramatically upgraded the backbone capacity of the Southside Virginia Regional Backbone Network in order to more effectively handle the needs of

large telecommunications carriers and service providers which need new access to data centers in Southside.

In Campbell County, MBC operates fiber along the U.S. Highway 29 and 460 corridors. A point of presence (POP) node has been established at Lynchburg Regional Airport, and access points have been established at Dearing Ford Business and Industrial Park and at Seneca Commerce Park. A point of presence (POP) is defined as a physical location that provides access from one specific place to the rest of the Internet. An access point is a physical device that connects wireless devices to another network. Plans exist to run an extension of MBC to Brookneal and establish an access point in the community. The date and details of this expansion has yet to be determined. MBC is presently working to attain funding to establish additional "last mile" connections throughout its territory.

MBC is not responsible for providing direct broadband service to consumers and businesses. It has successfully worked as a backbone with a number of Internet service providers wishing to launch coverage in specific markets. MBC is able to provide broadband access to local providers at below-market rates, allowing providers to establish a profitable presence in rural and underserved areas.

### **Future Broadband Technologies**

Broadband has tremendously evolved in the past decade, and dramatic changes are anticipated over the coming decades. Major changes that are taking place include:

- **Fiber:** Fiber is presently available in select areas of the United States, and because of its unparalleled transmission speeds many Fiber providers are expanding their networks. Verizon, for example, plans to spend \$23 billion to run fiber past 18 million homes within its territory (Fortt). Fiber is significantly cheaper to run and maintain than when it was first introduced into the market. As costs continue to decrease providers are anticipated to continue expanding fiber networks throughout the nation.
- **LTE:** Long Term Evolution is a forth generation wireless technology that is in direct competition with Wi-MAXX. LTE is years behind Wi-MAXX in development, yet it is being supported by Verizon and AT&T, both of which hope to begin rolling out LTE on their networks sometime in late 2009.
- **Naked DSL:** Traditional DSL requires that a user purchase a landline telephone service in order to access DSL. With naked DSL it is possible to purchase DSL service without having to bundle it into a landline telephone service. Naked DSL may or may not be cheaper than traditional DSL/landline service depending on the provider. It is presently available in select markets within the United States, but it is anticipated to be expanded further.
- **Wi-MAXX:** This technology is presently available in select areas of the nation, the closest of which to Campbell County is the Town of Appomattox. Because it operates on

a licensed spectrum, acquiring a license has proven difficult in years past and has slowed the deployment of this technology. In addition, broadcast range from towers is much more limited than with traditional Wi-Fi. With televisions switching to digital, huge amounts of analog frequency will be freed potentially allowing Wi-MAXX to expand.

### **Vertical Assets Inventory**

A meeting in December 2008 kicked off a regional project mapping vertical assets in all localities within Region 2000. Localities and organizations taking part in this initiative include the counties of Amherst, Appomattox, Bedford, and Campbell, the cities of Bedford and Lynchburg, and Virginia Tech and Virginia's Region 2000 Partnership. The purpose of this project is to create a template for recording vertical assets within Region 2000 and to use the template as a model for replication by other communities across Virginia to facilitate public and private investment in affordable and reliable wireless broadband.

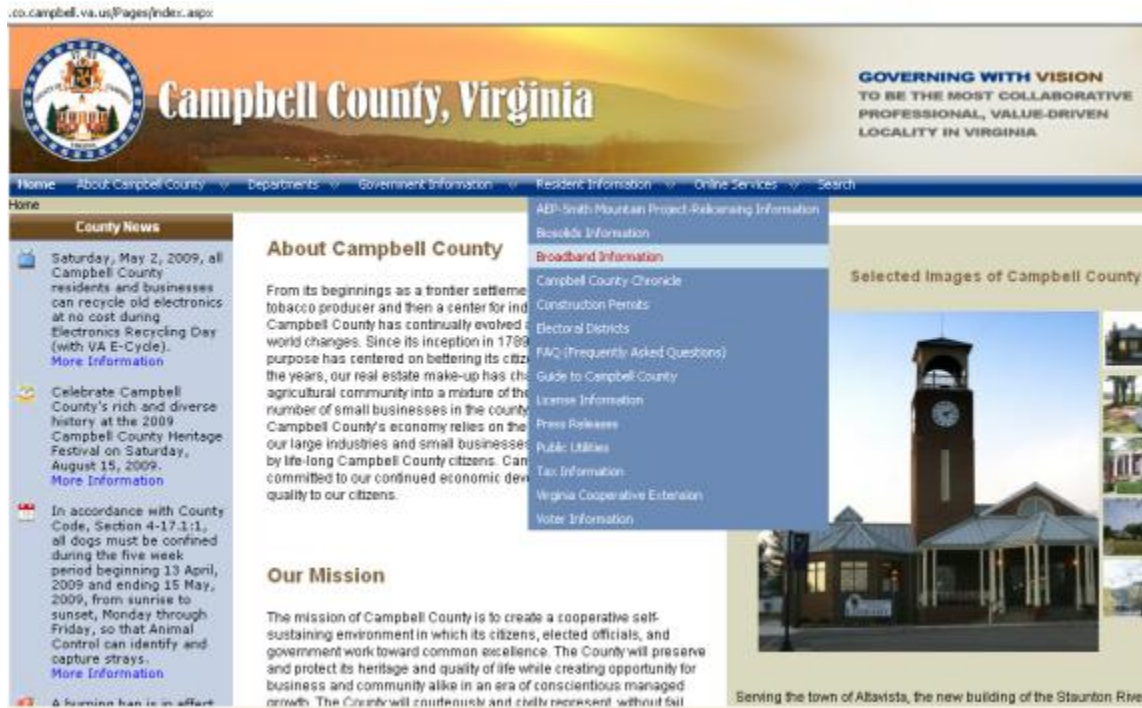
Vertical assets are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets, as identified by Virginia Tech, include structures such as cell towers, water tanks, grain silos, and multi-story buildings. Assets were to be placed online using a mapping tool powered by Google; an information form would then be created containing data input for each asset, such as height of structure, owner, and contact information. Consideration was not given to proximity of electric or existing broadband infrastructure; this was simply a way to map elevated structures and provide a database for providers to utilize.

Identifying and mapping elevated structures was conducted by utilizing sources such as Campbell County's GIS system and other in-house resources. Mapping for the initial phase of the project was completed in late March 2009. This database is open ended; localities are encouraged to continuously map assets as they are made available. No providers have yet taken advantage of this database; however, it provides a valuable tool for the participating localities to exploit while exploring potential broadband solutions.

## Campbell County Broadband Brochure & Web Sub-Site







In fall 2008, a brochure was created and a sub-site was created on the County's Web Site to make the citizens and businesses aware of the broadband assessment being performed. The following screen shots provide information available on the county web site:

### Link to Broadband Information on County Website Home Page







## Broadband Subsite Home Page

co.campbell.va.us/depts/it/broadband/Pages/index.aspx

<b>More Information</b>	<b>Campbell County Broadband Initiative</b>	
<a href="#">Broadband Home</a>	At the request of the Campbell County Board of Supervisors, County staff is conducting a countywide assessment to determine internet broadband availability.	
<a href="#">FAQ</a>	Broadband is critical for communities to attract new development and businesses and for supporting the growth of existing business. It is quickly becoming considered a utility, the same as electricity and phone service.	
<a href="#">Links</a>		
<a href="#">Maps</a>		
<a href="#">Service Providers</a>		
<b>Contact Us</b>	<b>Virginia's Region 2000 Broadband Infrastructure Study</b>	
<b>Broadband Initiative</b>	Virginia's Region 2000 Local Government Council updated the Broadband Infrastructure Study from 2004 to identify the region's broadband infrastructure and create a tool to show what broadband technologies are available in specific areas.	
 (434) 592-9595	For more information about Campbell County's involvement with the Region 2000 study, visit the <a href="#">Region 2000 study overview</a> .	
 <a href="#">Email</a>		
 P.O. Box 100 Rustburg VA 24588		
	<b>Brookneal 501 Corridor Wireless Broadband Internet System</b>	
	 During Fiscal Year 2008 (July 1, 2007 to June 30, 2008), one of Campbell County's Priority & Initiatives was to evaluate the Brookneal 501 Corridor Wireless Broadband Internet system's effectiveness and the potential to expand Wireless Broadband into the underserved areas of Campbell County.	
	 <a href="#">Download the study report</a> for more information about Campbell County's involvement with the Brookneal 501 Corridor Wireless Broadband Internet study.	

## Frequently Asked Questions Page

<b>More Information</b>	<b>Frequently Asked Questions</b>	
<a href="#">Broadband Home</a>	<b>What is Broadband?</b>	
<a href="#">FAQ</a>	Sometimes referred to as a high-speed internet, broadband is an 'always on' fast connection to the internet that offers speeds ten times faster than dial-up. There are a wide variety of broadband technologies available in most areas; two of the more commonly found and used are cable and DSL broadband.	
<a href="#">Links</a>	The term broadband is synonymous with 'high-speed internet' generally greater than 200 kilobits per second (Kbps), significantly higher speeds than can be reached on dial-up modems. Broadband speeds vary significantly, depending on the type, and level, of service ordered.	
<a href="#">Maps</a>	<b>Why is Broadband Important?</b>	
<a href="#">Service Providers</a>	Broadband is critical for communities to attract new development and businesses, and for supporting the growth of existing business. It is quickly becoming considered a utility, the same as electricity and telephone service. The leadership of Campbell County recognizes the potential of broadband to serve as a transformative technology to ensure that the community is economically well-positioned and socially well-served into the future. Viewed as an economic and community development tool, broadband has the evolving and ever-increasing capacity to transmit voice, data and video communications over time in ways that can favorably, and often profoundly, change lives. It is not broadband in and of itself that is transformative, but rather the applications enabled by broadband technology that can exert an increasingly positive influence over time in the community.	
<b>Contact Us</b>	<b>What Types of Broadband Are Available?</b>	
<b>Broadband Initiative</b>		
 (434) 592-9595		
 <a href="#">Email</a>		
 P.O. Box 100 Rustburg VA 24588		

## Campbell County Broadband Initiative Links

<b>More Information</b>	<b>Campbell County Broadband Initiative Links</b>
<a href="#">Broadband Home</a>	
<a href="#">FAQ</a>	
<a href="#">Links</a>	
<a href="#">Maps</a>	
<a href="#">Service Providers</a>	
<b>Contact Us</b>	
<b>Broadband Initiative</b>	
 (434) 592-9595	
 <a href="#">Email</a>	
 P.O. Box 100 Rustburg VA 24588	
	<b>Documents &amp; Reports</b>
	<ul style="list-style-type: none"><li> <a href="#">2004 Region 2000 Broadband Infrastructure Study</a></li><li> <a href="#">2008 Region 2000 Broadband Infrastructure Study Update</a></li><li> <a href="#">2008 Region 2000 Broadband Infrastructure Study Supplement</a></li><li> <a href="#">Broomeal 501 Corridor Wireless Broadband Report</a></li></ul>
	<b>Information Resources</b>
	<ul style="list-style-type: none"><li><a href="#">Virginia Region 2000 Partnership</a></li><li><a href="#">Virginia Office of Telework Promotion and Broadband Assistance</a></li></ul>
<small>© Copyright 2001-2008 Campbell County, Virginia. <a href="#">Privacy Policy</a>.</small>	
<small><a href="#">Employee Site</a></small>	

## Provider Coverage Maps

<b>More Information</b>	<b>Provider Coverage Maps</b>
<a href="#">Broadband Home</a>	
<a href="#">FAQ</a>	
	Below are coverage maps that encompass Campbell County, as provided by the service provider.

## Broadband Providers in Campbell County

<b>More Information</b>	<b>Broadband Providers in Campbell County</b>
<a href="#">Broadband Home</a>	
<a href="#">FAQ</a>	
<a href="#">Links</a>	
	<p>Note: The below links are used to provide internet service contacts and take you to sites outside of the Campbell County website. Campbell County does not endorse any company or service and provides the links as informational only.</p>

## **NEXT STEPS**

### **FEDERAL STIMULUS for BROADBAND**

In December 2008 Campbell County with the assistance of the Region 2000 Economic Development Council submitted an application to the Commonwealth of Virginia for \$5.6 million in federal stimulus funding. The application proposed working with telecom providers and assisting in providing broadband service to those areas that are underserved and unserved. The application recognized that multiple technologies and types of service were needed as there is no single type of service that will provide the perfect solution. The application identified the need for base network equipment, to construct 6 new towers to locate equipment on, and provide support to serve 1,000 new DSL lines.

Since December the distribution of the federal stimulus funds has changed from being state administered to being distributed through the federal agencies the Department of Agriculture and the Department of Commerce, Economic Development Administration. Once the eligibility requirements have been established Campbell County is prepared to submit an application.

### **IMPLEMENTATION WORK**

After July 2009, work will begin on the development of master plan for infrastructure locations to support maximum coverage for wireless broadband service in the county. During this same time, an implementation plan for providing public safety and general citizen access option to broadband. This implementation plan will also incorporate a community awareness component.

After July 2010, the recommendations and strategies, approved by the Board of Supervisors, for providing public safety and general citizen/business access options to broadband will be implemented.

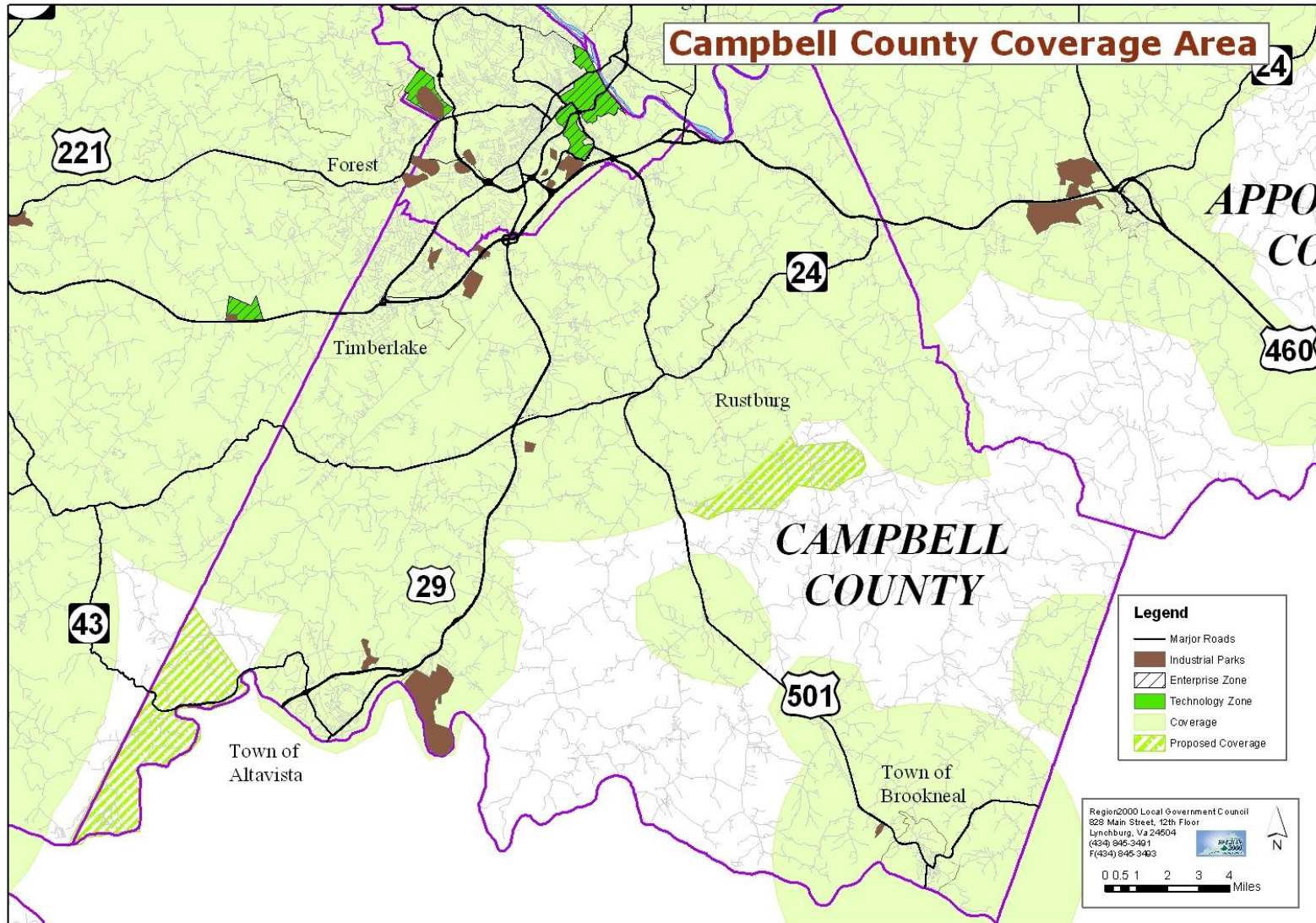
After July 2011, the implementation of the recommendations and strategies, approved by the Board of Supervisors, for providing public safety and general citizen/business access options to broadband will be completed.

**Exhibit 1 – Mid-Atlantic Broadband Coverage Maps**

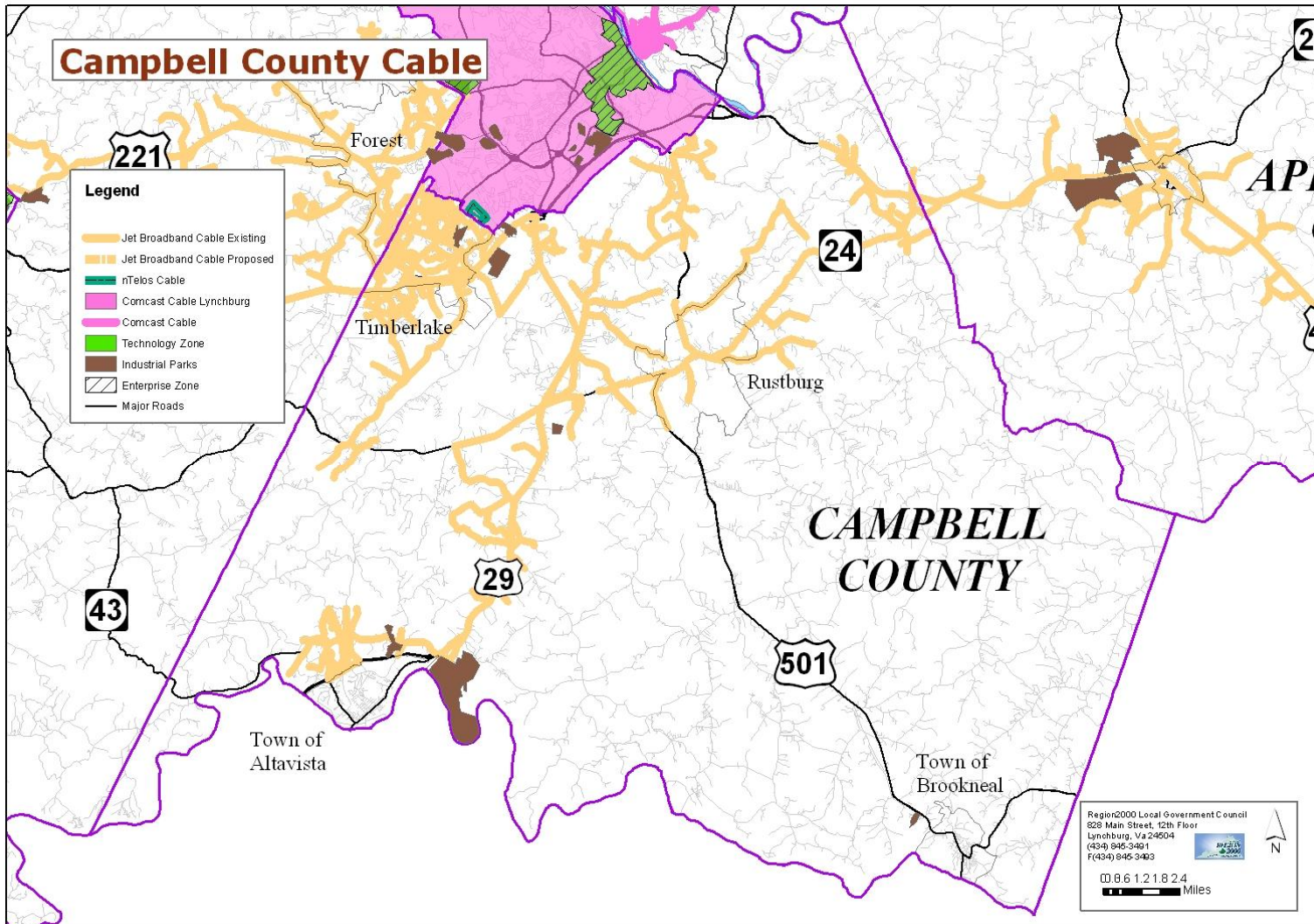


Source: Mid-Atlantic Broadband, 2009

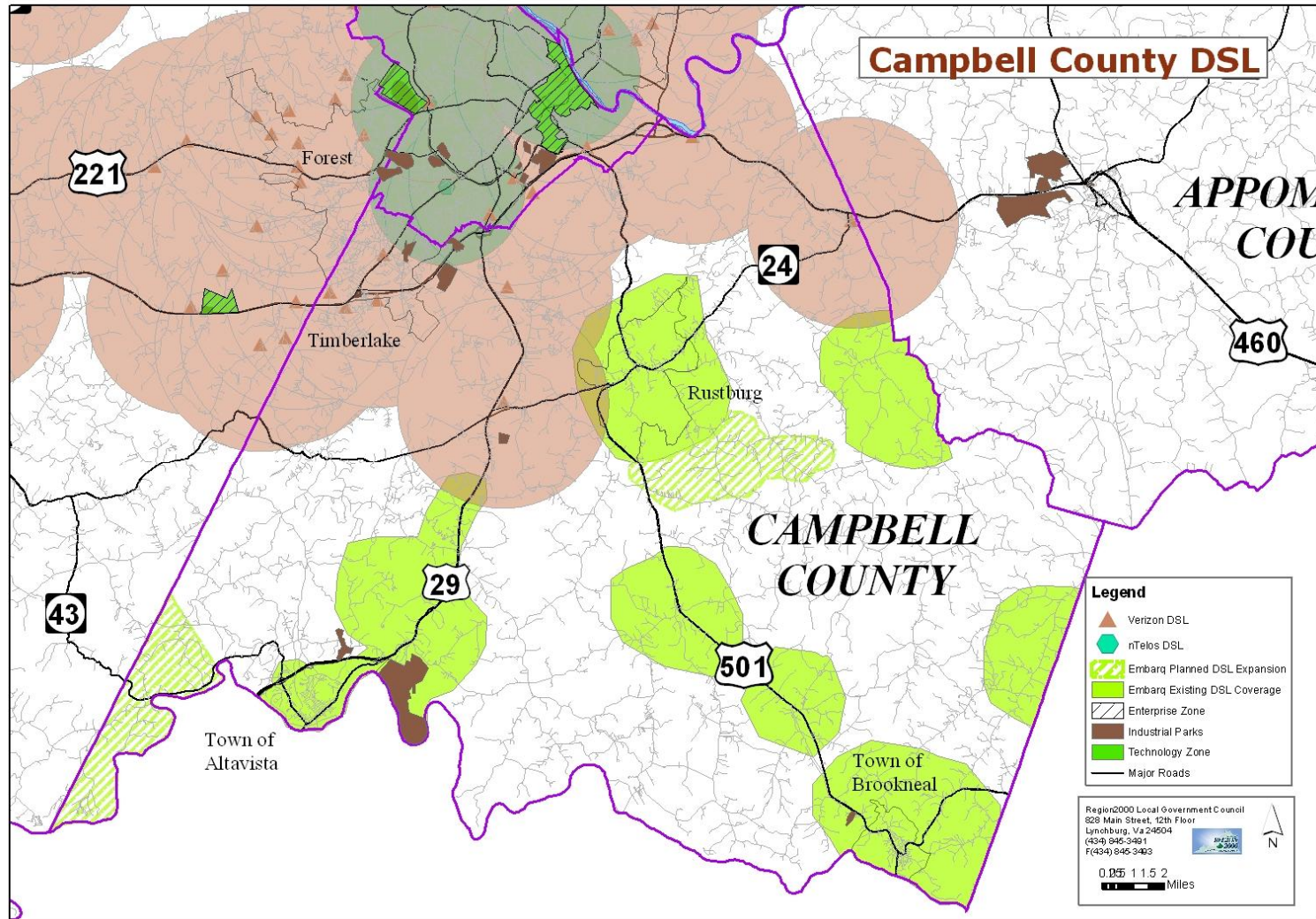
**Exhibit 2 – Campbell County Coverage Maps**



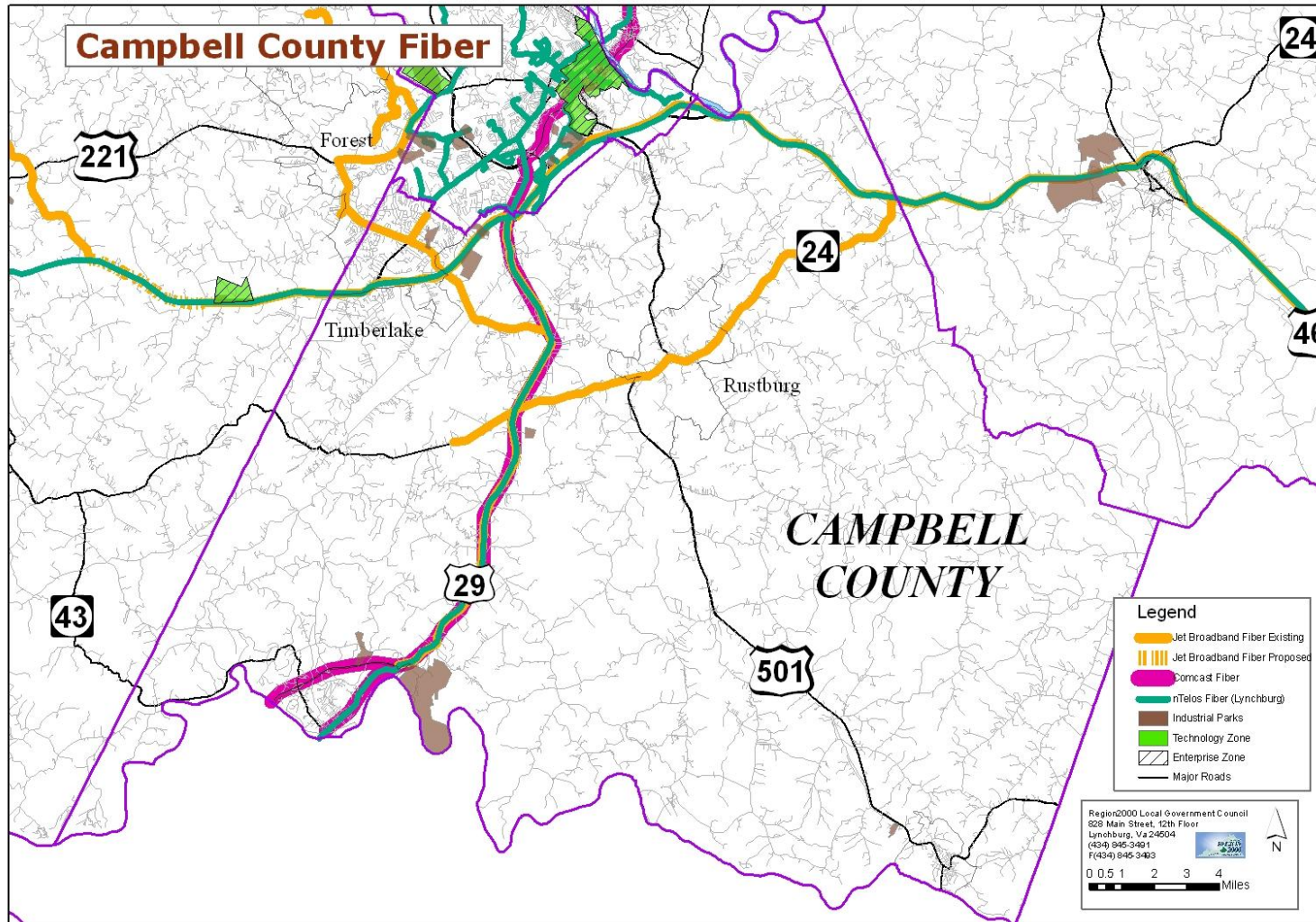
Source: Region 2000 Broadband Infrastructure Study, 2008.



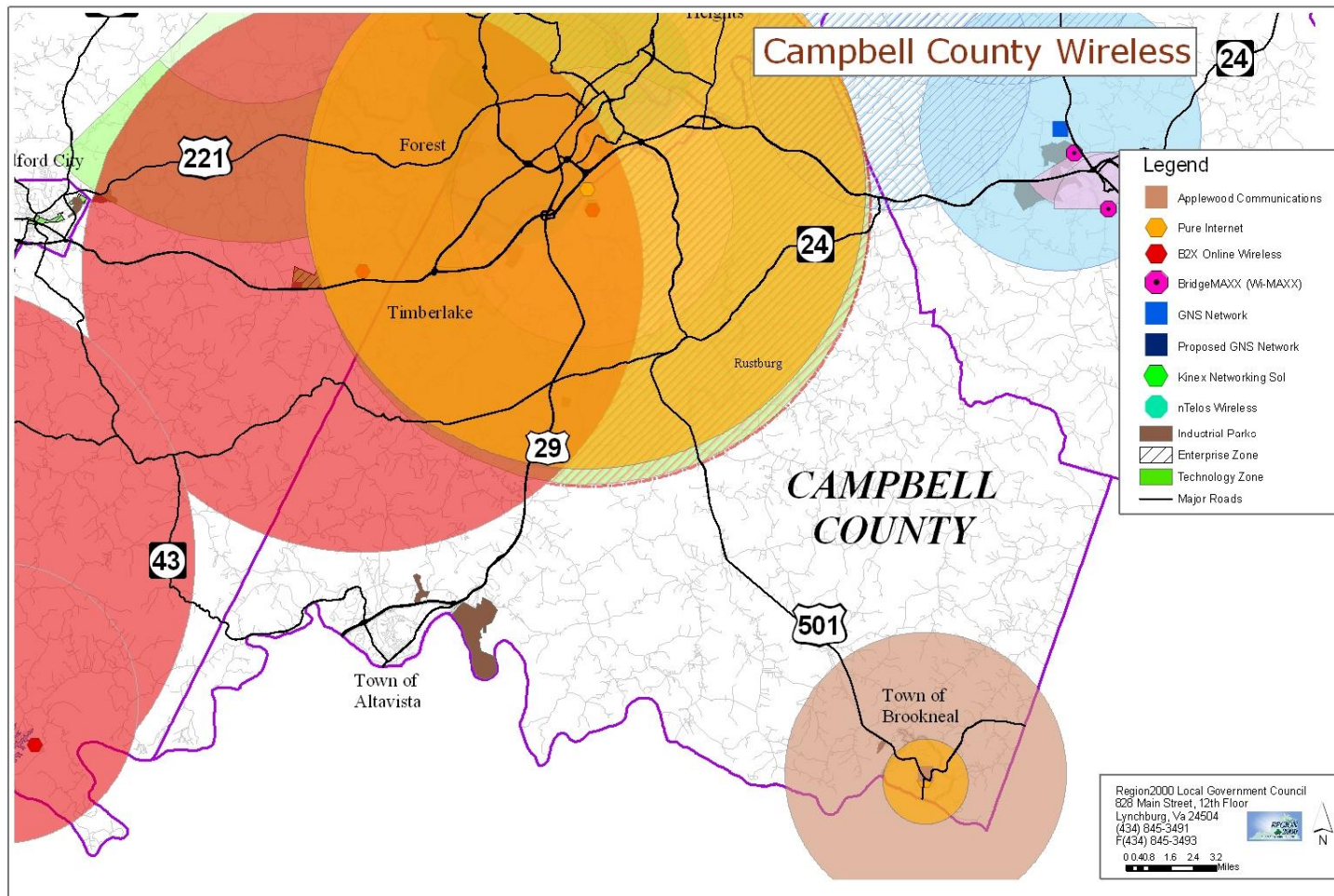
Source: Region 2000 Broadband Infrastructure Study, 2008.



Source: Region 2000 Broadband Infrastructure Study, 2008.



Source: Region 2000 Broadband Infrastructure Study, 2008.



Source: Region 2000 Broadband Infrastructure Study, 2008.

**Exhibit 3 – Broadband Providers and Available Technologies by Community**

Community	Provider	Technology
Concord	Jet Broadband	Cable
	Verizon	DSL
	Jet Broadband, nTelos	Fiber
	GNS Networks	Wireless
	ALLTEL, AT&T, nTelos, Sprint/Nextel	Cellular
Evington	Jet Broadband	Cable
	Verizon	DSL
	B2X Online, Pure	Wireless
	Alltel, AT&T, nTelos, Sprint/Nextel	Cellular
Gladys	Embarq	DSL
	Alltel, nTelos, Sprint/Nextel	Cellular
Leesville	Alltel, nTelos, Sprint/Nextel	Cellular
Lynch Station	Jet Broadband	Cable
	Embarq	DSL
	ALLTEL, AT&T, nTelos, Sprint/Nextel	Cellular
Rustburg	Jet Broadband	Cable
	Embarq	DSL
	Jet Broadband	Fiber
	B2X Online, Pure	Wireless
	Alltel, AT&T, nTelos, Sprint/Nextel	Cellular
Timberlake	Jet Broadband	Cable
	nTelos, Verizon	DSL
	Jet Broadband, nTelos	Fiber
	B2X Online, Pure, nTelos	Wireless
	ALLTEL, AT&T, nTelos, Sprint/Nextel	Cellular
Town of Altavista	Comcast	Cable
	Embarq	DSL
	Comcast, nTelos, Jet Broadband	Fiber
	ALLTEL, AT&T, nTelos, Sprint/Nextel	Cellular
Town of Brookneal	Embarq	DSL
	Applewood, Pure	Wireless
	Alltel	Cellular

Note: These services may not be available to all homes and businesses of the community.

## Section I - Introduction

### **Executive Summary**

Broadband Internet is as critical to a region's economic health as a well developed highway or rail infrastructure. Virginia's Region 2000 has a plethora of broadband technologies to provide coverage to the residents of the area, with the greatest number of technologies and maximum coverage area surrounding the City of Lynchburg. Prices, service plans, and actual coverage areas vary greatly throughout the region and between providers and technologies.

Virginia's Region 2000 Local Government Council has updated the Broadband Infrastructure Study from 2004 to identify the region's broadband infrastructure and create a tool to show what broadband technologies are available in specific areas. Equally as important, this report can serve as a guidepost to local leaders in introducing and expanding broadband coverage into parts of Virginia's Region 2000 where broadband presently does not exist or is underserved. Brandon S. Turner, Region 2000 Intern/Staff Assistant, conducted surveys with the region's broadband providers identifying available technologies, coverage zones, service plans, etc. April Branton, GIS Coordinator for Region 2000, compiled the collected data to create a series of maps showing broadband coverage throughout the region. Coverage maps, found at the end of this report, are broken down according to region, county, and city/town, and are based on the available broadband technology for that locality.

Since the Broadband Infrastructure Study released in 2004, coverage has increased throughout the region, most notably in Appomattox and Bedford Counties. Some areas, such as large tracks of Amherst and Campbell counties, remain underserved. DSL coverage has grown exponentially in the past four years, as has wireless coverage. One of the region's major changes is the creation of Mid-Atlantic Broadband Cooperative, which has established a broadband backbone throughout the region to support the creation and expansion of several broadband providers. More changes in coverage are anticipated within the next few years.

Special thanks are given to the region's providers; without their assistance this project would not be possible. Their openness and hard work has helped to give as accurate a map of broadband coverage as possible.

## **Exhibit 5 – Brookneal 501 Corridor Wireless Broadband Internet System Summary**

In May 2001, Campbell County Department of Community & Economic Development initiated a grant process to the Virginia Tobacco Indemnification and Community Revitalization Commission to study broadband coverage in Brookneal and along the U.S. 501 corridor from Brookneal to Gladys. The goal of this project was to answer the following questions:

- Is there adequate broadband coverage within the Town of Brookneal?
- If not, is there need for additional broadband access in the Brookneal area?
- How can the need for additional broadband access be met?

The Tobacco Commission awarded a \$50,000 grant for this project in 2001. Elert & Associates, a telecommunications consulting firm, studied the Brookneal area and found that the existing cable and telephone companies were not able, or willing, to provide broadband Internet. Wireless was recommended as the most economical form of broadband for the community, and Elert & Associates recommended a public/private partnership entity to handle broadband expansion. The Campbell County Industrial Development Authority acted as the fiscal agent for a Tobacco Commission Grant; Pure Internet was chosen as the provider to deliver wireless Internet to Brookneal. Wireless transmitters were placed on Brookneal's Main Street water tank, offering 360° coverage to the town and surrounding community. Interest in providing broadband to Brookneal increased following the announcement that Pure was moving into the area. Other providers immediately began offering broadband service to the community; presently Brookneal is covered by two wireless one DSL providers.

In 2005, the Campbell County departments of Economic Development and Information Technology adopted a future Priority and Initiative of researching the effectiveness of the Brookneal wireless system. Results show that wireless is now available to approximately 90% of residents living within a 3-mile radius of the water tank. Areas along U.S. 501 north of Brookneal are sparsely populated, and thus will be difficult to attract Internet service providers due to high infrastructure costs and low population density. Several cellular towers exist in the area; however, there are complications regarding co-locating broadband equipment on these structures. Construction of new towers for wireless is not cost-effective as the return on investment will not cover construction and operating costs. Significant grant funding an expanded partnership with Mid-Atlantic Broadband Cooperative, and or greater regional collaboration will be necessary to attract broadband providers to the 501 corridor.

**Exhibit 6 – Campbell County Broadband Providers – Contact Information**

Provider	Service Provided	Address	Phone Number	Website
Applewood Communications	Wireless	P.O. Box 1110 Brookneal, VA 24528	(434) 376-5529	<a href="http://www.brookneal.com">www.brookneal.com</a>
B2X Online	Wireless	30 Mill Lane Salem, VA 24153	1-866-800-8886	<a href="http://www.b2xonline.com">www.b2xonline.com</a>
Comcast	Cable, Fiber	400 Westfield Road Charlottesville, VA 22901	1-800-266-2278	<a href="http://www.comcast.com">www.comcast.com</a>
Embarq	DSL	707 East Main Street, Suite 1615 Richmond, VA 23219	1-866-304-6820	<a href="http://www.embarq.com">www.embarq.com</a>
GNS Networks	Wireless	P.O. Box 517 Concord, VA 24538	(434) 993-3709	<a href="http://www.gnsnetworks.com">www.gnsnetworks.com</a>
HughesNet	Satellite	1330 West Auto Drive, Suite 200 Tempe, AZ 85284	1-888-892-2434	<a href="http://www.nationwidesatellite.com">www.nationwidesatellite.com</a>
Jet Broadband	Cable, Fiber	94 Ewing Drive Rustburg, VA 24588	1-877-743-8538	<a href="http://www.jetbroadband.com">www.jetbroadband.com</a>
nTelos.com	Cable, DSL, Fiber, Wireless	P.O. Box 1990 Waynesboro, VA 22980	1-877-468-3567	<a href="http://www.ntelos.com">www.ntelos.com</a>
Pure Internet	Fiber, Wireless	P.O. Box 976 Halifax, VA 24558	(434) 476-8800	<a href="http://www.pure.net">www.pure.net</a>
Starband (by Spacenet)	Satellite	1750 Old Meadow Road, Suite 700 McLean, VA 22102	1-844-4STARBAND	<a href="http://www.starband.com">www.starband.com</a>
Verizon	DSL	600 East Main Street, Suite 100 Richmond, VA 23219	(804) 772-1913	<a href="http://www.verizon.com">www.verizon.com</a>
WildBlue	Satellite	5970 Greenwood Plaza Boulevard Greenwood Village, CO 80111	1-866-945-3258	<a href="http://www.wildblue.com">www.wildblue.com</a>

Note: Not all providers offer coverage to all communities within Campbell County.

**Exhibit 7 – Campbell County Cellular Broadband Providers – Contact Information**

Provider	Outlet	Address	City/State/Zip	Phone Number	Website
<b>Alltel*</b>	ALLTEL Retail Store – Montview Commons II	3919 Wards Road	Lynchburg, VA 24502	(434) 237-1729	<a href="http://www.alltel.com">www.alltel.com</a>
	Alltel Retail Store	21039 Timberlake Road	Lynchburg, VA 24502	(434) 832-0371	
	One Stop Cellular	1501 Village Highway	Rustburg, VA 24588	(434) 332-4477	
<b>AT&amp;T</b>	AT&T	120 A Simon’s Run	Lynchburg, VA 24502	(434) 258-8300	<a href="http://www.att.com">www.att.com</a>
	Wal-Mart Connection Center	125 Clarion Road	Altavista, VA 24517	(434) 309-2245	
<b>nTelos</b>	nTelos – Wards Road	4018 Wards Road, Suite E	Lynchburg, VA 24502	(434) 401-0004	<a href="http://www.ntelos.com">www.ntelos.com</a>
	nTelos – River Ridge Mall Kiosk	3405 Candler’s Mountain Road	Lynchburg, VA 24502	N/A	
<b>Sprint/Nextel</b>	Sprint Store	3920 Wards Road, Suite C	Lynchburg, VA 24502	(434) 239-8200	<a href="http://www.sprint.com">www.sprint.com</a>
	Cellcom	20911-C Timberlake Road	Lynchburg, VA 24502	(434) 239-8000	

Note: Providers cannot guarantee 100% coverage of Campbell County.

\*Alltel is anticipated to merge with Verizon in 2009 and will take on Verizon’s name.

**Exhibit 8 – Campbell County Broadband Providers – Estimated Bandwidth and Pricing\***

<b>Provider</b>	<b>Technology</b>	<b>Number of Service Plans</b>	<b>Available Bandwidth (Up/Down)</b>	<b>Monthly Price Range of Service Plans</b>	<b>Installation and/or Equipment Fees</b>
<b>Applewood Communications</b>	Wireless	One ó Both	1.5 Mbps / 1.5 Mbps ó Both	\$29.95 ó Both	\$250 ó Both
<b>B2X Online</b>	Wireless	One ó Residential	1 Mbps / 1 Mbps - Residential	\$42.50 ó Residential	\$120 ó Residential
		One ó Business	1.4 Mbps / 1.5 Mbps ó Business	\$100 ó Business	\$200 ó Business
<b>Comcast</b>	Cable	Three ó Residential	1-4 Mbps / 12-20 Mbps - Residential	\$42.95 - \$67.95 ó Residential	None ó Residential
		Three ó Business	384 Kbps-1 Mbps / 4-8 Mbps - Business	\$59.95 - \$160.00 ó Business	\$250 ó Business
	Fiber	Varies ó Business	Varies ó Business	Varies ó Business	Varies ó Business
<b>Embarq</b>	DSL	Five ó Residential	384-896 Kbps / 768 Kbps-10 Mbps ó Residential	\$24.95 - \$64.95 ó Residential	\$15 ó Residential
		Five ó Business	128-896 Kbps / 768 Kbps-10 Mbps ó Business	\$19.95 - \$119.95 ó Business	\$150 ó Business
<b>GNS Networks</b>	Wireless	One ó Both	512 Kbps / 1024 Kbps ó Both	\$39.95 ó Both	\$295 - Both
	T1 Line	One ó Business	1.5 Mbps / 1.5 Mbps ó Business	\$298.00 ó Business	N/A
<b>HughesNet</b>	Satellite	Six ó Residential	128-300 Kbps / 1-5 Mbps ó Residential	\$59.99 - \$349.99 ó Residential	\$399.98 ó Residential
		Seven ó Business	128 Kbps-1 Mbps / 1-5 Mbps ó Business	\$119.99 - \$199.99 ó Business	\$699 - \$899 ó Business
<b>Jet Broadband</b>	Cable	Three ó Residential	128-640 Kbps / 1.5-8 Mbps ó Residential	\$29.95 - \$59.95 ó Residential	\$49.95 ó Residential
		Four ó Business	512 Kbps-2.5 Mbps / 768 Kbps-8 Mbps - Business	\$39.95 - \$149.95 ó Business	\$100 ó Business
	Fiber	Varies ó Business	Varies ó Business	Varies ó Business	Varies ó Business
<b>nTelos</b>	DSL	One ó Residential	1 Mbps / 6 Mbps ó Residential	\$34.95 ó Residential	N/A
		Two ó Business	768 Kbps-1 Mbps / 3-6 Mbps ó Business	\$49.95 - \$79.95 ó Business	Varies
	Wireless	One ó Residential	550 Kbps / 1.5 Mbps ó Residential	\$34.95 ó Residential	\$49.95 - Residential
<b>Pure Internet, Inc.</b>	Wireless	Two ó Residential	768 Kbps-1.5 Mbps ó Residential	\$49.95 - \$79.95 ó Residential	\$150 ó Residential
		Two ó Business	768 Kbps-1.5 Mbps ó Business	\$59.95 - \$79.95 ó Business	\$150 ó Business
<b>Starband (by Spacenet)</b>	Satellite	Four ó Both	128-256 Kbps / 1-1.5 Mbps ó Both	\$69.99 - \$109.99 ó Both	\$299.99 ó Both
<b>Verizon</b>	DSL	Three ó Residential	384-768 Kbps / 1-7.1 Mbps ó Residential	\$19.99 - \$42.99 ó Residential	\$19.99 ó Residential
		Five ó Business	768 Kbps / 1-7.1 Mbps ó Business	\$19.99 - \$149.99 ó Business	Varies
	FiOS	Four ó Residential	2-20 Mbps / 10-50 Mbps ó Residential	\$49.99 - \$144.95 ó Residential	\$34.99 - Residential
		Four ó Business	5-20 Mbps / 20-50 Mbps ó Business	\$99.99 - \$279.99 ó Business	Varies
<b>Wildblue</b>	Satellite	Three ó Both	128-256 Kbps / 512 Kbps-1.5 Mbps ó Both	\$49.95 - \$79.95 ó Both	\$179.95 ó Both

\*Pricing and bandwidth data provided by broadband service provider websites. Prices, bandwidth, and availability may vary depending on the community.

**Exhibit 9 – Campbell County Cellular Broadband Providers – Estimated Bandwidth and Pricing**

<b>Provider</b>	<b>Number of Service Plans</b>	<b>Available Bandwidth</b>	<b>Monthly Price Range of Service Plans</b>	<b>Installation and/or Equipment Fees</b>
<b>Alltel</b>	One ó Both	Up to 3.1 Mbps	\$69.98 ó Both	\$25 Activation Fee, Free Wireless Cards Available
<b>AT&amp;T</b>	Three ó Business	5-50 Mbps	\$20-\$60 ó Business	Wireless Cards up to \$49.99
<b>nTelos</b>	One ó Both	1.2 Mbps	\$39.99 ó Both	Wireless Cards up to \$179.99
<b>Sprint/Nextel</b>	One ó Both	N/A	\$59.99 ó Both	Wireless Cards up to \$149.99

\*Pricing and bandwidth data provided by the cellular provider websites. Prices, bandwidth, and availability may vary depending on the community.

**Exhibit 10- Wireless 3G Survey**

**FY 09 BOARD OF SUPERVISORS PRIORITY 1 INITIATIVE**

**COMPUTER AIR CARD/3G COUNTY WIDE ASSESSMENT/EVALUATION**

Location	Description	GPS Coordinates**		Elevation	U S Cellular		Sprint		Alltel	
		Longitude	Latitude		Speeds Down	up	Speeds Down	Up	Speeds Down	Up
IT Office	Village Hwy	37* 16.509 N	079* 05.969W	816 ft	data not					
Concord Transfer Site		37* 19.636N	079* 00.530W	949 ft	available software issues		428	108	743	98
Big Horn Market	Rt. 24/460	37* 20.986N	079* 58.548W	899 ft			248	88	N/A	N/A
Thomas Terrace	near Springlake Rd.	37* 22.421n	079* 01.121W	698 ft			1160	110	0	0
County Haven	Pecan Dr.	37* 24.883n	079* 01.683w	608 ft			182	30	485	98
Lynchburg Airport	Control Tower/MBC Node Site	37* 19.744N	079* 12.181w	983 ft			301	151	1003	110
Turkey Foot Road	intersection 460	37* 18.296N	079* 16.787w	842 ft			1332	657	2041	100
Lawyers Road	near Waterlick	37* 17.947N	079* 12.447W	769 ft			0	0	0	0
Virginia Track		37* 18.720N	079* 11.083W	808 ft	102	87	428	82	827	81
Rt. 29- near Fosters	Jet broadband dishes	37* 16.896N	079* 10.037W	833 ft	129	95	1316	89	1912	95
Colonial Rest. Wards Road		37* 15.089N	079* 11.243W	967 ft	129	95	939	81	976	95
Seneca Commerce Park	end Cul-de-sac	37* 13.920n	079* 10.550w	839 ft	129	89	1584	97	2015	107
Rt. 29 South Dearing Ford Business & Manufacturing Center	Tree of Life Building	37* 09.356N	079* 13.634W	831 ft	129	91	231	89	178	73
Altavista HS	Phase I, Business Drive	37* 08.762N	079* 16.246W	688 ft	129	91	0	0	0	0
Altavista Town Hall	front parking lot	37* 06.582N	079* 17.688W	627 ft	129	94	715	65	786	109
Altavista Shopping Center		37* 07.302N	079* 16.386W	549 ft	129	92	1103	83	935	94
Browns Mill Rd		37* 07.302N	079* 16.386W	549 ft	129	54	0	0	1054	106
Start 2	IT Building	37* 13.063N	079* 09.964W	801 ft	120	86	0	0	1883	73
Rt. 24/ Mortimer Dr		37* 16.558N	079* 06.177W	816 ft.						
Evington Post Office		37* 14.787N	079* 12.114W	954 ft	129	87	551	94	588	91
		37* 14.787N	079* 12.114W	809 ft	108	81	208	84	214	103

		13.972N	16.882W								
Evington Rt. 24	west near county line	37* 14.115N	079* 17.948W	878 ft	129	39	358	96	503	90	
Rt. 24 CCUSA	water plant	12.692N	17.989w	580 ft	0	0	0	0			
Evington	Rangewood Drive	37* 12.091N	079* 14.910W		129	93			381	71	
Leesville 1		37* 09.439N	079* 21.790W	870 ft	124	87	533	114	786	73	
Leesville Methodist Church		37* 07.108N	079* 23.420W	612 ft	129	57	812	103	1038	79	
Runaway Bay 1		37* 04.601N	079* 25.033W	850 ft	135	28	0	0	0	0	
Runaway Bay 2		37* 03.870N	079* 24.489W	658 ft	136	98	0	0	0	0	
Lynch Station Post Office		37* 08.910N	079* 18.093w	734*	127	88	476	112	501	81	
Rt. 699- 1	near Rt. 29	37* 08.789N	079* 13.797W	750 ft	122	87	179	112	326	106	
Rt. 699- 2	midway through Nash's old saw mill	37* 07.700N	079* 09.702W	772 ft	129	63					
Gladys		37* 09.810N	079* 04.463W	775 ft	129	60	249	99	259	82	
Mollies Creek Road		37* 10.412N	079* 02.839W	721 ft	128	94					
Brookneal CC Airport	Runway Road	37* 08.322N	079* 01.061W	585 ft	123	34	0	0	0	0	
Swinging Bridge Rd		37* 37* 158N	078* 59.61W	574 ft	129	90					
Bknl- Rescue Squad		37* 03.524N	078* 56.983W	584 ft	129	93	0	0	0	0	
Bknl- Fire Dept.		37* 02.901N	078* 56.441W	535 ft	129	88					
Sugar Hill		37* 04.549N	078* 54.947W	618 ft	129	94	0	0	0	0	
Hwy 40 Charlotte Co.Line	Owl Road	37* 04.949N	078* 53.050W	568 ft	125	20	0	0	0	0	
Rt. 600		37* 37* 06.38N	078* 53.344W	664 ft	129	94					
Providence Church		37* 11.350N	078* 49.795w	763 ft	130	84					
Union Hill Church		37* 11.407N	079 55.277W	648 ft	129	81					
615- Bear Creek Rd.		37* 12.544N	079* 00.668W	712 ft	129	80	1131	101	1052	110	
Rustburg HS		37* 16.550N	079* 05.007W	915 ft	129	87	1338	107	1416	91	
Bocock Rd.	Mini Market	37* 21.513N	079* 06.548W	775 ft	128	85	829	109	849	87	
Eastbrook Rd.		37* 21.311N	079* 04.979W	690 ft	127	82	1504	100	2009	103	
Smokey Hollow		37* 19.678N	079* 03.749W	977 ft	129	93	0	0	1104	54	
Mt. Vista Drive		37* 19.295N	079* 03.033W	1,217 ft	126	81	492	117	508	104	

**\*\* Magellan GPS unit good for +or- 1 meter horizontal accuracy and within 20% vertical accuracy**

### **Bibliography**

Fortt, Jon. "WiMax's Last Best Hope." Fortune Magazine, 9 February 2009. Online:  
[http://money.cnn.com/2009/02/05/technology/WiMaxs\\_last\\_hope\\_fortt.fortune/index.htm](http://money.cnn.com/2009/02/05/technology/WiMaxs_last_hope_fortt.fortune/index.htm)

"Getting Broadband ó FCC Consumer Facts." Federal Communications Commission. 16 October, 2008. Online: <http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.html>.

"Virginia's Region 2000 ó Broadband Infrastructure Study." Virginia's Region 2000 Partnership. Spring 2008. Online:  
[http://www.campbellcountyva.gov/depts/it/broadband/Documents/2008\\_region2000\\_broadband\\_update.pdf](http://www.campbellcountyva.gov/depts/it/broadband/Documents/2008_region2000_broadband_update.pdf).