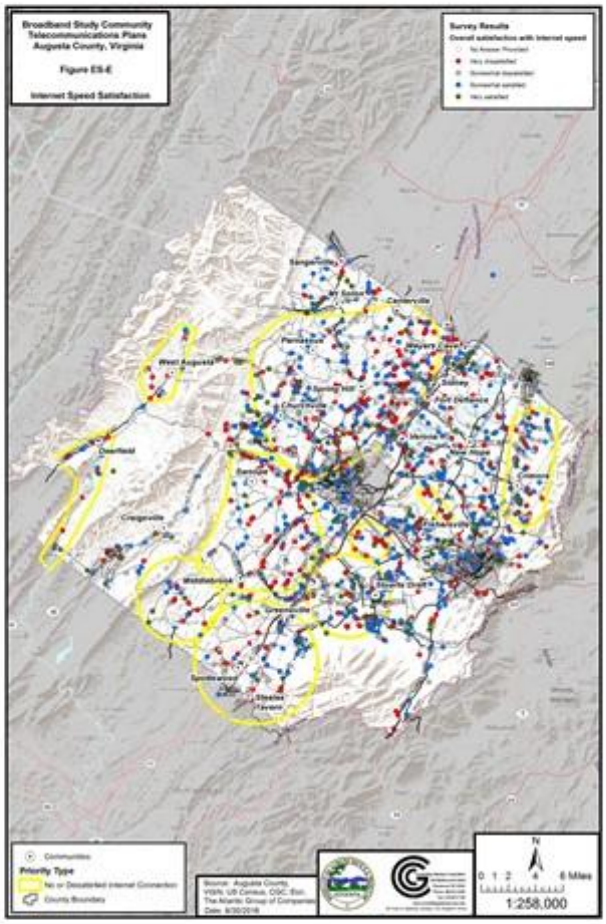
AUGUSTA
COUNTY, VIRGINIA
INTERNET INITIATIVE

County of Augusta, VA Community Broadband Telecommunications Strategic Plan

September 30, 2016



Submitted by the Augusta County Internet Initiative Project Management Team
Assisted by:

CCS COMMUNICATIONS CONSULTING SERVICES

The Telecommunications Division of

Consulting Gateway Corporation

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September 30, 2016

TRANSMITTAL LETTER

Mr. Timothy Fitzgerald
Augusta County Administrator
18 Government Center Lane
Verona, Virginia 24482

Board of Supervisors
Augusta County
18 Government Center Lane
Verona, Virginia 24482

RE: Augusta County, VA Community Broadband Telecommunications Strategic Planning Project

Dear Mr. Fitzgerald and Augusta County Board of Supervisors:

Consulting Gateway Corporation (CGC) and Dewberry are pleased to provide the Community Broadband Telecommunications Planning Project study report for Augusta County, VA. This report provides guidance to meet the established project milestones and expectations of the County while fulfilling the requirements of the Commonwealth of Virginia Rural Broadband Planning Initiative funded through the Department of Housing and Community Development (DHCD) consisting of 1) Analyzing Existing Conditions, 2) Setting Broadband Goals, and 3) Identifying Needed Action to Achieve Goals.

After examining the options and roles for the County to consider, it is our recommendation that the County can best meet their stated goal of enhancing and encouraging high speed Internet connectivity throughout the county by partnering with private sector providers in implementing a variety of proposed solutions presented in the report. Such a partnership is intended to use funds in a fiscally responsible manner, take advantage of the typical funding opportunities while minimizing the need for other long term funding. Four (4) options are presented for consideration that are not exclusive of each other and it is believed the most impactful solution may be a combination of some of the solutions presented. Details on these options are outlined in the study report.

Last Mile Connectivity Solutions	Considerations	Information Provided
Option No. 1: Marketing Existing & Potential Sites	Least Risk, Effort, Expense, Impact & Time	Seven (7) Primary Sites have been Identified for Potential Wireless Solutions
Option No. 2: Augusta Internet Initiative-Communication Assistance Program	Liaison Between Customer & Service Provider	Significant and Relevant End-User & Provider Information was Collected
Option No. 3: Network Extension Funding - Public Private Partnership	Provides Incentive for Private Borrowing	Numerous Typical Telecom Funding Opportunities Are Presented
Option No. 4: Customer Premise Equipment Last Mile Cost Subsidy	Aids Low to Moderate Income Households	Strategy to Financially Assist Potential Customers get Service

A significant catalyst in arriving at these options was direct input from the service providers providing broadband services within the study area, as well as feedback from the members of the Project Management Team.

Service Provider Input

- *The biggest obstacle stated to achieving connectivity (including Fiber) is the last mile cost and build.*

- The best way the county can assist the service providers in enhancing Internet last mile connectivity is to *share information collected through this study* and *assist in structuring low interest financing and cost sharing or structuring last mile connectivity solution options.*
- A liaison (Augusta County) between the end-users and the service providers could bridge the gap between lack of communication and/or knowledge of options available between the parties.

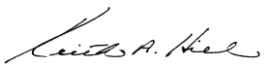
Project Management Team Feedback

- The municipalities would prefer not to own or operate network infrastructure of facilities.
- While the county is probably willing to make some manageable investment into enhancing Internet access within the county, without being a service provider there would be little monetary return on such an investment in the County providing services and Broadband it is just one of many infrastructure projects needing funding.
- *A sliding scale of options* to address enhancing Internet Connectivity should be presented so the elected officials representing the county can consider their comfort level in moving forward.

Other options, such as actual *network building* were not recommended at this time due to several concerns expressed by the Project Management Team members. By partnering with the private sector the County will minimize their investment and risk while meeting the need to address enabling broader service delivery. The most successful solutions will likely consist of the County assuming a liaison role between the service providers and the customers, exchanging service provider commitments of infrastructure investment with commitments by potential customers to take service; as well as the County assisting with funding applications, potential middle and last mile cost subsidy or sharing, and working with service providers to gain access to County owned vertical assets/property perhaps at reduced rates and expedited approvals and permitting. Both wireless and wireline (fiber connectivity) solutions and hybrid of both, such as connecting wireless vertical assets with fiber optic connectivity should be pursued. The County could implement any of the proposed solutions with revising the costs to fit a budget they are comfortable with, and take a 'wait and see' approach as to the effectiveness over the next 1 -2 years. It is not recommended the county proceed with any of the proposed options without getting cooperation and buy-in from the areas service providers. The Commonwealth encourages rural municipalities to establish such partnerships with private providers to enhance broadband service delivery to businesses and citizens. There is a unique funding opportunity coming up (2016 Virginia Acts of Assembly-Chapter 780) in which seed money will be made available towards private sector network construction activity by working with the public sector (County). Augusta County service providers expressed interest in this opportunity.

Regardless of the elected officials' decision on implementation, the Community Broadband Telecommunications Planning Study has collected, organized and mapped out significant data on the study area end-user perceptions, as well starting discussions with service providers' on potential solutions and increased mapping of their infrastructure that will undoubtedly play a role in enhancing broadband and other telecommunications services in the future. CGC and Dewberry appreciate the opportunity to be an integrated partner in this important initiative and look forward to continuing to assist the County in bringing this vital infrastructure to the County's Communities.

Sincerely,
Consulting Gateway Corporation



Keith A. Hill, President
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Enclosure: Augusta County, VA Community Telecommunications Broadband Planning Study

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ES Executive Summary

Introduction: VA-DHCD Community Telecommunications Broadband Planning Initiative

With the assistance of the Virginia General Assembly and the Virginia Department of Housing and Community Development (DHCD), Augusta County has undertaken a comprehensive telecommunications planning effort to identify and develop all elements of a successful community broadband network. Undertaken as part of the Virginia Rural Broadband Planning Initiative (VRBPI), the project is designed to create competitive communities and ensure community sustainability by building and utilizing telecommunications infrastructure.

The VRBPI has laid out a series of tasks which are designed to reach the project goals, consisting of:

1. Needs Assessment and Asset Inventory
2. Broadband Education Development Strategies and End User Application
3. Last Mile Connectivity Options
4. Preliminary Engineering, Design and Cost Estimates
5. Organization and Network Operation Options
6. Funding Strategies

A rural county broadband "Needs Assessment" reviews population and housing density, the locations of business, schools and colleges, hospitals, libraries and other strategic community anchor institutions to target the design of communications infrastructure to provide connectivity to these critical facilities. The assessment also focuses on other quality of life and economic development issues such as household income, unemployment statistics, technology and business training and resources, and much more. Augusta County has a significant number of existing towers and middle mile wireline - fiber optics communications infrastructure in-place deployed by the areas service providers such as Verizon, Comcast, MGW, Lumos Networks, New Hope Telephone Cooperative and more. In addition, there is significant long haul transportation fiber optic cabling along main transportation routes and interstates including Windstream, Sunesys, Light Tower, FPL Network and more. The problem is pockets of unmet needs and where there is no significant communication infrastructure currently, including lack of last mile infrastructure. By reviewing the responses to the end-user surveys, Internet connectivity has been fairly well addressed when in school, health care facilities and businesses or living in the more populated communities, but the greatest problem is when the students and teachers go home, in ability to conduct telemedicine applications outside the health care facilities, when workers go home, and for the residents and businesses in the more rural communities.

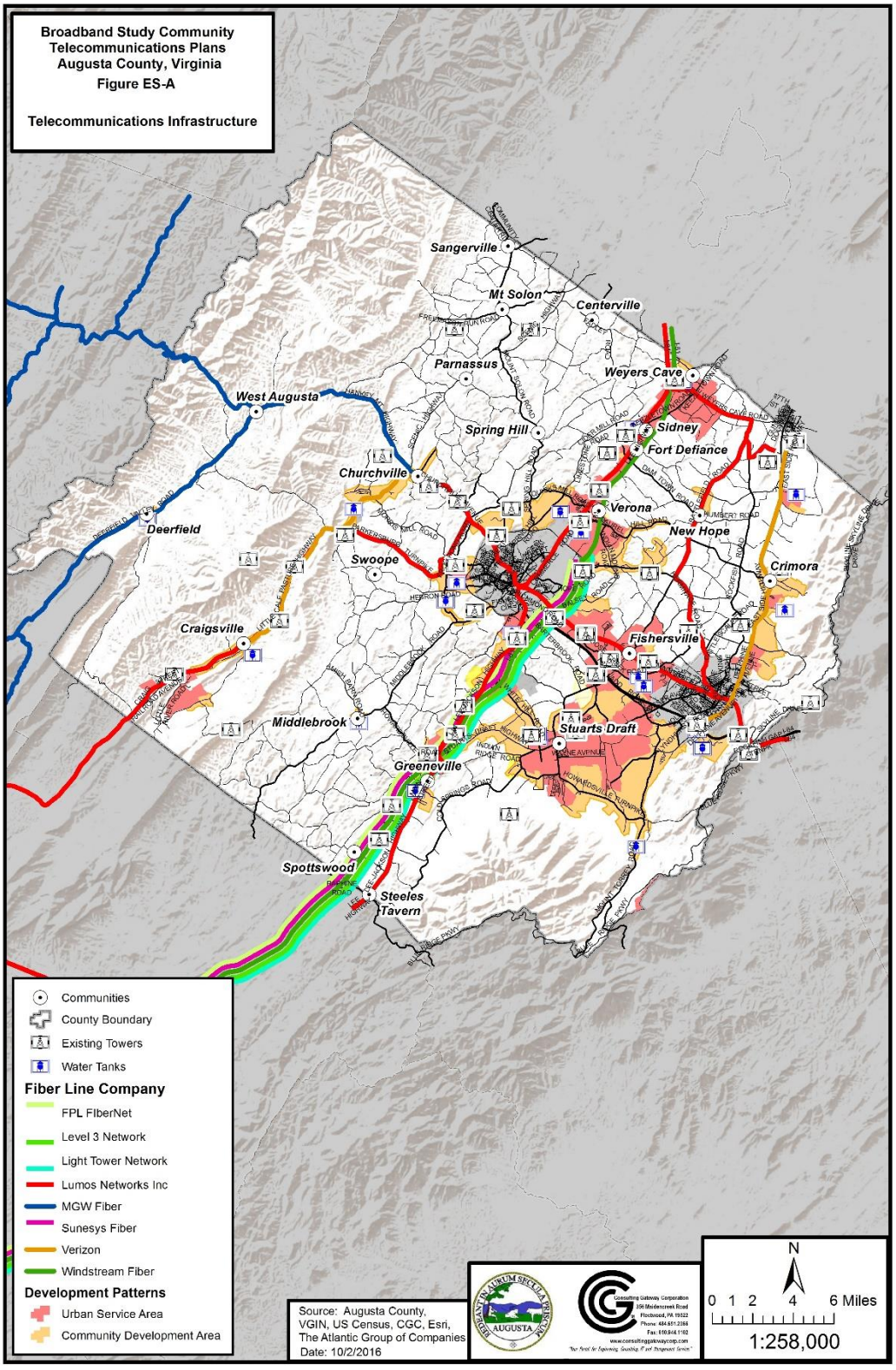
ES1.0 Needs Assessment and Asset Inventory

Region-Wide Data and Maps

The Needs Assessment was completed using existing data such as Comprehensive Plans, Zoning Maps and other studies, as well as new data collected through an on-line and hardcopy end-user survey. The data collected was then mapped to create pictures of current conditions and determine where need for action exists. In addition, data from complimentary projects such as the *Augusta County, VA Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services study prepared by The Atlantic Group of Companies, Inc. dated August 6, 2012* with potential tower build locations and identification of other vertical assets were also mapped. In other words, the regional maps generally demonstrate best estimated current conditions based on actual and analyzed data, where next step action should be focused.

See **Figure ES-A: Telecommunications Infrastructure**

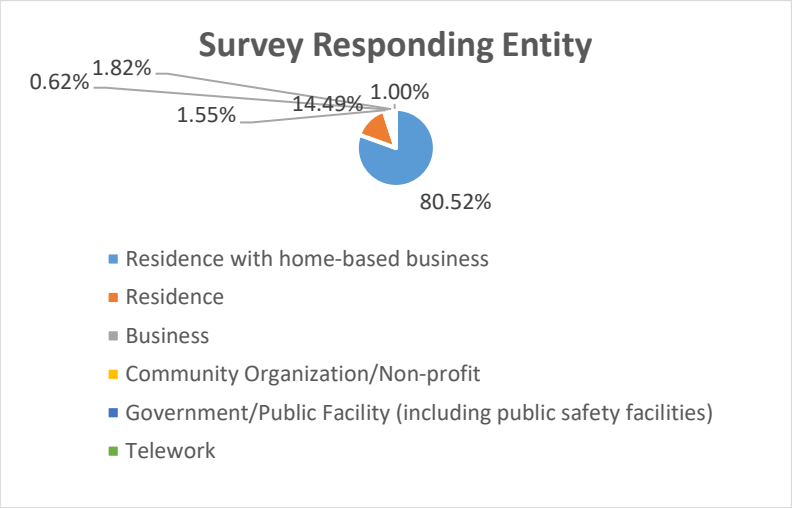
Figure ES-A: Telecommunications Infrastructure



ES1.1 Highlights of Survey Response in the Study Area

The following is the breakdown of survey responses were received:

Answer Choices	Responses	
Residence	80.52%	2,340
Residence with home-based business	14.49%	421
Business	1.55%	45
Community Organization/Non-profit	0.62%	18
Government/Public Facility (including public safety facilities)	1.82%	53
Telework	1.00%	29
Total		**2,906**



Due to Business responses only being 1.55% of total entities responding, and similarly since the other entities responding representing less than 20% of responses even when including businesses, separate highlighting of the surveys by type entity was not warranted. In addition, 8 surveys were near, but outside the county and Augusta County was not successful in geocoding less than 10% of survey responses. Therefore, while not all survey responses were able to be mapped, all survey responses received (2,906) as of the date when sent to the consultants by the County (7/15/2016) are included in the survey analysis to provide the most comprehensive picture of existing conditions, needs and perspectives in and adjacent to (less than 11 miles outside) the Augusta County region.

- **See Figure ES-B: Internet Connection User Type**

See Section 1.1 Study Findings for the majority of responses to the survey questions. The following tables provides an abbreviated summary of the more Internet related survey responses with maps for the study area regarding Internet Speed, Customer Satisfaction, and Overall Internet Satisfaction:

All Surveys
Q4 Name of company providing your Internet connection?

Answered: 2,526 Skipped: 380

Service Provider	Responses	
Verizon	28.15%	722
T Mobile	0.04%	1
Lumos	6.73%	170
MGW	6.97%	176
NTelos	9.58%	242
Satellite (Dish, Hughes, Wild Blue, DirectTV)	9.07%	229
Comcast	29.81%	753
Lingo	0.48%	12
Sprint	1.23%	31
New Hope Telephone Cooperative	1.78%	45
Shentel	1.50%	38
I don't know	2.06%	52
No Internet	2.61%	66
Total		**2,526**

- **See Figure ES-C: Internet Service Providers**

Figure ES-B: Internet Connection User Type

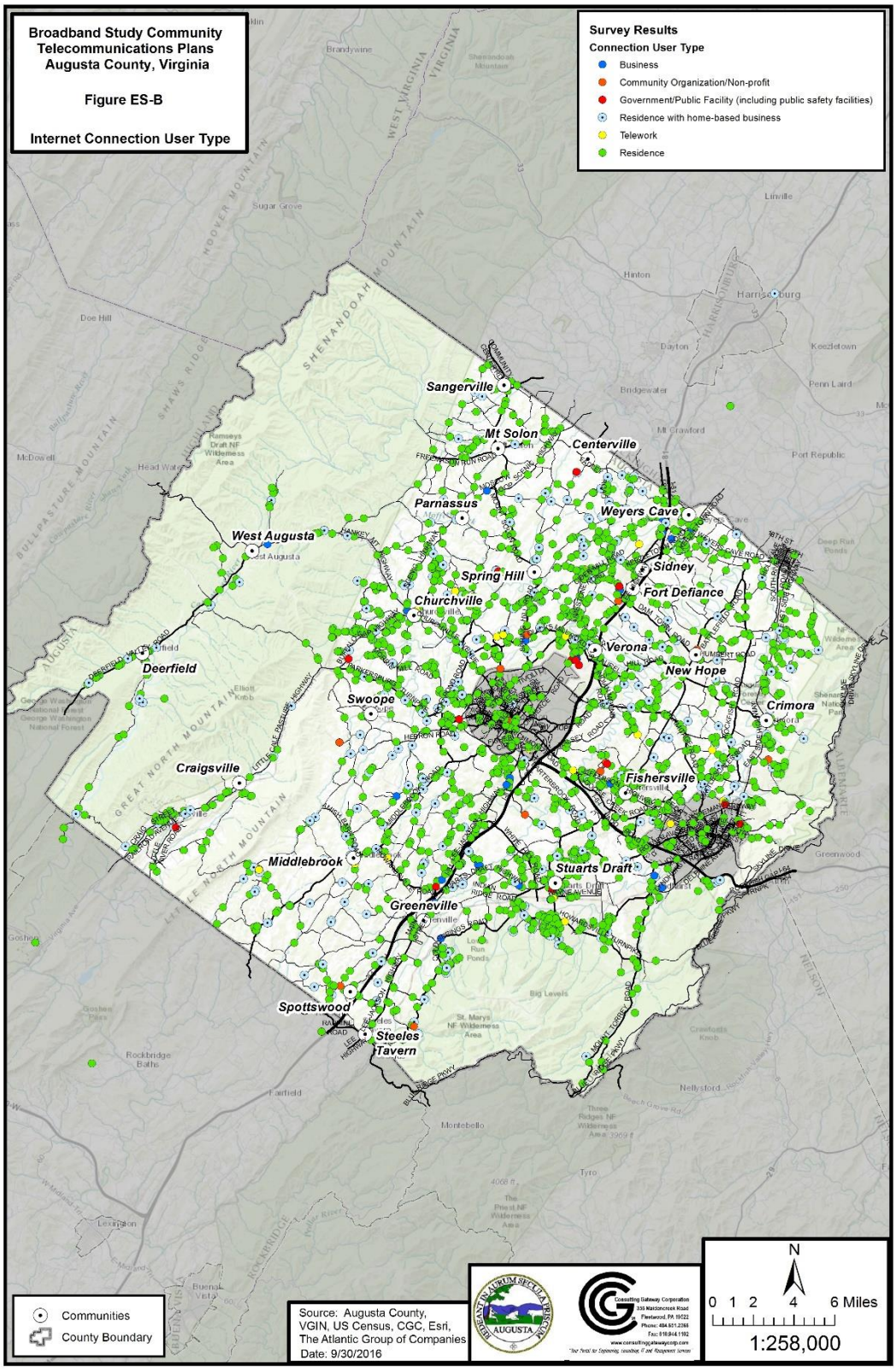
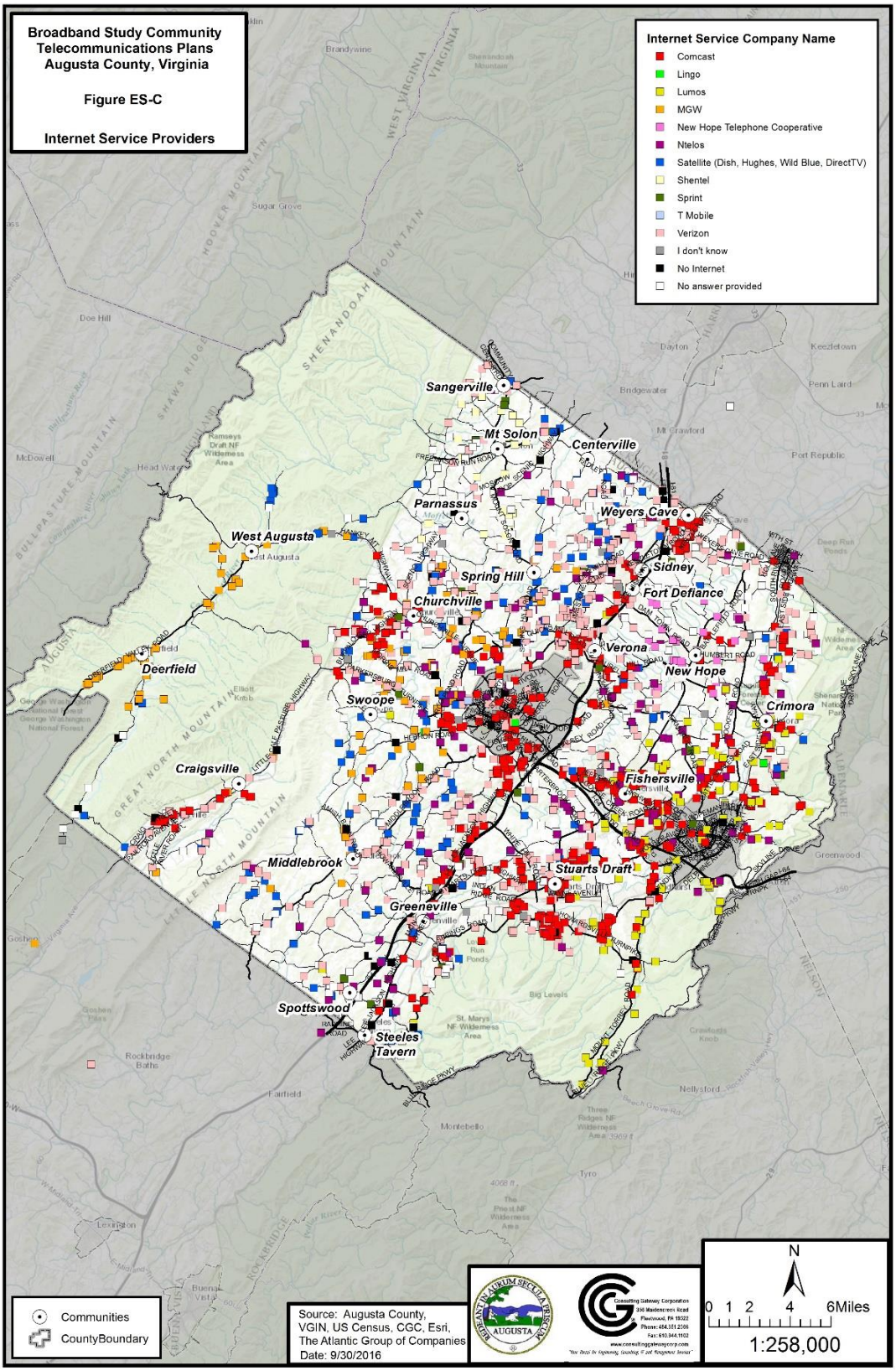


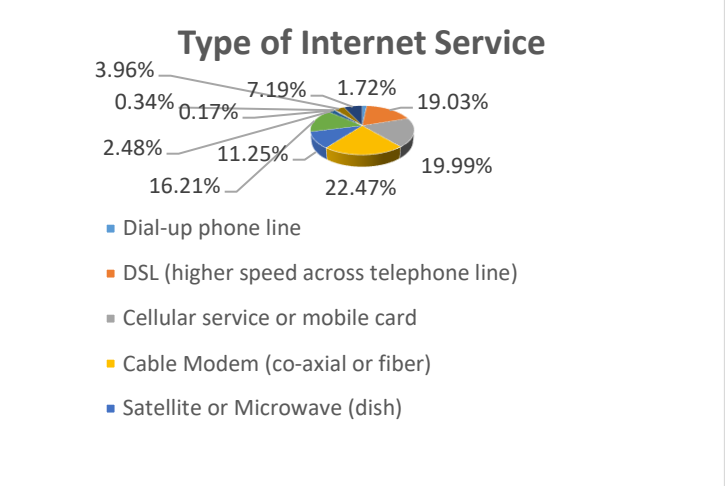
Figure ES-C: Internet Service Providers



Q5 Which of the following best describes the type of Internet service you subscribe to at this location?

Answered: 2,906 Skipped: 0

Answer Choices	Responses	
Dial-up phone line	1.72%	50
DSL (higher speed across telephone line)	19.03%	553
Cellular service or mobile card	19.99%	581
Cable Modem (co-axial or fiber)	22.47%	653
Satellite or Microwave (dish)	11.25%	327
Wireless (from service provider, not home network)	16.21%	471
Fiber Optics	2.48%	72
ISDN (Business)	0.17%	5
T-1/DS3 Line (Business)	0.34%	10
I don't know	3.96%	115
No Internet service	7.19%	209
Total		**2,906**



- **See Figure ES-D: Internet Connection Type**

Q12 Please rate your current speed of connection (bandwidth):

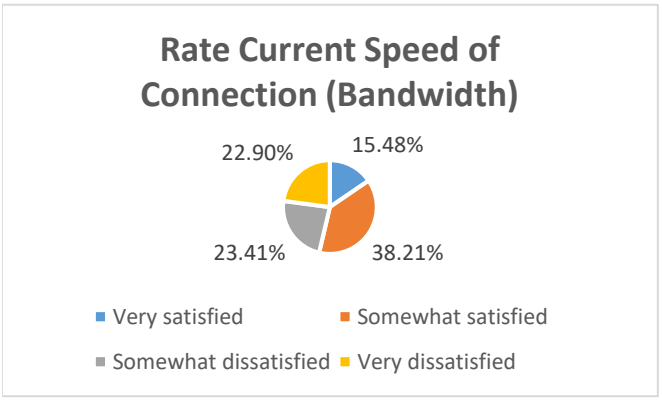
Answered: 2,764 Skipped: 142

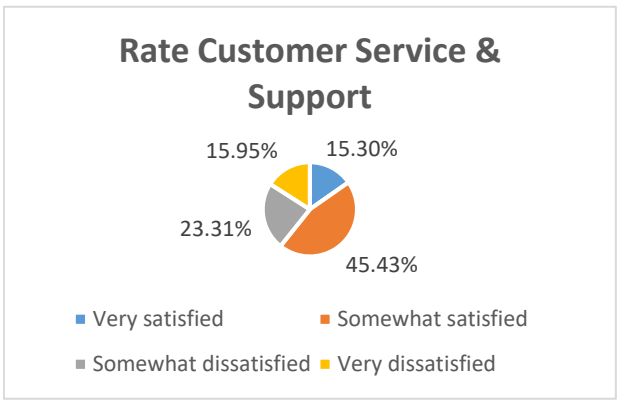
Answer Choices	Responses	
Very satisfied	15.48%	428
Somewhat satisfied	38.21%	1,056
Somewhat dissatisfied	23.41%	647
Very dissatisfied	22.90%	633
Total		**2,764**

Q13 Please rate the customer service and support from your provider:

Answered: 2,758 Skipped: 148

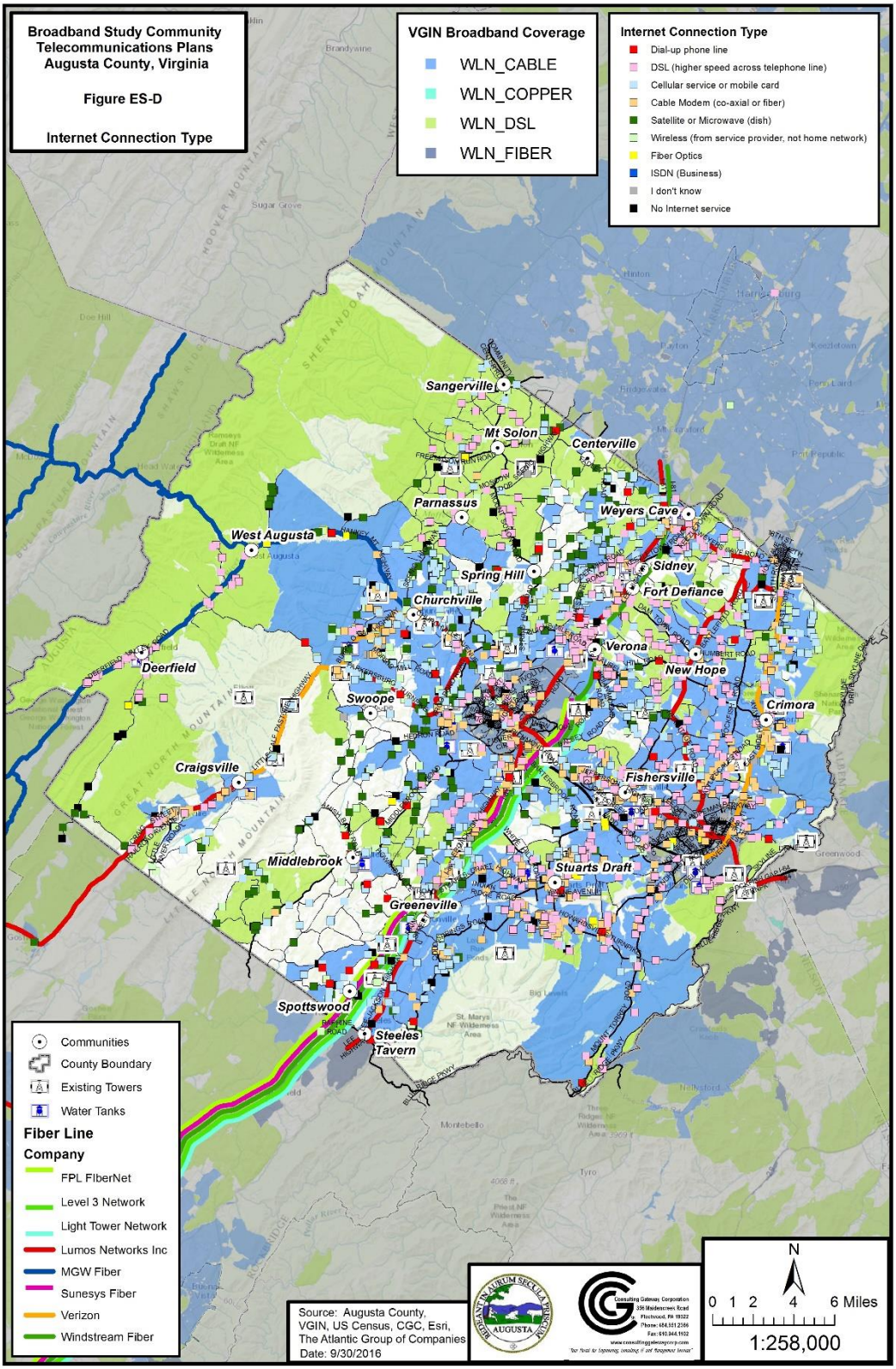
Answer Choices	Responses	
Very satisfied	15.30%	422
Somewhat satisfied	45.43%	1,253
Somewhat dissatisfied	23.31%	643
Very dissatisfied	15.95%	440
Total		**2,758**





Internet	Speed	Customer Service	Overall Satisfaction
Very Satisfied	*15.48%*	*15.30%*	*9.87%*
Somewhat Satisfied	*38.21%*	*45.43%*	*40.51%*
	53.69%	***60.73%***	***50.38%***
Very Dissatisfied	*22.90%*	*15.95%*	*22.71%*
Somewhat Dissatisfied	*23.41%*	*23.31%*	*26.91%*
	46.31%	***39.26%***	***49.62%***

Figure ES-D: Internet Connection Type



Q14 How would you describe your overall satisfaction with your current Internet service

Answered: 2,765 Skipped: 141

Answer Choices	Responses	
Very satisfied	9.87%	273
Somewhat satisfied	40.51%	1,120
Somewhat dissatisfied	26.91%	744
Very dissatisfied	22.71%	628
Total		**2,765**

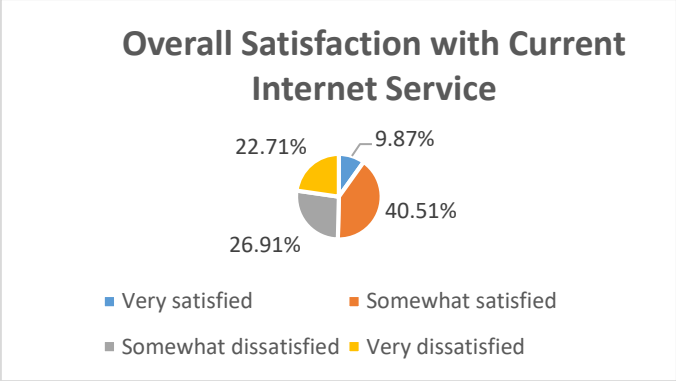
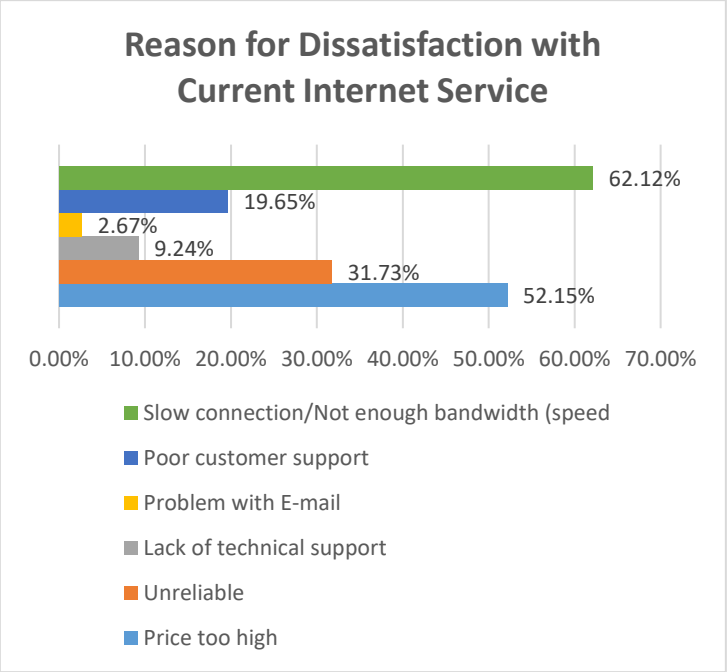


Figure ES-E "Internet Speed Satisfaction" and Figure ES-F "Internet Quality Satisfaction" The number of Somewhat or Very Dissatisfied users with Speed of Connection is over 46%, Customer Service & Support is over 39% with Overall Dissatisfaction with current Internet Service at nearly 50%.

- **See Figure ES-E: Internet Speed Satisfaction**
- **See Figure ES-F: Overall Internet Satisfaction**

Reasons for Internet Dissatisfaction

Two (2) major reasons (~50%) for Overall Internet dissatisfaction was reported as having a slow connection/not enough bandwidth speed (62%) & Price too high (52%). Almost 1/3 of users are dissatisfied with unreliable service (~32%).



Q15 Reason for dissatisfaction?

Answered: 2,468 Skipped: 438

Answer Choices	Responses	
Price too high	52.15%	1,287
Unreliable	31.73%	783
Lack of technical support	9.24%	228
Problem with E-mail	2.67%	66
Poor customer support	19.65%	485
Slow connection/Not enough bandwidth (speed	62.12%	1,533
Total		**2,468**

Internet Priority Areas

Priority Areas were established where service gaps were identified where reported no service was available and/or service was slow or unreliable (unserved and/or underserved). It was difficult to identify some pockets of need due to speed and overall satisfaction results hovering near 50%/50 % ratings.

When defining priority areas, isolated responses of either having no service or dissatisfaction of service were not used, but rather where many such responses were given and were clustered. Obviously expressing a level of satisfaction is subjective and the reason a response was provided as no service would have to be explored further as to the reasoning; i.e., not available, decided to take service due to cost or some other reason, do not need, etc.

Figure ES-E: Internet Speed Satisfaction

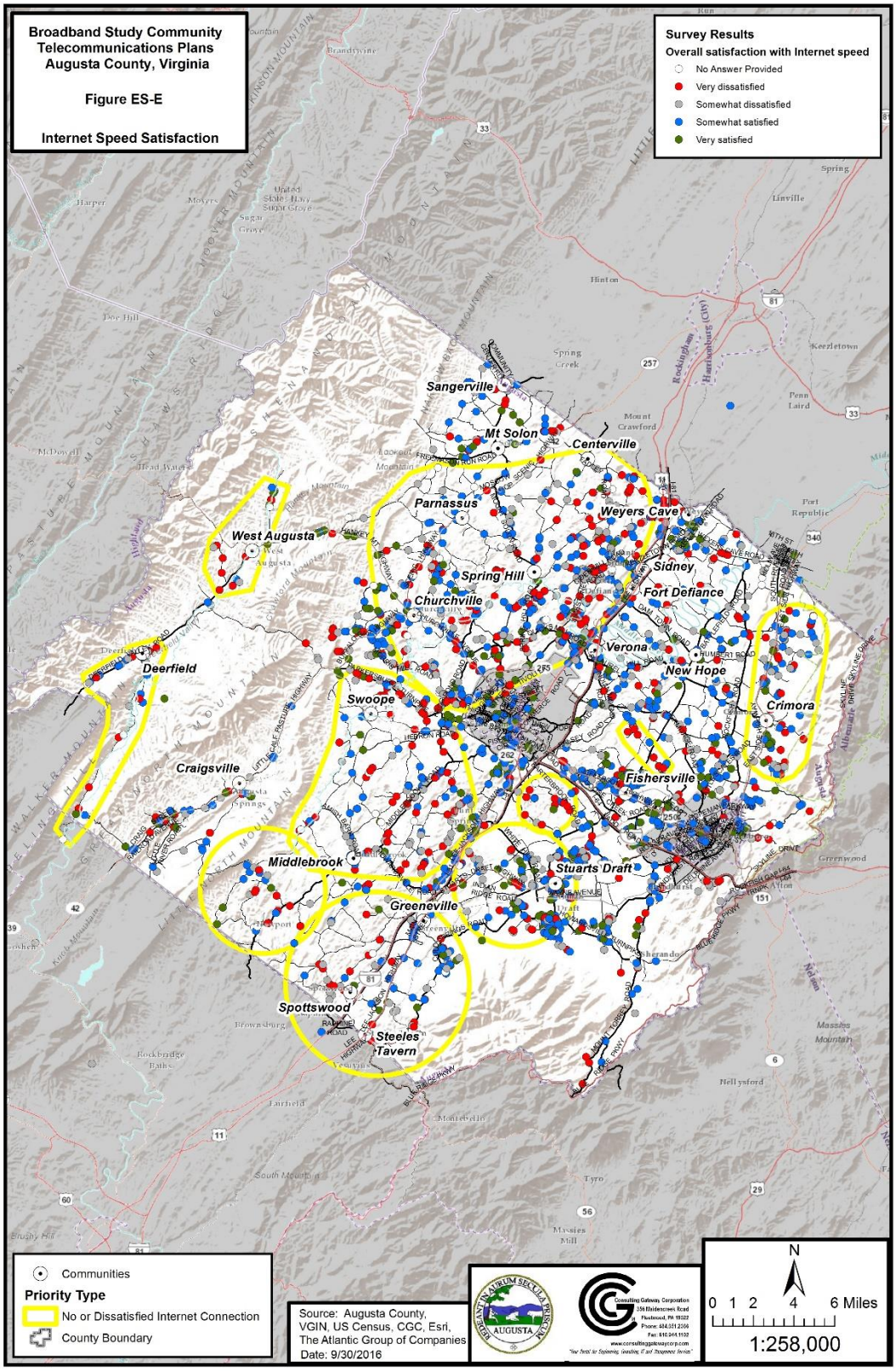
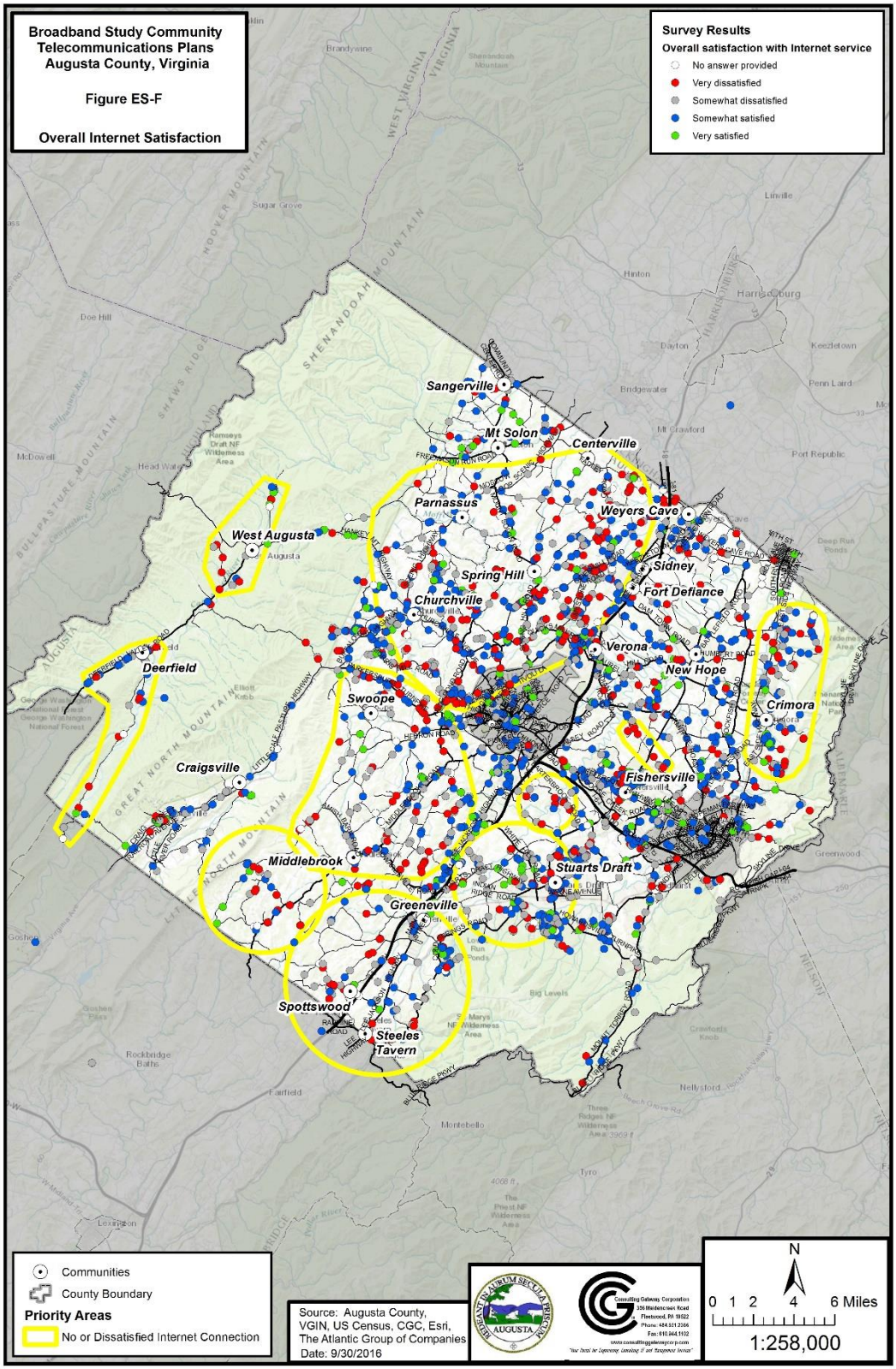


Figure ES -F: Overall Internet Satisfaction



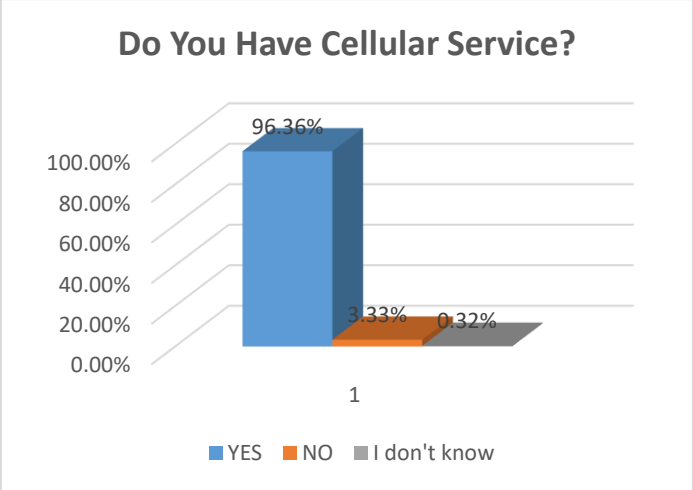
Cellular Service or Mobile Card

Cellular service or mobile card, reported at 19.99% type of Internet service subscribed to continues to gain in popularity as a main stream Internet Connection. Regardless, it is comparable with Cable Modem users at 22.47% and DSL type connections at 19.03%. Wireless from a service provider is at 16.21% and Satellite or Microwave (dish) was reported at 11.25%. In recent years, project team members have expressed that having good cellular service is equally as important has having a reliable and high speed Internet Connection.

Q18 Do you have cellular phone service?

Answered: 2,855 Skipped: 51

Answer Choices	Responses	
YES	96.36%	2,751
NO	3.33%	95
I don't know	0.32%	9
Total		**2,855**



Q19 Name of the company providing your cellular service?

Answered: 2,666 Skipped: 24

Service Provider	Verizon	nTelos	T Mobile	AT&T	Sprint	Shentel	I don't know	No Cellular Service	Total
	62.23%	21.68%	0.15%	4.88%	8.96%	0.49%	0.98%	0.64%	
	1,659	578	4	130	239	13	26	17	**2,666**

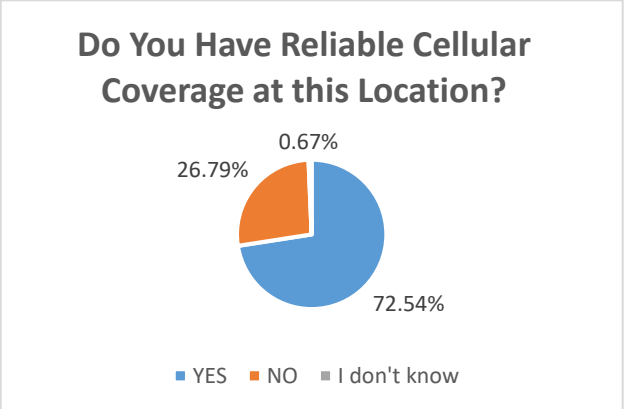
- **See Figure ES-G: Cellular Service Coverage and Service Provider**

Cellular priority areas were also identified based on responses of no service or unreliable service. Again, when defining priority areas, isolated responses of either having no service or unreliable service were not used, but rather where many such responses were given and were clustered.

Q20 Do you have reliable cellular coverage when using it at this location?

Answered: 2,822 Skipped: 84

Answer Choices	Responses	
YES	72.54%	2,047
NO	26.79%	756
I don't know	0.67%	19
Total		**2,822**



- **See Figure ES-H: Cellular Service Reliability**

Figure ES-G: Cellular Service Coverage and Service Provider

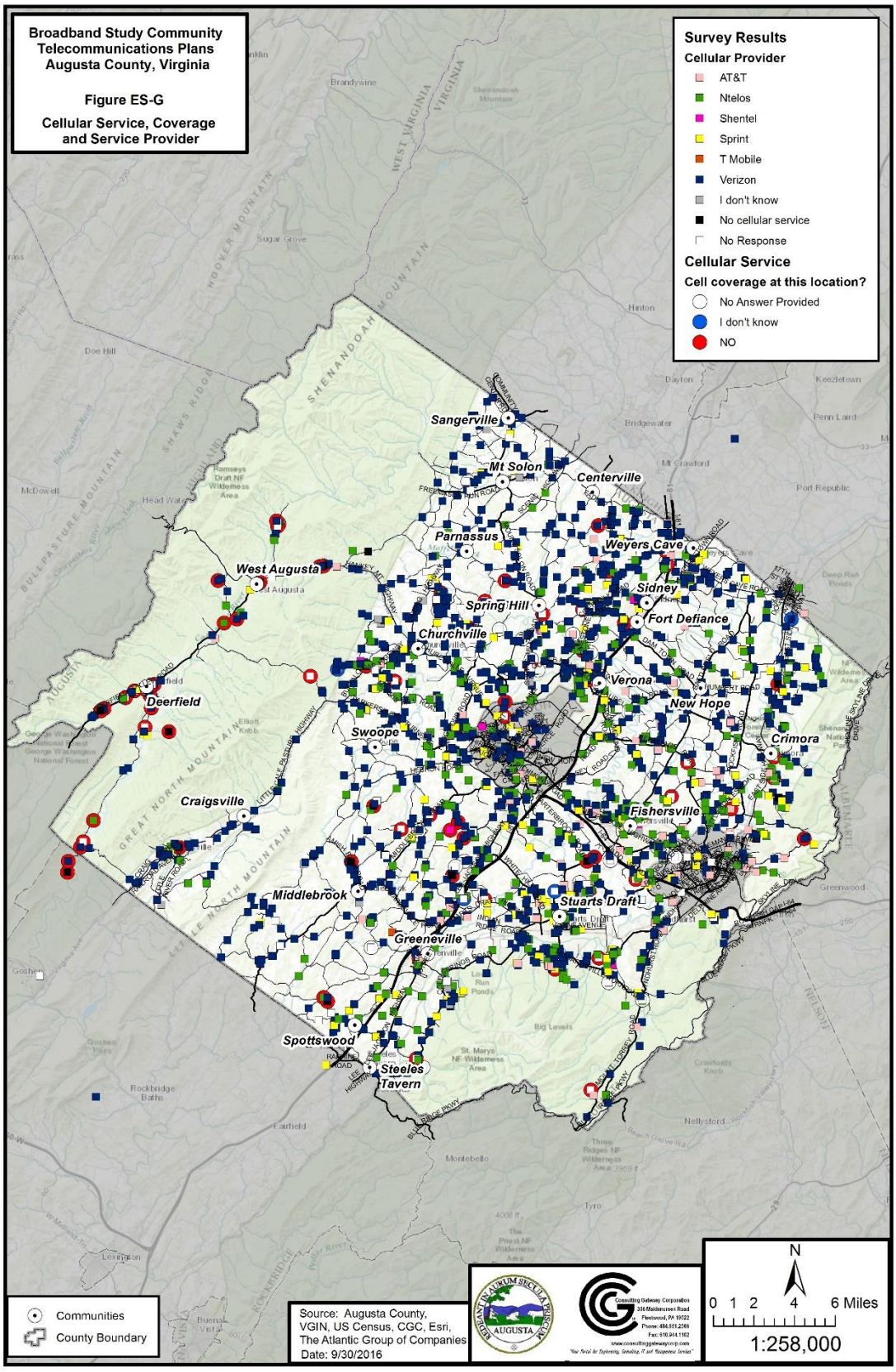
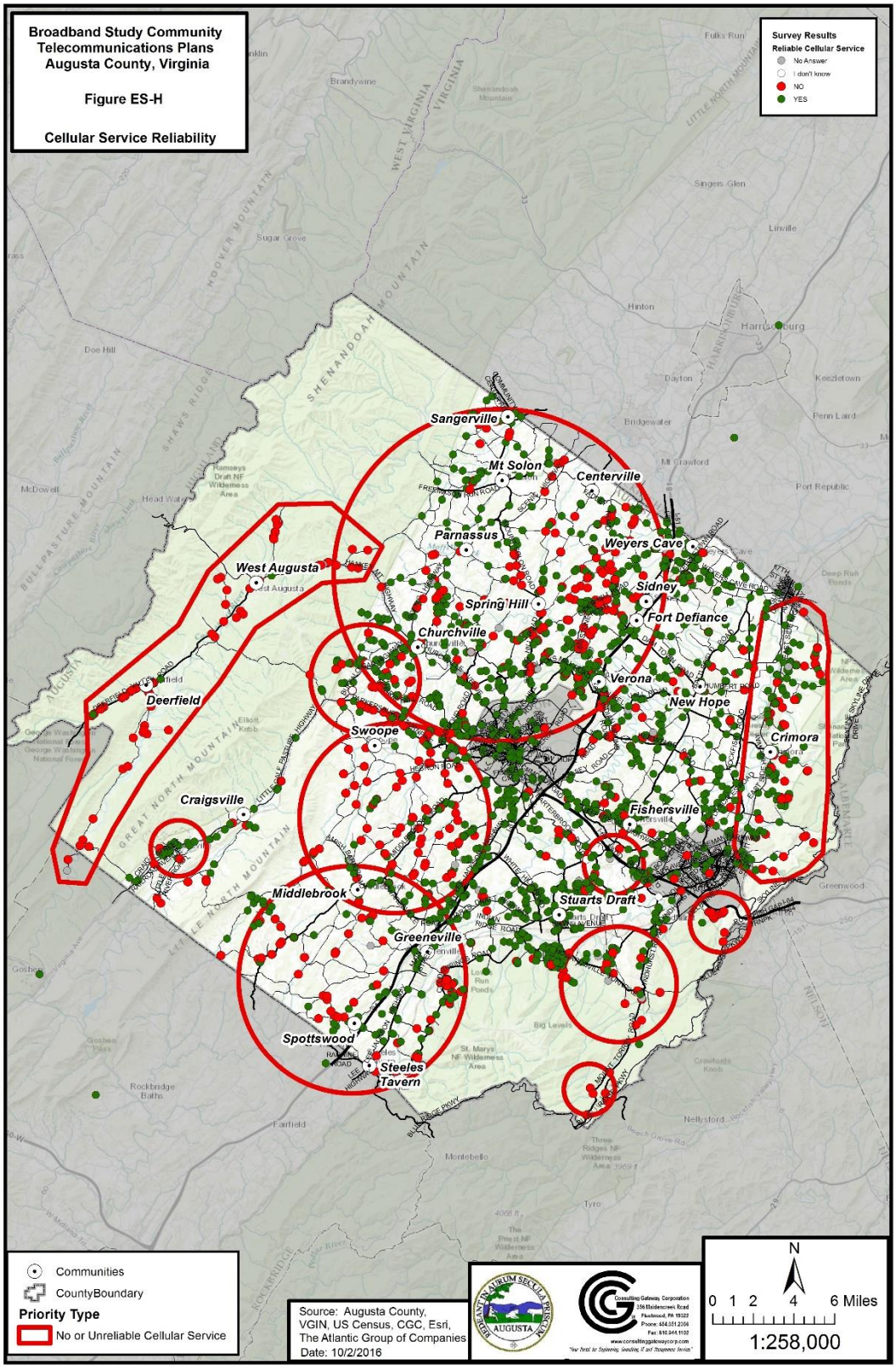


Figure ES-H: Cellular Service Reliability



ES2.0 Broadband Education Development Strategies and End User Application

ES2.1 Gap Analysis with Broadband Education Development and Strategies

A gap analysis was performed to address community needs such as job training; education, businesses and the local economy, community facilities (library, local government and public safety response organizations), and broadband education needs. The following sections briefly summarizes each of these important quality of life issues, observed gaps and suggested strategies to address deficiencies. A more comprehensive review is addressed later in the report.

ES2.1a Local and State Technology Training and Resources

Virginia recognizes the value of reliable, cost-effective high speed communication technology and the resulting impact on economic development and quality of life for its residents. Technology is a focus in all areas of State oversight and on opportunities for incorporating technology into the daily lives of citizens. Aside from setting standards for technology use within government, technology training standards are a core education requirement in public schools.

ES2.1b K-12 Schools

Biggest Education Problem: It has been reported be members of the Project Team, as well as educational member stakeholders that when people are at work or school, most locations have some type of high speed Internet connection, but many students and teachers at home lack necessary high speed Internet connections – Almost 43% of survey respondents indicated no one in their household uses Internet to complete school assignments or job training, while almost 57% does (K-12, 2 or 4 year college, or trade school). Without high speed Internet, teachers may not be able to access online courses at home and through the school system providing instruction on implementing technology into classroom learning. Teachers are proficient in basic computer knowledge and classroom applications, and typically have been provided technology tools for presenting material to students and measuring comprehension. All teachers have completed basic technology instruction courses and could continue to receive further instruction using online resources. The *solution* to the biggest obstacle facing education is to focus on addressing high speed connectivity issues at the homes of the students and teachers.

ES2.1c Adult Education

Through the Commonwealth's Race to GED program, classes, materials and pre-testing are free to any adult that has not graduated from high school. Online classes and streaming video is available for those unable to attend traditional classes. The PBS Literacy Link website[1] offers interactive lessons and activities as part of their Pre-GED and GED Connection program. eLearn Virginia is another online option for adults who wish to work towards GED completion, enhance job skills, or earning a Career Readiness Certificate[2]. These programs further assist with job placement.

ES2.1d Higher Education

Distance-learning classes are offered through the Virginia Community College System throughout the Commonwealth. The VA Community College System offers an extensive variety of courses available through online access.[3] Distance learning provides the opportunity for students to complete courses not available through traditional instruction at the colleges and complete degree programs, while remaining close to family and work.

[1] http://litlink.ket.org/wesged.aspl
[2] Program details available online at www.crc.virginia.gov

[3] The Virginia Community College Online Resource for Students; http://www.vccs.edu/vccsonline/index.html

When students are forced to leave their communities to pursue higher education, many do not return to apply their knowledge locally. The out-migration of young adults reduces a community's ability to maintain a skilled, 'technology-literate' workforce and attract new businesses to the area. Classes are web-based and require independent study. Access to the Internet and basic technology skills are required such as understanding of computer fundamentals, web browsing, email use, and word processing applications. The access to advanced learning opportunities provided by the community higher education partners enable students to get the training and certification they need, while keeping them close to home and saving on education expenses.

ES2.1e Growing Business

Virginia has numerous resources available to businesses for growing and competing digitally. One-on-one assistance is available from regional agencies such as the Virginia Employment Commission and the Center for Business and Workforce Development. Additionally, small/medium businesses and individuals have access to many online resources for e-commerce education and financial assistance through the Virginia Electronic Commerce Technology Center (VECTEC).

Another example of Virginia's pro-business focus is the Virginia Department of Business Assistance (VDBA). This department's goal is to connect businesses with the resources they need to meet challenges and realize market opportunities. "Since almost 99% of Virginia businesses are defined as small and they create the majority of new jobs, there is a special emphasis on building the capacity of these bold entrepreneurs."[4] The State maintains a resource directory for businesses at business.virginia.gov. Additional resources for technology education and implementation are available from the Virginia Center for Innovative Technology (CIT). CIT's mission is to accelerate Virginia's next generation of technology and technology companies.

ES2.1f Public Library

The Augusta County library system reported having to work with numerous providers at the different locations. Speed was a reported problem at Churchville. There is a planned switch from using 2-T1 lines to 75 Mbps at approximately one half the cost. Two (2) – T1 lines were also reported used between Fishersville and Middlebrook libraries. It was reported that the library system in Augusta County was found to be paying some of the highest costs for Internet service in the Commonwealth (Library of Virginia Report).

Typically, Library Internet access connections are shared between public users and staff to the library circulation system. The speed and quality of access within each library is subject to several factors: 1) the numbers of users accessing a single Internet connection, 2) the types of applications using the Internet bandwidth, 3) often slow processing capabilities of aging computers, and 4) location of the library facility (most in-town libraries have good Internet high-speed connections while more rural libraries struggle). As new applications, programs, and social media applications continue to grow, bandwidth can become strained and in need of updated faster computers.

Library hours *can limit access* by patrons who have no computer or Internet access at home, particularly students who need access to complete school assignments and job seekers. One *solution* to investigate is the possibility of

[4] Louisa M. Strayhorn, Director, Virginia Department of Business Assistance, *Connecting Businesses with Resources;* http://www.dba.state.va.us/about/default.asp

libraries being able to piggyback on government reduced pricing or arrangements with service providers for enhanced service.

ES2.1g Public Safety Education Resources

The need and study to address Emergency/Public Safety Radio Communications issues in the County are a separate initiative, but it was reported that there is a gap in having strong public safety response communications in the Craigsville area between Deerfield and Middlebrook on the west side of Interstate 81. The need to address Public Safety Communications needs could provide potential funding or cost sharing opportunities associated with communication towers or other vertical assets. The synergies between Broadband and Public Safety needs is addressed in more detail later within the report.

ES2.1h Healthcare

The hospital in Augusta County is located in Fishersville. It has been reported that the problem is not at the hospital but rather the *biggest obstacles* to healthcare related issues is in adequate bandwidth for remote diagnoses and consultation between medical professionals and doctor-patient, as well as keeping up with developing, storing and protecting the privacy of electronic medical records. The *solution* to Healthcare gaps is implementing overall better communications infrastructure, offering higher speed and more reliable bandwidth that can handle video imaging & large data transfer. Use of the Internet in the past 6 months included searching for health or medical information with 83.52%, ranked as the fifth highest use activity essentially tied with following social media (Facebook, Twitter, etc.) at 83.56%.

- **See Figure ES-I: Education, Public Safety, Health Care and Major Employers**

County Growth

All of these quality of life issues, schools and education, learning resources (libraries and distant learning), technology training and resources, growing businesses and job opportunities, and healthcare impact whether a region or County will grow and be prosperous or struggle and be stagnant or loss families and businesses. When reviewing the Comprehensive Plan and future growth maps of Augusta County, it is no surprise that typically growth occurs and is planned where public water and sewer treatment services exist, along major transportation routes, and employers have their facilities (essentially job centers and opportunities). Having high speed Internet and reliable cellular phone service are equally as important as these more traditional services in being attractive to both new businesses and families.

Augusta County recognizes that planning for high speed Internet and reliable cellular phone service must be a priority just as transportation and public services.

- **See Figure ES-J: Growth and Development Areas**

Figure ES-I: Education, Public Safety, Health Care and Major Employers

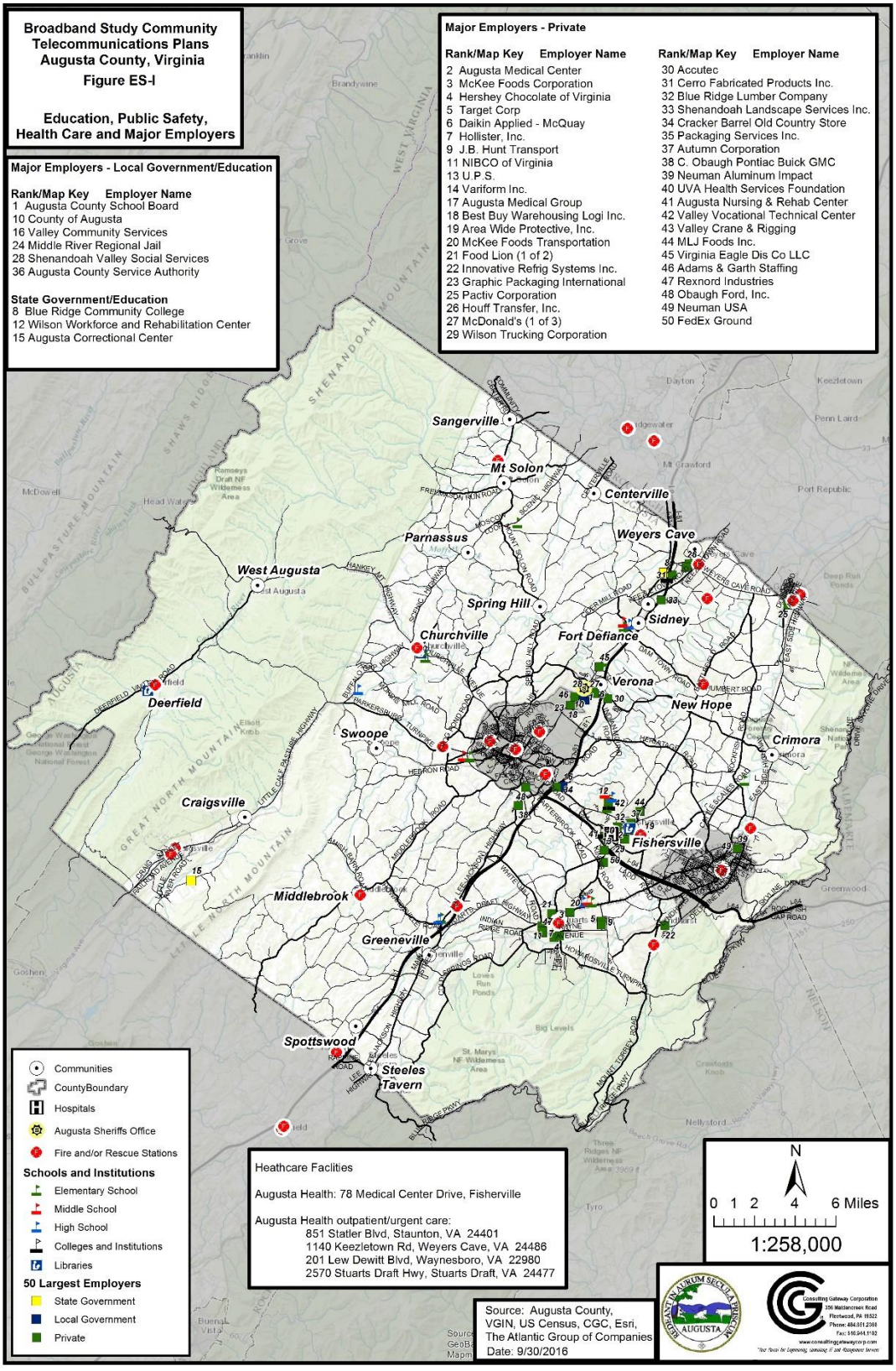
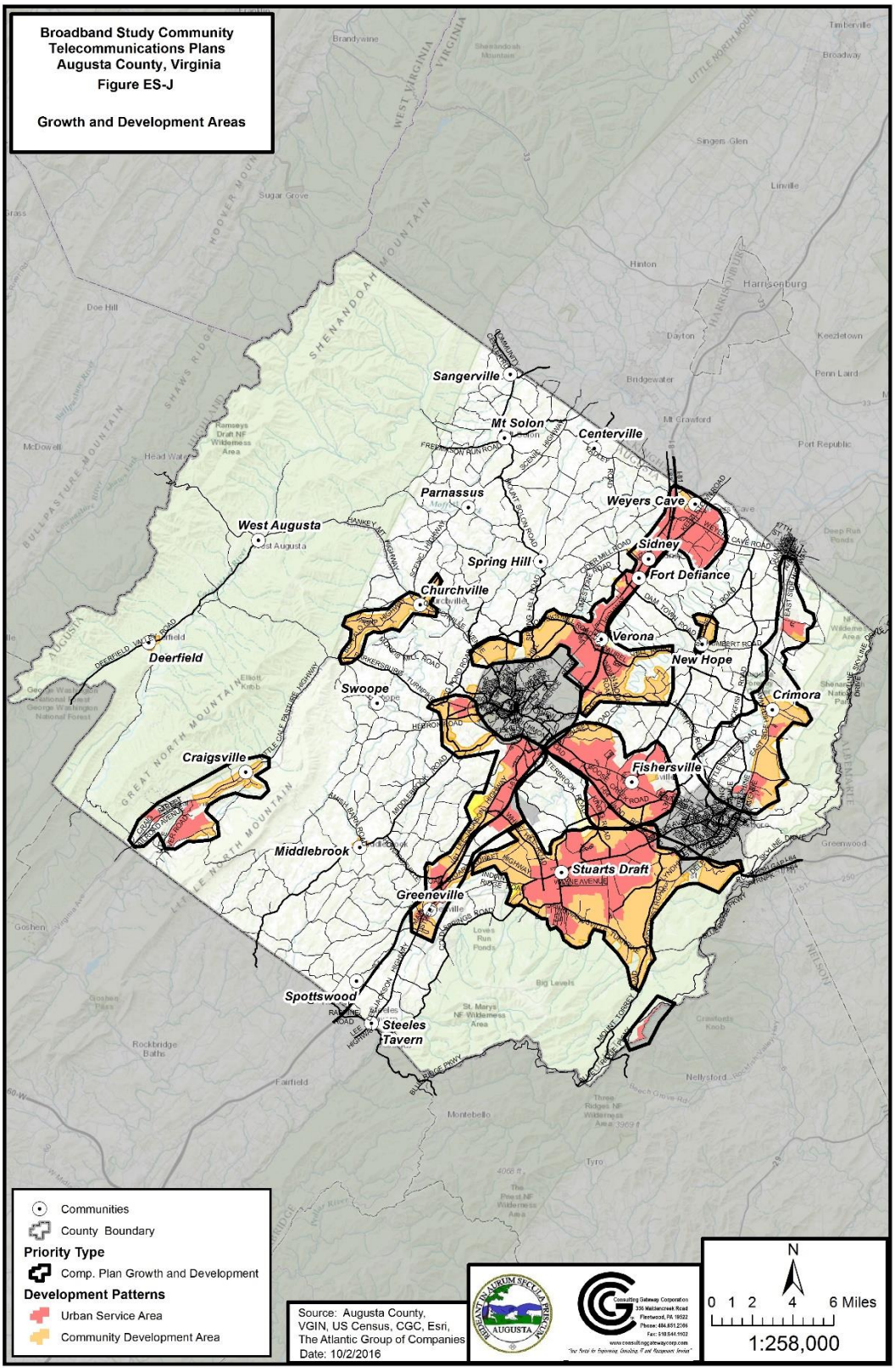


Figure ES-J: Growth and Development Areas



ES2.2 Additional Strategies to Consider

ES2.2a Community Intranet 'Portal'

Local information is still most commonly communicated by word-of-mouth, followed by radio and community newspapers. While this is typical for small towns in years past, it is inadequate today. A community network ('Portal') is a one-stop resource in an information age, whereby residents can access all community information. The county should have one portal, and all local governments should be encouraged to participate and update information frequently. Citizens should be encouraged to utilize their county portal as their start page, where they can get instant news and information. Opportunities for training, seminars and workshops should be featured along with upcoming community events. Key to the network's success are links to the school districts, community health providers, online learning sites, and local businesses, enticing users to explore and frequent the site. These sites should serve as the entrance to Economic Development information vital to those considering the county for a new business location. The County portal should be maintained by one entity, eliminating the need for each contributing source to possess the required technical capabilities. All local businesses should be represented and links to their web sites provided. Marketing is a critical component of a portal's success – locally and beyond. The current Eastern Shore Portal in VA (www.**virginiaeasternshoreportal**.com) is a good example to an intranet for access to community information.

ES2.2b E-Government

Large number of residents are turning to the Internet for news (88.54%), purchases (92.26% and 70.99% Major Purchases), travel (80.23%), and social media (83.56%) in past 6 months, as well as 75.00% have visited a government site. This represents an opportunity to promote e-government services. All municipalities should have a web presence, accessible from the community portal providing access to forms, online payments, meeting minutes, and contact information.

ES2.2c E-Commerce

Some portions of Augusta County are somewhat isolated geographically and do not have the benefit of commerce from those 'passing through'. It is critical for the region's businesses to be proactive in marketing their products and services. The Internet offers a tremendous opportunity to reach those who may never happen upon their business. Using the Internet for e-mails still remains the greatest use at 97.06%.

The community portal would provide a starting point for businesses to begin advertising online, with additional efforts aimed at educating businesses on the value of having their own website with a link from the portal. Home-based businesses should also be included on the portal in that the portal itself operates as a business incubator.

ES2.2d Training on Internet Use

Many residents and businesses are using the Internet without realizing the full advantages the Internet offers. There is sufficient interest among both residents and businesses to support training classes on selling goods and services on the Internet. Training should include hands-on workshops to actually place an item for sale on an online auction. Training should be aimed at businesses as to where and how to market their business online. A variety of computer and technology job skill training is available today at very low costs compared to private training providers. Entry level training should continue to be low to no-cost to encourage as many as possible to participate, and to reach many segments of the population. Libraries should organize opportunities for training classes that are Internet specific such as selling online and using search engines to conduct research. Volunteers are a critical component to filling training needs in the libraries or community centers, and municipal support is needed to advertise for trainers.

ES2.2e Lead by Example

Local businesses that have established websites are conducting commerce via the Internet, and those that have embraced technology are perfect spokespersons for educating others on the advantages of technology. Opportunities for business leaders to assist can be organized by the Chambers of Commerce, promoted through economic development workshops and marketed through the community portal. Local networking groups provide support for business success, and additional groups should be encouraged throughout the region. Networking groups are becoming popular among young business people who have become accustomed to social networking.

ES2.2f The Broadband Experience

Those who are subscribing to a broadband method of Internet access such as cable modem or DSL could not imagine going back to dial-up. Many residents were first introduced to the Internet at the workplace, and adopted Internet access at home primarily for email communication with family and friends. Many moved beyond applications such as email, to transferring digital pictures, and now online video. As the applications continue to evolve and more information becomes readily accessible, a greater value is placed on the speed of the connection.

In some areas of the country, municipalities who have led the way arranging for higher speed Internet access networks in their communities have made kiosks available in city halls/public buildings, local shopping mall exhibits, and at events for their citizens to see, feel and experience 'broadband'. Partnerships with local service providers should seek to create such opportunities for public demonstration to encourage broadband adoption where technology currently is available.

ES2.2g Encourage Local Provider Service Marketing

Too many businesses do not understand the value of Internet applications beyond email and research. Voice over Internet service offers an affordable alternative and few businesses with Internet access are taking advantage of this service today. It appears many businesses are aware of the security feature of using VPN (virtual private network) for remote access to their networks and sensitive information (12.99% reported using an VPN for employees to work from home). Many businesses are also interested in video conferencing, which functions optimally with a broadband connection. Local Internet providers offer services to support these applications. Service providers should tailor marketing of these products towards the region's businesses, with emphasis on the value these applications can potentially provide to the business.

ES2.3 Areas of Unmet Needs and/or Lack of Adequate Communication Infrastructure

There were a number of areas within Augusta County that were reported unmet needs and/or lack of adequate communication infrastructure. With cellular or mobile card service growing as a main stream access connection to the Internet, it is not surprising that many reports of no or unreliable cellular service and no or dissatisfied Internet overlapped. As a confirmation, while the previous Augusta County, VA Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services study completed by The Atlantic Group of Companies, Inc. was completed August 6, 2012, when mapping existing and potential tower or other vertical asset sites, many existing used sites were located in areas of the County where little problems were reported while many potential sites were located in areas of need.

Generally speaking, the areas of greatest needed focus in Augusta County consisted of the regions:

- Between Deerfield and West Augusta
- Craigsville and Deerfield/Middlebrook and Spottswood area-west of I-81 (reportedly same area where public safety communication gap exists)
- The large region both south and north of Swoope, northwest of I-81 from Middlebrook up to Sangerville

- Area around Spottswood
- Stuarts Draft, Fishersville and east to the County boundary
- Crimora corridor between I-64 north along Rt. 340 to the northern County Line.

The more populated town centers have access to the higher broadband speeds. Businesses and residents located outside of the town limits in the more rural sections report having unreliable service, service not available or too expensive, or no choice other than satellite and dial-up.

Proposed Wireline - Fiber Optic Cabling Solution Consideration

Because the Crimora corridor between I-64 north along Rt. 340 to the northern County Line is identified as a Growth/Development area and essentially the only such area where both Internet and Cellular service priority needs overlap, consideration of placing a fiber optic cable along this route could serve to accomplish growth, provide bandwidth and backhaul capabilities to a potential tower site in the region, and promote fiber connectivity to attract new businesses.

One location where fiber optic cabling consideration may be warranted is if a service provider wanted to use the Churchville Water Storage Tank with extending the fiber from the Buffalo Gap High School because of the fairly short distance required. Upon further analysis, this water tank has not been identified as a Primary or Secondary Potential Site, but that does not mean further consideration or interest by a service provider may occur in the future.

- **See Figure ES-K: Strategy Map with Potential Wireline - Fiber Solutions**

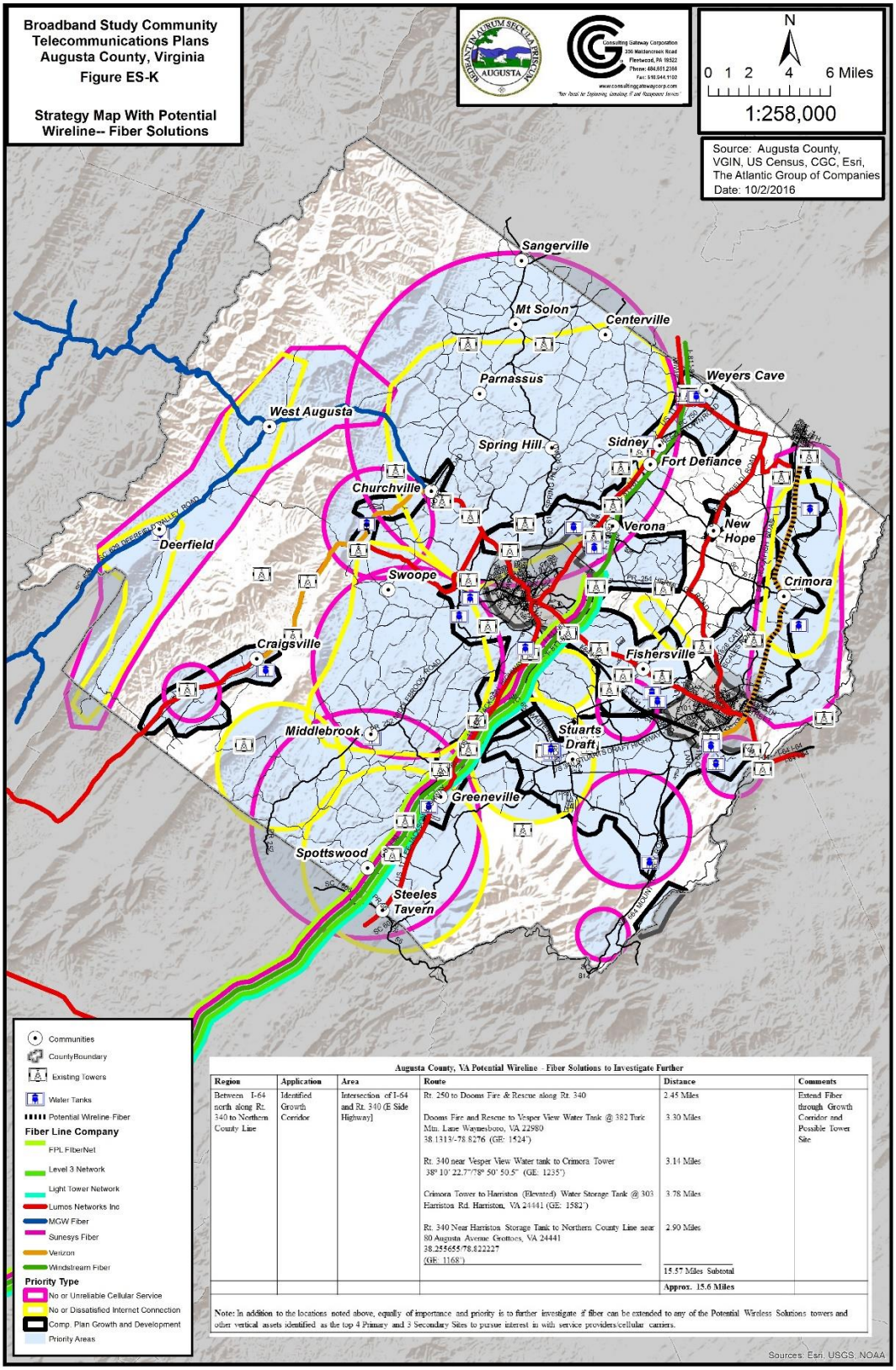
Proposed Wireless Solutions for Consideration

After investigating tower applications and permits, construction activity, and meeting with the County's wireless tower consultant, it is believed some of the ongoing tower planning and construction sites already being worked on will help eliminate some of the identified priority areas. In addition to potential tower sites previously identified by the wireless consultant, other sites warranting investigation would include property owned by the County and non-private party organizations such as water tank sites, school campuses, fire stations facilities, etc. Many times, but not in all circumstances, trying to attach antennae arrays or other equipment directly on tanks, buildings, or existing radio towers can create more problems than perhaps just building a new tower on the property of such facilities. Where wireless equipment should be located will have to be decided on a case-by-case basis.

On first pass, the potential sites warranting further investigation are listed on the following map. The proposed approach was to narrow down the list to a reasonable and more likely list of sites to pursue a model for implementation. Dewberry engineers who specialize in wireless technologies and towers investigated and conducted a preliminary assessment/feasibility review of each of the potential sites identified considering ingress/egress (access road conditions and length for new road if needed), number of housing units served on a conservative 2 mile radius of service, topology, distance to fiber, whether the property is privately or publicly owned, whether there is an existing vertical asset including water tank, etc. As a result, the original list of 34 sites was reduced to 7 sites from which 4 were further identified as Primary sites and 3 as secondary sites to pursue interest in from service providers/cellular carriers.

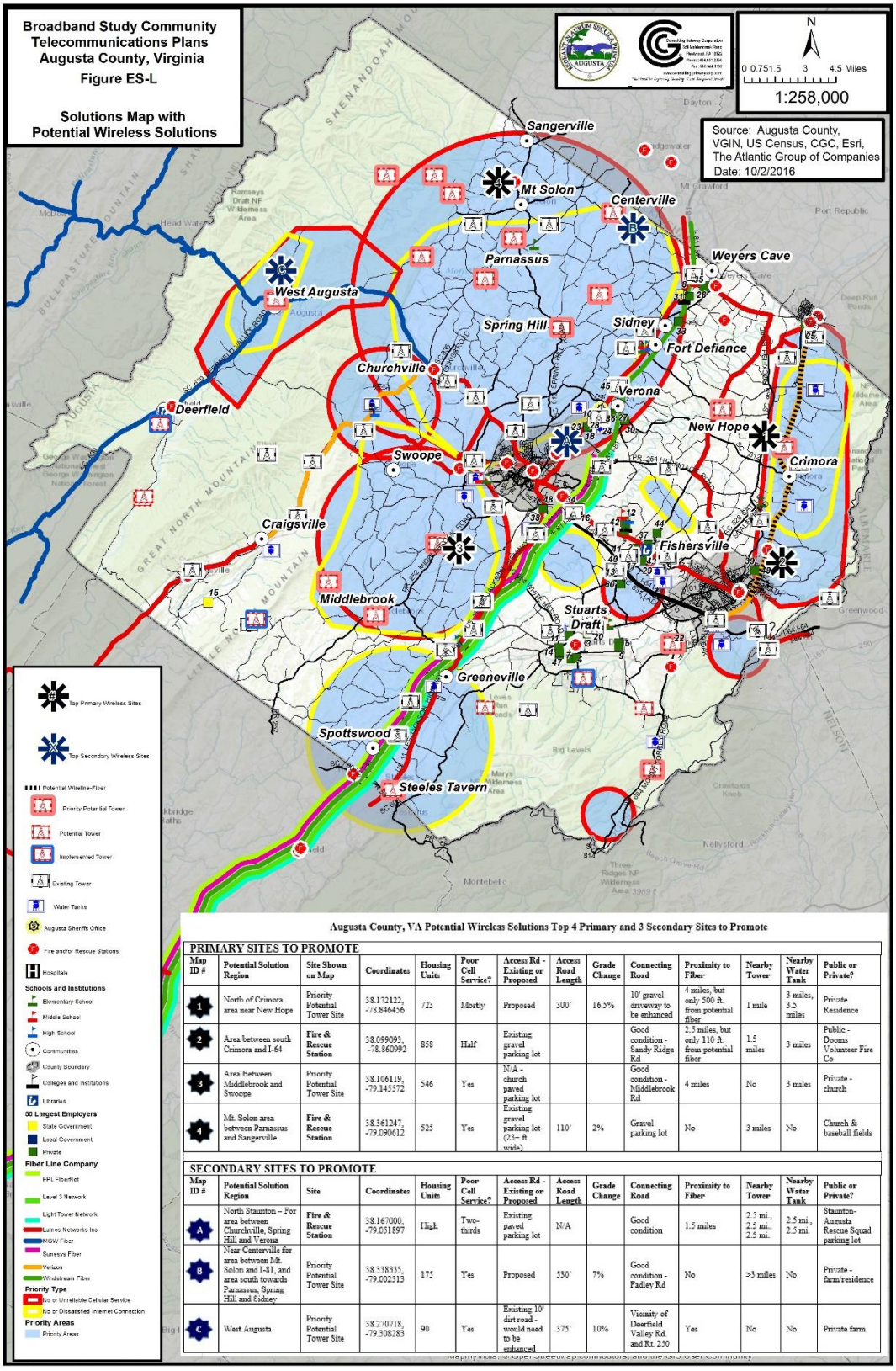
- **See Figure ES-L: Solution Map with Potential Wireless Solutions**

Figure ES-K: Strategy Map with Potential Wireline - Fiber Solutions



Augusta County, VA Potential Wireline - Fiber Solutions to Investigate Further					
Region	**Application**	**Area**	**Route**	**Distance**	**Comments**
Between I-64 north along Rt. 340 to Northern County Line	Identified Growth Corridor	Intersection of I-64 and Rt. 340 (E Side Highway]	Rt. 250 to Dooms Fire & Rescue along Rt. 340 Dooms Fire and Rescue to Vesper View Water Tank @ 382 Turk Mtn. Lane Waynesboro, VA 22980 38.1313/-78.8276 (GE: 1524') Rt. 340 near Vesper View Water tank to Crimora Tower 38º 10' 22.7"/78º 50' 50.5" (GE: 1235') Crimora Tower to Harriston (Elevated) Water Storage Tank @ 303 Harriston Rd. Harriston, VA 24441 (GE: 1582') Rt. 340 Near Harriston Storage Tank to Northern County Line near 80 Augusta Avenue Grottoes, VA 24441 38.255655/78.822227 (GE: 1168') _____ 15.57 Miles Subtotal	2.45 Miles 3.30 Miles 3.14 Miles 3.78 Miles 2.90 Miles	Extend Fiber through Growth Corridor and Possible Tower Site
				Approx. 15.6 Miles	
Note: In addition to the locations noted above, equally of importance and priority is to further investigate if fiber can be extended to any of the Potential Wireless Solutions towers and other vertical assets identified as the top 4 Primary and 3 Secondary Sites to pursue interest in with service providers/cellular carriers.					

Figure ES-L: Solution Map with Potential Wireless Solutions



Augusta County, VA Potential Wireless Solutions Top 4 Primary and 3 Secondary Sites to Promote

PRIMARY SITES TO PROMOTE

Map ID #	Potential Solution Region	Site Shown on Map	Coordinates	Housing Units	Poor Cell Service?	Access Rd - Existing or Proposed	Access Road Length	Grade Change	Connecting Road	Proximity to Fiber	Nearby Tower	Nearby Water Tank	Public or Private?
1	North of Crimora area near New Hope	Priority Potential Tower Site	38.172122, -78.846456	723	Mostly	Proposed	300'	16.5%	10' gravel driveway to be enhanced	4 miles, but only 500 ft. from potential fiber	1 mile	3 miles, 3.5 miles	Private Residence
2	Area between south Crimora and I-64	Fire & Rescue Station	38.099093, -78.860992	858	Half	Existing gravel parking lot			Good condition - Sandy Ridge Rd	2.5 miles, but only 110 ft. from potential fiber	1.5 miles	3 miles	Public - Dooms Volunteer Fire Co
3	Area Between Middlebrook and Swoope	Priority Potential Tower Site	38.106119, -79.145572	546	Yes	N/A - church paved parking lot			Good condition - Middlebrook Rd	4 miles	No	3 miles	Private - church
4	Mt. Solon area between Parnassus and Sangerville	Fire & Rescue Station	38.361247, -79.090612	525	Yes	Existing gravel parking lot (23+ ft. wide)	110'	2%	Gravel parking lot	No	3 miles	No	Church & baseball fields

SECONDARY SITES TO PROMOTE

Map ID #	Potential Solution Region	Site	Coordinates	Housing Units	Poor Cell Service?	Access Rd - Existing or Proposed	Access Road Length	Grade Change	Connecting Road	Proximity to Fiber	Nearby Tower	Nearby Water Tank	Public or Private?
A	North Staunton – For area between Churchville, Spring Hill and Verona	Fire & Rescue Station	38.167000, -79.051897	High	Two-thirds	Existing paved parking lot	N/A		Good condition	1.5 miles	2.5 mi., 2.5 mi., 2.5 mi.	2.5 mi., 2.5 mi.	Staunton-Augusta Rescue Squad parking lot
B	Near Centerville for area between Mt. Solon and I-81, and area south towards Parnassus, Spring Hill and Sidney	Priority Potential Tower Site	38.338335, -79.002313	175	Yes	Proposed	530'	7%	Good condition - Fadley Rd	No	>3 miles	No	Private - farm/residence
C	West Augusta	Priority Potential Tower Site	38.270718, -79.308283	90	Yes	Existing 10' dirt road - would need to be enhanced	375'	10%	Vicinity of Deerfield Valley Rd. and Rt. 250	Yes	No	No	Private farm

Augusta County, VA Potential Wireless Solutions Being Investigated *(Search in Vicinity of Coordinates)* ___ Top Seven (7) Potential Wireless Solution Sites After Analysis to Promote										
Status	**Potential Solution Region**	**Site**	**~ Latitude**	**~ Longitude**	**General Description**	**Comments**	**Housing Units**	**Poor Cell Service?**	**Access Rd. Length**	**Grade Change**
Implemented Towers	North & South of Deerfield	Deerfield Tower	38º 11' 10.351"	79º 24' 38.023"	289' Lattice Tower	County ECC Equip. on Tower				
	Between Craigsville, Middlebrook & Spottswood	Troxler Gap Tower (Also 2 other towers along Crawford Mtn. Ridgeline (AT&T Microwave & Rockford Co. VHF)	W79º 19' 17.40"	N38º 02' 50.00"	Tower Construction in Fall; County ECC Equip. on Top	Vertical Bridge				
	Stuarts Draft Region	Verizon Barterbrook Tower	38º 00' 37.90"N	79º 01' 18.71"W	190' Monopole 25 Campbell Lane Stuarts Draft, VA	Stuarts Draft – Concentrated Comcast service area – Cable Modem				
Previous or Current Sites Under Consideration	Stuarts Draft Region	Brenamin Lyndhurst Tower Site Miller Sherando Tower Site	38º 01' 38.19"N 37º 56' 34.8" N	78º 57' 21.751" W 78º 57' 48.1" W	195' Monopole 199' Monopole	Special Permit approved No Activity; AllTell				
	Between Swoope & Churchville	Buffalo Gap Mtn. Tower: 2171 Hewitt Rd. Swoope, VA	38º 10' 55.0"	79º 13' 38.0"	485' Guyed Wired Radio Tower	Potential Co-Location Site				
	West Augusta & S to Deerfield	Vertical Bridge W. Augusta Tower	36º 16' 34.5"	79º 18' 22"	240' Lattice Tower	Special Use Permit				
Potential Sites to Consider	Between Mt. Solon, Churchville & Spring Hill incl. Parnassus & Centerville	(7) Priority Potential Tower Sites	38°21'4.925"N 38°19'13.997"N 38°18'22.858"N 38°17'34.489"N	79°8'53.775"W 79°5'30.493"W 79°7'2.558"W 79°6'57.111"W		Stokesville Moscow Stribling Springs Parnassus	68 250 174 302	Half Yes Yes Yes	Prop. 98' Ex. 1300' Prop. ›1000' Prop. 150'	26% 8% 1.50% 22%
	(Near Centerville for area between Mt. Solon and I-81, and area south towards Parnassus, Spring Hill and Sidney)		38°20'18.005"N 38°15'26.484"N 38°16'48.872"N	79°0'8.325"W 79°2'52.922"W 79°0'53.323"W		Centerville Spring Hill Roman Road	175 392 326	Yes Yes Yes	Prop. 530' Prop. 340' Prop. 733'	7% 5% 7.5%
	(Mt. Solon area between Parnassus and Sangerville)	(4) Fire & Rescue Stations Sites	38°21'40.488"N 38°13'34.471"N	79°5'26.204"W 79°9'49.81"W	Church & BB Fields Yes-Proximity to Fiber	Mt. Solon Churchville	525 537	Yes Yes	Ex. 110' Prop. 25'	2% 4%
	(North Staunton – For area between Churchville, Spring Hill and Verona)	(3) Water Tank Site (1) School Sites	38°10'1.2"N 38°9'34.546"N 38°12'2.137"N 38°15'40.691"N 38°11'8.108"N 38°18'58.703"N	79°3'6.83"W 79°5'50.294"W 79°1'56.789"W 78°57'58.016"W 79°0'47.435"W 79°4'23.634"W	1.5 mi to Fiber 1 mi to Fiber 1 mi to Fiber ‹ 0.25 mi. 0.75 mi. Approx. 0.25 mi. East of Elem. School	Staunton Rescue Squad Lot Staunton Fire & Rescue Verona Mt. Sidney Mill Place-Priv Shamrock Farm N. River Elementary School	High High High 582 High	Two-thirds Mostly Yes Mostly Two-thirds	Ex. Paved Lot Prop. 65 Ex. 114' Ex. 100' Ex. 1000' Prop. 250'	 14% 15% 18% 0.50% 11%

	West Augusta & South towards Deerfield	(1) Priority Potential Tower Sites [In W. Augusta & North of W. Augusta]	38°21'53.218"N 38°21'51.997"N	79°12'27.581"W 79°9'48.908"W	Near Girl Scout Council	Todd Lake Rec. Camp May Flather	38 524	Half Mostly	Ex. 40'	22%
	Between Swoope & Churchville	(1) Water Tank Site (1600 Buffalo Gap Highway) (1) School Site (Buffalo Gap High School)	38°12'4.83"N 38°11'47.248"N	79°13'8.406"W 79°12'58.644"W	550' to Fiber 1,000' to Fiber	Churchville Water Tank Priv. Farm? next to Buffalo HS	495 495	Yes Yes	Ex. 550' Prop. 80'	12% 0.25%
	Spottswood and Steeles Tavern	(1) Priority Potential Tower Site	37°55'34.715"N	79°11'50.467"W	1,200' to Fiber	Steeles Tavern-Private Farm	280-Half supports Rockbridge	Mostly	Prop. 1000'	0.50%
	Mount Torrey Rd. (South pt. of County)	(1) Priority Potential Tower Site near road along north (1) Water Tank Site near road along north	37°56'31.716"N 37°57'43.872"N	78°57'51.312"W 78°57'42.949"W	Private? Do not see tank	Sherando Sherando Water Storage	285 354	Partially; Not in poor cell Half; Not in poor cell	Ex. 70'	10%
	Between Stuarts Draft and Fishersville	(2) Fire & Rescue Stations Sites (2) Water Tank Site (1) School Sites	38°5'45.162"N 38°5'38.712"N 38°4'55.82"N 38°4'33.962"N 38°2'46.114"N	78°59'13.923"W 78°57'35.366"W 78°57'38.023"W 78°57'20.029"W 79°0'43.89"W	‹ 0.5 mi. to Fiber 180' to Fiber 1 mi. to Fiber 1 mi. to Fiber 4 mi. to Fiber	AMC Rescue Yancy Fire Dept. Fishersville Water Tank Hickory Hill Water Tank Stuarts Draft High School	1,223 926 1150 1200 1105	Partially Partially Partially Partially Partially	Ex. Paved Lot Ex. Paved Lot Ex. 2000' Ex. 15'DW Ex. Park Lot	2%
	New Hope and Crimora (North of Crimora area near New Hope and Area between south Crimora and I-64)	(1) Priority Potential Tower Sites (1) Fire & Rescue Stations Sites (2) Water Tank Site (1)School Site	38°10'19.638"N 38°5'56.736"N 38°12'48.584"N 38°7'50.502"N 38°8'0.374"N	78°50'47.243"W 78°51'39.572"W 78°49'6.371"W 78°49'42.042"W 78°52'0.718"W	4 mi.; 500 ' Pot. Fiber 2.5 mi.; 110 ' Pot. Fiber 1 mi. to Pot. Fiber 1 mi. to Pot. Fiber	Crimora – Private Residence Dooms Fire Dept. Harriston Water Tank Vesper View Water Tank Hugh Cassel Elem.	723 858 502 640 515	Mostly Half Yes Yes Half	Prop. 300' Ex. Park Lot Ex. 1000' Prop. 27'	16.50% 1.70% 7%
	West Augusta	(1) Priority Potential Tower Site	38.270718	79.308283	Yes-Proximity to Fiber	Private Farm	90	Yes	Ex. 375'	10%
	Area Between Middlebrook and Swoope	(1) Priority Potential Tower Site	38.106119	79.145572	4 mi. to Fiber	Private Church	546	Yes	Ex. Park Lot	
	TOTAL SITES BEING INVESTIGATED	**14 Tower Sites + 7 Fire & Rescue Stations Sites + 9 Water Tank Sites + 4 School Sites = 34 Total Sites**								

Common sense would dictate that it is impractical to believe so many vertical asset sites would be developed and therefore these Potential Wireless Solution sites were evaluated against typical site engineering criteria to narrow-down the list and arrive at the top sites where there would be the largest return on investment (not necessarily just monetary return, but where there would be lower costs to develop, more housing units served, good elevation and/or Line of Site (less interference), close proximity to fiber, etc. The list of sites was evaluated based on the following criteria and considerations:

- Number of dwelling units served on a conservative 2-mile radius of service
- Is it currently in a poor service area?
- Access road conditions for new and/or existing
- Access road length for a new road
- Topography
- Condition of existing main road to the property
- Distance to fiber
- Is the property already publicly owned?
- Is there an existing water tank to be used for collocation in lieu of constructing a new tower?

Upon completion, the top sites to continue to pursue interest in from service providers/cellular carriers were identified and prioritized (See the following table). While implementation of potential solutions and goals is not within the scope and purpose of this study, the following actions are recommended to achieve identified goals and continue to investigate and implement proposed solutions recommended:

Wireless Potential Solutions

1. Tour each of the sites to identify list of amenities and obstacles to development
2. Take the list of top potential wireless sites and develop a simple one-page site features specification so service providers can quickly preview if the site may have interest to them in pursuing.
3. Determine what role the County will play and what expense the County is willing to make.
4. Include incentives such as a site being non-privately owned (County or fire department/rescue owned); County willingness to construct a simple and short distance access road; considerations of zoning variances where practical and needed; perhaps the County cost sharing in other areas such as environmental assessment, permitting, fiber build, lighting, co-location facility is available, etc.).
5. Work with tower site brokers and others (such as tower management firms) to promote and solicit interest from service providers regarding the sites.
6. Invite Service Providers to tour the sites with the County.
7. Investigate and pursue the legal avenue to establish a formal (if need be) or informal Public-Private-Partnership (i.e., public procurement, entering into agreement, funding opportunities, etc.).

Wireline Solutions (Including Fiber Optic Locations)

1. Determine what role the County will play and what expense the County is willing to make.
2. Continue to investigate where and what is would take to get the service providers to extend DSL and cable modem service.
3. Look into building/arranging/swapping/leasing fiber to towers and other vertical assets where there is interest.
4. Discuss with service providers locations where a small fiber connection would push a project to go further that otherwise would not.
5. Pursue funding opportunities for middle and last mile fiber build projects.

Augusta County, VA Potential Wireless Solutions Top 4 Primary and 3 Secondary Sites to Promote

PRIMARY INITIAL SITES TO PROMOTE

Map ID #	Potential Solution Region	Site Shown on Map	Coordinates	Housing Units	Poor Cell Service?	Access Rd - Existing or Proposed	Access Road Length	Grade Change	Connecting Road	Proximity to Fiber	Nearby Tower	Nearby Water Tank	Public or Private?
1	North of Crimora area near New Hope	Priority Potential Tower Site	38.172122, -78.846456	723	Mostly	Proposed	300’	16.5%	10' gravel driveway to be enhanced	4 miles but only 500 ft. from potential fiber	1 mi	3 mi, 3.5 mi	Private Residence
2	Area between south Crimora and I-64	**Fire & Rescue Station**	38.099093, -78.860992	858	half	Existing gravel parking lot			Good condition - Sandy Ridge Rd	2.5 miles but only 110 ft. from potential fiber	1.5 mi	3mi	Public - Dooms Volunteer Fire Co
3	Area Between Middlebrook and Swoope	Priority Potential Tower Site	38.106119, -79.145572	546	yes	N/A - church paved parking lot			Good condition - Middlebrook Rd	4 mi	NO	3 mi	Private - church
4	Mt. Solon area between Parnassus and Sangerville	**Fire & Rescue Station**	38.361247, -79.090612	525	yes	Existing gravel parking lot (23+ ft. wide)	110’	2%	Gravel parking lot	no	3 miles	no	Church & baseball fields

SECONDARY SITES TO PROMOTE

Map ID #	Potential Solution Region	Site	Coordinates	Housing Units	Poor Cell Service?	Access Rd - Existing or Proposed	Access Road Length	Grade Change	Connecting Road	Proximity to Fiber	Nearby Tower	Nearby Water Tank	Public or Private?
A	North Staunton – For area between Churchville, Spring Hill and Verona	**Fire & Rescue Station**	38.167000, -79.051897	HIGH	Two-thirds	Existing paved parking lot	n/a		Good condition	1.5 mi	2.5 mi, 2.5 mi, 2.5 mi	2.5, 2.5	Staunton-Augusta Rescue Squad parking lot
B	Near Centerville for area between Mt. Solon and I-81, and area south towards Parnassus, Spring Hill and Sidney	Priority Potential Tower Site	38.338335, -79.002313	175	yes	Proposed	530’	7%	Good condition - Fadley Rd	no	>3 miles	no	Private - farm/residence
C	West Augusta	Priority Potential Tower Site	38.270718, -79.308283	90	yes	Existing 10' dirt road - would need to be enhanced	375’	10%	Good condition - Jackson River Rd	YES	NO	NO	Private farm

ES3.0 Last Mile Connectivity Options

ES3.1 Service Provider Meeting Input:

From the service provider data, maps and meetings the following relevant input was obtained:

- **Number 1 obstacle to offering or significantly improving Broadband service is enhancing last mile connectivity technology and last mile cost and build.**
- While some fiber locations are shown on the maps, undoubtedly there is more fiber within the study area than found.
- Lumos Networks, MGW, Verizon, Shentel and others are currently constructing fiber in the County.
- At least two (2) retail services providers serving within the study area (MGW, and New Hope Telephone Cooperative), expressed interest in potentially partnering with the County on preparing and submitting a funding application for infrastructure construction related costs.
- There was some discussion regarding whether a wireless solution will have potential interference issues, as well as doubt whether wireless solutions will be able to keep-up with the ever changing broadband speed requirements for broadband of the Federal Communications Commission (FCC).
- There was some expressed concern over the reported Radio Quite Zone requirements of the National Radio Astronomy Observatory, Green Bank, WV site located outside the County.
- Some of the Internet services providers within the study area indicated future business plans includes offering Fiber-to-the-Home (FTTH)/Fiber-to-the-Premise (FTTP) service, however in most areas building FTTX technology is years away because of cost to both the service provider and end-user and limited access options.
- A liaison (Augusta County) between the end-users and the service providers could bridge the gap between lack of communication and/or knowledge of options available between the parties.
- The best way the county can assist the service providers in enhancing Internet last mile connectivity is to ***share information collected through this study*** and ***assist in structuring low interest financing and cost sharing or structuring last mile connectivity solution options.***

Service Provider Response as to Ways the County Can Help Expedite Improvement:

Low Interest Financing Options – *Assist in structuring low interest financing*

Strategies:

a) Use county resources to help service providers prepare program funding applications.
b) Discuss with the Commonwealth issuing bonds to underwrite telecommunications implementation programs.
c) Seek cost sharing and cost shifting solutions such as offering colocations, antennae mounting facilities, tower construction, fiber builds, etc.

Middle Mile Connectivity – *Assist in cost sharing or structuring middle mile connectivity solution options*

d) Leverage the Emergency Radio Communications Improvements Initiative to cost share a tower site to serve the Craigsville area between Deerfield and Middlebrook (reportedly same area where public safety communication gap exists). Perhaps also cost share the expense of attaching broadband communications equipment on other towers being utilized and being built. Today, most Emergency Response personnel want more than radios to communicate including texting, cell phones, use of tablets, etc.
e) Investigate the merits of partnering with a service provider to accomplish building middle mile fiber to serve the Crimora corridor between I-64 north along Rt. 340 to the northern County Line.

Last Mile Connectivity – *Assist in cost sharing or structuring last mile connectivity solution options*

Strategies

f) Assist the Service Providers and end-users communicate and enter into discussion regarding potential service options and arrangements. At least one service provider indicated if they knew which survey responses indicated no service or dissatisfied service in their service territory, they could reach out to those end-users. The County and consultants do not release or share survey respondent names, addresses or the surveys themselves, but the County could set up an office or assign a person to assist in getting the end-user and service provider into discussions using the maps and data collected, if requested by the end-user.

g) Establish a limited time CPE (Customer Premise Equipment) and/or Last Mile Connection cost supplementation (subsidy) program in exchange for service contract commitment.

h) Work with the electric and telephone cooperatives, as well as service providers to establish middle mile and last mile networks' interconnection locations.

Service Provider Meeting Observations Towards Potential Last Mile Solution Consideration:

- Electric and/or Telephone Cooperatives are Non-Profit Organizations created to benefit the members.
- Because cooperatives are owned by the members its serve, it is very difficult politically to disproportionately offer certain type services within one area of the cooperative and not others.
- New Hope Telephone Cooperative has underground infrastructure within approximately 7-mile radius of New Hope in Augusta County.
- New Hope Telephone Cooperative expressed interest in potentially partnering with the County on preparing and submitting a funding application for infrastructure construction related costs.
- MGW expressed interest in potentially partnering with the County on preparing and submitting a funding application for infrastructure construction related costs to better serve the Craigsville area between Deerfield and Middlebrook (reportedly same area where public safety communication gap exists).
- Some service providers expressed a yearly pole use fee (typically $30-$40 per year) would greatly impact the return on any aerial investment made.

ES3.2 County Meetings Observations Leaning Towards Potential Last Mile Solution Consideration

- The County would prefer not to own or operate network infrastructure of facilities.
- While the County may be willing to make some manageable investment into enhancing Internet access within the County, without being a service provider there would be little monetary return on such an investment and Broadband it is just one of many infrastructure projects needing funding.
- ***A sliding scale of options*** to address enhancing Internet Connectivity should be presented so the elected officials in the county can consider their comfort level in moving forward.

ES3.3 Collaboration Partners and Projects

There are several reasons for the private sector to consider a collaboration with the public sector on projects including:

Monetary Incentives

- Access to Government Funding
- Enhanced Funding for Regional Projects
- Cost Sharing in Design and Construction in Expanding Infrastructure

Regulatory Incentives

- North American Electric Reliability Corporation (NERC) as the Electric Reliability Organization (ERO) Energy Policy Act of 2005 **Reliability Standards – Critical Infrastructure Protection** (CIP Standards 001 through 009) security of cyber assets essential to the reliable operation of the electric grid using fiber for:

- ✓ SCADA Systems (Remote Monitoring & Control) and Smart Grid Applications
- ✓ Cameras and Motion Detection Security Enhancements
- ✓ RFID Access/Retina Scan Access to Facilities

Infrastructure Assets

- Expanding infrastructure use through dark fiber leasing, co-location,

Service Enhancements

- Extending Carrier's Carrier Services (Long-Haul, Back-Haul Transport)
- Addressing Service Provider Reliability and Redundancy Needs
- Offering New or Improving Existing Wholesale and Retail Voice, Video and Data Services

ES3.4 Last Mile Connectivity Considerations

There was little to no request or expressed need for middle mile fiber or other infrastructure to be built from Service Providers. Since some of the service providers indicated their long range business plan includes a FTTX solution, what was requested by the consultants of the service providers with only limited response was to provide a map of their service area, infrastructure and indicating where cabinets can be placed (or exist) for the interconnection point in all the neighborhoods being served or planned to be served between the service provider distribution network and the customer FTTH/FTTP customer last mile access connection network, as well as what last mile connection average price point if paid by customer/other would expedite the schedule for more FTTH/FTTP service. Because there was limited response to such a request, the strategy of potentially building interconnection points between the middle mile and last mile networks was eliminated as a potential strategy. If in the future there is interest by a service provider on such a proposal, whether the last mile when constructed is aerial (from pole line) or underground, cabinets placed on the ground to avoid service provider facilities on pole lines would probably more favorable to the ISPs. Since the cooperatives are nonprofit and exist to the benefit of its members, perhaps the customers themselves through the Cooperatives would have more success in getting last mile access to the property off the poles (at no or much more reduced attachment fees) than for-profit service providers**. Since in many locations it will be years before the service providers build FTTH/FTTP last mile access, then perhaps the County may want to seek funding to expedite some type of wireless last mile solution, perhaps with (or without) a small fiber build to feed and backhaul off the towers.**

While the County would prefer the service providers build the access network and the County not own and operate infrastructure, they may be unwilling to wait years with an unknown, uncommitted timeline for such build to occur. **What is being proposed is the County and service providers cooperate and work together to address the most difficult obstacles identified, enhancing wireless middle mile and/or last mile connectivity technology.** When and if the County finds itself participating in infrastructure costs, the consultants recommend the County's money be invested in the long-term service life of infrastructure, such as fiber, towers, etc. It is recommended the County not invest in electronic equipment that has to be replaced every 5-7 years. The one exception to not investing in electronic equipment may be some form of cost subsidy program in Customer Premise Equipment (CPE) to help low to moderate income families receive a wireless solution. Perhaps the County could participate in or apply resources to seek initial funding of such a program. Some Counties default to owning towers on County owned land (or just being the landlord with another party owning the tower), and not the equipment on the tower. Reasonable revenues can be realized if tower site lease agreements and/or co-location agreements are properly negotiated.

In lieu of participating in construction costs, there are other roles and areas of infrastructure the County could play such as a funding application partner/administrator, help offset engineering assistance, expedite plan review approval and

permitting, help mitigate environmental review costs, participate in land lease identification and discussions with property owners, and more. Regardless of what solution if any the County would decide to pursue, the information collected, analyzed, and reported within this document can be used provide credibility as to need, priorities, potential solutions and to expedite seeking funding to aid the service providers in building the last mile.

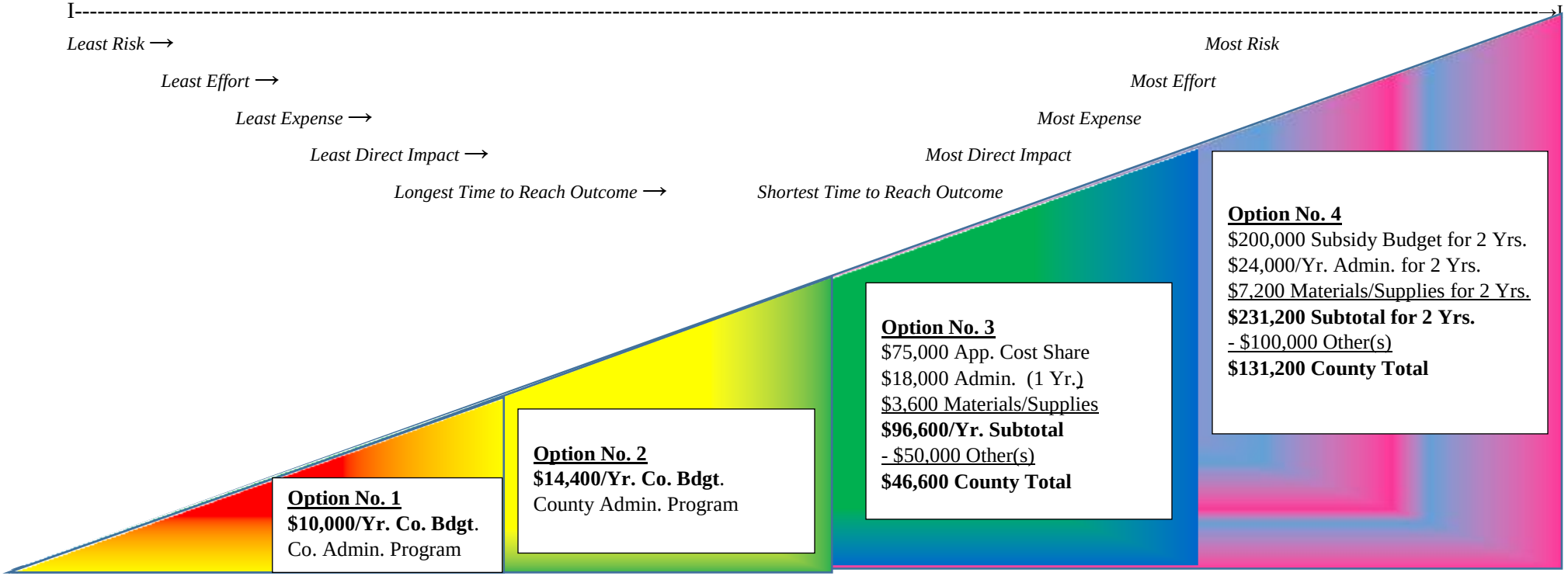
ES3.5 Last Mile Connectivity Solutions

From both service provider input, as well as feedback from the Augusta County Project Management Team, the following summarizes the basis for forming the recommendations for connectivity solutions.

ES3.5a Middle Mile/Last Mile Solution – Ten (10) Step Summary

1) Create the Augusta Internet Initiative County Assistance Program *(Augusta Internet Initiative CAP)* to be the liaison between the end-use customer and service provider.
2) Encourage extension of existing infrastructure to capture more customers or improve existing service such as DSL/DSA, cable modem areas, wireless or fiber FTTX service.
   (a) Pursue further discussions with New Hope Telephone Cooperative and MGW (2 service providers who stepped up with specific requests and proposed projects) regarding partnering with the County to address infrastructure project. Shentel often works with MGW and also indicated they would probably be willing to participate where MGW needs Shentel services. [There is a unique funding opportunity coming up (2016 Virginia Acts of Assembly-Chapter 780) in which seed money will be made available towards private sector network construction activity by working with the public sector (County)].
3) Set-up both financing application assistance programs for service providers and cost subsidy programs for customers' equipment and/or middle/last mile connection.
4) If need be form a Virginia Allowed Wireless Broadband Authority to undertake building/operating or managing municipal telecommunications assets.
5) If a VA Wireless Broadband Authority can't get adequate funding, the formation of a Telecommunications Cooperative could be investigated to leverage funding opportunities, focus on interested parties willing to make an investment in their telecommunications services, and take a more active role where limited and allowed of municipalities.
6) Continue to pursue the wireless towers identified as needed and seek wireless Internet Service Providers (ISPs), perhaps through some form of Public-Private-Partnership (see King and Queen County, VA initiative) to attach equipment and/or cost share expense.
7) Continue to discuss with cellular service providers potential use of the wireless towers (existing or proposed) to enhance cellular service and broadband from these providers through the issuance of a Request for Proposal (RFP).
8) If the service providers do not step up to build last mile connectivity solutions, form a Wireless Broadband Authority to build such solutions on a case-by-case basis to allow middle mile and last mile network solutions.
9) If the County ends up building and owning infrastructure, the County should develop a Network Governance Doctrine to address network use issues and ensure a level playing field.
10) Endorse and support any one or combination of the above options that the County are comfortable with in order to continue action in the community for improving Internet, Emergency Response Communications, Cellular Coverage Service and overall telecommunications service applications in the communities.

ES3.5b Augusta County, VA Menu of Solution Options



Market Existing and Potential Sites	Augusta Internet Initiative CAP	Network Extension Funding PPP	CPE/Last Mile Cost Subsidy
Marketing Sites & Other Assets	*Communication Assistance Program*	*Get Middle/Last Mile Where Not Existing*	*Assisting Connecting Customers*
Promote/Seek Interest from Service Providers	*Liaison Between Customer & Provider*	*DSL/DSA, Wireless, Fiber Extension*	*Cost Subsidy for Eligible Applicants*
1. Hire Consultant for Assistance/Negotiations	1. Take & Investigate Service Claims	1. Aggregate Demand	2. Discuss Funding w/VA, ARC, etc.
2. Develop Marketing Portfolio of Assets	3. Work w/Provider on Solution	2. Encourage to Extend Middle/Last Mile	2. Establish Eligibility Criteria
3.Hire tower broker-solicit interest from Providers	1. Work with Customer on Contract	3. Define Scope & Return on Investment	3. Verify Credibility of Cost
4. Determine what role if any County would play	5. Assess Price Fairness	4. Cost Share Funding Applications	4. Determine Provider Share
5. Prepare RFP to incorporate provisions	2. Recommend Eligibility for Other Solutions	5. Plan for Future Technology	5. Determine Customer Share
6. Solicit/Award RFP	3. Secure Commitments from all Parties	6. Evaluate Formal vs. Informal PPP	6. Design Refunding Formula
7. Administer Arrangement	8. Provide Assistance with Other Solutions	7. Ensure Commitment for Muni $	7. Administer Program
Project Management Team	**County/Proj. Mgmt. Team**	**Co./Proj. Mgmt. Team**	**Co./Proj. Mgmt. Team**

ES4.0 Preliminary Engineering, Design & Cost Estimates
(Design & Cost details addressed in Section 1.4)

ES4.1 Proposed Last Mile Connectivity Solutions with Preliminary Cost Estimates

ES4.1A - OPTION NO. 1: MARKET EXISTING & POTENTIAL SITES/ASSETS

Premise: Marketing Sites and Other Assets in the County

Description: Promote and seek Interest from Service Providers of existing and potential sites and assets

Approach: As part of the grant for this study, the County was required to have a matching share of $10,000 towards these planning efforts. Experience of the consultants from similar projects is that it is difficult for the County to communicate directly with large cellular carriers (Verizon, Sprint, AT&T, etc.) regarding if there is any interest in existing and potential tower/vertical asset sites, as well as to communicate with wireline connection service providers (cable modem, DSL, FTTX, WISP, etc.). Recognizing that significant and important information has been collected, analyzed, displayed, discussed and reported on, the next logical step would be to distribute, market and more formally seek interest from these types of service providers. There are firms that act like brokers of sites and assets to service providers that can get the attention of these companies that is difficult to get by the County or even engineering consultants. These broker like companies deal directly with service providers, tower management companies, field engineers and others that have direct input in the decision process of the service providers.

ES4.1B - OPTION NO. 2: AUGUSTA INTERNET INITIATIVE CAP

Premise: Augusta Internet Initiative Communications Assistance Program

Description: Liaison between Customer & Service Provider

C3 Approach:

Some end-users are claiming there is no Internet access to them and/or too expensive while some service providers are stating Internet access is available in their service area. Augusta County should develop an Internet Initiative ***Communications Assistance Program*** (CAP) to assist the end-user or service provider recognize their position is incorrect and whichever party is incorrect, take steps to document there is a real commitment by the party to move forward with either service sign-up or infrastructure build.

Challenge	• Investigate End-User claims no Internet access option is immediately available. • Investigate Service Providers claim Internet access options are available at speeds advertised in their service areas.
Commitment	• Document commitments from property owners claiming no Internet access option exists to subscribe to service if made available. • Push to get a fixed timeline for providing Internet access to end-users with no Internet access option, as well as a fixed timeline for providing FTTX throughout from the service providers.
Control	• If immediate access is not available or service providers are unwilling to make an acceptable good faith commitment, then Augusta County should take control to address the shortcoming.

ES4.1C - OPTION NO. 3: *NETWORK EXTENSION FUNDING PPP*

Premise: Getting middle mile/Last Mile where not existing or improving where exists

Description: Extending DSL/DSA, Wireless, Fiber where not existing

Approach

Service Providers indicated two (2) actions the County could take to assist in enhancing broadband service in the County is assist in securing lower interest or better terms financing, and assist in overcoming the middle mile and/or last mile and connectivity obstacles. The County has access to potential financing sources that the service providers may not have and/or the County could provide resources and/or help cost share a funding application if the return on such an investment is worthwhile. The return on investment to the County would not likely be monetary, but rather increased number of residents and businesses able to get connected.

Shortly (before end of year) the Commonwealth will be opening applications for the Virginia Telecommunications Initiative 2016 Virginia Acts of Assembly – Chapter 780. The Virginia Department of Housing and Community Development (DHCD) will be implementing the Virginia Telecommunications Initiative (VATI). The goal of VATI is to create strong, competitive communities throughout the Commonwealth by preparing those communities to build, utilize, and capitalize on telecommunications infrastructure. Consistent with the enabling legislation, DHCD will award the $1.25 million appropriation to eligible applicants to provide Last-Mile services to Unserved areas of the State. However, there is no specific maximum dollar amount attributable to FY 2017 funding and the DHCD reserves the flexibility to award any amount, depending entirely on the quality and quantity of applications received. **The primary objective of the VATI is to provide financial assistance to supplement construction costs by private sector broadband service providers to extend service to areas that presently are unserved by any broadband provider. Applications must be submitted by a unit of government (Towns, Cities, Counties, EDA/IDA, Broadband/Wireless Authorities, Planning District Commissions, etc.) with a private sector provider(s) as a co-applicant.**

Being that the County has received interest from New Hope Telephone Cooperative (1 of 2 service providers who stepped up with a specific request and proposed project) in partnering with the County to address an infrastructure project, and interest from MGW (2 of 2 service providers who stepped up with a specific request and proposed project) in partnering with the County to address an infrastructure project, the County should continue to pursue such a funding application PPP. Shentel often works with MGW and also indicated they would probably be willing to participate where MGW needs Shentel services. The MGW proposed project is intended to address the Craigsville area between Deerfield and Middlebrook (reportedly same area where public safety communication gap exist). The New Hope Telephone Cooperative would address their current service area needs.

ES4.1D - OPTION NO. 4: *CPE/LAST MILE COST SUBSIDY*

Premise: Assisting customers get connected by partially subsidizing a portion of the Customer Premise Equipment (CPE) or last mile connection cost.

Description: Develop parameters for participation and provide cost subsidy for eligible applicants.

Approach

Two (2) big reasons for no Internet connectivity occurring is cost of customer equipment and last mile build. This option is intended to assist in providing a partial subsidy to eligible county residents faced with financial challenges

and/or unusual CPE and/or last mile connectivity costs in exchange for a multiyear service contract commitment.

ES4.1E -*FIBER AND/OR WIRELESS NETWORK BUILD*

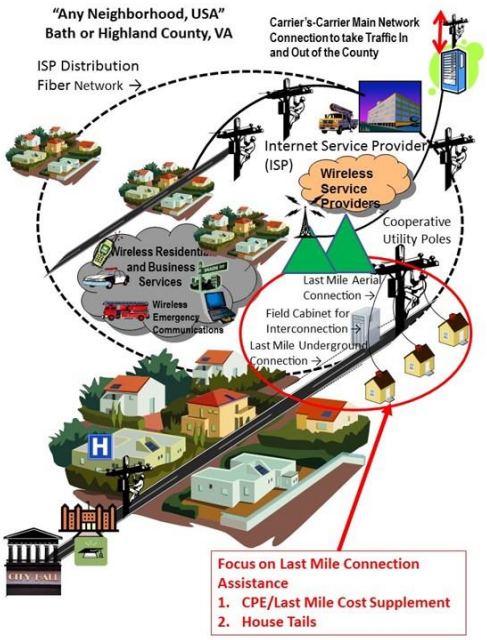
While a *Network Build Option* is discussed for informational purposes only, it is not being recommended at this time based upon concerns expressed by the Project Management Team members including risk, limited funding, lack of experience, regulatory oversight and compliance, etc.

Premise: Because not having middle and last mile access is the number one obstacle to service providers, if the County wants to expedite arranging for high speed bandwidth which has become integral with quality of life needs and applications, then on a case-by-case basis, the County may want to consider financing and building the last mile and/or middle mile network for Internet Service Providers (ISP) to use in serving the customers. An investment in this option may address to some extent the following multiple objectives: (i) Enhancing broadband service and availability; (ii) Improving emergency response radio communications; (iii) Playing a future role in Public Safety Data Network (PSDN) applications; (iv) Improving cellular service coverage.

Description: Typically, a Request for Proposal (RFP) is issued seeking a Wireless Internet Service Provider (WISP) and/or Wireline Internet Service Provider to become a Public-Private-Partner (PPP) with the County to cost share in the construction, management and operation of vertical tower sites or other vertical assets, independent or along with fiber build to feed and backhaul off towers or interconnect with middle mile networks, at strategic locations, and then once the infrastructure is built, issue a secondary Request for Proposal (RFP) to other providers for co-location (such as Cellular Service Providers and WISP) and to locate equipment on the towers to improve coverage and service or to lease fiber. If fiber is to be built, the County should first confirm that a middle mile owner Internet service provider will connect to a last mile fiber network and at what particular location should the aggregation of last mile fibers be located (cabinet). [This type of fiber build and lease of the network for access to the customer by the middle mile fiber owner has been referred to as **"Homes with Tails".]** If fiber is to be built to serve a tower location, also confirm bandwidth availability.

Approach

There was little to no interest expressed by the County Project Management Team regarding this solution. At the same time, it is the understanding of the consultants that there may be isolated gap areas existing in the County regarding Emergency response/Public Safety communications requiring additional vertical assets be located or built at a strategic location, in particular in the Craigsville area between Deerfield and Middlebrook to improve response and interoperability communications. This area with the radio communication gap coincides in the general area identified for gaps in Internet service and planned growth/development. Therefore, this option is intended to leverage each other in an attempt to improve many different objectives. The trend in the cellular service industry seems to favor companies being more willing to submit a proposal to attach to existing towers (especially with a fiber feed) rather than get involved assisting other parties in locating and cost sharing the build of towers.



ES4.2 Last Mile Connectivity Solutions Assessment

The consultants are not recommending the County implement any of the proposed solutions without getting cooperation and buy-in from the areas service providers. The options are not exclusive of each other and it is believed the most impactful solution may be a combination of some of the options. The consultants are also not suggesting the County incur significant debt service especially that associated with *a Fiber and/or Wireless Network Build.* The County will most likely not recover all the capital and operating expenses associated with significant network build projects. If however pursued, minimal administration and operations and maintenance expense may be a potential if repair and routine maintenance of the fiber and facilities would be outsourced to a service provider utilizing the infrastructure as part of the PPP negotiations.

Fiber and/or Wireless Network Build is addressed to demonstrate the significant expense that the middle and last mile connectivity obstacle costs. When looking at such expense, it is more understandable why the service providers themselves are struggling with a FTTX or wireless last mile connectivity solutions. A network build option would best be evaluated on a cost share model, where the expense and savings is distributed among multiple parties. General costs were demonstrated using examples of where additional middle mile could be built, as well as existing fiber. However, during a recent Project Management Team meeting, it was mentioned that just recently some construction activity was occurring in the County. Also the proposed fiber build locations of the study may not necessarily be where fiber would capture the most houses within a 0.1mile fiber distance (near typical maximum distance for FTTP connectivity), but be the location where addressing broadband, cellular communications needs, and an identified growth/development area. This fiber build could alternatively be used for a tower feed and backhaul. If a network build option was pursued, additional discussions with the service providers and planning would be needed and therefore the costs at this time can't be refined because the service providers need to be more engaged in the solution discussion. Also, some service providers have already committed to serving some areas FTTH/FTTP over the next several years with additional fiber planned, but not shown.

Option No. 3: Network Extension Funding PPP is addressed because the County has the unique opportunity of having two (2) service providers with specific projects identified willing to partner with the County to achieve implementation. In addition, it is believed the MGW project may potentially help address the one emergency response/public safety communications gap identified. There is not much detailed information included in this report regarding these projects because of the service providers wanting some confidentiality and no detailed disclosure regarding these projects in the public at this time. The service providers do understand if the County and service providers PPP does move forward, action by the County's elected officials and expenditure of funds will need to be discussed and taken in public with more details outlined. Depending on what is included in the final scope of these projects, they could also potentially be leveraged for enhancing cellular service. One caution that warrants further investigation is that besides some concern expressed from service providers that a wireless will have interference and topology challenges, and the doubt that wireless technology will be able to keep up with the ever changing and increasing speed used by the Federal Communications Commission (FCC) to define broadband, there was a comment that the National Radio Astronomy Observatory in Green Bank, WV is restrictive in requiring a Radio Quite Zone and control over use of spectrum. In addition, there was no strong interest in the project from a wireless service provider. It is believed that some wireless signal propagation modeling was part of the previous Augusta County, Virginia Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services prepared by The Atlantic Group of Companies and the Emergency Response Radio Communications study and therefore it is recommended the County include these consultants if wireless solutions are pursued. There are a number of wireless technologies that may be considered including use of licensed and unlicensed spectrum.

The County could implement any one or all of the four (4) solution options, revise costs to fit a budget they are comfortable with, and take a 'wait and see' approach as to the effectiveness over the next 1 -2 years. Depending on continued progress in discussions with service providers and the ability to secure funding, a modified solution of any of the proposed options may have merit. At this time, it is doubtful the County would get all needed parties in agreement in order to pursue *a Fiber and/or Wireless Network Build.* There could also be some relevant and contributing issues in the near future that come about as the federal government continues to pursue the FirstNet initiative (interconnecting local networks for homeland security and emergency related issues).

ES5.0 Organization and Network Operation Options

When evaluating a solutions impact to the municipal organization and best role of government to play in network operations, the first focus must be on what Virginia law allows. The Commonwealth of Virginia is a Dillion state, essentially meaning the Commonwealth must explicitly grant powers to municipalities in order for them to be authorized to carry out such activities. References to the applicable Virginia law on allowances and prohibitions of local government involvement can be found in Section 2.1. A quick reference as to whether a Wireless Broadband Authority must be formed under each of the options presented can be found at the bottom of the Menu of Solution Options for Augusta County, VA at ES-3.5B. In short, it is felt that formation of a Wireless Broadband Authority may only be warranted under *a Fiber and/or Wireless Network Build option.*

ES6.0 Funding Strategies

The following provides an outline of typical funding resources previously used in strategies for financing telecommunications network initiatives.

1. USDA-RUS Telecommunications Funding Programs

- ❖ Community Connect Grants
- ❖ Distance Learning & Telemedicine Grants
- ❖ Expansion of Rural 911 Service Access Loans & Loan Guarantees
- ❖ Farm Bill Broadband Loans & Guarantees
- ❖ Public TV Digital Transition Grants
- ❖ Telecommunications Infrastructure Loans & Guarantees

2. CDBG – Local Innovation Funding
   - ✓ Up to $200,000/Project with 50% Match in 2015
   - ✓ Up to $300,000/Regional Project with 25% Match in 2015

3. Community Connect Grant Program
   - ✓ Minimum Award $100,000; Maximum is $3,000,000 in 2015

4. VA Dept. of Business Assistance through the Worker Retraining Tax Credit Program (Local businesses that take an active role in workforce training are eligible for funding assistance)

5. **VA-DHCD – 2016 Virginia Acts of Assembly - Chapter 780.** Shortly (before end of year) the Commonwealth will be opening applications for the Virginia Telecommunications Initiative 2016 Virginia Acts of Assembly – Chapter 780. The Virginia Department of Housing and Community Development (DHCD) will be implementing the Virginia Telecommunications Initiative (VATI). The goal of VATI is to create strong, competitive communities throughout the Commonwealth by preparing those communities to build, utilize, and capitalize on telecommunications infrastructure. Consistent with the enabling legislation, DHCD will award the $1.25 million appropriation to eligible applicants to provide Last-Mile services to Unserved areas of the State. However, there is no specific maximum dollar amount attributable to FY 2017

funding and the DHCD reserves the flexibility to award any amount, depending entirely on the quality and quantity of applications received. **The primary objective of the VATI is to provide financial assistance to supplement construction costs by private sector broadband service providers to extend service to areas that presently are unserved by any broadband provider. Applications must be submitted by a unit of government (Towns, Cities, Counties, EDA/IDA, Broadband/Wireless Authorities, Planning District Commissions, etc.) with a private sector provider(s) as a co-applicant.**

6. FEMA, Dept. of Homeland Security (such as COPS FAST), U.S. Fire Administration and the VA Dept. of Emergency Management

7. FirstNet Initiative - DOJ-Homeland Security: Possible Funding in the Future

8. Appalachian Region Commission (ARC) – Focuses on Last Mile Connectivity

9. Public-Private Partnership (PPP) Cost-Sharing (conventional loans, municipal bonds, tax assessment, etc.)

ES7.0 Next Steps

The elected officials must decide if enhancing Broadband service to the communities is a high enough priority to the constituents to warrant committing county resources such as staff time and money towards continuing efforts including how much money (cash without borrowing or incurring long-term debt), as well as the following:

1. What will be the end goal or measure of success, i.e., 15%, 35%, 55% or more for increased connectivity?
2. What timeline is reasonable?
3. Will the County go it alone, together and/or in some form of Public-Private Partnership?
4. What role will the County play (lead role, support role or no role)?
5. Where is the comfort level of the Options provided, i.e., least risk, effort, expense, impact and timeliness or most risk, effort, expense, impact and timeliness?
6. How should the Options be modified to meet budget and time constraints?
7. What type of Organization Structure will be needed, i.e., continue working with the Project Management Team or form a Wireless Broadband Authority?

There are certainly other concerns and issues to investigate, such as obtaining success in getting available funding, but the first question that must be answered is another question of "Do we need to plan Next Steps and work towards an Implementation Plan or is the County going to take a wait and see approach?" Within short time of completing the study report, the County's consultants were notified of the draft language of the *VA-DHCD – 2016 Virginia Acts of Assembly - Chapter 780* for consideration of funding construction activity. **Given this unique opportunity, this issue will probably be an early next step to address.**

ES8.0 Closing

Not all regions of the study area have ubiquitous broadband. Once accomplished, competition typically drives service offerings and price. True competition in broadband only occurs when there is more than one choice of providers. If towers are constructed, perhaps more Wireless Internet Service Providers (ISPs) will take interest in providing services but to date, there has been little interest expressed.

Telecommunications initiatives must address both the supply and demand side. Now that a comprehensive assessment of broadband availability has been completed, continued monitoring and tracking of the market at both a local and regional level will be necessary in order to measure progress. As a separate initiative, the County should leverage their GIS and use it as a management tool over the broadband issues. GIS creates map layers of data sets to visually display the data in separate or in composite layers, stores the data, and can be used to measure and analyze data to assist in determining needs, solutions and what-if scenarios. The GIS systems will allow continual tracking of progress and assist in near and long-term solution planning to meet the identified needs of this broadband assessment. Now that the Augusta County, VA Internet Initiative Project Management Team has this valuable data, it is recommended that planning include making this data readily available to parties that can assist the County in accomplishing its goals. Today, web-enabled GIS is popular as an information resource for many different entities to access. Web-enabled GIS can be static or dynamic with interactive mapping, data queries, data manipulation and downloading capabilities.

Even though Augusta County is fortunate to have a significant amount of fiber with extensive existing wireless communications infrastructure and services to build upon, it is only being leveraged in select locations, the ***important question to be answered is, "will it deliver the needed and desired services of the future universally to all parties?"*** Eventually, to accommodate and go beyond the newer bandwidth applications and beyond, **the focus will need to shift to much more than "better than dial-up speed" or even low end Mbps bandwidth speeds** in order to be prepared for widespread adoption of some current and many future applications. The definition of broadband by the FCC for delivery of increased bandwidth changes from time to time and currently the definition of Broadband by the FCC is 25 MB down and 3 Mb up. It will be up to the County to ensure broadband availability, reliability and affordability meet the needs of the future for the businesses, communities and residents they represent.

Like it or not, investment in technology infrastructure follows demand. How well the technology and services is marketed will have a direct impact on economic growth and leveraging the opportunities in a competitive international marketplace. A stated objective of the Augusta County Community Broadband Telecommunications Study is**:** to increase access throughout the **project study area**, to advance telecommunications services that provide for high speed transmission of data, voice, and video over the Internet and other networks to foster the development of distance learning, e-commerce, e-government, telemedicine, and overall economic development and enhancement of quality of life. The County is best positioned to work with service providers and pursue state and federal implementation funding. It was determined that the best approach to address these findings should be left up to the county elected officials where they and other community stakeholders understand their unique needs and are in the best position to implement a solution.

The more specific purposes of pursuing this type of broadband assessment project is to provide information to economic development leaders, the County, service providers and funding agencies for improving the telecommunications infrastructure, for better marketing of the region's technology advantages, and to provide data for plans and grant applications aimed at highlighting the region's strengths and mitigating local weaknesses. In addition, the findings can be used in the development of marketing materials encouraging companies to locate their operations in Augusta County. Regardless of the outcome of the decision of the elected officials, the Community Broadband Telecommunications Planning Study has collected, organized and mapped out data on the study area end-user perceptions, as well as service providers' telecommunications infrastructure that will undoubtedly play a role in enhancing broadband and other telecommunications services in the future.

1.0 Study Approach

1.01 Understanding Broadband's Impact on Community and Economic Development

New communication technologies are changing every aspect of our lives including work, education, healthcare, and entertainment and access to Broadband and information technology is no longer a convenience, but a necessary part of growing, prospering, and improving the overall quality of life in the community. The initiative is a response to the recognition that broadband has risen to the level of necessary infrastructure to the Region's ability to effectively compete in a global market.

"Community connectivity" is an often used expression that refers to having affordable high speed voice, video and data network infrastructure available to enhance local government, maximize teaching and learning opportunities, attract economic development and improve the overall quality of life. The Internet is here to stay and the World-Wide Web is our entertainment, City Hall, marketplace, and classroom. Without adequate, easily accessible and affordable bandwidth, municipal services are less effective and marketplaces are less competitive, fewer opportunities exist for training adults in their chosen vocations, for educating children, and for maintaining a highly skilled workforce that can compete in a global economy. Its absence is an impediment to progress.

Community telecommunications initiatives have different objectives than private, for-profit initiatives. Communities generally enter into telecommunications initiatives with the objective of improving government services and maximizing teaching and learning opportunities. They also focus on attracting economic development to retain or grow businesses thereby providing an increased tax base, additional employment opportunities and new revenue sources. Basically, they improve the overall quality of life for families in the community. Unlike the private sector business model, communities do not necessarily need to recover their investment in telecommunications' infrastructure in a short 3-5 years, and may wish only to cover expenses and investment while minimizing risk to the community.

It is expected that over time, technological innovation will help reduce the minimum broadband demand size necessary to make rural deployment more economically feasible. If our rural communities are expected to wait until years after urban America has broadband and are excluded from high-speed connectivity technology, how many jobs will be in rural areas a decade from now?

1.02 Study Milestones

The approach used for the broadband assessment study included the following milestones:

- Completing a **Needs Assessment** utilizing existing data and reports, as well as use of a hardcopy and on-line end-user survey designed for residential and business entities, as well as Government/Public Safety Facilities and Community/Non-Profit organizations.
- **Educating residents and stakeholders** on broadband and public/private service business models, and review of technology programs for shortcomings and recommendations for improvements through a gap analysis.
- **Developing Last Mile Connectivity Options** that are cost feasible with feedback from the communities
- **Performing Preliminary Engineering, Conceptual Design and Cost Estimates** to review with the elected officials and stakeholders' options being proposed for consideration
- **Review Possible Organization Structures and Network Operation Options** allowed by Virginia Law
- **Encourage collaboration** with service providers, local organizations and other intergovernmental partnerships by sharing findings of the study, telephone interviews, face-to-face meetings, and inquiring as to the level of interest to work with the communities on network related projects.

- **Identify funding sources** from federal, state and county/local resources, as well as foundations, nonprofit organization, institutional, private, grants and special interest groups.

A "funnel-down" approach was used to assist in analyzing the study area to locate underserved areas and examine current conditions. Essentially all the data that was developed or supplied was put figuratively into the "funnel" and graphically represented where possible, overlaid and analyzed.

The enormous volume of data collected was reviewed and pertinent features were identified for mapping. The focus on conditions and needs progressed as follows:

1. Created region-wide study area maps showing
   - Community Anchor Institutions (CAI) such as Schools (Education Institutions), Public Safety Agencies, Health Care Facilities, and Government Buildings
   - Economic Development Features, typically including locations of Major Employers, Industrial/Commercial Parks, Business districts, Growth Corridors, and if available where Water and Wastewater Infrastructure exists (County prefers to keep water and sewer infrastructure data confidential)
   - Type of Internet Connection
   - Service Providers and Facilities
   - Internet Speed and Quality Satisfaction, as well as Wireless Interest
   - Population and Housing Density
   - Cellular Service, Coverage and Provider
   - Priority Service Areas in Relation to CAI, Economic Development Features and Proposed Solutions
2. Some of the above maps include existing data and responses from the end-user surveys to identify where discrepancies and agreement occur.
3. ***In-Field Assessment*** (Review existing conditions)
4. ***Preliminary Cost Estimates and Engineering*** (Conceptual Solution Options)
5. ***Research of Applicable Laws*** for Organizational Structuring
6. ***Business Model Roles that Municipalities Consider in Community Broadband Initiatives***

7. ***Discussion of Implementation Assessment/Decisions for use in Funding Applications***
   - ✓*Selecting Last Mile and Main Network Connectivity Solution(s)*
   - ✓*Determine Extent of Network Architecture Design/Cost Estimate*
   - ✓*Create and Apply for Funding Plan*
   - ✓*Establish Timeline, Service Provider Agreements Needed, Etc.*

1.1 Study Findings

1.1.1 Community Needs Assessment and Asset Inventory

One objective of the broadband assessment is to document the availability of communication technologies throughout the study area and to assess the amount of demand by residential and business end-users. Typically, in such assessments communication technologies include any form of Internet access, pay TV, and telephone delivered by any medium.

The use of some mailed surveys, text and voice message notifications, organization/association visits, advertising in the recreation newsletter and support by an on-line copy, allowed for a greater percentage of the population to be polled, including those that would potentially be reluctant to respond to telephone solicitations for surveying. The overwhelming popularity of the national 'Do Not Call' list and the increasing use of caller ID to screen out unwanted calls substantiate use of written and on-line survey as the preferred means to obtain community input from the largest number of respondents. Additionally, as stated, the survey collection process included an online version of the survey for the convenience of those using the Internet regularly.

In addition to validating service availability by geographic area, end users provided valuable input to evaluate demand for advanced technologies such as higher speed and wireless Internet access, phone service that uses the Internet as a transmission medium, and number of devices in the household accessing the Internet for use. This information is valuable to service providers contemplating the deployment of new services or to areas not presently served. Government leaders can use this knowledge as a tool for measuring how their community compares to others in relation to technology adoption by citizens, and for developing broadband education strategies.

1.1.2 Survey Methodology

A simple to complete survey (see Appendices) polled basic demographic data, Internet usage habits, method of access (e.g. dial-up, DSL, Satellite, etc.), satisfaction with current providers, monthly cost of access to the Internet, and much more. As stated before, mailed surveys were augmented by an online survey version. The on-line survey was an exact replica of the mailed survey available for easy online entry. The results of the online survey were combined with the mailed survey results. The combination of mailed and online surveying was to ensure that all County citizens were afforded the opportunity to provide input for the market assessment.

The new survey was designed as one survey for:

- Residence
- Business
- Residence with home-based business,
- Government/Public Facility (including Public Safety facilities),
- Community Organization/Non-Profit
- Telework

1.1.3 Survey Distribution and Response

Surveys were mailed during the 2nd quarter of 2016. Hard copies of the survey had been collected from drop-off locations and online surveys had been recorded. The responses to the hardcopy surveys were data input into the electronic survey database with a combined total response of 2,906 surveys collected.

The successful response was attributed to the efforts of the Augusta County staff and Project Management Team in promoting the online survey and distributing additional copies throughout the County.

The responses were geocoded and mapped to show areas of demand and technology in use. See the Executive Summary for some of the more immediate responses of interest to the survey questions. The subject matter previously addressed in the Executive Summary were questions regarding:

- Cell Towers and Infrastructure
- Type Entity completing the survey
- Internet Connection User Type
- Type of Internet Connection
- Internet Service Providers
- Satisfaction with Internet Speed, Customer Support and Overall Satisfaction
- Cellular Service Reliability
- Cellular Service Coverage and Providers

1.1.4 End-User Input

End-user input was provided from both the mailed, on-line, and dropped off surveys. Due to Business responses only being 1.55% of total entities responding, and similarly since the other entities responding representing less than 20% of responses even when including businesses, separate highlighting of the surveys by type entity was not warranted. The small number of responses by businesses likely represents a reasonable satisfaction by the majority of the business sector. In addition, 8 survey responses were near, but outside the county. Augusta County was not successful in geocoding less than 10% of survey responses. Therefore, while not all survey responses were able to be mapped, all survey responses received (2,906) as of the date when sent to the consultants by the County (7/15/2016) are included in the survey analysis to provide the most comprehensive picture of existing conditions, needs and perspectives in and adjacent to (less than 11 miles outside) the Augusta County region.

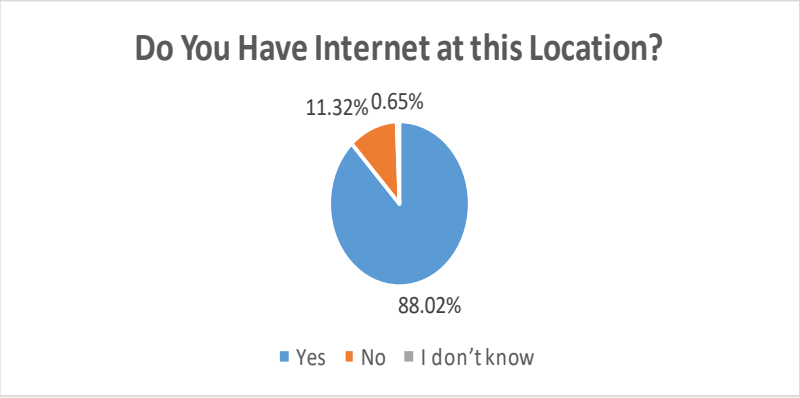
The following results are from the remaining survey questions not addressed in the Executive Summary.

Q3 Do you have Internet access at this location?

Answered: 2,906 Skipped: 0

Answer Choices	Responses	
Yes	88.02%	2,558
No	11.32%	329
I don't know	0.65%	19
Total		**2906**

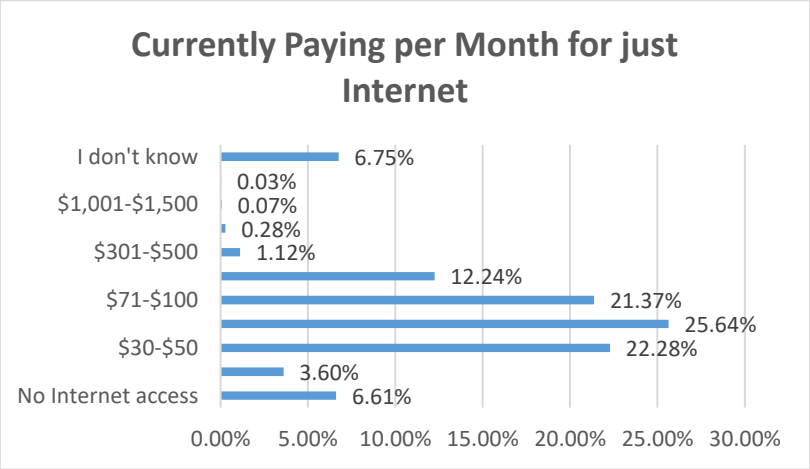
Over 93% of Responses have Internet Access & almost 74% consider Internet Access Very Important or Critical



Q6 To the best of your knowledge, how much are you currently paying per month just for Internet access (unbundled) ?

Answered: 2,859 Skipped: 47

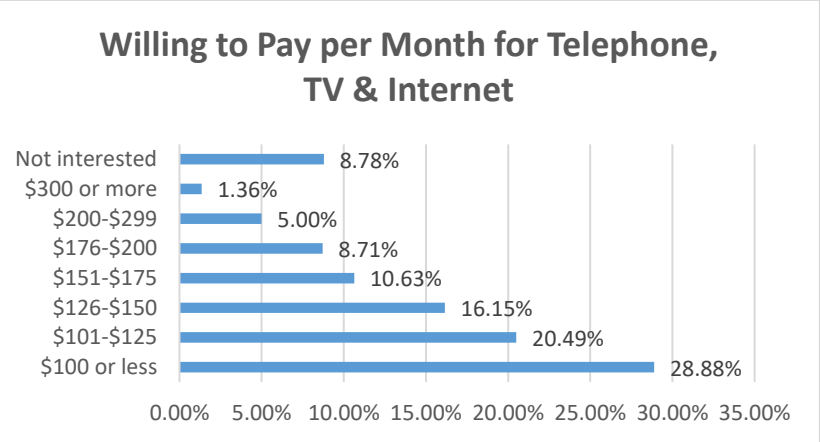
Answer Choices	Responses	
No Internet access	6.61%	189
Under $30	3.60%	103
$30-$50	22.28%	637
$51-$70	25.64%	733
$71-$100	21.37%	611
$101-$300	12.24%	350
$301-$500	1.12%	32
$501-$1,000	0.28%	8
$1,001-$1,500	0.07%	2
Over $1,500	0.03%	1
I don't know	6.75%	19
Total		**2,859**



Q7 Thinking about your current communications expenses, how much would you be willing to pay per month for a combination package of high-speed Internet, telephone and pay TV services?

Answered: 2,860 Skipped: 46

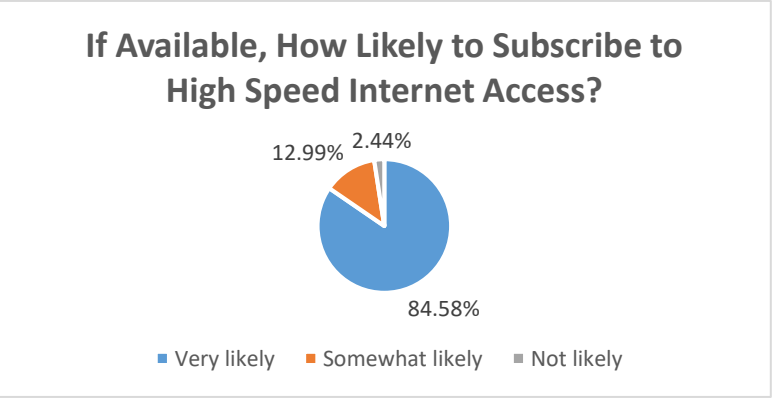
Answer Choices	Responses	
$100 or less	28.88%	826
$101-$125	20.49%	586
$126-$150	16.15%	462
$151-$175	10.63%	304
$176-$200	8.71%	249
$200-$299	5.00%	143
$300 or more	1.36%	39
Not interested	8.78%	251
Total		**2,860**



Q8 If affordable wireless high-speed Internet access was available in your community, how likely would you be to subscribe to this service?

Answered: 2,872 Skipped: 34

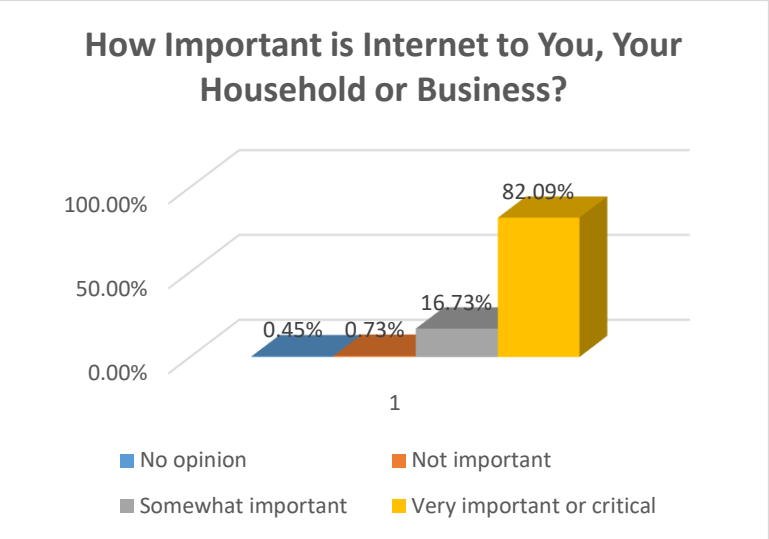
Answer Choices	Responses	
Very likely	84.58%	2,429
Somewhat likely	12.99%	373
Not likely	2.44%	70
Total		**2,872**



Q9 How important is Internet access to you/your household or business?

Answered: 2,887 Skipped: 19

Answer Choices	Responses	
No opinion	0.45%	13
Not important	0.73%	21
Somewhat important	16.73%	483
Very important or critical	82.09%	2,370
Total		**2,887**



Q10 How many computers, tablets, iPads, wireless phones, and/or other devices utilize an Internet service at this location?

Answered: 2,861 Skipped: 45

No. of Devices	0	1	2	3	4	5	More than 5	Total
	1.47%	3.57%	5.91%	11.50%	15.38%	14.89%	47.29%	
	42	102	169	329	440	426	1,353	2861

Q11 In the past 6 months, which of the following activities have you performed online and/or conducted at this location? (Check all that apply)

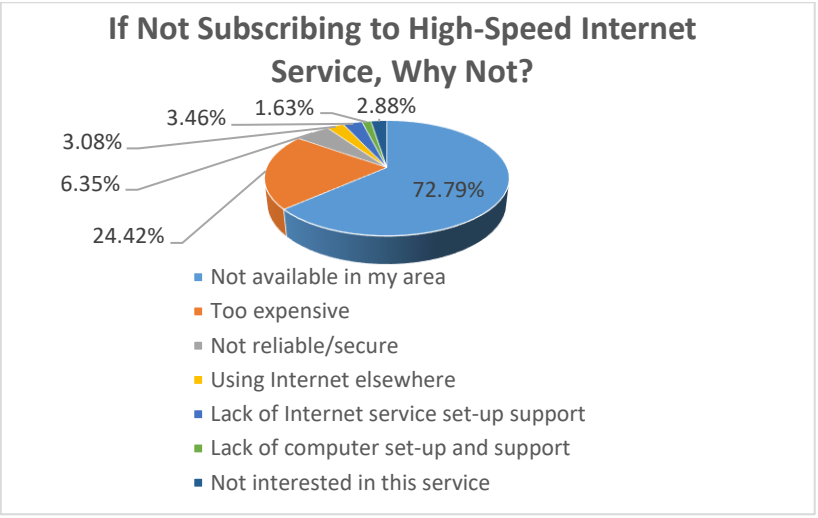
Answered: 2,792 Skipped: 114

Answer Choices	Responses	
Searched for travel related info	80.23%	2,240
Searched for health or medical info	83.52%	2,332
Purchased products or services	92.26%	2,576
Sold products or services	23.75%	663
Visited a News website	88.54%	2,472
Researched a major purchase	70.99%	1,982
Communicated with a teacher	47.17%	1,317
Searched for a job	33.09%	924
Took an online course	26.72%	746
Visited a government website	75.00%	2,094
Searched info related to school	53.98%	1,507
Performed bank transaction	84.56%	2,361
Download/watched video online	69.34%	1,936
Completed school assignments	42.84%	1,196
Used E-mail	97.06%	2,710
Followed social media (Facebook, Twitter, etc.)	83.56%	2,333
Total		**2,792**

Q16 If you do not subscribe to a high-speed Internet service (faster than dial-up over the telephone line), why not?

Answered: 1,040 Skipped: 1,866

Answer Choices	Responses	
Not available in my area	72.79%	757
Too expensive	24.42%	254
Not reliable/secure	6.35%	66
Using Internet elsewhere	3.08%	32
Lack of Internet service set-up support	3.46%	36
Lack of computer set-up and support	1.63%	17
Not interested in this service	2.88%	30
Total		**1,040**



Q17 Please share any other comments about your Internet service:

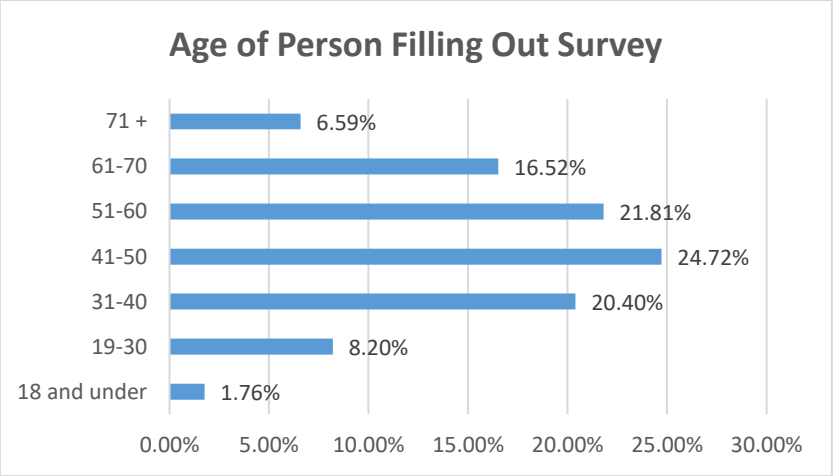
Answered: 1,166 Skipped: 1,740

See Survey Results. Many comments were repetitive and/or supported the typewritten answers in response to the questions included on the survey.

Q21 What is your age? (the person actually filling out the survey)

Answered: 2,779 Skipped: 127

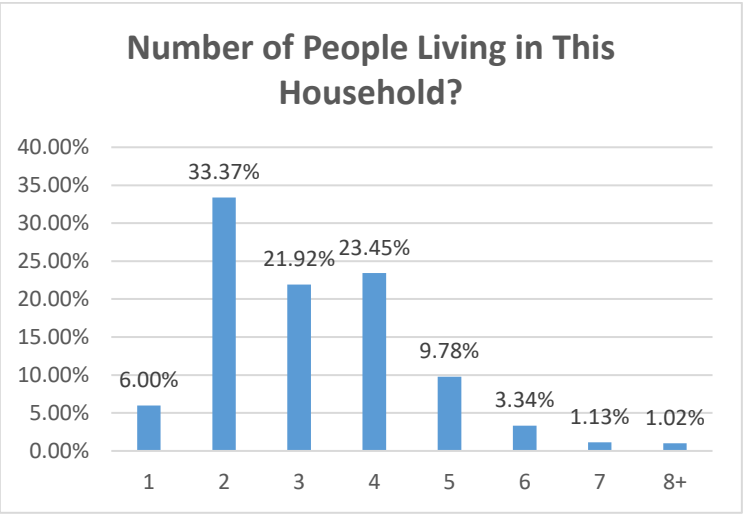
Answer Choices	Responses	
18 and under	1.76%	49
19-30	8.20%	228
31-40	20.40%	567
41-50	24.72%	687
51-60	21.81%	606
61-70	16.52%	459
71 +	6.59%	183
Total		**2,779**



Q22 What is the number of people living in this household?

Answered: 2,751 Skipped: 155

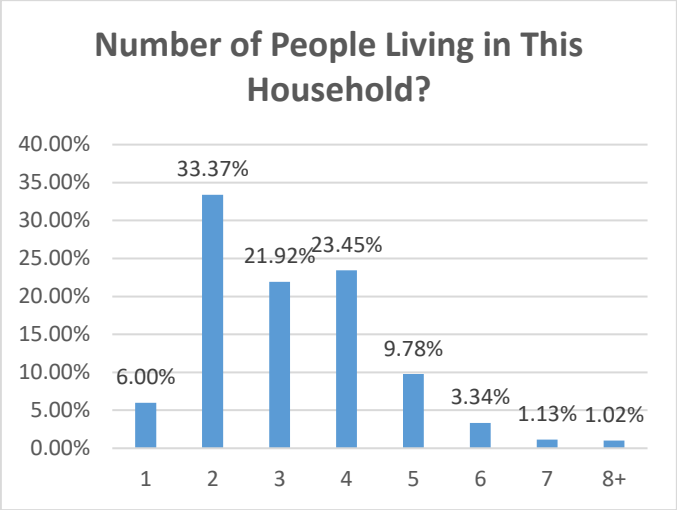
Answer Choices	Responses	
1	6.00%	165
2	33.37%	918
3	21.92%	603
4	23.45%	645
5	9.78%	269
6	3.34%	92
7	1.13%	31
8+	1.02%	28
Total		**2,751**



Q22 What is the number of people living in this household?

Answered: 2,751 Skipped: 155

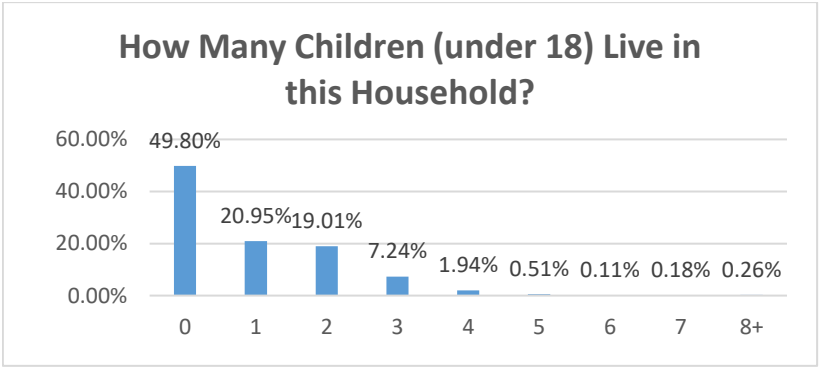
Answer Choices	Responses	
1	6.00%	165
2	33.37%	918
3	21.92%	603
4	23.45%	645
5	9.78%	269
6	3.34%	92
7	1.13%	31
8+	1.02%	28
Total		**2,751**



Q23 How many children (under 18) live in this household?

Answered: 2,735 Skipped: 171

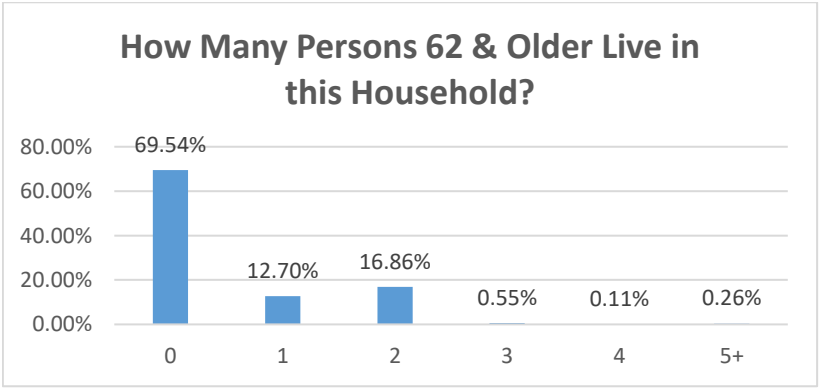
Answer Choices	Responses	
0	49.80%	1,362
1	20.95%	573
2	19.01%	520
3	7.24%	198
4	1.94%	53
5	0.51%	14
6	0.11%	3
7	0.18%	5
8+	0.26%	7
Total		**2,735**



Q24 How many persons 62 and older live in this household?

Answered: 2,741 Skipped: 165

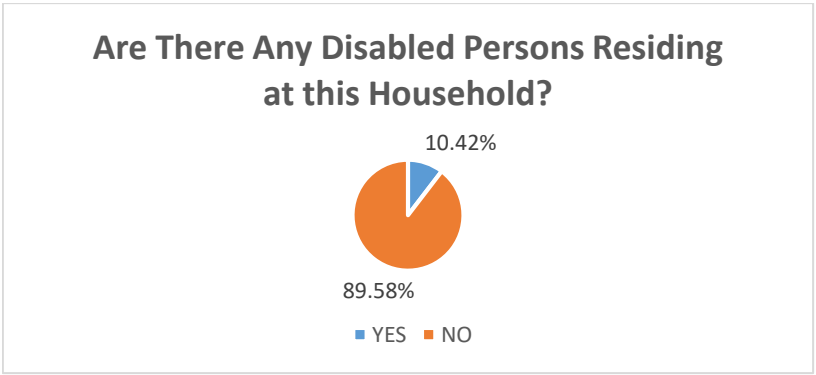
Answer Choices	Responses	
0	69.54%	1,906
1	12.70%	348
2	16.86%	462
3	0.55%	15
4	0.11%	3
5+	0.26%	7
Total		**2,741**



Q25 Are there any disabled persons residing at this household?

Answered: 2,753 Skipped: 153

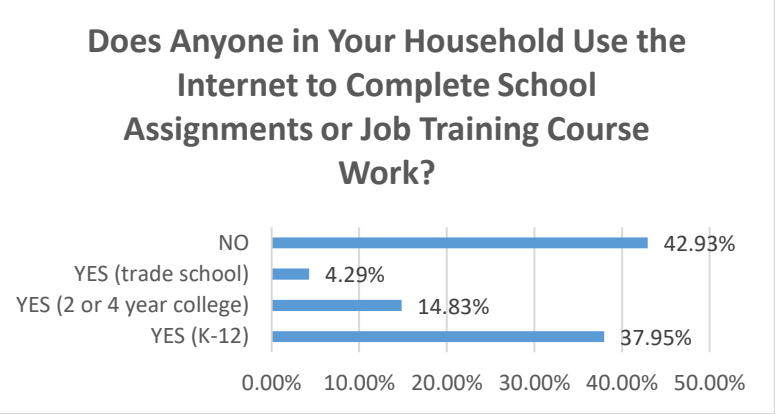
Answer Choices	Responses	
YES	10.42%	287
NO	89.58%	2,466
Total		**2,753**



Q26 Does anyone in your household use the Internet to complete school assignments or job training course work?

Answered: 2,751 Skipped: 155

Answer Choices	Responses	
YES (K-12)	37.95%	1,044
YES (2 or 4-year college)	14.83%	408
YES (trade school)	4.29%	118
NO	42.93%	1,181
Total		**2,751**

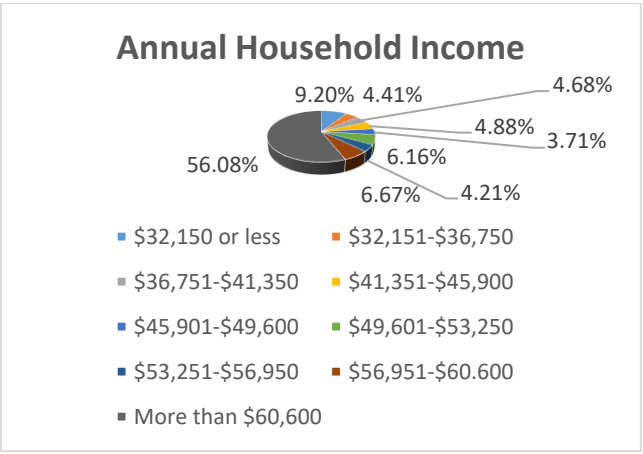


Q27 ANNUAL HOUSEHOLD INCOME:

Household income is defined as income of all adult (18 and older) household members received from all sources such as wages, salaries, interest income, investment income, social security, public assistance, or other sources.

Answered: 2,564 Skipped: 342

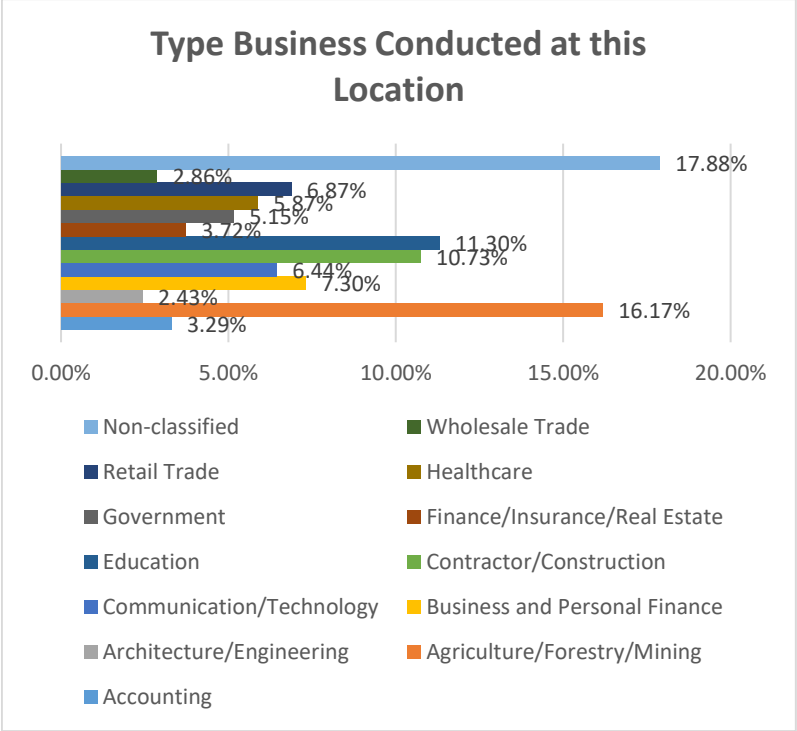
Answer Choices	Responses	
$32,150 or less	9.20%	236
$32,151-$36,750	4.41%	113
$36,751-$41,350	4.68%	120
$41,351-$45,900	4.88%	125
$45,901-$49,600	3.71%	95
$49,601-$53,250	6.16%	158
$53,251-$56,950	4.21%	108
$56,951-$60.600	6.67%	171
More than $60,600	56.08%	1,438
Total		**2,564**



Q28 Please check the type of business conducted at this location (Check one):

Answered: 699 Skipped: 2,207

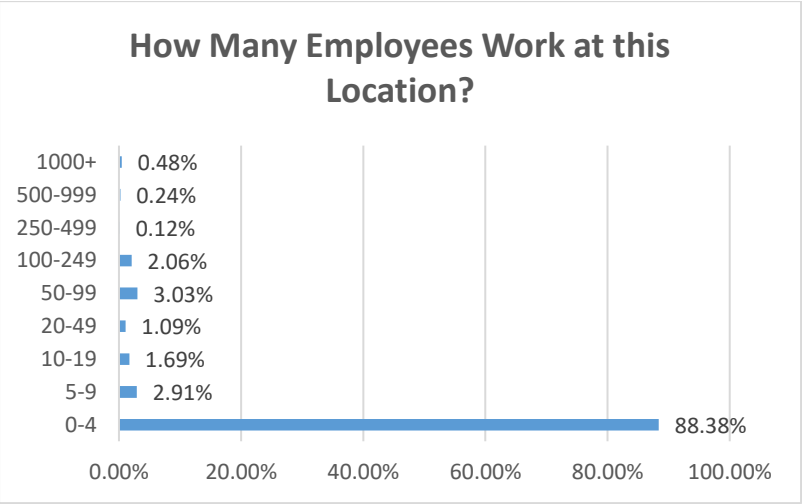
Answer Choices	Responses	
Accounting	3.29%	23
Agriculture/Forestry/Mining	16.17%	113
Architecture/Engineering	2.43%	17
Business and Personal Finance	7.30%	51
Communication/Technology	6.44%	45
Contractor/Construction	10.73%	75
Education	11.30%	79
Finance/Insurance/Real Estate	3.72%	26
Government	5.15%	36
Healthcare	5.87%	41
Retail Trade	6.87%	48
Wholesale Trade	2.86%	20
Non-classified	17.88%	125
Total		**699**



Q29 How many employees work at this location?

Answered: 826 Skipped: 2,080

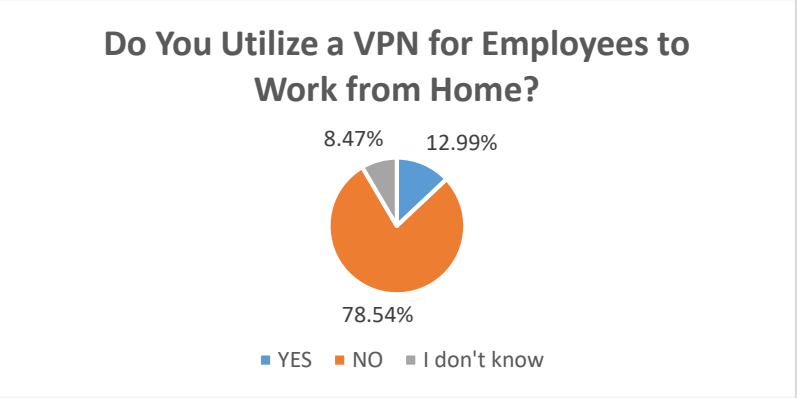
Answer Choices	Responses	
0-4	88.38%	730
5-9	2.91%	24
10-19	1.69%	14
20-49	1.09%	9
50-99	3.03%	25
100-249	2.06%	17
250-499	0.12%	1
500-999	0.24%	2
1000+	0.48%	4
Total		**826**



Q30 Do you utilize a VPN (Virtual Private Network) for employees to work from home?

Answered: 862 Skipped: 2,044

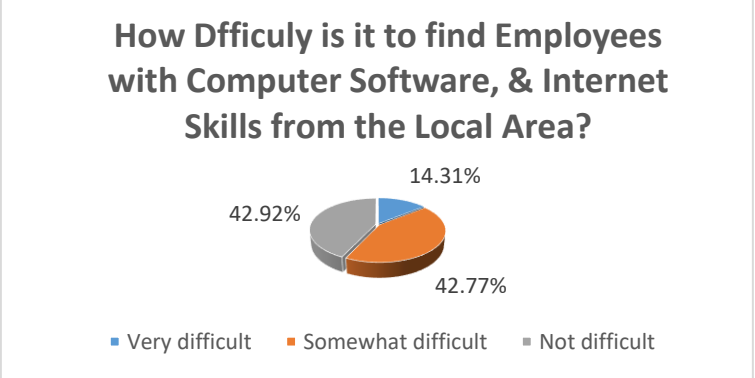
Answer Choices	Responses	
YES	12.99%	112
NO	78.54%	677
I don't know	8.47%	73
Total		**862**



Q31 How difficult is it to find employees with computer, software, and Internet skills from the local area?

Answered: 636 Skipped: 2,270

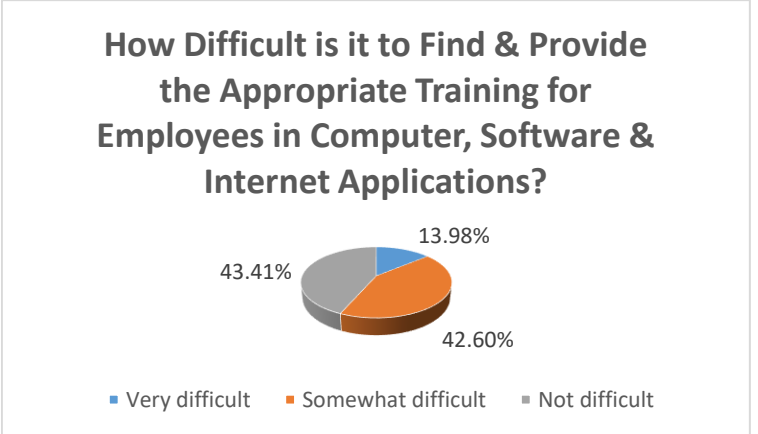
Answer Choices	Responses	
Very difficult	14.31%	91
Somewhat difficult	42.77%	272
Not difficult	42.92%	273
Total		**636**



Q32 How difficult is it to find and provide the appropriate training for employees in computer, software, and Internet applications?

Answered: 615 Skipped: 2,291

Answer Choices	Responses	
Very difficult	13.98%	86
Somewhat difficult	42.60%	262
Not difficult	43.41%	267
Total		**615**



1.2 Gap Analysis with Broadband Education Development and Strategies

1.2.1a Local and State Technology Training and Resources

Adults seeking to become proficient in using computers and technology applications have many choices for learning, with flexible programs aimed to reduce potential barriers such as distance, time, and cost.

1.2.1b K-12 Schools

The Standards of Learning (SOL) for Virginia Public Schools include computer/technology as a core standard, with the goal of producing "Technology Literate" students that "possess technology skills that support learning, personal productivity, decision making, and daily life."[5] The skills learned during childhood lay the foundation for continuous learning and encourages adoption of new technologies and applications throughout adulthood.

Computer applications and Internet research are introduced early in grammar school, integrated in all content areas rather than one specific course. Students are tested at various grades to ensure competency. By the end of grade 5, students should understand computer principles and technology, be able to process, store, retrieve, send electronic information, and communicate using software. By the end of grade 8, students should become more skilled at communication using computer software, networks, and telecommunications; and practice processing, storing, retrieving, and transmitting electronic information. Throughout high school, students are expected to use technology and computer applications to collaborate with peers, express ideas, perform Internet research, and possess an understanding of basic technology operations and concepts. Upon graduation, students will be prepared to enter college or workforce skilled at using technology for research, problem-solving, decision-making, and communication.

High school students have additional opportunities for study through State and District-approved online classes. Online classes, completed during students' time outside of normal school hours, allow for college-credit courses (Advanced Placement or AP) to be completed prior to graduation for students that have the aptitude for advanced learning. Additionally, some AP classes are available through traditional classroom instruction.

Augusta County public schools have a Tablet Take Home Program where information is uploaded to the cloud and pushed onto the tablets. Other observations regarding the County's schools include:

- Survey Responses indicated 53.98% Respondents used the Internet to search for school related information
- ***Full Gig Ring built for the schools***
- **Biggest Ed Problem:** It has been reported that a good number of Students at Home Lack Necessary High Speed Internet Connections
- The solution to the biggest obstacle facing Education in Augusta County is addressing High Speed Connectivity issues at the homes of the students and teachers where inadequate

1.2.1c Adult Education

The Staunton-Augusta Adult Learning Center serves Staunton City and Augusta County and is part of **S.H.I.N.E.*(Shenandoah* Initiative for Adult Education)[6].** Program Coordinator is Janita McNemar, (540) 245-5083 jmcnemar@augusta.k12.va.us. The Central Office is the: Adult Learning Center 49 Hornet Rd. Fishersville, VA 22939 (located in building two of the Valley Career and Technical Center).

[5] *Six-Year Educational Technology Plan for Virginia, 2003-2009; Computer/Technology Standards of Learning*
[6] http://www.shineadulted.org/augustaadultlearningcenter

Programs Offered:

- Adult Basic Education
- High School Equivalency Test Workshops
- High School Equivalency Test preparation and testing
- National External Diploma Program (NEDP)
- English Language Acquisition (ELA)
- Pearson Vue Testing Center

Many regional community colleges partnered with the Southwest Regional Adult Education program to create an innovative GED technology program entitled 'PlugGED In'. This curriculum was created through a partnership of educational and governmental institutions in response to the current adult literacy crisis and the increased need to prepare adults for jobs in the technology-driven economy. It provides learners who have not completed high school, with a GED course that incorporates information technology skills essential for entry-level employment in global, knowledge-driven, technology-rich jobs. These skills include specialized technology reflected in earned Microsoft certifications and "soft skills" such as communication, workplace ethics, collaboration and innovation.

1.2.1d Higher Education

Augusta County has Blue Ridge Community College campuses in Fishersville, Waynesboro, and Weyers Cave. Typically, higher education institutions not only design their academic/vocational programs to meet state and industry wide mandates and certifications, but also many higher institutions offer some degree of customized curriculum and internships or apprenticeships to meet local employer needs. Specialized training and certification programs and public/private partnerships for workforce development training through outreach sites are identified as target industries for economic development. One objective of such initiatives is to help prevent what is often referred to as "brain drain", the migration of, young people from the area to pursue careers elsewhere. High quality education is a factor along with other quality of life issues influenced by bandwidth availability, considered by young professionals and craftsman when making a decision on where to live and work.

It is common for higher education institutions to make an effort to become integrated with the local community, partnering, to some degree, on mutually beneficial initiatives. Typically, the higher education partners work with the local school district, providing opportunities for students to receive academic and technical training to ensure an effective transition from high school to college and/or the workplace.

Counties that have a higher education facility located in the community report an increase in the numbers of students transitioning from tech and career prep programs to college, and from two-year to four-year degree programs. Students participating in dual enrollment scenarios are graduating high school with a year or more of college completed. Not only does the student gain the advantage of earning a degree at a faster rate, but overall college tuition expenses are reduced as well. Dual enrollment options increase the numbers of students transitioning to higher education.

1.2.1e Growing Business

Virginia has numerous resources available to businesses for growing and competing digitally. One-on-one assistance is available from regional agencies such as the Virginia Employment Commission and the Center for Business and Workforce Development. Additionally, small/medium businesses and individuals have access to many online resources for e-commerce education and financial assistance through the Virginia Electronic Commerce Technology Center (VECTEC). VECTEC is a tenant in the Richlands' Business Incubator. Another example of Virginia's pro-business focus is the Virginia Department of Business Assistance (VDBA) whose goal is to connect businesses with the resources

they need to meet challenges and realize market opportunities. "Since almost 99% of Virginia businesses are defined as small and they create the majority of new jobs, there is a special emphasis on building the capacity of these bold entrepreneurs."[7] The State maintains a resource directory for businesses at business.virginia.gov. Additional resources for technology education and implementation are available from the Virginia Center for Innovative Technology (CIT). CIT's mission is to accelerate Virginia's next generation of technology and technology companies.

Greater Augusta Regional Chamber of Commerce

30 Ladd Road P.O. Box 1107 Fishersville, VA 22939 P: 540-324-1133

The Greater Augusta Regional Chamber of Commerce provides a long list of member services, promotional opportunities and business assistance /protection benefits. Chambers of Commerce works to preserve, promote and assist businesses in the community. The Chamber serves as a resource for inquiries related to business opportunities, tourism, and relocation of families and businesses. The following is a list of typical Chamber of Commerce primary functions:

- Community support
- Economic development
- Information resource
- Educational partnerships
- Regional partnerships
- Networking opportunities
- Legislative lobbying

1.2.1f Small Business Development Center

The Virginia Small Business Development Center (SBDC) serves Virginia counties. The center offers free counseling services, business planning, seminars and training events, and provides information and other services to new and existing small and medium-sized businesses. The SBDC is the best resource for aspiring entrepreneurs to gain knowledge on the requirements for going into business, financial management issues, marketing issues and techniques, business plan development and implementation, and the qualifications for obtaining start-up funds. The center also serves the experienced owner who wants to expand a business, solve business problems, do strategic planning, develop new ideas, enter new markets, or access expansion capital. Seminars and appointments with counselors are held at the Center; current seminars for businesses include Business Planning Basics for Starting a Small Business. The SBDC also works in concert with SCORE volunteers reaching out to offer experience and advice to new and existing businesses. A new program of peer advisory groups has recently launched called "Business Advantage Circles".

The SBDC offers no-fee consulting and other services through its offices in the Augusta County Government Center for any business wanting to start, plan, or grow. Located on the lower level of the Augusta County Government Center, anyone can utilize the services of the SBDC – living in Augusta County or wishing to start a business in Augusta County is not a requirement. The SBDC serves the counties of Augusta, Rockbridge, Bath, Highland, Rockingham, and Page and the cities and towns within.

The SBDC offers consultation by appointment for new as well as established businesses. The Small Business Development Center often has free or low-cost workshops at the Augusta County Government Center. The Start Smart workshop series is a particularly good series for new business owners.

[7] Louisa M. Strayhorn, Director, Virginia Department of Business Assistance, *Connecting Businesses with Resources;* http://www.dba.state.va.us/about/default.asp

To learn more about Start Smart and all SBDC resources, visit the SBDC Website at www.ValleySBDC.org. To schedule an appointment, call the SBDC's main office in Harrisonburg at 540-568-3227 and specifically ask for an appointment at the Augusta County Government Center

Shenandoah Valley Angel Investors[8]

Shenandoah Valley Angel Investors (SVAI) is a network of private investors that help fund entrepreneurial enterprises located in our communities. SVAI's founding members have broad experience, spanning multiple market sectors, including: Manufacturing, Healthcare, Construction, Public Accounting, Outdoor Recreation, Legal, Senior Assisted Living, Insurance, Distribution and Logistics, Agriculture, Commercial Real Estate, Property Management, Government and Technology.

SVAI's primary interest is Start-Up/ Early Stage business ventures with funding needs in the range of $50,000 to $300,000 that leverage technology to create a new product or service. A review committee assesses and ranks business proposals based on several factors, including: market potential, scalability, new job creation, intellectual property, competition, management team, business acumen, capital intensity and potential return on an equity investment.

SVAI's members meet once a quarter to hear presentations by the top ranked business proposals and determine if they want to invest. The investment decision is solely up to each investor in the network. To learn more about SVAI, contact George Pace at gwpace1@comcast.net.

1.2.1g SCORE

The service corps of retired executives (SCORE), a non-profit association, aims to mentor to aspiring entrepreneurs and foster the growth of new businesses. Retired executive volunteers present low-cost seminars and free business consulting as a resource partner with the Small Business Administration. One particular seminar is aimed at educating businesses on how to market and sell on the Internet. By researching on-line, the location of the nearest SCORE classes can be found. SCORE also reaches out to businesses by offering 6 Online Business Workshops:

* Developing a Business Plan * Creating a Profit and Loss Statement * Creating a Competitive Advantage
* Promoting Your Business * Pricing Products and Services * Building a Web Site

1.2.1h Business Training Resources

Virginia is a right-to-work state with one of the lowest unionization rates in the country. In Augusta County and the surrounding region, we provide a quality, motivated, and skilled labor base. Employers can recruit from a pool of over 22,000 annual graduates from 14 colleges and universities in the area. There is a workforce development team in place that coordinates and funds employment and customized training activities to help new and existing employers achieve their company goals.

Local technical training programs currently include:

• Mechatronics • Bioprocessing • Welding • Commercial Driving • Commercial Pilot • Packaging

Regional Workforce Training Initiatives

- Blue Ridge Community College Advanced Manufacturing Center
- Dream It. Do It.
- Valley Workforce Initiatives
- Valley Career and Technical Center
- Shenandoah Valley Partnership Education and Training Database
- Innovate Live

[8] http://augustavabusiness.com/start_locate_expand/small_business

Valley Career Hub

An online career resource that highlights opportunities and training for high-growth, high-wage, in-demand careers in the Shenandoah Valley

Local businesses that take an active role in workforce training are eligible for funding assistance from the VA Dept. of Business Assistance through the Worker Retraining Tax Credit program.

Current efforts by public schools and higher education workforce training partners to engage local businesses in offering apprenticeship opportunities should include marketing the economic development benefits of employee training and financial benefits available to employers.[9]

Virginia Employment Commission

About VEC

Our Vision
Virginia's First Choice for Workforce Services

Our Mission	Our Values
To promote economic growth and stability by delivering and coordinating workforce services to include: • Policy development • Job Placement • Temporary income support • Workforce information • Transition and training services To accomplish our mission, we will: • Partner with our stakeholders • Develop and empower staff • Improve our processes • Embrace innovative solutions and technologies • Continually renew our organization	Ethical Conform to professional standards of conduct. Achieving Make a worthwhile contribution to society. Meet the needs of customers. Purposeful Have a clear sense of purpose. Evaluate results and activities compared to established goals, objectives, and performance measures. Fulfilling Create an environment for meaningful work, where individual, team, and VEC contributions are recognized, valued, and rewarded. Balanced Concern for the needs of communities, customers, employees, and other stakeholders. Secure Provide a safe and secure work environment

Serving Augusta County

Fishersville - Local Office

1076 Jefferson Hwy Staunton, VA, 24401

PHONE: (540) 332-7750 FAX: (540) 332-7764

Julie Goodlick

Virginia Cooperative Extension of Augusta County

Virginia Cooperative Extension brings the resources of Virginia's land-grant universities, Virginia Tech and Virginia State University, to the people of the commonwealth. Understanding that knowledge is power, the Extension places that

[9] http://augustavabusiness.com/start_locate_expand/workforce_training

power in the hands of Virginians and help them learn how to use it to improve the quality of their lives. The Extension agents and specialists form a network of educators whose classrooms are the communities, homes, and businesses of Virginia, where they bring research-based solutions to the problems facing Virginians today.

To better utilize resources, the Extension forms collaborations with hundreds of public and private partners and volunteers, who help reach larger and more diverse audiences and also leverage the impact of work performed. The Extension is a product of cooperation among local, state, and federal governments in partnership with tens of thousands of citizens, who, through local Extension Leadership Councils, help design, implement, and evaluate needs-driven programs. The Extension is a dynamic organization that stimulates positive personal and societal change, leading to more productive lives, families, farms, and forests as well as a better environment. The mission of Virginia Cooperative Extension is to enable people to improve their lives through an educational process that uses scientific knowledge focused on issues and needs. Areas of emphasis are: agriculture and natural resources, 4-H youth development, and family & consumer sciences. 4-H is a comprehensive youth development program for youth between the ages of 5 and 18 engaged in hands-on learning experiences under the guidance of adult or teen 4-H volunteers trained by 4-H agents. 4-H members learn how to: make decisions, manage resources, work with others, and utilize effective communication skills.

Programming efforts in agriculture and natural resources address a broad range of problems from traditional agricultural management and production issues in livestock and crops, to farm business management, farm labor, soil and water conservation, environmental issues, pesticide applications, forestry and other natural resources, commercial and consumer horticulture, water quality, and skin cancer prevention. Family and Consumer Sciences programming is focused around three broad areas: nutrition and wellness; financial management, housing and consumer education; and family and human development.

Virginia Cooperative Extension is an educational outreach program of Virginia's land-grant universities: Virginia Tech and Virginia State University, and a part of the National Institute for Food and Agriculture, an agency of the United States Department of Agriculture. Extension programs are delivered through a network of faculty at two universities, 107 county and city offices, 11 agricultural research and Extension centers, and six 4-H educational centers. Our system incorporates the expertise of faculty in the Virginia Tech College of Agriculture and Life Sciences, College of Natural Resources and Environment, Virginia-Maryland Regional College of Veterinary Medicine, and the Virginia Agricultural Experiment Station; as well as the College of Agriculture at Virginia State University.

Virginia Cooperative Extension (Augusta County Office)

13 Government Center Lane Verona, VA 24482

Main Office: (540) 245-5750 Fax: (540) 245-5752

Shenandoah Valley Workforce Investment Board

The Shenandoah Valley Workforce Investment Board, "SVWIB"), is a non-profit organization established to implement the Workforce Investment Act of 1998 ("WIA"). The SVWIB operates five Valley Workforce Centers that serve individuals and employers located in Harrisonburg, Staunton, Winchester, Page/Luray, and Buena Vista. The Staunton Workforce Center is located at 1600 North Coalter Street, #14 Staunton, VA 24401.

Valley Workforce Centers have extensive services for anyone seeking employment offering assistance with job searching, resume writing, interviewing skills, networking, filing for unemployment compensation, career exploration, skills assessment, use of computer-phone-fax-printer for job searching, and workshops on many job seeking topics. Employer services include: find and prescreen candidates, help hire Veterans, post and host a

job/career fair, labor market information, federal bonding for hiring ex-offenders, and space for hosting job fairs, trainings, or interviews. Essentially, the SVWIB equips job seekers with the necessary shills and education to successfully compete in the job market.

Valley OJT is an on-the-job training initiative, funded by a U.S. Department of Labor grant that subsides wages of employees during their on-the-job training. Advanced manufacturing and health care employers are eligible. Some businesses in our region have received over $100,000 in wage subsidies and hundreds of individuals have obtained full-time jobs through the Valley OJT initiative.

1.2.1i Public Library

The Augusta County Library creates an environment for people to learn, to explore, to enjoy, to create, and to connect with each other and their community. It provides materials and services to the residents of Augusta County to meet their educational and recreational needs.

In Fiscal Year 2014-2015, Augusta County residents:

- Checked out **558,946** items combined at all 5 our locations
- Volunteered **6,778** hours at the Library
- Asked reference librarians **30,542** questions
- Enjoyed **745** library programs, w/**24,800** people attending
- Used Library computers **29,970** times
- **22,992** people have an Augusta County Library card

Fishersville Library (Main)
1759 Jefferson Highway Fishersville, VA 22939
540-885-3961 or 540-949-6354
Monday – Thursday: 9 a.m. – 8 p.m.
Friday & Saturday: 9 a.m. – 5 p.m.
Sunday: Closed

Churchville Branch Library
3714 Churchville Avenue Churchville, VA 24421
540-245-5287
Monday: 12 p.m. – 8 p.m.
Tuesday & Wednesday: 10 a.m. – 6 p.m.
Saturday: 10 a.m. – 5 p.m.
Closed Thursday, Friday & Sunday

Craigsville Library Station
18 Hidy Street Craigsville, VA 24430
540-997-0280
Monday – Wednesday: 1 p.m. – 6 p.m.
Saturday: 11 a.m. – 4 p.m.
Closed Sunday, Thursday & Friday

Deerfield Library Station
59 Marble Valley Road Deerfield, VA 24432
540-939-4123
Tuesday: 3 p.m. – 6 p.m.
Wednesday: 10 a.m. – 4 p.m.
Thursday: 3 p.m. – 8 p.m.
Saturday: 10 a.m. – 1 p.m.
Closed Sunday, Monday & Friday

Middlebrook Library Station
3698 Middlebrook Road Middlebrook, VA 24459
540-885-1008
Tuesday & Thursday: 3 p.m. – 7 p.m.
Wednesday: 11 a.m. – 3 p.m.
Saturday: 11 a.m. – 2 p.m.
Closed Sunday, Monday & Friday

Verona Book Drop
Augusta County Government Center
18 Government Center Lane Verona, VA 24482

Weyers Cave Book Drop
Houff Library – Blue Ridge Community College
One College Lane Weyers Cave, VA 24486

The Woodrow Wilson Presidential Library is located at 18 N. Coalter Street in Staunton, VA, home to the birthplace of our 28th President, a museum, and a research library.

Citizens without computers or home Internet access and visitors to the County can access the Internet and several applications at no charge. Patrons with laptop computers can access the Internet wirelessly. Station access is being

used for many functions. These include leisure activities such as surfing the Internet and email, to more critical job-search related functions such as working on resumes, researching job opportunities, and applying for jobs advertised by national databases such as Monster.com. It is a common practice for companies to require job applications to be submitted only through an online process. The majority of users are students who either do not have a computer at home or have no Internet access. Other users come to the library to read email, online news and magazines, and perform general Internet searching.

As new applications, programs, and social media applications continue to grow, bandwidth can become strained and in need of updated faster computers. Library hours can limit access by patrons who have no computer or Internet access at home, particularly students who need to access to complete school assignments and job seekers

One potential solution to investigate in aiding libraries is to research the possibility of being able to piggyback on government reduced pricing or arrangements w/service providers for enhanced service

1.2.1j Public Safety Education Resources

APCO (Association of Public Safety Communication Officials) offers extensive training courses for public safety and emergency personnel. Training options consist of traditional instructor-led classes hosted by public safety agencies to online courses and web seminars. Through a partnership with Jacksonville State University and the Institute for Emergency Preparedness, public safety employees can receive certification and degrees without leaving the County. Numerous other training courses are available online through agencies such as FEMA, Department of Homeland Security, US Fire Administration, and the Virginia Department of Emergency Management. To complete online courses, a student need only be skilled with basic computer knowledge to go online and use a web browser such as Internet Explorer. Accessing mission-critical training online seeks to close the preparedness gap between rural and urban public safety entities.

1.2.1k Healthcare

Health-Medical related use of Internet is tied for 5th highest use with Social Media over past 6 months.
The Hospital is located in Fishersville and Health outpatient/urgent care facilities are located in Staunton, Weyers Cave, Waynesboro and Stuarts Draft areas.

Telemedicine applications in rural areas (i.e., viewing higher resolution radiology images) requires higher bandwidth access. The biggest obstacles to healthcare related issues is in adequate bandwidth for remote diagnoses and consultation between medical professionals and doctor-patient, as well as keeping up with developing, storing and protecting the privacy of electronic medical records.

Schools & health care providers are aware of the benefits that broadband communications bring to their tasks, but the biggest problem is not at the schools and health care facilities, but rather not having broadband at home for students, teachers, patients and health care professionals.

The solution to Healthcare gaps is an overall better communications infrastructure in the county, offering higher speed and more reliable bandwidth that can handle video imaging & large data transfer

1.3 Service Provider Input

A communication for Request of Interest was mailed and e-mailed to numerous service providers and/or network managers to attend an August 31st meeting to review the Broadband Assessment and Proposed Network Planning Strategies, collect feedback and suggestions, as well as address potential collaboration through a Public-Private Partnership (PPP). Two (2) service providers, New Hope Telephone Cooperative and MGW followed up discussions

with the project consultants regarding specific infrastructure projects they were interested in further exploring with Augusta County. Shentel also indicated they would support MGW on their project. Follow-up face-to-face meetings were held with New Hope Telephone Cooperative and MGW and a telephone conference call with Lumos Networks. In addition, Comcast followed up via e-mails regarding survey respondents in their service area of Augusta County.

MGW and New Hope Telephone Cooperative during the follow-up meetings provided input and basic information regarding their service territory, products and infrastructure and facilities. Additional information on all existing service providers identified in the surveys can be gleaned from the end-user survey results and maps. These have been compiled to serve as an aid in discussions with providers to extend service to underserved areas.

A reluctance on the part of incumbent cellular telephone service companies to participate with localities presents an impediment to the broadband assessment. A major concern expressed from the surveys and Project Management Team was unreliable cellular service or no cellular phone service in some parts of the county. In addition, it has been reported the Emergency Response Radio Communications efforts have reported improvements are needed in the Craigsville area between Deerfield and Middlebrook. The survey responses were intended to be used for more than just capturing a snapshot of the state of telecommunications today from a service provider's viewpoint, but also used to verify and investigate responses from the end-user surveys and customers of the service providers. If a firms do not get involved, it is difficult to identify the firm as part of the solution. The project consultants appreciate the efforts of the service providers that responded to the request for information and interest. Such collaboration should continue and expand in working with the county and other grass root initiatives on expediting and implementing broadband solutions throughout their member service areas and proposed new areas, as improving communities and quality of life in Virginia is everyone's business.

1.4 Preliminary Engineering, Network Design and Cost Considerations

Last Mile Network Strategies

The end-user survey responses played a large role in delineating current conditions and was used to supplement the telecommunications data provided by the service providers. Priority Areas (focus areas) were established based on the areas of greatest need to allow a phased in approach if warranted. The existing service providers and their infrastructure were included on these maps to know who to talk to and what infrastructure exists to work from.

Finally, once the most cost feasible last mile connectivity options were determined, preliminary engineering of conceptual designs of the proposed solutions with cost estimates were created and the maps refined to show only the relevant information remaining.

Some of the study findings regarding service provider infrastructure and facilities had to be interpreted due to the current regulatory and legal inability to compel its production. The service providers were requested to note any incorrect information presented at the service provider meeting. Most readily available data is received from State regulatory filings, such as regulated antennae structures through the FCC and other Internet searches. In addition, it is probable that fiber exists in more locations than shown on the maps because service providers will normally not disclose all their infrastructure locations or only under a Non-Disclosure Agreement (NDA).

Once the service provider facility, infrastructure maps and coverage area maps were created, the economic development data collected from Comprehensive Plans, on-line data research, and data collected from the face-to-face meetings with service providers was mapped and overlaid with the coverage area data including type Internet connection. Less attention was given to those areas identified as being well served and where a majority of survey

responses indicated current Internet service was adequate, and the remaining non-adequate Internet Service, underserved areas or no service areas were focused on with the economic development data, facility/infrastructure data, and service provider data used to identify which areas to prioritize (focus on), what technologies are in the area, and what service providers should be talked to for expanding service areas. If an area was identified as an adequate Internet service area, but considerable survey response data indicated Internet access was inadequate or not available, then regardless some portions of areas of adequate service area were identified as a priority area. Priority areas were delineated where clusters of no or dissatisfied or unreliable service was noted. Isolated disgruntled responses were ignored if a majority of adjacent responses were satisfied or positive. Delineation was somewhat subjective since the breakdown between satisfied and dissatisfied or no service and service was within +/- 10% of a 50%/50% distribution. One area warranting further investigation is where infrastructure was indicated existing, but many surveys indicated service was not available. Option No. 2 for Last Mile Solution connectivity suggests creating a Network Assistance Program to investigate and resolve such contradictions.

Implementation Criteria

Since one result the Assessment Study wants to accomplish is sustainability of funded projects, selection of **Priority of Future Implementation Projects** in the non-adequate Internet service areas, underserved areas or no Internet service areas is often made using the following parameters:

- **Criteria** – Greatest potential for return of investment resulting in new or increased employment opportunity and/or tax base; i.e., Economic Development Features
  - Zoning-Industrial/Commercial Parks and Downtown Business Districts (i.e., Incorporated Areas)
  - Major Employers
  - Enterprise Opportunity Zones (Tax Incentive Sites/Zoning)
- **Criteria** – Greatest aggregation of demand per capita; i.e.,
  - Urban and suburban communities (Housing and Population Density)
  - Growth Corridors
- **Criteria** – Strategic end users, specialty needs areas; i.e.,
  - Community Anchor Institutions (CAI) such as schools/vocational centers and libraries
  - 911 Emergency Response Agencies, Hospitals
  - Municipal Facilities, Public Works Buildings, Water Towers, Maintenance Garages, Treatment Plants
- **Criteria** – Remaining rural areas not addressed
  - Towns, Villages, Strip Malls, etc.

Major employers, schools and health care facilities are important end-users and must be considered in the quality of life concerns. Feedback from these facilities indicated that while many had adequate service at the location, the bandwidth and speed is still inadequate at the homes of the employees, students or patients to meet their applications adequately.

There was little to no interest in the project expressed by Wireless Service Facilities Providers" which may include both towers and anchored antennae facilities (such as roof top) and Interior Wi-Fi hotspots and facilities. While attaching antennae arrays on water tanks and schools can sometimes create problems, building a tower on County owned or non-private land such as water tank sites, fire station/rescue sites or school sites can make tower construction more cost feasible and/or attractive to service providers, particularly if the site is or could be served with fiber.

The location of "Telecommunications Infrastructure" of Figure ES-A is qualitative because of the reluctance of fiber owners to pinpoint all routes or locations with great detail. The greatest benefit of applying the data layer on

the county maps is to identify owners of fiber and vertical assets in the area. These providers should be contacted when investigating build-out, connectivity and transport options for broadband services.

Augusta County is fortunate to have a large staff work force that may be able to implement many of the following options at reduced or no additional cost. In the event existing staff is not available or somewhat limited, it is recommended Augusta County negotiate and hire the services of the Central Shenandoah Planning District Commission to assist in the administration and carrying out of certain aspects (where appropriate) of the following options.

1.4.a OPTION NO. 1: *MARKET EXISTING & POTENTIAL SITES/ASSETS*

Premise: Marketing Sites and Other Assets in the County

Description: Promote and seek Interest from Service Providers of existing and potential sites and assets

Approach: While generalized and abbreviated, the overall approach recommended is to hire a consultant to work with the Project Management Team to identify and work with these companies to solicit interest from service providers. An asset portfolio should be developed including any incentives the County is willing to offer to make the solicitation more attractive (such as funding/cost offset or assistance with funding applications, expedited approval and permitting, use of County owned land, co-location sites, cost sharing, etc.). Along with creating incentives, the County will need to determine what role, if any, it is willing to offer to play in the arrangement (i.e., landlord or assistance with property owner negotiations, tower builder/owner, tower fiber build, etc.). Depending on response from the site broker firm and role of the County if any, an RFP may be needed to comply with public procurement requirements to address the proposed provision of the arrangement. If an RFP is required, the County will then have to solicit, receive, analyze, and award a contract. If the County is involved in some aspect, it is likely such an arrangement will be multiyear in term and will have some minor administration responsibilities involved.

1.4.b - Option No. 2: *Augusta Internet Initiative-Communications Assistance Program (CAP)*

Premise: Augusta Internet Initiative Communications Assistance Program

Description: Liaison between Customer & Service Provider

BHT-NAP Structure

Start by continuing to support and operate the Augusta Internet Initiative Project Management Committee

1. Design an Internet Service Application to collect data from potential end-users including, but not limited to why end-user is making a claim of no service available or poor service or too expensive; location of service desired; steps taken in attempting to get service in the past; document conversations held with service providers; cost data; speed or service desired; qualifying data for low to moderate income subsidies programs, and much more.
2. Take and investigate service applications:
    - From property owners claiming no option for Internet access to property.
    - From property owners claiming paying too much or access too expensive. Assess price fairness.
    - From property owners claiming Internet connection is unreliable.
3. Take above claims to incumbent or applicable Internet service provider for response to report back to end-user (investigate if misleading advertising exists of availability, speed, cost, etc., and report findings).
4. Determine if applicant would be eligible for other solution options such as CPE/Last Mile Cost Subsidy.
5. Work with customer and service provider to mitigate cost details, service contract issues, timeline, etc.
6. Provide assistance with other available last mile solution options.

Basis of Estimated Cost

a) It is recommended the county appoint a staff person to assist in the administration of the service applications, liaison with the service providers, providing maps, etc. For government accounting purposes of cost breakdown or whether using CSPDC assistance, the estimated cost to the county is $1,000 per mo. or $12,000 plus $2,400 for materials and supplies for the first year after which the success and effectiveness of the program can be evaluated if warranted to be renewed.

Augusta Internet Initiative CAP					
Cost Item	***Amount***	***Subtotal***	***Total Cost***		***Comment***
Administration of Program	$1,000/Mo. x 12 mos.	$12,000 per Year			Perhaps the CSPDC could assist if needed or supplement County Staff
Materials/Supplies/Overhead	$200/Mo. x 12 mos.	$2,400 per Year			Map Printing, phone calls, fax, mileage, etc.
Augusta Internet Initiative CAP Total			**$14,400/Yr.**		← Program Cost for the County; Does not include cost for CSPDC Support

1.4.c - Option No. 3: *NETWORK EXTENSION FUNDING PPP*

Premise: Getting middle mile/Last Mile where not existing or improving where exists

Description: Extending DSL/DSA, Wireless, Fiber where not existing

Structure

1. Aggregate Demand.
2. Encourage Service Providers to extend middle mile/last mile infrastructure.
3. Define the scope of the project, roles of the parties, and return on investment if the county were to contribute resources to the cost of a middle mile build funding application.
4. Assist in completing a funding application.
5. Plan for future technology. While DSL is a major technology being used, with FTTH/FTTP planned, implement technology to accommodate future plans such as using fiber in lieu of copper for extensions.
6. Determine and evaluate if a formal PPP would be required to secure financing or can an informal PPP be utilized. While possible, it is doubtful that a Wireless Broadband Authority would need to be formed for this option.
7. Negotiate and ensure the commitment of municipal resources will result in the ability for x-number of end users to get connected to high speed Internet access.

Basis of Estimated Cost

a) Funding applications, such as the USDA-RUS Telecommunications Loans and Grants, quite often cost $50,000 or more to prepare and provide all the required information for submittal. Certainly the county should not shoulder the entire cost, but perhaps consider cost sharing this expense with a service provider(s) who commits to x-number of end users to being able to get connected to high speed Internet access, perhaps at discounted cost. Therefore, the estimated cost includes a $46,600 cost share from the county towards 1 or 2 funding applications plus $50,000 from service provider(s) for a total of $96,600.

b) Again, in addition to the above suggested county budget, if Augusta County staff personnel are too busy to prepare funding applications, an option would be for the county to consider negotiating and contracting for services with the Central Shenandoah Planning District Commission (CSPDC) to assist the county and their staff in the administration of the funding applications providing maps, survey results, demographic data, etc. The administrative budget is an estimated cost of $18,000 for the first year after which the success and effectiveness of this option can be evaluated if warranted to be renewed.

NETWORK FUNDING EXTENSION - PPP					
Cost Item	***Amount***	***Subtotal***	***Total Cost***		***Comment***
1. Application-Service Provider Share	$50,000	$50,000			1-2 Applications (Depending on Funding Source)
2. Application - County's Share	$25,000	$25,000			1-2 Applications (Depending on Funding Source)
3. Administration of Program	$1,500/Mo. x 12 mos.	$18,000/Yr.			Perhaps the CSPDC could assist if needed or supplement County Staff
4. Materials/Supplies	$300/Mo. x 12 mos.	$3,600/Yr.			Map Printing, phone calls, fax, mileage, etc.
NETWORK FUNDING EXTENSION - PPP Total			**$96,600/Yr.**		← Program Cost for the County; Does not include cost for CSPDC Support

1.4.d - Option No. 4: *CPE/LAST MILE COST SUBSIDY*

Premise: Assisting customers get connected by partially subsidizing a portion of the Customer Premise Equipment (CPE) or last mile connection cost.

Description: Develop parameters for participation and provide cost subsidy for eligible applicants.

Structure

1. Seek a funding source, such as the Virginia Housing & Community Development Office (VAHCD) or Appalachian Region Commission (ARC), say $100,000.
2. Establish eligibility criteria (requirements may be tied to a funding source) such as low to moderate income families or families with children on the subsidized school lunch program, job creation businesses, etc.
3. Develop an application and advertise its basic purpose and criteria, as well as its availability.
4. Verify the credibility of the unusual cost for CPE or last mile connectivity build and that the situation meets all eligibility criteria established.
5. Negotiate with service provider portion of cost to be covered by provider based on service commitment by customer.
6. Determine the balance remaining for the customer's share and portion to be subsidized by the program.
7. As part of the above negotiations with service providers, negotiate a refunding formula (such as a small % of monthly service cost for a limited period of time or flat amount) that will go back into this option funding availability to extend and offer the program to other eligible applicants.
8. Administer the program.

Basis of Estimated Cost

a) The cost estimate for this option also assumes a matching share requirement from the county. Since this option is a cost subsidy program to the customer, it is anticipated the likeliest funding source might be the Virginia Housing and Community Development (VAHCD) Office. Another possible source would be the Appalachian Region Commission (ARC). It is anticipated that approximately $100,000 might be secured from an outside funding agency for each county to be matched by local shares from the county, say $100,000 for a total county program of $200,000. If $100 was an average subsidy allowance, this program could fund 2,000 applications in each county without a refunding formula and much more with one.

b) As with the first two (2) options, if staff time and load is a problem it is recommended the county negotiate and contract for services with the Central Shenandoah Planning District Commission (CSPDC) to assist the county and their staff in the administration of this option. The estimated cost is $12,000 per year or $24,000 for the anticipated 2-year program after which the success and effectiveness of this option can be evaluated if warranted to be refunded. Materials and supplies was estimated at $300/mo. or $7,200 for the 2-year program.

CPE/LAST MILE COST SUBSIDY					
Cost Item	***Amount***	***Subtotal***	***Total Cost***		***Comment***
1. Subsidy-Outside Funding Share	$100,000	$100,000 over 2 Yrs.			@ $100 avg. Subsidy = 1,000 Hook-ups
2. Subsidy-County's Share	$100,000	$100,000 over 2 Yrs.			@ $100 avg. Subsidy = 1,000 Hook-ups
3. Administration of Program	$1,000/Mo. x 12 mos.x2 yrs.	$24,000/2 Yrs.			(Only County cost addressed) Discuss w/CSPDC if assistance is needed
4. Materials/Supplies	$300/Mo. x12 mos.x2 yrs.	$7,200/2 Yrs.			Map Printing, phone calls, fax, mileage, etc.
CPE/LAST MILE COST SUBSIDY Total			**$231,200/2-Yrs.**		← Program Cost for the County; Does not include cost for CSPDC Support

1.4.e - *Fiber and/or Wireless Build*

While a *Network Build Option* is discussed for informational purposes only, it is not being recommended at this time based upon concerns expressed by the Project Management Team members including risk, limited funding, lack of experience, regulatory oversight and compliance, etc.

Wireless Network Build

Premise: An investment in this option may address to some extent the following multiple purpose objectives: (i) Enhancing Broadband Service and availability; (ii) Addressing current problems with the Emergency Response Land, Mobile, Radio (LMR) communications; (iii) Playing a role in future Public Safety Data Network (PSDN) applications; (iv) Improving cellular service coverage.

Description: Typically, a Request for Proposal (RFP) is issued seeking a Wireless Internet Service Provider (WISP) to become a Public-Private-Partner (PPP) with the county to cost share in the construction, management and operation of vertical tower assets at strategic locations, and then once the towers are built, issue a secondary Request for Proposal (RFP) to Cellular Service Providers to located equipment on the towers to improve coverage and service.

Structure

1. Seek tower siting, design and construction finance options and develop a funding plan.
2. Develop a Request for Proposal (RFP) for Wireless Internet Service Providers (WISP) or other type wireless communications providers to respond to as a Public-Private-Partner with a Wireless Broadband Authority formed by the County.
3. Negotiate a win-win arrangement with a service provider addressing issues such as roles, responsibilities, and other terms and conditions.
4. Support tower construction and backhaul solutions.
5. Address the colocation of equipment on the towers.
6. Solicit responses to an RFP from Cellular Service providers to collocate equipment on the towers.
7. Lease/maintain the towers if that becomes a role of the county in the PPP.

Basis of Estimated Cost

a) Since the number of towers sites would not yet have been finalized, the cost estimate for this option is intended to represent an average cost per tower site, not a total cost to the county. The actual costs to the county would also depend on the RFP to the service providers and the amount the county would decide to undertake to entice a Public-Private-Partner. Given the rural region, minimum number of homes/premises, and competition by wireline service providers, and the fact that a much more robust tower construction meeting cellular service specifications would have to be built to be attractive for cell service providers to consider, it is anticipated the county would have to fund a significant amount of total expense, some of which may be offset by grants. Hopefully some of the cost could be offset by a cost share from a wireless Internet service provider (WISP).

The cost estimate is very tentative because needs of Emergency Radio communications has not been reviewed, as well as no determination and finalization of the number and location of the towers, design, and extent of site work needed, etc. During the study there have been a number of potential tower sites discussed for which preliminary data had been collected **(see Augusta County, Virginia Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services** completed August 6, 2012 by The Atlantic Group of Companies, Inc.), but no field verification, wireless signal propagation modeling or Radio Frequency (RF) engineering has been performed because of being outside the scope of this broadband study. These discussions are for information only.

Typically, a new 200 ft. Monopole tower alone costs nearly $80,000 just for the tower, but when you add expense for foundation, site work, ingress/egress, power, equipment sheds, security fencing, backhaul arrangements, environmental issues and more, new tower construction can cost between $350,000 to $450,000 depending on site specific location and conditions. **In the average suggested cost of $420,000 per tower site**, there is no budget allowance for radio communications, broadband service, bandwidth or other operational and maintenance expense included because of relying on others to address this expense, but some party will have to cover such expense.

While towers could easily have a much longer life than fifteen (15) years, it is difficult to get lending agencies to amortize funding for more than 15 years for telecommunications assets, not to mention technology is changing rapidly. Therefore 15 years is suggested to be used for the amortization period at say 5% interest (may not be able to use municipal tax free bonds if private sector gains benefit), and 15 years used for administration and Operation & Maintenance (O&M) expense. Another 10% of the subtotal is recommended to be used for closing and soft costs of the financing, permitting, environmental studies, cost overrun, and miscellaneous other expense.

While tower use and future colocation fees will help offset some of the monthly debt service (probably not more than $1,000 - $3,000 per/tower/month depending on service provider, and most likely not all towers built would be used by others), this option should be viewed as a means to an end, particularly since the emergency communications must be addressed regardless of any revenue source, there are no current wireless Internet service providers that expressed interest, and the priority given for improving cellular service. An average of $1,750/mo. for the first 4 years for one carrier increasing $1,250 (lower rate for second positioning) for a second carrier after 4 years to $3,000/mo. total seems reasonable. There is the potential for more than 2 carriers, but again a number of years may pass before additional carriers attach and later positioning typically comes with a lower cost.

Just Some Wireless Options

FCC Allows Operators to Apply On-line for non-exclusive use of "lightly licensed" spectrum in the 50 MHz band from 3650 MHz to 3700 MHz.

WiMAX supports this special spectrum which operates at higher power levels compared to license exempt bands and affords superior non-line-of-site (NLOS) propagation compared to higher frequencies (visit: http://wireless.fcc.gov/services/index ; htm?job-licensing&id=3650_3700 for link to FCC's online Universal Licensing System (ULS)

- In rural areas that are devoid of any wireless communications infrastructure, and therefore unlikely to experience RF interference, WiMAX also supports license-exempt spectrum

WiMax operates on licensed frequency

- Licensed Spectrum Examples: 2.3 GHz, 2.5 GHz (Incl. Colleges**)**, 4.9 GHz (4.9 GHz Public Safety Use Only)
- Non-Line of Sight (NLOS)
- (Portable) Plug in modem and connect to Internet anywhere in the entire service area
- Typical speeds offered are Up to 2 Mbps download and 256 Kbps uploads

Wi-Fi WLAN: 2.4 GHz 802.11b/g Radio (Commercial Wireless) and 5.8 GHz 802.11a Radio

- Can be vulnerable to scanning and packet interception
- Only Available in "hot-spots"

Cellular Mobile Broadband: 3G and 4G Technologies

Wireline (Fiber Optics) Network Build

Premise: On a case-by-case basis, be prepared to finance and build the last mile network for middle mile Internet Service Providers (ISP) to connect to and peer through the access network to serve the customer.

Description: Confirm a middle mile owner Internet service provider will connect to a last mile fiber network and at what particular location should the aggregation of last mile fibers be located (cabinet), finance and build the last mile network either aerially if the electric cooperative plays a role or underground direct fiber to the home/premise.

Structure

1. Confirm provider participation &strategic location to locate the aggregated fibers to the homes/premises.
2. If there is interest, form a Wireless Broadband Authority to have legal standing on building and owning a network.
3. Discuss with electric and phone cooperatives use of existing poles for aerial drops of fiber to the homes or business premises. Since the customers, or members of the cooperatives would gain the benefit of service, negotiate mitigation of annual pole fees against use of the fiber by the cooperatives, or some other arrangement.
4. Determine if the last mile will be aerial or underground.
5. Finalize the location of point of interconnection.
6. Publicly procure the services of a contractor to construct the last mile network.
7. If need be, some middle mile fiber may be needed to centrally locate interconnection points or meet existing fiber.
8. Administer the network and lease fees.

Basis of Estimated Cost

a) The cost estimate for this option is also generalized because depending on type construction, aerial or underground, boring or direct burial, presence of congestion (other utilities), geology and topography, whether conduit is used, amount of make ready work, permitting and right-of-way work involved, environmental requirements, whether prevailing wages apply, engineering and inspection costs, and much more, costs can vary tremendously. As a quick general rule of thumb, an estimate can be based on $25,000 - $50,000 per mile for aerial construction or $50,000 - $75,000+ per mile for underground construction.

While fiber use lease fees (and/or access to the customer if a last mile network) will help offset some of the monthly debt service and capital expense, a last mile network is not a complete network that can operate on its own without middle mile and therefore unlike a full municipal network from Central Office/Point of Presence (POP)/Headend to the customer, revenue potential will be limited because of not offering services. Lease revenue will also be less than a network providing triple play services (voice, video and data). Because of these shortcomings, on many instances there is not enough opportunity to recover the investment, even with aerial construction to make this option feasible. One possible way to warrant continuing to look at the aerial construction of last mile connectivity, would be to approach the network build from a multi-party cost share approach involving the electric and telephone cooperatives due to owning poles, the county, grant funding agencies, and perhaps the home owner contributing towards the last mile build. Without these other parties, this debt service and network build is not only too expensive, but too risky.

1.41 Strategic Recommendations

Strategic recommendations are designed to bring choices to the more rural areas, generally provide increased competition, and educate consumers on high-speed options available to them.

The county is fortunate to have service providers with some existing telecommunications fiber optics infrastructure to build upon. One contrasting problem to the existence of having some current telecommunications fiber infrastructure, is that the survey results indicate dissatisfaction and reports of current Internet service inadequacy to meet their needs in many areas of the region. As a result, where there is significant reports of dissatisfaction and/or current Internet service inadequacy, these areas were identified as Priority Areas. Last Mile Connectivity solution options were prepared for consideration.

Another area needing to be addressed is broadband education. Businesses and residents are not leveraging use and applications of the Internet to the degree available and utilized elsewhere where adequate Internet services exist.

Current and Near-Term Recommendations in Addition to Last Mile Connectivity Solutions to be Considered

1. Enhance the region's Economic Development efforts with utilizing a Community Intranet Portal.
2. Continue to promote a "Broadband for all" policy to foster economic development activities and increase community awareness.
3. Remove municipal obstacles to provider deployment (Update ordinances and resolutions to address right-of-way, standardize permits and fees, allow attachments to water towers, etc.)
4. Seek out strategic collaboration partners and projects and continue to seek funding
5. Educate residents and businesses on Broadband options
6. Stay involved in regulatory policy
7. Encourage the expansion of DSL and cable modem services and FTTH/FTTP connectivity solutions into the rural areas.
8. Create Wireless Service Incentive Programs, particularly if new towers are constructed as a result of Emergency Radio Communications efforts.
9. Encourage the spread of new technologies to provide additional options for consumers and increased competition.

Long-Term Recommendation in Addition to Last Mile Connectivity Solutions to be Considered

1. Continued expansion of long-haul/back-haul fiber
2. Explore options to increase Network Access Points (NAPs)
3. Centralize telecommunications data, maps, site select information on one site with links to the county
4. Strive for Megabit-Gigabit per second bandwidth benchmark

The primary need to develop affordable broadband across the area will be to encourage infrastructure development, particularly last mile solutions, in the more rural areas; talk to service providers about the dissatisfaction and reports of current Internet service inadequacy to meet current needs, and facilitate projects that will improve service and speed, educate your citizens, businesses and elected officials on the available options for obtaining broadband services and the importance the Internet plays in day to day activities and quality of life issues; and continue to strive to obtain not just adequate services and broadband speed for today, but next generation applications and technologies for tomorrow.

These additional recommendations may need to be changed as new technologies evolve. What we currently know is a significant number of end-users are utilizing DSL and cable modem to access the Internet, outside of a satellite and a few unique and fortunate customers that have a fiber-to-the-home (FTTH)/fiber-to-the-premise (FTTP) connectivity.

Service providers attempt to maximize the use of their existing infrastructure. The major exception to this is the FTTH/FTTP technologies that are being installed over all fiber optic networks. Wireless technologies and products have evolved and become more efficient in the use of spectrum and as a result, many different transmissions coexist. Wireless technologies have some advantages and disadvantages in serving rural areas. They need not develop an entirely new wired outside plant infrastructure, but also face interference and technology challenges, struggle with reliability and to keep up with the ever increasing definition of broadband by the FCC, as well as the need for vertical assets to deploy from. The future requirements and changes to recommendations will be driven by the applications that become "must have" across the landscape.

1.5 Organization and Network Operation Options

The organization structure of local government and best way to operate a network involved with a municipality depends on the role the municipality intends to play. Virginia is a Dillon Rule State whereby the State must explicitly grant powers to municipalities. Virginia allows local governments to provide communications services, but with restrictions. See Section 2.1 for applicable sections of the VA Code stating allowances, as well as prohibitions.

There are number of roles a municipality can consider in an Open Access Telecommunications Initiative:

Option A "Dark Fiber Network": The municipality does not invest in electronic equipment and generates revenue by leasing dark fibers, collocation fees & through savings by owning the network serving its own facilities. This model can also include the municipalities building towers & leasing space for equip.

Option B "Hybrid Fiber Network": The municipality owns and operates the network providing only lit services (municipality buys the equipment and content [i.e., bandwidth, voice services, etc.]) to only serve the municipality facilities itself. The municipality also leases dark fiber, collocation space, etc. to private providers to service the other end-use customers on the network

Option C "Wholesale Fiber Network": The municipality builds the middle mile and last mile networks where intended to serve & lights the network (electronic equipment) and sells bandwidth and/or access to providers for all customers on the network. Typically, service providers buying access provides content.

Option D "Retail Fiber Network": The municipality owns and operates the network as a service provider providing retail services to the end-use customers.

Option E "Hosted Network": The municipality is not a service provider, but rather a promotional entity to endorse a wholesale transport/open-access network. **Note: VA Law does not allow** the locality or authority be involved in marketing or promoting the services of the lessee or purchaser of a Network

There are other models including slight variations to the above, but these are the most popular. Input from the County's Project Management Team Meetings played a role in arriving at the proposed solutions with the consideration of the type organization that would be needed including:

- Municipalities would prefer not to own or operate network infrastructure of facilities
- While the county is willing to make some manageable investment into enhancing Internet access within the county, without being a service provider there would be little monetary return on such an investment and Broadband it is just one of many infrastructure projects needing funding.

Of the five Last Mile Connectivity solutions presented, it is felt that formation of a Wireless Broadband Authority may only be warranted under Option No. 5 - Fiber or Wireless Network Build

1.6 Funding Strategies and Resources for Future Implementation Projects

Typical telecommunications funding resources were provided in Section ES6.0. The best funding resource to pursue often depends on answers to the following questions or requirements:

a. Who will own and operate the asset(s) being funded?
b. How much is intended to be borrowed and for how long (amortization of the debt)?
c. What are the applicant eligibility requirements?
d. Are there matching funds or must all of the debt service be underwritten?
e. Is there historical performance and financial data available to support an application or only pro-forma data?
f. Does the applicant have the expertise to successfully carryout and manage the operations?

There are much more criteria that needs to be considered, but the answers to the questions above start to narrow down who should be the applicant for what proposed project. For example, Option No. 3 – Network Extension Funding through a Public-Private Partnership (PPP) probably lends itself to the private sector service provider being the applicant while Option No. 4 – CPE/Last Mile Cost Subsidy program will likely be more successful for the public sector (local government) to be the applicant. Some of the advantages for service providers and local government to consider a Public-Private-Partnership were provided in section ES3.3.

The decision to move forward by elected officials typically requires other decisions that have to be made including:

1. **Select Last Mile and Main Connectivity Solution(s)**
   - Continuing Face-to-face meetings with the service providers regarding requirements.
   - Location for construction and cost, as well as what type of Main Network Connection is needed.
     - Distribution NAPs • POP and NOC location(s) • Detailed rt. planning to minimize make-ready
     - Equip choices (impacts extent of fiber) • Fiber count • Connections to wholesale Internet providers

2. **Extent of the Fiber and Network Architecture Conceptual Design /Cost Estimates**
   - Ultimate decisions of how extensive a network to build based on cost & comfort level of financing and:
     - Extent of Provider Interest and Customer Interest (Bandwidth Aggregation)
     - Business Model: Who will Provide/Operate Various Components of Network?

3. **Select the Organizational Governance and Structure of the Network**
   - VA Law and Federal Law each play a major part (investigate legal steps necessary to set-up Authority)
     - Document justification for recommending the most appropriate ownership model
     - Provide Pro-forma data outlining near/long-term revenues/expense estimates
     - Planning for utilization by schools, hospitals and municipals (anchor customers)
     - Document preliminary interest of service providers (Letters of Intent/Understanding)

4. **Create a Funding Plan**
   - Discussions with financing consultants, bond underwriters/counsel, bank tax credit programs, capital lenders

5. **Create an Implementation Plan**
   - Development of agreements for network access with providers-incorporate equipment needs
   - Pole attachment agreements • Maintenance Agreements • Design, Specs, Bidding Docs.
   - Operations Mgmt. Agreements • Content Acquisition Agreements • Solicitation & Award of Bid
   - Marketing Program • Project Timetable • Testing, Punch List, Start-up

2.0 Project Input

In April 2016, Augusta County, VA hired a telecommunications consultant to lead the county through the development of the comprehensive Strategic Community Broadband Telecommunications Plan that will serve as a guide in determining the areas with the most need, and the type(s) of broadband technology that is most feasible for serving them. These efforts and the work of the consultant are being funded by a grant from the Virginia Department of Housing and Community Development.

From the Kick-off Meeting held on April 14, 2016 and County response to the consultant's Data Request Form of the Augusta County, VA Community Broadband Telecommunications Plan Project, it quickly became evident Augusta County has made broadband enhancement a high priority of County government over the past several years. The following previous efforts had been undertaken in working towards accomplishing this priority and some of the results are referenced throughout this summary in support of discussions, but are not intentionally reiterated within this report to avoid redundancy, but rather to serve as a foundation from which the Strategic Broadband Plan can build upon.

2.1 Previous Broadband Telecommunications Planning Efforts (Author & Credit Source provided in Attachment "A")

The following documents previous efforts of Augusta County regarding Broadband Telecommunications Planning:

- Previous Augusta County, VA Broadband Survey Results contained in April 30, 2016 Memorandum (Attachment "B")
- From CAMS *(Centralized Application and Management System)*, Augusta County (Attachment "C"):
- Augusta County, VA Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services, August 6, 2012 (Attachment "D")
- LIFECORE Blue Ridge Health Science Corridor Stakeholders August 6, 2015 Survey (Attachment "E")
- Augusta County May 20, 2015 Letter of Interest for the Virginia Telecommunications Planning Initiative (VATPI) Grant Funding (Attachment "F")
- County of Augusta, VA Comprehensive Plan Update "*Growing Together to Shape Our Future 2007-2027"* Adopted: April 25, 2007 As amended January 28, 2009 / Augusta County Comprehensive Plan Update 2014/2015 Adopted August 26, 2015 (Attachment "G")
- The Fishersville Small Area Plan was prepared as a follow-up the Augusta County Comprehensive Plan. (Attachment "H"), adopted January 28, 2009 by Board of Supervisors
- Economic Development Strategic Plan Executive Summary January 2009 (Attachment "I"), updated January 14, 2015
- 50 Largest Employers in Augusta County, VA (Attachment "J")

2.2 Observation of Existing County Data

From CAMS *(Centralized Application and Management System)*

In accordance with the narrative of CAMs, the County's hopes are that the plan will streamline the County's goals and define the role the County is to play in furthering broadband initiatives.

- "Broadband is needed throughout the county so students can connect for both on-line and even seated classes. Students need to be able to access educational resources".

- Several responses also noted that it was somewhat difficult to find personnel with the needed computer, software and internet skills from the local area and that is was difficult to find and provide the appropriate training for personnel in these areas.

- ❖ Broadband growth is needed throughout the entire County. The most vocal constituents have historically been small home-based business owners and parents of students that live in rural areas of the County. But due to the topography of the County, even the largest of industries may not have adequate broadband available to them.

- ❖ The County contains an urban core that stretches from Staunton through the community of Fishersville to Waynesboro and south to Stuarts Draft. This core has seen major growth over the years. The core contains community anchor institutions, such as:

  - *Healthcare:* Augusta Health (hospital), Wilson Workforce Rehabilitation Center (State), University of Virginia facility
  - *Education:* Murphy Deming College of Health Sciences, Blue Ridge Community College satellite campus, Augusta County Schools Wilson complex (elementary, secondary and high), Valley Career and Technical Center
  - *Industry:* Hollister, McKee, Hershey, NIBCO, Target Distribution, Rexnord, Bloomaker, Augusta Lumber

  Twenty-on percent (21%) of the County's workforce is in manufacturing, and Education/Healthcare is the largest employment sector. Healthcare is also the second largest growth sector in Augusta County. Hollister, Sunlite Plastics, and the Wilson Workforce Rehabilitation Center, among several other healthcare-related businesses, are all located in Augusta County.

- ❖ The County has identified other areas that could benefit from fiber installation, including:
  - Rt. 608 corridor from Fishersville to Stuart Draft industries
  - Rt. 11 corridor from Weyers Cave to Verona, which includes education and industry/business components.

Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services (2011)

- ❖ Determination: For Augusta County to be able to service current poorly served 3-G service areas and anticipate future 4-G services, the county should help facilitate these needs through a plan that will address this issue. The analysis addresses the potential tower sites that will service the new 4-G networks.
  - Based upon the review, it is determined that the existing infrastructure is not capable of meeting most of the future needs of voice and texting services.
  - Wireless broadband must be supplemented with additional tower structures.
  - In areas where structures don't currently exist, Potential Commercial Tower Development Areas of PCTDAs have been identified as areas where tower development is needed.
  - The conclusion has identified twenty-one (21) rural villages and areas where the existing tower structures would not provide high speed service to the areas for Broadband internet usage for 4th Generation wireless services.
  - As a result of expanding 4G data and voice services, incoming wireless 9-1-1 calls for emergency services will be enhanced significantly.
  - The consultant of the study recommends that twenty-one (21) new Potential Commercial Tower Development Areas be established due to the lack of wireless service.

Fishersville Small Area Plan and "Lifecore"

- ❖ Future plans could include discussion on the need for broadband in the community if the citizens in the area choose to pursue.

- Fishersville is home to almost 400 acres with existing medical facilities, but also almost 300 acres of primary development opportunities and another almost 100 acres of supporting opportunities.
- A new connector road, opened in March 2015, was named "Lifecore Drive" to represent the concept of developing – or continuing the development – of a life sciences corridor. The corridor is anchored by the Augusta Health campus, our 250-bed independent hospital with a cancer center with Duke Oncology affiliate and a new heart and vascular center, on one end and the Wilson Workforce Rehabilitation Center on the other.

❖ A meeting was held on August 6, 2015 with the Lifecore Stakeholders Group to review the possibilities of expanding the work of the group for broadband initiatives.

- The group meets the stakeholder requirements of expanding health care and educational benefits to the community and understands the investment necessary to obtain the goals.
- Public/private partnerships may be further realized through the implementation of broadband buildout along the corridor.
- There is a portion of this corridor that needs fiber connectivity to other areas in the urban core.
- Stakeholders completed an exit survey. The population included retail, commercial and service businesses, residential, government, and secondary and higher education. Note excerpts from the surveys:
  - "Fiber has become a necessity for most national retailers as part of the site selection process. Broadband is acceptable, but fiber in increasingly important."
  - "Vocation training for individuals with disabilities [using] video conferencing from classroom to remote locations [is a future need]."
  - "Ensuring that we have fiber/broadband availability will be critical for the expansion/development/buildout of the corridor."
  - "Medical and Education uses require high-speed delivery of information, as well as the people working and living in communities along Lifecore."
  - "Broadband is needed throughout the county so students can connect for both on-line and even seated classes. Students need to be able to access educational resources."
  - Several responses also noted that it was somewhat difficult to find personnel with the needed computer, software and internet skills from the local area and that is was difficult to find and provide the appropriate training for personnel in these areas.

August County May 20, 2015 Letter of Interest for the Virginia Telecommunications Planning Initiative (VATPI) Grant Funding

❖ Due to its size, location and topography, much of Augusta County lacks broadband infrastructure and/or has insufficient broadband and internet service.

- Currently, much of the County, especially in the more rural western part of the County, remains underserved or un-served.
- County officials recognize that the availability of Internet access is a vital community service that supports economic development, education, healthcare and emergency services, …

❖ The topography of Augusta County, particularly in western Augusta County, is characterized by high, narrow mountain ridges making both cell service and internet services unreliable.

❖ The draft Comprehensive Plan makes two policy statements regarding broadband:

- Policy 1: Expand Broadband. Implement the recommendations of the county's telecommunications consultant to expand the broadband communications infrastructure to serve underserved areas. Consider public/private partnerships where beneficial.
- Policy 2: Co-Location. Ensure co-location opportunities are fully evaluated before permitting new wireless communications towers and require new towers to provide space for county emergency communication systems.

❖ There is an immediate need for adequate broadband services in Augusta County.

❖ The major internet/broadband and telephone providers that serve the County:

- Century Link
- Comcast
- Hughes Net
- Verizon Wireless
- New Hope Telephone Coop.
- AT&T
- Lumos
- Sprint
- High Speed Link
- Lingo Network
- Ntelos
- MGW
- Shentel
- +Several cell tower co.

(Note: Ntelos recently acquired by Shentel; Shentel uses Sprint as the Customer Service Provider in Augusta Co.)

Comprehensive Plan

The following observations were made from the documents supplied to the consultants in response to the Telecommunications Study Information Request:

❖ While the Comprehensive Plan is an extensive community planning document, there was very little direct reference to "broadband" or "telecommunications" contained in the narrative, but rather within the Volume 1: IV. Goals, Objectives and Policies, Objectives and Policies were identified for important aspects of Policy Planning Areas for which broadband high speed Internet and reliable cellular service with mobile broadband are dependent. Two other sections of the Comprehensive Plan that has direct application to the Broadband Telecommunications Study are VIII. Capital Improvement Plans and Volume 2: IX. Existing Conditions Analysis (See Attachment "G"). The subject matters of Policies contained in the County's Plan that typically rely on dependable and adequate high speed Internet to accomplish stated goals include:

Augusta County Comprehensive Plan Goals, Objectives & Policies Subject Matter Dependent on Broadband to Accomplish

Attracting Employees/Employers	Development Standards	Infrastructure Capital Improvements	Retiree & Elderly Housing/Services
Collocation	Disability Services	Library Support	Site Locators
Continuing Education	Distance Learning	Marketing	Social Services Access
Community Centers	Education/Education Programs	Mental Health & Substance Abuse	Technical Assistance/Advancements/ Sharing
Competitive Jobs & Wages	Funding	Outreach	Tourism
Cost-Benefit Analysis & Allocation	Health Promotions	Promotion	Training
Cooperation Among Providers	High Value Housing	Public Facilities Services	Ubiquitous Service
Continuing Education	Higher Education	Recruitment	Utility Infrastructure
Curriculum Support	Home Occupations	Regional Planning	Websites Support
Data Collection & Management	Industrial, Commercial, Residential & Rural Development	Research	Youth Special Needs

Comprehensive Plan Existing Conditions Analysis & Capital Improvements Planning Broadband Subject Matters

County Communications	Emergency Operations Center (EOC) Consolidation	Emergency Preparedness, Response, Communication and Training	Vertical Assets Construction

- Policy Subject Matter of **Fishersville Small Area Plan,** County of Augusta, VA January 28, 2009 was the encouragement of "cooperation among the providers of utility services" to more efficiently provide telecommunications services to the Fishersville area (See Attachment "H").

Economic Development Strategic Plan:

- The 2015 update to the plan notes that reliable broadband access is currently a weakness and that broadband services are critical to future growth.

Economic Development Strategic Plan *Executive Summary January 2009*

The Economic Development Strategic Plan for Augusta County, VA identified:

- **Targeted Industries for Augusta County's Future Economic Growth** which included:
  - *Professional, Business & Technical Services (Computer software, engineers, architects, graphic design, etc.)*
    - Comments: Having air access (local and in Charlottesville) and high speed internet along with a defined quality of life will attract these types of service businesses over time.

- **Resource Requirements by Industry Sector**
  - *Telecom with high speed access for:*
    - Small/Medium Manufacturing
    - Large Manufacturing
    - Warehousing (may be required)

- **Evaluation of Augusta County's Resource for Economic Development**
  - *Telecom*
    - Comment: Broadband and cell phone coverage is a challenge in some sections and the availability and quality of service should be monitored at least annually.

- **Development of the Strengths, Weaknesses, Opportunities and Threats Analysis (SWOT Analysis)**
  - *Weaknesses*
    - Comment: Cell phone coverage and reliable broadband access is limited – these services will be critical to future growth.
  - *Opportunities*
    - Comment: The new technology center at Blue Ridge Community College and the manufacturing and technology program at Stuarts Draft High School may have a positive impact on the supply of technical labor in the area. This will provide a needed resource for local employers (See Attachment "J" for 50 Largest Employers in Augusta County, VA)

- **Goals for the Strategic Plan**
  - *Focus on what is important for the County to meet the Vision for the Strategic Plan*
    - Enhance Physical Infrastructure and Site Readiness

- **Recommendations/Action Items for Each Goal - Goal 2: Support Existing Businesses**
  - *2.7 Establish Technology Zone in the County to offer incentives for job growth and investments to businesses within target industries*
    - Augusta County Mid-Term Timing

- **Recommendations/Action Items for Each Goal - Goal 3: Stimulate New Business Activities**
  - *2.7 Establish Technology Zone to provide additional incentives to attract incremental businesses to the area*
    - Greater Augusta Economic Partnership; SBDC; SCORE, etc. Mid-Term Timing

- **Recommendations/Action Items for Each Goal - Goal 5: Enhance Physical Infrastructure and Site Readiness**
  - *5.3 Monitor the quality, cost and coverage of broadband service in the County (incorporate in annual business survey)*

  Augusta County and Augusta County Service Authority Mid-to Long-Term Timing

- A goal of the plan is to "monitor the quality, cost and coverage of broadband service in the County" (See Attachment "I").

Large Employers

A list of Augusta County's 50 Largest Employers can be found in Attachment "J".

2.3 Planning Goals and Criteria Set by the County Used to Rank Areas of Priority

Targeted Development Areas - According to the County's Comprehensive Plan **Policy Areas identified on the Planning Policy Area/Future Land Use Map**, it is the intention of this Plan to encourage as much development as possible to take place in the Urban Service and Community Development Areas. Because of this, a target of 90% of future residential development locating in these areas has been established.

Urban Service Areas are defined as areas which are appropriate locations for development of a full range of public and private land uses of an urban character on public water and sewer, in either the immediate or long term future. Urban Service Areas are characterized by relatively substantial amounts of existing development and public utilities and facilities, substantial amounts of available developable land, and good transportation access. Those areas designated as Urban Service Areas are those which are appropriate for urban development on public water and sewer within the 20-year timeframe of this Plan.

Urban Service Areas are priority locations for:

- Significant amounts of urban residential and employment growth
- Expansions of public water and sewer service
- Local and regional public facilities; Most "one-of-a-kind" public facilities such as hospitals Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009
- Most industrial development – light, medium, and heavy, with adequate facilities and buffers; Larger scale urban residential and business developments
- Larger scale mixed use developments, where different combinations of residential, business, and industrial uses will be found within a development

Community Development Areas are local community settlements which have existing public water or public sewer systems in place or which have relatively good potential for extensions of either of those utilities. These areas are appropriate locations for future low density, rural land uses based upon road access, the existing land

use pattern, and proximity to existing public facilities and services, although they are planned to remain predominantly residential in character.

Most of the Community Development Areas have only public water service. The ***New Hope area*** has only public sewer service. Community Development Areas do not have both public water and sewer service; therefore, they are only suitable for lower density, primarily residential uses. As development occurs over the very long term and public water and sewer service is extended, some Community Development Areas may evolve to the point that they are designated Urban Service Areas.

Community Development Areas are priority locations for:

- Moderate amounts of small scale residential and employment growth at marginally higher densities than in the Rural Conservation Areas
- Limited expansions of public water or sewer service (Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009)
- Local public facilities
- Small scale, low-intensity commercial and/or light industrial developments

Land Use Categories

The future land use categories function within the geographic areas defined by the Urban Service and Community Development Areas. They serve to identify the specific use and density that is proposed for a parcel. There are eleven (11) future land use categories identified by the Planning Policy Area/Future Land Use Map, but those categories that typically drive Broadband Development starts with business related and public use land use from which nearby residential land use subsequently benefits from starting with denser residential development followed by more suburban and then rural residential land use. The most applicable land use categories to assist in setting priorities include:

Business Related and Public Land Use

- **Industrial**, where industrial uses of varying scale and scope would be appropriate
- **Business**, where business uses of varying scale and scope would be appropriate
- **Public Use**, which identifies land owned by, or utilized by, a federal, state or local government agency
- **Community Mixed Use**, which may include a variety of residential uses at a density of six to twelve dwelling units per acre and, on up to 40% of the total land area, retail and office uses and in some, but not all cases, industrial uses
- **Neighborhood Mixed Use**, which may include a variety of residential uses at a density of four to eight dwelling units per acre and convenience retail and office uses on up to 20% of the total land area

Denser Residential Land Use

- **Planned Residential**, which may include a variety of residential uses at a density of four to eight dwelling units per acre Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009
- **Multifamily Residential**, which may include residential buildings housing between nine and sixteen dwelling units per acre, as well as manufactured home developments

Attached and Medium Density Residential Land Use

- **Single-Family Attached Residential**, which may include attached residential units like townhouses and duplexes at a density of between four and eight dwelling units per acre; will be found only in the Urban Service Area
- **Medium Density Residential**, which may include detached residential units at a density of between three and four dwelling units per acre

Low Density Residential Land Use

- **Low Density Residential**, which may include detached residential units at a density of between one-half and one dwelling unit per acre; will be found only in the Community Development Area

Non-Growth Areas of Less Priority

- Both **Rural Conservation** and **Agricultural Conservation Areas** are not targeted development areas.

2.4 Existing Conditions Assessment

The county was fortunate in that much of the requested data was being maintained by the county in Geographic Information System (GIS) software. Other data, such as location of infrastructure was estimated from hardcopies or from input from community stakeholders. Therefore, while the mapped data serves planning and assessment purposes in this report, the exact location and accuracy of the data would need to be further confirmed if needed to be relied upon for other than the purposes used in this study.

Now that existing County data was collected and Planning Goals and Criteria Set by the County have been identified, the power of electronic mapping, data storage and analysis using Geographic Information Systems (GIS) is used to visualize existing end-users and non-existing end-users, prioritize the study areas, as well as existing technology available to consider in developing a strategic plan. One objective in developing the strategic plan is to prioritize areas to be addressed (focus on) by not having to focus on existing areas already being adequately served (reduce study area to a manageable area) and identifying those areas underserved or with no service (areas needing to be prioritized). From the available data, the following layers were combined on the following five (5) maps:

Existing End Users
- Facilities Using Telehealth
- Previous Survey Results of End Users
- County Points of Interest

Non-Existing End Users
- County Points of Interest

Wireless
- Fixed Wireless
- Mobile Wireless
- Vertical Assets
- 4G Coverage
- Airport Safety Zones

Wireline
- Fiber
- DSL Wireline
- Cable Wireline

Land Use
- Comprehensive Plan (Existing & Future Land Use)
- Zoning
- Population Density per Square Mile
- Housing Density per Square Mile

- **See Figure 2.4-A: Population by Census Block**

2.5 Findings of Existing Conditions Assessment

In reviewing the above maps with multiple data layers, the following observations were made:

- While there is little previous survey data collected, the reported Non-Existing End Users locations are within reasonable proximity to Existing Und Users raising doubt that the problem is unlikely unavailable service, but rather other reasons for no service such as pricing, reliability, speed, etc.
- There is a fairly large number of parties using Telehealth applications.

- There was no response clearly identifying using fiber to provide service. Even the number of parties using other wireline such as DSL and High Speed Cable (coaxial cable) was limited.
- Wireless service use was more prominent than wireline.
- There is significant reported wireless service coverage.
- There is a considerable amount more of fiber running through the County than the local data files contain.
- There are a number of providers offering service within Augusta County.
- The following communities appear to have little to no service options:
  Lyndhurst West Augusta Mount Solon Moscow New Hope Steels Tavern
  (Northern Rural Communities between Interstate 81 and George Washington and Jefferson National Forrest)
  (Western County Rural Communities)
- Communities located near or along Interstate 81 and 64 have multiple service providers
- Need to first focus on Business Related & Public Land Use areas that are unserved/underserved, followed by Denser Residential Land Use, Attached & Medium Density Residential Land Use; then Low Density Residential Land Use.

  - **See Figure 2.5-A: Housing Units by Census Block**

Figure 2.4-A: Populations by Census Block

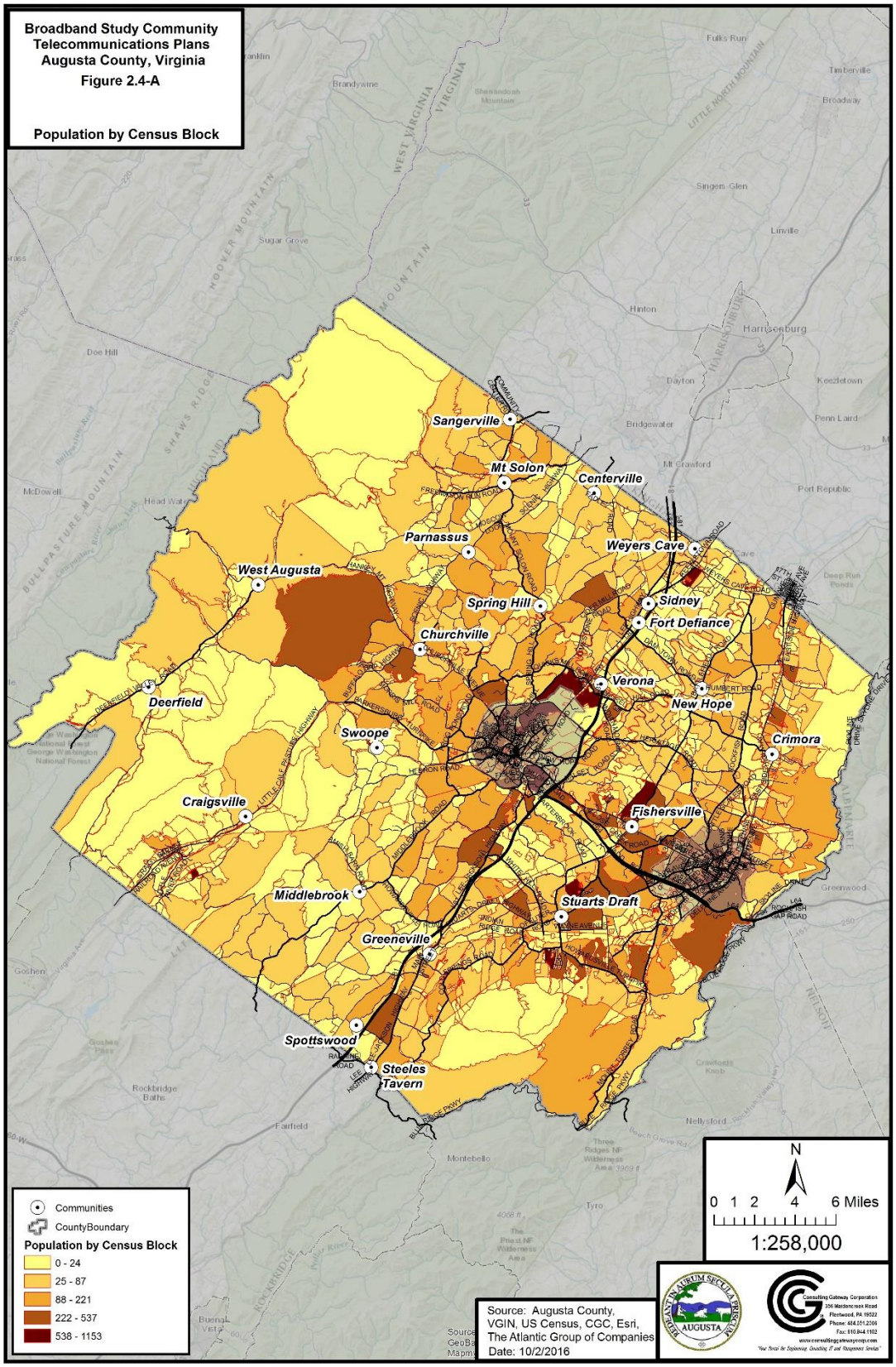
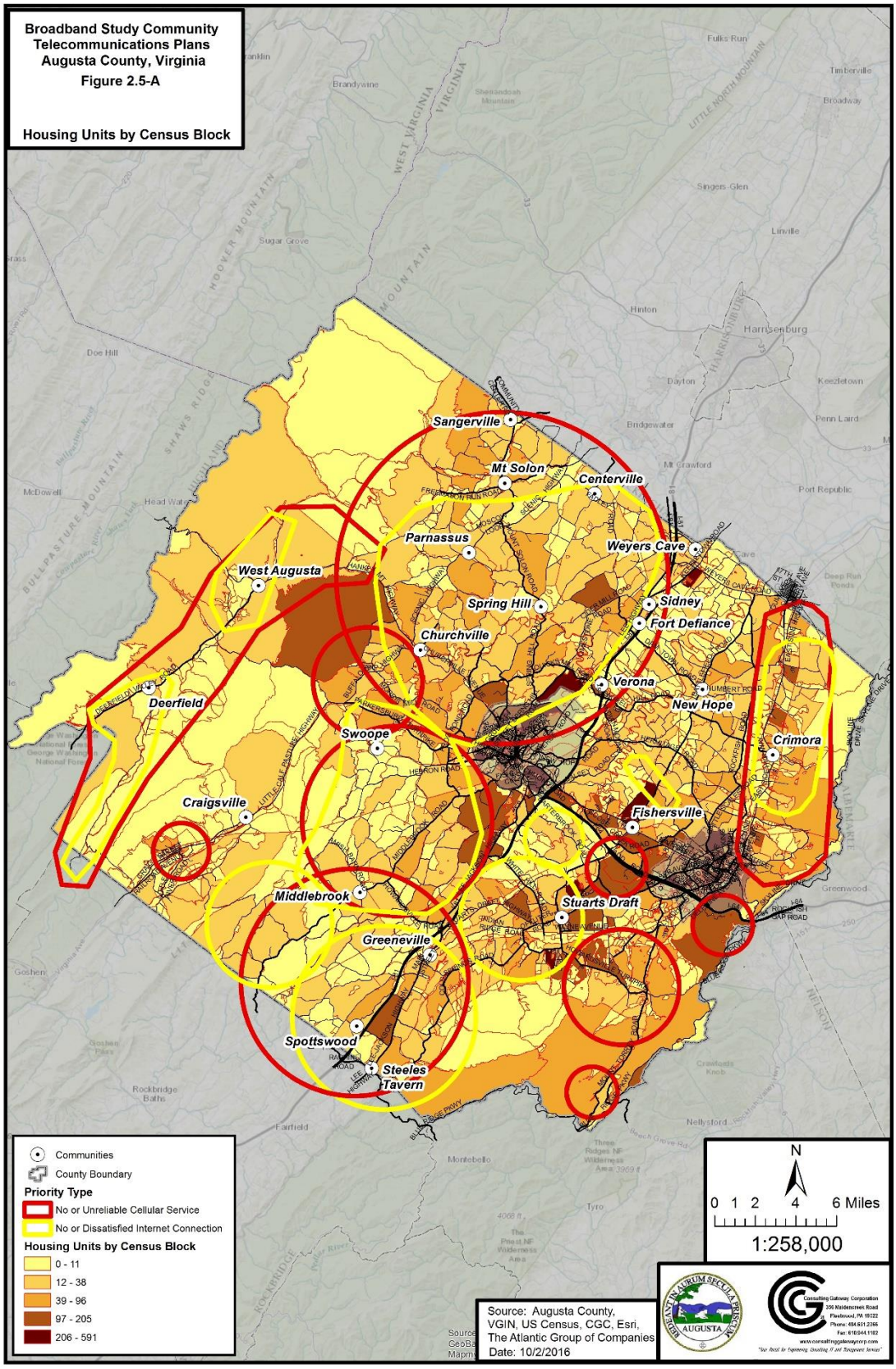


Figure 2.5-A: Housing Distribution by Census Block



2.6 VA Legislative Policy

VA is a Dillon Rule State, whereby the State must explicitly grant powers to municipalities. VA does allow local governments to provide communication services, but with restrictions

VA Code § 15.2-1500

- Locality can build a network and provide services to its departments, boards, agencies, etc. and to adjoining locality's so long as the charges for equipment, infrastructure, and/or services do not exceed the cost of providing same.
- The network infrastructure and equipment can be sold, and the locality may receive communication services from the purchaser (to be used solely for internal use) in full or partial consideration for the sale.
- Dark fiber can be leased by any locality, electric commission or board, industrial development authority, or economic development authority.
- Under no circumstances can the locality or authority be involved in marketing or promoting the services of the lessee or purchaser

VA Code § 56-484.7.1

- Virginia State Corporation Commission (SCC) allows "any county, city, town, electric commission or board, industrial development authority, or economic development authority" to provide "qualifying communication services" only as long as there are not more than three separate private businesses making "functionally equivalent" telecommunications services generally available in the community.
- Qualifying communication services do not include cable TV and video services. Prices for services cannot be lower than any incumbent provider of a functionally equivalent service.

VA Code §§ 15.2-2108, 15.2-2160, 56-265.4:4, 56-484.7.1

- Municipal electric utilities (does not apply to County or other political subdivisions) are permitted to become certified municipal local exchange carriers (MLEC) and offer all communications services. In doing so they are prohibited from cross-subsidizing services, must impute costs that private sector providers typically would incur, and must comply with procedural, financing, reporting and other requirements.

VA Code § 15.2-5431

- The VA Wireless Services Authority Act authorizes a locality to "convey or lease to [an] authority, with or without consideration, any systems or facilities for the provision of qualifying communications services" and "contract, jointly or severally, with any authority for the provision of qualifying communications services."
- Localities are still held to the requirements of the "qualifying communication services" and service gap provisions (not more than three providers). This legislation provides the method by which projects can be financed by an authority.

VA Code § 15.2-1500

- A locality, electric commission or board, industrial development authority, or economic development authority, may lease dark fiber. For purposes of this section, "dark fiber" means fiber optic cable that is not lighted by lasers or other electronic equipment. The locality, electric commission or board, industrial development authority, or economic development authority, shall not be involved in the promotion or marketing of the lessee as the provider of the services.

3.0 Broadband Technologies

Service providers come in many different flavors. For example, telephone companies, cable television companies and Internet Service Providers are all offering broadband. Different categories of service providers include:

3.1 Service Provider Descriptions

Incumbent Local Exchange Carriers (ILECS)

The incumbent telephone company that, prior to deregulation of the industry had the exclusive rights to provide ordinary local voice-grade telecommunications service within a specified service area.

Competitive Local Exchange Carriers (CLECS)

A company providing common carrier communications service in competition with the incumbent telephone company.

Competitive Access Provider (CAP)

A company that provides exchange access services in competition with an established U.S. telephone local exchange carrier. Private network links, independent of Local Exchange Carriers, are provided between the Inter-exchange carrier or Internet Service Provider and the end-use customer.

Long Distance Provider Interchange Carrier

A network owner that carries long distance telephone service from interchanges across that network between the Local Exchange Carriers and outside the Local Access Transport Areas.

Local Phone Company

Normally, the incumbent telephone company is referred to as the local phone company.

Regional/Alternative Competitive Phone Company

A competitive local exchange carrier as alternative service to the incumbent local exchange carrier serving within a region.

Cellular or Wireless Internet Service Provider (WISP)

A company that provides voice, video and data services using cellular or other type of wireless access technologies (handheld computers/telephones) through radio frequency (RF) signals rather than through hard-wire communication lines.

Cable Companies

A company that provides television programming over coax cable. Some cable companies provide cable modem Internet service which uses a modem box that connects a computer to a television cable for access to the Internet with connectivity 24 hours a day.

Internet Service Providers (ISPs)

A company that provides customer access to the largest internet, or largest network of networks, functioning as a gateway for online services and electronic information exchange between provider or source and receiver or user.

Satellite Service Provider

Satellite service communications is provided via one or more satellite relays and their associated uplinks and downlinks between earth and satellites in space.

3.2 Service Provider Technologies (Just some Technologies)

Phone Modem
xDSL (Digital Subscriber Line)
ISDN (Integrated Services Digital Networks)
Cable Modem
Optical Fiber
FWA (Fixed Wireless Access)/WISP (Wireless Internet Service Provider)
3G Wireless/4G Wireless
Optical Wireless
Consumer (MPEG) Broadband
Wi-Fi and WiMax
WLAN (Wireless Local Area Networks)
Ultra-Wideband
BPL (Broadband over Power Lines)
Satellite

The following brief technological summaries are provided to help the decision makers understand these technologies better and what options they have in meeting their objectives and leveraging existing networks and service providers

(Note: Information for the following definitions not footnoted was obtained and can be found at www.webopedia.co).

Phone Modem

A phone modem enables a computer to transmit data over a telephone line. Information is transmitted in the form of analog waves. Computer information is stored digitally. The modem converts the data between these two forms. Typical speeds of phone modems are 28.8-33.6 Kbps without data compression and 56.6 Kbps with data compression.

Digital Subscriber Line (DSL)

This technology works best when the user is located near the local phone switch. Data may then be received at rates up to 6.1 Mbps out of a theoretical 8.448 Mbps, enabling continuous transmission of motion video, audio and 3-D effects. The copper telephone network was originally designed only to transmit analog voice conversations. Early modems transmitted at 300 bps. Modem speeds increased until reaching the current maximum of 56 Kbps. More speed can be tweaked from copper telephone lines by using Digital Subscriber Line (DSL) technology.

ADSL is the most commonly deployed types of DSL in North America. Short for ***a****symmetric* ***d****igital* ***s****ubscriber* ***l****ine* ADSL supports data rates of from 1.5 to 9 Mbps when receiving data (known as the downstream rate) and from 16 to 640 Kbps when sending data (known as the upstream rate). ADSL requires a special ADSL modem. SDSL is still more common in Europe. Short for ***s****ymmetric* ***d****igital* ***s****ubscriber* ***l****ine*, a technology that allows more data to be sent over existing copper telephone lines (POTS). SDSL supports data rates up to 3 Mbps. SDSL works by sending digital pulses in the high-frequency area of telephone wires and cannot operate simultaneously with voice connections over the same wires. SDSL requires a special SDSL modem. It supports the same data rates for upstream and downstream traffic.

In the past, most major DSL deployments by the incumbent phone companies and competitive local exchange carriers had been in large cities, limiting broadband telecommuting. In recent years more Central Office (CO) locations have been DSL enables and the use of remote cabinets are being installed to deploy DSL in smaller and midsize community locations and where warranted, further into rural areas of the counties especially along roads that connect communities.

Integrated Services Digital Network (ISDN)

An ISDN is an integrated digital network in which same time-division switches & digital transmission paths are used to establish connections for sending voice (telephone), video & data (including electronic mail, facsimile) over

digital tele- phone lines & POTS lines. ISDN is an international communications standard with typical speeds 64 Kbps to 128 Kbps.

Broadband over Power Lines (BPL)

Often referred to as power line communications, BPL uses the electric utility power grid as the medium for broadband communications. In theory, plugging a computer device into a power outlet would connect the end-user to the Internet. Speeds have been advertised up to 3.5 Mbps.

Cable Modem

In theory, the top cable modem speed is between approximately 512 Kbps to 52 Mbps, but a more realistic expectation is about up to 10 - 20 Mbps. Uploading is somewhat slower. Cable television networks are generally constructed as a fiber optic cable backbone with coaxial cable into neighborhoods and homes. Coaxial cables can carry multiple channels of video signals. Advanced cable systems can transmit 135 channels of analog video signals over a single cable. By converting to digital transmission technology, cable operators can use compression techniques to squeeze additional programs into each channel, thus providing consumers with hundreds of channels to choose from. Many cable companies have decided that the provisioning of Internet access is lucrative enough to devote at least one transmission channel to such use. A single analog cable channel, when devoted to digital transmission, has a 27 Mbps capacity. However, this must be partitioned between upstream and downstream use and shared by multiple cable subscribers.

In 2002, the FCC ruled that Internet service provided via a cable modem was determined to be an Information Service, not a Cable Service. Therefore, cable operators are not being held to the line sharing requirements that phone companies are currently held to for providing DSL Internet access. Cable operators do not have to open their lines to competing companies. Although most city cable franchise agreements are non-exclusive, competition among cable companies is generally seen only in large metropolitan areas. Consumers have little choice in providers of Internet via cable. The Internet access is provided via cable modem over coaxial cable lines, the same lines that transmit cable television signals. Cable modem speeds are generally faster than DSL speeds, but it is a distributed medium, in that access is shared by other subscribers on the same node or distribution box. Downstream (to the user) speeds are generally sufficient, but during peak hours of use the upstream speeds are diminished greatly. Upstream speed can be just as critical as downstream speeds, particularly for those accessing corporate VPNs (virtual private networks); the typical upstream speeds of most cable modems are woefully insufficient for this access.

Consumer (MPEG) Broadband (Direct Broadcast Satellite and Terrestrial Television)

MPEG **(**Moving Pictures Experts Group) entertainment-based broadband services such as digital video, audio and data can be delivered over a variety of digital TV networks, including cable, satellite or terrestrial broadcast systems. DBS (Direct broadcast Satellite) provides 52 Mbps bandwidth, fully digital content and support for interactive purchases and content selection. Digital terrestrial television holds tremendous promise. Over seven million digital television sets were sold in 2004 with the number expected to grow at fifty percent per year. The numbers may be greatly accelerated by recent FCC decisions.

Optical Fiber to the Customer

Fiber optic cable uses hair thin filaments of transparent glass or plastic for transmitting digital voice, video and data signals using light pulses at very high speeds. Systems that provide services via a fiber optic connection from a central equipment point directly to the customer are typically referred to as Fiber-to-the-Home (FTTH) or Fiber-to-the Premise FTTP. An FTTH.FTTP system uses fiber optic cabling for the “last mile” (common term for distance from the curb or last distribution pole in a network to the customer). Currently this technology probably provides

the fastest, most secure transport and delivery system of services to the customer, but requires expensive laser equipment at the network operating center (NOC) and demarcation units on the premise.

Fixed Broadband Wireless (FBW) Access

Originally called "wireless cable", FBW often refers to LMDS (local Multipoint Distribution Service), as well as MMDS. LMDS operates in the 28 GHz and 31 GHz bands with theoretical data rates up to 1.5 Gbps to 2 Gbps downstream; more realistic speeds average around 38 Mbps. Generally, frequencies above 10 GHz are known as LMDS. MMDS operates in the 2.5 GHz band, reaches speeds up to 27 Mbps over unlicensed channels or 1 Gbps over licensed channels. Other frequencies are the 24 GHz, 26 GHz, 38 GHz and 39 GHz bands.[10]

Satellite Access

Advertised maximum speeds are typically in the range of 128 Kbps to 256 Kbps upstream and 512 Kbps to 1.5 Mbps downstream, but because of shared networks, the average data throughput may be significantly less. Data transmission and reception over satellite is not new; very small aperture terminal (VSAT) providers have been providing data connections to businesses, such as banks, for many years. Internet access via satellite is usually more costly than either cable modem or DSL, sometimes experiencing interference with severe weather, but possibly the only choice for rural consumers.

Optical Wireless (Free-Space Optics)

Optical wireless technology or free-space optics facilitates broadband communication through the atmosphere using line of sight optical signals up to distances of a few kilometers. Compared to optical fiber and fixed microwave systems, optical wireless is an inexpensive solution which is quick and easy to install.[11]

Mobile (e.g. Third Generation Mobile – 3G and 2.5G)

Unlike DSL, Cable and fixed wireless, which are still relatively computing-centric, 3G wireless combines high-speed data access with the mobility of handsets. 3G provides over 384 Kbps of bandwidth when a device is stationary or moving at pedestrian speed, 128 Kbps in a car, and 2 Mbps in fixed applications. Recognized data transfer speeds are up to 2 Mbps with download speeds. 3G technologies include CDMA2000 and Wideband CDMA (W-CDMA). CDMA2000 is digital spread-spectrum cellular standard with data rates ranging from 384 Kbps for mobile applications to well over 2 Mbps for stationary applications. W-CDMA is the evolutionary path for GSM, the standard with the majority of worldwide cellular subscribers. W-CDMA data rates compare to CDMA2000, 384 Kbps – over 2 Mbps. Both CDMA2000 and W-CDMA are shared resource technologies, meaning that these transmission levels are shared across all users within one RF carrier per sector.[12]

Mobile (e.g. Fourth Generation Mobile – 4G)

Short for fourth generation, 4G is an ITU specification for broadband mobile capabilities. 4G technologies enable IP-based voice, data and streaming multimedia at higher speeds and offer at least 100 Mbit/s with high mobility and up to 1GBit/s with low mobility (nomadic). 4G is an IP-based and packet-switched evolution of 3G technologies

[10] Source of some info.: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.
[11] Future Delivery of Broadband in Ireland, September 19, 2002, Office of the Director of Telecommunications Regulation, Dublin Ireland
[12] Source of some information: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.

(such as WCDMA, HSDPA, CDMA2000 and EVDO) that uses voice communications. A number of technologies considered to be 4G standards include Long Term Evolution (LTE), Ultra Mobile Broadband (UMB) and the IEEE 802.16 (WiMAX) standard. While 3G is defined by ITU as IMT-2000, IMT-Advanced is being studied by ITU as 4G. IMT is now used as the generic name for 3G and 4G. 3G and 4G technologies are c0-extensive with cellular networks advertised to cover almost 96% of the U.S. population.

Wi-Fi

Wi-Fi is short for *wireless fidelity* and used generically when referencing any type of 802.11 network. 802.11 refers to specifications developed by IEEE, and accepted in 1997, for wireless technology. An 802.11 network specifies an over-the-air interface between a wireless end-user and a base station or between two wireless end-users. There are several specifications that applies to wireless LANs (Local Area Networks) which includes 802.11 which provides 1 or 2 Mbps transmission in the 2.4 GHz band (using frequency hopping spread spectrum or direct sequence spread spectrum); 802.11a which is an extension to 802.11 and provides up to 54 Mbps in the 5 GHz band (using orthogonal frequency division multiplexing encoding); 802.11b which is an extension to 802.11 and provides 11 Mbps transmission with a fall back to 5.5, 2 and 1 Mbps in the 2.4 GHz band (uses only direct sequence spread spectrum); and 802.11g provides 20 up to 54 Mbps in the 2.4 GHz band.

WiMAX

WiMAX is an acronym for Worldwide Interoperability for Microwave Access. Products are certified if passing compatibility and interoperability tests for IEEE 802.16 standards, specializing in point-to-multipoint broadband wireless access (BWA) networks. 802.16 wireless connection technology is expected to enable multimedia applications with a range of up to 30 miles. There is a wireless industry coalition to advance IEEE 802.16 standards and develop and certify devices for the industry. 802.16a provides up to 75 Mbps.

WLAN (Wireless Local Area Network)

WLAN uses high-frequency radio waves between nodes rather than wires to communicate.

Ultra-Wideband (UWB)

UWB transmits ultra-low power radio signals with very short electrical pulses across all frequencies at once. Ultra-Wideband is a wireless technology that can transmit data at speeds between 40-60 Mbps, eventually up to 1 Gbps. Ultra-Wideband spans license and unlicensed frequencies and can be used indoors and underground.

3.3 Technical Obstacles

Some technologies require significantly more time and cost to implement then others. Some technologies are more future-proof than others. The following discussions touch on just some of the technical obstacles service providers and communities face when searching for the best solutions.

DSL (Digital Subscriber Line) - With DSL, line performance degrades with end-user distance from the telephone company's central switching office (CSO). Performance limitations result in provider's reluctance to deploy beyond about 15,000 feet, and therefore most potential DSL applications are looked at by establishing a 3-mile buffer zone around a CSO location[13].

[13] Source of information: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.

ISDN Line (Integrated Services Digital Network) – ISDN has a basic rate of 128 Kbps and carries voice and data over the same line by sharing two channels A and B. A third channel, D, carries the call set-up information. If the phone is used, one channel drops resulting in 64 Kbps. Primary rate ISDN is the same technology, but uses 24 channels. Primarily used by businesses that relies on video-conferencing and/or downloading large files. It is relatively expensive for unlimited use[14].

Cable Modem – The difference in delivery speed between theory and actuality is rather extreme and the majority of cable systems were designed only for one-way data transport, to send video to the home[15].

Fixed Wireless – Traditionally, fixed broadband services have been slow to develop partially because of challenges associated with the need for greater standardization in technology among hardware manufacturers[16].

Satellite-Because of shared networks, average data throughput may be significantly less than perceived purchased speed.

3G Wireless – Third-Generation technology data rates received by a user in heavy trafficked areas could be substantially less than perceived purchased speed. Speeds will also typically slow down as the mobile user's speed increases. The highest data rates will be available to stationary users.[17]

Further Discussion Regarding Wireless Service

One area of high interest throughout the United States is wireless broadband service. Over the past few years, wireless has been expanding rapidly from a LAN (local area network) technology to a quick-build, cost affordable WAN (wide area network) service offering in those expensive to reach and build rural areas and urban areas where it is hard to justify overbuilding of existing infrastructure. Wireless technology today does not provide the high bandwidth applications of IPTV, nor provide high quality VoIP with five nines reliability standards of lifeline support technology[18], nor bandwidth that is expected to be needed in years to come. This is a technology that is evolving rapidly, however, and much hope and investment is being invested in future generations of wireless to deliver very high bandwidth voice, video and data applications. Wireless technologies are usually an improvement over dial-up.

Four (4) significant trends energizing municipal Wi-Fi deployments are:

- Many local governments wish to deploy municipal broadband networks for public safety – as well as increased government efficiency.
- Alternative ISPs see mesh networking as a method to compete with incumbent service providers.
- Wireless mesh networking is seen as an efficient and cost-effective means of proving broadband access to underserved areas. This is true as the municipal Wi-Fi trend moves from larger cities into smaller towns.
- Potentially, wireless mesh networking technology can serve as a competitive tool for cable operators." [19]

[14] Source of information: Worwetz Education Systems, Inc. 2000-2001, Jacksonville, Florida
[15] Source of information: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.
[16] Source of information: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.
[17] Source of information: Moving Towards Broadband Ubiquity in U.S. Business Markets, April 2001, Cahners In-Stat Group 2001.

[18] The concept of five nines (99.999% uptime) was developed by Bellcore, now Telcordia as the standard for the portion of the elapsed time that devices such as local telephones should be operational. Five nines service corresponds to a down time of approximately 315 seconds/year.
[19] March 22, 2006 e-article by eMarketer Inc. (www.emarketer.com)

Attachment "A": Listing of Previous Telecommunications Planning Efforts

Previous Broadband Telecommunications Planning Efforts

The following documents previous efforts of Augusta County regarding Broadband Telecommunications Planning:

- Previous Augusta County, VA Broadband Survey Results contained in a Saturday, April 30, 2016 Memorandum from Jackie Zetwick, Information Technology Director, County of Augusta Department of Information Technology to Dr. Pattie and Mr. Pyles Subject: Broadband (Attachment "B")

- From CAMS, Augusta County addressed and discussed (Attachment "C"):
    1. How Telecommunications Planning fits into community development needs & opportunities
    2. How Telecommunications Planning supports or aligns with existing community plans
    3. How Telecommunications Planning benefits the community in economic development and educational opportunities
    4. The long-term benefits or outcomes of Telecommunications Planning to the community
    5. The County's readiness to implement telecommunications' projects
    6. Identification of names and organizations for members of a telecommunications management team
    7. Anticipated timeline of developing a Telecommunications Strategic Plan
    8. Summary of previous work to meet telecommunications needs in the locality
    9. Developing a Request for Proposals to procure services of a Telecommunications Planning consultant

- Augusta County, VA Wireless Facilities Telecommunications Analysis for Wireless Voice and Broadband Services Prepared by the Atlantic Group of Companies, Inc., August 6, 2012 (Attachment "D")

- LIFECORE Blue Ridge Health Science Corridor Stakeholders August 6, 2015 Survey (Attachment "E")

- Augusta County May 20, 2015 Letter of Interest for the Virginia Telecommunications Planning Initiative (VATPI) Grant Funding (Attachment "F")

- County of Augusta, VA Comprehensive Plan Update "*Growing Together to Shape Our Future 2007-2027*" Adopted: April 25, 2007 As amended January 28, 2009 (Attachment "G")

- The Fishersville Small Area Plan was prepared as a follow-up to the Augusta County Comprehensive Plan. The Fishersville Plan added another level of detail to the plans the Comprehensive Plan established for the Fishersville area, with a particular focus on land use and transportation issues. The Planning process began in October 2007 and was completed in late-spring 2008. A ten-member Advisory Committee appointed by the Board of Supervisors worked with Augusta County staff in developing the plan. On January 28, 2009 the Board of Supervisors adopted the Fishersville Small Area Plan and made it part of the Comprehensive Plan (Attachment "H").

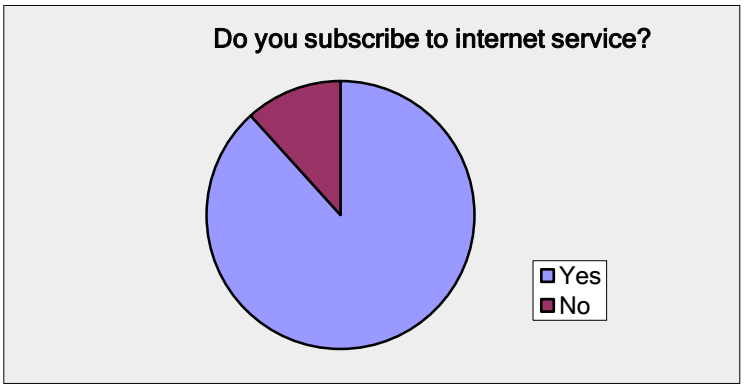
- Economic Development Strategic Plan Executive Summary January 2009 (Attachment "I")

- 50 Largest Employers in Augusta County, VA (Attachment "J")

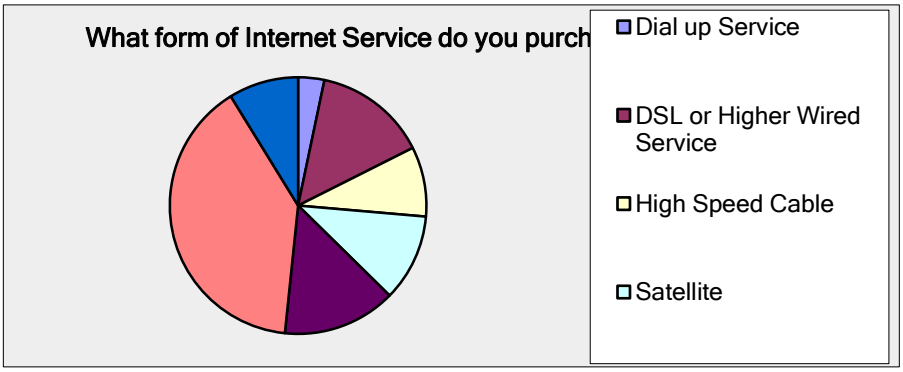
Attachment "B": Augusta County, VA Developed Survey Results[20]

Analysis of survey results

Augusta County has done an initial brief survey on our website. We had 94 responses. Below is an analysis of our results.

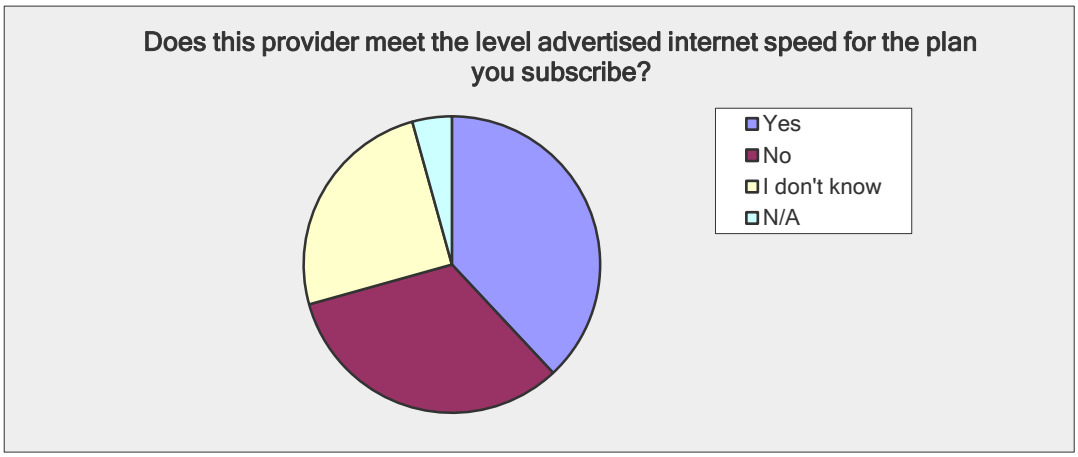


What form of Internet Service do you purchase?		
Answer Options	**Response Percent**	**Response Count**
Dial up Service	3.3%	3
DSL or Higher Wired Service	14.3%	13
High Speed Cable	8.8%	8
Satellite	11.0%	10
Fixed Antennae Wireless	14.3%	13
Mobile Wireless (Smartphone, Mobile Laptop Card)	39.6%	36
N/A	8.8%	8
answered question		**91**
skipped question		**3**

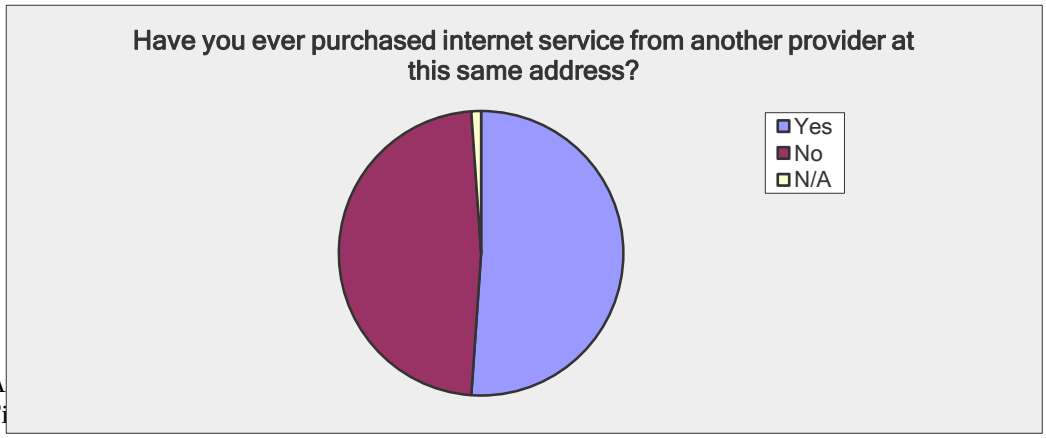


[20] Saturday, April 30, 2016 Memorandum from Jackie Zetwick, Information Technology Director, County of Augusta Department of Information Technology to Dr. Pattie and Mr. Pyles Subject: Broadband

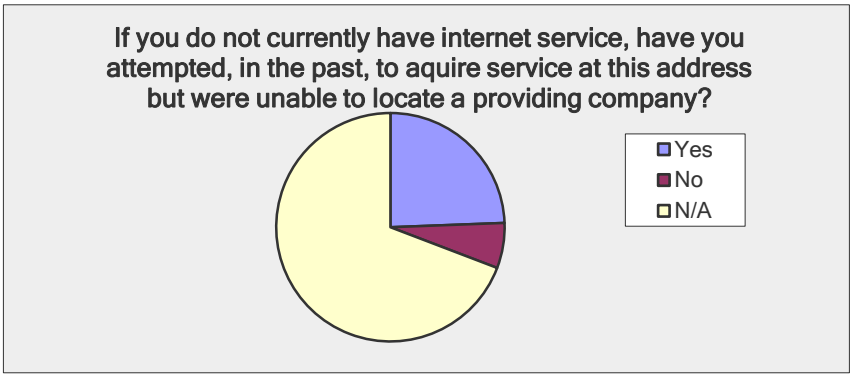
Does this provider meet the level advertised internet speed for the plan you subscribe?		
Answer Options	**Response Percent**	**Response Count**
Yes	38.0%	35
No	32.6%	30
I don't know	25.0%	23
N/A	4.3%	4
answered question		**92**
skipped question		**2**



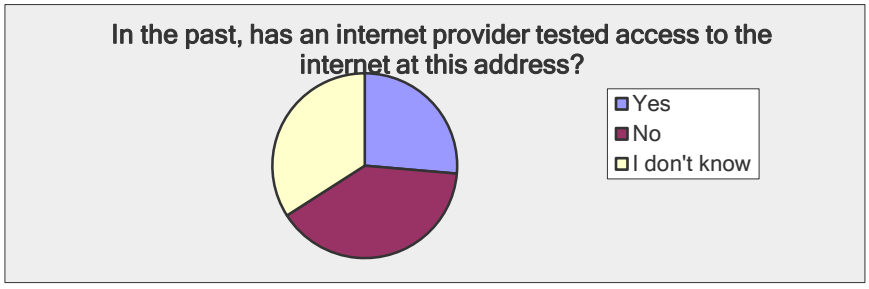
Have you ever purchased internet service from another provider at this same address?		
Answer Options	**Response Percent**	**Response Count**
Yes	51.1%	47
No	47.8%	44
N/A	1.1%	1
answered question		**92**
skipped question		**2**



If you do not currently have internet service, have you attempted, in the past, to acquire service at this address but were unable to locate a providing company?		
Answer Options	**Response Percent**	**Response Count**
Yes	24.4%	19
No	6.4%	5
N/A	69.2%	54
answered question		**78**
skipped question		**16**

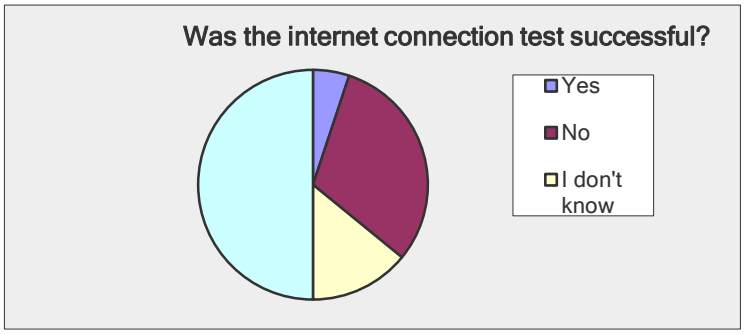


In the past, has an internet provider tested access to the internet at this address?		
Answer Options	**Response Percent**	**Response Count**
Yes	26.4%	24
No	39.6%	36
I don't know	34.1%	31
answered question		**91**
skipped question		**3**

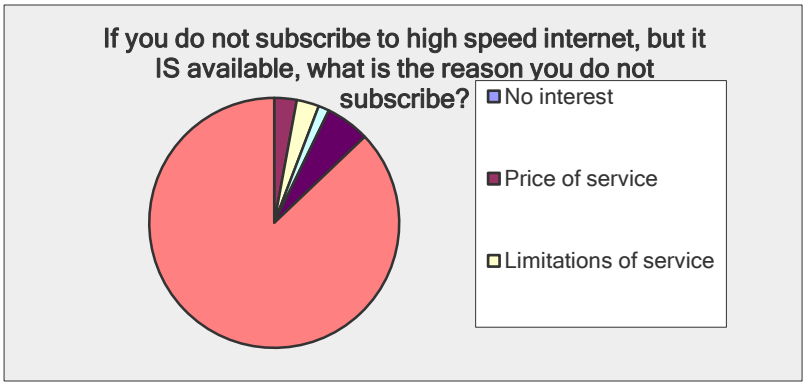


Was the internet connection test successful?		
Answer Options	**Response Percent**	**Response Count**
Yes	5.1%	4
No	30.8%	24
I don't know	14.1%	11

N/A	50.0%	39
answered question		**78**
skipped question		**16**



If you do not subscribe to high speed internet, but it IS available, what is the reason you do not subscribe?		
Answer Options	**Response Percent**	**Response Count**
No interest	0.0%	0
Price of service	2.9%	2
Limitations of service	2.9%	2
Need a different option to fit my hardware needs	1.4%	1
Other	5.7%	4
N/A	87.1%	61
answered question		**70**
skipped question		**24**



Q13 If Other, please explain...
Answered: 8 Skipped: 86
 # Responses Date

1. only dial up is avail, or satellite dish 11/4/2014 2:33 PM

2. Would really appreciate the opportunity to purchase high-speed internet. With school age children, we are forced
to seek neighbors, family or public access for projects we don't have the service at home to complete.

10/6/2014 12:35 PM

3. WE DO NOT HAVE HIGH SPEED INTERNET, BUT VERY MUCH NEED TO. HUGES SERVICE IS DEPLORABLE AND VERY VERY EXPENSIVE. ONLY 300MB ALLOWED DAILY 10/6/2014 8:03 AM

4. Other options unavailable duer to location 10/4/2014 6:35 PM

5. I would purchase high speed internet if it worked at my home. 10/4/2014 9:02 AM

6. There is no Internet service to our address other then thru mobile broadband. 10/4/2014 7:05 AM

7. Slow MiFi service 10/4/2014 6:33 AM

8. I live in the mountains. Internet service is SLOW!!! 8/9/2014 9:45 AM

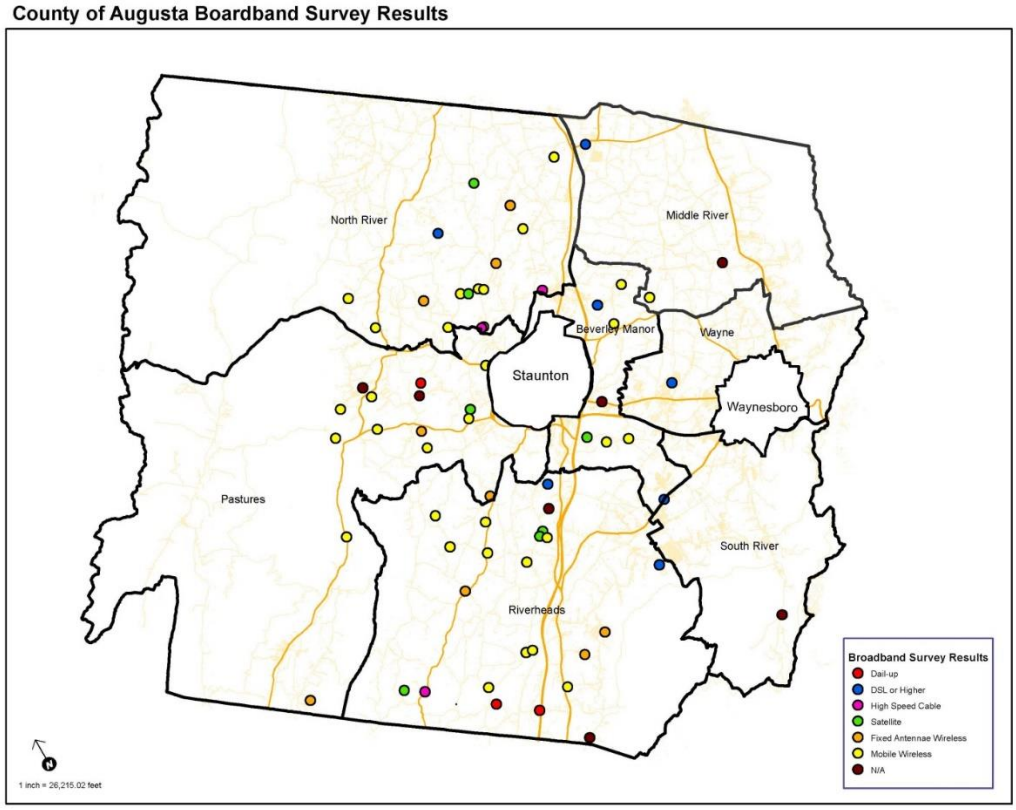
Any other comments about your internet or this survey?		
Answer Options		**Response Count**
		58
	answered question	**58**
	skipped question	**36**
Number	**Response Date**	**Response Text**
1	**Nov 4, 2014 7:33 PM**	I have no internet service now because I do not wish to puchase internet access as part of a bundle with cable tv products. I don't watch TV at all.
2	**Oct 19, 2014 12:35 PM**	I do subscribe to high speed internet. But service is slower than promised, loss of connection is frequently and we have data limits that restrict internet use. We need a cable connection to get better speed with no data restrictions.
3	**Oct 12, 2014 11:43 PM**	wireless service signal is weak
4	**Oct 9, 2014 4:47 PM**	mobile broadband and satellite are only residential options available--neither provide reliable, moderately fast connections. Even dial-up is not an option due to excessive line noise on Verizon's overhead lines
5	**Oct 9, 2014 4:32 PM**	We are continually told we are 'lucky' to have any connection. It definately is not high speed and fees for the only data packages are exceptionally expensive. Our daughter is a student and unable to access & utilize her laptop for required school work.
6	**Oct 9, 2014 12:27 PM**	there is no high speed internet available
7	**Oct 6, 2014 10:13 PM**	My only options are my current wireless or satellite. Both expensive and limited, ie no Movies, limited downloads. I would jump at alternatives.
8	**Oct 6, 2014 7:33 PM**	Very slow & unreliable service - we are just out of the edge of Ntelos coverage. Not unusual to get dropped in the middle of work, not on at all, or time out. Receive slow speed messages on some sites.
9	**Oct 6, 2014 6:42 PM**	We have been told our only other option is Hughes Net, which is expensive. We are retired and on fixed income.
10	**Oct 6, 2014 6:02 PM**	I only have Ntelos because I work for them, but the signal is awful. I have a Verizon wiress card, but the rates are so high I try an not use it. We need to have cable, dsl or some other solution that is not metered.

11	**Oct 6, 2014 5:43 PM**	Fixed, wired internet would be a tremendous addition to my area. I live roughly .75 miles from the stop of service. They claim not enough subscribers past that point to run service for. however I know there are many folks here who would subscribe.
12	**Oct 6, 2014 5:32 PM**	Residents of Augusta County MUST have highspeed internet access to be competitive. We have school age children and we are considering moving to Staunton due to the lack of access!
13	**Oct 6, 2014 5:31 PM**	survey monkey will not allow me the space to write what I need to explain I will write my BOS rep
14	**Oct 6, 2014 5:08 PM**	We lose internet connection several times a day and have been for years. Nothing that has ever been done has fixed this problem.
15	**Oct 6, 2014 4:35 PM**	Neither Verizon nor Comcast will even entertain the option to bring to our location -while our neighbors do have service. This is UNFAIR to school-age children trying to have the same resources as others.
16	**Oct 6, 2014 1:10 PM**	Mobile wireless is not a reliable form of Internet service. There are currently no high speed broadband providers servicing this address.
17	**Oct 6, 2014 11:38 AM**	Verizon is pretty pricey - and they have a literal monopoly in this part of the valley. Some competition would be a positive for consumers.
18	**Oct 6, 2014 12:58 AM**	We very much desire high speed internet service
19	**Oct 5, 2014 10:22 PM**	I have taught seniors how to use computers in their homes and have visited a number of homes in Augusta County. The Comcast monopoly on true high speed is horrible. They are unethical in pricing and raising prices. It's tough to get price back down.
20	**Oct 5, 2014 8:31 PM**	We need data capacity for our home, not just speed.
21	**Oct 5, 2014 1:13 PM**	To expensive, not unlimited data like many providers in populated areas. No tv or internet cable provided in our area
22	**Oct 4, 2014 10:35 PM**	Didn't see Broadband over Power lines listed
23	**Oct 4, 2014 9:13 PM**	Unable to take advantage of more reasonable services due to lack of cable or DSL service.
24	**Oct 4, 2014 7:46 PM**	My current serivce has limited data and speed limiting my access and ability to work from home.
25	**Oct 4, 2014 6:55 PM**	service is spotty and inconsistent. Download speed is only slightly better than dial up/ We use MGW (and pay a lot for doing so)because we have no alternative. I don't know whyy the county cannot force Comcast to run wire ?
26	**Oct 4, 2014 6:30 PM**	I pay $140 per month for 25 gigs a month. Comcast refuses to come down our road even though it is 1/2 mile away in either direction. nTelos/Dish is installing in Staunton and there is 4G on a tower we can see out our window, but Dish says it isn't avail
27	**Oct 4, 2014 6:28 PM**	we have a chid that requires internet service in order to assomplish homework given.
28	**Oct 4, 2014 5:47 PM**	Our connection speed is NOT as fast as I'd like. I would like to have high speed cable available.
29	**Oct 4, 2014 4:46 PM**	we have a mobile hot spot. it isn't very fast but better than nothing
30	**Oct 4, 2014 4:11 PM**	I would like to have a broandband service that is more reliable
31	**Oct 4, 2014 4:09 PM**	Internet Service via wifi card is expensive; we make decisions about whether or not to use the internet based on monthly allowance (20 G), cutting back as the month's billing cycle progresses. We'd like to see high speed access provided at a reasonable co

32	**Oct 4, 2014 2:46 PM**	MGW is not high speed. Would love to have high Speed internet service
33	**Oct 4, 2014 2:44 PM**	I would like to have high speed interent service
34	**Oct 4, 2014 2:16 PM**	Weak and sporadic connection with Verizon. Poor to non-existent service for phone.
35	**Oct 4, 2014 2:01 PM**	When we moved to Augusta County over 10 years ago, we didn't expect to have no access to internet. Ten years later we can only get sub-standard service via satellite or mobile wireless - very expensive and not as fast as advertised
36	**Oct 4, 2014 1:55 PM**	using a Verizon hotspot provides spotty access dependant on the weather. there have been times where we have lost service for at least 2 days because of weather
37	**Oct 4, 2014 1:52 PM**	Live a mile off main highway. Need affordable broadcast high speed Internet service. DSL is overloaded and usually painfully slow. Would pay more for faster service.
38	**Oct 4, 2014 1:30 PM**	No internet available at address other than mobile or satellite
39	**Oct 4, 2014 1:26 PM**	Wireless service is data limited and expensive. It is also at times unreliable.
40	**Oct 4, 2014 1:19 PM**	I have looked into satellite service but all are to expensive for my budget.
41	**Oct 4, 2014 1:16 PM**	Cable internet is not available to us
42	**Oct 4, 2014 1:02 PM**	please help bring high speed internet service to Bowman Springs Rd. Cell phones do not work at my home. I have to have office work done in the City due to no service. Bring the Arbor Hill/Middlebrook VA into the present century! Thank you.
43	**Oct 4, 2014 12:37 PM**	Verizon Mobil Broadband (MiFi) is very expensive. NTelos was less expensive but then throttled speed to a crawl.
44	**Oct 4, 2014 12:21 PM**	Highest capacity plan at $112 per month buys 20GB of data which does not allow any use of video or music after email, text only news, online moocs and limited web surfing. Cmpared to our friends with city service we are not getting our moneys worth.
45	**Oct 4, 2014 12:15 PM**	Current service not always fast enough to stream video.
46	**Oct 4, 2014 10:33 AM**	Internet service ought to be provided free by the County and State governments.
47	**Oct 4, 2014 9:57 AM**	We have a hotspot at home. Having to pay data plans is expensive, but currently our only other option is satellite which is too slow for the price
48	**Oct 4, 2014 2:40 AM**	Too expensive and unreliable
49	**Sep 22, 2014 12:19 AM**	The Wildblue service was not dependable. I would subscribe to a high speed provider if the service was available in our area and was reliable
50	**Aug 28, 2014 12:55 AM**	We are in a "dead spot" as far as cell and internet service is concerned. We and others in our area have done a lot of research in trying t find a provider with no sucess. We really need some help.
51	**Aug 27, 2014 1:06 PM**	Phone lines are overloaded in this area. Internet is commonly slow or cuts out all together.
52	**Aug 25, 2014 11:30 PM**	No high-speed internet service is available from ANY provider. We would be glad to purchase it if it were!
53	**Aug 16, 2014 9:19 AM**	It's wifi and very expensive.
54	**Aug 11, 2014 6:00 PM**	I have children in school and college, and the lack of broadband access makes it difficult for them to complete assignments and online tests/quizzes. Any help would be appreciated.

55	**Aug 9, 2014 11:20 PM**	Need high speed broadband at this address. Our cellular internet is VERY slow. Comcast does only part of our road.
56	**Aug 9, 2014 2:55 AM**	Would like cheaper service if it ever comes available
57	**Aug 8, 2014 10:13 PM**	highes net services cost 89 dollars per month. Where I live we get limited cell service so I have a cell bill and a land line bill, plus I have to pay for satelite internet service.
58	**Aug 8, 2014 1:01 PM**	Hughes is the only available provider. I don't think they take their customers seriously because there is no competition from another company

We have mapped the results. As you can see, based on the survey results there isn't a clear area of need. The vast majority of responders do subscribe to high speed internet and some were satisfied with their service. Of the 58 written comments, there was a wide variety of complaints, but the most common was slow speed and high expense.



Grant Requirements

Virginia's CDBG Planning Grant program is designed to aid in developing clearly articulated strategies for addressing communities' greatest economic development needs following meaningful citizen participation. Telecommunication planning grants are available for future system development and support or implementation efforts. Funds may be utilized to:

• Assist in promoting awareness of potential CDBG eligible activities and gauging stakeholder interest

• Creating a management team of potential user groups to oversee the creation of a Telecommunications Plan

• Conduct surveying efforts to document the eligibility of future telecommunication planning and implementation efforts for CDBG funding

• Conduct informational and training programs

• Identify and procure professional assistance as necessary.

In order to access CDBG funds for telecommunication implementation, a locality must have completed a community-based telecommunications plan. Please note that CDBG funds can only be used for open-access networks that allow for competition among different service providers. Up to $25,000 per project is available for Telecommunications Planning Grants. DHCD's
experience is that the maximum available amount for telecommunications planning grants is not sufficient to complete the activities required to create a community telecommunications study. Applicants are expected to show additional funding is available and committed prior to receiving a planning grant offer. It is estimated that the County would need approximately $70,000 on top of the grant money, if awarded.

Planning Grant investment decisions will be based on the following:

- Proposals must demonstrate some local knowledge of the scope and scale of the community development needs in the proposed project area. There must be evidence that the needs are known among potential beneficiaries and local officials.

- The needs identified must generally be eligible targets for future CDBG investments.

- There must also be evidence of participation by potential beneficiaries to the extent that needs and demand can be fully assessed.

- A management team must exist which is comprised of stakeholders and local officials. This team must agree to meet regularly to actively address issues that arise during the planning process. The locality must show a willingness to remove any barriers to addressing the identified needs, particularly those which are controlled locally. The locality must also commit financial resources to fill gaps not covered by Planning Grant assistance.

- There must be evidence that the locality and management team have the time, funding, and expertise to follow through with the planning process. If local expertise is lacking, the locality must procure professional assistance. If funding is lacking, the locality must identify other sources of funding

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Recommendation for future planning

Based on the information we received after meeting with the Central Shenandoah Planning District Commission, we don't feel there is adequate evidence that the need is there for Economic Development reasons. If we are to move forward, we recommend that a 'Task Force Team' with citizen participation and a member of the PDC facilitating, be created. Once a team is formed we could establish a better way to poll our citizens, residential and businesses and determine if there is a need large enough to move forward. One of the first things we could do is mimic the Albemarle County Survey and insert it in the Parks and Recreation Flyer, and have the schools distribute to children.

Attachment "C": From CAMS:

1. Discuss how telecommunication planning fits into your community development needs and opportunities.

Our goal is to obtain clarity in how to get the best service to our citizens. The County of Augusta has investigated the needs for broadband in the community over the last several years. Members of the Board of Supervisors are interested in pursuing better internet service for their constituents, hearing primarily from residents and small home-based businesses. Being a primarily rural county, realistic expectations are that a gamut of technologies will be needed to provide internet service to all of the constituents. The first formal step in our process, and also the one noted as important by the Center for Innovative Technology, is for the County to develop a formal strategic broadband plan. We are applying for this grant to pursue funding for a plan. Our hopes are that the plan will streamline the County's goals and define the role the County is to play in furthering broadband initiatives. The plan can assist in pursuing future grant opportunities, identifying areas for future deployment and telecommunications partners, and assist with planning for growth in the County.

2. Please discuss how telecommunication planning supports or aligns with existing community plans (i.e. comprehensive plan, strategic development plans, or any other community revitalization plans or feasibility studies).

Comprehensive plan: The Board of Supervisors are scheduled to adopt the County's draft Comprehensive Plan on August 26, 2015. This plan makes two policy statements regarding broadband-1. to expand broadband and 2. to support co-location opportunities. This plan was discussed in more detail on page 2 of the Phase I Letter of Interest.

Economic Development Strategic Plan: The 2015 plan notes that reliable broadband access is currently a weakness and that broadband services are critical to future growth. A goal of the plan is to "monitor the quality, cost and coverage of broadband service in the County".

Small Area Plans: Future plans could include discussion on the need for broadband in the village if the citizens in the area choose to pursue.

3. Discuss the economic and educational benefits to the community. For example, the applicant should discuss how broadband availability will help foster economic development and how the use of broadband applications is relevant to its target constituency group(s), businesses, telemedicine, teleworking/telecommuting, public schools, distance learning, e-commerce, e-government, public safety, tourism, entertainment, etc. *Please note the primary focus of the Virginia Telecommunication Planning Initiative is economic development.

Broadband growth is needed throughout the entire County. The most vocal constituents have historically been small home-based business owners and parents of students that live in rural areas of the County. But due to the topography of the County, even the largest of industries may not have adequate broadband available to them.

The County contains an urban core that stretches from Staunton through the village of Fishersville to Waynesboro and south to Stuarts Draft. This core has seen major growth over the years. The core contains community anchor institutions, such as:

Healthcare: Augusta Health (hospital), Wilson Workforce Rehabilitation Center (State), University of Virginia facility

Education: Murphy Deming College of Health Sciences, Blue Ridge Community College satellite campus, Augusta County Schools Wilson complex (elementary, secondary and high), Valley Career and Technical Center
Industry: Hollister, McKee, Hershey, NIBCO, Target Distribution, Rexnord, Bloomaker, Augusta Lumber

Twenty-on percent (21%) of our workforce is in manufacturing, and our largest employment sector is in Education/Healthcare. Healthcare is also the second largest growth sector in Augusta County. Hollister, Sunlite Plastics, and the Wilson Workforce Rehabilitation Center, among several other healthcare-related businesses, are all located in Augusta County.

Fishersville is home to almost 400 acres with existing medical facilities, but also almost 300 acres of primary development opportunities and another almost 100 acres of supporting opportunities. All available property was not easily accessible lacking road frontage and visibility and was not likely to be developed without the extension of what was a "paper street." With an estimated cost of about $20 million, the solution for a new connector road was found in a public-private partnership. The County financed just over $5 million through a VRA loan, VDOT contributed close to $10 million and a private developer contributed just over $2 million. The road, opened in March 2015, has been named "Lifecore Drive" to represent the concept of developing – or continuing the development – of a life sciences corridor. The corridor is anchored by the Augusta Health campus, our 250-bed independent hospital with a cancer center with Duke Oncology affiliate and a new heart and vascular center, on one end and the Wilson Workforce Rehabilitation Center on the other.

The road project has supported the community and become a key traffic artery. With this road completion, Route 250 and Route 608 are now connected in Fishersville. Citizens
are provided an additional connection to access Augusta Health, as well as Murphy Deming College of Health Sciences. Traffic will be reduced on other secondary roads. This project will bring development to an area in the County that is targeted for development in the County's Comprehensive Plan. The road access provides greater opportunities to bring jobs and investment to Augusta County and the region.

The County wishes to continue the momentum in this area that began with the transportation project. The group of stakeholders that participated in the road project are invested and participatory in furthering the growth in this area. The group continues to meet on a regular basis since before the road was completed. Stakeholders include: Augusta Health, Augusta Health Lifetime Fitness Center, Blue Ridge Community College, Department of Aging and Rehabilitative Services, Murphy Deming College of Health Sciences, University of Virginia Health System, Valley Career and Technical Center and the Wilson Workforce Rehabilitation Center, as well as developers, property owners, doctors and business owners in the area. County staff from Community Development and Economic Development and the Board of Supervisors District representative participate also.

A meeting was held on August 6, 2015 with the Lifecore Group to review the possibilities of expanding the work of the group for broadband initiatives. The group meets the stakeholder requirements of expanding health care and educational benefits to the community and understands the investment necessary to obtain the goals. Public/private partnerships may be further realized through the implementation of broadband buildout along the corridor. There is a portion of this corridor that needs fiber connectivity to other areas in the urban core.

Stakeholders completed an exit survey. The population included retail, commercial and service businesses, residential, government, and secondary and higher education. Note excerpts from the surveys:

> "Fiber has become a necessity for most national retailers as part of the site selection process. Broadband is acceptable, but fiber in increasingly important".
>
> "Vocation training for individuals with disabilities [using] video conferencing from classroom to remote locations [is a future need]".

> "Ensuring that we have fiber/broadband availability will be critical for the expansion/development/buildout of the corridor. Medical and Education uses require high-speed delivery of information, as well as the people working and living in communities along Lifecore".

"Broadband is needed throughout the county so students can connect for both on-line and even seated classes. Students need to be able to access educational resources".
Several responses also noted that it was somewhat difficult to find personnel with the needed computer, software and internet skills from the local area and that is was difficult to find and provide the appropriate training for personnel in these areas.

The County has identified other areas that could benefit from fiber installation, including the Rt. 608 corridor from Fishersville to Stuart Draft industries and the Rt. 11 corridor from Weyers Cave to Verona, which includes education and industry/business components. We are interested to see the needs that arise in these areas from the telecommunications planning study.

4. Describe the long-term benefits, or outcomes of telecommunication planning to the community.

The long term benefits of telecommunication planning to the County are categorized below:

Planning and policy:
Defining the role of government in broadband expansion
Impact of local ordinances, fees or processes on telecommunications providers
Determine realistic expectations for the citizens
Education on how to pursue legislative changes to fund broadband

Economic Development:
Assist in identifying the availability and quality of services available to business wishing to locate to Augusta County
Eliminate the weakness noted in the County Economic Strategic Plan
Impact of broadband in K-12 education and businesses

Providers:
Identifying the challenges faced by providers
Estimating costs of buildout
Assist in business plan of local telecommunications providers
Understand the business case necessary for providers to participate in buildout
Identify terrain issues

Citizens:
Highlight areas of unmet demand
Insight into barriers to adaptions of technology and the Internet
Insight into citizen's utilization of broadband
Identify digital literacy training needed in the community
How do we build demand for broadband and inspire citizens to lead the charge

5. Briefly discuss your readiness to implement the project. Identify the lead entity and any other entities responsible for implementation of the project. Describe the organizational capacity of each participating entity and their role to successfully guide the implementation of a telecommunication planning grant.

The County is ready to post the Request for Proposals for a telecommunications consultant upon notification of grant award. County Finance and IT Departments will be the lead entities throughout the planning process. Expertise from the stakeholder group with special emphasis on Economic Development will be utilized.

6. Please provide names and organizational information for members of the management team and describe their role in supporting the project.

Board of Supervisors-Marshall Pattie
Board of Supervisors (project specific)-Jeff Moore
Finance Director-Jennifer Whetzel
IT Director-Jackie Zetwick
Economic Development Director-Amanda Glover
Zoning Administrator-John Wilkinson

Members of the management team will review proposals, interview and select a telecommunications consultant. The team will meet periodically with the consultant to vet questions, provide data, and review progress of the plan. Community meetings will be attended by members of the team and County resources will be available to assist in drafting the plan (GIS, website, press releases). The team will provide support to the consultant when the plan is presented to the Board.

7. Provide an anticipated timeline of activities to be completed as part of the telecommunications planning project. Incorporate a project management plan into the timeline to identify responsible entities for each task.

Procurement:
Issue RFP-Upon grant award (September 2015)
Proposals Due-30 days from grant award (October 2015)
Distribute Proposals to Selection Committee-Upon receipt (October 2015)
Selection Committee Interviews with selected Firms-October 2015
Contract Finalization and Award-October/November (BOS meetings Oct. 28, 2015 & Nov. 11, 2015)

Project:
Begin Fieldwork-October/November 2015

- Kick-off meeting
- Data gathering
- Survey
- Progress meetings with contractor
- Community meetings
- Draft plan
- Final review
- Present plan to Board of Supervisors

Project completion-May/June 2016 (9 months from grant award notice or other deadline proposed by DHCD)

8. Please provide a brief summary of any previous work that has been done to determine and meet telecommunication needs in the locality, lessons learned from those efforts, a description of why additional planning is needed and the benefits that are expected to be realized.

Phase I letter noted past efforts of the County including a wireless cell tower study, RFI for tower in the Deerfield are for public safety, RFP for tower in Deerfield for public safety, attendance at CIT workshop and hosted regional workshop, on-line community survey.

Lessons learned include the need for clarity and direction in how to pursue the planning task. Staff has limited expertise to guide a County only project and it is hard to properly reach citizens using limited staff time. The survey primarily highlighted areas that have unmet demand, which can lead to many alternatives to gain service. The expertise of a consultant paired with County leadership can successfully and realistically pursue the planning project. It will also be beneficial to establish a timeline that matches process of realistic implementation and budget (capital improvement plan).

CIT recently informed localities that Connect America funding is available to incumbent wireline telephone providers. The Federal Communications Commission (FCC) and the Wireline Competition Bureau reallocated a portion of the Universal Service Fund (USF), used for subsidizing plain telephone service, to fund broadband deployment in rural areas.
The providers have until August 27, 2015 to accept or decline the funds. The funding is determined by defining the unserved eligible areas by census block. By accepting the funds, the provider agrees to build all of the eligible blocks offered to them in the state. If the incumbent provider declines the money, the funds will then be made available to other providers to service these rural areas. County staff will discuss the issue with the Board of Supervisors to see if they wish to contact the incumbent providers to encourage them to pursue rural broadband buildout in these rural areas. In Augusta County, rural areas include villages such as McKinley, Walkers Creek and Newport in the southern part of the County; pockets that border the City of Staunton; and expansive rural areas in the western part of the County, some along Rt. 250 and others bordering the Town of Craigsville.

9. Please draft a request for proposal to procure the services of a telecommunication planning consultant.

A draft request for proposal is uploaded per document requirements.

Please submit/upload following required documents:
1. Community Meeting Documentation Aug. 6 meeting
2. List of Stakeholders Same as Phase I letter, updated
3. Budget Sources Table Per PDC, grant plus local match
(to get the template file by clicking HERE)
4. Match Documentation BOS letter
5. Draft RFP Done, Sherri reviewed also
6. Phase 1 Application Zip File Why zip file? Send pdf before.

STAFF BRIEFING ITEM S/B -08

Augusta County, Virginia

Wireless Facilities Telecommunications Analysis For Wireless Voice and Broadband Services

Prepared by

THE ATLANTIC GROUP OF COMPANIES, INC.

6260 Pine Slash Road

Mechanicsville, Virginia 23116

August 6, 2012

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Attachment "E" LIFECORE Blue Ridge Health Science Corridor August 6, 2015 Survey Results

LIFECORE
BLUE RIDGE HEALTH SCIENCE CORRIDOR

LifeCore Stakeholders
August 6, 2015
10:00a.m.

Augusta Health
Fishersville VA

Welcome and Introductions
10:00-10:10a.m.

County Broadband Study/Survey
10:10-10:30a.m.

Marketing Piece Review
10:30-10:50a.m.

Exit 91-Transportation Update
10:50-11:00a.m.

Idea Exchange
11:00-11:30a.m.

Adjourn

AUGUSTA
COUNTY, VIRGINIA

Attachment "F" August County May 20, 2015 Letter of Interest for the Virginia Telecommunications Planning Initiative (VATPI) Grant Funding

COUNTY OF AUGUSTA, VA.
BOARD OF SUPERVISORS

MARSHALL W. FAVILL
North River

LARRY J. WILLS
Middle River

TRACY C. PYLES, JR
Pastures

JEFFREY A. MOORE
Wayne

DAVID A. BOWERS
Beverley Manor

MICHAEL L. SHULL
Riverheads

CAROLYN S. BRAGG
South River

PATRICK J. COFFIELD - COUNTY ADMINISTRATOR
AUGUSTA COUNTY GOVERNMENT CENTER
P.O. BOX 590, VERONA, VA 24482-0590
(540) 245-5610 FAX (540) 245-5621
coadmin@co.augusta.va.us

May 20, 2015

Ms. Tamarah Holmes, Ph.D.
Associate Director
Project Management Office
Virginia Department of Housing &
Community Development
600 East Main Street, Suite 300
Richmond, Virginia 23219

Dear Ms. Holmes:

On behalf of Augusta County, I am pleased to submit this Letter of Interest for the Virginia Telecommunication Planning Initiative (VATPI) grant. Funding would allow Augusta County to develop a comprehensive telecommunications plan that will help develop strategies and identify solutions and resources to address the growing issue of insufficient internet services in this rural part of Virginia.

1. Statement of Need

Augusta County does not have a comprehensive telecommunications plan. Several efforts have been made to understand the needs, issues, and challenges involved, but without funding dedicated to these efforts, a comprehensive and strategic plan has not been feasible.

Due to its size, location and topography, much of Augusta County lacks broadband infrastructure and/or has insufficient broadband and internet service. This has become even more evident in recent years with the latest trends in Internet usage and the demand for high speed, reliable and affordable broadband. Currently, much of the County, especially in the more rural western part of the County, remains underserved or un-served. County officials recognize that the availability of Internet access is a vital community service that supports economic development, education, healthcare and emergency services, for example:

- Economic Development - Broadband access is critical for small rural businesses, home-based businesses and entrepreneurial start up companies including agricultural businesses that need to connect to producers of goods, retailers, and consumers directly. Telework opportunities are limited without accessible broadband as well. Augusta County's Economic Development Strategic Plan (updated in 2015) makes several references to the need for reliable broadband and cell phone coverage in the County, citing that these services are critical to the future growth of Augusta County. The Plan goes on further to state that the quality, cost and coverage of broadband should be

Attachment "G": County of Augusta, VA Comprehensive Plan Update "*Growing Together to Shape Our Future 2007-2027"* Adopted: April 25, 2007 As amended January 28, 2009

Strategies for Growth

The four **Policy Areas identified on the Planning Policy Area/Future Land Use Map** include:

- Urban Service Areas (80% of future residential growth)
- Community Development Areas (10% of future residential growth)
- Rural Conservation Areas (5% of future residential growth)
- Agricultural Conservation Areas (5% of future residential growth)

While it is anticipated that each of these Policy Areas will absorb their share of residential growth, at approximately the rates outlined above, it is the intention of this Plan to encourage as much development as possible to take place in the Urban Service and Community Development Areas. Because of this, a target of 90% of future residential development locating in these areas has been established.

Table 3 provides a statistical breakdown of the County by Planning Policy Area. Table 3. Acreage by Planning Policy Area Policy Area

Policy Area	Acres	Percent
Urban Service Area	40,574	6.6%
Community Development Area	34,881	5.6%
Rural Conservation Area	82,948	13.4%
Agricultural Conservation Area	246,901	39.8%
Public Land	214,409	34.6%
Total	**619,713**	**100.0%**

Source: Augusta County GIS

Urban Service Areas are defined as areas which are appropriate locations for development of a full range of public and private land uses of an urban character on public water and sewer, in either the immediate or long term future. Urban Service Areas are characterized by relatively substantial amounts of existing development and public utilities and facilities, substantial amounts of available developable land, and good transportation access. Those areas designated as Urban Service Areas are those which are appropriate for urban development on public water and sewer within the 20-year timeframe of this Plan.

Urban Service Areas are priority locations for:

- Significant amounts of urban residential and employment growth
- Expansions of public water and sewer service
- Local and regional public facilities *ƒ* Most "one-of-a-kind" public facilities such as hospitals Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009
- Most industrial development – light, medium, and heavy, with adequate facilities and buffers *ƒ* Larger scale urban residential and business developments
- Larger scale mixed use developments, where different combinations of residential, business, and industrial uses will be found within a development

Community Development Areas are local community settlements which have existing public water or public sewer systems in place or which have relatively good potential for extensions of either of those utilities. These areas are appropriate locations for future low density, rural land uses based upon road access, the existing land use

pattern, and proximity to existing public facilities and services, although they are planned to remain predominantly residential in character.

Most of the Community Development Areas have only public water service. The New Hope area has only public sewer service. Community Development Areas do not have both public water and sewer service; therefore, they are only suitable for lower density, primarily residential uses. As development occurs over the very long term and public water and sewer service is extended, some Community Development Areas may evolve to the point that they are designated Urban Service Areas.

Community Development Areas are priority locations for:

- Moderate amounts of small scale residential and employment growth at marginally higher densities than in the Rural Conservation Areas
- Limited expansions of public water or sewer service Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009
- Local public facilities
- Small scale, low-intensity commercial and/or light industrial developments

Rural Conservation Areas Rural Conservation Areas are areas which are substantially subdivided and/or developed with residential uses, which have no public water or sewer service and which have few existing intensive agricultural operations. They are therefore priority locations for moderate amounts of future rural residential development. Ideally, any development would be in the form of incremental additions to existing settlements.

Any development taking place in the Rural Conservation Areas would be expected to be sensitive to the context of the surrounding agricultural areas as well as the surrounding natural features. Such development would primarily be in the form of Rural Residential subdivisions as well as business uses related to agriculture.

Rural Conservation Areas are priority locations for:

- Moderate amounts of low density rural residential development on individual wells and septic fields, including clustered development (although there are concerns about groundwater protection)
- Non-intensive agricultural and forestry activities

Agricultural Conservation Areas are areas which have mainly farm or forest uses and have generally the lowest overall density of residential uses, have no public water or sewer service, and have most of the county's intensive agricultural operations. These areas are planned to remain in predominantly agricultural and forestal uses with very little additional residential development.

Agricultural Conservation Areas are priority locations for:

- Minimal, incremental amounts of very low density rural residential development on individual wells and septic fields
- A full range of long term agricultural, forestry and natural resource industry activities, including intensive agricultural operations.

Future Land Use Categories

The future land use categories function within the geographic areas defined by the Urban Service and Community Development Areas. They serve to identify the specific use and density that is proposed for a parcel. There are eleven future land use categories identified by the Planning Policy Area/Future Land Use Map. Those areas include:

- **Industrial**, where industrial uses of varying scale and scope would be appropriate
- **Business**, where business uses of varying scale and scope would be appropriate
- **Public Use**, which identifies land owned by, or utilized by, a federal, state or local government agency
- **Community Mixed Use**, which may include a variety of residential uses at a density of six to twelve dwelling units per acre and, on up to 40% of the total land area, retail and office uses and in some, but not all cases, industrial uses
- **Neighborhood Mixed Use**, which may include a variety of residential uses at a density of four to eight dwelling units per acre and convenience retail and office uses on up to 20% of the total land area
- **Planned Residential**, which may include a variety of residential uses at a density of four to eight dwelling units per acre Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009
- **Multifamily Residential**, which may include residential buildings housing between nine and sixteen dwelling units per acre, as well as manufactured home developments
- **Single-Family Attached Residential**, which may include attached residential units like townhouses and duplexes at a density of between four and eight dwelling units per acre; will be found only in the Urban Service Area
- **Medium Density Residential**, which may include detached residential units at a density of between three and four dwelling units per acre
- **Low Density Residential**, which may include detached residential units at a density of between one-half and one dwelling unit per acre; will be found only in the Community Development Area
- **Rural Community**, where an appropriate mix of uses may be found that conforms to the established development pattern in a rural community; will be found only in the Community Development Area
- **Urban Open Space**, which identifies land permanently set aside for open space uses such as conservation easements and county recreation areas
- **Flood Plain**, which includes lands identified by the Federal Emergency Management Agency (FEMA) as prone to flooding during a 100-year flood event and therefore unsuitable for most land uses

Like the Planning Policy Areas, the future land use categories are not zoning classifications. Instead they act to inform the decision making process on rezoning and development applications. Since the land located in the Rural and Agricultural Conservation Areas is expected to remain rural in character, those Policy Areas do not have designated future land uses. Table 4 provides a statistical breakdown of the future land use categories. Table 4. Acreage by Future Land Use Category

Future Land Use	Acres	Percent
Industrial	5,807	7.7%
Business	4,216	5.6%
Public Use	2,752	3.7%
Community Mixed Use	3,462	4.6%
Neighborhood Mixed Use	3,357	4.4%
Multifamily Residential	824	1.1%
Single-Family Attached Residential	862	1.1%
Medium Density Residential	14,695	19.5%
Planned Residential	2,880	3.8%
Low Density Residential	30,728	40.7%
Rural Community	1,019	1.4%
Urban Open Space	537	0.7%
Flood Plain	4,316	5.7%
Total	75,455	100.0%

Source: Augusta County GIS

Role of Broadband Telecommunications and Potential Strategies

The following table information are related excerpts from the County's Comprehensive Plan found at http://www.co.augusta.va.us/Index.aspx?page=278
County of Augusta, VA Comprehensive Plan Update "*Growing Together to Shape Our Future 2007-2027"* Adopted: April 25, 2007 As amended January 28, 2009
Volume 1: IV. Goals, Objectives, and Policies

Policy Planning Area	Objective	Policy	Role of Broadband Telecommunications	Strategies
Agriculture Goal 1: Enhance the economic strength of the county's agriculture and forestry industry.	C: Ensure the agricultural and forestry industry has available to it a wide array of methods for maintaining a viable agricultural economy.	Policy 1: **Promoting**	*Promoting* and **marketing the local agricultural industry** through such organizations as local farm agencies, educational institutions, and farmers' markets.	On-Line Marketing and Promotion Presence
		Policy 2 **Planning**	The utilization of the Agricultural Enterprise **Grant program** for qualified businesses to *develop and implement business plans.*	On-Line Business Plan Development
	D: Support programs to help ensure the transition of agricultural land ownership. Work with state and federal agencies to develop programs in acquiring resources ranging from education and mentorship to investment capital and tax breaks.	Policy 1 **Education**	Vigorously support **agriculture education and youth programs**. *Learn from mentors in the agri-business community*, and create new and diverse agriculture enterprises.	On-Line Learning
Agriculture Goal 3: Ensure that agricultural and forestry operations use environmentally sound methods.	Objective A: Support a variety of programs and strategies for farmers to ensure that their operations are both profitable and environmentally sound.	Policy 4 **Education**	**Public Education.** The county should *make available, to all county farmers and foresters, information* on environmentally sound practices and the federal, state, and local programs that encourage them.	On-Line Learning
Economy Goal 1: Retain and expand the business and industrial operations currently located in the county. The primary focus of economic development efforts should be to retain the county's existing employers and facilitate their growth and expansion.	Objective A: Prepare, with public input, and adopt a strategic plan for the economic development of the county. The strategic plan should include strategies for retaining and expanding the businesses and industries now operating in the county.	Policy 1 **Outreach**	**Develop an Existing Industry Program.** The strategic plan should make recommendations on how the county should work to *improve its outreach efforts for existing businesses and industries.*	On-Line Business and Industry Outreach; Lead by Example
		Policy 2 **Training**	**Training.** The strategic plan should make recommendations for *developing a workforce training program* to ensure that existing businesses and industries have a sufficient supply of skilled and well trained workers available.	On-Line Workforce Training Programs; Business/Industry Forums; On-Line Job Bulletin Boards
Economy Goal 2: Attract industries and businesses which are compatible with	Objective A: Prepare, with public input, and adopt a strategic plan for the economic development of the	Policy 1 **Research**	**Target Industries.** The strategic plan should *research* and make recommendations on which types of businesses and industries are most compatible with Augusta County's strengths and assets. The county should	On-Line Research, Promotion and Recruiting; On-Line Site Selector

and enhance the county's economic climate as well as its environmental, scenic, agricultural, and historic character.	county. The strategic plan should identify the strengths and weaknesses of the county and develop an action plan for attracting new industries that are compatible with the county.		*focus its business promotion and recruitment efforts on the target industries* …	
		Policy 2 **Recruitment**	**Recruitment of Business.** The strategic plan should make recommendations on strategies the county should employ for *recruiting new businesses and industries.* The county should be proactive in seeking to recruit new businesses and industries.	On-Line Economic Development Website with Site Selector; On-Line Job Bulletin Boards
		Policy 3 **Site Locator**	**Identify Sites.** The strategic plan should *identify the best potential industrial and business sites which are suitably located and which have adequate land, roads, and utilities to support business and industrial development.*	On-Line Site Selector using a Unified Process Disciplines and Phased Development approach, as well as incorporating data suggested through the International Economic Development Council (IEDC).
		Policy 6 **Training**	**Training.** The strategic plan should make recommendations on how the county should *develop a training program to provide training to ensure an adequate trained and skilled labor force to meet the needs of the identified target businesses and industries.*	On-Line Workforce Training Programs; Business/Industry Forums; On-Line Job Bulletin Boards
		Policy 7 **Marketing**	**Marketing Strategies**. The strategic plan should make recommendations on how the county can *market itself for potential new businesses and industries.* …	On-Line Marketing and Promotion Presence
	Objective B: Provide adequate land and facilities for future business and industrial development.	Policy 1 **Site Locator**	**Suitable Locations**. *Ensure that new business and industrial development occurs in suitable locations* and is compatible with existing and planned adjacent land uses.	On-Line Site Selector using a Unified Process Disciplines and Phased Development approach, as well as incorporating data suggested through the International Economic Development Council (IEDC).
	Objective C: Ensure the county's unemployment rate remains low and wages remain competitive.	Policy 1 **Competitive Jobs & Wages**	Employers Offering **Competitive Wages.** The county should work to *attract new businesses and industries* that pay competitive wages	On-Line Job Bulletin Boards; Job Search Sites and Available Work Force Statistics
	Objective E: Increase the coordination of economic development efforts with the state as well as with neighboring jurisdictions.	Policy 2 **Websites**	**Virginia Economic Development Partnership.** Continue to participate in and support the economic development efforts of the Virginia Economic Development Partnership. *Encourage available business and industrial sites to be listed on the VirginiaScan website* and in other similar programs.	Link VirginiaScan website with the County's and Business Sector websites such as the Chamber of Commerce
Economy Goal 3: Maintain the overall high	Objective A: Capitalize on the economic assets of the agricultural	Policy 1	Agriculture. Economic development staff, in cooperation with the Director of Agriculture Development, should **promote** *the continued and enhanced*	On-Line Marketing and Promotion of the Local

quality of life in the county which serves as a major attraction for new employers and employees.	landscape, natural beauty, and historic resources.	**Promotion & Technical Assistance**	*viability of the local agricultural industry,* including innovative farming practices, new products, and support businesses. The county should continue to **support and encourage** the continuing work of the Cooperative Extension Service in **providing technical assistance** *to the local agricultural industry.*	Agricultural Industry; Link Ag-related websites; Develop Ad-Industry Related Resource Sites such as commodity pricing/selling, regulations, etc.
		Policy 2 **Tourism**	**Tourism.** *Promote* the local tourism industry, including the conservation of the agricultural, historic, and environmental resources that fuel it.	On-Line Tourism Marketing and Promotion
		Policy 3 **Tourism**	**Agricultural Tourism.** The county should explore and *promote* all possibilities for expanding agricultural tourism.	On-Line Tourism Marketing and Promotion
Education Goal 1: Ensure that the county's public education facilities and services meet the needs of local residents by producing well educated graduates that are prepared for a lifetime of learning and for working in tomorrow's economy.	Objective A: The School Board should prepare, with public input, and adopt a strategic plan for the county's public education system. The strategic plan should consider the number and location of new and upgraded public school facilities to ensure that they are located efficiently and cost-effectively.	Policy 2 **Capital Improvements**	**Capital Improvements**. Recommended school capital improvement projects should be proposed by a system to include real and projected enrollment growth, the age of the existing facilities, their remaining productive life and the *ability to deliver special programs and services to all students in the school.*	On-Line School Board Meetings; On-line School Budget Posting; Fund Distant Learning Capital Improvement Needs
		Policy 4 **Community Centers**	**Schools as Focal Points of Communities.** The strategic plan should recommend ways in which public school facilities can best serve as *focal points of local communities and civic activities, while meeting the primary function of educating children.*	Offer Evening/Weekend Computer/Internet Learning Classes in schools for community residences of all ages
		Policy 7 **Community Centers**	**Multi-Purpose Schools.** The strategic plan should make recommendations on ways to ensure that school facilities continue to be *multi-purpose community facilities that benefit all county citizens,* after the primary function of educating the children is met.	In school kiosk availability to experience Internet and High Speed Broadband
	Objective B: The School Board should prepare, with public input, and adopt a strategic plan for the county's public education system. The strategic plan should consider ways in which the public schools can provide the best possible educational programs to ensure that they are established, maintained, and delivered in an efficient, equitable, and cost-effective manner.	Policy 1 **Curriculum**	Policy 1: **Curriculum**. The strategic plan should make recommendations on how the public schools can provide the most *rigorous, relevant, and diverse curriculum* possible.	On-Line Distance Learning and Research and Development
		Policy 2 **Distance Learning**	**Continued Support of Local Educational Resources.** The strategic plan should recommend ways in which the county and the School Board can continue to *encourage students to use fully the facilities and opportunities at Valley Vocational-Technical Center, the Central Shenandoah Valley Regional Governor's School, Blue Ridge Community College, and nearby colleges and universities.*	Access to High Speed Broadband at the various local educational resources emphasizing cloud hosting of information for access from anywhere
		Policy 3 **Attracting Staffing**	**Staffing.** The strategic plan should recommend programs to *maintain a competitive edge in attracting, hiring, and retaining highly qualified staff* while continuing to provide positive staffing ratios in the classroom.	Add value-added benefits such as providing tablets and notebooks with electronic media policies for mixed use (business and personal)

		Policy 4 **Technical Education**	**Career and Technical Education Programs.** The strategic plan should explore potential new career and *technical education programs that will assist young people as they attempt to acquire the education and experience they will need to move into the workforce of the 21st Century.*	On-Line Distant Learning; On-Line Technical Workforce Development Training
		Policy 5 **Technology**	**Technology in the Classroom**. The strategic plan should make recommendations on how the School Board can continue to *improve the level of technology in the classrooms.*	Work with the Business Sector to develop classes and technical training programs to meet local workforce needs
		Policy 6 **Continuing Education**	**Continuing Education.** The strategic plan should recommend ways in which the percentage of students *continuing their education beyond the high school level* can be increased.	On-Line Distant Learning and Degree Programs
	Objective C: The county should work with the School Board to ensure that the public education system is effectively administered in conjunction with overall county planning efforts.	Policy 2 **Data Collection & Management**	**Monitor Trends.** The county, in cooperation with the School Board, should monitor trends in public and non-public enrollments, on a regional basis, to anticipate changes in demand for school facilities. *Improving the data collection and management* procedures for state reports and operational decisions should be a priority.	On-Line Survey Tools to monitor local community needs and trends; On-Line Community Suggestion portal
Education Goal 2: Foster the educational attainment of all county residents.	Objective A: Provide assistance to those children attending private schools or being home schooled.	Policy 1 **Library**	**Augusta County Library.** The county should continue to recognize the *role that the public library plays in supporting the education of home school and private school students.*	On-Line Library Collection Access; Computer access in library; In Library Assistance
	Objective B: Continue to support area colleges and adult education facilities.	Policy 1 **Higher Education**	**Blue Ridge Community College.** The county should continue to *provide support* to Blue Ridge Community College.	On-Line Distant Learning and Degree Programs
		Policy 2 **Vocational-Vo-Tech Education**	**Valley Vocational-Technical Center.** The county should continue to *support the School Board's adult education* efforts at Valley Vocational-Technical Center.	On-Line Adult Education Programs; On-Line Technical Training; On-Line Degree Programs
General Government Goal 1: Manage the county's expenditures and investments so as to obtain maximum long-term efficiency and value from each dollar expended.	Objective A: Efficiently and effectively plan for the county's capital improvements. Maintain a low to moderate level of debt burden for county capital expenditures, consistent with state guidelines.	Policy 1 **Government Capital Improvement Program**	**Capital Improvements Program (CIP).** The county should develop, refine, and use its CIP as a planning and budgeting tool for all capital investment decisions. *The CIP, based on the policies of the Comprehensive Plan*, should be revised annually and should forecast capital expenditures for five year periods.	On-Line Government Meetings; On-line Government Budget Posting; Fund Distant Learning Capital Improvement Needs
	Objective C: Coordinate the planning, funding, and delivery of all public facilities and services with the cities of Staunton and	Policy 1 **Regional Planning**	**Regional Planning Efforts.** The county should continue to *participate in regional planning efforts* such as the Central Shenandoah Planning District Commission.	On-Line Presence of County Data Available at Multiple Sites such as the CSPDC; Off-Site Data Storage and Sharing

	Waynesboro, as well as other applicable neighboring localities, so as to maximize economies of scale and minimize redundancies.	Policy 2 **Coordinated Emergency Services**	**Coordinated Emergency Services Programs.** The county should work with the cities of Staunton and Waynesboro to *provide backup Emergency Operations Center coverage.* The county should *explore further options for coordinating the delivery of emergency services* with the cities and the neighboring localities, including shared services agreements, and mutual aid agreements.	On-Line EOC Information such as Material Safety Data Sheets, GIS Maps of Evacuation Maps; Ability to Access Data Stored in the Cloud; Broadband Texting for EOC Communications
		Policy 3 **Regional Education Programs**	**Regional Educational Programs.** The county should *continue to participate in regional educational programs* such as Valley Vocational Technical Center and the Central Shenandoah Valley Regional Governor's School.	On-Line Distant Learning
General Government Goal 2: Manage the allocation of costs and benefits of public services in a fair and equitable manner so that all residents receive their fair share of facilities and services and contribute their fair share of funding for those facilities and services.	Objective A: Allocate the costs and benefits of new and existing facilities and services in a balanced and equitable manner so that those who benefit pay a fair share of the costs.	Policy 1 **Cost-Benefit Fiscal Impact**	**Fiscal Impact Analysis**. The county should examine the feasibility of establishing a fiscal impact analysis procedure. In order to aid the county in estimating and forecasting its capital and service expenditures, *the fiscal impact of each major development proposal should be analyzed.*	On-Line Collection of Data and posting of resulting Fiscal Impact Analysis
		Policy 2 **Cost Allocation**	**Proffer Guidelines.** The county should examine the possibility of *establishing guidelines for the proffering* of land, facilities, and/or funds *to offset a portion of the cost of providing capital facilities to serve a new development.*	On-Line Collection of Data and resulting posting of Cost of Service Studies
		Policy 3 **Cost Allocation**	**Special Service Districts**. The county should examine the possibility of *establishing special service districts to provide the funding for additional public facilities and services for particular areas of the county that desire such additional facilities and services*. Such districts should be located in the Urban Service or Community Development Areas designated in the Comprehensive Plan.	On-Line Collection of Data and resulting posting of Cost of Service Studies
	Objective B: Ensure that all county residents equitably pay for resources that benefit all county residents	Policy 1 **Funding**	**Funding** Increased Density in Urban Areas. The county should *develop a strategy* for ensuring that the infrastructure improvements that permit higher densities in the Urban Service and Community Development Areas are funded by all county residents.	On-Line Collection of Data and resulting posting of Cost of Service Studies
	Objective C: Allocate new investments in public facilities and services within the county on the basis of population growth, and local demand/need, in accordance with Comprehensive Plan and Capital Improvements Program policies.	Policy 1 **Ubiquitous Service**	**Central and Local Facilities**. The county should balance the need to centralize as many facilities and services as possible for purposes of economy and efficiency with the need to disperse them for purposes of *providing convenient service to all county residents.*	On-Line Collection of Data and resulting posting of Cost of Service Studies; Post justification of prioritizing phases of offering services
		Policy 2 **Colocation**	**Combine Public Facilities.** When feasible and consistent with service delivery objectives, the county should *locate compatible public facilities together on a shared site* in order to minimize the costs of land and utilities and to provide maximum convenience to citizens.	Provide Access to Public Facilities service (such as government services) from multiple sites such as library, Chamber of Commerce,

				Schools, Court House, etc.; Create Community Intranet
Historic Resources Goal 3: Foster public education and greater appreciation and understanding of historic and archaeological resources, and public support for preservation of those resources.	Objective A: Enhance local awareness and understanding of the county's historic resources and their relationship to the county's current culture and economy, as well as the tourism industry.	Policy 1 **Education**	**Education**. *Promote public and private education efforts* about the county's historic resources and efforts to conserve them. *Encourage public awareness efforts through the schools, the media, and local civic and business organizations.*	On-Line Historical Society Data Access; On-Line Promotion;
		Policy 2 **Tourism**	**Tourism.** Foster a strong and complementary relationship between tourism promotion and historic preservation efforts. *Encourage the promotion* and awareness of the county's historic resources through the tourism industry development process. Consider developing a countywide heritage tourism program.	On-Line Historical Society Data Access; On-Line Tourism, Marketing and Promotion
		Policy 3 **Data Collection & Management**	Historic Resource Information. **Compile and maintain a file**, in the form of *a GIS database*, on local historic resources for use by citizens and by county and state agencies in the review of public and private plans and development proposals.	On-Line Access and Data Sharing of GIS Maps and Databases; On-line posting of review of Public and Private Plans & Development
		Policy 4 **Promotion**	Augusta County Historical Society. Support the activities of the Augusta County Historical Society as it seeks to study, collect, preserve, publish, *educate about,* and **promote** the history of Augusta County and its communities.	On-Line Historical Society Data Access; On-Line Promotion;
Housing Goal 1: Ensure the provision of a variety of housing types and values that will meet the needs of county residents.	Objective A: Help to ensure that the local housing market offers a range of housing densities, types and prices.	Policy 3 **High Value Housing**	**"High value" Housing.** Encourage builders and developers to *provide "high value" housing rather than simply "affordable" housing.*	Offer Incentives/Require Conduit Placement in Public Streets for Fiber Placement to the Curb/Access to the House
		Policy 4 **Retiree & Elderly Housing/Services**	**Retiree and Elderly Housing.** Promote the *development of housing to accommodate the growing retiree and elderly population.* Monitor the *provision of adequate senior care facilities* to accommodate the growing retiree and elderly population.	In House Retiree and Elderly Housing Assistance and Access to Computer and Internet use
	Objective B: Ensure the provision of an adequate supply of safe, suitable and affordable housing for all county residents of all income levels.	Policy 4 **Funding**	**Federal and State Programs**. Explore the further *use of federal and state programs to help meet local housing needs, including Block Grants for housing rehabilitation* and HUD Section 8 rental housing vouchers.	On-Line Data Collection to meet CDBG Funding Requirements
Housing Goal 2: Ensure that housing development occurs in a pattern which is efficient and affordable to the county taxpayers at large in terms of providing	Objective A: Encourage housing development to locate in areas where adequate water and/or wastewater service is available, roads and schools have adequate	Policy 2 **Community Centers**	**Staunton and Waynesboro as Growth Areas.** The county should recognize the role of the cities as growth areas and should *expect the cities to be centers of future development.*	Offer Evening/Weekend Computer/Internet Learning Classes in city facilities for community residences of all ages; In city government kiosk availability to experience

public facilities and services.	capacity, and emergency services have adequate coverage.			Internet and High Speed Broadband
Human Services Goal 1: Maintain the current quality of public health and social services to residents of all ages and needs in the county, in conjunction and cooperation with local, state, and federal agencies.	Objective A: Protect citizens in at-risk situations from neglect, abuse, and exploitation.	Policy 1 **Youth Special Needs & Promotion**	**Youth Services.** The county should continue to focus efforts to *meet the special needs of local youth through* **promoting** *cooperative and coordinated efforts of all public and private entities that serve children and young adults, including public and private schools, public safety agencies, social services, civic organizations, and local youth-oriented businesses.* Services such as employment training, teen pregnancy prevention, substance abuse prevention, and juvenile offender programs should continue to receive county support.	On-Line Resources Directory for Youth Special Needs; On-Line Distant Learning and Research; On-Line EOC data needed such as Back-up power needs; On-Line Promotion of Available Services
		Policy 2 **Mental Health & Substance Abuse**	**Mental Health and Substance Abuse Services.** The county should *support the mental health and substance abuse services* provided by federal, state, and local government agencies as well as other programs provided by nonprofit organizations.	On-Line Resources Directory for Mental Health & Substance Abuse; On-Line Promotion of Available Services
		Policy 3 **Disability Services**	**Disability Services**. The county should support all government, private, and nonprofit programs that provide *services to disabled individuals.*	On-Line Resources Directory and Promotion of Services for Persons with Disabilities
		Policy 4 **Elderly Services & Library Services**	**Elderly Services.** The county should *promote and support public and private services, projects, and policies which focus on assisting and involving senior citizens,* including transportation assistance, adult day care, recreation and education programs, volunteer programs, and *library services.*	In House Elderly Housing Assistance and Access to Computer and Internet use; On-Line access to library collection; In-library assistance and computer access, as well as training
	Objective B: Promote conditions that support the development of healthy individuals and families.	Policy 1 **Health Promotion**	**Health Department Programs**. The county should continue to support the Virginia Department of Health in its efforts to *promote proper nutrition, immunizations, family planning, environmental health, cancer screening, and other public health programs.*	On-Line Health Education, Marketing & Promotion; On-Line Health Resources Directory
		Policy 2 **Social Services Access**	**Social Services Programs**. The county should continue to *support the Department of Social Services through such programs as food stamps, Medicaid, Family Access to Medical Insurance Security (FAMIS), and other child and adult services.*	On-Line Social Services Resources Directory
		Policy 3 **Retiree & Elderly Housing**	**Retiree and Elderly Housing.** The county should promote the development of housing to accommodate the growing retiree and elderly population. The county should *monitor the provision of adequate senior care facilities* to accommodate the growing retiree and elderly population and ensure that they are located in close proximity to the facilities that are needed to serve them.	In House Retiree and Elderly Housing Assistance and Access to Computer and Internet use
Land Use and Development Goal 1:		Policy 8	**Development North of Waynesboro.** The County and the Service Authority should examine ways in which *public water and wastewater services can be*	On-Line Utility Infrastructure Data and GIS Mapping

Encourage a compact, orderly, and coordinated development pattern in the Urban Service and Community Development Areas	Objective A: Provide a convenient, safe, and efficient network of urban land uses.	**Utility Infrastructure**	*extended to the area immediately adjacent to the northern boundary of the City of Waynesboro, north of Route 250 and west of Route 254, in order to serve existing and future residential developments in that area.*	Access; On-Line Collection of Data and resulting posting of Cost of Service Studies
		Policy 9 **Business Development**	**Location of Business Development**. Larger scale, regional, and community businesses and *higher intensity business uses should be permitted only in designated Urban Service Areas,* where the majority of future population growth is expected to occur, and where the services and facilities necessary to support these businesses are located. *Smaller scale, local neighborhood business uses may locate in the designated Urban Service Areas or Community Development Areas.* Also, *business uses may be permitted in areas designated Mixed-Use on the Planning Policy Area/Future Land Use Map provided they are designed in such a manner that the different uses are fully compatible with each other.*	On-Line Research, Promotion and Recruiting; On-Line Site Selector using a Unified Process Disciplines and Phased Development approach, as well as incorporating data suggested through the International Economic Development Council (IEDC); On-Line Zoning and Subdivision Regulations
		Policy 10 **Industrial Development**	**Location of Industrial Development**. *Most industrial uses should be permitted only in designated Urban Service Areas, where the roads, utilities, and other necessary infrastructure are sufficient to support such uses.*	On-Line Utility Infrastructure Data and GIS Mapping Access; On-Line Collection of Data and resulting posting of Cost of Service Studies; On-Line Zoning and Subdivision Regulations
	Objective B: Increase the percentage of new residential units locating in the Urban Service Areas to 80% of all new residential development. Increase the percentage of new residential units locating in the Community Development Areas to 10%.	Policy 4 **Role of Cities in Residential Development**	**Role of Cities in Absorbing New Residential Development.** The county should *recognize the role of Staunton and Waynesboro in absorbing new residential development in the region.*	On-Line Marketing and Promotion
		Policy 5 **Rural Communities**	**Rural Communities.** Encourage any new development in and adjacent to the county's rural communities, as identified by this Plan, to conform to the established development pattern in the community. *Rural communities with public water and/or sewer service will have a designation of Rural Community on the Planning Policy Area/Future Land Use Map where uses compatible with the existing development pattern in the community will be encouraged*.	On-Line Utility Infrastructure Data and GIS Mapping Access; On-Line Collection of Data and resulting posting of Cost of Service Studies; On-Line Zoning and Subdivision Regulations
	Objective D: Enhance the character of the urban environment.	Policy 3 **Public Facilities**	**Public Facilities.** *Schools, parks, community centers, and other public facilities should be located and designed so as to provide a focus for urban neighborhoods and communities*, with clear visual identities and convenient access for pedestrians as well as vehicles.	Provide Access to Public Facilities service (such as government services) from multiple sites such as library, Chamber of Commerce, Schools, Court House, etc.;

				Create Community Intranet; On-Line Promotion
		Policy 5 **New Development Infrastructure Planning**	**Development Standards.** The county should *require that new residential developments provide adequate on-site facilities to accommodate the needs of the new residents and coordinate those improvements with adjacent sites and with the county.* Such facilities may include but not be limited to recreation facilities, land for schools, *community centers or other public use sites,* adequate stormwater management facilities and adequate roads and parking.	Offer Incentives/Require Conduit Placement in Public Streets for Fiber Placement to the Curb/Access to the House
Land Use & Development Goal 2: Maintain the county's predominantly rural character, including the small towns and villages.	Objective D: Prevent conflicts between residential, business, and industrial land uses and agricultural land use activities.	Policy 2 **Home Occupations**	**Non-Residential Development**. *Limited, compatible, small scale, rural business uses may locate in the designated Rural Conservation and Agricultural Conservation Areas* if adequate buffers between adjacent properties, road access, and on-site well and sewage disposal are sufficient to ensure long term public health and safety. *Compatible home occupation uses should be encouraged in the rural areas.*	On-Line Utility Infrastructure Data and GIS Mapping Access; On-Line Collection of Data and resulting posting of Cost of Service Studies; On-Line Zoning and Subdivision Regulations
	Objective G: Keep the cost of providing public services to rural areas to a minimum.	Policy 1 **Utility Infrastructure Development Standards**	**Development Standards**. *Require that new residential developments provide adequate on-site facilities to accommodate the needs of the new residents.* In rural areas, it is expected that fewer on-site facilities will be needed than in urban areas due to the lower population densities of rural development. However, contributions for off-site facilities will be appropriate to offset a portion of the costs of the facilities that the county will provide to new rural residents.	Offer Incentives/Require Conduit Placement in Public Streets for Fiber Placement to the Curb/Access to the House
Library Goal 1: Establish and maintain library facilities and services that provide efficient, effective, and readily available service to all county residents in accordance with state service standards.	Objective A: Provide high-quality library facilities, services, and programs that are efficient, effective, and readily available to serve all county residents.	Policy 2 **Technology Advances**	**Library Facility Improvements**. In the short term, library improvements should be focused on renovating the Main Library and transitioning the Craigsville Station to a new facility while continuing to support the Churchville Library and the Deerfield Station. In the longer term, a branch facility will likely be appropriate in the Verona area. The county should *encourage the increased use of technological advances to improve library service delivery.*	On-Line Library Collection Access; Computer access in library; In Library Assistance
		Policy 5 **Technology Sharing**	**Coordinate Efforts and Resources**. The library system should continue to cooperate with neighboring jurisdictions in *sharing materials, technology, and services.* Economies of scale that may be achieved through further sharing or combining of resources should be explored.	On-Line Library Collection Access; Computer access in library; In Library Assistance
Natural Resources Goal 3: Promote development layout that protects natural and scenic resources by design.	Objective C: Raise citizen and landowner awareness about land protection and possible conflicts with agriculture and forestry.	Policy 2 **Outreach**	**Targeted Outreach Materials**. The county should develop brochures and *outreach materials that can be distributed with building permits or by other means to raise awareness for people living in or moving to the county's rural areas*. Outreach can be targeted to residential developments within the Rural Conservation and Agricultural Conservation Areas, adjacent to Agricultural and Forestal Districts, and within the Woodland Home Communities and	On-Line Residential Outreach Materials; On-Line Zoning and Subdivision Regulations; On-Line Promotion

			Wildland/Urban Interface Areas identified by the Virginia Department of Forestry. Information can include what to expect from active agricultural and forestry operations, ways to protect water quality and wildlife habitat on rural residential properties, and methods to reduce risk from wildfires. The county should collaborate in this task with organizations and agencies such as the Department of Forestry and the Headwaters SWCD.	
Natural Resources Goal 6: Protect the citizens, property, and natural resources of the county from flood damage by integrating public safety with environmental protection.	Objective A: Ensure that the operation of flood control dams is coordinated with upstream and downstream land uses.	Policy 3 **Outreach & Emergency Preparedness**	**Outreach Within Inundation Zones**. Work with Headwaters SWCD and the County Fire & Rescue Department to *develop outreach materials for residents within inundation zones, real estate agents, and other audiences that highlight the nature of the inundation zones and steps for emergency preparedness.*	On-Line Outreach Materials within Inundation Zones; On-Line Zoning and Subdivision Regulations; On-Line Emergency Preparedness Guidelines
Public Safety (Including Law Enforcement and Fire & Rescue)	Objective C: Develop and improve the emergency communications and geographic information systems in order to provide the most effective and cost-efficient emergency services.	**Emergency Communications and Information Management**	Develop and improve the **emergency communications and geographic information systems** in order to *provide the most effective and cost-efficient emergency services.*	On-Line EOC Information such as Material Safety Data Sheets, GIS Maps of Evacuation Maps; Ability to Access Data Stored in the Cloud; Broadband Texting for EOC Communications
	Objective D: Work with the cities of Staunton and Waynesboro and the other adjacent localities to provide efficient, effective, and economical public safety service.	Policy 2 **Emergency Communications & Coordination**	**Coordinated Emergency Services Programs**. The county should work with the cities of Staunton and Waynesboro to *provide backup Emergency Operations Center coverage*. The county should explore further options for *coordinating the delivery of emergency services with the cities.*	On-Line EOC Information such as Material Safety Data Sheets, GIS Maps of Evacuation Maps; Ability to Access Data Stored in the Cloud; Broadband Texting for EOC Communications; Backup multiple means of Communication
Utilities Goal 5: Coordinate with non-public utility providers including telephone, gas and electric services in order to ensure adequate provision of services.	Objective A: Achieve such coordination through the ongoing processes for Comprehensive Planning, CIP and land development project reviews.	Policy 1 **Information Collection and Management**	**Coordinated GIS Database System.** Develop a *coordinated GIS database system for mapping all applicable utilities*, both public and private, located within the county.	On-Line Utility Infrastructure Data and GIS Mapping Access; On-Line Collection of Data and resulting posting of Cost of Service Studies

VIII. Capital Improvement Plans

Public Utilities	The Service Authority's current Master Water and Sewer Plan support the following	**Information Management**	**Creation of a Geographical Informational System (GIS)** with multiple layers that can *guide capital investment decisions* in regards to repair and replacement as well as new construction	On-Line Capital Investment Infrastructure Data and GIS Mapping Access; On-Line Collection of Data and resulting posting of Cost of Service Studies
		Information Management Systems	Data gathering from **SCADA systems** that *allow monitoring of remote locations to protect and maintain public water and sewer infrastructure*	On-Line Supervisory Controlled and Data Acquisition System monitoring and controlling of utilities; Cloud hosted data & remote access
		Vertical Assets Construction	**Water system projects** include membrane filtration systems at several existing sources required by the Virginia Department of Health, land acquisition and *water tank replacements at four to five locations* to meet new county fire flow regulations and source water protection land acquisitions as well as the development of supplementary wells.	On-Line Vertical Assets Construction Infrastructure Data and GIS Mapping Access; On-Line Regulations and Well Head/Source Water Protection Information
Emergency Services	There are two capital projects identified for the county's Emergency Operations Center (EOC). Both projects are anticipated to fall within the 20-year planning period.	**Consolidated EOC**	**New Center** – *to accommodate future growth (personnel and technology) the current EOC could be located in the Fire Training Center* and built as part of the Public Safety Building that would also include Fire & Rescue administrative offices and Fire/Rescue training classrooms. Estimated cost for equipment only is $4.5 million (the building costs are included in the Fire Training Center estimate below).	On-Line EOC Information such as Material Safety Data Sheets, GIS Maps of Evacuation Maps; Ability to Access Data Stored in the Cloud; Broadband Texting for EOC Communications; On-Line Fire/Rescue Training
		EOC Radio System	**EOC Radio System Upgrade** – The current system was installed in 1998 at a cost of $2.3 million. *The FCC has mandated that all radio stations will have to be converted to "narrowband" by 2013*. The estimated cost for this upgrade is $11.2 million	On-Line EOC Radio System Infrastructure Data and GIS Mapping Access
Fire and Rescue	The 2000 Fire and Rescue Study was updated in 2005. The study recommended a number of capital projects to enhance the ability of volunteer and paid service providers to meet the needs of the community. Augusta County Comprehensive Plan Update 2007-2027 – Volume 1 April 25, 2007, as amended January 28, 2009 128	**Training**	**Fire Training Center** – Phase I, construction of a building, is underway at a cost of $1.6 million. Phase II would include the development, planning, design, and *construction of a classroom/office building*. The offices would have Fire/Rescue Administration offices and 911 operations center. Estimated cost $4.8 million	On-Line Fire Training; GIS Mapping for Development and Construction Planning
		Emergency Response	**Fire Stations** – *The Master Plan anticipates the need for four new stations (three new and one replacement) over the next twenty years*. The estimates include one station in the first 5 years and three in the next fifteen years. The stations involved could be Company 10, and ones north, south, and east of the City of Staunton. The estimated cost per location: $6 million for a total of $24 million over the next 20 years.	On-Line Emergency Response Infrastructure Data and GIS Mapping Access and Master Planning

Volume 2: IX. Existing Conditions Analysis

5. Energy and Communication Facilities	I. Community Facilities, Services, and Utilities	**Communication**	Most of Augusta County is served with electricity by Dominion Virginia Power with its local office in Verona. Some portions of the county are served by Shenandoah Valley Electric Cooperative (SVEC) or the Bath-Allegheny Rockbridge Electric Cooperative (BARC). Both of these cooperatives purchase all, or nearly all, of their electricity from Virginia Power. These companies have adequate electric power for foreseeable growth in Augusta County. Natural gas is provided to the area by Columbia Gas of Virginia through a 20- inch, high pressure pipeline that crosses the southeastern portion of the county. Distribution lines connect to the main line and serve the areas of Staunton, Verona, Fishersville, Stuarts Draft, and Waynesboro. **Telecommunications and internet services** *are provided by nTelos and Verizon of Virginia. Cable television and internet services are provided by Adelphia.*	Approach existing Service Providers about expanding service and/or regarding Public-Private Partnerships; Seek what incentives or conditions will support their business plan for service expansion
8. Libraries		**Libraries**	Augusta County and the cities of Staunton and Waynesboro each have their own independent public library systems. Library locations in the Augusta County system include the main library in Fishersville, a branch library in Churchville, and library stations in Craigsville and Deerfield. The Augusta County Library is a department within Augusta County Government and is funded through local tax monies. Each year, the Library Board submits an approved budget to the County Administrator for recommendation and final approval by the Board of Supervisors. Augusta County Comprehensive Plan Update 2007-2027 – Volume 2 April 25, 2007, as amended January 28, 2009 240 In April 2003, Augusta County joined the two city library systems to create the **"Valley Libraries Connection"** *whereby all three catalog systems are readily available to the central valley communities, one card is accepted at all three systems, and books can be returned to any location. In addition, the two local colleges (Mary Baldwin and Blue Ridge Community College) have their own libraries that are also made available to the public. Together, these five library systems contain more than one million volumes of materials including hardback and paperback books, microfilm, periodicals, slides, and tapes.*	On-Line Library Collection Access; Computer access in library; In Library Assistance

Study Area History

Historical Features (***From*** Augusta County Comprehensive Plan Update 2007-2027 – Volume 2 April 25, 2007, as amended January 28, 2009)

The Shenandoah Valley, including the area that is now Augusta County, was for many centuries a hunting ground for a variety of Native American tribes, including the Shawanese, Tuscaroras, and Senedos.[21] These tribes enhanced the natural productivity of the land by regularly burning the dry grasses of the valley floor in the autumn in order to promote the growth of pasture for the production of wild game. Shenandoah, or Sherando, is a native word meaning "beautiful daughter of the stars."

The Valley was first visited by non-native settlers in 1716 when Colonel Spotswood's "Knights of the Golden Horseshoe" discovered it during an expedition. In 1732, 16 families from Pennsylvania crossed the Potomac River and settled in the northern part of the Valley near what is now the City of Winchester.
Settlement continued as word spread about the natural abundance of the Valley and in 1738 the General Assembly found reason to establish Augusta County as a distinct governing entity, separate from Orange County. The county appears to have been named for Princess Augusta, mother of King George III and wife of Frederick Lewis, then Prince of Wales. Frederick County, Virginia was established at the same time. The original western boundary of the county was the western edge of Virginia, which at the time was the Mississippi River. The boundaries of the county were set at their present location in 1790.

The first settler of Augusta County was John Lewis, who was born in Ireland and educated in Scotland, and who settled in what is now the City of Staunton. Lewis was followed by other Scotch-Irish settlers, and soon thereafter by Germans and those of German lineage from Pennsylvania. In 1745, once the population had grown large enough to support a local government, the county seat was organized at Staunton.

Much of what is Augusta County today was part of the Beverley Manor grant from Governor William Gooch to William Beverley in 1736. The grant consisted of 118,491 acres of land and was followed by a 500,000-acre grant to Benjamin Borden, however most of that grant was for land in present-day Rockbridge County. Beverley and Borden were encouraged by the terms of the grants to bring additional families to settle the land.

The Valley was the site of substantial action during the Civil War, resulting in extensive damage to farms and infrastructure. Battles were fought in and around Augusta County in 1862, 1864, and 1865.

The cities of Staunton and Waynesboro developed in close conjunction with Augusta County. Staunton was established as a town in 1761 and incorporated as a city in 1871. In addition to serving as the county seat and a center of local commerce, Staunton became an educational center as well, with the establishment of the Virginia School for the Deaf and Blind in 1839 and Mary Baldwin College, a private college for women, in 1842. Waynesboro was established in 1801, became a town in 1834, and was incorporated as a city in 1948. With its location at the intersection of two major railroads, Waynesboro became an industrial center by the late 19th century. There were also several major transportation corridors through the county that helped contribute to settlement. Route 11 began as an Indian trail, then changed to the Great Wagon Road, and finally became known as the Valley Pike, which was used to transport settlers and goods out west. The Staunton-Parkersburg Turnpike was also a major route.

Augusta County continued to prosper as an agricultural and manufacturing center into the 20th century. During the second half of the 1900s, the two cities continued to develop and mature, two interstate highway links were built

[21] 1 History of Augusta County, J. Lewis Peyton, 1953.

through the county, the agricultural base further developed and the area became widely recognized as one of the outstanding natural, historic, and recreational areas in the nation. The county has established and maintained a high quality of life for its citizens through an extended period of steady growth in both jobs and population.

Geography Features (***From*** Augusta County Comprehensive Plan Update 2007-2027 – Volume 2 April 25, 2007, as amended January 28, 2009)

Augusta County lies within the Valley and Ridge Physiographic Province, which is characterized by gently rolling and hilly valleys, as well as gradual mountain slopes. The extreme eastern edge of the county is within the Blue Ridge Physiographic Province, distinguished by sharp mountain peaks. Elevations range from 1,050 to 1,800 feet above sea level in the Shenandoah Valley. The Blue Ridge Mountains and the Allegheny Mountains have many peaks, which exceed 3,500 feet above sea level. The level areas of the county are located in the vicinity of Fishersville, Middlebrook, Spotswood, Stuarts Draft, Swoope, Waynesboro, and Weyers Cave.

Study Area Key Demographics & Socioeconomics

Demographic & Socioeconomics Features (***From*** Augusta County Comprehensive Plan Update 2007-2027 – Volume 2 April 25, 2007, as amended January 28, 2009)

1. **Population Change**

   Between 1990 and 2000, at a time when the state population grew by 14.4 percent, Augusta County and the cities of Staunton and Waynesboro experienced a combined increase of 11,301 persons for a net gain of 11.6 percent. In 1990, the area's population accounted for about 1.6 percent of the state's total population; in 2000, the area's population of 108,988 made up about 1.5 percent of the state's total population of 7,078,515. Area population has continued to grow over the last 40 years. The 11.6 percent growth rate for the decade 1990-2000 was the largest increase since the decade 1960-1970. Most of the growth in the last decade occurred in Augusta County, which had a 20 percent increase. Between 1980 and 1990, Augusta County had only a 1.76 percent increase; however, this low growth rate for that period is misleading because of annexations of county land by both Staunton and Waynesboro. Without the 6,154 former county residents brought into city limits through annexation, the county population would have increased by 13.2 percent.

   In 1994, Augusta County produced population growth forecasts that predicted between 7.5 percent and 12.1 percent growth by 1999. These forecasts proved to be lower than the actual growth that occurred. Between 1990 and 1999, the Census showed 18.6 percent growth in the county, a higher rate of growth than experienced by the state in the same period (14.3 percent). Population change varied significantly among census tracts ranging from population loss to 45 percent growth. Between 2000 and 2003, Augusta County grew by an additional 1,812 people. By 2004, Augusta County's population was 68,774 (according to Census estimates), marking a 25.8 percent increase since 1990. However, the county experienced only a 4.8 percent increase in population from 2000 to 2004, an average of 1.16 percent per year.

   Augusta County is growing at a rate nearly two and a half times that of Waynesboro and nearly ten times that of Staunton. The population of Staunton decreased by 2.5 percent and Waynesboro's population grew by only 5.2 percent from 1990 to 2000. In 1990, Augusta County accounted for 53.8 percent of the population of the county and two cities combined. This figure increased to 58 percent by 2000.

   According to the VEC's population projections, the county population is expected to reach 71,300 in 2010, a 12.5 percent increase from 2000. Updated population projections were produced, comparing VEC projections to extrapolated trends of Cooper Center and Census Bureau estimates, following the development of this study. These updated projections are considered the official projections for this Plan and can be found in Section IV.

Table 14. Population Change in Augusta County, 1980 – 2030

Year	Total Population of County	% change
1980	53,732	
1990	54,677	1.76
2000	65,615	20.00
2010 (projected)	71,300	8.66
2020 (projected)	76,100	6.73
2030 (projected)	80,900	6.31

Source: U.S. Censuses 1980-2000, U.S. Bureau of Census. Population projections for 2010-2030 from VEC, 2003.
Notes: 1990 data reflects annexation of 3,234 Augusta County residents by Waynesboro in 1986 & 2,920 Augusta County residents by Staunton in 1987.

Migration

Population growth, particularly from migration, has a significant socioeconomic impact on a community and typically reflects the strength of the local economy. From 2002 to 2003, the increase in population in the county was split roughly evenly between natural increase (51.6 percent) and migration (48.4 percent). According to Census migration data, Augusta County netted 3,323 people from migration between 1995 and 2000. The five-year population mobility rate[22] in Augusta County remained fairly low, 38 percent compared to a statewide average of 47.8 percent. Albemarle County was the leading source of migrants to Augusta County between 1995 and 2000, followed by Fairfax and Arlington County. Several jurisdictions adjacent to Augusta are also significant sources of migration into the county such as Rockbridge, Rockingham, Highland, and Nelson County.

Cohort Analysis

A cohort analysis provides insight into the ages of migrants into and out of the county. A "cohort" refers to a group of people born within a 10-year time span. A cohort analysis tracks changes in the number of people in each birth cohort over several decades. Since only a few people in younger age groups die over a 10-year span, any significant change in the size of the group can be attributed to migration.

An analysis of the size of cohorts (Table 15) from 1990 to 2000 indicates that families with children are moving to the county. The cohorts aged 0-9 in 1990 and 10-19 in 2000 increased in size from 7,345 people to 8,962 people. Similarly, the cohorts aged 20-29 in 1990 and 30-39 in 2000 increased significantly as they aged by 10 years. The increases in these age groups can only be due to net migration into the county. The largest increases are consistently for the cohorts that are 30-39 in the ending time period. These cohorts heavily represent young families and correspond to the increase in children in the county.

Table 15. Cohort Analysis in Augusta County, 1990-2020

Age	Population			
	1990	**2000**	**2010**	**2020**
0-9	7,345	8,087	9,042	10,422
10-19	7,549	8,962	6,997	8,730
20-29	7,801	6,673	9,016	5,116
30-39	9,497	10,183	8,719	13,374
40-49	8,084	11,128	9,587	7,433

[22] The percent of the population aged 5 and over that lived in a different residence in 2000 than in 1995.

50-59	5,665	8,921	11,900	9,484
60-69	4,735	5,773	8,548	11,165
70-79	2,907	3,990	4,540	6,902
80+	1,094	1,898	2,952	3,474

Source: VEC, 2005.

Due to net in-migration, the cohorts aged 40-49 in 2000 increased by 1,631 people (17 percent) between 1990 and 2000. The VEC projections, however, indicate that younger cohorts contribute to net out-migration, particularly between the ages of 0-9 and 30-39 in 2010. The cohorts aged 50-59 in 2000 show a similar pattern; the current cohort contributes to net in-migration, but younger cohorts will produce out-migration as they reach the ages of 50-59 after 2010. The reason for these reversals in migration patterns is unclear and the VEC projections for these cohorts might be too conservative. If this proves to be the case, Augusta County can expect higher population growth than projected by the VEC.

Cohorts in older age groups are obviously at greater risk of death due to natural causes. In addition, post-retirement migration streams typically flow toward sunbelt locations. However, the cohort aged 60-69 in 2000 increased slightly over its size 10 years earlier as 50-59 year olds, due to net in-migration. Although the 6069 age groups in 2010 and 2020 are smaller than the 50-59 age groups 10 years earlier, there will be an ever increasing number of people ages 60-69 in the county. In 2000, there were 5,773 60-69 year olds; by 2020 there will be a projected 11,165 persons' ages 60-69. This occurs because although net loss among these cohorts is projected as they age, the cohorts are larger when they are younger than their predecessors have been.

2. Race and Ethnicity

Augusta County's population is rather homogenous with 95 percent of the population classified as white in 2000. Of the remaining 5 percent, 3.6 percent were black or African American. Although Staunton and Waynesboro were more racially diverse than Augusta County, all three areas were significantly less diverse than the state. Table 16 shows the racial composition of the county and two cities. Similarly, less than 2.5 percent of residents of the county and cities were foreign born with almost half of the foreign born having become naturalized citizens.

Table 16. Race in Augusta County, Staunton, and Waynesboro, 2000

Race/Ethnicity	Augusta County	Staunton	Waynesboro
White	95.0%	84.1%	86.7%
Black/African American	3.6%	13.3%	10.0%
2 or More Races	0.7%	1.9%	1.9%
Hispanic	0.8%	1.1%	3.2%

Source: U.S. Census Bureau, 2000.

3. Elderly and Persons with Disabilities[23]

The elderly and persons with disabilities often need assistance with transportation, access to health care, financial advising, assistance with home maintenance, and other social services. The projected growth in the senior population in the county highlights the need for social services to help this population live independently for as long as possible. At the time of the 2000 Census, there were 8,428 persons aged 65+, 12.8 percent of the

[23] Augusta County, Virginia Housing Assessment, Center for Housing Research, Virginia Tech, April 2005.

total population. This population is spread evenly throughout the county with some concentrations in Staunton and Waynesboro. The highest concentration of elderly and/or disabled persons occurs along the Route 42 corridor, between Buffalo Gap and Craigsville, and along Route 250 between Churchville and West Augusta. Waynesboro has the highest overall disability rate within the local area, with 27.7 percent of the working age population disabled.

4. **Incomes and Poverty** Real (inflation adjusted) incomes in Augusta County increased 6.9 percent between 1989 and 1999 while real incomes decreased in Staunton and Waynesboro during the same time period. According to the Bureau of Labor Statistics, the inflation rate during this period was 34.4 percent. The largest gains in income were in the areas between Staunton and Waynesboro and along the northwestern border of the county.

   The median household income in Augusta County was $43,045 in 1999 but incomes varied widely within the county and cities. This is an increase of 31.5 percent from the 1989 median income of $29,474. This increase was mirrored in the increase in median housing values which rose from between $75,000 and $99,999 in 1990 to $110,900 in 2000. Incomes also varied according to the races of the householder. The median income for white householders was $43,459 while that of black or African American householders was $31,737 or 26.3 percent lower.

   Per capita income is the total personal income of all the residents of a locality divided by the total population. This number differs from adjusted gross income for individuals in that the adjusted gross income is derived from persons filing their income tax returns as individuals, rather than the total population.

   In 2003 the Augusta County area, including Staunton and Waynesboro, had a per capita personal income (PCPI) of $25,847. This PCPI ranked 47 in the state and was 77 percent of the state average, $33,730, and 82 percent of the national average, $31,472. The 2003 PCPI reflected an increase of 2.3 percent from 2002. The 2002-2003 state change was 2.3 percent and the national change was 2.2 percent. In 1993 the PCPI of Augusta County, Staunton, and Waynesboro was $18,386 and ranked 39 in the state. The 1993-2003 average annual growth rate of PCPI was 3.5 percent. The average annual growth rate for the state in this time period was 4.1 percent and for the nation was 4.0 percent.[24]

   Poverty rates also indicate the county's relative prosperity. Just 5.8 percent of the county's population fell below the poverty line in 2000, compared to approximately 12 percent (Staunton) and 13 percent (Waynesboro) in the cities and 9.6 percent in the state. Nearby Rockingham County's poverty rate was 8.2 percent. Poverty distribution by age, as reported by the Census, shows that five year olds (now 9-10 year olds) are disproportionately affected.

Table 17. Poverty Rates by Age in Augusta County, 2000

	Augusta County	Staunton	Waynesboro
Total 2000 below poverty level	3,685	2,485	2,459
Percent Total			
Under 5 years	7.03%	7.89%	10.98%
5 years	2.20%	1.37%	3.29%
6 to 11 years	8.58%	11.75%	16.10%
12 to 14 years	5.59%	5.07%	4.72%
15 years	1.22%	0.28%	3.29%

[24] Bureau of Economic Analysis, Regional Facts, Augusta County, Virginia 2003.

16 and 17 years	3.85%	3.78%	2.24%
18 to 24 years	9.53%	9.54%	13.05%
25 to 34 years	10.23%	8.57%	11.18%
35 to 44 years	14.14%	13.96%	13.14%
45 to 54 years	10.23%	10.99%	6.83%
55 to 64 years	12.81%	10.06%	7.32%
65 to 74 years	7.54%	8.09%	2.89%
75 years and over	7.06%	8.65%	4.96%

Source: U.S. Census Bureau, 2000.

The incidence rate of female-headed households (no husbands present) with children under the age of 18 provides another measure of poverty and economic stability. In 2000 in the county, 4.5 percent of all households were female headed, compared to 6.7 percent statewide. While the overall incidence of single mothers was low in Augusta County, there are a few areas where the incidence was relatively high. For example, 14.7 percent of householders in Verona were female-headed households.

5. Earnings by Place of Work

Earnings of persons employed in the Augusta County area increased from $1.9 billion in 2002 to $2 billion in 2003, an increase of 4.3 percent. The 2002-2003 state change was 4.8 percent and the national change was 4.1 percent. The average annual growth rate from the 1993 estimate of $1,324,290 to the 2003 estimate was 4.3 percent. The average annual growth rate in 2003 for the state was 5.9 percent and for the nation was 5.3 percent.[25]

[25] Bureau of Economic Analysis, Regional Facts, Augusta County, Virginia 2003

Updated Demographic Information

Source: United States Census Bureau http://www.census.gov/quickfacts/table/PST045215/51015

Table

links AUGUSTA

PEOPLE

Population	
Population estimates, July 1, 2015, (V2015)	74,314
Population estimates, July 1, 2014, (V2014)	73,862
Population estimates base, April 1, 2010, (V2015)	73,736
Population estimates base, April 1, 2010, (V2014)	73,736
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	0.8%
Population, percent change - April 1, 2010 (estimates base) to July 1, 2014, (V2014)	0.2%
Population, Census, April 1, 2010	73,750
Age and Sex	
Persons under 5 years, percent, July 1, 2014, (V2014)	4.3%
Persons under 5 years, percent, April 1, 2010	5.2%
Persons under 18 years, percent, July 1, 2014, (V2014)	19.7%
Persons under 18 years, percent, April 1, 2010	21.4%
Persons 65 years and over, percent, July 1, 2014, (V2014)	19.4%
Persons 65 years and over, percent, April 1, 2010	16.1%
Female persons, percent, July 1, 2014, (V2014)	49.4%
Female persons, percent, April 1, 2010	49.3%
Race and Hispanic Origin	
White alone, percent, July 1, 2014, (V2014) (a)	93.7%
White alone, percent, April 1, 2010 (a)	93.4%
Black or African American alone, percent, July 1, 2014, (V2014)(a)	4.2%
Black or African American alone, percent, April 1, 2010 (a)	4.0%
American Indian and Alaska Native alone, percent, July 1, 2014, (V2014) (a)	0.3%

American Indian and Alaska Native alone, percent, April 1, 2010(a)	0.2%
Asian alone, percent, July 1, 2014, (V2014) (a)	0.6%
Asian alone, percent, April 1, 2010 (a)	0.5%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2014, (V2014) (a)	0.0%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	Z
Two or More Races, percent, July 1, 2014, (V2014)	1.3%
Two or More Races, percent, April 1, 2010	1.2%
Hispanic or Latino, percent, July 1, 2014, (V2014) (b)	2.5%
Hispanic or Latino, percent, April 1, 2010 (b)	2.1%
White alone, not Hispanic or Latino, percent, July 1, 2014, (V2014)	91.5%
White alone, not Hispanic or Latino, percent, April 1, 2010	92.2%
Population Characteristics	
Veterans, 2010-2014	6,279
Foreign born persons, percent, 2010-2014	1.7%
Housing	
Housing units, July 1, 2014, (V2014)	31,798
Housing units, April 1, 2010	31,194
Owner-occupied housing unit rate, 2010-2014	81.1%
Median value of owner-occupied housing units, 2010-2014	$197,600
Median selected monthly owner costs -with a mortgage, 2010-2014	$1,265
Median selected monthly owner costs -without a mortgage, 2010-2014	$347
Median gross rent, 2010-2014	$806
Building permits, 2014	418
Families and Living Arrangements	
Households, 2010-2014	28,124
Persons per household, 2010-2014	2.49

Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	90.7%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	2.8%
Education	
High school graduate or higher, percent of persons age 25 years+, 2010-2014	85.7%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	21.2%
Health	
With a disability, under age 65 years, percent, 2010-2014	9.4%
Persons without health insurance, under age 65 years, percent	⚠ 14.5%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2010-2014	59.9%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	58.1%
Total accommodation and food services sales, 2012 ($1,000)	56,499
Total health care and social assistance receipts/revenue, 2012 ($1,000)	512,215
Total manufacturers shipments, 2012 ($1,000)	1,884,187
Total merchant wholesaler sales, 2012 ($1,000)	249,603
Total retail sales, 2012 ($1,000)	621,286
Total retail sales per capita, 2012	$8,435
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2010-2014	24.1
Income and Poverty	
Median household income (in 2014 dollars), 2010-2014	$54,018
Per capita income in past 12 months (in 2014 dollars), 2010-2014	$26,398
Persons in poverty, percent	⚠ 9.8%
BUSINESSES	
Total employer establishments, 2014	1,415
Total employment, 2014	19,027

Total annual payroll, 2014	750,386
Total employment, percent change, 2013-2014	-1.4%
Total nonemployer establishments, 2013	4,359
iAll firms, 2012	5,645
Men-owned firms, 2012	3,051
Women-owned firms, 2012	1,784
Minority-owned firms, 2012	282
Nonminority-owned firms, 2012	5,174
Veteran-owned firms, 2012	728
Nonveteran-owned firms, 2012	4,536

GEOGRAPHY	
Population per square mile, 2010	76.3
Land area in square miles, 2010	967.00
FIPS Code	51015

- **1**. Independent city of Bedford, Virginia (51515) changed to town status and was added to Bedford County (51019) effective July 1, 2013.

⚠ This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

- **(a)** Includes persons reporting only one race
- **(b)** Hispanics may be of any race, so also are included in applicable race categories
- **(c)** Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

- **D** Suppressed to avoid disclosure of confidential information
- **F** Fewer than 25 firms
- **FN** Footnote on this item in place of data
- **NA** Not available
- **S** Suppressed; does not meet publication standards
- **X** Not applicable
- **Z** Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits

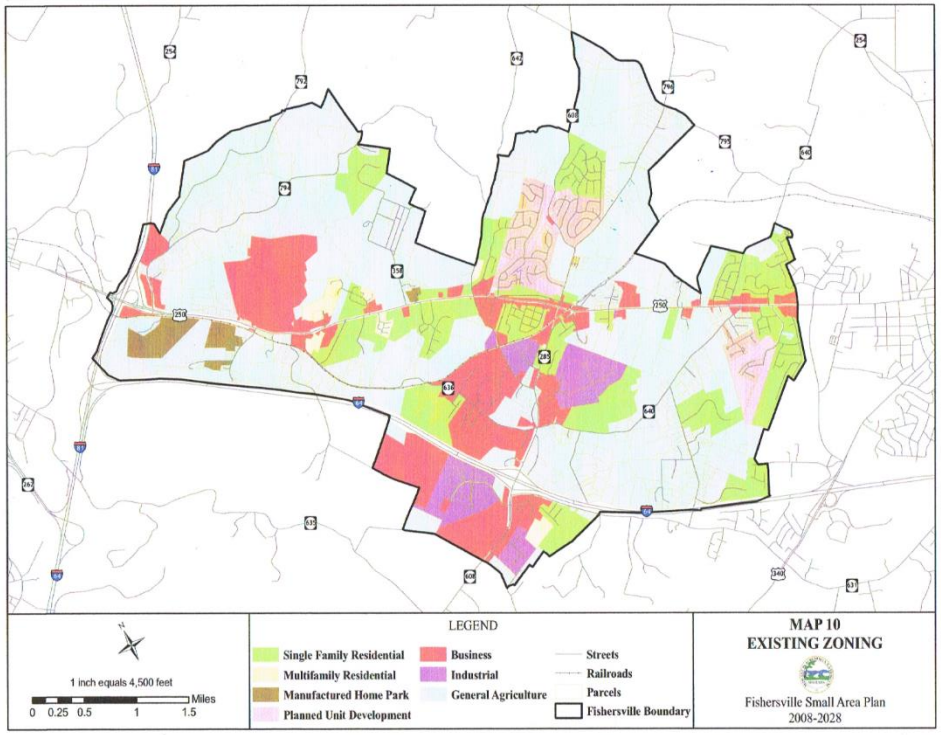
Attachment "H": Fishersville Small Area Plan County of Augusta January 28, 2009

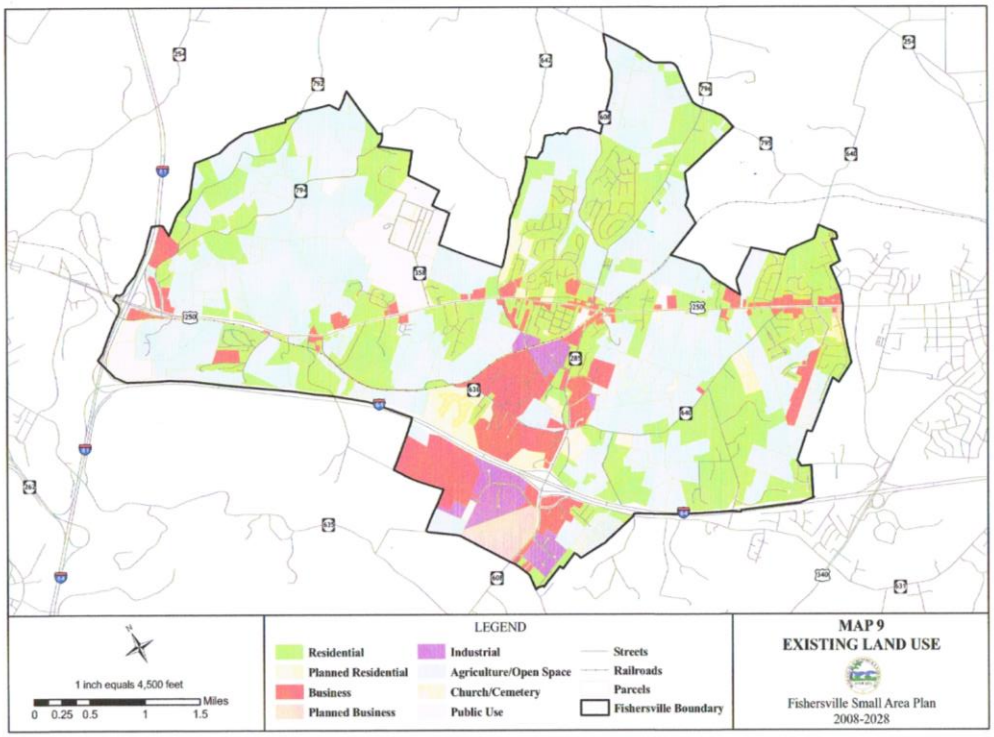
Consulting Assistance provided by: Anderson & Associates – Blacksburg, Virginia

Fishersville Small Area Plan

The Fishersville Small Area Plan was prepared as a follow-up to the Augusta County Comprehensive Plan. The Fishersville Plan added another level of detail to the plans the Comprehensive Plan established for the Fishersville area, with a particular focus on land use and transportation issues. The planning process began in October 2007 and was completed in late-spring 2008. A ten-member Advisory Committee appointed by the Board of Supervisors worked with Augusta County staff in developing the plan. The planning process involved three public workshops in addition to Advisory Committee meetings. The first public workshop was held November 29, 2007. The second was held February 19, 2008. The final public meeting was held on May 20, 2008. Public hearings on the final draft of the plan were conducted on August 12, 2008 by the Planning Commission and August 27, 2008 by the Board of Supervisors. As a result of suggestions and concerns raised at the public hearings, additional worksessions were conducted by the Planning Commission and the Board of Supervisors to consider the recommendations of the plan and the applicability of those recommendations on the County's Comprehensive Plan and future land use map. Two additional public hearings were conducted in January of 2009. On January 28, 2009 the Board of Supervisors adopted the Fishersville Small Area Plan and made it part of the Comprehensive Plan.

Last updated: 2/9/2009 11:44:10 AM





Policy Planning Area	Objective	Policy	Role of Broadband Telecommunications	Strategies
Utilities Goal 2: Coordinate with non-public utility providers including telecommunications, natural gas, and electric services in order to ensure adequate provision of services. .	Objective A: Work with telecommunications providers to ensure that modern, high-quality services are provided to all portions of the Fishersville area, particularly those that are planned for business or industrial uses. Fishersville Small Area Plan January 28, 2009	**Policy 1: Cooperation Among Providers**	The County should **encourage an increased level of cooperation among the providers of utility services** to more efficiently *provide telecommunications services to the Fishersville area.* Where possible, providers should consider shared locations and facilities in order to reduce the amount of land required to provide services to the community.	Approach existing Service Providers about expanding service and/or regarding Public-Private Partnerships; Seek what incentives or conditions will support their business plan for service expansion

Attachment "I": Economic Development Strategic Plan Executive Summary January 2009

TARGET INDUSTRIES FOR AUGUSTA COUNTY'S FUTURE ECONOMIC GROWTH

Industry	Comments
Manufacturing	Taking care of the labor needs of existing companies is Job #1 for the county. In addition, companies with initial employment of 10 to 150 employees are good size targets for the short term.
• Food Processing	Availability of water ultimately may be an issue as well as access to pre-treatment facilities.
• Medical Preparations	Availability of water ultimately may be an issue and access to pre-treatment facilities – particularly for waste streams with substances that can kill/impact the biomass at the wastewater treatment plant.
• Molded Plastic Products	These firms will typically look for existing buildings. Larger molding operations also require rail access.
• Fabricated Metal Products	These firms will typically look for existing buildings. Having a presence of other fabricators as well as training programs in welding and automated machine tools is critical.
• Medical Devices	These firms may look for existing buildings first, then consider constructing a new building. Access to university R&D may also be a consideration.
• Other Light Manufacturing	These firms will typically look for existing buildings first then maybe consider constructing a new building.
Services	The community does not currently have the significant college-attainment labor force for this segment and therefore must grow it over time. Companies ranging from one person firms up to 25 employees are the best initial targets.
• Professional, Business & Technical Services (Computer software, engineers, architects, graphic design, etc.)	Having air access (local and in Charlottesville) and high speed internet along with a defined quality of life will attract these types of service businesses over time. Office space availability will also be critical to growth. Many of the firms will initially be attracted to unique office space (renovation of older homes into offices or the major institutional building renovations) that are within the City of Staunton. As the companies expand, they may seek to have offices in the county. The City of Staunton and Augusta County must work together to realize this potential.
• Medical Services	Growth within this segment will reflect the regional demographics but can be facilitated with the availability of medical office facilities.
• Back Office Operations	Small to medium back office operations (25 to 150 employees) can be attracted to the area if there is more market awareness and there are available office buildings provided.
Warehousing	The incremental opportunities will be for smaller foot-print operations (50,000 - 100,000 SF) due to the availability of land and the desire for the community to increase job content per square foot of building.

RESOURCE REQUIREMENTS BY INDUSTRY SEGMENT

Resources	Small/Medium Mfg.	Large Manufacturing	Warehousing
Site (readiness)	Lease existing building	Available developed site	Available developed site or available building of appropriate size
Labor Skills Required	• Entry level labor • Technical skills • Business support services	• Experienced labor • Technical skills	• Experienced/inexperienced labor • Technical skills for maintaining computerized equipment
Utilities • Water/Sewer • Electric Power • Gas • Telecom	 • Low to moderate • Moderate • Varies by process • High speed access	 • Moderate to high • High • Depends on process • High speed access	 • Low • Low to moderate • Optional (for heat) • High speed access may be req'd
Interstate Access	Within 5 miles on good roads	Within 5 miles on good roads	Within 5 miles on good roads
Air Access	Freight, some passenger	Important for mgmt/sales	May be required for certain products.
Rail Access	Depends on process needs	Depends on process needs	Depends on type of products
Incentives	• Available facility • Recruiting and training • Roads/utilities to site/bldg.	• Developed site • Recruiting and training • Roads/utilities to site/bldg.	• Developed site • Recruiting and training • Roads/utilities to site/bldg.

Resource Requirements by Industry Segment		
Resources	**Professional/Medical Office-Based Services**	**Back Office Operations**
Site (readiness)	Lease existing building	Lease existing building
Labor Skills Required	• Clerical • Technician • Professional • Management	• Clerical • Customer service • SEC series certified • Management
Utilities • Water/Sewer • Electric Power • Gas • Telecom	• Low • Low, except w/data center • Optional • High speed internet	• Low • Low, except w/data center • Optional • High speed internet
Interstate Access	Varies: 1 to 5 miles	Varies: 1 to 5 miles
Air Access	Important	Important
Incentive Package	• Available facility • Recruiting and training • Local amenities	• Available facility • Recruiting and training • Local amenities

Evaluation of Augusta County's Resource for Economic Development	
Resource	**Comments/Observations**
Industrial/Commercial Sites for Growth	Under the long-term Comprehensive (land use) Plan that are a number of sites in the County that will be zoned industrial. However, the sites are currently zoned "agriculture" and if a company wanted to relocate to the community in the near future there would be a substantial time period required to rezone the land, obtain all the permits, grade the site, as well as design and construct a building. If another community has a situation that will substantially reduce the deliver time, the company will most likely not select Augusta County. Some companies may also be more interested in leasing or buying an existing building. There are few if any available buildings for companies to expand or relocate to in the County.
Labor Quantity and Quality	For the past generation there has been a "farm to factory" transition of workers with a very high work ethic available for expanding manufacturing operations. However, that source has essentially been tapped out as that generation begins to retire and most of the next generation seeks non-manufacturing jobs. In addition, the skill levels for many manufacturing jobs has moved up due to the sophistication from automated systems and the technical content of the products produced. This may lead to a significant gap in skilled labor resources as the economy expands in the future.
Utilities • Water/Sewer • Electric Power • Gas • Telecom	• In order to expand in the Weyers Cave section of the County there will need to be an expansion of the wastewater treatment facilities. If there are additional food processing or medical preparations produced in the Stuarts Draft area there needs to be additional pretreatment facilities installed. • Electric power and gas are well served in most potential development areas of the County. • Broadband and cell phone coverage is a challenge in some sections and the availability and quality of service should be monitored at least annually.
Interstate Access	The County has very good interstate access in all four directions that positions the County as a strategic location to serve key East Coast markets.
Air Access	The local airport has limited service (to Dulles) but the connection may provide an opportunity to attract Washington area businesses to the County.
Rail Access	There is potential rail access to a number of the long-term industrially zoned sites within the County.
Incentives	Current incentive package is "modest" reflecting mostly state-level offerings for non-economically challenged communities. There is an opportunity to establish a Technology Zone which is described in recommendation 2.7 described in the Recommendations Section in the back of this summary.

Development of the Strengths, Weaknesses, Opportunities and Threats Analysis (SWOT Analysis)

The purpose of a SWOT analysis is to highlight both the assets and liabilities of a community as the baseline for defining the situation and then setting priorities and action items to reach specific goals.

Strengths	• Relatively **diverse economy** – not dependent on a few major employers. • **Strong existing industry base** composed of health care, manufacturing, distribution, agriculture, and transportation/warehousing. • **Strategic location** at the intersection of I-64 and I-81 in the Mid-Atlantic region. • A **good inventory of flat land** that is designated for future commercial and industrial development. • **Water and sewer infrastructure** with good capacity (in some areas such as Stuarts Draft). • **Quality and productivity of workforce** is good and is highly valued by local employers.
Weaknesses	• The **County is not communicating with each local business** to determine labor and other resource needs. Reflects a lack of pro-active emphasis on retention and expansion. • With the exception of MeadWestvaco, **no major companies have been recruited** to Augusta County since 1995. Market demands for resources and their level of readiness is changing. • **Site readiness is very low** and there are no buildings (existing of speculative) available for medium-size businesses. In addition, most land earmarked for industrial use is currently zoned agriculture and would take a significant time period (2+ years) to develop into usable facilities. • **Water and sewer services need to be expanded** in the Weyers Cave area and **pre-treatment capacity** in the Stuarts Draft area (if additional food and medical preparations are located there). • **Cell phone coverage and reliable broadband access** is limited – these services will be critical to future growth. • **Labor force is aging and emerging workforce less interested in manufacturing**. This will make the supply for manufacturing labor very tight in the next 5-10 years. • **Lower levels of education attainment (college level)** in the County make the area less attractive for employers offering knowledge-based jobs. There is also a very limited presence of information technology, professional services and financial services jobs in the County – based on national averages and in comparison to Rockingham and Albemarle Counties. • **The County has very limited experience in office development projects** and perceives them as less valuable to the tax base than manufacturing jobs.

Recommendations/Action Items for Each Goal (cont'd)

Goal 3: Stimulate New Business Activities

Discussion: A healthy local economy not only supports existing business but also supports the attraction and start-up of new businesses. This constant flow of opportunities not only broadens job opportunities and the tax base, but also helps to fill in gaps that are formed as some businesses decline for various reasons. Periodic "churn" of business should be anticipated and new business growth helps address this situation, particularly in the current economic situation.

Recommendation	Responsibility	Timing
3.1. Expand local use of locally grown agricultural products	• VA Cooperative Extension • Shenandoah Resource Conservation and Development Council • Greater Augusta Chamber	Ongoing
3.2. Recruit new targeted businesses to the area through expanded marketing efforts	Greater Augusta Economic Partnership with support from the Shenandoah Valley Partnership	Mid-Term
3.3. Establish **Technology Zone** to provide additional incentives to attract incremental businesses to the area	• Augusta County with support from state-level programs	Mid-Term
3.4. Stimulate entrepreneurial activities and the start-up of new businesses	• Greater Augusta Economic Partnership • SBDC • SCORE, etc.	Mid-Term
3.5. Encourage development of agri-tourism and supplemental business activity on existing farms	• Augusta County • Augusta County Agriculture Industry Board	Mid-Term
3.6. Expand tourism activities • Package hospitality/attractions • Develop additional outdoor venues and signage/maps • Establish Grandma Moses Museum and the Center for the Visual Arts in Verona • Sponsor farm technology exhibit at the Frontier Culture Museum	• Greater Augusta Regional Tourism Board • Greater Augusta Chamber • Frontier Culture Museum of VA • Augusta County • Other interested stakeholders	Mid-Term to Long-term

Recommendations/Action Items for Each Goal (cont'd)

Goal 2: Support Existing Businesses

Discussion: On of the most important aspects of economic development is supporting the growth of existing businesses in Augusta County. Critical to this effort is anticipating the need for resources – whether for additional labor, capacity of utilities, a building expansion or new site, etc. – and being able to respond at a pace that meets the requirements of individual companies. Companies also need to be aware of the resources that are available to them at the local and state level. The recommendations noted below represent components of a system to detect and address company resource needs.

Recommendation	Responsibility	Timing
2.1. Expedite development review and permitting process for expansion projects	Augusta County	Ongoing
2.2. Assist businesses with site and infrastructure needs by issuing bonds for selected activities	Augusta County IDA	Ongoing
2.3. Identify opportunities for farmers to grow/diversify their businesses (Set specific targets and action plans)	• VA Cooperative Extension • Shenandoah Resource Conservation and Development Council • Augusta County Agriculture Industry Board • Small business assistance providers	Ongoing
2.4. Establish formal business visitation and survey program to identify and anticipate needs of existing businesses	Joint effort of Chamber and the Greater Augusta Economic Partnership	Short-term
2.5. Promote awareness of current workforce training resources, incentives and other available resources via web site and e-mail	Greater Augusta Economic Partnership	Short-term
2.6. Provide resource package to small emerging businesses • Financial assistance options • Business/marketing plans • Operations advice • Location of low-cost space	Greater Augusta Economic Partnership with support from SBDC, SCORE, local banks, BRCC, etc.	Mid-Term
2.7 Establish **Technology Zone** in the County to offer incentives for job growth and investments to businesses within target industries	Augusta County	Mid-Term

Technology Zone (Background Information)

- Established by ordinance
- Can grant tax incentives for up to 10 years that my include:
  - Reduction of permit fees
  - Reduction of user fees
  - Reduction of any type of gross receipts tax
- Can also provide regulatory flexibility related to:
  - Special zoning for the designated area
  - Permit process reform (enhance time for processing)
  - Exemption from certain ordinances
- Opportunity to establish an Enterprise Zone that has incentives for:
  - Providing jobs at or above certain wage levels
  - Making certain levels of investment in facilities

Recommendations/Action Items for Each Goal (cont'd)

Goal 5: Enhance Physical Infrastructure and Site Readiness

Discussion: A critical aspect of both business attraction and retention is to have the utilities, infrastructure and sites/buildings at the level of readiness needed by the local of prospective company. Readiness is critical for companies to assure speed-to-market and overall competitiveness .

Recommendation	Responsibility	Timing
5.1. Update County zoning regulations to support business friendly development in accordance with Comprehensive Plan	Augusta County	Short-Term
5.2. Invest in sites and buildings to increase the County's readiness for business expansion/attraction • Construct spec-built flex building in Mill Place Commerce Park • Secure options on 2-3 sites in Stuarts Draft area • Acquire some sites in Stuarts Draft area and assure utilities and road access within 3-6 months of a signed contract	Augusta County	Short- to Mid-Term Mid-Term Mid-Term
5.3. Monitor the quality, cost and coverage of broadband service in the County (incorporate in annual business survey)	• Greater Augusta Economic Partnership • Area telecom service providers	Mid-Term
5.4. Upgrade wastewater treatment system • Develop plans and set aside funds for Weyers Cave area • Develop plans and set aside funds for pretreatment system for Stuarts Draft area in response to specific opportunity	• Augusta County • Augusta County Service Authority	Mid- to Long-Term
5.5. Upgrade Mount Vernon Road in Stuarts Draft area by expanding to four-lane from Wayne Ave. to Route 340	VDOT	Long-Term

Attachment: "J": 50 Largest Employers in Augusta County, VA[26]

50 Largest Employers in Augusta County
2nd Qtr. 2015

Rank	Employer	NAICS Code	Ownership *	Size Code **
1	Augusta County School Board	611	30	09
2	Augusta Medical Center	622	50	09
3	McKee Foods Corporation	311	50	08
4	Hershey Chocolate of Virginia	311	50	08
5	Target Corp	452	50	08
6	Hollister, Inc.	339	50	08
7	AAF McQuay, Inc.	333	50	08
8	Blue Ridge Community College	611	20	07
9	J.B. Hunt Transport	484	50	07
10	County of Augusta	922	30	07
11	Woodrow Wilson Rehabilitation Center	624	20	07
12	NIBCO of Virginia	332	50	07
13	Variform Inc	326	50	07
14	Augusta Correctional Center	922	20	07
15	Valley Community Services	624	30	07
16	U.P.S.	492	50	07
17	Area Wide Protective, Inc.	519	50	06
18	Augusta Medical Group	621	50	06
19	McKee Foods Transportation	484	50	06
20	Food Lion	445	50	06
21	Innovative Refrig Systems Inc	238	50	06
22	Pactiv Corporation	326	50	06
23	McDonald's	722	50	06
24	Best Buy Warehousing Logi Inc	493	50	06
25	Houff Transfer, Inc.	484	50	06
26	Carded Graphics LLC	322	50	06
27	Middle River Regional Jai	922	30	06
28	Staunton - Augusta Department of Social Services	624	30	06
29	Wilson Trucking Corporation	484	50	06
30	Shenandoah Landscape Services Inc	561	50	06
31	Blue Ridge Lumber Company	321	50	06
32	Cerro Fabricated Products Inc	332	50	06
33	Schick Manufacturing Inc	332	50	06
34	Cracker Barrel Old Country Store	722	50	06
35	Augusta County Service Authority	221	30	06
36	Packaging Services Inc.	322	50	06
37	Autumn Corporation	623	50	06
38	Neuman Aluminium Impact	331	50	05
39	Adams & Garth Staffing	561	50	05
40	C. Obaugh Pontiac Buick GMC	441	50	05
41	UVA Health Services Foundation	621	50	05
42	Rexnord Industries	333	50	05
43	Valley Vocational Technical Center	611	50	05
44	Virginia Eagle Dis Co LLC	424	50	05
45	Augusta Nursing & Rehab Center	623	50	05
46	Valley Crane & Rigging	238	50	05
47	Neuman USA	331	50	05
48	Waynesboro Nurseries, Inc.	424	50	05
49	Coca Cola	424	50	05
50	Postal Service	491	10	05

Ownership Code *	Ownership Type
10	Federal Government
20	State Government
30	Local Government
50	Private

Size Code **	Number of Employees
09	1000 and over employees
08	500 to 999 employees
07	250 to 499 employees
06	100 to 249 employees
05	50 to 99 employees
04	20 to 49 employees
03	10 to 19 employees
02	5 to 9 employees
01	0 to 4 employees

Source: Virginia Employment Commission,
Quarterly Census of Employment and Wages (QCEW)

[26] http://augustavabusiness.com/news_media/publications

Attachment "K": Augusta County, VA 2016 Broadband Assessment Survey

Internet Survey for Augusta County, VA - 2016

Reliable high-speed internet access is important to keep pace with the world. Connectivity is essential for businesses, education, healthcare, emergency services, and the daily activities of residents. Augusta County was fortunate to receive a Virginia Telecommunication Planning Initiative (VATPI) Grant to develop a plan that will lay the groundwork to improve and expand internet service in the area. Please help County officials obtain clarity in the need for affordable high-speed internet throughout the County. **Your response to this survey is critical.**

We encourage you to take this survey online at **www.augusta.va.us**, OR you may return your completed paper survey by mail or at one of several drop-off locations. Mailing and drop-off information is shown on the back of this form. Any questions about the survey may be directed to the County Administration Office at 540-245-5610. Please submit your survey no later than **May 31, 2016**. All individual responses are confidential. Thank you for your input!

LOCATION & INTERNET SERVICE:

1. What is the street address for this location? (Use physical address-no PO Boxes)
   A. Street address_____
   B. City_____, VA C. Zip code_____

2. Please check the most appropriate category for this location:
   ☐ Residence ☐ Residence with home-based business
   ☐ Business ☐ Community Organization/Non-profit
   ☐ Government/Public Facility (including public safety facilities)
   ☐ Telework

3. Do you have Internet access at this location?
   ☐ YES ☐ NO ☐ I don't know

4. Name of company providing your Internet connection?
   _____ ☐ I don't know ☐ No Internet

5. Which of the following best describes the type of Internet service you subscribe to at this location? (*See reverse side for definitions)
   ☐Dial-up phone line
   ☐DSL (higher speed across telephone line)
   ☐Cellular service or mobile card
   ☐Cable Modem (co-axial or fiber)
   ☐Satellite or Microwave (dish)
   ☐Wireless (from service provider, not home network)
   ☐Fiber Optics
   ☐ISDN (Business)
   ☐T-1/DS3 Line (Business)
   ☐I don't know
   ☐No Internet service

6. To the best of your knowledge, how much are you currently paying per month just for Internet access (unbundled)?
   ☐ No Internet access ☐ Under $30 ☐ $30-$50 ☐ $51-$70
   ☐ $71-$100 ☐ $101-$300 ☐ $301-$500 ☐$501-$1,000
   ☐ $1,001-$1,500 ☐ Over $1,500 ☐ I don't know

7. Thinking about your current communication expenses, how much would you be willing to pay per month for a combination package of high speed Internet, telephone and pay TV services?
   ☐ $100 or less ☐ $101-$125 ☐ $126-$150 ☐ $151-$175
   ☐ $176-$200 ☐ $201-$299 ☐ $300 or more ☐ Not Interested

8. If affordable wireless high-speed Internet access was available in your community, how likely would you be to subscribe to this service?
   ☐ Very likely ☐ Somewhat likely ☐ Not likely

9. How important is Internet access to you/your household or business?
   ☐ No opinion ☐ Not important ☐ Somewhat important
   ☐ Very important or critical

10. How many computers, tablets, iPads, wireless phones, and/or other devices utilize an Internet service at this location? _____

11. In the past 6 months, which of the following activities have you performed online and/or conducted at this location? (*Check all that apply*)
    ☐ Searched for travel related info
    ☐ Searched health or medical info
    ☐ Purchased products or services
    ☐ Sold products or services
    ☐ Visited a News website
    ☐ Researched a major purchase
    ☐ Communicated with a teacher
    ☐ Searched for a job
    ☐ Took an online course
    ☐ Visited government website
    ☐ Searched info related to school
    ☐ Performed bank transaction
    ☐ Download/watched video online
    ☐ Completed school assignments
    ☐ Used E-mail
    ☐ Followed social media (Facebook, Twitter, etc.)

12. Please rate your current speed of connection (bandwidth):
    ☐ Very satisfied ☐ Somewhat satisfied
    ☐ Somewhat dissatisfied ☐ Very dissatisfied

13. Please rate the customer service and support from your provider:
    ☐ Very satisfied ☐ Somewhat satisfied
    ☐ Somewhat dissatisfied ☐ Very dissatisfied

14. How would you describe your overall satisfaction with your current Internet service?
    ☐ Very satisfied ☐ Somewhat satisfied
    ☐ Somewhat dissatisfied ☐ Very dissatisfied

15. Reason for dissatisfaction?
    ☐ Price too high ☐ Unreliable ☐ Lack of technical support ☐ Problem w/E-mail
    ☐ Poor customer support ☐ Slow connection/Not enough bandwidth (speed)

16. If you do not subscribe to a high-speed Internet service (faster than dial-up over the telephone line), why not?
    ☐ Not available in my area ☐ Too expensive ☐ Not reliable/secure
    ☐ Using Internet elsewhere ☐ Lack of Internet service set-up support
    ☐ Lack of computer set-up and use support ☐ Not interested in this service

17. Please share any other comments about your Internet service:
    _____
    _____

CELLULAR PHONE SERVICE:

18. Do you have cellular phone service? ☐YES ☐NO ☐I don't know

19. Name of the company providing your cellular service?
    _____ ☐ I don't know ☐ No cellular service

20. Do you have reliable cellular coverage when using it at this location?
    ☐YES ☐NO ☐I don't know

DEMOGRAPHIC INFORMATION: If you checked "Residence" or "Residence with home-based business" for #2, please complete the following questions of the survey. *Please note that demographic information is confidential and will only be used to assist in qualifying the County for future grants related to broadband implementation.*

21. What is your age? (the person actually filling out the survey) _____

22. What is the number of people living in this household? _____

23. How many children (under 18) live in this household? _____

24. How many persons 62 years or older live in this household? _____

25. Are there any disabled persons residing at this household?
    ☐ YES ☐ NO If YES, how many? _____

26. Does anyone in your household use the Internet to complete school assignments or job training course work?
    ☐ YES (K-12) ☐ YES (2 or 4 year college) ☐ YES (trade school) ☐ NO

27. ANNUAL HOUSEHOLD INCOME: Household income is defined as income of all adult (18 and older) household members received from all sources such as wages, salaries, interest income, investment income, social security, public assistance, or other sources. (*Check only one*)
    ☐ $32,150 or less ☐ $32,151 - $36,750 ☐ $36,751- $41,350
    ☐ $41,351 - $45,900 ☐ $45,901 - $49,600 ☐ $49,601 - $53,250
    ☐ $53,251 - $56,950 ☐ $56,951 - $60,600 ☐ More than $60,600

Continue if you selected Residence with a home-based business in Question #2.

ADDITIONAL BUSINESS QUESTIONS: If you checked any category other than "Residence" for #2, please complete the following questions and YOU'RE DONE!

28. Please check the type of business conducted at this location (*Check one*):
    ☐ Accounting ☐ Architecture/Engineering
    ☐ Agriculture/Forestry/Mining ☐ Business and Personal Finance
    ☐ Communication/Technology ☐ Contractor/Construction
    ☐ Finance/Insurance/Real Estate ☐ Education
    ☐ Healthcare ☐ Government
    ☐ Retail Trade ☐ Wholesale Trade
    ☐ Non-classified ☐ Other _____

29. How many employees work at this location? _____

30. Do you utilize a VPN (Virtual Private Network) for employees to work from home? ☐ YES ☐ NO ☐ I don't know

31. How difficult is it to find employees with computer, software, and Internet skills from the local area?
    ☐ Very difficult ☐ Somewhat difficult ☐ Not difficult

32. How difficult is it to find and provide the appropriate training for employees in computer, software, and Internet applications?
    ☐ Very difficult ☐ Somewhat difficult ☐ Not difficult

DO YOU HAVE ADEQUATE, AFFORDABLE INTERNET SERVICE? TELL US ABOUT IT!!!

TYPES OF INTERNET SERVICE: For Question #5 of the survey

- Dial-up phone line - A slower 'landline' connection often provided by a telephone company. This type of connection produces a 'dial-tone' and 'connect-tone' when connecting the modem.
- DSL phone line - Digital Subscriber Line, a higher speed landline connection often provided by a telephone company. This type of modem connection is 'always on.'
- Cellular service or mobile card - A higher speed connection provided by your cell phone service, may be provided as a data package added to your existing cell phone service.
- Fixed wireless - Higher speed through an external receiver on your premises or an antenna connected to your computer.
- Satellite - Higher speed connection from a satellite dish.
- Cable Modem - Higher speed connection often provided by a cable TV company, may be bundled with television and phone services.
- Fiber - High speed fiber-optic connection. This is a dedicated circuit, typically used in businesses.

ONLINE SURVEY OPTION: We encourage you to take this survey online. To do so, you may find it at the following web address.

www.co.augusta.va.us

DROP-OFF LOCATIONS/RETURN BY MAIL: For your convenience, the following locations have volunteered to be pick-up and drop-off locations for surveys. Please be sure to seal your survey prior to drop-off or mailing. To return your survey by mail, please seal it with tape (no staples), attach a stamp, and drop it in any mailbox.

Return by Mail	Drop-off Locations
Augusta County County Administration Office PO Box 590 Verona, VA 24482	Government Center, County Administrator's Office Fishersville Library Churchville Library Deerfield Book Station Middlebrook Book Station Craigsville Book Station

PLACE STAMP HERE

Please mail your completed survey to:

AUGUSTA COUNTY
COUNTY ADMINISTRATION OFFICE
PO BOX 590
VERONA, VA 24482

Attachment "L": Augusta County, VA Potential Wireless Solutions Supporting Information

Potential Solution Region	Site	Coordinates	#	Housing Units	Poor Cell Service?	Access Rd - Existing or Proposed	Access Road Length	Grade Change	Connecting Road	Proximity to Fiber	Nearby Tower	Nearby Water Tank	Public or Private?	Notes
Between Mt. Solon, Churchville, and Spring Hill including Parnassus and Centerville	Priority Potential Tower Site 1	38.351368, -79.148271	1	68	half	proposed	98	26%	good condition residential driveway	no	3 miles	no		
	Priority Potential Tower Site 2	38.320555, -79.091804	2	250	yes	existing gravel/dirt ~13ft wide	1300	8%		no	2 miles	no		
	Priority Potential Tower Site 3	38.306349, -79.117377	3	174	yes	proposed	>1000	1.50%		no	2 miles	no		
	Priority Potential Tower Site 4	38.292914, -79.115864	4	302	yes	proposed	150	22%		no	2 miles	no		
	Priority Potential Tower Site 5	38.338335, -79.002313	5	175	yes	proposed	530	7%		no	>3 miles	no		
	Priority Potential Tower Site 6	38.257357, -79.048034	6	392	yes	proposed	340	5%	10' church parking lot	no	4 miles	5 miles		
	Priority Potential Tower Site 7	38.280242, -79.014812	7	326	yes	proposed	733	7.50%	10' gravel residential driveway to be enhanced	no	3 miles	3 miles		
	Fire & Rescue Stations 1	38.361247, -79.090612	8	525	yes	existing gravel parking lot (23+ ft. wide)	110	2%	gravel parking lot	no	3 miles	no	church & baseball fields	
	Fire & Rescue Stations 2	38.226242, -79.163836	9	537	yes	proposed	25	4%	12' gravel driveway	yes	1 mi, 2 mi, 3 mi	< .25 mi	private - small gazebo	
	Fire & Rescue Stations 3	38.167, -79.051897	10	HIGH - Staunton discolored	two-thirds	existing paved parking lot	n/a		good condition	1.5 mi	2.5, 2.5, 2.5	2.5, 2.5	Staunton-Augusta rescue squad parking lot	
	Fire & Rescue Stations 4	38.159596, -79.097304	11	HIGH - Staunton discolored	mostly	proposed	65	14%	26' paved driveway	1 mile	1 mile	3 mi, 3 mi	Staunton fire and rescue	

	Water Tank 1 (Verona)	38.200594, -79.032441	12	HIGH - Staunton discolored	yes	existing 12' gravel	114	15%	varying width gravel road (would need to be enhanced)	1 mile	1 mile	yes	water tower	stats based on water tower location
	Water Tank 2 (Mt Sidney)	38.261303, -78.966116	13	582	mostly	existing - can't determine condition	100	18%	good condition Seawright Springs Rd	< 0.25 mile	.5 mi, 2 mi	yes	public	at residence next to water tower? But stats based on water tower location
	Water Tank 3? (Mill Place)	38.185586, -79.013176	14	HIGH - Staunton discolored	two-thirds	existing 12' gravel	1000	0.50%	good condition Mill Pl Pkwy wide, paved	0.75 mi	0.75 mi, 2 mi	yes?	private - shamrock farms	
	School Site	38.316306, -79.073232	15			proposed	250	11%	good condition Scenic Hwy				private - farm	about .25 mi east of elementary school. Stats based off coordinates
West Augusta & South Towards Deerfield	Priority Potential Tower Site	38.364783, -79.207661	16	38	half									
	Priority Potential Tower Site	38.364444, -79.163586	17	524	mostly	existing - can't determine condition	40	22%	can't determine condition Stokesville Rd	no	2.5 mi	no	near Girl Scout Council	
Between Swoope and Churchville	Water Tank	38.201342, -79.219002	18	495	yes	existing gravel - would need to be enhanced	550	12%	good condition Buffalo Gap Hwy	550 ft.	1.5, 2mi	1.75 mi	water tower	stats based on water tower location
	School Site	38.196458, -79.21629	19	495	yes	proposed	80	0.25%	9' gravel road would need to be enhanced	1,000 ft.	1.5, 2mi	1.75 mi	private farm(?) next to Buffalo Gap HS	
		0, 0												

Spottswood & Steeles Tavern	Priority Potential Tower Site	37.92631, -79.197352	20	280 - half of range supports Rockbridge Co	mostly	proposed	1000	0.50%	good condition - Lee Jackson Hwy	1200	no	no	private farm	
		0, 0												
Mount Torrey Rd (South Point of County)	Priority Potential Tower Site	37.942143, -78.964253	21	285	partially; densely populated area not in poor service	existing - can't determine condition								
	Water Tank	37.962187, -78.96193	22	354	half; densely populated area not in poor service	existing Coal Rd - can't determine condition	70	10%	good condition Mt Torrey Rd				private	do not see water tank
Between Stuarts Draft and Fishersville	Fire & Rescue Stations 1	38.095878, -78.987201	23	1223	partially	existing paved parking lot			good condition - Medican Center Cir	< .5 mi	1 mi, 1.5 mi, 1.5 mi	1 mi, 1.5 mi	private - Augusta Medical Center	
	Fire & Rescue Stations 2	38.094087, -78.959824	24	926	partially	existing paved parking lot			good condition - Jefferson Hwy	180 ft.	< .5mi, 2 mi, 2.5 mi	.5 mi, 1 mi	public - Preston L Yancey Fire	
	Water Tank 1	38.082172, -78.960562	25	1150	partially	existing 10' gravel - would need to be enhanced	2000	2%	good condition - Goose Creek Rd	1 mile	1 mi, 1.5 mi	yes	public - water tower	stats based on water tower location
	Water Tank 2	38.076101, -78.955564	26	1200	partially	existing 15' paved driveway			good condition Hickory Hill Ln	1 mile	1.25 mi, 2.5 mi	yes	private residence?	stats based on water tower location
	School Site	38.046143, -79.012192	27	1105	partially	existing good condition parking lot			good condition	4 miles	1 mi, 1 mi	no	public - Stuarts Draft HS	
New Hope and Crimora	Priority Potential Tower Site	38.172122, -78.846456	28	723	Mostly	proposed	300	16.50%	10' gravel driveway to be enhanced	4 miles but only 500 ft. from	1 mi	3 mi, 3.5 mi	private residence	

									potential fiber					
	Fire & Rescue Stations	38.099093, -78.860992	29	858	half	existing gravel parking lot			good condition - Sandy Ridge Rd	2.5 miles but only 110 ft. from potential fiber	1.5 mi	3mi	public - Dooms Volunteer Fire Co	
	Water Tank 1	38.213496, -78.818436	30	502	yes	existing 10' gravel - would need to be enhanced	1000	1.70%	good condition - Harriston Rd	1 mile to potential line	2 mi, 2.5 mi	yes	public - water tower	stats based on water tower location
	Water Tank 2	38.130695, -78.828345	31	640	yes	proposed	27	7%	28' wide paved	1 mile to potential line	2 mi, 2.5 mi	yes	water tower	satellite? Stats based on satellite
	School Site	38.133437, -78.866866	32	515	half									
West Augusta	Priority Potential Tower Site	38.270718, -79.308283	33	90	yes	existing 10' dirt road - would need to be enhanced	375	10%	Vicinity of Deerfield Valley Rd. and Rt. 250	YES	NO	NO	private farm	
Other Between Middlebrook and Swoope	Priority Potential Tower Site	38.106119, -79.145572	34	546	yes	N/A - church paved parking lot			good condition - Middlebrook Rd	4 mi	NO	3 mi	private - church	

Acknowledgements

While every effort has been made to accurately document the origin and sources of information received and used within this report, multiple parties provided a vast array of resources and it is possible footnotes, end-notes, other references or acknowledgement were missed and/or an interested party may need to go to the original document to see the complete list of participants and resources in the preparation of the information. If an omission or error is noted, Consulting Gateway Corporation (CGC) sincerely apologizes and the party discovering such unintended omission or error should contact CGC and corrections will be made and the report resubmitted to the county for distribution. Every reasonable effort has been made to assure the accuracy of information contained within this report through the use of standardized, reliable data sources, including the communities and service providers. However, CGC provides this information 'as is' and therefore assumes no liability arising from the use of this report or data.

Contributing Participants and/or Information Resources

- Members of the Augusta County, VA Broadband Study Project Management Team
- Central Shenandoah Planning District Commission, Staunton, VA
- Staff, elected officials and citizens of Augusta, VA
- Emergency Response Center and Personnel for Augusta, VA
- Augusta County Comprehensive Plan
- Commonwealth of Virginia Housing and Community Development
- Consulting Gateway Corporation, Fleetwood, PA
- Dewberry Engineers, Inc. Glen Allen, VA
- MLMapping Wyomissing, PA
- New Hope Telephone Cooperative, New Hope, VA
- Lumos Networks Waynesboro, VA
- MGW Telephone Williamsville, VA
- Lingo Networks, Staunton, VA
- ValleyNet (Partnership of Century Link, Lumos Network and Shentel) Waynesboro, VA
- Verizon, New York, NY
- Service Corps of Retired Executives, Virginia www.score.org
- Virginia Employment Commission www.vec.virginia.gov
- Virginia Small Business Development Center (VASBDC) www.virginiasbdc.org
- http://www.cspdc.org
- http://quickfacts.census.gov