Application to DHCD Submitted through CAMS

County of Franklin

Franklin County Broadband Authority

Application ID:	64508232019084323
Application Status:	In Progress - DHCD
Program Name:	Virginia Telecommunications Initiative 2020
Organization Name:	County of Franklin
Organization Address:	1255 Franklin Street, Suite 103 Rocky Mount, VA 24151
Profile Manager Name:	Lisa Cooper
Profile Manager Phone:	(540) 483-3027
Profile Manager Email:	lisa.cooper@franklincountyva.gov

Project Name:	Franklin County Broadband Authority
Project Contact Name:	Steven Sandy
Project Contact Phone:	(540) 483-3027
Project Contact Email:	steve.sandy@franklincoutyva.gov
Project Location:	1255 Franklin Street Rocky Mount, VA 24151-1289
Project Service Area:	Franklin County, Henry County, Patrick County, Boones Mill Town, Rocky Mount Town

Total Requested Amount: $2,383,039.00

Required Annual Audit Status: Accepted

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Budget Information:

Cost/Activity Category	DHCD Request	Other Funding	Total
Telecommunications	**$2,383,039.00**	**$2,216,038.00**	**$4,599,077.00**
Construction	$1,945,283.00	$1,258,288.00	$3,203,571.00
Construction Related Soft Costs	$218,752.00	$957,750.00	$1,176,502.00
Contingencies	$219,004.00	$0.00	$219,004.00
Total:	**$2,383,039.00**	**$2,216,038.00**	**$4,599,077.00**

Budget Narrative:

Questions and Responses:

1. Project Area

   Explain why and how the project area(s) was selected. Describe theproposed geographic area including specific boundaries of the project area (e.g. street names, local and regional boundaries, etc.). Attach a copy of the map of your project area(s). Label map: Attachment 1 –Project Area Map.

Answer:

In the foothills of the Blue Ridge mountains, lies rural Franklin County with a population of more than 56,000. The County consists of 712 square miles, from gently rolling hills to mountainous terrain all lying between two lakes. According to the Center for Innovative Technology's 2017 needs assessment, more than 20% of the County is unserved by broadband access. In 2018, the County recognized the need for better broadband access and created a broadband authority to help manage development of broadband. Completed in 2019, the consulting firm Design Nine assisted the County with development of a broadband plan to improve broadband coverage and Internet access countywide. In developing the plan, several focus areas were confirmed from the CIT work and identified as unserved. This plan offers a hybrid solution to solve the broadband issue, calling for fixed wireless deployment in phases on existing structures where possible and building new structures where needed to reach the more remote communities of the County. The Plan also outlines a phased approach to install fiber to the homes in the County's designated growth areas and villages, where higher residential density and more commercial activity is envisioned and makes deployment more practical and cost effective to serve with fiber.
The project areas were identified by both Franklin County and the Center for Innovative Technology as areas that meet the eligibility criteria and locations where BRISCNET, Blue Ridge Towers, Shentel and the County received inquiries from citizens regarding broadband availability. See Attachment 1 for project area maps and insets which provide more details on individual areas which are expected to receive coverage from this new service. Additional detailed maps of the project areas are attached, showing the complete unserved target areas, along with road names, the locations of the proposed towers and the coverage they will provide in Franklin County. In addition,

some fixed wireless service areas will be able to provide coverage into portions of Henry and Patrick counties for this project phase.

Through the RFP process, Franklin County has established a relationship with Blue Ridge Towers and BRISCNET to develop a fixed wireless system that can meet the County's objectives. This VATI application represents a collaborative effort to satisfy Phase 1 of the County's Broadband Plan and provide broadband to some of the communities most in need. These areas include Burnt Chimney, Scruggs, and Westlake in the northeast; Glade Hill, Snow Creek, Sontag, and Tom's Knob in the southeast; Callaway and Summit View Business Park in the northwest; and Fork Mountain and Henry in the southwestern portion of the County. Funding for the fixed wireless system in Phase 1 will allow for service to more than 21,500 homes, businesses, and other critical sites in Franklin County.

Shentel has also prepared a solution to provide new fiber connections to the homes in areas designated in the County's Broadband Plan. Shentel proposes to add 6.5 miles of new fiber in the Union Hall Village area to serve an estimated 190 properties, homes and businesses along Old Salem School Road in the Penhook community, which is part of the County's Village Plan for this area. This fiber provides up to 1 Gbps service to residences and businesses in this growth area.

2.

Describe your outreach efforts to identify existing providers in the selected project area. Provide a detailed explanation of how this information was compiled and the source(s). Provide a map and list of all existing providers (fixed and wireless) and speeds offered within the project area. Label Map: Attachment 2 – Existing Provider Map; label documentation: Attachment 3 – Documentation on CAF Funding Area.

Answer:

In May 2017, a study was conducted by the Center for Innovative Technology (CIT) in conjunction with Franklin County to analyze the current broadband coverage, demand, local assets, local policies and fees, and needs along with future capacity. A community survey was also done to assist in these efforts. In July 2017, the Broadband Needs Assessment Study was presented by CIT. In 2019, the County received a planning grant from VA DHCD to complete this needs assessment and also provide the County with a plan for meeting the identified needs and gaps in coverage within Franklin County. The County hired Design Nine consulting firm to complete this work. The number and types of service providers within the County are detailed in the attached document identified as, Attachment 2 - Existing Provider Map with supporting documentation, and found in Chapter 5 of the Design Nine Broadband Assessment and Plan dated August 2019 (complete copy of the report also attached). To summarize, the report identifies ten (10) service providers currently in the County based on zip code information.

Century Link

Citizens Telephone*

Consolidated Communications

Verizon

Shentel

Xfinity*

Cox Communications*

B2X Online

HughesNet

ViaSat/Exede

However, providers such as Cox Communications, Xfinity and Citizens are only referenced because the zip code includes portions of Franklin County. Cox provides service to Roanoke County residents; Xfinity serves Bedford and Henry and Citizens provides service within Floyd County. As the report outlines, much of the data available by providers, zip code, census tract, etc. is very optimistic. Through the CIT research, county survey of citizens we have found that many areas that claim to have service are very lacking in reliable service of 10 Mbps or greater. In addition, many citizens have expressed concerns and frustration with this lack of service and support from Century Link and B2X Online in particular. There are small pockets of the rural areas that have access to minimal fixed wireless service available through B2X and some satellite service available. Much of the County's project area is unserved, lacking sufficient coverage.

The County has also established a broadband authority to identify community needs and help establish a broadband deployment plan and associated funding streams. The broadband authority has conducted multiple public meetings, executed a Teaming Agreement with Roanoke Valley Broadband Authority, and had discussions with Mid-Atlantic Broadband, Shentel, Blue Ridge Towers and B2X about broadband service in the County. In addition, the Franklin County Broadband Authority has adopted a broadband plan prepared by Design Nine, Inc. which identifies a phased hybrid approach to broadband deployment in Franklin County. The plan was developed over six months in which public meetings were held and input from the community was received through community meetings and meetings with Chamber of Commerce.

The County Broadband Authority initiated a request for proposals (RFP) process to solicit broadband solutions from existing providers and potential new providers. Three providers responded to this RFP and were interviewed for additional information on their proposals. The three providers who responded to the formal RFP were BRISCNET, B2X Online and Point Broadband. The County Broadband Authority voted to move forward with BRISCNET for a fixed wireless solution to implement phase 1 of the hybrid broadband approach presented by Design Nine in their Plan which was adopted by the broadband authority.

Additionally, in preparation of this opportunity to provide fixed wireless service in the region, Blue Ridge Towers/BRISCNET conducted a marketing campaign and customer outreach survey via a television marketing program through the local NBC affiliate (WSLS –Channel 10). To reach as many citizens as possible, BRISCNET launched this TV campaign during the February 2018 Super Bowl game, and a continued heavy rotation campaign for an additional 2 months. Nearly 4,100 responses and requests for service were received, with about 1,200 of those requests from Franklin County residents. BRISCNET continues to receive calls daily requesting services at a

rate of nearly 30 calls per week, half of which come from Franklin County residents. BRISCNET maintains a log of potential customers with addresses and contact information.

3. Project Need/Description

To be eligible for VATI, applicants must demonstrate that the proposed project area(s) is unserved. An unserved area is defined as an area with speeds of 10 Mbps / 1 Mbps or less and with less than 10 percent service overlap within the project area. Describe any anticipated service overlap with current providers within the project area. Provide specific information as to how you determined the percentage overlap. Label Attachment: Attachment 4 – Documentation Unserved Area VATI Criteria.

Answer:

The project areas are shown on the National Broadband Map as unserved (See Attachment 4). In addition, the CIT assessment and associated surveys also validated that the selected areas are unserved. Funding for this project will help breakdown the digital divide in Franklin County, expanding broadband connectivity, improving digital inclusion, and supporting local priorities established by the County. Furthermore, this initiative will serve to facilitate 21 st century broadband access, capacity, and utilization in the proposed unserved areas, providing stronger connectivity for community anchors such as elementary schools and public safety facilities, and increasing opportunities for education, home businesses, and telemedicine for seniors and disabled citizens in remote communities.

Most of the proposed areas are unserved, with very limited coverage and unaffordable services. There is minimal fixed wireless service available and some satellite service, but most services are currently below, or at best, have the 10 mbps down bandwidth service level, as identified in the County's Broadband Plan, severely impacting economic development, educational/distance learning opportunities, and health care. Moreover, the existing services are inadequate for future needs. Affordability is another major consideration for services.

Due to proprietary information, detailed information on levels of service are not available. As stated in the recent Commonwealth Connect report, "The primary issue with FCC data is the lack of details related to coverage by providers." Referenced in the report is the fact that, "Federal maps compiled by the FCC suffer from an insufficient granularity as well as potentially misleading coverage areas." Further, "Existing maps, including some mandated by the federal government, are not reliable to access the extent of broadband coverage and gaps in the coverage." This also goes back to the method in which coverage is reported – if there is one customer in a Census block, the entire block is counted as being served. In some areas (rural and agricultural) like Franklin County, Census blocks are extremely large, so this can be very misleading and inaccurate. Additionally, there is no way to determine if people are actually using wireless connections within a particular service area, as highlighted in the Commonwealth Connect report.

Snow Creek area and a portion of Callaway area have access to fixed wireless from B2X Online. This overlap area is considered to be less than ten percent (10%) of the service area and has speeds less than 10 Mbps. However, in consideration of BRT's current tower construction project in neighboring Bedford County and funded in the previous VATI grant round, this project will serve to strengthen future services in the Westlake/Scruggs area of Franklin County. Since construction is still underway, there is no available data to project service overlap and there is no concrete reporting system for any current providers.

The Shentel fiber portion of this project will provide high speed internet to a growth area (Village) in the county

that currently only has Century Link DSL. Residents have complained of the lack of performance and customer support for their existing service for years. Many have tried satellite and cellular service but found it to be too slow and too expensive to meet their needs. They have requested that Shentel expand its coverage to this area. This fiber to the home meets an objective of the Franklin County Broadband Plan in the designated growth areas of the County (Villages). This area adjacent to Smith Mountain Lake is poised for both residential and commercial growth.

4. Provide the number of residential serviceable units in the project area(s). Describe the eligible premises that will be served by the proposed project and the basis for these projections.

Answer:

Within the unserved target areas, there are more than 22,500 potential customers – both residential and non-residential. All are eligible users, but there is the potential for additional subscribers. These projections are based on the number of addressed units within the radius of each proposed fixed wireless service antennae. A radius of 4 miles was utilized for the large monopoles and two and one-half (2.5) miles for the smaller community poles that are proposed. See Attachments 1 and 5 for project area maps. Based on the technology that will be employed by BRISCNET, the fixed wireless system will utilize two frequencies, 900 MHZ and 5800 MHZ that will enable the signals to penetrate leaf on conditions and rough terrain areas. Future phases of the fixed wireless buildout identified in the County's Broadband Plan call for additional community poles to be installed to help reach customers in hard to serve rural areas.

There are a number of additional households (approx. 600) outside of the proposed project area in Henry and Patrick counties, as depicted on the attached project area map, that could receive service depending on topography.

The Shentel fiber project will pass approximately 190 eligible premises with the 6.5-mile fiber extension. This new service will provide high speed internet (up to 1 Gbps) throughout the network. See Attachment 1 for project area maps.

5. Indicate the numbers of businesses and community anchor institutions the proposed project will pass in the project area. Also indicate the number of home-based businesses. Provide specific information.

Answer:

Based on the maps generated by Franklin County GIS Department, there are approximately 1000 non-residential addressed within the project area that could receive new fixed wireless service. As a result of the online survey conducted by CIT and Franklin County, there were also many reported businesses (self-employed) in the rural areas. This may be a sales person, hair dresser, realtor, or a number of other entrepreneurs who work from home in Franklin County. There are also a large number of short term rentals of properties at Smith Mountain Lake or nestled in the mountains due to the beautiful views and quiet lifestyle. While an exact number within the proposed service area is not available, twelve percent (12%) of County residents expressed an interest in working from home if there were more broadband accessibility and capacity. As previously stated, there are 1,123 working age adults who may have the opportunity to work from home if reliable Internet service is provided. Further, it should be noted that more than one-third (34%) of business owners in the County reported dissatisfaction with their current business Internet service.

There are several community anchors included in the project area. Almost all of the County's elementary schools (Boones Mill, Burnt Chimney, Dudley, Glade Hill, Callaway, Henry, Lee Waid, Rocky Mount, Snow Creek &

Sontag) will be included in the proposed project area to receive fixed wireless service. The school facilities are currently connected to educational fiber provided by Mid-Atlantic Broadband and/or Shentel. However, children living in areas around the schools have very limited access to perform online homework tasks at home.

The proposed fixed wireless services will provide reliable internet services to many businesses in the rural areas including convenience and general stores, agricultural operations, quarries/asphalt plants, churches, automobile repair facilities, campgrounds at both Smith Mountain Lake and Philpott Reservoir.

Another major benefit of the proposed fixed wireless system is increasing access to tele-medicine within the rural community who often times has difficulty with transportation to medical appointments. Both Tri-Area Community Health and Carilion have expressed a desire to provide more tele-medicine options to their patients to access healthcare, pharmacies and health information. This affordable option of fixed wireless will help meet a major need related to healthcare for many residents in Franklin County.

The proposed fiber extension by Shentel will serve at least four current businesses including Magnum Point Marina and Restaurant, Magnum Point Boat Repair and Camp Reel Simple.

6. Understanding that projected take rates are an estimate, provide the anticipated take rate for the proposed service within one year of project completion and describe the basis for the estimate. Also detail all actions (e.g. marketing activities, outreach plan) to be implemented to reach the identified potential serviceable units within the project area.

Answer:

BRISCNET has a 3 Phase plan to capture a 58% total take rate of the County's underserved citizens. According to Center for Innovative Technology's 2016 survey, there are currently 26,000 citizens in the Franklin County market that have been deemed underserved. This population is comprised of mostly rural single-family dwellings. Blue Ridge Towers in its design and planning phase, utilized a number of 2.5 tenants per single family dwelling yielding a total net of 10,000 homes without adequate internet/broadband access. Phase I, easily allows BRISCNET in the initial 12 month plan to attract a customer base of 2,500 to 3,000; bringing critically needed Broadband access to 25% of the total underserved population in the initial launch of BRISCNET in the Franklin County market. Phase II will allow BRISNET to add additional coverage, enhancing remote repeater sites that will reach gaps in coverage to those citizens not reached in the original launch of BRICNET. In our projections we will have become a proven and reliable resource for the underserved citizens of Franklin yielding an additional 1,500 customers/subscribers bringing our total take rate to 37% in year 2. Phase 3 of the BRISCNET 3 year plan allows us to continue a heavy marketing plan to add the final 1800 customers needed to reach our goal of a 47% total take rate.

In preparation for this opportunity Blue Ridge Towers/BRISCNET conducted a marketing campaign and customer outreach survey via a Television marketing program through the local NBC affiliate (WSLS – Channel 10). In an effort to reach as many citizens as possible BRISCNET launched this TV campaign during prime time viewing with 2 commercials during the 2018 Super Bowl game, and a continued heavy rotation campaign for an additional 2 months of coverage. We received nearly 4,100 responses and requests for service, with nearly 1,100 of those requests coming from Franklin County residences. We continue to receive calls daily requesting our services at a rate of nearly 30 calls per week, all coming from Franklin County residents. BRISCNET maintains a log of those potential customers, their addresses, and contact information.

BRISCNET, will maintain this Television marketing presence over the Southwest Virginia region, to include a focus on Franklin County. We will also promote heavily through radio, and conduct community outreach efforts in conjunction with the County utilizing local publications to reach all citizens of the County that need Broadband to reach our take rate of 47%.

7. For wireless projects only: Please explain the ownership of the proposed wireless infrastructure. Will the wireless co-applicant own or lease the radio mast, tower, or other raised structure onto which the wireless infrastructure will be installed?

Answer:

The project proposes the construction of six (6) new poles as part of this wireless infrastructure. Blue Ridge Towers Inc. will own the newly constructed monopoles in Summit View Business Park and Westlake. Franklin County will own new towers built at Snow Creek and Callaway Elementary School. In addition, the project proposes to rebuild two (2) existing public safety structures at Fork Mountain and Henry Fire Departments that are owned by the county as well as installing two (2) new eighty (80) foot tall relay poles at Glade Hill and Sontag Elementary Schools. Colocation of wireless equipment is also proposed on four (4) existing structures. These structures are identified as Grassy Hill, Tom's Knob, Scruggs public safety towers owned by Franklin County and the Burnt Chimney water tank owned by Western VA Water Authority (WVWA).

BRISCNET as the co-applicant will lease space from the County on County-owned towers with an initial 5-year lease to provide initial wireless internet service. BRISCNET will own, operate and maintain the fixed wireless and microwave backhaul equipment that will be installed on each tower. It is also anticipated that other cellular providers will lease space on these new towers giving residents options for high speed internet service and extended wireless cellular coverage.

Fiber to the towers will be provided by either Mid-Atlantic Broadband, Shentel, BRISCNET or Franklin County to ensure the system has strong and reliable signal strengths.

8. Provide the proposed download and upload speeds for the project area. Detail whether that speed is based on dedicated or shared bandwidth, and detail the technology that will be used. This description can be illustrated by a map or schematic diagram, as appropriate. Describe the Internet service offerings to be provided after completion of this project and your price structure for these services. The service offerings should include all relevant tiers.

Answer:

BRISCNET will provide broadband access through a fixed wireless system, utilizing a combination of unlicensed frequencies delivered by technology provided by Cambium Networks, (formerly Motorola) and using spectrum of both 900 MHZ and 5800 MHZ frequency to bring high speed Internet to the service area. The fixed wireless system works by placing access point antennas at the top rad center or mounting height of each tower and connecting to customers via a near line of sight system directly to the subscribers. The end user will receive service through a subscriber module unit to be mounted to the home, with final delivery of service provided via a wireless modem. Each tower (AP unit) can propagate a 3-4-mile coverage radius depending on topography. Each Access Point provides a 90-degree coverage radius and can handle 500 to 600 subscribers depending upon total subscriber usage per 90 degrees. BRISCNET will deploy 4 AP's per site/per tower to offer 360 degrees of coverage allowing coverage of up to 2,000 subscribers per tower without interruptions.

Attached is a coverage map illustrating projected coverage (See Attachments 1 and 5).

BRISCNET will offer the following entry level service plans to all users:

10x2 Mbps - $73 The 10 Mbps service delivers more bandwidth for households that stream video, audio, download music or play online games.

25x3 Mbps - $86 The 25 Mbps Internet service delivers even more bandwidth and data usage for households that spend a lot of time on the Internet and have multiple computers and mobile devices.

50x5 Mbps - $108 The 50 Mbps Internet service delivers significantly more bandwidth and data usage at low latency ping times for those who depend on the Internet for work or want the most speed they can get - even during peak Internet usage times.

75x10 Mbps - $145 The 75 Mbps service is for the business user who requires huge bandwidth and no data caps.

Shentel offers the following service plans for internet:

Shentel will provide a triple play (voice, video, and Internet) to the project grant areas. Internet will be provided though cable modems. Residential speeds will include the following: 50 Mpbs, 150 Mpbs, 300 Mbps, and 1 Gigabit.

Internet speeds (additional discounts are applied for ordering phone or TV):

1. 50 Mbps $65/Mo

2. 150 Mbps $80/Mo

3. 300 Mbps $110/Mo

4. 1 Gig Mbps $200/Mo

Through the MOU between the Franklin County Broadband Authority and Shentel, the fiber will be available to customers for more than three (3) years. Additional fiber will be made available for other uses by providing by one additional buffer tube (12 strands) of fiber with each project and a thirty (30) year IRU (Indefeasible Right to Use) agreement for its use.

The proposed project and construction will be incorporated into the existing hybrid fiber-coax (HFC) network owned and operated by Shentel and will be capable of providing residential and business customers with download speeds of up to 1 Gbps and upload speeds of up to 30 Mbps through the Docsis 3.0 platform. The network will also enable customers to access video, data and telephone services available through Shentel.

Shentel acquired Jetbroadband in 2010 and has maintained the hybrid fiber-coax (HFC) network in the Franklin County for nearly 10 years. Shentel has built and maintained HFC network in other parts of the state for over 25 years. Services are delivered over the network from one of several hubsites that Shentel owns and operates in Franklin County. Shentel trains and employs engineers and technicians to ensure we maintain a near 100% network reliability. The network and hubsite are monitored both locally and nationally 24 hours a day and 365 days a year.

Shentel will use the funds for last mile fiber construction for the Union Hall (Old Salem School) project. Shentel will cover customer premise equipment and install costs at the customer location. Shentel allocates $1800 towards every home and business passed that could be served with a coaxial or fiber drop.

9. Provide a description of the network system design used to deliver broadband service from the network's primary Internet point(s) of presence to end users, including the network components that already exist and the ones that would be added by the proposed project. Also describe specific advantages of using this technology. Provide a detailed explanation on how this information was compiled and source(s). For wireless projects, provide a propagation map including the proposed project. Label Map: Attachment 5 – Propagation Map Wireless Project

Answer:

BRISCNET will provide broadband access through a fixed wireless system, utilizing a combination of unlicensed frequencies delivered by technology provided by Cambium Networks, (formerly Motorola) and using spectrum of both 900 MHZ and 5800 MHZ frequency to bring high speed Internet to the service area. The fixed wireless system works by placing access point antennas at the top rad center or mounting height of each tower, and connecting to customers via a near line of sight system directly to the subscribers. The end user will receive service through a subscriber module unit to be mounted to the home, with final delivery of service provided via a wireless modem. Each tower (AP unit) can propagate a 3-4 mile coverage radius depending on topography. Each Access Point provides a 90 degree coverage radius and can handle 500 to 600 subscribers depending upon total subscriber usage per 90 degrees. BRISCNET will deploy 4 AP's per site on this tower to offer 360 degrees of coverage allowing coverage of up to 2,000 subscribers per wireless tower location without interruptions.

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Shentel will cover customer premise equipment and install costs at the customer location. Shentel allocates $1800 towards every home and business passed that could be served with a coaxial or fiber drop.

Attached is a coverage map illustrating projected coverage (See Attachments 1 and 5).

10. Project Readiness

What is the current state of project development (e.g. planning, preliminary engineering, identifying easements/permits, final design, etc.)? Prepare a detailed project timeline or construction schedule which identifies specific tasks, staff, contractor(s) responsible, collection of data, etc., and estimated start and completion dates. Provide any Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) (drafts are allowable), letters of support, etc. The timeline should include all activities being completed within 12 months of

contract execution with DHCD. Label Attachments: Attachment 6 – Timeline/Project Management Plan; Attachment 7 – Relationship between Applicant/Co-Applicant; Attachment 8 – Letters of Support;

i. If the partnership is formalized in a written agreement, provide a copy of that agreement.

ii. If the partnership has not been formalized, provide a short description of the project management role, financial commitment, or other contribution to the project for the applicant, co-applicant, and any additional partners.

iii. If applicant is not a locality(s) in which the project will occur, please provide a letter of support from that locality.

Answer:

Franklin County has been involved in the development of this application for well over a year. The County began in 2018 preparing for the development of a Broadband Plan for the County. The County received a DHCD planning grant in December 2018 to hire a consultant to assist the County in the Plan development. The Plan involved numerous public meetings of the Broadband Authority and meetings with stakeholders in the community. During the planning period, the County also issued a Request for Proposals (RFP) for private providers to offer solutions to the solve the broadband issues in Franklin County. As part of this process, BRISCNET analyzed the County and prepared a proposal to provide a county-wide fixed wireless solution. Significant planning has gone into their proposal. In addition, BRISCNET and Design Nine have reviewed, discussed and modified the proposal to be more consistent with the County's approved Plan. BRISCNET performed additional analysis and received quotes for constructing the network. Significant planning and analysis has been performed by BRISCNET and the County's consultant to make the project viable and ready for final engineering should the funding become available.

In addition, BRISCNET has secured locations for the Summit View, Westlake and Snow Creek new tower sites. In fact, construction of the the Summit View tower is underway. Due to the scale of the project of the fixed wireless project, an eighteen (18) month project schedule has been developed.

Franklin County is providing space for colocation on towers under County control for this project. The remaining towers will be on school properties where the School Board, Board of Supervisors and Broadband Authority will work together to determine location, construction and lease details. The County and BRISCNET have discussed the proposed use of the Burnt Chimney water tank with the Western VA Water Authority who indicates their support of the use of the tank but will require that a structural analysis be performed to ensure the equipment can be placed on the structure. The County and BRISCNET have also had discussions with Mid Atlantic Broadband to assist with fiber needed for the project. They have expressed their support of the project and indicated their willingness to help in any way they may be able to assist.

Shentel has performed preliminary engineering of the proposed fiber project and the project is on Shentel's 2020 project list. If funding is approved, this project will be ready for final engineering and construction in 2020. This project has a twelve (12) month expected completion.
The County has entered into Memoranda of Understanding with BRISCNET/Blue Ridge Towers and Shentel for these projects to outline the preliminary roles and responsibilities of each of the parties and commitment of the

parties should funding become available.

See Attachments 6, 7 and 8 for more detailed information.

11. Matching funds: Provide a description of the matching funds the applicant and co-applicant will invest in the proposed project (VATI funding cannot exceed 80 percent of total project cost). The Funding Sources Table must be completed. Label Attachments: Attachment 9 - Documentation of Match Funding; Attachment 10 – Funding Sources Table;

    i. For each element of matching funds in the description, indicate the type of match (e.g. cash, salary expense, or in-kind contribution).

    ii. Identify whether the applicant or co-applicant is responsible for providing each element of the proposed matching funds.

    iii. Include copies of vendor quotes or documented cost estimates supporting the proposed budget.

Answer:

Franklin County is committed to providing matching capital funds for the 2020 VATI Broadband project through several methods as follows:

Matching local funds – The County currently has appropriated $140,000 in a capital spending account dedicated to broadband. Furthermore, the County is currently projecting $1,005,000 of funding for broadband deployment over the next ten (10) years as shown on attached Capital Improvement Plan for FY 20-21. See optional attachment for Franklin County Capital Improvements Plan documenting Broadband funding.

In-kind Contribution/Services - The County has several vertical assets (towers) and land that will be made available for this project. The County will be acquiring land leases on two of the new tower sites that will require monthly or annual lease payments. In addition, the County already maintains leases on other sites where public safety radio equipment is located. The County projects that these land leases will have a five year lease value of $378,000. The County also has co-location leases on existing sites as well as potential rental space on other towers that will be allocated for this project. The County has calculated the five-year value of these leases to be $260,000.

Franklin County will be managing the aspects of the project over the next 12-18 months. Franklin County has dedicated staff resources to the preparation of the grant application and to grant and project management. This includes the Director of Planning & Community Development, Finance Director, GIS Coordinator, IT Director, and others to ensure that the project is successful and completed on time and on budget. It was estimated that County staff would work 15-20 hours per week on this project over the entire 18 month life of the project.

In addition, the County has secured the services of Andrew Cohill of Design Nine, Inc. as the County's Broadband Consultant. In addition to creating the Broadband Plan for the County, Mr. Cohill will be assisting with grant applications and providing technical project oversight. The County will also require the services of the County Attorney to review, draft, and approve documents related to the partnership between Franklin County and VA

DHCD as well as Blue Ridge Towers, BRISCNET and Shentel to implement the project.

Estimated Costs

	Rate	Hours	Cost
Franklin County Staff	$70/hr	1157	$81,000
County Attorney	$150/hr	60	$9,000
Consultant	$125/hr	80	$10,000

Blue Ridge Towers will be providing $570,000 in matching funding for tower construction and another $144,000 in land lease value for property for which they will have lease payments for structures/equipment. BRISCNET will be providing $483,000 in matching funds for WISP equipment and microwave equipment necessary for backhaul. In addition, BRISCNET will be providing $28,000 in in-kind payments for colocation leases. Shentel will be providing $95,038 in capital matching funds for all phases of the fiber to the home development associated with the Union Hall project.

Also, please see attached supporting documentation for cost estimates and letter provided by the co-applicants, Blue Ridge Towers/BRISCnet and Shentel.

See Attachments 9 and 10 for more info on Matching Funds.

12. Applicant and Co-Applicant: A description of the public-private partnership involved in the project. Detail the local government assistance: Local government co-applicants should demonstrate assistance to project that will lower overall cost and further assist in the timely completion of construction, including assistance with permits, rights of way, easements, and other issues that may hinder or delay timely construction and increase cost. Provide detail if this project includes additional partners such as municipal providers, middle mile providers, or investor

detail if this project includes additional partners such as municipal providers, middle-mile providers, or investor-owned utilities

Answer:

The Franklin County Broadband Authority has entered into separate Memoranda of Understanding (MOU) with Blue Ridge Towers, Inc./BRISCNET and Shentel to partner on efforts to close rural broadband gaps in Franklin County. See Attachment 7 for Memorandum Of Understanding documents. Franklin County is committed to working with its private partners in this project for permit review assistance and approvals. Some of the proposed project sites are located in non-zoned areas of the County, so there are no zoning reviews or approvals needed. Permits required in zoned areas will have no fees and will be expedited. The project will require comprehensive plan conformance review, building permits as well as erosion and sediment control and stormwater management plan approval from the County. The County is prepared to waive fees for this project and expedite reviews to ensure completion of the project on time and within budget.

The County is also poised to assist with other partners such as Franklin County Public Schools, Western Virginia Water Authority, Fork Mountain and Henry Volunteer Fire Departments, Mid Atlantic Broadband, VDOT and others to continue good working relationships to see the broadband issue in Franklin County solved.

13. Identify key individuals, including name and title, who will be responsible for the management of the project. Provide a concise description of their role and responsibilities for the project. Present this information in table format.

Answer:

Franklin County VATI 2020 Broadband Project - Key Individuals		
Name	Title	Project Role
Franklin County		
Steven Sandy	Project Manager/ Director of Planning & Community	County's overall point of co
Mike Lockaby	County Attorney	Internal legal assistance
John Harrison	IT Director	Information technology spe
Christopher Whitlow	Interim County Administrator	Project Oversight
Brian Carter	Finance Director	Project funding, reporting
Bob Camicia	FC Broadband Authority Chairman	Regulatory Oversight
Blue Ridge Towers/BRISCnet		
Anthony Smith	President of Blue Ridge Towers Inc and BRISCnet	Wireless Internet Service P
Warner Hall	Chief Financial and Operations Manager for BRISCn	Will oversee BRSICnet ope
Sean Cai	Project Manager for Blue Ridge Towers	Will assist in numerous dut project
Shentel		
Jason Durrance	OSPE Supervisor	Project design and construc
Christopher Kyle	Vice President - Regulatory Affairs	Project oversight

Larry Hubbard	OSPE Manager	Project oversight and custo

14. Project Budget and Cost Appropriateness

Applicants shall provide a detailed budget as to how the grant funds will be utilized, including an itemization of equipment and construction costs and a justification of proposed expenses. Expenses should substantiated by clear cost estimates. Label Attachment: Attachment 11 – Derivation of Costs; Attachment 12 - Documentation of Supporting Costs; Attachment 13 – Supporting Documentation of Cost Estimates.

Answer:

BRISCNET, Blue Ridge Towers and Shentel have all provided a project budget and cost estimates based on their professional knowledge and the current market pricing for the project items. Please see attachments 11, 12 & 13 for supporting documentation for cost estimates and project budget and details.

15. The cost benefit index is comprised of three factors: (i) state share for the total project cost, (ii) state cost per unit passed, and (iii) the internet speed. From these statistics, individual cost benefit scores are calculated. Finally, the three component scores are averaged together and converted to a 30-point scale to form a composite score. Please provide the following three pieces of information:

a. Total State funding requested / Total Project cost

b. Number of serviceable units

c. Highest residential speed available

Answer:

a. $2,383,039/$,599,077

b. 22,500

c. 1 Gbps

16. A brief description of applicant and co-applicant's history or experience with managing grants and constructing broadband communication facilities in the Commonwealth of Virginia and elsewhere.

Answer:

Franklin County has experience with managing grants through various state and Federal programs such as Community Development Block Grants, VDOT's Smart Scale, Revenue Sharing, Economic Development Access and Recreation Access, Federal Transportation Enhancements and Federal Lands Access Program (FLAP) and Tobacco Region Revitalization Commission.

West Piedmont Planning District Commission has an experienced staff and a long history of managing numerous state and federal grants for various projects. On an annual basis, staff works with the U.S. Department of Commerce, Economic Development Administration; the Appalachian Regional Commission; the U.S. Federal Highway Administration; the Virginia Department of Transportation; and the Virginia Department of Housing and

Community Development to administer and manage a variety of programs.

Franklin County's broadband consultant is Design Nine of Blacksburg, Virginia. Design Nine has extensive experience with both grant management and the construction of broadband networks in Virginia. Their work on grants has included assisting Virginia localities with the management and execution of DHCD-funded planning grants, CDBG grants, USDA grants, and Tobacco Commission grants. Their work with broadband network construction includes both broadband wireless facilities (design, construction, management) and aerial and underground fiber networks (design, construction, management). Design Nine has worked with more than forty Virginia counties, towns, and cities on broadband grant projects.

Blue Ridge Towers/BRISCNET is a new & innovative wireless Internet service provider based in Roanoke, VA serving the rural county areas of Bedford, Franklin, Botetourt, Roanoke, and surrounding SWVA. BRT/BRISCNET was a co-applicant with Bedford County and received VATI funding in 2019. Blue Ridge Towers specializes in developing build-to-suit towers and has earned an outstanding reputation as a go to, turn-key resource for the major carriers in the service provider markets. Blue Ridge Towers has longstanding relationships with the municipalities they serve. The company is currently developing specific sites for Verizon and Sprint, and working with National Park Service to develop a coverage strategy for a 469-mile corridor from Ashville, NC to Charlottesville, VA.

Shentel, officially Shenandoah Telecommunications Company, is a publicly traded telecommunications company headquartered in Edinburg, Virginia. It operates a digital wireless and wireline network in rural Virginia, West Virginia, Maryland and Pennsylvania. Shentel operates its wireless division as a Sprint affiliate, serving 1,006,874 subscribers. Shentel was founded in 1902 as the Farmers Mutual Telephone System (FMTS). Its initial goal was to bring telephone service to rural residents of Shenandoah County, VA. In 1960 the name changed to Shenandoah Telephone Company, then in 1981to Shenandoah Telecommunications Company (Shentel). The company launched cable TV service and a fiber optic network in the 1980s. In 1984 Shentel added mobile and paging services. In 1990 Shentel launched Shenandoah Cellular, the first company in Virginia to offer cellular service to a rural area. Internet service was made available to Shentel customers in 1994.

In the 2000s Shentel began to expand its cable footprint - purchasing cable assets from Rapid Communications in Virginia and West Virginia in 2008 and acquiring Jet Broadband in southern Virginia and southern West Virginia in 2010. Later in2010, Shentel purchased two small cable systems from Suddenlink Communications (one in West Virginia, the other in Maryland). In May 2016, Shentel finished acquiring its competitor Ntelos for 640 million dollars acquiring 297,500 subscribers. The deal also transferred an additional 291,000 subscribers from Sprint in exchange for Ntelos spectrum, making Shentel the sixth largest public wireless company in the United States. (Source: Wikipedia). Shentel has been awarded Tobacco Commission grants to extend fiber in Franklin County and other localities in Virginia.

17. Commonwealth Priorities

Additional points will be awarded to proposed projects that reflect Commonwealth priorities. Please describe if the project fits into a larger locality or regional universal broadband plan.

Answer:

FCBA procured Design Nine, Inc., to develop a countywide broadband plan for Franklin County. Adopted in August 2019, the Franklin County Broadband Assessment and Plan sets forth a hybrid, phased approach utilizing

fixed wireless technology and fiber to the home to meet the broadband needs of Franklin County. The County also initiated an RFP process for broadband services and is currently working with multiple partners including, BRISCNET, Mid-Atlantic Broadband, Shentel and Point Broadband to develop proposals to implement the hybrid phasing plan developed by Design Nine, Inc. In doing all of this, the County followed the recommendations and guidance of the various state agencies to create a blueprint to close the broadband connection gap.

This phased hybrid approach to broadband seeks to leverage existing state, local and private resources wherever possible. Of keynote is the use of Mid-Atlantic Broadband middle mile fiber wherever possible. The Tobacco Commission leveraged significant resources to develop this open access resource which FCBA intends to utilize in its broadband deployment wherever possible.

This project aligns with the Commonwealth's priorities to address the digital divide and complies with the state's goals set forth by the Virginia Department of Housing and Community Development, The Tobacco Commission, the Commonwealth Connect Coalition, and the Center for Innovative Technology's Broadband Path. The proposed Franklin County project will help address unserved rural areas in need of broadband connectivity and affordable internet access, and address issues of unevenly dispersed broadband in remote areas. With funding, this public-private partnership will help connect the citizens of Franklin County to education and workforce training opportunities, increase small business opportunities, and enable new health care technologies for seniors and disabled citizens, as specified by all the state agencies listed above.

Within the Commonwealth Connect report, Franklin County Broadband Authority is listed as a regional authority, having prepared the universal broadband plan. Upon funding, the project is ready for implementation. A portion of the proposed project will serve the Summit View Business Park, estimated by the Chumura economic impact report to employ 1,562 by businesses within the park and a total of 2,221 direct, indirect, and induced jobs due to the park and spur additional private investment. Two businesses have already located in the Park. Expansion of broadband services will attract more companies and further economic development initiatives in the County. In addition, the new fiber will advance economic and community development in the Union Hall Village area, as prescribed in the County's Village Plan.

Project also utilizes fixed wireless broadband system implemented in Bedford County. The new system developed in Franklin County will also provide services to customers in Henry and Patrick counties.

18. Additional Information

Any other equitable factor that the applicant desires to include. Applicants are limited to four additional attachments. Label Additional Attachments as:

a. Attachment 14 – Two most recent Form 477 submitted to the FCC or equivalent

b. Attachment 15 – Copy of Public Notice

c. Attachment 16 – XXXXXXX

d. Attachment 17 – XXXXXXX

e. Attachment 18 – XXXXXXX

f. Attachment 19 – XXXXXXX

Answer:

Attachment 16 - Franklin County Broadband Plan by Design Nine, Inc.

Attachment 17 - Franklin County Broadband Assessment by CIT

Attachment 18 - Franklin County Wireless Tracker

Attachment 19 - Franklin County Capital Improvements Program

Attachments:

Map(s) of project area, including proposed infrastructure

Attachment1ProjectArea93201920929.pdf

Map(s) or schematic of existing broadband providers (inventory of existing assets)

Attachment2ExistingProviderMap932019115644.pdf

Documentation that proposed project area is not designated for Connect America Funding (CAF)

Attachment3DocumentationonCAFFundingArea932019121221.pdf

Documentation that proposed project area is unserved based on VATI criteria

Attachment4DocumentationofUnservedArea93201915030.pdf

Propagation Map if Wireless Project

Attachment5PropagationMap93201914913.pdf

Project Management Plan

Attachment6TimelineProjectManagementPlan932019123142.pdf

Documentation of relationship between applicant and co-applicant (formal or informal)

Attachment7Documentationofrelationship93201933321.pdf

Application to DHCD Submitted through CAMS

County of Franklin

Franklin County Broadband Authority

Letters of Support

Attachment8LettersofSupport93201921306.pdf

Documentation for in-kind contributions, including value(s)

Attachment9DocumentationofMatchFunding93201943645.pdf

Funding Sources Table

Attachment10FundingSourcesTable93201935119.pdf

Derivation of Cost (Project Budget)

Attachment11DerivationofCost93201934214.pdf

Documentation supporting project costs (i.e. vendor quotes)

Attachment12Documentationsupportingprojectcosts932019120507.pdf

Supporting documentation for costs estimates

Attachment13SupportingDocumentationforcostestimates932019120817.pdf

Two most recent Form 477 submitted to FCC

Attachment14TwomostrecentForm477submitted932019115833.pdf

Copy of Public Notice

Attachment15CopyofPublicNotice932019122207.pdf

Optional

FranklinCountyBroadbandAssessmentAndPlanAdopted082019Opt8292019113631.pdf

Optional

FranklinCommunityBroadbandAssessmentbyCIT8292019125644.pdf

Optional

FCWirelessTracker932019121840.xlsx

Application to DHCD Submitted through CAMS

County of Franklin

Franklin County Broadband Authority

Optional

FCCIPDocument93201921333.pdf

Notes:

Franklin County has been actively working to address the issue of broadband access for several years now. Much work has been completed since 2016, the Center for Innovative Technology (CIT) provided assistance to Franklin County by performing a Needs Assessment and a community survey in 2016/17. This identified the focus areas for broadband deployment and documented over 6200 citizen comments/needs for broadband. In 2018, the County created a broadband authority. The Authority applied for and received planning grant funding to finalize the County's broadband plan using Design Nine, Inc. The Authority adopted this plan in August 2019. The adopted plan offers a hybrid solution to solving the broadband issue in Franklin County. This hybrid solution calls for deploying fixed wireless in phases on existing structures where possible and building new structures where needed to reach the more rural and remote communities of Franklin County. The Plan also outlines a phased approach to installing fiber to the homes in the County's designated growth areas and villages. These areas are expected to have higher residential density and more commercial activity making these areas more practical and cost effective to serve with fiber. Concurrently, the County solicited proposals from private providers for broadband solutions. Through the RFP process, Franklin County has developed a relationship with Blue Ridge Towers and BRISCNET to develop a fixed wireless system that can meet the County's objectives. This VATI application represents a collaborative effort to satisfy Phase 1 of the County's Broadband Plan and provide broadband to some of the communities most in need. Shentel has also partnered with Franklin County to provide fiber connections to the homes in areas designated in the County's Broadband Plan. This fiber provides up to 1 Gbps service to residences and businesses in the County's growth areas. Shentel proposes to add 6.5 miles of fiber in the Union Hall Village area.

Franklin County

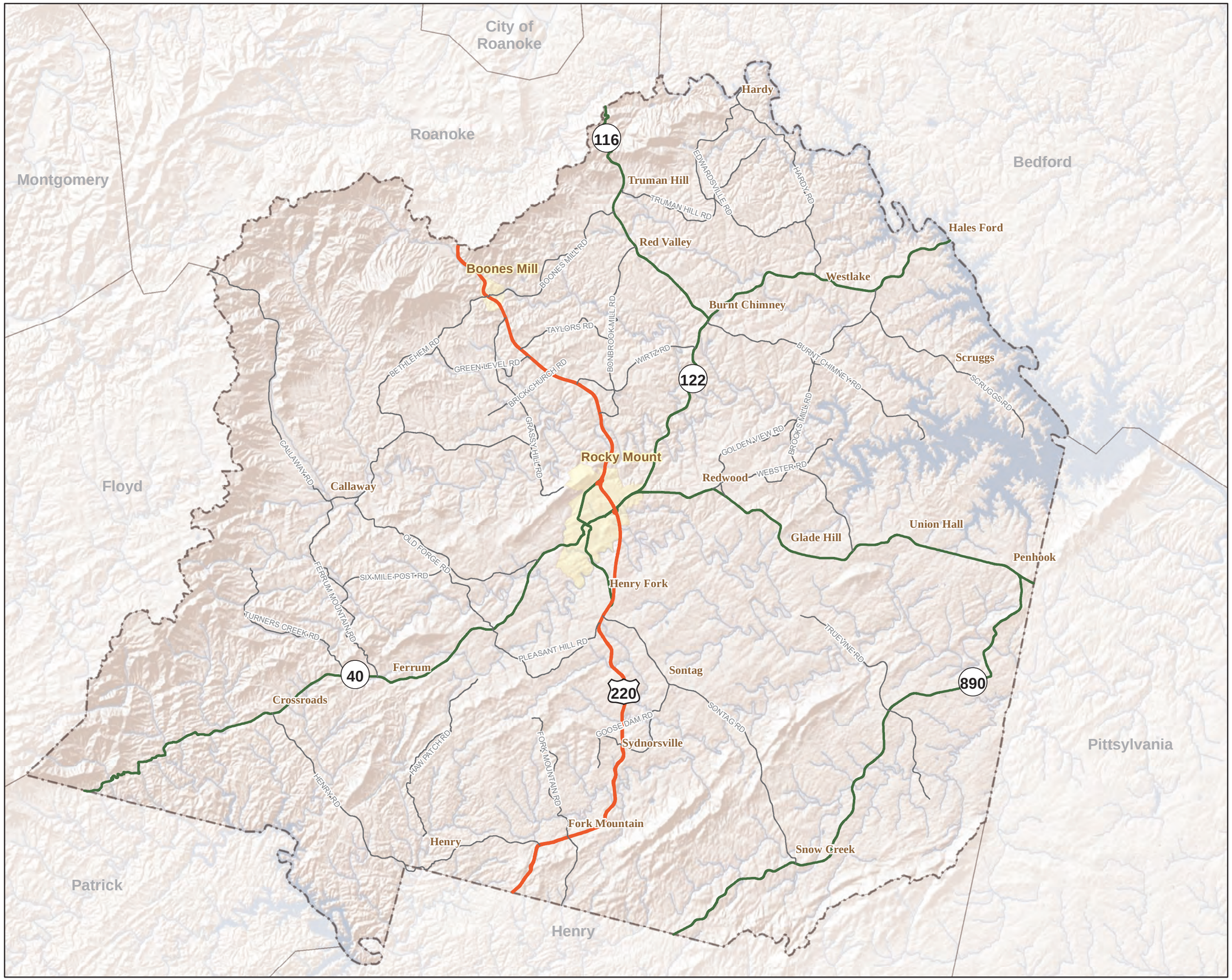
VATI 2020 Application

Attachment 1
Project Area Map

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map

Sheet 1 of 5



- Franklin County
- Surrounding Counties
- Water Features
- US Hwy
- State Hwy
- Collector

0 2.5 5 Mi

The data layers provided herein were compiled from various sources within a geographic information system (GIS) for the primary use of Franklin County. The data provided herein are believed to be accurate but are provided for reference purposes only. These GIS data are in no way meant as a replacement for a legal survey, legal description, or standard due diligence. No guarantee, expressed or implied, is made regarding their accuracy, currency, adequacy, usefulness, or reliability. These data are provided "as is" and neither Franklin County nor its employees shall be held responsible for their inappropriate use.

Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless Structures & Fiber Area

Sheet 2 of 5

- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Backhaul
- Bedford Co Backhaul
- Shentel Fiber Proposal (See Sheet 5 of 5)
- Franklin County
- Surrounding Counties
- Towns
- Water Features
- US Hwy
- State Hwy
- Collector

0 2.5 5 Mi

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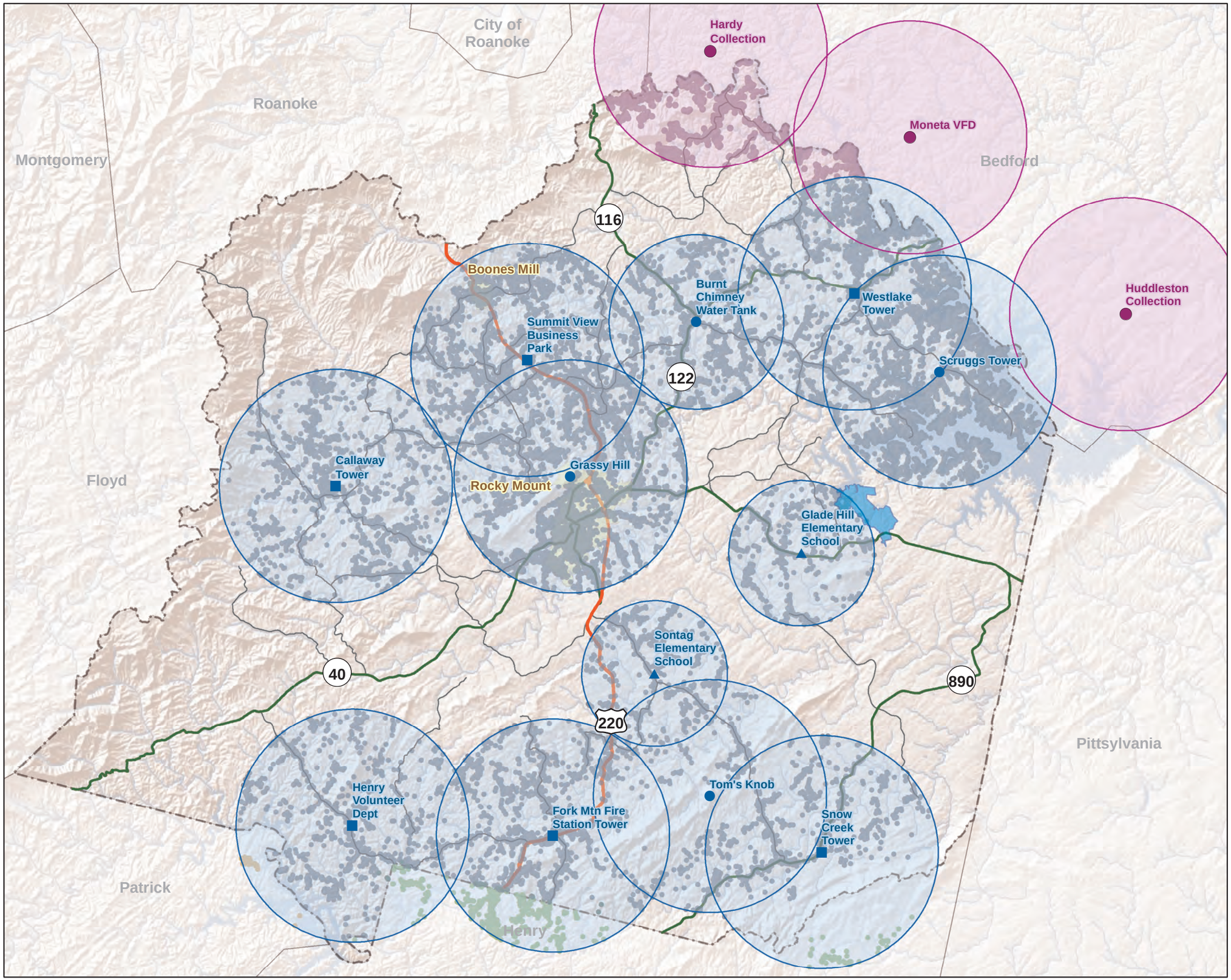
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Sheet 3 of 5



- Reached by Franklin Sites (21,495 Addresses)
- Reached by Bedford Sites (725 Addresses)
- Henry Co Coverage (541 Addresses)
- Patrick Co Coverage (39 Addresses)
- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal (See Sheet 5 of 5)
- Franklin County
- Surrounding Counties
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 2.5 5 Mi

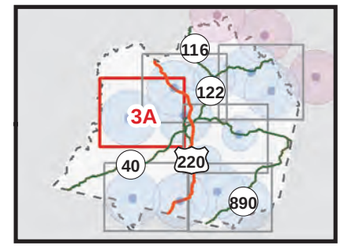
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3A



- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 0.45 0.9 1.8 Mi

Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3B

- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 0.45 0.9 1.8 Mi

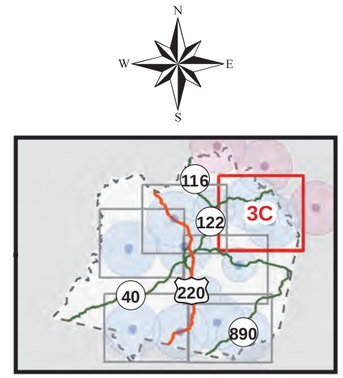
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3C



- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 0.5 1 2 Mi

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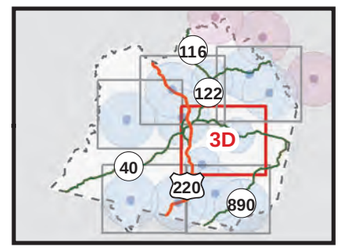
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3D



- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 0.45 0.9 1.8 Mi

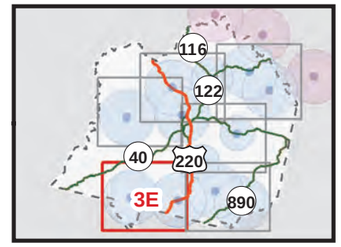
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3E



- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 12.5 25 50 Mi

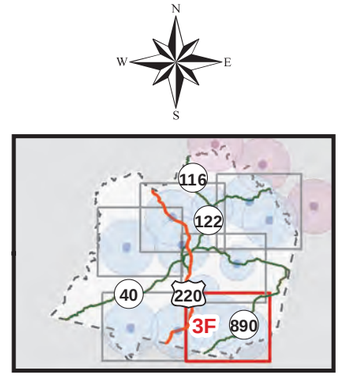
Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

Proposed Fixed Wireless & Fiber Coverage

Inset 3F



- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Shentel Fiber Proposal
- Tax Parcels
- Franklin County
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 0.45 0.9 1.8 Mi

Date: 9/3/2019

Tom's Knob

Snow Creek Tower

Henry

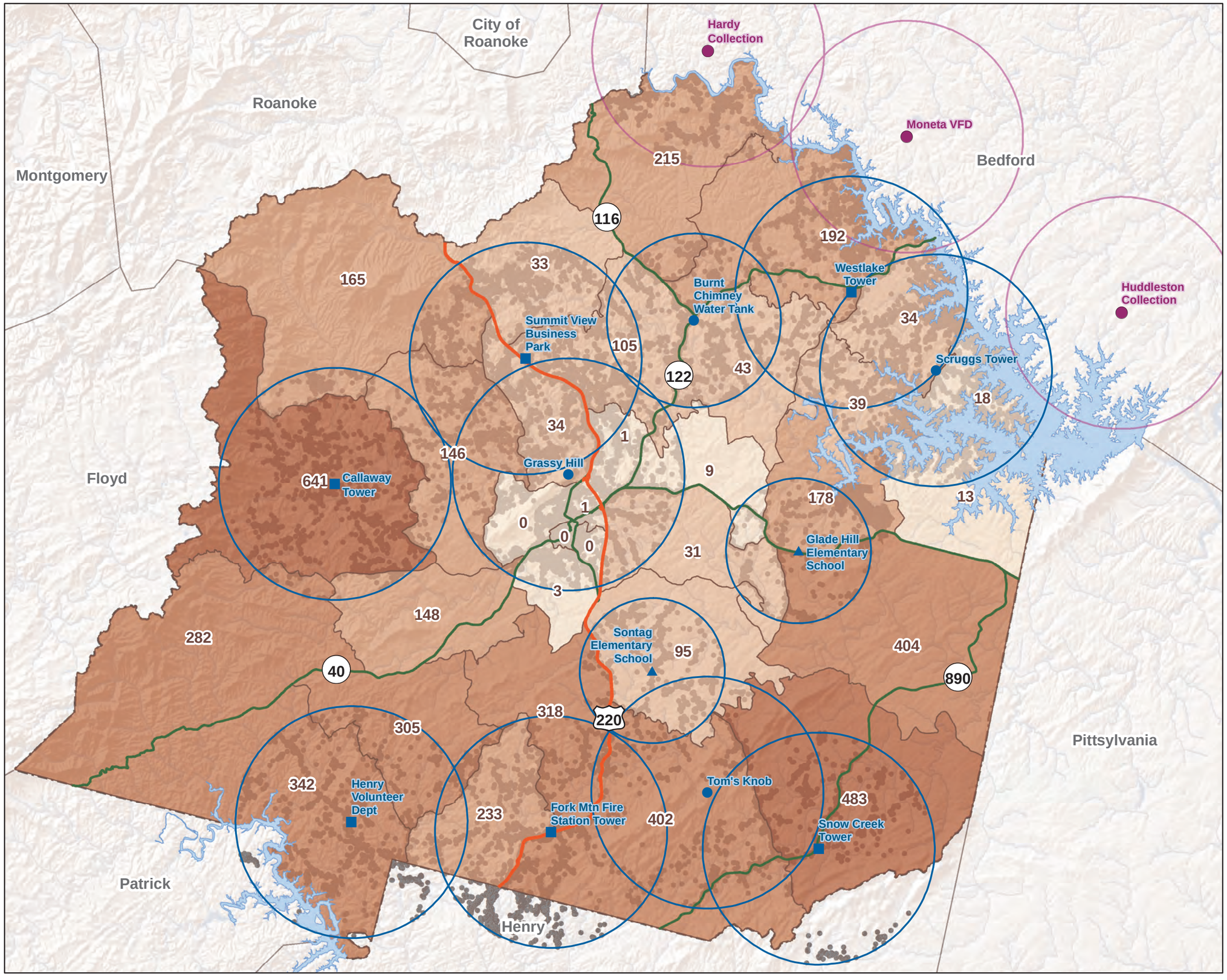
Pittsylvania

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

US Census Bureau Block Group Coverage

Sheet 4 of 5



Underserved Addresses per Block Group

- 0 - 18
- 19 - 105
- 106 - 233
- 234 - 404
- 405 - 641
- All Covered Addresses (22,800 Potential Clients)
- Shentel Fiber Proposal (187 Potential Clients)
- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin Co Tower Coverage
- Bedford Co Tower Coverage
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 2.5 5 Mi

Date: 9/3/2019

Franklin County 2020 VATI Grant

Attachment 1 - Project Area Map Showing:

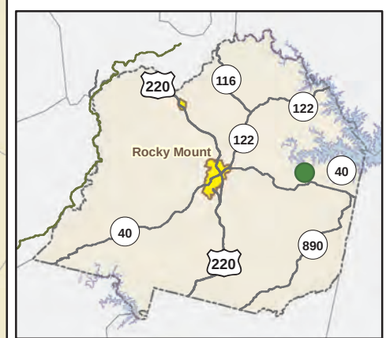
Potential Fiber Broadband Service Expansion

Sheet 5 of 5

Potential Clients

- Residential (112)
- Non-Residential (4)
- Vacant Lot (76)
- Potential Service Area
- Tax Parcels
- Water Features

0 550 1,100 2,200 Ft



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Date: 9/3/2019

Franklin County

VATI 2020 Application

Attachment 2

Existing Provider Map with Documentation

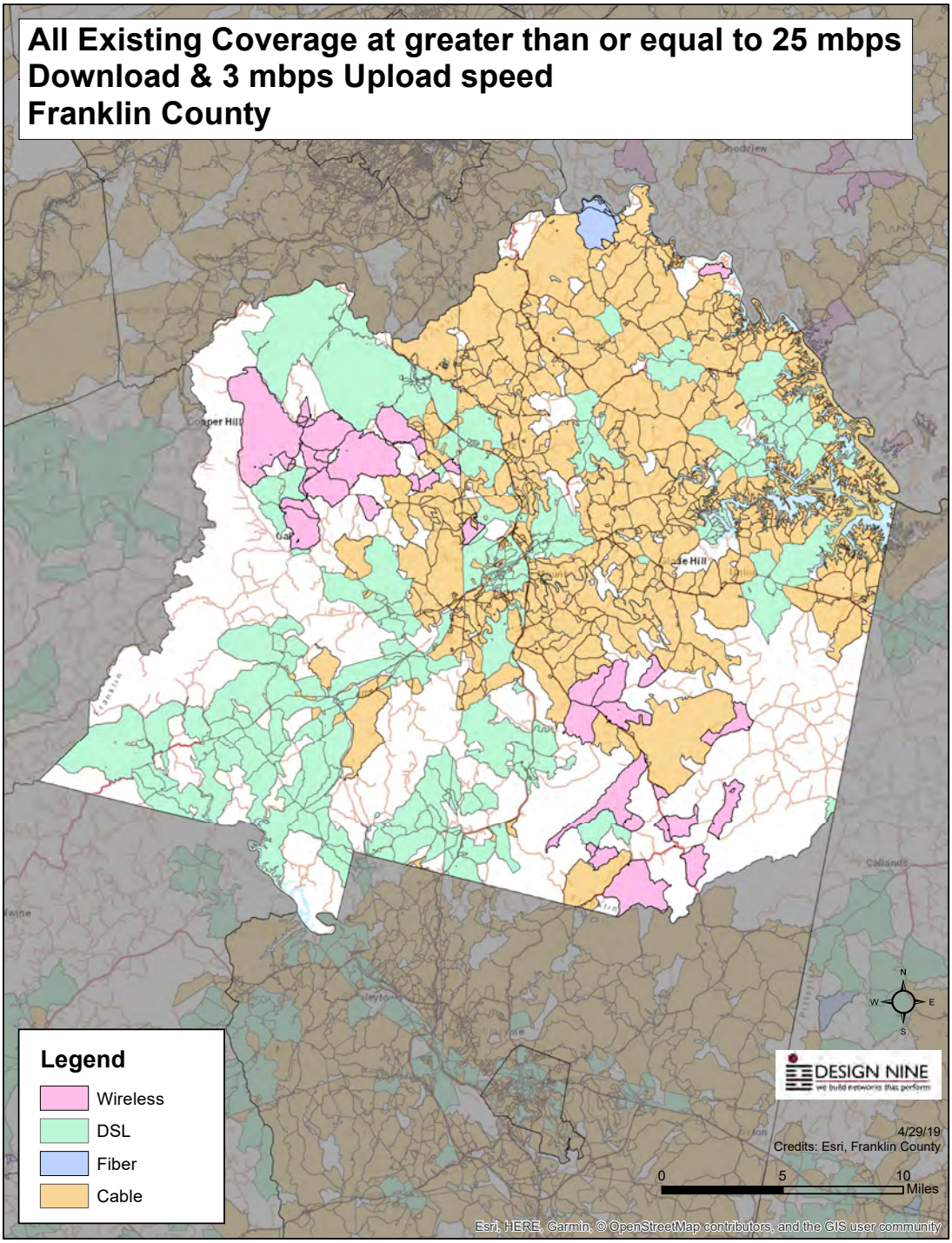
5 EXISTING ASSETS AND DEMOGRAPHY

The maps on the following pages include information on where Internet and cellular phone service is available. Due to the way that the FCC allows the incumbent telephone, cable and Internet providers to report data by census block, if a single location in a census block is able to receive a given service level, every home in the census block is listed as "served." This leads to coverage maps that are optimistic about where coverage is actually available.

- Existing coverage areas at 25/3 speeds. The FCC defines an area as "served" if provider can deliver 25 Meg down and 3 Meg up to customers.
- DSL coverage at the 25/3 rate.
- Fixed point wireless broadband service in the county at 25/3 speeds.
- Cellular service is widely available in the County, but the cellular providers tend to be very optimistic about where service is available. There are many areas of the County, particularly in the western and southwestern portions of Franklin County, where service is spotty or not available.
- Broadband wireless, cable and DSL at 25/3 or greater, with17% of locations remain underserved, the actual number of underserved is likely higher.
- At least 4,913 addresses are underserved (less than 25/3 Internet service), mostly in the rural parts of the county.
- Points of interest, including household density (an important factor when evaluating new service areas).
- LMI Areas of the county (Low and Moderate Income). Very important for certain kinds of grants.
- Towers in various parts of the county. These are taken from the FCC tower registry and other sources. The FCC registry which includes both cell towers and other kinds of towers (e.g. radio/TV broadcast towers, public safety towers).
- Long haul fiber routes through the county, which are important data routes to the rest of the Internet.

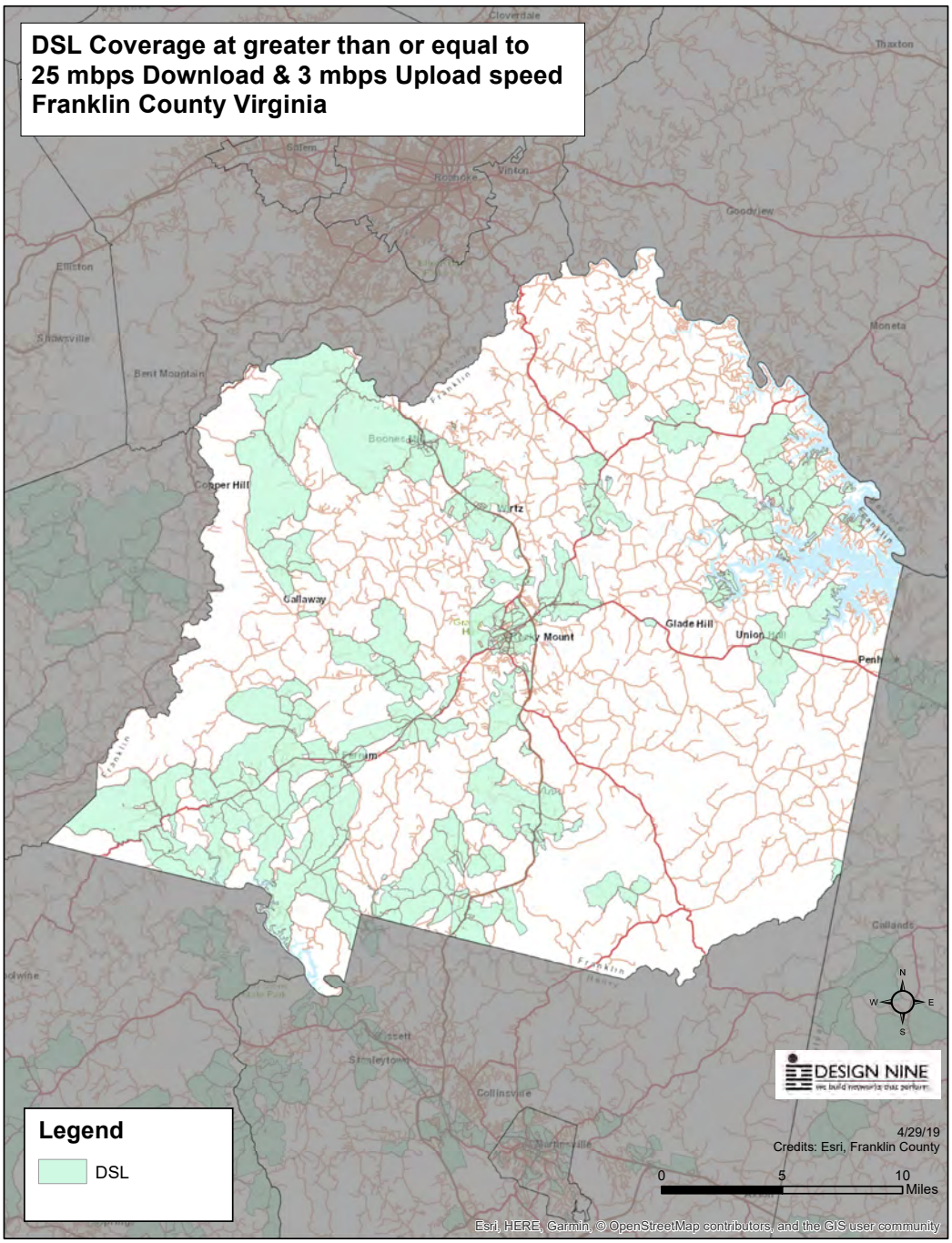
5.1 EXISTING BROADBAND COVERAGE AT 25/3 SPEEDS

Many areas of the County are not able to get service at 25/3 speeds.



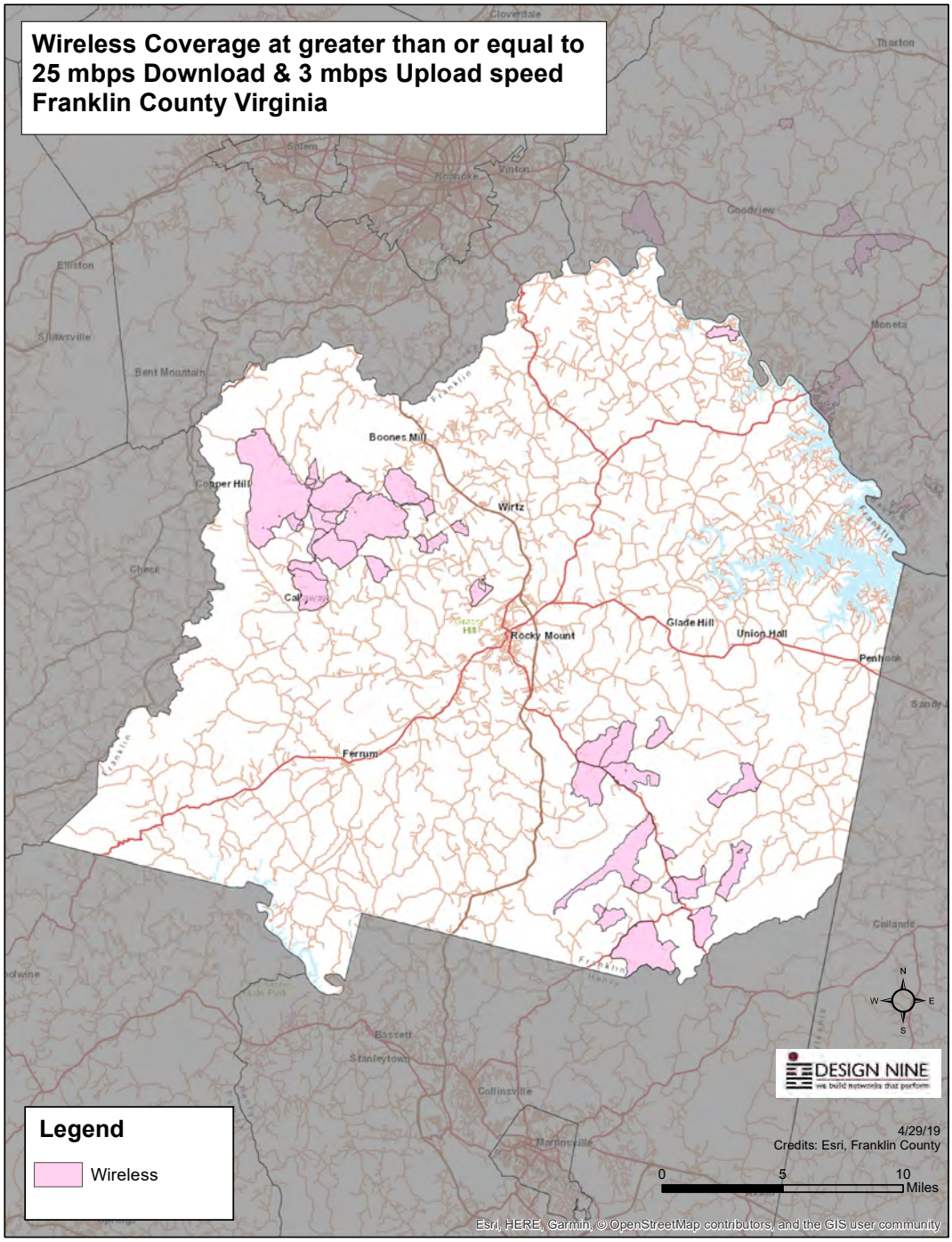
5.2 EXISTING DSL COVERAGE AT 25/3 SPEEDS

Most homes and businesses in the county have access to DSL service, but not all locations can receive DSL service at 25/3 speeds.

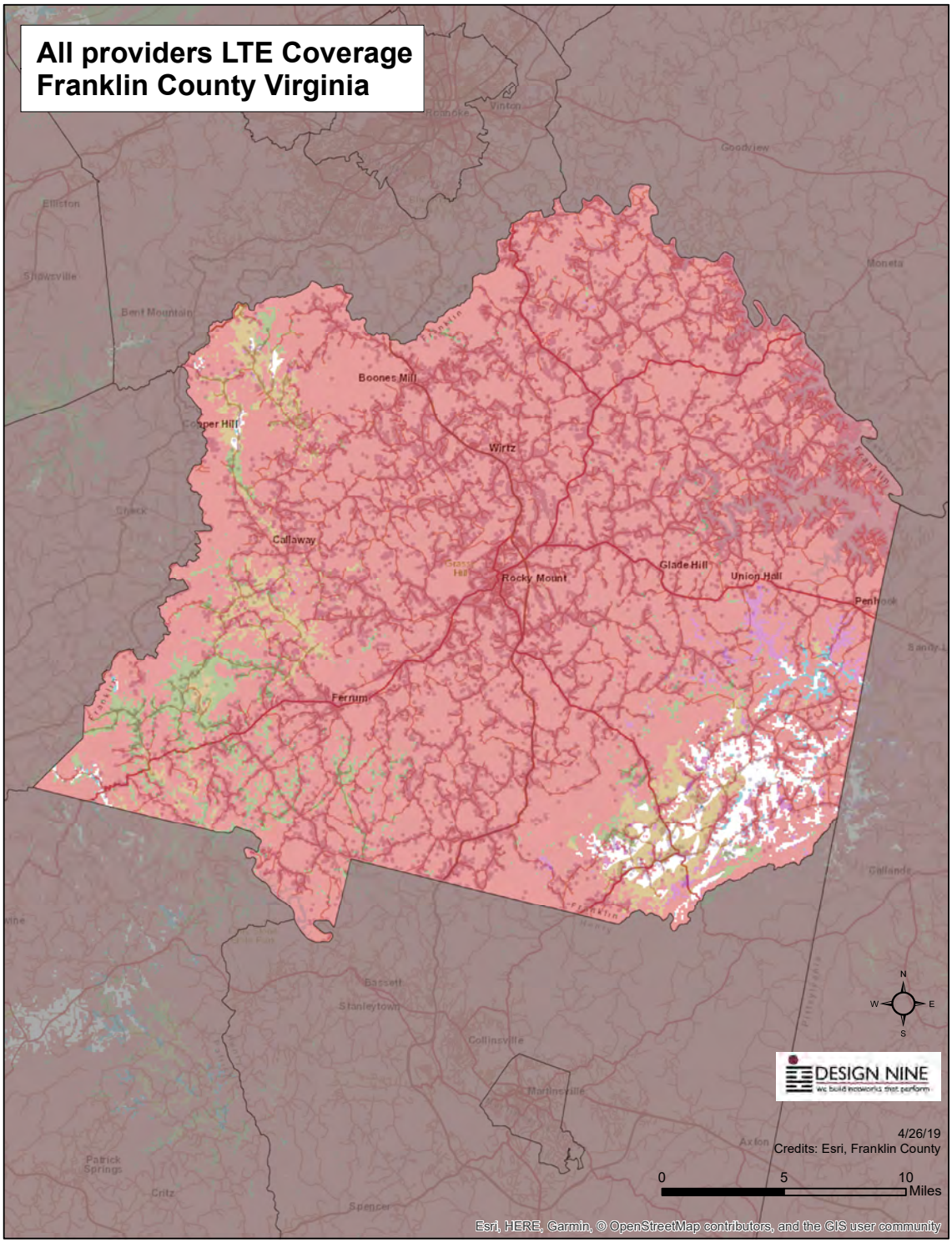


5.3 FIXED POINT WIRELESS AT 25/3 SPEEDS

Fixed point wireless broadband is more widely available in the County than this map indicates, but not all wireless tower sites are able to deliver 25/3 speeds.

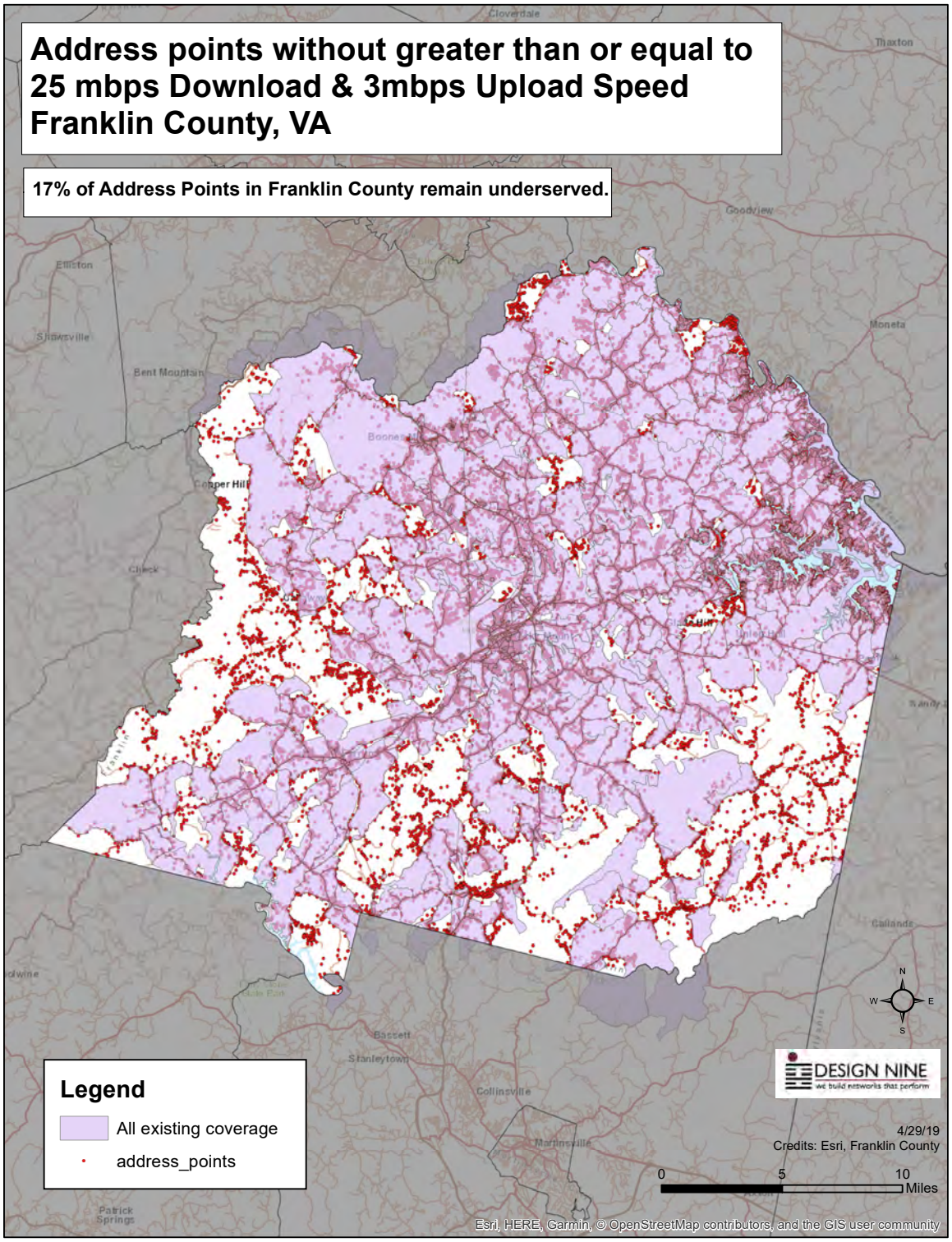


5.4 CELLULAR COVERAGE BY ALL PROVIDERS



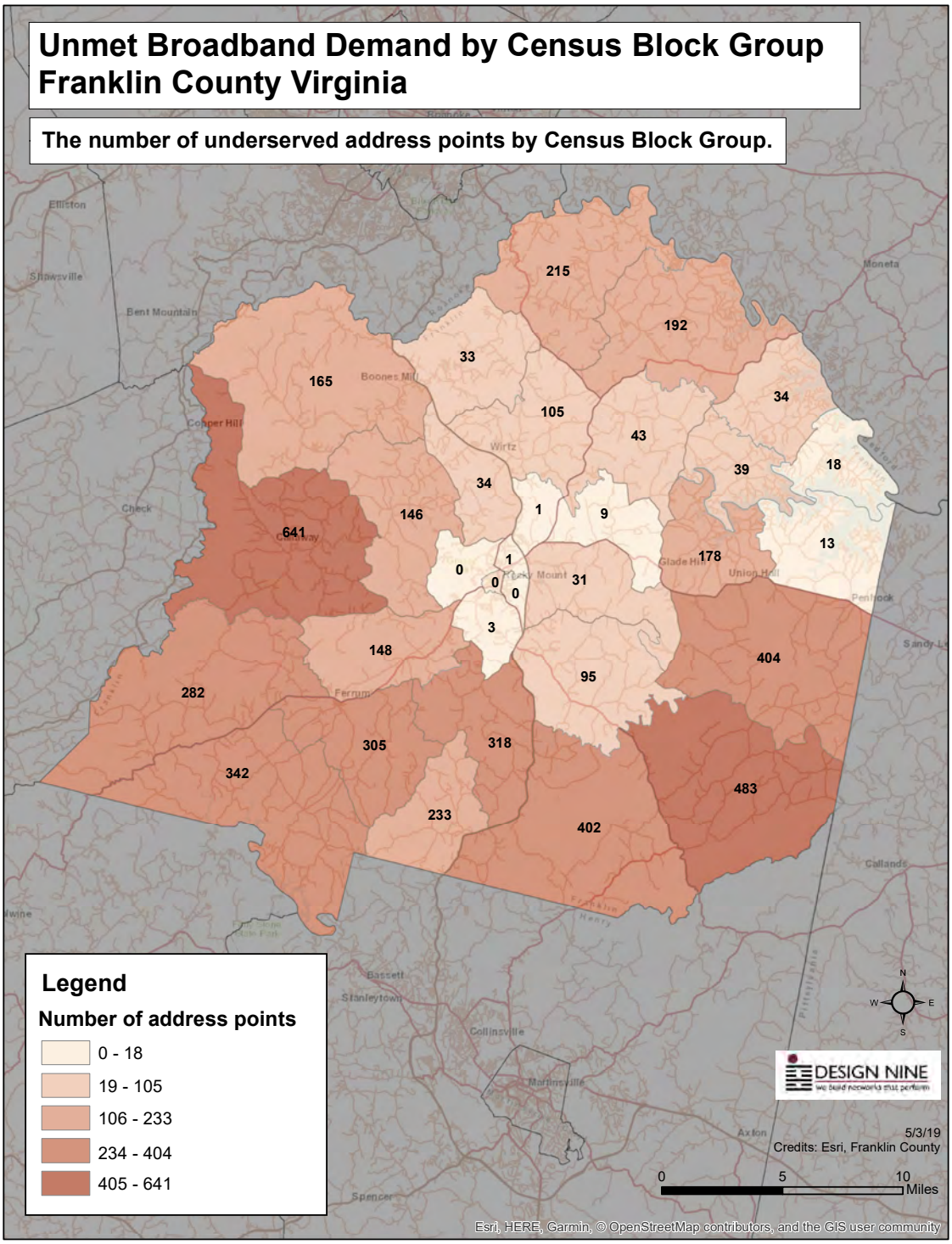
5.5 25/3 COVERAGE WITH ADDRESS POINTS

Broadband wireless, cable and DSL at 25/3 or greater, with17% of locations remain underserved, the actual number of underserved is likely higher.

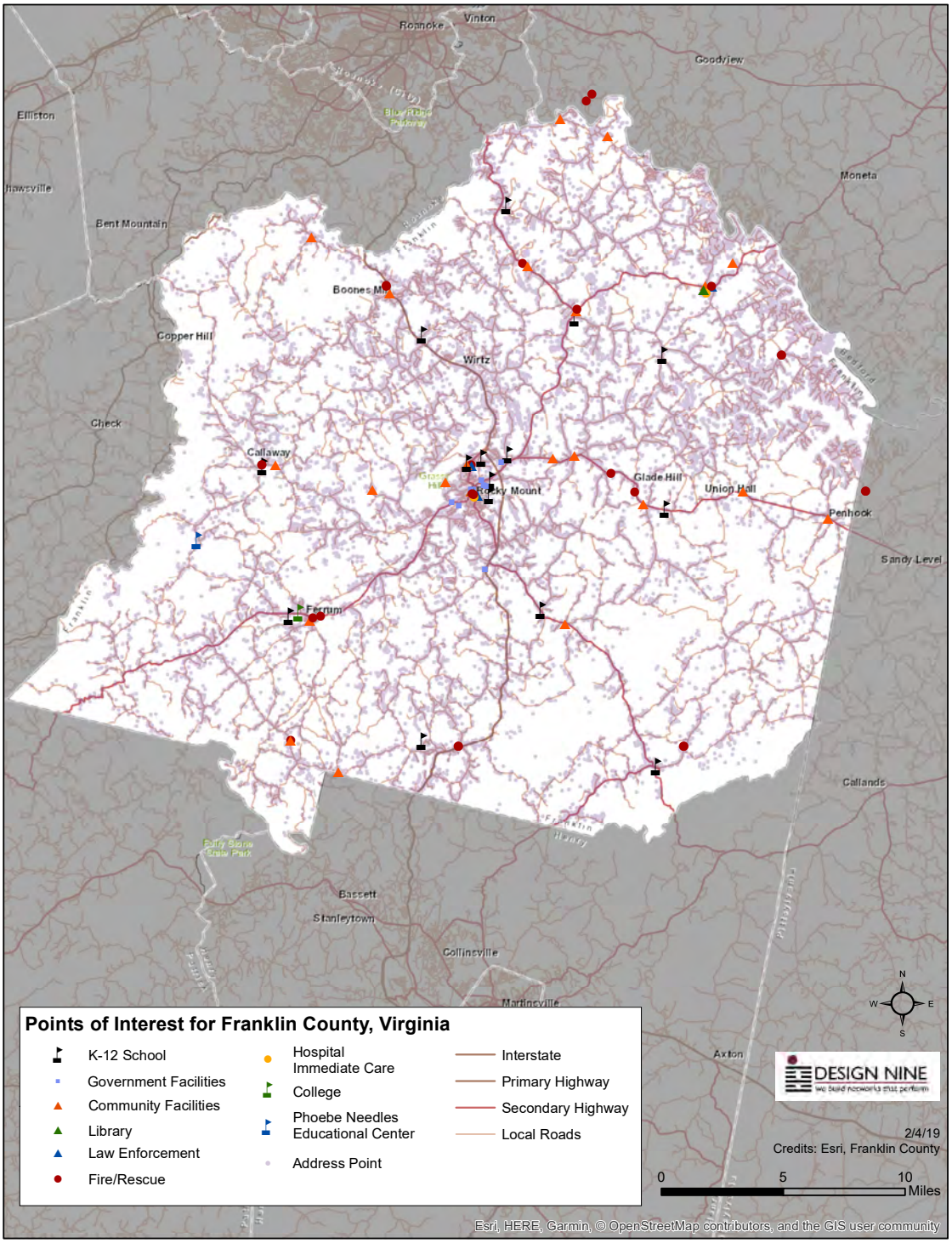


5.6 UNDERSERVED BY CENSUS BLOCK GROUP

At least 4,913 addresses are underserved (less than 25/3 Internet service), mostly in the rural parts of the county.

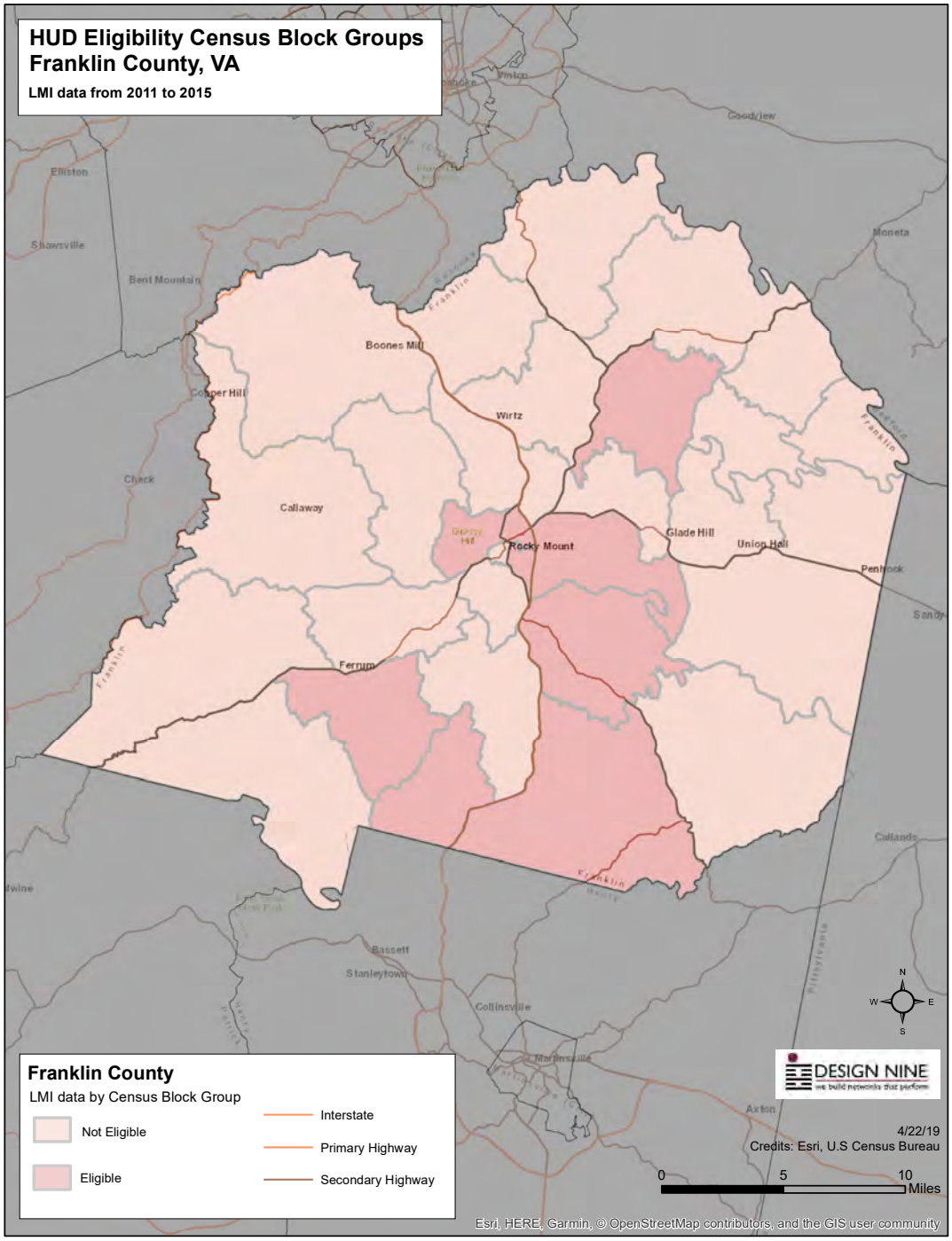


5.7 POINTS OF INTEREST



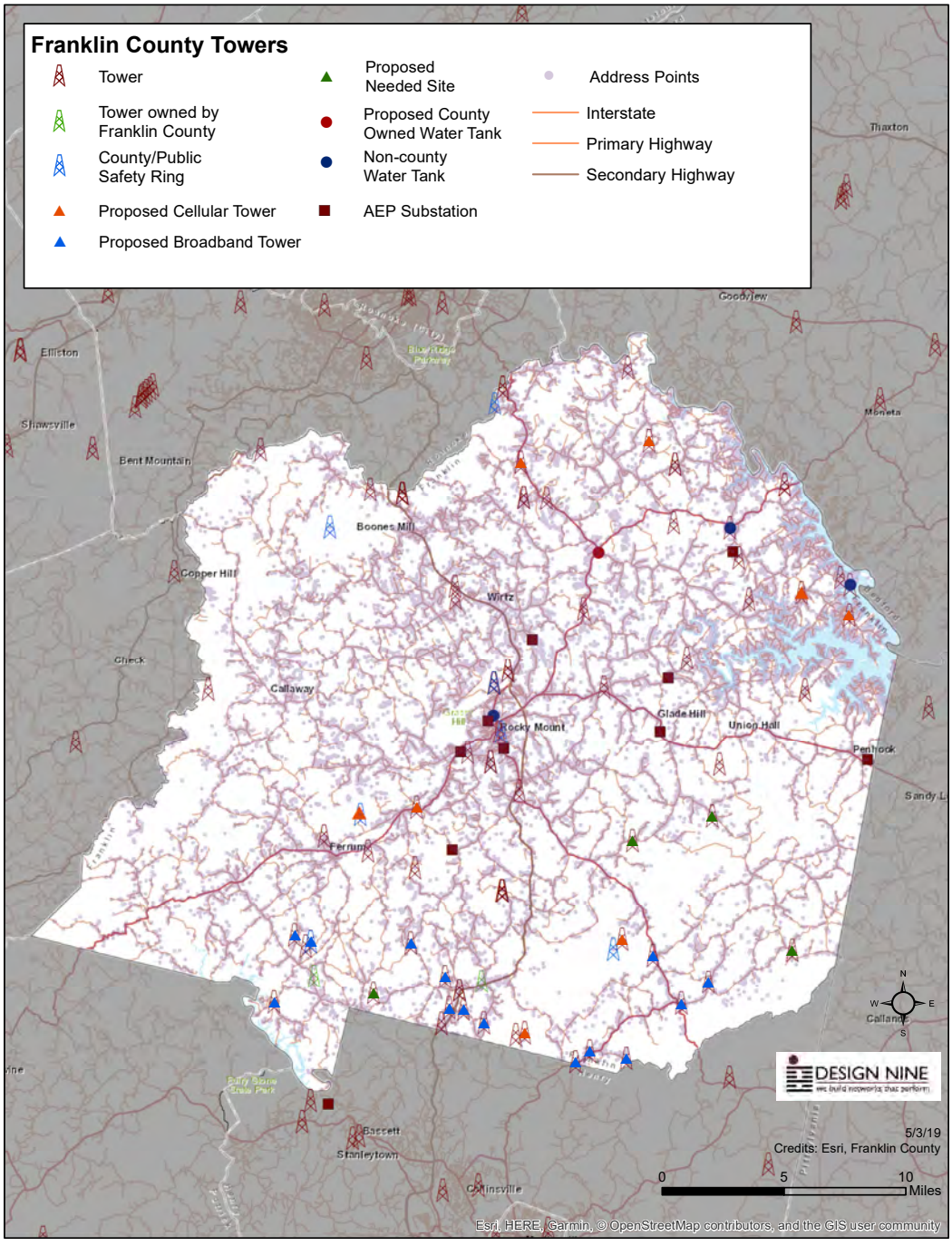
5.8 LMI AREAS OF THE COUNTY

Certain kinds of grants (e.g. CDBG funding) favor LMI (Low and Moderate Income) areas. Large parts of the county would qualify for grants that have a preference for LMI areas.



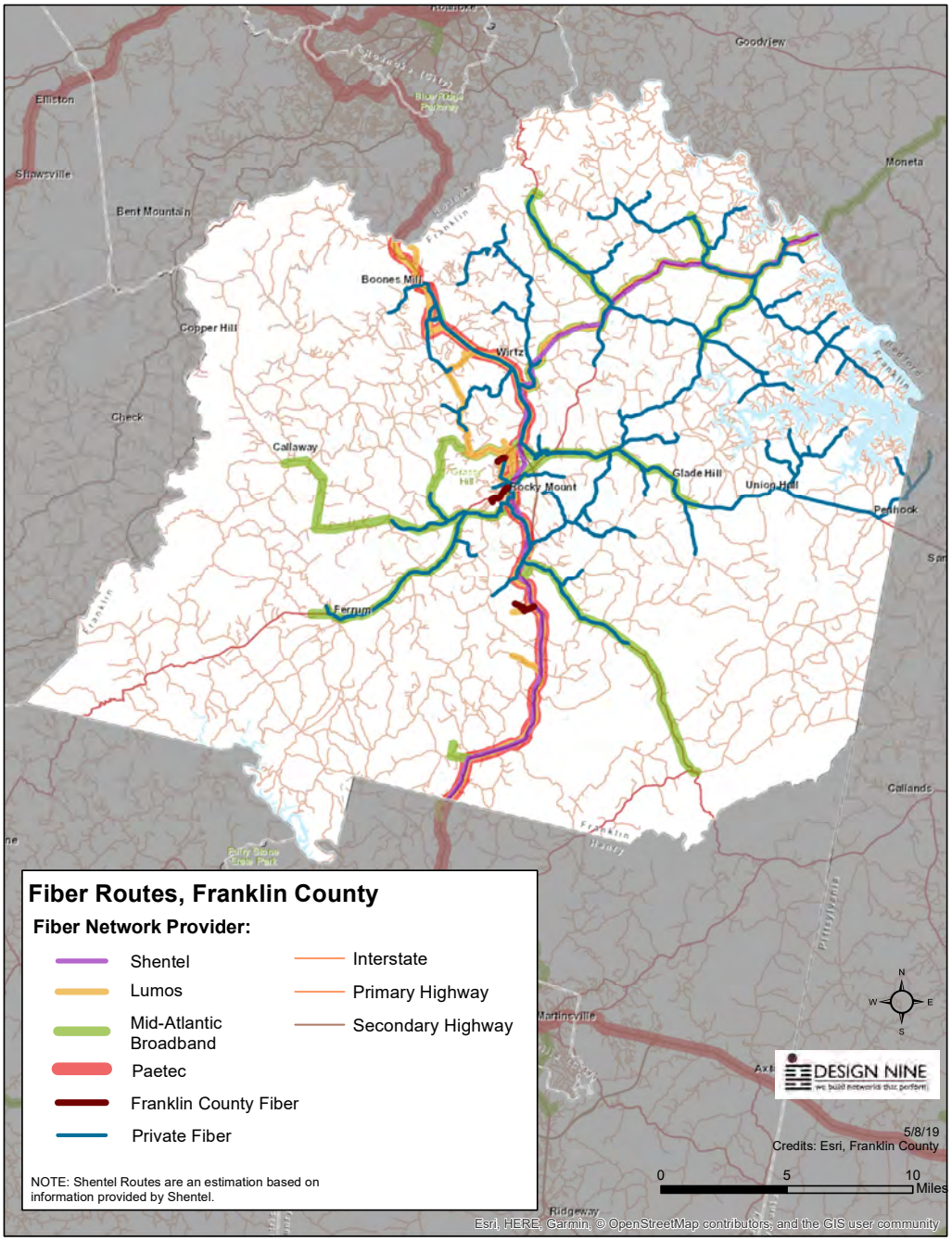
5.9 TOWER ASSETS AND SUB-STATIONS

There are a number of cellular towers in the county. These are clustered along major travel routes, which leaves many areas of the county with marginal or no cellular service. Increased availability of good wireless and/or fiber broadband service would enable many residents and businesses to use inexpensive nano-cell boxes in their home or business. More information on nano-cells is contained in a later section of this report. Appendix B contains a list of known tower owners; this list was developed from the FCC tower registry and from data supplied by Franklin County.



5.10 FIBER ASSETS

Some limited third party (e.g. not incumbent) fiber is in or near the county. These routes are extremely important as more "last mile" broadband improvements are made–competitive ISPs and WISPs can generally get better pricing from companies like Shentel and Lumos than from the telephone or cable companies. Paetec is a long haul fiber firm that is probably leasing fiber pairs from Shentel or Lumos; the company has no apparent service presence in the county (i.e. the fiber just passes through).



Franklin County

VATI 2020 Application

Attachment 3

Documentation on CAF Funding Area

Department of Planning & Community Development

Franklin County
A Natural Setting for Opportunity

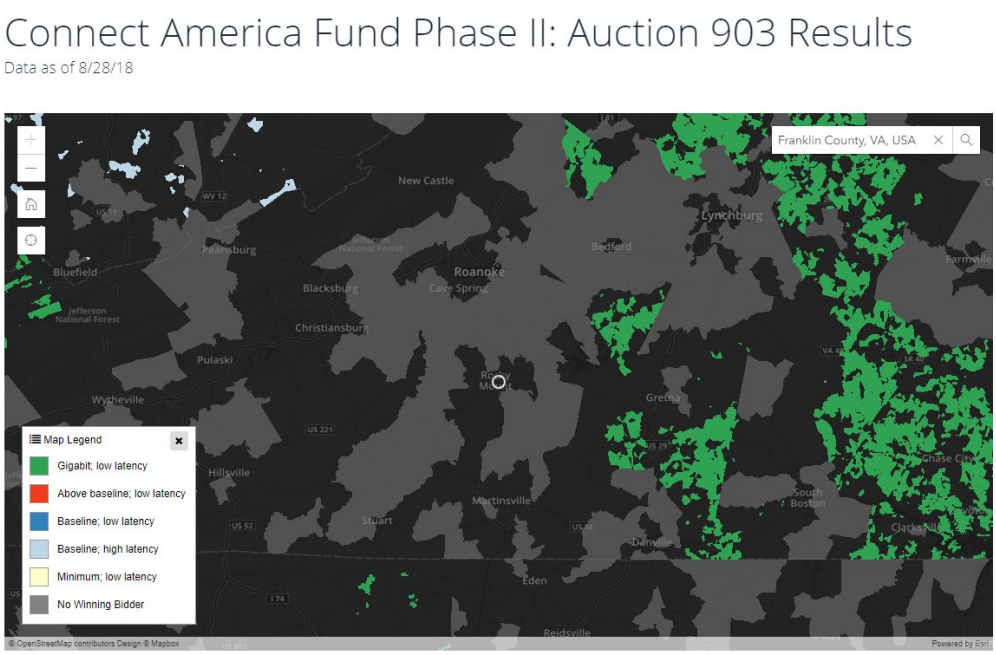
August 29, 2019

RE: Documentation that proposed project area is not designated for Connect America Funding (CAF)

To Whom it May Concern:

Review of the National Broadband Maps and Connect America information did not show any designated CAF funding for the project area (See copy of map from website). Furthermore, Franklin County is not aware of any Connect America funding that has been designated for this project area.

Connect America Fund Phase II: Auction 903 Results



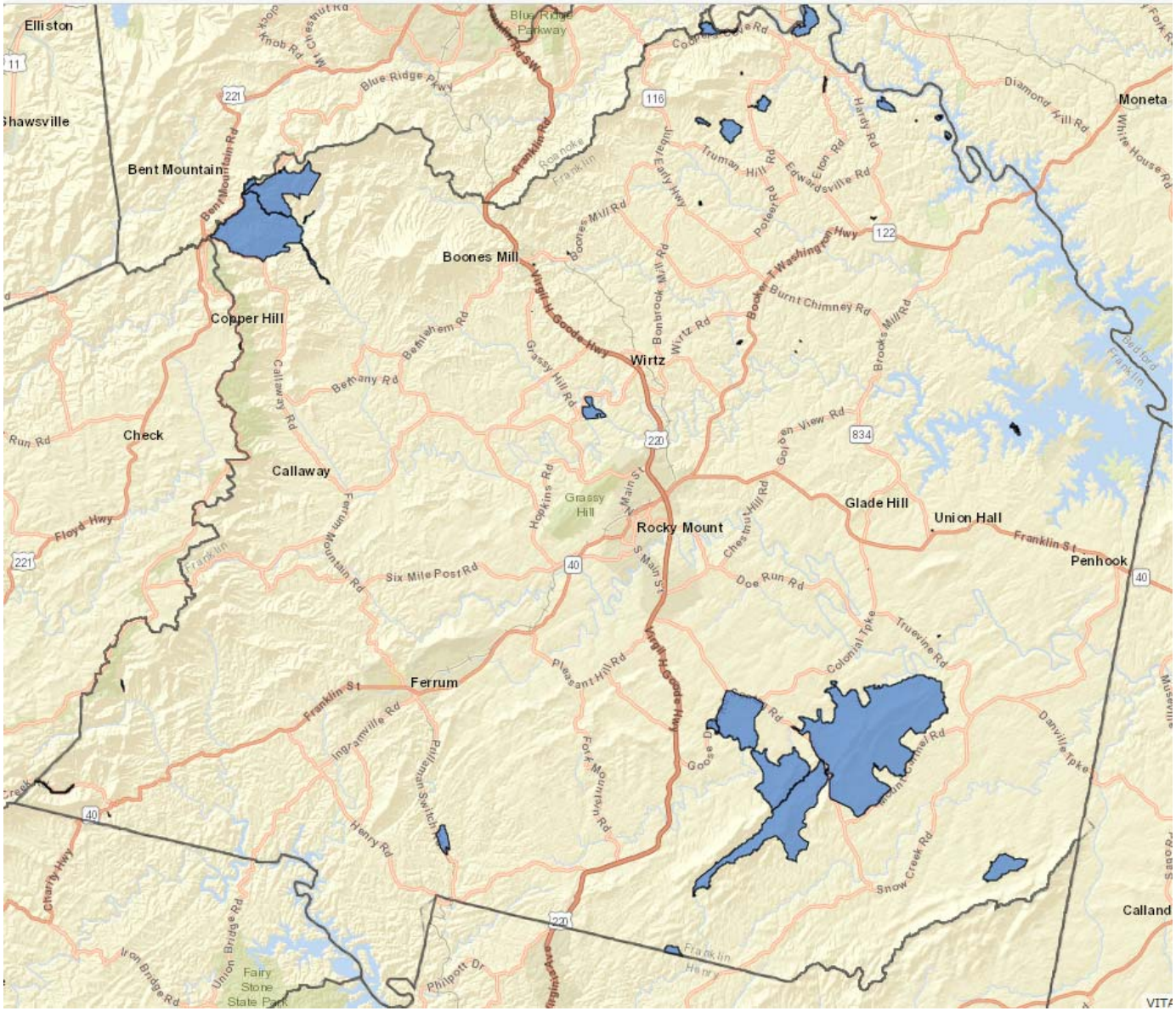
Source: https://www.fcc.gov/reports-research/maps/caf2-auction903-results/

Steven M. Sandy, AICP
Director of Planning & Community Development
Franklin County

Franklin County CAFII Funding Areas

Connect America Funds Phase II (CAFII) Eligible Blocks
(Preliminary)

Potential Funding
$80,548.13 per year
over 6 yrs.

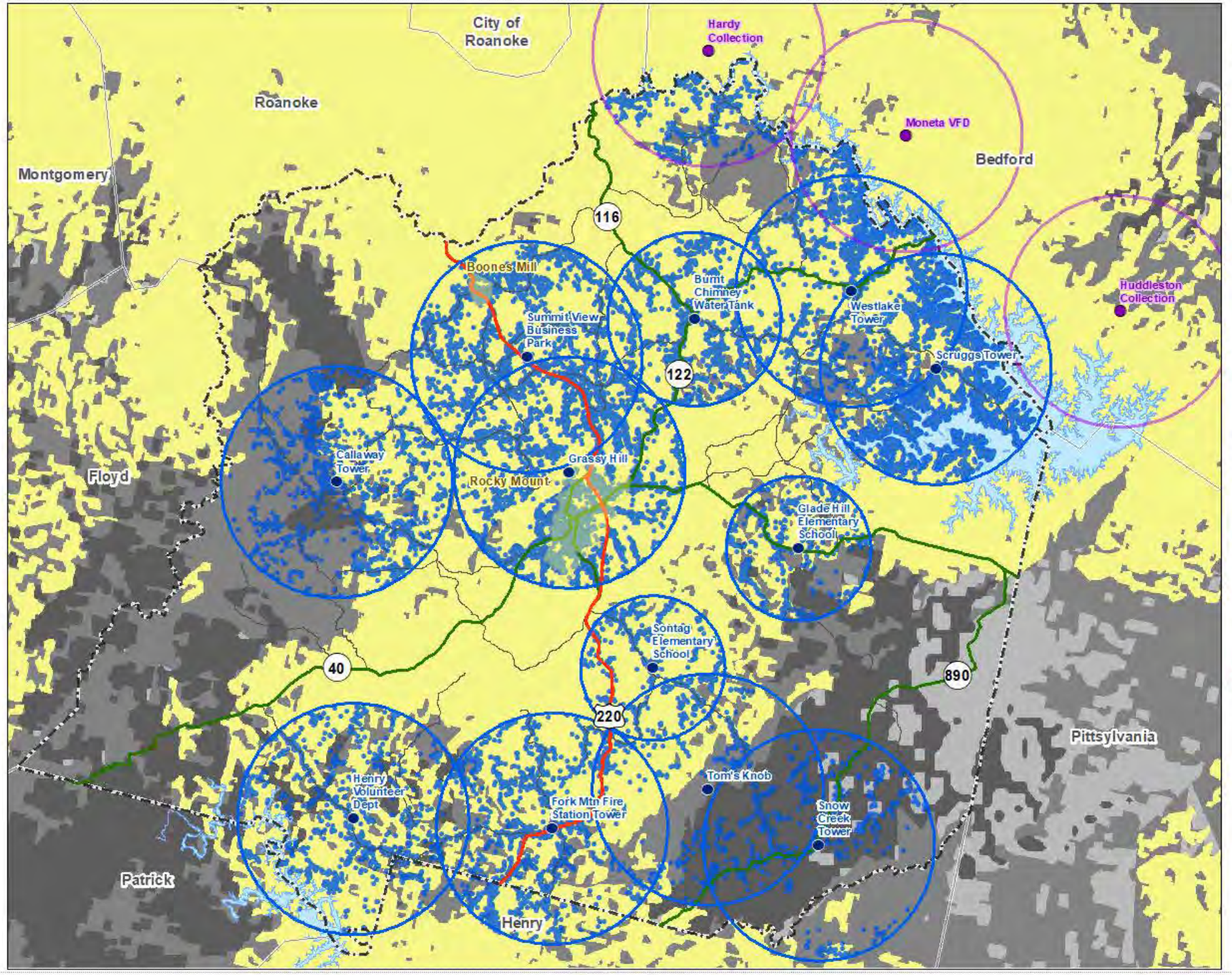


Franklin County

VATI 2020 Application

Attachment 4

Documentation Unserved Area VATI Criteria



Franklin County 2020 VATI Grant

Attachment 4

Documentation Unserved Area VATI Criteria

Potential Wireless Customers
(20,202 Residential)
(947 Non-Residential)
(580 Henry Co/Patrick Co)

Franklin Tower Sites

Bedford Tower Sites

Franklin Co Tower Coverage

Bedford Co Tower Coverage

Available Download Speeds

- 0.2 - 1.5 mbps
- 1.5 - 6 mbps
- 6 - 10 mbps
- 10 - 50 mbps
- 50 - 100 mbps
- No Download Speed Data
- No Available Service

Service Layer Credits:
National Telecommunications Information Administration (NTIA) State Broadband Data Development Program

Water Features

US Hwy

State Hwy

Primary Collector

0 2.5 5 Mi

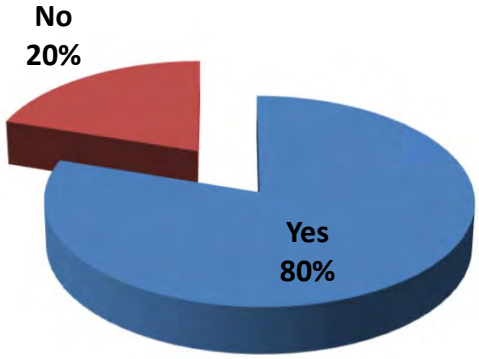
Date: 9/3/2019

Franklin County Citizen's Survey

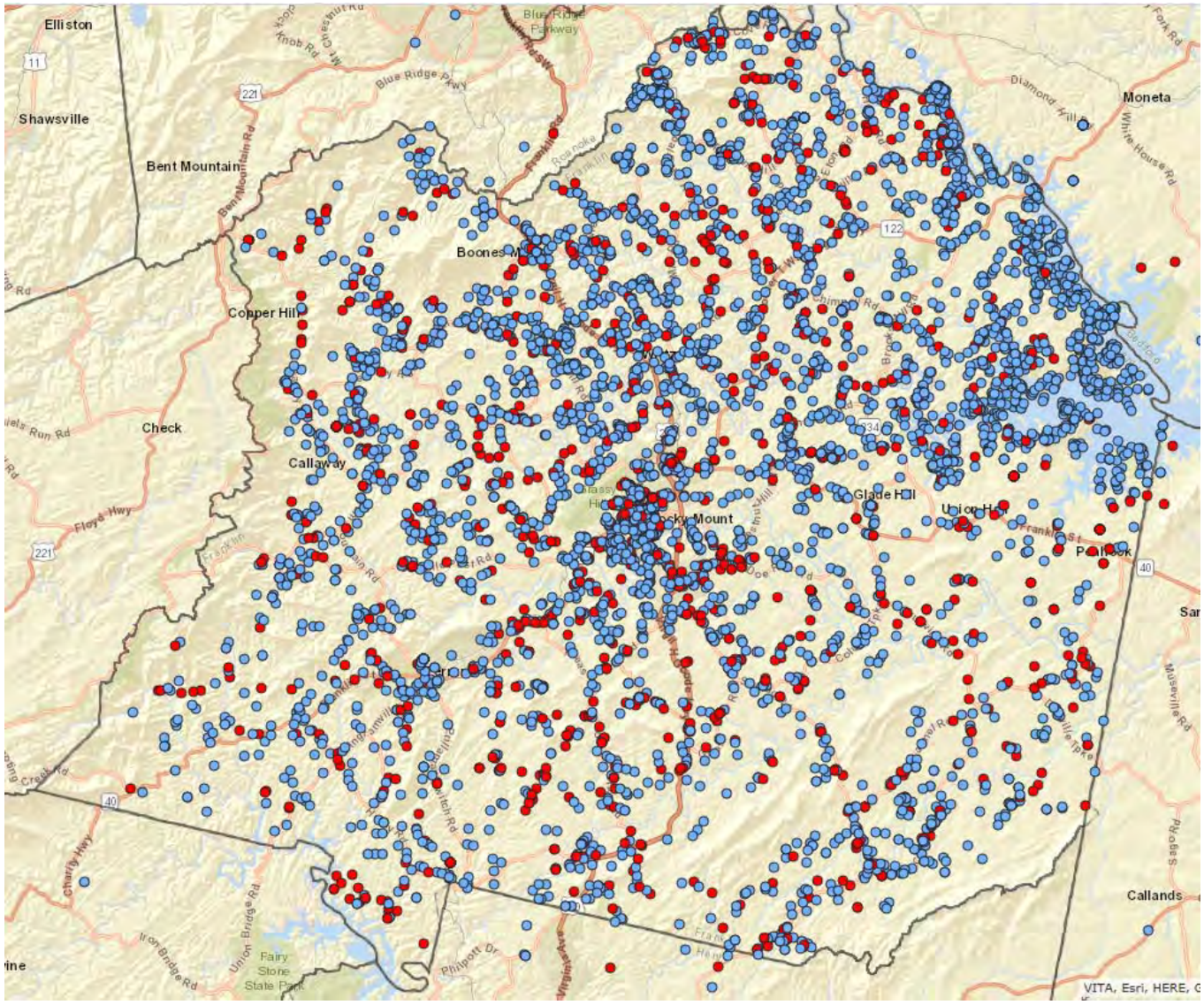
6258 Responses

99% +/- 1.39
based on occupied housing units (23,248)

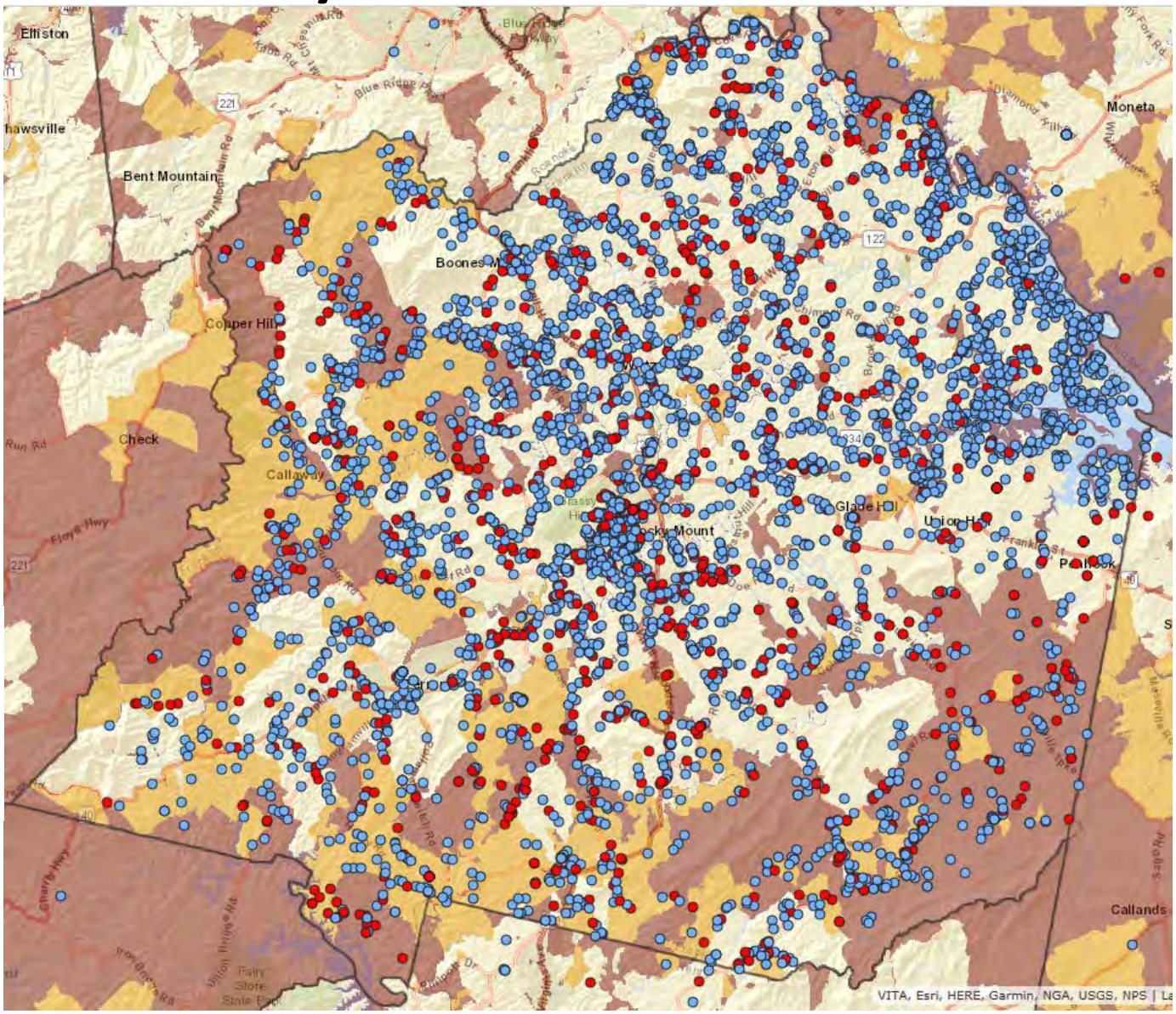
Do you have Internet service at home?



Over 90% of respondents feel the Internet is important.



Franklin County Un/Underserved



● Unserved = Broa*d*band speed below 10 Mbps Download speed

● Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

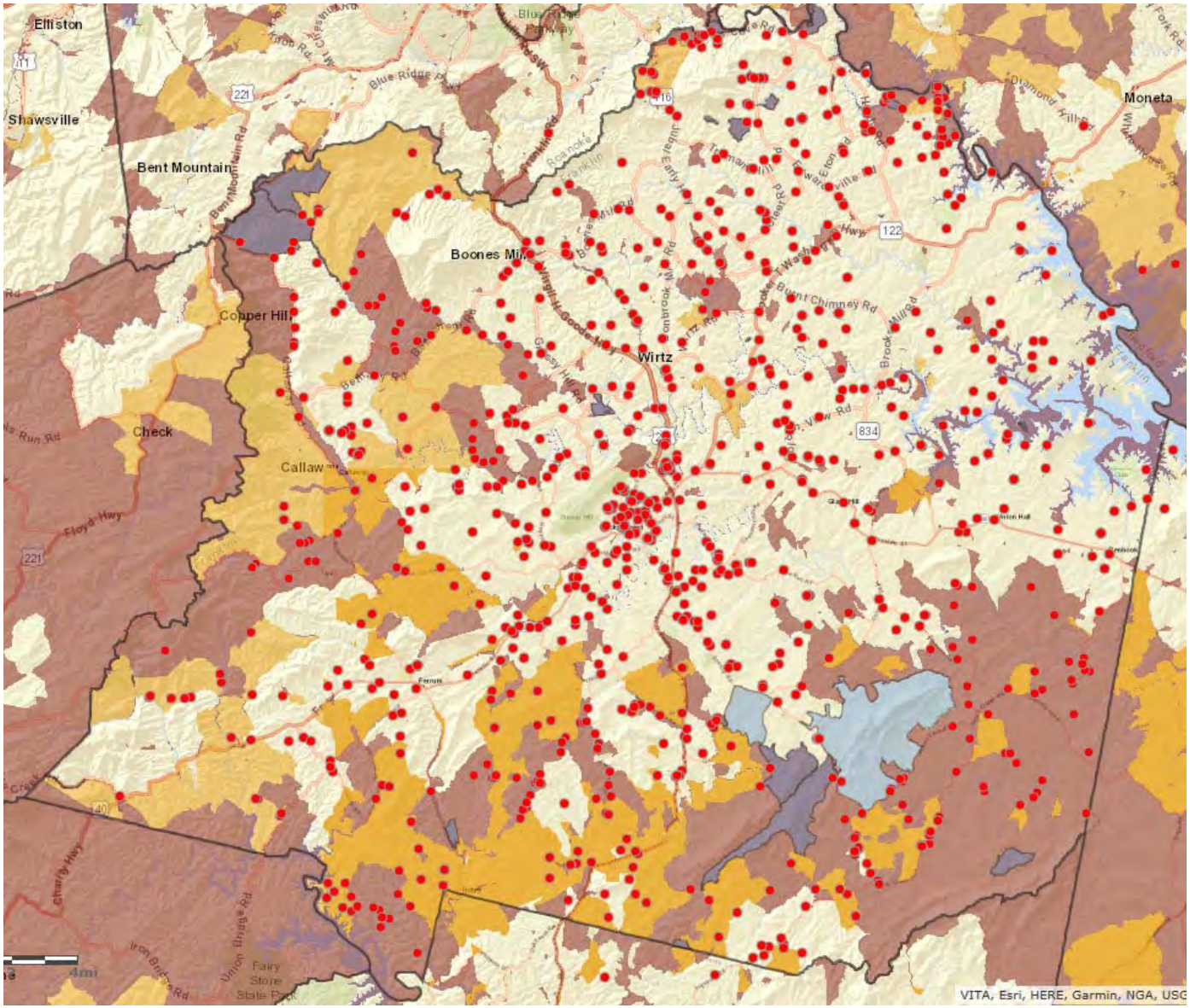
Franklin County Un/Underserved

Do you have Internet Service at Home?

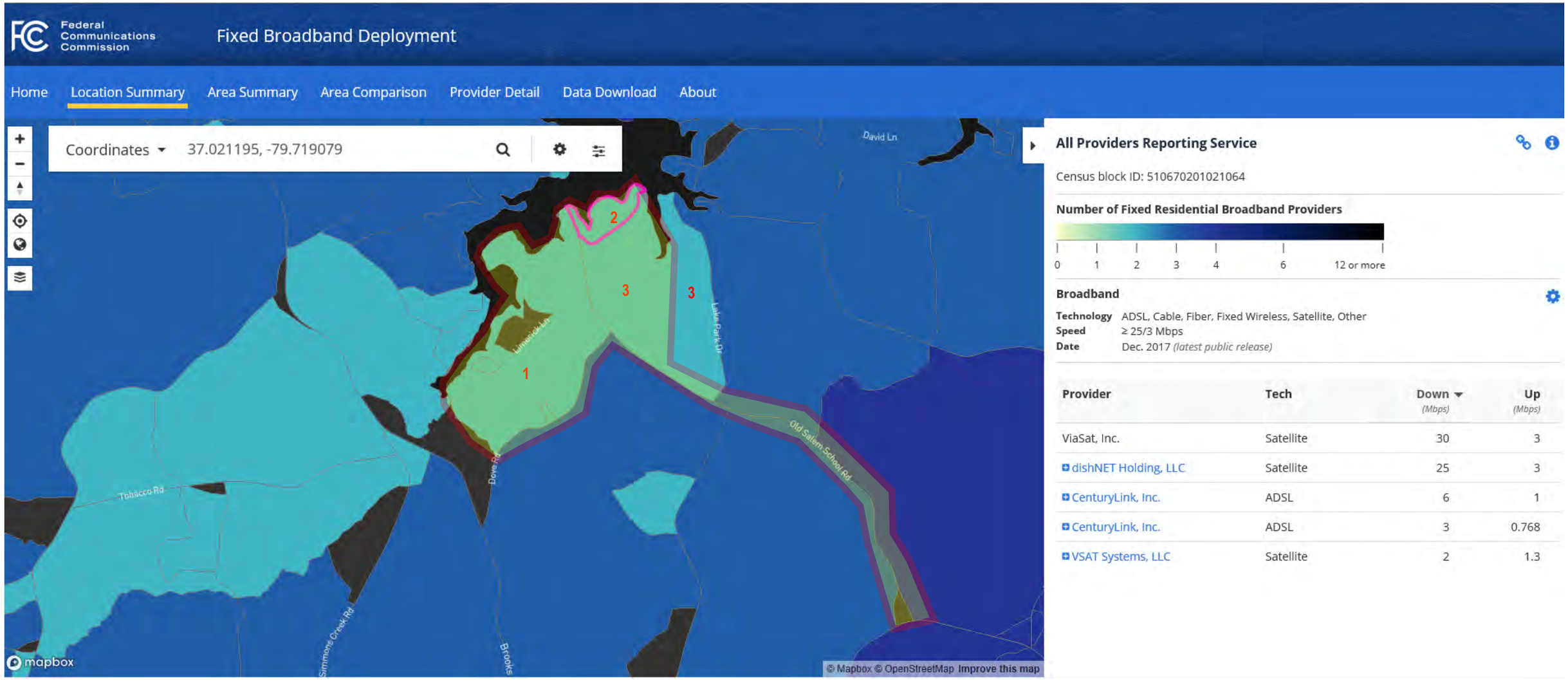
- No.

Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed



Attachment 4 - Documentation Userved Area VATI Criteria



Penhook 477 Broadband Sencus Data:
The proposed area the for Shentel fiber extension is located in the yellow boundary. This area is divided into 3 census block (1-3). Area 1 and 2 is currently provided by CenturyLink with a maxium 6Mbps down and 1Mbps up. CenturyLink is reporting in area 3, 20Mpbs up with 2Mbps down and 1.5Mbps up with 0.512 down. Shentel would build an RFoG (RF Over Glass) fiber to the home network that would offer 1Gbps down and 10Mbps up utilizing a CMTS Docsis 3.1 technology for broadband plus offer video and telephone service.

Franklin County

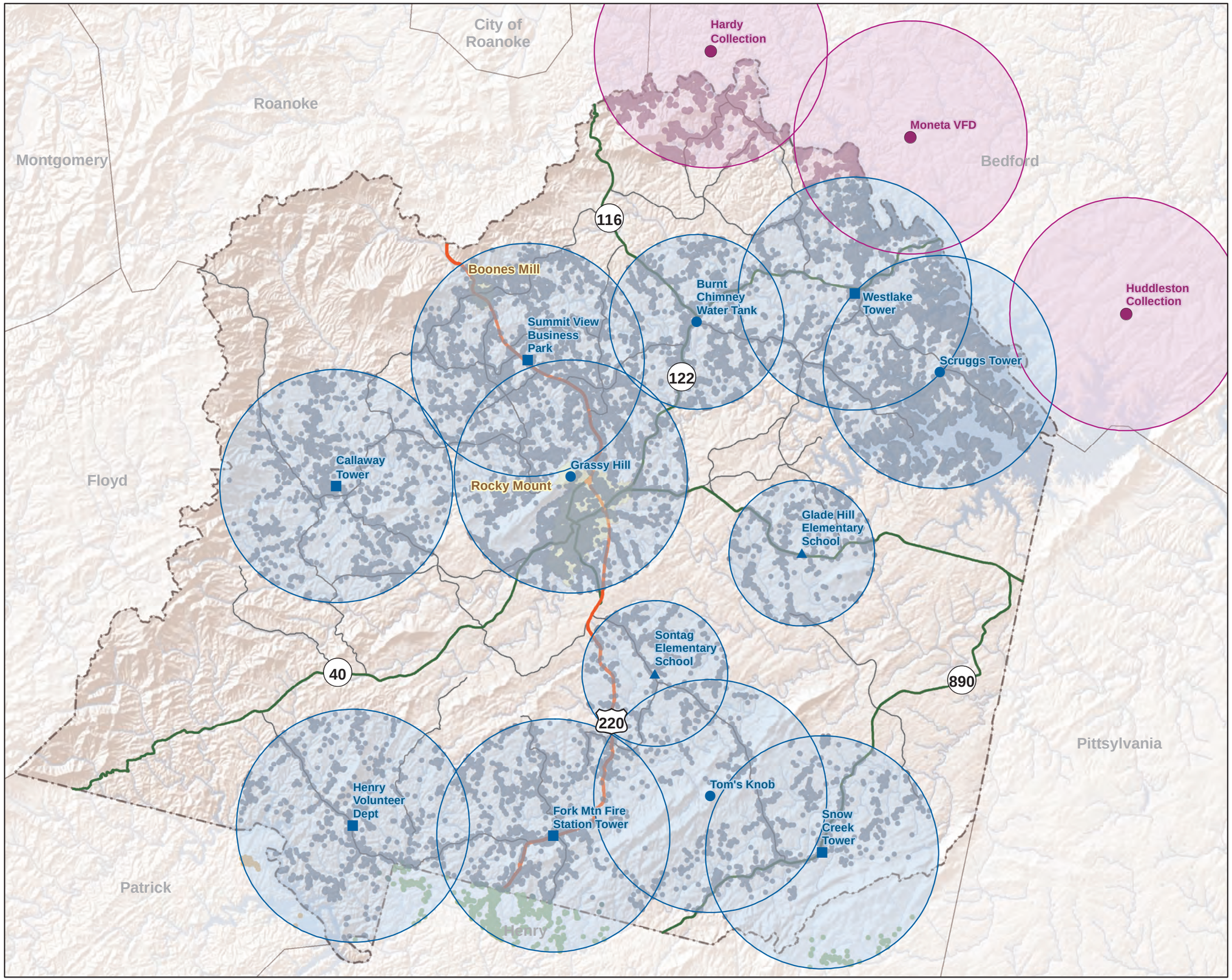
VATI 2020 Application

Attachment 5

Propagation Map Wireless Project

Franklin County 2020 VATI Grant

Attachment 5 - Propagation Map Wireless Project



- Reached by Franklin Sites (21,495 Addresses)
- Reached by Bedford Sites (725 Addresses)
- Henry Co Coverage (541 Addresses)
- Patrick Co Coverage (39 Addresses)
- Franklin - Existing Pole
- Franklin - New Monopole
- Franklin - Community Pole
- Bedford - Tower Sites
- Franklin - Potential Coverage
- Bedford - Potential Coverage
- Franklin County
- Surrounding Counties
- Water Features
- US Hwy
- State Hwy
- Primary Collector

0 2.5 5 Mi

Date: 9/3/2019

Franklin County

VATI 2020 Application

Attachment 6

Timeline/Project Management Plan

Franklin County VATI Proposed Project Management Plan

Task	Responsible Person	Responsible Entity	2019-2020 Proposed Timeline															
			Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21
Site Candidate Identification Pkg	Sean Cai (BRT)	Blue Ridge Towers Inc																
Site Lease Agreement	Sean Cai (BRT)	Blue Ridge Towers Inc																
Survey	Sean Cai (BRT)	Blue Ridge Towers Inc																
TOW/AIR Approval	Sean Cai (BRT)	Blue Ridge Towers Inc																
SHPO/NEPA	Tower Engineering Profession	State/Federal Agencies																
Compliance Review	Steve Sandy (FC)	Franklin County																
Geotech Report	Sean Cai (BRT)	Blue Ridge Towers Inc																
Design/Construction Dwgs	Sean Cai (BRT)	Blue Ridge Towers Inc																
Permit Approval	Steve Sandy (FC)	Franklin County																
Tower Order	Sean Cai (BRT)	Blue Ridge Towers Inc																
Construction Starts	Anthony Smith (BRT)	Blue Ridge Towers Inc																
Foundation Complete	Anthony Smith (BRT)	Blue Ridge Towers Inc																
Tower Delivery	Sean Cai (BRT)	Blue Ridge Towers Inc																
Tower Stack	Anthony Smith (BRT)	Blue Ridge Towers Inc																
Inspections Complete	Building Inspector	Franklin County																
Construction Complete	Anthony Smith (BRT)	Blue Ridge Towers Inc																
Service Deployment	Anthony Smith (BRT)	BRISCNET																
Prepare Quarterly Reports	Brian Carter (FC)	Franklin County																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**Task**	**Responsible Person**	**Responsible Entity**	**2020 Proposed Timeline**											
2				January	February	March	April	May	June	July	August	September	October	November	December
3															
4															
5	Field Engineering	Jason Durrance	Shentel -OSPE Supervisor												
6	Permitting	Jason Durrance	Shentel -OSPE Supervisor												
7	Permitting Management	John Stotler	Shentel-Permitting Supervisor												
8	Construction	Gary Marino	Shentel Construction Mgr												
9	Invoicing	Larry Hubbard	Shentel-OSPE Manager												
10	Project Management	Jason Durrance	Shentel -OSPE Supervisor												
11	Quarterly Reporting	Brian Carter	Franklin County												
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															

Franklin County

VATI 2020 Application

Attachment 7

Relationship Between Applicant/Co-Applicant

MEMORANDUM OF UNDERSTANDING BETWEEN
FRANKLIN COUNTY BROADBAND AUTHORITY, BLUE RIDGE TOWERS, INC. AND BRISCNET, LLC.
FOR APPLYING FOR VIRGINIA TELECOMMUNICATIONS INITIATIVE FUNDING FOR PROVIDING BROADBAND SERVICES

I. PARTIES AND PURPOSE

This Memorandum of Understanding (MOU) is made and entered into this 3rd day of September, 2019 by and between the Franklin County Broadband Authority (FCBA), a political subdivision of the Commonwealth of Virginia under the Wireless Service Authorities Act, hereinafter referred to as the "FCBA", Blue Ridge Towers, Inc. (BRT), a Virginia Corporation, and BRISCNET, LLC. (BRISCNET)., a wireless internet service provider, for the purpose of creating a partnership to prepare and submit an application for grant funding through the Virginia Telecommunications Initiative (VATI) Funding Program managed by the Virginia Department of Housing and Community Development (DHCD) in an effort to expand and improve broadband services to the citizens of Franklin County, Virginia..

The FCBA recognizes that in order to attain and maintain a high-quality level of broadband service to the citizens of Franklin County, a close working relationship with the private internet providers is desirable and will be made possible in large part through state and Federal grant funding opportunities.

II. SCOPE OF WORK

The FCBA, BRT and BRISCNET desire to cooperatively work together to prepare and submit an application for grant funding through the 2020 Virginia Telecommunications Initiative (VATI) Funding Program managed by the Virginia Department of Housing and Community Development (DHCD) to construct towers and develop a fixed wireless broadband service in the County by construction and developing the necessary infrastructure to create a fixed wireless service with facilities and associated microwave or fiber optic backhaul. The application for funding anticipates wireless service coverage to be made available to approximately 21,495 County households and businesses in Franklin County. Service is envisioned to be provided through the following infrastructure improvements:

Construction/Installation of four (4) new monopole towers
Rebuild two (2) existing tower structures
Installation of two (2) new 80' community poles
Colocation of equipment on four (4) existing County/WVWA structures
Installation of nine (9) microwave backhauls
Installation of fixed wireless internet equipment for access points
Purchase of subscriber modules for customer access
Installation of approximately 6.5 miles of new open access fiber in cooperation with Franklin County Broadband Authority and/or Mid-Atlantic Broadband.

FCBA, BRT and BRISCNET agree to provide the necessary funding to purchase the above equipment, construct the above items, manage the fixed wireless network and other work necessary to deliver a fully functional fixed wireless service in Franklin County providing minimum average wireless speeds of 25 Mbps/3 Mbps and up to 75Mbps/10 Mbps. The total cost of this project is estimated at $4,000,000..

FCBA agrees to complete a grant funding application, with assistance from the FCBA consultant, BRT and BRISCNET through the 2020 VATI Program requesting $1,878,920 in VATI funding for the fixed wireless project on or before September 3, 2019.

All parties confirm that a detailed agreement shall be executed if funding is approved to outline all the obligations of the FCBA, BRT and BRISCNET and provide performance guarantees for service delivery and maintenance. If funding is approved from VATI, all parties confirm and understand that the parties will be responsible for providing the remainder of the funding necessary to complete the project for which VATI funding was received.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Understanding on the day, month, and year indicated:

FOR FRANKLIN COUNTY BROADBAND AUTHORITY:

Approved as to Form:

Mark C. Popovich
County Attorney

FRANKLIN COUNTY BROADBAND AUTHORITY, VIRGINIA

By:
Robert Camicia
FCBA Chairman

STATE OF VIRGINIA
COUNTY OF FRANKLIN, to wit:

The foregoing instrument was acknowledged before me this 30th day of August, 2019, by Robert Camicia, FCBA Chairman on behalf of the Franklin County Broadband Authority.

Registration #: 7705113

My Commission expires: 10/31/2020

Hannah L Powell
Notary Public

HANNAH LONG POWELL
NOTARY PUBLIC
REG. #7705113
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES OCT. 31, 2020

FOR BRISCNET, LLC.

By: _____
Anthony Smith
Managing Partner

STATE OF VIRGINIA
COUNTY OF FRANKLIN, to wit:

The foregoing instrument was acknowledged before me this 3rd day of September, 2019, by Anthony Smith, Managing Partner of BRISCNET.

Registration # 7781233

My Commission expires on May 31, 2022

Notary Public _____

SHAQUANNA BRUCE
NOTARY PUBLIC
REGISTRATION # 7781233
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES
MAY 31, 2022

FOR BLUE RIDGE TOWER, INC.:

By: _____
Anthony Smith
Blue Ridge Tower, Inc.

STATE OF VIRGINIA
COUNTY OF FRANKLIN, to wit:

The foregoing instrument was acknowledged before me this 3rd day of September, 2019, by Anthony Smith, President.

Registration #: 7781233

My Commission expires on May 31, 2022

_____
Notary Public

SHAQUANNA BRUCE
NOTARY PUBLIC
REGISTRATION # 7781233
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES
MAY 31, 2022

MEMORANDUM OF UNDERSTANDING BETWEEN FRANKLIN COUNTY BROADBAND AUTHORITY AND SHENTEL FOR APPLYING FOR VIRGINIA TELLECOMMUNICATIONS INITIATIVE FUNDING FOR PROVIDING BROADBAND SERVICES

I. PARTIES AND PURPOSE

This Memorandum of Understanding (MOU) is made and entered into this 8 day of August, 2019 by and between the Franklin County Broadband Authority (FCBA), a political subdivision of the Commonwealth of Virginia under the Wireless Service Authorities Act, hereinafter referred to as the "FCBA," and Shenandoah Telecommunications Company, hereinafter referred to as "Shentel," for the purpose of creating a partnership to prepare and submit an application for grant funding through the Virginia Telecommunications Initiative (VATI) the Virginia Department of Housing and Community Development in an effort to expand and improve broadband services to the citizens of Franklin County, Virginia.

The FCBA recognizes that in order to attain and maintain a high-quality level of broadband service to the citizens of Franklin County, a close working relationship with the private internet providers is desirable and will be made possible in large part through state and federal grant funding opportunities.

II. SCOPE OF WORK

The FCBA and Shentel desire to cooperatively work together to prepare and apply for grant funding through the 2020 Virginia Telecommunications Initiative (VATI) Funding Program managed by the Virginia DHCD to provide fiber broadband service in several areas of the County by extending their existing fiber network. The application for funding anticipates coverage to be made available to approximately 255 households and businesses in the County that are currently unserved/underserved. Service is envisioned to be provided through the following infrastructure improvements:

- Penhook: Coaxial cable/fiber extension (21,500 feet of Aerial, 13,000 feet of Underground). Approximately 191 homes and businesses passed.

FCBA and Shentel agree to provide the necessary funding to construct the projects above to deliver internet service to the homes/businesses in these areas by providing minimum average internet speeds ranging from 50 Mbps/10 Mbps to 1 Gbps. The total cost of these projects is estimated at $380,153.

To obtain necessary project funding, the FCBA agrees to complete a grant funding application, with assistance from the FCBA consultant and Shentel through the DHCD VATI Funding Program requesting $285,115 to be allocated to the above projects on or before September 3, 2019. Shentel agrees to provide the remaining project funding to complete the above projects.

Both parties confirm that a detailed agreement shall be executed if funding is approved to outline all the obligations of the FCBA and Shentel and provide performance guarantees for service delivery and maintenance. If funding is approved from DHCD, both parties confirm and understand that Shentel will be responsible for providing the remaining of the funding necessary to complete the project for which DHCD funding was received. In addition, as part of the funding agreement, Shentel agrees to provide one buffer tube (12 strands) of fiber with each project and a thirty (30) year IRU (Indefeasible Right to Use) agreement for the FCBA subject to no up-front fees. However, a market rate annual maintenance fee may be required.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Understanding on the day, month, and year indicated:

FOR FRANKLIN COUNTY BROADBAND AUTHORITY:

Approved as to Form:

By: _____
Mark C. Popovich
County Attorney

FRANKLIN COUNTY
BROADBAND AUTHORITY,
VIRGINIA

By: _____
Robert Camicia
FCBA Chairman

STATE OF VIRGINIA
COUNTY OF FRANKLIN, to wit:

The foregoing instrument was acknowledged before me this 30th day of August, 2019 by Robert Camicia, FCBA Chairman on behalf of the Franklin County Broadband Authority.

Registration #: 7705113
My Commission expires: 10/31/2020

_____
Notary Public

HANNAH LONG POWELL
NOTARY PUBLIC
REG. #7705113
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES OCT. 31, 2020

FOR SHENTEL:

By: _____
Christopher S. Kyle,
Vice President Industry Affairs
and Regulatory

STATE OF VIRGINIA
COUNTY OF FRANKLIN, to wit:

The foregoing instrument was acknowledged before me this 3rd day of September, 2019 by Christopher S. Kyle, Vice President of Shenandoah Telecommunications Company (Shentel).

Registration #: 169485
My Commission expires: 7-31-2020

_____
Notary Public

NORMA J COPELAND
NOTARY PUBLIC
REG. #169485
MY COMMISSION EXPIRES
07/31/2020
COMMONWEALTH OF VIRGINIA

Franklin County

VATI 2020 Application

Attachment 8
Letters of Support

Town of Rocky Mount
345 Donald Avenue
Rocky Mount, Virginia 24151

PHONE : 540.483.7660
FAX : 540.483.8830

E-mail: jervin@rockymountva.org
www.rockymountva.org

August 27, 2019

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County 2020 VATI Broadband Application

Dear Mr. Johnston:

The Town of Rocky Mount Supports the Franklin County 2020 VATI application. This broadband project is vital to the citizens and businesses in Franklin County. The Franklin County Center for Innovative Technology (CIT) survey of County households found that 66% of County residents lacked adequate internet service. High speed, reliable broadband services are essential for our students, citizens, and businesses to be competitive in today's workforce.

The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Therefore, we support the County's request for funding the necessary broadband improvements in Franklin County.

The Town requests that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

C. James Ervin

C. James Ervin,
Town Manager

CJE:rhd

cc: Christopher Whitlow, Interim County Administrator
Steven Sandy, Director of Planning & Community Development

West Piedmont
Planning District Commission

P.O. Box 5268
Martinsville, VA 24115-5268
Phone: (276) 638-3987
Fax: (276) 638-8137
e-mail: staff@wppdc.org

Serving Franklin, Henry, Patrick, and Pittsylvania Counties - Cities of Danville and Martinsville - Town of Rocky Mount - Since 1970

August 23, 2019

Mr. Chris Whitlow, County Administrator
Franklin County
1255 Franklin Street
Rocky Mount, VA 24151

Dear Mr. Whitlow,

On behalf of the West Piedmont Planning District Commission, the Board of Commissioners would like to offer support for Franklin County's application to the Department of Housing and Community Development's Virginia Telecommunications Initiative (VATI). We understand funds obtained through this program will allow for a combination of fixed wireless and fiber to customers in several unserved areas of the County. We acknowledge this will be implemented in partnership with Blue Ridge Towers for the fixed wireless service and Shentel for the fiber to home in conjunction with the Mid-Atlantic Broadband Corporation.

Further, we realize that more than 20% of Franklin County lacks adequate access to broadband as identified in the Center for Innovative Technology's 2017 needs assessment. Additionally, the increased Internet service will be implemented in a phased approach as outlined in the Franklin County Broadband Assessment and Plan prepared by Design Nine, Inc.

We highly commend the efforts of Franklin County to expand broadband and Internet accessibility throughout the County. We wish you every success in this endeavor to enhance quality of life and propel the economic vitality in these rural areas of the County.

Sincerely,

David R. Hoback
Executive Director

cc: Steve Sandy, Franklin County

SMITH MOUNTAIN LAKE
Regional Chamber of Commerce

August 26, 2019

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County
2020 VATI Broadband Application

Dear Mr. Johnston:

I am writing to express the support of Smith Mountain Lake Regional Chamber of Commerce for the Franklin County 2020 VATI application. This broadband project is vital to the citizens and businesses in Franklin County. The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Therefore, we support the County's request for funding the necessary broadband improvements in Franklin County.

We request that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

Lindsey Coley
SMLRCC Board Chairman

Cc: Christopher Whitlow, Franklin County
Steven Sandy, Franklin County

FRANKLIN COUNTY PUBLIC SCHOOLS
Office of Superintendent
25 Bernard Road • Rocky Mount, VA 24151-6614
(540) 483-5138 • FAX (540) 483-5806

August 26, 2019

Virginia Department of Housing & Community Development
ATTN: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County 2020 VATI Broadband Application

Dear Mr. Johnston:

I am writing to express the support of Franklin County Public Schools for the Franklin County 2020 VATI application. This broadband project is vital to the students, parents, citizens, and businesses in Franklin County. A recent Center for Innovative Technology (CIT) survey of County households found that 34% of County residents had inadequate internet service with another 15%-20% of K-12 households reporting no internet access. The school system can attest to multiple stories of K-12 students found sitting on school porches during evenings and weekends to utilize school WiFi in order to complete school assignments. The inadequate and/or sometimes non-existent internet service in Franklin County neighborhoods places our K-12 students at a significant disadvantage when competing in the global marketplace.

The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Franklin County Public Schools are interconnected with high speed fiber. A large portion of the County Broadband Plan will look to utilize such fiber, as well as the properties of various elementary schools in the County to construct towers for wireless internet service providers to co-locate broadband equipment. The Franklin County Public Schools is supportive of this effort, and therefore supports the County's request for funding the necessary broadband improvements in the community.

We request that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

W. Mark Church, Ph.D.
Division Superintendent

cc: Christopher Whitlow, Interim County Administrator
Steven Sandy, Director of Planning & Community Development

WESTERN VIRGINIA
WATER AUTHORITY

UTILITY ADMINISTRATION

August 27, 2019

VIA EMAIL

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

Re: Franklin County's 2020 VATI Broadband Application

Dear Mr. Johnston:

This letter is in support of Franklin County's 2020 VATI Application. As you are aware, broadband is vital to citizens and businesses and its development has been slower in rural parts of the Commonwealth. Franklin County's Broadband Authority has gathered input from its citizens and a consultant to develop a proposal that will meet some of the greatest needs in the County.

The Western Virginia Water Authority has been a partner with Franklin County on infrastructure projects for more than 10 years. During that time, Franklin County has always met project goals and requirements, delivering needed services to its citizens. I enthusiastically support the County's request for funding the necessary broadband improvements in Franklin County.

Please do not hesitate to contact me if you have any questions or need additional information.
Sincerely,

Michael T. McEvoy
Executive Director

cc: Steve Sandy, Planning Director

FERRUM COLLEGE

August 23, 2019

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County
2020 VATI Broadband Application

Dear Mr. Johnston:

I am writing to express Ferrum College's support for the Franklin County 2020 VATI application. Since 1913, Ferrum College has sought to provide educational opportunities to students in the region and to work alongside our community partners to boost the economic health of our region.

This broadband project represents an important need to the citizens and businesses in Franklin County. The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Therefore, we support the County's request for funding the necessary broadband improvements in Franklin County.

We request that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

Wilson Paine
Vice President for Institutional Advancement
Ferrum College

Cc: Christopher Whitlow, Franklin County
Steven Sandy, Franklin County

August 26, 2019

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County
2020 VATI Broadband Application

Mr. Johnston:

I am writing to express the support of the Town of Boones Mill for the Franklin County 2020 VATI application. This broadband project is vital to the citizens and businesses in Franklin County including those in the Town. The Center for Innovative Technology (CIT) survey of County households found 34% of residents had inadequate internet service. High speed, reliable broadband services are essential for our students, citizens, and businesses to be competitive in today's workforce. The County's Broadband Authority has gathered input from citizens and consultants to develop a proposal which will meet some of the greatest needs in the County. We support the County's request for funding the necessary broadband improvements in Franklin County.

We request DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

B.T. Fitzpatrick III

B.T. Fitzpatrick III
Town Manager

cc: Christopher Whitlow, Interim County Administrator
Steven Sandy, Director of Planning & Community Development

HENRY VOLUNTEER FIRE DEPT.

5241 Henry Road Henry, VA 24102 · 540-365-2157

Chief Neal Ingram · Assistant Chief Scott Cowen

August 24, 2019

Virginia Department of Housing & Community Development
Att: Mr. Erik Johnson, Director
600 E. Main Street #300
Richmond, VA 23219

RE: Letter of Support of the Franklin County
2020 VATI Broadband Application

Dear Mr. Johnson

I am writing to express the support of the Henry Volunteer Fire Department for the Franklin County 2020 VATI application. This broadband project is vital to the citizens and businesses in Franklin County. The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Therefore, we support the County's request for funding the necessary broadband improvements in Franklin County.

We request that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

Neal Ingram, Chief
Henry Volunteer Fire Department

Cc: Christopher Whitlow, Franklin County
Steven Sandy, Franklin County

Franklin County

VATI 2020 Application

Attachment 9

Documentation of Match Funding

DOCUMENTATION OF IN-KIND CONTRIBUTIONS

FRANKLIN COUNTY 2020 VATI APPLICATION

Site Leases

BRT land leases	2 @ $14,400/YR @ 5 YRS	$144,000.00	
FCBA Land leases	4 @ $14,400/yr @ 5 YRS (New sites)	$288,000.00	
	5 @ $3600/yr @ 5yrs (Existing sites)	$90,000.00	
Equipment/colocation leases	12 sites @ $4800/yr over 5yrs	$288,000.00	
Total Lease Cost			**$810,000**

Legal/Administration **$100,000**

Estimated Costs

	Rate	Hours	Cost
Franklin County Staff	$70/hr	1157	$81,000
County Attorney	$150/hr	60	$9,000
Consultant	$125/hr	80	$10,000

Permitting fees	$2,000 per new site x 6	$12,000.00	
	$1000 per collocate x 6	$6,000.00	
Permitting Fees			**$18,000**
BRISCNET/Blue Ridge Towers leases			**$172,000**
TOTAL IN-KIND CONTRIBUTIONS			**$1,100,000**

Franklin County

VATI 2020 Application

Attachment 10
Funding Sources Table

VATI FUNDING SOURCES TABLE – FC 2020 VATI APPLICATION

Please fill in the chart below with a description of the project funding source (local, federal, state, private, other), the amount from that source, the percentage of total project funding that source represents, and a description of the current status of the funds (pending, secured, etc.).

Source	Amount	%	Status
REQUESTED VATI	$ 2,383,039	52	Pending
Blue Ridge Towers	$ 714,000	16	Secured
BRISCNET	$511,000	11	Secured
FC BA- Capital	$140,000	3	Secured
FC in-kind	$ 756,000	16	Pending
Shentel	$95,038	2	Secured
TOTAL	**$ 4,599,077**	**100 %**	

Franklin County

VATI 2020 Application

Attachment 11
Derivation of Costs

Franklin County 2020 VATI

Derivation of Cost

Product	Total	VATI	Non-VATI	Source of Estimate	Date
FIXED WIRELESS					
TOWER CONSTRUCTION					
Class 4 Monopole Tower	**$450,000**	**$0**	**$450,000**	**BRT**	**8/28/2019**
Class 2 Monopole Tower	**$420,000**	**$350,000**	**$70,000**	**BRT**	**8/28/2019**
Rebuilds	**$272,000**	**$232,000**	**$40,000**	**BRT**	**8/28/2019**
Community Poles	**$108,000**	**$78,000**	**$30,000**	**BRT**	**8/28/2019**
TOWER DEVELOPMENT					
New Sites	**$342,000**	**$242,000**	**$100,000**	**BRT**	**8/28/2019**
Existing Sites	**$180,000**	**$180,000**	**$0**	**BRT**	**8/28/2019**
MICROWAVE CONSTRUCTION					
Equipment	**$346,500**	**$233,500**	**$113,000**	**BRT**	**8/28/2019**
Eng/Design	**$13,500**	**$13,500**	**$0**	**BRT**	**8/28/2019**
EQUIPMENT COST					
Cambium antennae	**$390,000**	**$0**	**$390,000**	**BRT**	**8/28/2019**
FIBER INSTALLATION					
Fiber	**$433,920**	**$433,920**	**$0**	**BRT**	**8/28/2019**
Eng/Design	**$30,000**	**$30,000**	**$0**	**BRT**	**8/28/2019**
LEASES					
Land leases	**$522,000**	**$0**	**$522,000**	**FCBA**	**8/28/2019**
Colocation leases	**$288,000**	**$0**	**$288,000**	**FCBA**	**8/28/2019**
SHENTEL FIBER TO HOME					
Permitting/Make Ready	**$69,650**	**$52,238**	**$17,412**	**Shentel**	**8/28/2019**
Engineering	**$19,352**	**$14,514**	**$4,838**	**Shentel**	**8/28/2019**
Electronics	**$30,000**	**$22,500**	**$7,500**	**Shentel**	**8/28/2019**
Construction	**$151,911**	**$113,933**	**$37,978**	**Shentel**	**8/28/2019**
Materials	**$109,240**	**$81,930**	**$27,310**	**Shentel**	**8/28/2019**

Franklin County 2020 VATI

Derivation of Cost

ADMINISTRATIVE					
Bonding/Insurance	**$86,000**	**$86,000**	**$0**	**BRT**	**8/28/2019**
Legal/Administration	**$100,000**	**$0**	**$100,000**	**FCBA**	**8/28/2019**
Permitting	**$18,000**	**$0**	**$18,000**	**FCBA**	**8/28/2019**
Contingencies	**$219,004**	**$219,004**	**$0**	**FCBA**	**8/28/2019**
TOTAL PROJECT COST	**$4,599,077**	**$2,383,039**	**$2,216,038**		

Franklin County

VATI 2020 Application

Attachment 12
Documentation of
Supporting Costs

CORE Telecom Systems

CELEBRATING 20 YEARS IN BUSINESS

CORE Telecom Systems, Inc.
1131 North Warson Rd
St. Louis, MO 63132
314-372-0240

Quote

Quote Number: Quote: 0051465
Quote Date: 20190301
Salesperson: James Shell
Customer Number: BLU540

Sold To:
BLUE RIDGE TOWERS
1125 1ST STREET
ROANOKE, VA 24016
United States
Confirm To:

Ship To:
BLUE RIDGE TOWERS
PMP FRANKLIN COUNTY
1125 1ST STREET
ROANOKE, VA 24016
United States **Attention To:**

Customer PO:	Ship Via:	F.O.B:	Terms:
QUOTE	UPS GROUND		NET 30

Item Code	Unit	Quantity	Price	Amount
C009045A001A 900 MHZ PMP 450I CONNECTORIZED ACCESS POINT..	EACH	1.00	2,324.84	2,324.84
C000065L007B CAM PTP650/670 LPU AND GROUNDING KIT	EACH	5.00	320.00	1,600.00
KPPA-900DP-90S-PMP 900MHZ DUAL POL 12.5 DBI 90 DEGREE SECTOR WITH PMPO MOUNTING BRACKET	EACH	1.00	345.00	345.00
30009406002 CAMBIUM N-TO-N CABLE, 16"	EACH	2.00	19.20	38.40
N000000L034A CAM POWER SUPPLY, 30W, 56V-GBPS SUPPORT	EACH	1.00	20.00	20.00
N000900L007A CAM AC LINE CORD - US	EACH	1.00	4.00	4.00
C009045C001A 900 MHZ PMP 450I CONNECTORIZED SUBSCRIBER MODULE..	EACH	5.00	234.84	1,174.20
600SSH SURGE SUPPRESSOR	EACH	9.00	28.00	252.00
N009045D003A 900 MHZ 12 DBI GAIN DIRECTIONAL ANTENNA (DUAL SLANT) - SUBSCRIBER MODULE	EACH	5.00	67.64	338.20
C000000L500A CMM5 CONTROLLER SUPPORTS UP TO 8 CMM5 POWER INJECTORS (32 PORTS). INCLUDES CONTROLLER, CONTROLLER TO INJECTOR CABLE, DC POWER PLUG, RACKMOUNT KIT, QUICKSTART GUIDE	EACH	1.00	796.00	796.00
C000000L556A CMM5 POWER AND SYNC INJECTOR 56V	EACH	2.00	1,036.00	2,072.00
N000000L054B POWER SUPPLY, AC, 56V, 240W	EACH	2.00	160.00	320.00
C000000L066A CNPULSE SYNC GENERATOR WITH CAMBIUMSYNC	EACH	1.00	223.20	223.20
N000000L125A CMM5 TO CNPULSE SHIELED CABLE, 20 METER	EACH	1.00	63.20	63.20
C050045A006B 5GHZ PMP 450I INTEGRATED ACCESS POINT, 90 DEGREE, US	EACH	4.00	2,552.84	10,211.36
C050045H012A	EACH	1.00	1,091.36	1,091.36

PMP450B 5GHZ SM, 4-PACK INTEGRATED 25DBI HIGH-GAIN ANTENNA WIDE BAND SUBSCRIBER MODULE, 4900-5925MHZ, UNCAPPED THROUGHPUT				
C000000L030A CNPILOT R201P, US, 802.11AC DUAL BAND GIGABIT WLAN ROUTER WITH ATA AND POE	EACH	9.00	117.06	1,053.54
01010419001 Coaxial Cable Grounding Kits for 1/4 and 3/8 Cable	EACH	22.00	21.00	462.00
WB3175A Description: Cable reel - 1000 ft. bulk clad CAT5e cable (BBDGe - Copper-clad steel armor)	EACH	2.00	950.00	1,900.00
/ONSITE SERVICES LABOR	EA	4.00	1,500.00	6,000.00
/TRAVEL TRAVEL	EACH	1.00	0.00	0.00

Net Order:	30,289.30
Less Discount:	0.00
Freight:	0.00
Sales Tax:	1,605.33
Order Total:	31,894.63

1131 North Warson Road
St. Louis, MO 63132

Quote

Valid Till:
Quote Number : 502397000016787027

Bill to:

Blue Ridge Towers
1125 1st Street
Roanoke, VA 24016

Ship To:

Blue Ridge Towers
PTP Franklin County

Quoted by:**Janessa Meeks** Contact phone:**1-888-375-8826**
Contact email:**jmeeks@coretelecom.net**

S.No.	Product Details	Part Number	Qty	Unit Price	Total
1.	**C000000L033A** GIGABIT SURGE SUPPRESSOR 56V		4	$40.00	$160.00
2.	**C180082B011A** PTP 820S RADIO TR 1560 HI 19260-19710 MHz		1	$3,298.00	$3,298.00
3.	**C180082B012A** PTP 820S RADIO TR 1560 LO 17700-18150 MHz		1	$3,298.00	$3,298.00
4.	**N000065L001B** 56 VDC, 60W POWER SUPPLY		2	$64.00	$128.00
5.	**N000065L003A** PTP650 US LINE CORD		2	$16.00	$32.00
6.	**N000082L014A** GLANDS X5 KIT		2	$25.60	$51.20
7.	**N000082L016A** CAT5E OUTDOOR 100M DRUM		2	$236.00	$472.00
8.	**N000082L017A** GROUNDING KIT FOR CAT5E F/UTP CABLE		7	$12.80	$89.60
9.	**N000082L034A** PTP820S CAPACITY KEY 650M, ACM ENABLED		2	$1,358.00	$2,716.00
10.	**N000082L073A** GBE CONNECTOR KIT		2	$20.80	$41.60
11.	**N000082L116A** GROUND CABLE FOR POE AND ODU		2	$12.80	$25.60
12.	**N180082D031A** 1' ANTENNA, SP, 18 GHZ, RFU-C & STD, UBR320		2	$381.90	$763.80

S.No.	Product Details	Part Number	Qty	Unit Price	Total
13.	**/ONSITE SERVICES** LABOR		4	$1,500.00	$6,000.00
14.	**/TRAVEL** TRAVEL		1	$0.00	$0.00
15.	**POFE159N** FCC Filing per terminal		2	$1,050.00	$2,100.00
16.	**WB3659** FCC Microwave Frequency Coordination Service per link		2	$1,050.00	$2,100.00
				Sub Total	**$21,275.80**
				Tax	$0.00
				Freight	$0.00
				Grand Total	**$21,275.80**

Terms and Conditions

Net 30 days with approved credit. Taxes and Freight not included unless specified. All Pricing in USD.

TERMS: 50% due on PO. 50% net 30 from delivery. Services Net 30.

There may be miscellaneous items that need to be added to complete the project. Travel costs will be figured in after travel has been completed. ***FCC Filing and Coordination Service is subject to change!***

Sales Order

Order Number: 0048933
Order Date: 6/6/2019
Salesperson: JAMES SHELL
Customer Number: 30-BLU540

CORE TELECOM SYSTEMS, INC.
1131 NORTH WARSON ROAD
ST. LOUIS, MO 63132
3143720240

Sold To:

BLUE RIDGE TOWERS
1125 1ST STREET
ROANOKE, VA 24016

Ship To:

BLUE RIDGE TOWERS
1125 1ST STREET
ANTHONY SMITH
ROANOKE, VA 24016

Confirm To:
SEAN

Fax No.

Customer P.O.	Ship VIA	F.O.B.	Terms
3CAB QUOTE	UPS GROUND	DESTINATION	NET 30

Item Number	Unit	Ordered	Shipped	Back Order	Price	Amount
BLUE RIDGE TOWERS SO QUOTE						
CTOS0201.002	EACH	12.00	0.00	0.00	1,682.0000	20,184.00
FLATPACK S POWER SYSTEM FRONT/REAR WIRE 40AMP MAX 48V NEGATIVE OUTPUT POLARITY / 1RU / FLUSH OR MID MOUNT INDIVIDUAL AC INPUTS TO SYSTEM (LU AC CORD) 2QTY RECTIFIER POSITIONS, E/W 2X 1000W 48V RECTIFIERS (241122.105) FRONT ACCESS PLUGGABLE 4QTY B FRAME DISTRIBUTION LOAD CIRCUIT BREAKER POSITIONS UP TO 30AMPS MAX (10AWG MAX), E/W 2X 20A & 2X 15A BREAKERS 2QTY LVBD INSTALLED 60AMP BATTERY BULLET CIRUCIT BREAKER POSITIONS (6AWG MAX)242100.410 SMARTPACK S CONTROLLER INCLUDED				**Whse:** 001		
48NPFC50	EACH	12.00	0.00	0.00	2,490.0000	29,880.00
PSI 48VDC LIFEPO4 RACK MOUNT BBU, 50AH. 7 YEAR REPLACEMENT AND INSTALLATION WARRANTY				**Whse:** 001		
PS48NPFC-E	EACH	12.00	0.00	0.00	286.0000	3,432.00
ETHERNET TO SERIAL ADAPTER FOR RACK MOUNT 7 YEAR WARRANTY				**Whse:** 001		
OD-30DX	EACH	12.00	0.00	0.00	2,624.0000	31,488.00
30H x 25W x 25DFRONT AND REAR DOORS3 POINT PAD LOCKING SYSTEMALUMASHIELDUN-PAINTED.125 ALUMINUM CONSTRUCTIONNEMA 3R/4X CLASS 250ONE REMOVABLE FILTER PANEL PER DOOR1 SET OF ADJUSTABLE 19 RACKING RAILS15 RACKING UNITS / RAIL SETRU RAIL MARKINGS(1) 1.25 CABLE PASS THRU HOLE ON EACH RAILETL Listed to UL standards ANSI/UL 60950-1/CSA C22.2 No. 60950-1				**Whse:** 001		
painted						
F25-115T	EACH	12.00	0.00	0.00	276.0000	3,312.00
110 VOLTS, DUAL FAN KIT W/ ADJUSTABLE THERMOSTAT, 210 CFM				**Whse:** 001		
PMS-3030UP	EACH	12.00	0.00	0.00	512.0000	6,144.00
30W x 30D POLE OR WALL MOUNTING SHELF..UNPAINTED				**Whse:** 001		
painted						

Continued

Sales Order

Order Number: 0048933
Order Date: 6/6/2019
Salesperson: JAMES SHELL
Customer Number: 30-BLU540

CORE TELECOM SYSTEMS, INC.
1131 NORTH WARSON ROAD
ST. LOUIS, MO 63132
3143720240

Sold To:

BLUE RIDGE TOWERS
1125 1ST STREET
ROANOKE, VA 24016

Ship To:

BLUE RIDGE TOWERS
1125 1ST STREET
ANTHONY SMITH
ROANOKE, VA 24016

Confirm To:
SEAN

Fax No.

Customer P.O.	Ship VIA	F.O.B.	Terms
3CAB QUOTE	UPS GROUND	DESTINATION	NET 30

Item Number	Unit	Ordered	Shipped	Back Order	Price	Amount
MISC EQUIPMENT	EACH	12.00	0.00	0.00	325.0000	3,900.00
				Whse: 001		
ZZ-4SQUARE-P	EACH	12.00	0.00	0.00	90.0000	1,080.00
				Whse: 001		

50% due on PO. 50% net 30 from delivery

Net Order:	99,420.00
Less Discount:	0.00
Freight:	0.00
Sales Tax:	5,269.26
Order Total:	104,689.26

QUOTATION

Valmont Industries, Inc.
28800 Ida Street

Valley, NE 68064

Quote Number: 459584-01
Created: 8/22/2019 4:12:55 PM
Revised:

Prepared for: Blue Ridge Towers
Attention: Sean Cai
Address1: 1125 1st Street
Address2:
City: Roanoke
State: VA
Zip: 24016
Phone: (540) 595-7060
Email: sean.cai@blueridgetowers.com

Budgetary: Yes
RFQ:
Project: Blue Ridge Towers - Budgetary Quote - 80' Monopole

NOTICE

Quoted prices will be held firm for 15 days. Prices are subject to change if product is not shipped within 2 months of Purchase Order receipt.

ITEM	DESCRIPTION	QTY	UNIT PRICE
1	80' MONOPOLE - 79' POLE WITH 1' FOUNDATION PROJETION	1	$10,735

Price Includes:
- Steel templates and anchor bolts.
- Pole sections and accessories to be hot dipped galvanized.
- Transmission line entry ports at the base of the pole.
- Transmission line exit ports at each specified antenna level.
- Pole assembly hardware.
- Removable climbing steps with galvanized Tuf-Tug cable type safety climb system (less harness).
- Includes TIA-G standard grounding provisions welded to pole.
- Includes 4'-7' adjustable lightning rod

2	STRUCTURAL ANALYSIS	1	$400

Engineering drawings per design, to be P.E. sealed by a Registered Professional Engineer.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Additional charges may apply for hard copies larger than 8-1/2" x 11".

3	FOUNDATION DESIGN PER CUSTOMER FURNISHED SOIL REPORT	1	$600

Custom foundation (unit base or drilled caisson) if soil report is supplied.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Rock foundations may incur additional charges. Price is for one site. Soils report to be provided by the customer.

		3	**$11,735**

NOTES

GENERAL
Budgetary quote, not valid for order entry. Full details needed prior to order.

QUOTATION

Valmont Industries, Inc.
28800 Ida Street

Valley, NE 68064

Quote Number: 459584-01
Created: 8/22/2019 4:12:55 PM
Revised:

MONOPOLE

For pole weight, base reactions and design/antenna loads, please refer to Valmont Permit Drawing File ID 459584R0.

Pole sizes are preliminary only and may change slightly at time of order entry.

Foundation build and tower erection are by others.

Products may be foreign built - if this is not acceptable please request a revised quote.

FREIGHT

Estimated Cost to be determined, with unloading of truck by others to nearest access point to the site, via flat bed tractor trailer. Any special handling by other. (1 trucks required)

Estimated anchor steel freight shipped direct from our supplier. Average anchor steel lead time is 4 to 6 weeks. $300

DELIVERY

Estimated lead time is 12 to 14 weeks. Please note that lead times are estimated and can fluctuate due to production capacity. Please contact customer service to verify current lead times or if a better delivery date is possible when placing an order. A complete soil report and plot plan (for guyed towers) must be received by Valmont prior to manufacturing.

MATERIAL PRICE

Due to material price fluctuations, Valmont reserves the right to review all material pricing prior to accepting any order. Any order placed on hold is subject to a price review at the time of its release.

Valmont may be required by state law to collect Sales/Use Tax at the time of shipment. If required, this tax will appear as a separate item on the invoice. If you have a tax exempt certificate, submit it at the time of order.

* Valmont reserves the right to apply storage charges of three-hundred and fifty dollars ($350.00) per month for structures kept in our yard beginning 60 days after original ship date.
* Quote is subject to Valmont's standard terms and conditions. See attached copy.
* All quotations subject to acceptance by Valmont at time of order placement.
* F.O.B Valmont Factory
* Terms: NET 30 Days (upon approved credit)

* Prepared by David Schoenecker | Project Administrator
Valmont Industries, Inc. | www.valmont-towers.com

valmont STRUCTURES

COMMUNICATIONS
STANDARD TERMS AND CONDITIONS OF SALE

AGREEMENT: This document ("Document") contains the standard terms and conditions of sale by Valmont Industries, Inc. ("Supplier"), to Purchaser, of products, materials, other goods, equipment, operations, or services ("Product"). If this Document is a quotation, then the offer contained herein shall remain open for thirty (30) days from the date it was issued, unless otherwise specified, and Purchaser shall be deemed to have accepted the offer and terms and conditions contained herein upon the earlier of: (1) Purchaser's signature and return of this Document to Supplier by fax or any other means; (2) Supplier's receipt of any order or any other writing from Purchaser indicating Purchaser's acceptance and agreement to the terms hereof; or (3) Purchaser's acceptance of any shipment of Product. Whether this Document is a quote, an invoice, or otherwise, the terms and conditions of the parties' agreement shall consist solely of the terms and conditions contained in this Document, together with any separate written agreement previously executed by both Purchaser and Supplier, any invoices generated in connection herewith, and any written addenda to the foregoing that are signed by Purchaser and Supplier (all of which are hereinafter collectively referred to as the "Agreement"). Any additional or different terms contained in any order or other document submitted by Purchaser to Supplier shall be deemed rejected, unless expressly accepted in writing by Supplier. In no event shall Supplier's silence or failure to respond to any such additional or different terms be deemed to constitute acceptance or approval thereof. If this Document is a quotation, then failure of the Purchaser to reject these terms and conditions in writing upon the first to occur of the receipt of this or any other document from or on behalf of the Supplier containing these terms and conditions or the delivery of Product pursuant to the Agreement shall constitute final acceptance of the terms and conditions hereof. To the extent this invoice is in any way deemed to be an acceptance of an offer of the Purchaser, any such acceptance of the Supplier is expressly conditioned upon the consent of the Purchaser to the terms and conditions of the Agreement.

MODIFICATIONS, RESCISSION & CANCELLATION: The Agreement may be modified or rescinded only in writing signed by duly authorized representatives of the parties. For any changes requested by Purchaser to the specification, style, or quantity of the Product, Purchaser shall pay the Supplier a charge equal to the actual additional cost incurred by the Supplier as a result of such change plus a reasonable percentage of such actual cost for overhead and profit. Orders may be canceled only with Supplier's written consent and upon terms which will save Supplier from loss, including all out-of-pocket costs and lost profits.

LIMITED WARRANTY: Supplier warrants the Product to be free of material and workmanship defects for a period of two years from the date of shipment, but said warranty is limited to material and workmanship of Product designed and manufactured by the Supplier. For any product manufactured using items supplied by Purchaser or Purchaser's designee, Supplier makes no warranty concerning the design, fabrication, or manufacture of the items supplied. Such items shall carry only the respective designer's, fabricator's, or manufacturer's warranty, if any. For product manufactured or fabricated by Supplier according to specifications or designs provided by Purchaser or Purchaser's designee, Supplier makes no warranty concerning the adequacy or sufficiency of the specifications or designs themselves. All warranty claims alleging defects of materials or workmanship must be submitted in writing within seven (7) days after the discovery of the defect or such claim shall be considered waived. Supplier will not accept Product returned to it for repair or replacement, unless Supplier is previously notified of the defect in writing and the return or correction is authorized by Supplier in writing. Any Product deemed by Supplier, in its sole discretion, to be defective in material or workmanship will be repaired or replaced, at Supplier's option, F.O.B. Supplier's plant. Supplier's obligation to repair or replace any defective Product shall not include any obligation to reimburse the Purchaser for transportation, installation, removal, unauthorized repairs, or any other expenses that may be incurred by the Purchaser or others in relation to any Product defect. **THIS WARRANTY EXCLUDES (I) FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT. FURTHER, LABOR REQUIRED TO REMOVE AND/OR REINSTALL ORIGINAL OR REPLACEMENT PARTS SHALL BE THE RESPONSIBILITY OF THE CUSTOMER; (II) DAMAGE CAUSED BY IMPROPER INSTALLATION, OVERLOADING, MISUSE, ABUSE, ACCIDENT OR NEGLECT.** In addition, this warranty does not cover alterations, modifications, or additions unless the change is acknowledged and accepted, in advance in writing, by Valmont; and (iii) if the products are to be used on an existing foundation or on other structures, the customer assumes all responsibility for the structural integrity of the existing foundation, anchorage or structures and all the consequences arising therefrom.

THE FOREGOING WARRANTIES ARE THE ONLY WARRANTIES GIVEN BY SUPPLIER, AND SUPPLIER HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE. THE REMEDY OF REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT SET FORTH IN THE FOREGOING WARRANTIES SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO ANY PERSON. SUPPLIER SHALL NOT BE LIABLE FOR ANY LOSS, INJURY, EXPENSE, OR DAMAGE, WHETHER DIRECT, CONSEQUENTIAL, INCIDENTAL, OR OTHERWISE (INCLUDING LOST PROFITS, LOSS OF CONSTRUCTION BONUS OR INCENTIVES), RESULTING FROM THE POSSESSION, INSTALLATION, ERECTION, START-UP, USE, MAINTENANCE, OPERATION, REMOVAL, OR RESALE OF SUPPLIER'S PRODUCT OR CAUSED BY ANY DEFECT, FAILURE, OR MALFUNCTION OF ANY PRODUCT, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE. NO PERSON HAS THE AUTHORITY TO BIND THE SUPPLIER TO ANY REPRESENTATION OR WARRANTY OTHER THAN THE FOREGOING LIMITED WARRANTIES AS DISCLAIMED.

DELIVERY, FREIGHT & RISK OF LOSS: All products are sold F.O.B. factory, full freight allowed within the continental United States, consisting of the lower 48 contiguous states, unless otherwise specified in writing. For shipment destinations outside the continental U.S., freight charges will be prepaid to the nearest port of exit with all other applicable charges from said point of delivery being the responsibility of the customer, unless otherwise noted. The method of shipment will be solely determined by Valmont, using a common carrier of Valmont's choice and delivered to the nearest destination. The customer assumes and will pay all charges for special services such as cartage, airfreight, express deliveries, parcel post and multiple deliveries on one order. For orders less than $1,500, freight may not be included and may be prepaid and charged to the customer. Orders below $500 may incur a processing fee. Freight charges for anchor bolts or accessories shipped independent of the structures (at the customer's request) may be billed separately and paid by the customer, unless otherwise specified in writing. Risk of Loss, including transportation delays and losses, shall pass to Purchaser upon the earlier of (i) completion of the Product's manufacture, if shipment is delayed by Purchaser, (ii) delivery of the Product to the Purchaser in cases where shipment is F.O.B. destination, or (iii) delivery of the Product to the carrier in cases where shipment is collect or is F.O.B. point of shipment.

PRICING: All prices and discounts are subject to change without advance notice except those shown on a specific quotation indicating the prices to be firm for thirty (30) days from the date of the quotation. For quotations accepted by Purchaser, Purchaser agrees that if the contract documents or designs or the prices of raw materials change from that contained in the quotation, Supplier has a right to charge additional compensation for increased costs, including, without limitation, costs related to freight and raw materials, as well as for increased margin associated therewith. Orders delayed or put on customer hold may not be price protected beyond the date of a general price increase announcement.

RETURNS & CLAIMS FOR SHORTAGES: Supplier will not accept returns for custom-made Product for any reason, provided that Supplier will accept returns made solely for repair or replacement under the foregoing express warranties, but only if Supplier has previously authorized said returns in writing. Standard (non-custom) Product may not be returned without the written consent of Supplier obtained within thirty (30) days after shipment, and only upon the following conditions: (i) all returned Product must be in excellent and merchantable condition and in the original packaging; (ii) the outbound and return freight must be pre-paid; and (iv) the return is subject to certain charges depending on current pricing and product. All claims for shortages must be made in writing within 30 days of receipt of shipment at destination.

PRODUCT SHIPPED WITH PROTECTIVE COVERING: Product received at the point of destination with protective covering should be unwrapped immediately and inspected. Any exposure to moisture during transportation or storage may cause the wrapping materials to stain the Product. Product is wrapped for protection during shipment.

INSTALLATION: Purchaser shall be solely responsible at its cost for the installation and erection of the Product purchased. Although Supplier may, in some cases, provide data, manuals, instructions, designs, drawings or specifications to aid Purchaser with installation or start-up, **SUPPLIER ASSUMES NO RESPONSIBILITY FOR PROPER INSTALLATION OR SUPPORT OF THE PRODUCT WHEN ERECTED AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO SUCH INSTALLATION OR SUPPORT, WHETHER OR NOT DATA, MANUALS, INSTRUCTIONS, DESIGNS, DRAWINGS OR SPECIFICATIONS ARE PROVIDED.**

DELAYS: Supplier will deliver or ship with reasonable promptness, but shall not be liable for delays for any reason beyond the Supplier's reasonable control, including, but not limited to, delays caused by acts of God, war, riot, embargoes, acts of civil or military authorities, fires, floods, accidents, quarantine restrictions, mill conditions, strikes, differences with workmen, delays in transportation, shortages of cars, fuel, labor or materials. **IN ANY SUCH EVENT, SUPPLIER SHALL HAVE SUCH ADDITIONAL TIME WITHIN WHICH TO PERFORM AS MAY BE REASONABLE AND NECESSARY UNDER THE CIRCUMSTANCES, AND SUPPLIER SHALL NOT BE LIABLE TO PURCHASER FOR ANY DAMAGES ARISING FROM SUCH DELAYS, LOSS OF USE OR FOR OTHER DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND WHATSOEVER. IN NO EVENT SHALL SUPPLIER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR CLAIMS FOR LABOR RESULTING FROM FAILURE OR DELAY IN DELIVERY.**

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CREDIT APPROVAL & SECURITY FOR PAYMENT: Acceptance of any offer of Supplier is subject to Supplier's approval of Purchaser's credit, and Supplier may at any time decline to make any shipment or delivery, or to perform any services, except upon receipt of payment or security, or upon such other terms as may be satisfactory to Supplier. To secure the payment of any and all amounts due Supplier under this Agreement or any other contract between the parties, Supplier retains and the Purchaser grants to Supplier a security interest in the Product purchased hereunder and agrees to execute and deliver to Supplier such financing statements or to take any other action necessary to perfect Supplier's security interest as Supplier may reasonably request.

TERMS, INVOICES, PAYMENT, LATE CHARGE & TAXES: Payment terms are NET thirty (30) days from the date of Supplier's invoice, unless otherwise specified and approved in advance in writing from the Valmont Credit Department. Invoices will be rendered upon delivery of each order to Purchaser. All payments shall be made to the "remit to" location as stated on the Supplier's invoice. Supplier reserves the right to invoice, and Purchaser agrees to pay for, any or all Product ready for shipment, together with expenses, costs, and losses associated therewith, whenever shipment is delayed pursuant to Purchaser's written instructions or for other reasons beyond Supplier's control. Invoices for anchor bolts shipped in advance of the structures may be billed at the time of such anchor bolt shipment. A monthly late charge of 1.5% of the invoice amount or $50, whichever is greater, will be assessed on all past-due amounts. Any tax or other charge imposed by law on the sale of goods or the performance of services shall be paid by the Purchaser, unless the law specifically provides that such payment must be absorbed by Supplier. Purchaser shall inform the Supplier, in advance in writing, of such taxes or other charges imposed by state, municipal, or other law that are to be paid by the Supplier.

DEFAULT OF PURCHASER: In the event that (i) Purchaser fails to pay any invoice when due; (ii) Purchaser breaches this Agreement or any other contract with Supplier or any of its affiliated companies; or (iii) Purchaser's financial strength becomes unsatisfactory, Purchaser shall thereby be in default, and Supplier reserves the right, in its sole discretion, to do any one or more of the following: (i) cancel this Agreement and any work in progress, shipments, and pending orders without further notice; (ii) declare all sums owing from Purchaser to Supplier to be due and payable; (iii) require payment in advance of performance, in certified funds; (iv) foreclose any security interest; (v) require other security satisfactory to Supplier. Purchaser shall be liable to Supplier for any and all damages, whether direct, indirect, consequential, special or any other kind of damages, caused by or arising out of any breach of this agreement, provided that the exercise of any rights under this contract shall not bar Supplier from exercising its rights under the UCC or any other applicable law. The Purchaser waives any applicable statutory exemptions and shall pay all expenses incurred by Supplier in the collection of the amounts due under the Agreement, including attorneys' fees.

INDEMNIFICATION & GOVERNING LAW: Purchaser shall indemnify and hold Supplier harmless from all expenses (including attorneys' fees), claims, demands, suits, judgments, actions, costs, and liabilities (including without limitation those alleging Supplier's own negligence) which may arise from, relate to, or be connected with the Purchaser's possession, installation, erection, start-up, use, maintenance, operation, removal, or resale of the Product described herein and any manuals, instructions, designs, drawings or specifications related thereto. All disputes relating to the execution, interpretation, construction or enforcement of the rights and obligations of the parties hereto shall be governed by the laws of, and resolved in the State and Federal courts in the State of Nebraska, and the parties hereby consent to venue in Omaha, Nebraska. **THE PURCHASER AND SUPPLIER EACH HEREBY WAIVE THEIR RIGHT TO A TRIAL BY JURY ON ANY CLAIM (INCLUDING COUNTERCLAIMS) ARISING WITH RESPECT TO THE GOODS PURCHASED HEREUNDER.** Any lawsuit based on or related in any way to the Agreement or the Product described therein must be commenced within two (2) years after delivery of the Product or other goods to the Purchaser or it shall be barred.

QUOTATION

Valmont Industries, Inc.
28800 Ida Street

Valley, NE 68064

Quote Number: 421135-02
Created: 11/8/2018 6:56:09 PM
Revised:

Prepared for: Blue Ridge Towers
Attention: Sean Cai
Address1: 1125 1st Street
Address2:
City: Roanoke
State: VA
Zip: 24016
Phone: (540) 595-7060
Email: sean.cai@blueridgetowers.com

Budgetary: No
RFQ:
Project: Blue Ridge - VA024 Industrial Park, VA - 175' MP - 4 Carrier

NOTICE

Quoted prices will be held firm for 15 days. Prices are subject to change if product is not shipped within 2 months of Purchase Order receipt.

ITEM	DESCRIPTION	QTY	UNIT PRICE
1	175' MONOPOLE - 174' POLE WITH 1' FOUNDATION PROJECTION	1	$48,028

Price Includes:
- Steel templates and anchor bolts.
- Pole sections and accessories to be hot dipped galvanized.
- Transmission line entry ports at the base of the pole.
- Transmission line exit ports at each specified antenna level.
- Pole assembly hardware.
- Removable climbing steps with galvanized Tuf-Tug cable type safety climb system (less harness).
- Includes TIA-G standard grounding provisions welded to pole.
- Includes 4'-7' adjustable lightning rod

2	STRUCTURAL ANALYSIS	1	$400

Engineering drawings per design, to be P.E. sealed by a Registered Professional Engineer.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Additional charges may apply for hard copies larger than 8-1/2" x 11".

3	FOUNDATION DESIGN PER CUSTOMER FURNISHED SOILS REPORT	1	$600

Custom foundation (unit base or drilled caisson) if soil report is supplied.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Rock foundations may incur additional charges. Price is for one site. Soils report to be provided by the customer.

		3	**$49,028**

NOTES

MONOPOLE
For pole weight, base reactions and design/antenna loads, please refer to Valmont Permit

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Quote Number: **421135-02**
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Revised:

Drawing File ID 421135R2.

Pole sizes are preliminary only and may change slightly at time of order entry.

Foundation build and tower erection are by others.

FREIGHT

Estimated Cost, with unloading of truck by others to Rocky Mount, VA nearest access point to the site, via flat bed tractor trailer. Any special handling by other. (1 truck required)	$3,275
Estimated anchor steel freight shipped direct from our supplier. Average anchor steel lead time is 3 to 4 weeks.	$400

DELIVERY

Estimated lead time is 7 to 9 weeks. Please note that lead times are estimated and can fluctuate due to production capacity. Please contact customer service to verify current lead times or if a better delivery date is possible when placing an order. A complete soil report and plot plan (for guyed towers) must be received by Valmont prior to manufacturing.

MATERIAL PRICE

Due to material price fluctuations, Valmont reserves the right to review all material pricing prior to accepting any order. Any order placed on hold is subject to a price review at the time of its release.

Valmont may be required by state law to collect Sales/Use Tax at the time of shipment. If required, this tax will appear as a separate item on the invoice. If you have a tax exempt certificate, submit it at the time of order.

* Valmont reserves the right to apply storage charges of three-hundred and fifty dollars ($350.00) per month for structures kept in our yard beginning 60 days after original ship date.
* Quote is subject to Valmont's standard terms and conditions. See attached copy.
* All quotations subject to acceptance by Valmont at time of order placement.
* F.O.B Valmont Factory
* Terms: NET 30 Days (upon approved credit)

* Prepared by David Schoenecker | Project Administrator
Valmont Industries, Inc. | www.valmont-towers.com

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COMMUNICATIONS
STANDARD TERMS AND CONDITIONS OF SALE

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RETURNS & CLAIMS FOR SHORTAGES: Supplier will not accept returns for custom-made Product for any reason, provided that Supplier will accept returns made solely for repair or replacement under the foregoing express warranties, but only if Supplier has previously authorized said returns in writing. Standard (non-custom) Product may not be returned without the written consent of Supplier obtained within thirty (30) days after shipment, and only upon the following conditions: (i) all returned Product must be in excellent and merchantable condition and in the original packaging; (ii) the outbound and return freight must be pre-paid; and (iv) the return is subject to certain charges depending on current pricing and product. All claims for shortages must be made in writing within 30 days of receipt of shipment at destination.

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CREDIT APPROVAL & SECURITY FOR PAYMENT: Acceptance of any offer of Supplier is subject to Supplier's approval of Purchaser's credit, and Supplier may at any time decline to make any shipment or delivery, or to perform any services, except upon receipt of payment or security, or upon such other terms as may be satisfactory to Supplier. To secure the payment of any and all amounts due Supplier under this Agreement or any other contract between the parties, Supplier retains and the Purchaser grants to Supplier a security interest in the Product purchased hereunder and agrees to execute and deliver to Supplier such financing statements or to take any other action necessary to perfect Supplier's security interest as Supplier may reasonably request.

TERMS, INVOICES, PAYMENT, LATE CHARGE & TAXES: Payment terms are NET thirty (30) days from the date of Supplier's invoice, unless otherwise specified and approved in advance in writing from the Valmont Credit Department. Invoices will be rendered upon delivery of each order to Purchaser. All payments shall be made to the "remit to" location as stated on the Supplier's invoice. Supplier reserves the right to invoice, and Purchaser agrees to pay for, any or all Product ready for shipment, together with expenses, costs, and losses associated therewith, whenever shipment is delayed pursuant to Purchaser's written instructions or for other reasons beyond Supplier's control. Invoices for anchor bolts shipped in advance of the structures may be billed at the time of such anchor bolt shipment. A monthly late charge of 1.5% of the invoice amount or $50, whichever is greater, will be assessed on all past-due amounts. Any tax or other charge imposed by law on the sale of goods or the performance of services shall be paid by the Purchaser, unless the law specifically provides that such payment must be absorbed by Supplier. Purchaser shall inform the Supplier, in advance in writing, of such taxes or other charges imposed by state, municipal, or other law that are to be paid by the Supplier.

DEFAULT OF PURCHASER: In the event that (i) Purchaser fails to pay any invoice when due; (ii) Purchaser breaches this Agreement or any other contract with Supplier or any of its affiliated companies; or (iii) Purchaser's financial strength becomes unsatisfactory, Purchaser shall thereby be in default, and Supplier reserves the right, in its sole discretion, to do any one or more of the following: (i) cancel this Agreement and any work in progress, shipments, and pending orders without further notice; (ii) declare all sums owing from Purchaser to Supplier to be due and payable; (iii) require payment in advance of performance, in certified funds; (iv) foreclose any security interest; (v) require other security satisfactory to Supplier. Purchaser shall be liable to Supplier for any and all damages, whether direct, indirect, consequential, special or any other kind of damages, caused by or arising out of any breach of this agreement, provided that the exercise of any rights under this contract shall not bar Supplier from exercising its rights under the UCC or any other applicable law. The Purchaser waives any applicable statutory exemptions and shall pay all expenses incurred by Supplier in the collection of the amounts due under the Agreement, including attorneys' fees.

INDEMNIFICATION & GOVERNING LAW: Purchaser shall indemnify and hold Supplier harmless from all expenses (including attorneys' fees), claims, demands, suits, judgments, actions, costs, and liabilities (including without limitation those alleging Supplier's own negligence) which may arise from, relate to, or be connected with the Purchaser's possession, installation, erection, start-up, use, maintenance, operation, removal, or resale of the Product described herein and any manuals, instructions, designs, drawings or specifications related thereto. All disputes relating to the execution, interpretation, construction or enforcement of the rights and obligations of the parties hereto shall be governed by the laws of, and resolved in the State and Federal courts in the State of Nebraska, and the parties hereby consent to venue in Omaha, Nebraska. **THE PURCHASER AND SUPPLIER EACH HEREBY WAIVE THEIR RIGHT TO A TRIAL BY JURY ON ANY CLAIM (INCLUDING COUNTERCLAIMS) ARISING WITH RESPECT TO THE GOODS PURCHASED HEREUNDER.** Any lawsuit based on or related in any way to the Agreement or the Product described therein must be commenced within two (2) years after delivery of the Product or other goods to the Purchaser or it shall be barred.

QUOTATION

Valmont Industries, Inc.
28800 Ida Street

Valley, NE 68064

Quote Number: 432075-01
Created: 11/20/2018 3:57:53 PM
Revised: 11/20/2018 3:58:12 PM

Prepared for: Blue Ridge Towers
Attention: Sean Cai
Address1: 1125 1st Street
Address2:
City: Roanoke
State: VA
Zip: 24016
Phone: (540) 595-7060
Email: sean.cai@blueridgetowers.com

Budgetary: No
RFQ:
Project: Blue Ridge Towers - Snow Creek (Franklin County), VA - 195' Monopole - 3 Carrier

NOTICE

Quoted prices will be held firm for 15 days. Prices are subject to change if product is not shipped within 2 months of Purchase Order receipt.

ITEM	DESCRIPTION	QTY	UNIT PRICE
1	195' MONOPOLE - 194' POLE WITH 1' FOUNDATION PROJETION	1	$52,700

Price Includes:
- Steel templates and anchor bolts.
- Pole sections and accessories to be hot dipped galvanized.
- Transmission line entry ports at the base of the pole.
- Transmission line exit ports at each specified antenna level.
- Pole assembly hardware.
- Removable climbing steps with galvanized Tuf-Tug cable type safety climb system (less harness).
- Includes TIA-G standard grounding provisions welded to pole.
- Includes 4'-7' adjustable lightning rod

2	STRUCTURAL ANALYSIS	1	$400

Engineering drawings per design, to be P.E. sealed by a Registered Professional Engineer.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Additional charges may apply for hard copies larger than 8-1/2" x 11".

3	FOUNDATION DESIGN PER CUSTOMER FURNISHED SOIL REPORT	1	$600

Custom foundation (unit base or drilled caisson) if soil report is supplied.
A pdf copy of the drawing is supplied, if hard copies are required please indicate on order.
Rock foundations may incur additional charges. Price is for one site. Soils report to be provided by the customer.

		3	**$53,700**

NOTES

MONOPOLE
For pole weight, base reactions and design/antenna loads, please refer to Valmont Permit

QUOTATION

Valmont Industries, Inc.
28800 Ida Street

Valley, NE 68064

Quote Number: 432075-01
Created: 11/20/2018 3:57:53 PM
Revised: 11/20/2018 3:58:12 PM

Drawing File ID 432075R0.

Pole sizes are preliminary only and may change slightly at time of order entry.

Foundation build and tower erection are by others.

Estimated lead time 7-9 weeks; lead time starts after release and receipt of approved production drawings from the customer. Please note that lead times are estimated and can fluctuate due to production capacity. Please contact customer service to verify current lead times or if better delivery is needed when placing an order.

** PLEASE NOTE THAT LEAD TIMES ARE ESTIMATED AND DUE TO PRODUCTION CAPACITY LEAD TIMES MIGHT FLUCTUATE. PLEASE ALWAYS CONTACT CUSTOMER SERVICE TO VERIFY CURRENT LEAD TIMES WHEN PLACING AN ORDER. **

Products may be foreign built - if this is not acceptable please request a revised quote.

FREIGHT

Estimated Cost, with unloading of truck by others to Franklin County, VA nearest access point to the site, via flat bed tractor trailer. Any special handling by other. (1 truck required)	$3,560
Estimated anchor steel freight shipped direct from our supplier. Average anchor steel lead time is 3 to 4 weeks.	$400

MATERIAL PRICE

Due to material price fluctuations, Valmont reserves the right to review all material pricing prior to accepting any order. Any order placed on hold is subject to a price review at the time of its release.

Valmont may be required by state law to collect Sales/Use Tax at the time of shipment. If required, this tax will appear as a separate item on the invoice. If you have a tax exempt certificate, submit it at the time of order.

* Valmont reserves the right to apply storage charges of three-hundred and fifty dollars ($350.00) per month for structures kept in our yard beginning 60 days after original ship date.
* Quote is subject to Valmont's standard terms and conditions. See attached copy.
* All quotations subject to acceptance by Valmont at time of order placement.
* F.O.B Valmont Factory
* Terms: NET 30 Days (upon approved credit)

* Prepared by David Schoenecker | Project Administrator
Valmont Industries, Inc. | www.valmont-towers.com

valmont STRUCTURES

COMMUNICATIONS
STANDARD TERMS AND CONDITIONS OF SALE

AGREEMENT: This document ("Document") contains the standard terms and conditions of sale by Valmont Industries, Inc. ("Supplier"), to Purchaser, of products, materials, other goods, equipment, operations, or services ("Product"). If this Document is a quotation, then the offer contained herein shall remain open for thirty (30) days from the date it was issued, unless otherwise specified, and Purchaser shall be deemed to have accepted the offer and terms and conditions contained herein upon the earlier of: (1) Purchaser's signature and return of this Document to Supplier by fax or any other means; (2) Supplier's receipt of any order or any other writing from Purchaser indicating Purchaser's acceptance and agreement to the terms hereof; or (3) Purchaser's acceptance of any shipment of Product. Whether this Document is a quote, an invoice, or otherwise, the terms and conditions of the parties' agreement shall consist solely of the terms and conditions contained in this Document, together with any separate written agreement previously executed by both Purchaser and Supplier, any invoices generated in connection herewith, and any written addenda to the foregoing that are signed by Purchaser and Supplier (all of which are hereinafter collectively referred to as the "Agreement"). Any additional or different terms contained in any order or other document submitted by Purchaser to Supplier shall be deemed rejected, unless expressly accepted in writing by Supplier. In no event shall Supplier's silence or failure to respond to any such additional or different terms be deemed to constitute acceptance or approval thereof. If this Document is a quotation, then failure of the Purchaser to reject these terms and conditions in writing upon the first to occur of the receipt of this or any other document from or on behalf of the Supplier containing these terms and conditions or the delivery of Product pursuant to the Agreement shall constitute final acceptance of the terms and conditions hereof. To the extent this invoice is in any way deemed to be an acceptance of an offer of the Purchaser, any such acceptance of the Supplier is expressly conditioned upon the consent of the Purchaser to the terms and conditions of the Agreement.

MODIFICATIONS, RESCISSION & CANCELLATION: The Agreement may be modified or rescinded only in writing signed by duly authorized representatives of the parties. For any changes requested by Purchaser to the specification, style, or quantity of the Product, Purchaser shall pay the Supplier a charge equal to the actual additional cost incurred by the Supplier as a result of such change plus a reasonable percentage of such actual cost for overhead and profit. Orders may be canceled only with Supplier's written consent and upon terms which will save Supplier from loss, including all out-of-pocket costs and lost profits.

LIMITED WARRANTY: Supplier warrants the Product to be free of material and workmanship defects for a period of two years from the date of shipment, but said warranty is limited to material and workmanship of Product designed and manufactured by the Supplier. For any product manufactured using items supplied by Purchaser or Purchaser's designee, Supplier makes no warranty concerning the design, fabrication, or manufacture of the items supplied. Such items shall carry only the respective designer's, fabricator's, or manufacturer's warranty, if any. For product manufactured or fabricated by Supplier according to specifications or designs provided by Purchaser or Purchaser's designee, Supplier makes no warranty concerning the adequacy or sufficiency of the specifications or designs themselves. All warranty claims alleging defects of materials or workmanship must be submitted in writing within seven (7) days after the discovery of the defect or such claim shall be considered waived. Supplier will not accept Product returned to it for repair or replacement, unless Supplier is previously notified of the defect in writing and the return or correction is authorized by Supplier in writing. Any Product deemed by Supplier, in its sole discretion, to be defective in material or workmanship will be repaired or replaced, at Supplier's option, F.O.B. Supplier's plant. Supplier's obligation to repair or replace any defective Product shall not include any obligation to reimburse the Purchaser for transportation, installation, removal, unauthorized repairs, or any other expenses that may be incurred by the Purchaser or others in relation to any Product defect. **THIS WARRANTY EXCLUDES (I) FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT. FURTHER, LABOR REQUIRED TO REMOVE AND/OR REINSTALL ORIGINAL OR REPLACEMENT PARTS SHALL BE THE RESPONSIBILITY OF THE CUSTOMER; (II) DAMAGE CAUSED BY IMPROPER INSTALLATION, OVERLOADING, MISUSE, ABUSE, ACCIDENT OR NEGLECT.** In addition, this warranty does not cover alterations, modifications, or additions unless the change is acknowledged and accepted, in advance in writing, by Valmont; and (iii) if the products are to be used on an existing foundation or on other structures, the customer assumes all responsibility for the structural integrity of the existing foundation, anchorage or structures and all the consequences arising therefrom.

THE FOREGOING WARRANTIES ARE THE ONLY WARRANTIES GIVEN BY SUPPLIER, AND SUPPLIER HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE. THE REMEDY OF REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT SET FORTH IN THE FOREGOING WARRANTIES SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO ANY PERSON. SUPPLIER SHALL NOT BE LIABLE FOR ANY LOSS, INJURY, EXPENSE, OR DAMAGE, WHETHER DIRECT, CONSEQUENTIAL, INCIDENTAL, OR OTHERWISE (INCLUDING LOST PROFITS, LOSS OF CONSTRUCTION BONUS OR INCENTIVES), RESULTING FROM THE POSSESSION, INSTALLATION, ERECTION, START-UP, USE, MAINTENANCE, OPERATION, REMOVAL, OR RESALE OF SUPPLIER'S PRODUCT OR CAUSED BY ANY DEFECT, FAILURE, OR MALFUNCTION OF ANY PRODUCT, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE. NO PERSON HAS THE AUTHORITY TO BIND THE SUPPLIER TO ANY REPRESENTATION OR WARRANTY OTHER THAN THE FOREGOING LIMITED WARRANTIES AS DISCLAIMED.

DELIVERY, FREIGHT & RISK OF LOSS: All products are sold F.O.B. factory, full freight allowed within the continental United States, consisting of the lower 48 contiguous states, unless otherwise specified in writing. For shipment destinations outside the continental U.S., freight charges will be prepaid to the nearest port of exit with all other applicable charges from said point of delivery being the responsibility of the customer, unless otherwise noted. The method of shipment will be solely determined by Valmont, using a common carrier of Valmont's choice and delivered to the nearest destination. The customer assumes and will pay all charges for special services such as cartage, airfreight, express deliveries, parcel post and multiple deliveries on one order. For orders less than $1,500, freight may not be included and may be prepaid and charged to the customer. Orders below $500 may incur a processing fee. Freight charges for anchor bolts or accessories shipped independent of the structures (at the customer's request) may be billed separately and paid by the customer, unless otherwise specified in writing. Risk of Loss, including transportation delays and losses, shall pass to Purchaser upon the earlier of (i) completion of the Product's manufacture, if shipment is delayed by Purchaser, (ii) delivery of the Product to the Purchaser in cases where shipment is F.O.B. destination, or (iii) delivery of the Product to the carrier in cases where shipment is collect or is F.O.B. point of shipment.

PRICING: All prices and discounts are subject to change without advance notice except those shown on a specific quotation indicating the prices to be firm for thirty (30) days from the date of the quotation. For quotations accepted by Purchaser, Purchaser agrees that if the contract documents or designs or the prices of raw materials change from that contained in the quotation, Supplier has a right to charge additional compensation for increased costs, including, without limitation, costs related to freight and raw materials, as well as for increased margin associated therewith. Orders delayed or put on customer hold may not be price protected beyond the date of a general price increase announcement.

RETURNS & CLAIMS FOR SHORTAGES: Supplier will not accept returns for custom-made Product for any reason, provided that Supplier will accept returns made solely for repair or replacement under the foregoing express warranties, but only if Supplier has previously authorized said returns in writing. Standard (non-custom) Product may not be returned without the written consent of Supplier obtained within thirty (30) days after shipment, and only upon the following conditions: (i) all returned Product must be in excellent and merchantable condition and in the original packaging; (ii) the outbound and return freight must be pre-paid; and (iv) the return is subject to certain charges depending on current pricing and product. All claims for shortages must be made in writing within 30 days of receipt of shipment at destination.

PRODUCT SHIPPED WITH PROTECTIVE COVERING: Product received at the point of destination with protective covering should be unwrapped immediately and inspected. Any exposure to moisture during transportation or storage may cause the wrapping materials to stain the Product. Product is wrapped for protection during shipment.

INSTALLATION: Purchaser shall be solely responsible at its cost for the installation and erection of the Product purchased. Although Supplier may, in some cases, provide data, manuals, instructions, designs, drawings or specifications to aid Purchaser with installation or start-up, **SUPPLIER ASSUMES NO RESPONSIBILITY FOR PROPER INSTALLATION OR SUPPORT OF THE PRODUCT WHEN ERECTED AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO SUCH INSTALLATION OR SUPPORT, WHETHER OR NOT DATA, MANUALS, INSTRUCTIONS, DESIGNS, DRAWINGS OR SPECIFICATIONS ARE PROVIDED.**

DELAYS: Supplier will deliver or ship with reasonable promptness, but shall not be liable for delays for any reason beyond the Supplier's reasonable control, including, but not limited to, delays caused by acts of God, war, riot, embargoes, acts of civil or military authorities, fires, floods, accidents, quarantine restrictions, mill conditions, strikes, differences with workmen, delays in transportation, shortages of cars, fuel, labor or materials. **IN ANY SUCH EVENT, SUPPLIER SHALL HAVE SUCH ADDITIONAL TIME WITHIN WHICH TO PERFORM AS MAY BE REASONABLE AND NECESSARY UNDER THE CIRCUMSTANCES, AND SUPPLIER SHALL NOT BE LIABLE TO PURCHASER FOR ANY DAMAGES ARISING FROM SUCH DELAYS, LOSS OF USE OR FOR OTHER DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND WHATSOEVER. IN NO EVENT SHALL SUPPLIER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR CLAIMS FOR LABOR RESULTING FROM FAILURE OR DELAY IN DELIVERY.**

valmont STRUCTURES

CREDIT APPROVAL & SECURITY FOR PAYMENT: Acceptance of any offer of Supplier is subject to Supplier's approval of Purchaser's credit, and Supplier may at any time decline to make any shipment or delivery, or to perform any services, except upon receipt of payment or security, or upon such other terms as may be satisfactory to Supplier. To secure the payment of any and all amounts due Supplier under this Agreement or any other contract between the parties, Supplier retains and the Purchaser grants to Supplier a security interest in the Product purchased hereunder and agrees to execute and deliver to Supplier such financing statements or to take any other action necessary to perfect Supplier's security interest as Supplier may reasonably request.

TERMS, INVOICES, PAYMENT, LATE CHARGE & TAXES: Payment terms are NET thirty (30) days from the date of Supplier's invoice, unless otherwise specified and approved in advance in writing from the Valmont Credit Department. Invoices will be rendered upon delivery of each order to Purchaser. All payments shall be made to the "remit to" location as stated on the Supplier's invoice. Supplier reserves the right to invoice, and Purchaser agrees to pay for, any or all Product ready for shipment, together with expenses, costs, and losses associated therewith, whenever shipment is delayed pursuant to Purchaser's written instructions or for other reasons beyond Supplier's control. Invoices for anchor bolts shipped in advance of the structures may be billed at the time of such anchor bolt shipment. A monthly late charge of 1.5% of the invoice amount or $50, whichever is greater, will be assessed on all past-due amounts. Any tax or other charge imposed by law on the sale of goods or the performance of services shall be paid by the Purchaser, unless the law specifically provides that such payment must be absorbed by Supplier. Purchaser shall inform the Supplier, in advance in writing, of such taxes or other charges imposed by state, municipal, or other law that are to be paid by the Supplier.

DEFAULT OF PURCHASER: In the event that (i) Purchaser fails to pay any invoice when due; (ii) Purchaser breaches this Agreement or any other contract with Supplier or any of its affiliated companies; or (iii) Purchaser's financial strength becomes unsatisfactory, Purchaser shall thereby be in default, and Supplier reserves the right, in its sole discretion, to do any one or more of the following: (i) cancel this Agreement and any work in progress, shipments, and pending orders without further notice; (ii) declare all sums owing from Purchaser to Supplier to be due and payable; (iii) require payment in advance of performance, in certified funds; (iv) foreclose any security interest; (v) require other security satisfactory to Supplier. Purchaser shall be liable to Supplier for any and all damages, whether direct, indirect, consequential, special or any other kind of damages, caused by or arising out of any breach of this agreement, provided that the exercise of any rights under this contract shall not bar Supplier from exercising its rights under the UCC or any other applicable law. The Purchaser waives any applicable statutory exemptions and shall pay all expenses incurred by Supplier in the collection of the amounts due under the Agreement, including attorneys' fees.

INDEMNIFICATION & GOVERNING LAW: Purchaser shall indemnify and hold Supplier harmless from all expenses (including attorneys' fees), claims, demands, suits, judgments, actions, costs, and liabilities (including without limitation those alleging Supplier's own negligence) which may arise from, relate to, or be connected with the Purchaser's possession, installation, erection, start-up, use, maintenance, operation, removal, or resale of the Product described herein and any manuals, instructions, designs, drawings or specifications related thereto. All disputes relating to the execution, interpretation, construction or enforcement of the rights and obligations of the parties hereto shall be governed by the laws of, and resolved in the State and Federal courts in the State of Nebraska, and the parties hereby consent to venue in Omaha, Nebraska. **THE PURCHASER AND SUPPLIER EACH HEREBY WAIVE THEIR RIGHT TO A TRIAL BY JURY ON ANY CLAIM (INCLUDING COUNTERCLAIMS) ARISING WITH RESPECT TO THE GOODS PURCHASED HEREUNDER.** Any lawsuit based on or related in any way to the Agreement or the Product described therein must be commenced within two (2) years after delivery of the Product or other goods to the Purchaser or it shall be barred.

Franklin County

VATI 2020 Application

Attachment 13

Supporting Documentation of Cost Estimates

Franklin County Cost Quotes

Blue Ridge Towers Inc
2820 Electric Road, Suite 104B
Roanoke, VA 24018

August 29, 2019

For Franklin County VATI Application:

Due Diligence Soft Cost (New Tower Site Development) $57,000 (Site ID, Lease, Title, FAA, Survey, 2-C, Phase 1, NEPA.SHPO, Zoning Building Permit/All approvals)

Due Diligence Soft Cost (Collocation Site Development) $30,000 (Site ID, Lease, Title, FCC Filing, Survey, Structural, NEPA/Phase 1 checklist, Zoning Building Permit/All approvals)

The cost breakdown for the construction of each new site in the county is as follows:

A- Monopole cost $65000.00 ($50,000 for Class 2 Monopoles)
B- Foundation cost $75000.00
C- Civil/ Complete Site Construction (all inclusive, Road, fence, electrical, landscaping) $85,000
D- Total $225,000 per site ($210,000 for Class 2 monopole)

The cost of Reconstruction of an existing tower consists of new site construction cost of $225,000 and $47,000 in removal costs. ($272,000 total)

The cost of constructing an 80' community relay pole consists of pole purchase/foundation work and site construction for the total cost of $54,000 per site. ($108,000 total for 2 community poles)

The cost of designing and completion of 6.4 miles of new 48 strands (pairs) of fiber from fiber tie points to each tower, and back to BRISCNET Network Operations Center is:
$67,800 Per mile x 6.4 miles = $433,920 plus $30,000 Design Cost ($463,920.00)

The cost breakdown for the Access Points (infrastructure/equipment) for BRISCNET on each tower site is as follows:

A-Cost of equipment and Labor (installation /site turn up/testing) $32,500.00 per site
C-Total $390,000.00 (12 sites)

The cost to install and design the Microwave backhaul per Microwave Hop is as follows:

A-Microwave equipment system and installation/testing per site is $38,500.00 x 9 sites
B-Microwave Design and Engineering Cost $13,500.00
C-Total $360,000.00

Sincerely,

_____*Sean Cai*_____
Sean Cai, Site Acquisition Manager

Franklin County

VATI 2020 Application

Attachment 14
Two Most Recent Form 477 Submitted to the FCC or Equivalent

Federal Communications Commission

(RETAIN FOR YOUR RECORDS)

Form 477 Filing Summary

FRN: **0028068567** | Data as of: **Dec 31, 2018** | Operations: **Non-ILEC** | Submission Status: **Original - Submitted** | Last Updated: **Aug 27, 2019 20:41:58**

Filer Identification

Section	Question	Response
Filer Information	Company Name	blue ridge towers inc
	Holding Company Name	blue ridge towers inc
	SAC ID	
	499 ID	
Data Contact Information	Data Contact Name	sean cai
	Data Contact Phone Number	(540) 793-0810
	Data Contact E-mail	sean.cai@blueridgetowers.com
Emergency Operations Contact Information	Emergency Operations Name	sean cai
	Emergency Operations Phone Number	(540) 793-0810
	Emergency Operations E-mail	sean.cai@blueridgetowers.com
Certifying Official Contact Information	Certifying Official Name	anthony smith
	Certifying Official Phone Number	(540) 397-6628
	Certifying Official E-mail	asmith@blueridgetowers.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	excel_template_fbd 4.txt	Aug 27, 2019 20:14:53	164
Fixed Broadband Subscription	Interactive data entry		10

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Virginia	BRISCNET	Terrestrial Fixed Wireless	164
Total			**164**

Fixed Broadband Subscription

Fixed Broadband Subscriptions by State, Technology and End-user Type

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Virginia	Terrestrial Fixed Wireless	10	10	0	10
Total		**10**	**10**	**0**	**10**

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
25.000	3.000	10	0	10
Total		**10**	**0**	**10**

Fixed Broadband Subscriptions by Technology, Bandwidths and End-user Type

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Terrestrial Fixed Wireless	25.000	3.000	10	0	10
Total			**10**	**0**	**10**

Federal Communications Commission

(RETAIN FOR YOUR RECORDS)

Form 477 Filing Summary

FRN: **0028068567** | Data as of: **Jun 30, 2019** | Operations: **Non-ILEC** | Submission Status: **Original - Submitted** | Last Updated: **Aug 27, 2019 20:11:49**

Filer Identification

Section	Question	Response
Filer Information	Company Name	blue ridge towers inc
	Holding Company Name	blue ridge towers inc
	SAC ID	
	499 ID	
Data Contact Information	Data Contact Name	sean cai
	Data Contact Phone Number	(540) 793-0810
	Data Contact E-mail	sean.cai@blueridgetowers.com
Emergency Operations Contact Information	Emergency Operations Name	sean cai
	Emergency Operations Phone Number	(540) 793-0810
	Emergency Operations E-mail	sean.cai@blueridgetowers.com
Certifying Official Contact Information	Certifying Official Name	anthony smith
	Certifying Official Phone Number	(540) 397-6628
	Certifying Official E-mail	asmith@blueridgetowers.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	excel_template_fbd 4.txt	Aug 27, 2019 20:09:01	164
Fixed Broadband Subscription	Interactive data entry		10

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Virginia	BRISCNET	Terrestrial Fixed Wireless	164
Total			**164**

Fixed Broadband Subscription

Fixed Broadband Subscriptions by State, Technology and End-user Type

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Virginia	Terrestrial Fixed Wireless	10	10	0	10
Total		**10**	**10**	**0**	**10**

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
25.000	3.000	10	0	10
Total		**10**	**0**	**10**

Fixed Broadband Subscriptions by Technology, Bandwidths and End-user Type

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Terrestrial Fixed Wireless	25.000	3.000	10	0	10
Total			**10**	**0**	**10**

Franklin County

VATI 2020 Application

Attachment 15
Copy of Public Notice

COUNTY OF FRANKLIN, VIRGINIA

PUBLIC COMMENT NOTICE

The Franklin County Broadband Authority intends to file grant application(s) with Virginia Department of Housing and Community Development (DHCD) under its 2020 Virginia Telecommunications Initiative Program (VATI). In accordance with the VATI Program Guidelines, the Franklin County Broadband Authority is requesting public comments as to its submission of grant application(s) that is due on September 3, 2019.

Franklin County consists of 712 square miles and a population of approximately 56,000 with over 20% of the area that is unserved by broadband as identified in the Center for Innovative Technology's 2017 needs assessment. The County is seeking to improve broadband coverage and access in the areas of the County that are currently considered unserved. The VATI program defines unserved as areas that have broadband speeds of 10 Mbps download and 1 Mbps upload or less. The County proposes to accomplish this through an approach to develop increased fixed wireless service opportunities as well as developing more fiber to the home/business using a phased implementation approach as outlined in the Franklin County Broadband Assessment and Plan prepared by Design Nine, Inc.

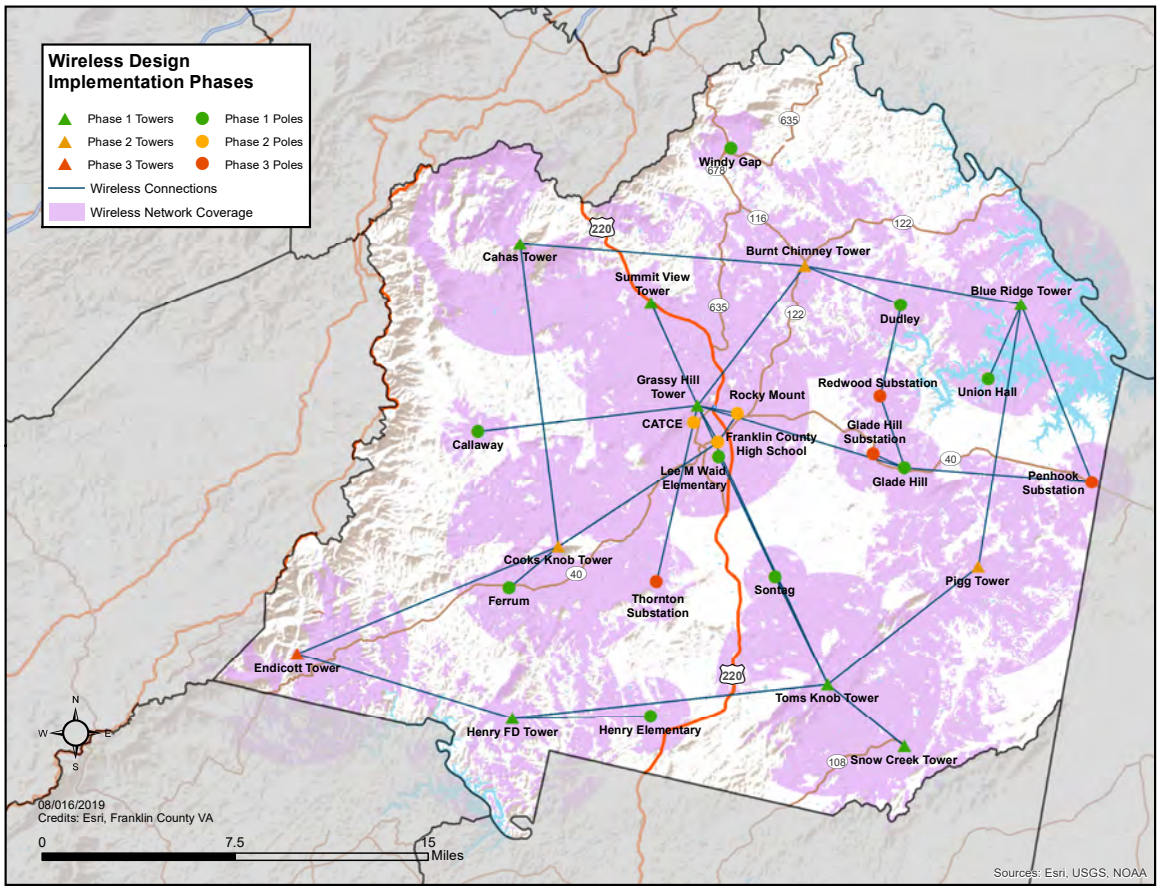
In order to provide a record to the Virginia Department of Housing and Community Development, comments should be addressed to Steven Sandy, Director of Planning and Community Development. The preferred methods of comment would be by email to steve.sandy@franklincountyva.gov or by letter sent to Steven Sandy, 1255 Franklin Street, Suite 103, Rocky Mount, VA 24151. Comment will also be received by telephone (540) 483-3027, ext. 2304. These comments will be recorded. Public comment will be open from Friday, August 9, 2019 to Friday, August 30, 2019. A complete list of all of the comments will be sent to VHCD.

DHCD will post electronic copies of all submitted applications to the agency website after the deadline for application submissions has passed and before project approval. Any private sector service provider wishing to request that DHCD deem a proposed project area as ineligible for VATI must submit a challenge with the information required in this section no later than 5:00 p.m. on October 9, 2019. DHCD will have 30 business days to validate a challenge.

BROADBAND FOR FRANKLIN COUNTY

Broadband Assessment and Plan

August 2019



DESIGN NINE
broadband planners

TABLE OF CONTENTS

1 BROADBAND INFRASTRUCTURE AS A UTILITY

Governments build and manage roads, but don't own or manage the businesses that use those roads to deliver goods and services.

The tremendous versatility of the Internet and the underlying technology bases now allows services that used to require their own, separate (analog) road system (voice telephony and TV services) to be delivered alongside other services like Internet access on a single, integrated digital road system.

If we managed overnight package delivery the way we manage telecom, UPS and Fedex would only deliver packages to residences and businesses where each delivery firm had built a private road for their exclusive use. We recognize immediately the limitations of such a business model–few of us would have overnight package delivery to our homes because the small number of packages delivered would not justify the expense of building a private paved road.

Before the rise of the automobile, most roads were built largely by the private sector. After cars became important to commerce and economic development, communities began building and maintaining roads because it became an economic development imperative to have a modern transportation system in communities.

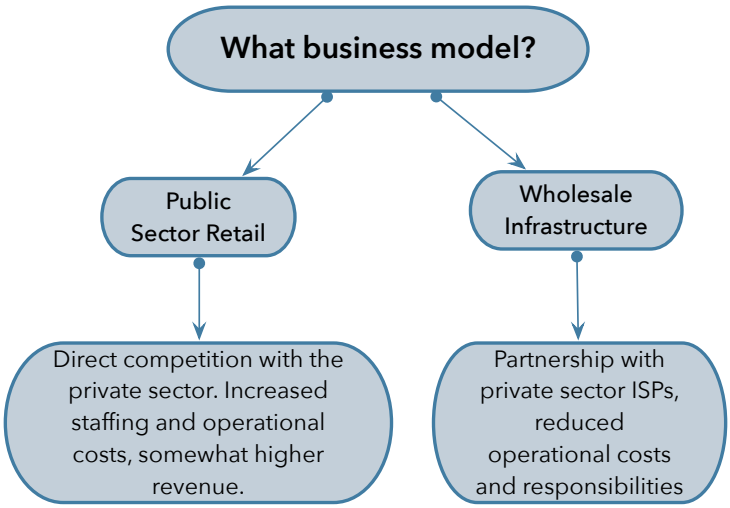
Before the rise of the Internet, digital networks were built largely by the private sector. As broadband has become critical to commerce and economic development, communities with digital roads are more competitive globally.

The time has come to recognize that it is inefficient and wasteful to build full duplicated digital road systems, which only raise the cost of telecom services to all public and private users. Networks that share capacity among a wide variety of public and private users have a lower cost of construction and a lower cost of operation–benefiting all users.

A UTILITY COMPARISON		
SHARED ROADS	SHARED AIRPORTS	SHARED TELECOM
Historically, roads have been built and maintained by the community for the use of all, especially private firms that want to use them to deliver goods and services.	Airports are built and maintained by a community or region as an economic and community development asset. Both public and private users benefit from the shared use of a single, well-designed airport	Towers, duct and fiber may be installed and maintained by the community and/or a neutral owner/operator for the use of all, including private firms that want to use them to deliver goods and services.
Access to the community road system is provided by parking lots and driveways, built by property owners, developers and builders.	Airport assets like departure gates, ticket areas, and runways provide access to the airline services.	In the digital road system, access across private property to the community–wide network in the public right of way is provided by towers, duct and fiber built by property owners and/or developers and builders.
The local government uses roads only to deliver government services. Local government does not offer services like overnight package delivery.	While the local government or a consortium of local governments typically own the airport facility, the local governments do not offer flight services.	Local government uses the digital transport system only to deliver government services. Government does not offer services like Internet access or Voice over IP.
Private sector businesses use roads so that their own cars and trucks can deliver goods and services to customers. Because businesses do not have to build and maintain roads, all businesses benefit directly by being able to reach more customers at less	Private sector airlines are able to offer competitively priced airfares because of the shared cost of the airport terminal facilities. Each airline does not build its own airport (which would sharply increase the cost of airfare).	Private sector businesses use the digital transport system to deliver goods and services to customers. Because businesses do not have to build and maintain a digital road system, all service providers benefit directly by being able to reach more customers at less
There are no road connection fees, and anyone may connect to the road system for free. Governments pay for the cost of maintaining roads largely from those that use the roads . Fees are proportional to use, from taxes on tires and gasoline.	Businesses and citizens do not pay a fee to access the airport facility. The cost of maintaining the airport facility is paid by the airlines, which bundle that cost into the price of airfare. Fees are proportional to actual use by flying customers. Airlines benefit because they do not have to build, own, and operate the airport directly. Those costs are shared across all users.	Any qualified service provider may connect to the digital road system for a nominal fee and begin to offer services, without any significant capital expense. Network capital and operating costs are recovered by charging service providers a small fee that is based on a percentage of their income from services offered over the system.

1.1 THE SHARED INFRASTRUCTURE BUSINESS MODEL

Traditionally, the telecom services market has been vertically integrated, with telephone and cable companies owning the cable infrastructure (i.e. twisted pair copper cable for telephone, and coaxial copper cable for TV). These companies bundled analog services with their own infrastructure, which made sense when only one service could be delivered over the cable.



American residents and businesses needed two networks: one for voice telephone service, and one for television. The rise of the Internet and associated changes in technology led to digital services (voice, video, Internet) that could be delivered simultaneously over a single cable or wireless connection.

By the early 2000s, it was becoming apparent that it was inefficient and costly to have two competing "retail" cable systems (e.g. telephone, cable) delivering the same content and services—it was only creating higher costs for residents and businesses.

A new business model became possible: wholesale leasing of the cable/wireless infrastructure to private sector service providers, which unbundles the infrastructure from the services. A side effect of this unbundling is that it becomes much easier to determine what a customer is actually paying for a given service: in the vertically integrated 20th century model, with the cost of infrastructure maintenance bundled together with the services, it is much more difficult to determine what a service actually costs.

While a few communities have pursued the retail business model (typically building fiber to the home and business and selling retail Internet and other services directly to customers), most of these retail efforts have been by local governments that are also providing electric service—owning the utility poles is a significant cost advantage not available in most communities.

In the wholesale infrastructure business model, local government investments are limited to passive infrastructure like conduit, dark fiber, and wireless tower space. Services for businesses and residents are offered by private sector providers offering Internet, TV, telephone and other data services. The components of the transport network include conduit, handholes, cabinets and shelters, splice closures, and network equipment.

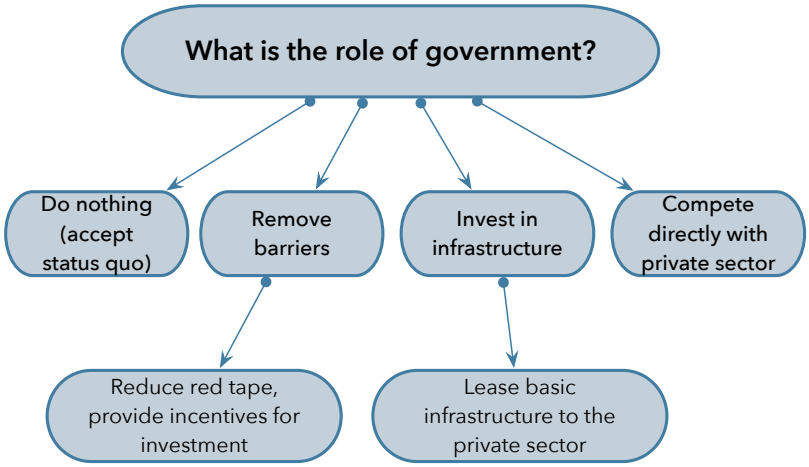
Recommendation

In the county, improved wireless broadband is going to be an important part of improving broadband service availability and affordability, and WISP access to existing and/or new towers should continue.

Features	Municipal Retail	Wholesale Infrastructure
Basic Concept	Generally more difficult to because of possible legal challenges from incumbent providers.	One or more private sector ISPs would use the infrastructure to sell their own services directly to residents and businesses. Use of County-owned conduit, fiber, and wireless towers makes it less expensive for ISPs to expand service.
Government Involvement	Local government competes directly with the private sector for Internet service.	County involvement is limited to providing basic infrastructure to ISPs.
Management	Local government is responsible for management and operations. Most functions could be outsourced to a qualified third party entity.	ISPs responsible for virtually all day to day customer services and support. The Broadband Authority is only responsible for network and tower maintenance and repairs.
Competition	The incumbent telephone and cable providers would compete vigorously against local government service offerings.	Private sector ISPs would provide competition to the telephone and cable companies.
Service Options	Local government would sell only Internet. Businesses and residents could get TV and voice using their Internet connections.	ISPs would focus on high speed Internet, with some other service offerings like voice and business services.
Risks	The primary risk would be lawsuits from incumbent providers.	Leasing tower space, conduit, or dark fiber is relatively simple to manage, with limited day to day responsibilities. A tower-based radio backhaul network requires some additional management, but most tasks can be outsourced to a qualified private sector firm. It is important to identify prospective service providers early in the process.

2 WHAT IS GOVERNMENT'S ROLE?

Successful improvements in broadband access, affordability, and reliability for the county involves several decision points, as outlined in the illustration below. Government has several "first choice" options.



Do nothing is to accept that businesses and residents in the county will have to continue to use whatever is available, despite the cost and bandwidth limitations that limit what many are able to do online.

Government can ***remove barriers*** to private sector investment. This can be an effective and low cost strategy. Possibilities include reducing permit fees for fiber construction and tower installation, incentives to developers to install conduit and meet-me boxes in new residential and commercial construction, simplified permit requirements for rural utility pole installation on private property, and identifying areas of residential and business demand and sharing that information with providers.

The county could choose to make ***investments in basic infrastructure*** and make that infrastructure available to the private sector via revenue-generating lease agreements.

When communities have chosen the option to ***compete directly with the private sector*** by offering retail Internet, phone, and TV services lawsuits from incumbents often create difficulty moving forward as well as expensive legal fees.

Recommendation

The County and the Broadband Authority can both **remove barriers** and **make targeted investments** in infrastructure. These two activities can be executed in parallel, with investments taking place as funding sources are identified. There are a variety of low cost and no cost efforts, mostly at the policy level, that the County can do to encourage more private investment–with a primary focus on keeping the cost of permitting and constructing new wireless towers as low as possible.

As one example, investments in improvements to existing county-owned towers and/or adding new county-owned towers could help the county's existing wireless providers bring more services to underserved areas of the county (e.g. the Snow Creek project) and/or attract much competitive broadband wireless providers into the county.

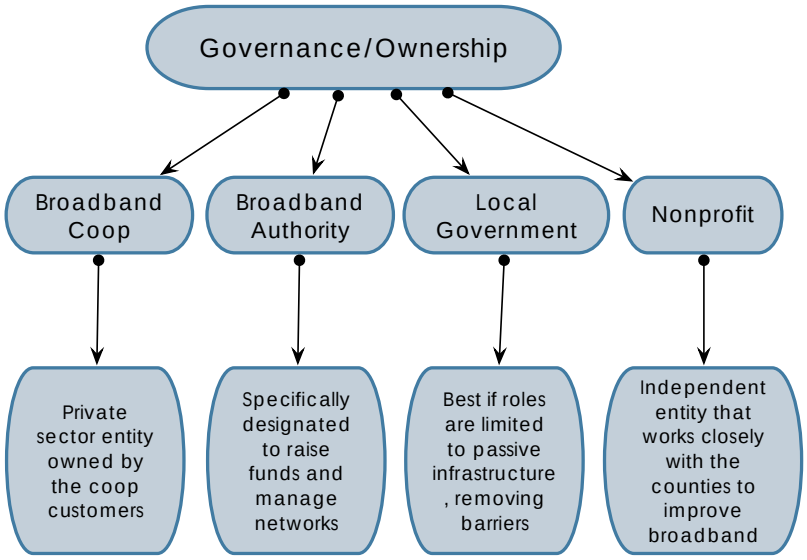
3 GOVERNANCE AND OWNERSHIP OPTIONS

For whatever infrastructure improvements may be made in the county, there will be a limited number of essential roles.

Community and county government investments in telecom improvements can be a mix of passive infrastructure like dark fiber, conduit, and wireless towers and well as some network electronics. These assets can be leased out to the private sector.

Franklin County has already formed a Broadband Authority , and there is no reason to change this structure. County departments can provide assistance as needed. In other areas of the country, where it is often more difficult to form an authority specifically for broadband, other approaches are being adopted.

In Virginia, a **Broadband Authority** has been both popular and effective in improving broadband access, especially in rural Virginia counties. Broadband Authorities are a political subdivision, have bonding privileges, and are able to operate across multiple jurisdictions. The Wired Road Broadband Authority, as one of several Virginia multi-jurisdictional authorities include Carroll County, Grayson County, and the City of Galax.



In some instances, broadband infrastructure projects are owned directly by a **local government** entity. The nDanville fiber network is part of the City of Danville's Utility Department. The City of Palm Coast, Florida also directly owns its fiber network. However, most direct local government ownership efforts are managed as an enterprise fund to provide full transparency on revenue and expenses related to the network.

Another option is to form a **nonprofit**, which would not be subject to the state level restrictions on local government. A number of communities have formed a nonprofit (typically a 501(c)(4) to provide the governance and ownership roles for a community broadband effort.

A **broadband coop** is becoming evaluated more frequently. Coops are typically formed as a 501(c)(12) and are owned by the members (who are also the customers of the coop). Coops can receive membership fees in advance of providing the service, which can help raise the funds needed for infrastructure. There can also be more than one type of membership (e.g. residential, small business, large business, government, institutional, etc.), and each membership type can have a different membership fee associated with it.

3.1 ABOUT BROADBAND AUTHORITIES

The primary advantages of an Authority as opposed to other ownership options include:

- A single entity manages and coordinates a wide variety of activities effectively with less duplication of effort and overlap.
- Coordination and management of grant funding opportunities, preparation of grant applications, and management of grant funds.
- Coordination of expenditures of County CIP funds when available.
- Work directly with existing incumbent and competitive service providers to assist them in making service improvements, coordinating CAF2 expenditures (Connect America Fund round 2), and coordinating any joint funding opportunities (e.g. DHCD funds).
- Work closely with local government departments (e.g. planning, IT, GIS, etc.) to remove barriers, simplify permitting, and track assets like towers and fiber/conduit.
- Collaborate with public safety initiatives, including shared space on existing towers and shared use of any new towers.

Franklin County has a Broadband Authority in place that is working closely with County staff and public safety officials. The existing Authority should continue to be the lead on broadband in Franklin County.

3.2 ABOUT NONPROFITS

There are various kinds of nonprofit businesses. The most common is the 501(c)(3), which is limited to strictly charitable efforts. A 501(c)(3), according to IRS rules, must have a well-defined charitable purpose targeted toward a specific need and/or a specific target population. In other words, a 501(c)(3) cannot, according to IRS rules, operate as a nonprofit business that provides services to the general public.

Many of the first community networking projects in the early and mid-nineties were formed as 501(c)(3) organizations; it was common for these entities to offer dial-up Internet access to the general public at a time when Internet service providers were still relatively uncommon. But by 2000, most of these organizations had closed their doors and/or discontinued their Internet access services because of IRS challenges.

Today (2019), we have seen new 501(c)(3) and 501(c)(4) organizations being formed, and the Federal government's 2015 endorsement of both community-owned networks and the open access business model has removed the uncertainty of using a nonprofit for this kind of effort. The IRS defines one role for 501(c)(4) entities as "*Social welfare organizations: Civic leagues or organizations not organized for profit but operated exclusively for the promotion of social welfare.*"

A 501(c)(3) can accept tax deductible donations, but contributions to a 501(c)(4) are not tax deductible. The advantage of a nonprofit is that they are relatively easy to create and legal fees are usually nominal. Nonprofits are often eligible for certain kinds of grants not available to for profit enterprises, and the nonprofit can provide the needed oversight to manage broadband infrastructure investments.

3.3 ABOUT COOPS

Cooperative business enterprises as formal entities date from the mid-1800s. The first cooperative was set up in England to serve customers unhappy with local merchants. In the United States, the Grange movement began setting up cooperatives in rural areas to sell needed items to members and to help sell produce and other agricultural products that were produced by members. Today, credit unions are the most common form of coop business in the United States, with more than 65 million people obtaining services from over 12,000 credit unions.

Telephone and electric coops continue to be very common in rural parts of the U.S., and in fact, the majority of telephone companies in the United States are coops, but most have very small numbers of customers--often less than a thousand subscribers. Telephone coops serve more than a million subscribes in thirty-one states. The True Value and Ace Hardware chains are actually buying coops that help keep independent hardware stores competitive with the large chain stores.

The U.S. Department of Agriculture (USDA) provides extensive support for existing coops, and also helps communities start coops. One of their publications lists the principles of the coop:

- User-Benefits Principle -- Some purposes of a coop are to help members get services that might otherwise not be available, to get access to markets, or for other "mutually beneficial" reasons.
- User-Owner Principle -- The users of the cooperative own it.
- User-Control Principle -- The owners of the coop (i.e. members) control the coop through voting (annual meetings, etc), and indirectly by electing a board of directors to manage the enterprise. Large users who make high volume purchases of goods or services may receive additional votes.

Because cooperatives are user-managed, control of the enterprise is vested in the community or region where the users reside. Cooperatives also return excess earnings to its members; these refunds are called patronage refunds, and are typically computed at the end of the fiscal year. The expenses and income of the coop are calculated for the year, and any excess is returned to members, based on the percentage paid in by each member (e.g. a member that paid in 1% of total earnings would get a refund of 1% of any excess earnings).

Most cooperatives do not pay dividends on capital. This helps keep outsiders from taking control of the company, which would result in the community losing control over the quality of services and direction of the enterprise.

Coops are organized in part based on the territory they serve, and there are several classifications that may be relevant for community broadband efforts. A local coop serves a relatively small area that may be a single town or county and/or a radius of ten to thirty miles. A super local coop serves two or more counties. A regional coop may have a service area of several counties up to an entire state (or multiple states). For projects that involve several local government entities that are already trading services like local public safety dispatch, a super local coop may be the most appropriate designation.

Most local and super local coops use the centralized governance structure, which means that individuals and businesses represent the bulk of members.

Cooperatives offer one or more of three kinds of services:

- Marketing coops help sell products or services produced by members.
- Purchasing coops buy products and services on behalf of members.
- Service cooperatives provide services to members, and service coops include the credit unions, the electric coops, and the telephone coops.

Equity is typically raised for coops by direct investment from members. In return for an investment, members receive a membership certificate. The member may also receive shares of stock if the cooperative issues stock (some do, and some do not). Once a member has invested, they gain the right to vote in elections. As an example, if a local government made a large initial investment in the cooperative, they could gain substantial influence in the affairs of the organization by gaining multiple shares and increased voting rights. Property owners (residential property owners and business property owners) who paid an initial connection or pass-by fee would also gain shares in the business, so every property owner that pays the connection fee gains ownership in the enterprise--an important selling point when encouraging property owners to, quite literally, invest in the project.

Although cooperatives are typically constrained by both Federal and state laws to do a majority of business with members, in most cases, cooperatives are able to do business with nonmembers up to some percentage of business income that can be as high as 49 percent. Note that this may be affected by the underlying legal incorporation of the cooperative--if incorporated as a 501(c)(12), the IRS requires that 85% of income must come from members for the purpose of meeting ordinary expenses.

In summary:

- Coops are member (subscriber) owned, meaning they are strongly vested in the community. Any effort by the coop board to dispose of assets or to sell the coop would have to be approved by a majority vote of the members.
- Members play an active long term role in governance by nominating and electing board members. So members have a straightforward way of influencing decision-making by the board.
- Coops generally operate on a cost-plus basis. Income that exceeds some preset level is returned to members periodically as a distribution of funds.
- Broadband coop bylaws must be carefully written, especially if there is an interest in several classes of membership. Each class of membership can be charged a different membership fee, and this can be a valuable source of start up funds, but membership categories are difficult to change later.
- Coops are largely immune to challenges by incumbent telecom providers due to the long history of existing coops and because of special legislation passed by Congress.
- Coops can tap USDA funds, but the application process would be time-consuming and expensive for a start up coop.

Advantages of a Coop

The primary advantages of an Coop as opposed to a local government pursuing projects independently include:

- Avoids the strict limitations on local government participation. A coop, as a private sector entity, would have a wider range of infrastructure options, including offering retail wireless and fiber services.
- Coops can raise funds prior to delivering services to its shareholder customers. A broadband coop could solicit memberships from throughout the county (as long as the coop can clearly articulate its mission). Alternately, it could start with smaller "first phase" service areas and only solicit memberships from the initial target areas.
- A coop, with local members as the shareholders and owners, is firmly vested in the community. By comparison, a nonprofit, while easier to set up, does not have the same vesting in the community–the volunteer board of a nonprofit can sell the assets and/or disband it without any input from the community.

A broadband coop would need a carefully selected board of directors with significant business and management experience.

3.4 GOVERNANCE QUANTITATIVE EVALUATION

Six factors can be evaluated to provide a assessment of the governance options. These factors are:

- Transparency - Does the governance structure provide adequate transparency about decision making? Do stakeholders and interested parties have adequate ways to obtain documents, financial reports, and related governance materials?
- Timeliness - How quickly can the governance entity be legally formed? Time may be of the essence.
- Community Oversight - Does the entity have adequate community control and oversight? Does the community at large and the County have adequate representation in the governance structure to ensure that assets are managed properly?
- Legislative Authority to Build/Operate - Does the governance entity have clear legislative approval to build and operate a telecommunications network?
- Financing Options - Are there adequate financing options available to provide the appropriate level of funding over time to meet the long term vision of the county?
- Tax Liability - Does the governance entity incur tax obligations?

3.5 RECOMMENDATION

There is a role for investments by the County, especially if public safety tower needs can be combined with improved broadband wireless tower needs in underserved areas of the county.

In Virginia, the Broadband Authority is an ideal vehicle for obtaining grants and for managing broadband infrastructure. The County should continue to fund and support the existing Broadband Authority.

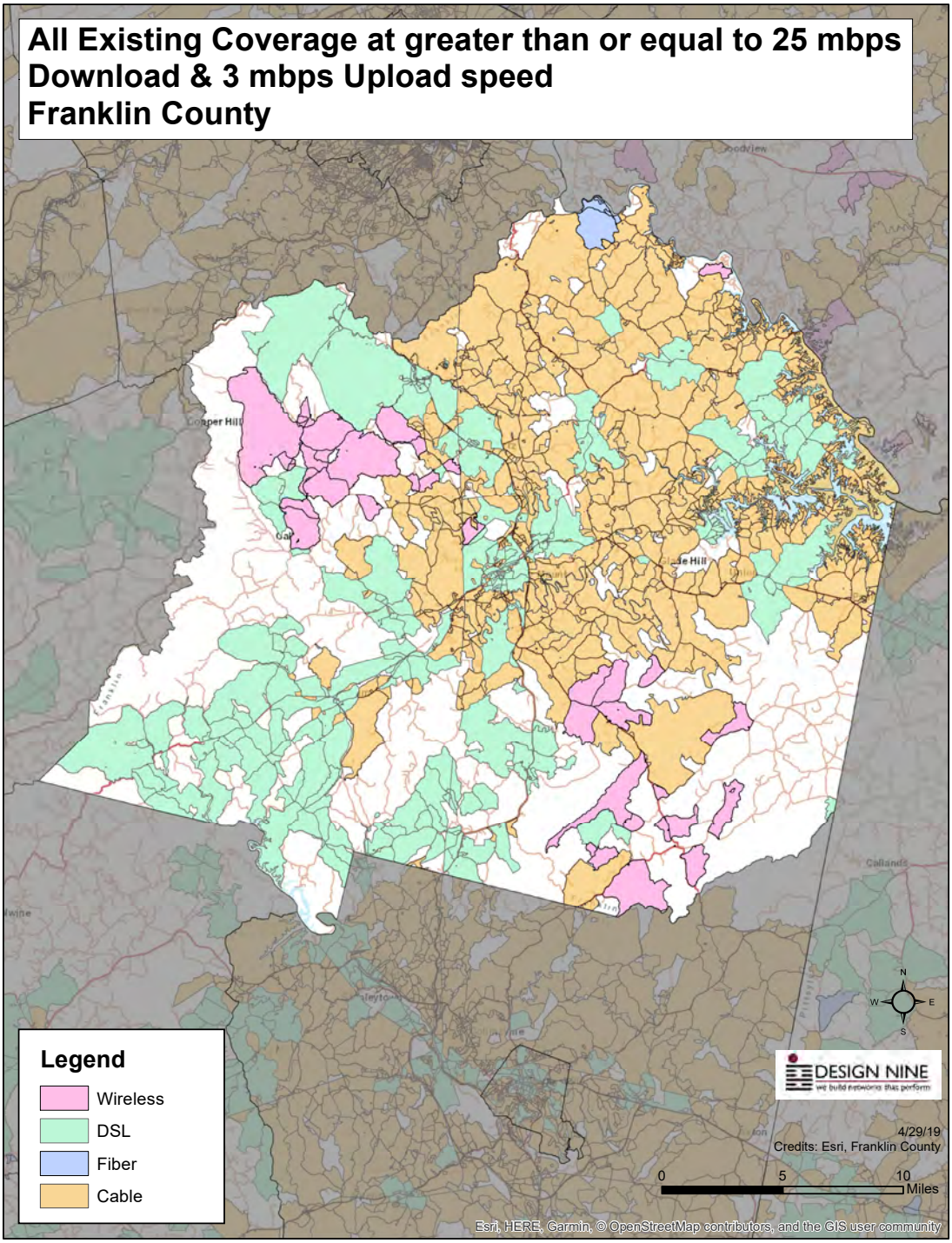
5 EXISTING ASSETS AND DEMOGRAPHY

The maps on the following pages include information on where Internet and cellular phone service is available. Due to the way that the FCC allows the incumbent telephone, cable and Internet providers to report data by census block, if a single location in a census block is able to receive a given service level, every home in the census block is listed as "served." This leads to coverage maps that are optimistic about where coverage is actually available.

- Existing coverage areas at 25/3 speeds. The FCC defines an area as "served" if provider can deliver 25 Meg down and 3 Meg up to customers.
- DSL coverage at the 25/3 rate.
- Fixed point wireless broadband service in the county at 25/3 speeds.
- Cellular service is widely available in the County, but the cellular providers tend to be very optimistic about where service is available. There are many areas of the County, particularly in the western and southwestern portions of Franklin County, where service is spotty or not available.
- Broadband wireless, cable and DSL at 25/3 or greater, with17% of locations remain underserved, the actual number of underserved is likely higher.
- At least 4,913 addresses are underserved (less than 25/3 Internet service), mostly in the rural parts of the county.
- Points of interest, including household density (an important factor when evaluating new service areas).
- LMI Areas of the county (Low and Moderate Income). Very important for certain kinds of grants.
- Towers in various parts of the county. These are taken from the FCC tower registry and other sources. The FCC registry which includes both cell towers and other kinds of towers (e.g. radio/TV broadcast towers, public safety towers).
- Long haul fiber routes through the county, which are important data routes to the rest of the Internet.

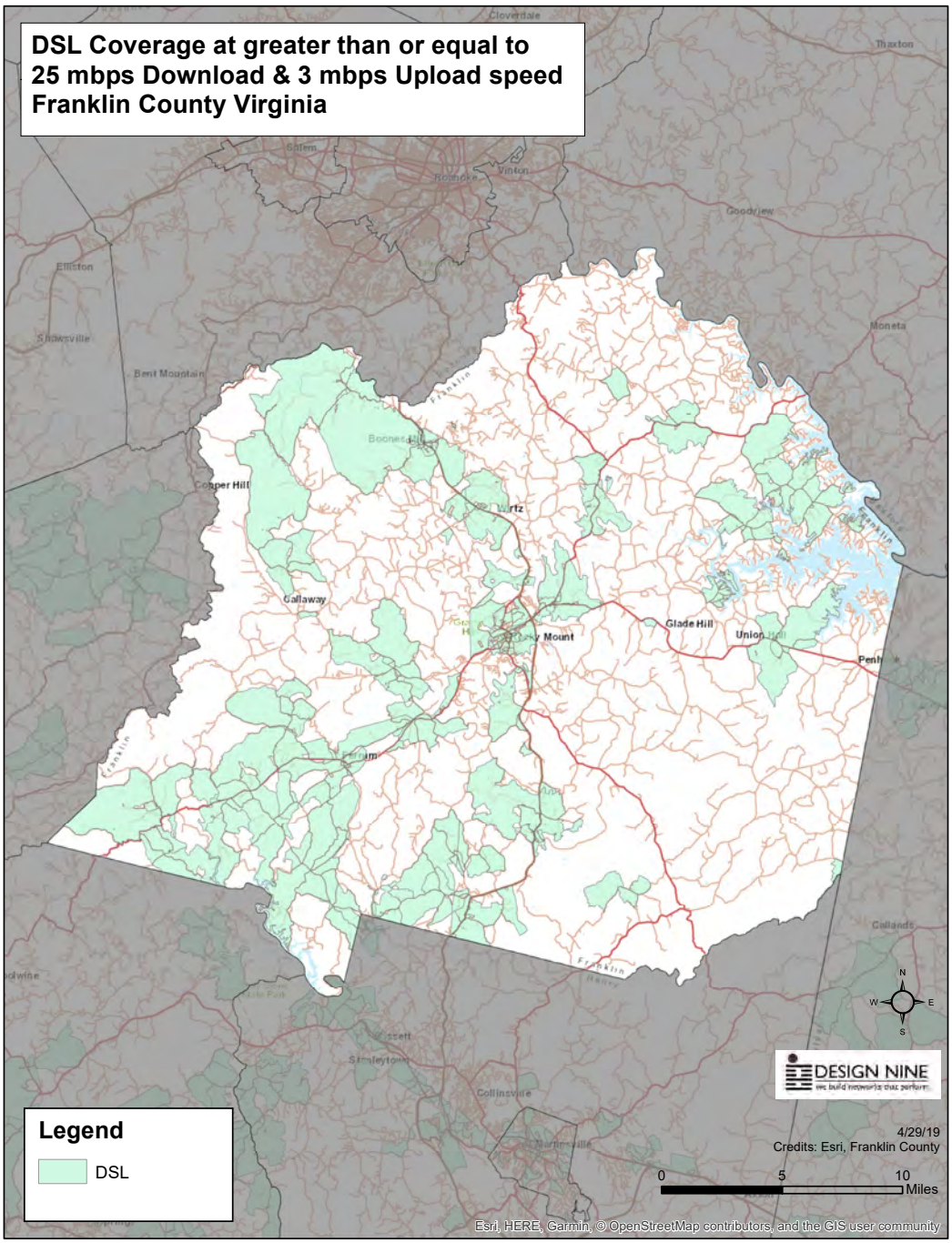
5.1 EXISTING BROADBAND COVERAGE AT 25/3 SPEEDS

Many areas of the County are not able to get service at 25/3 speeds.



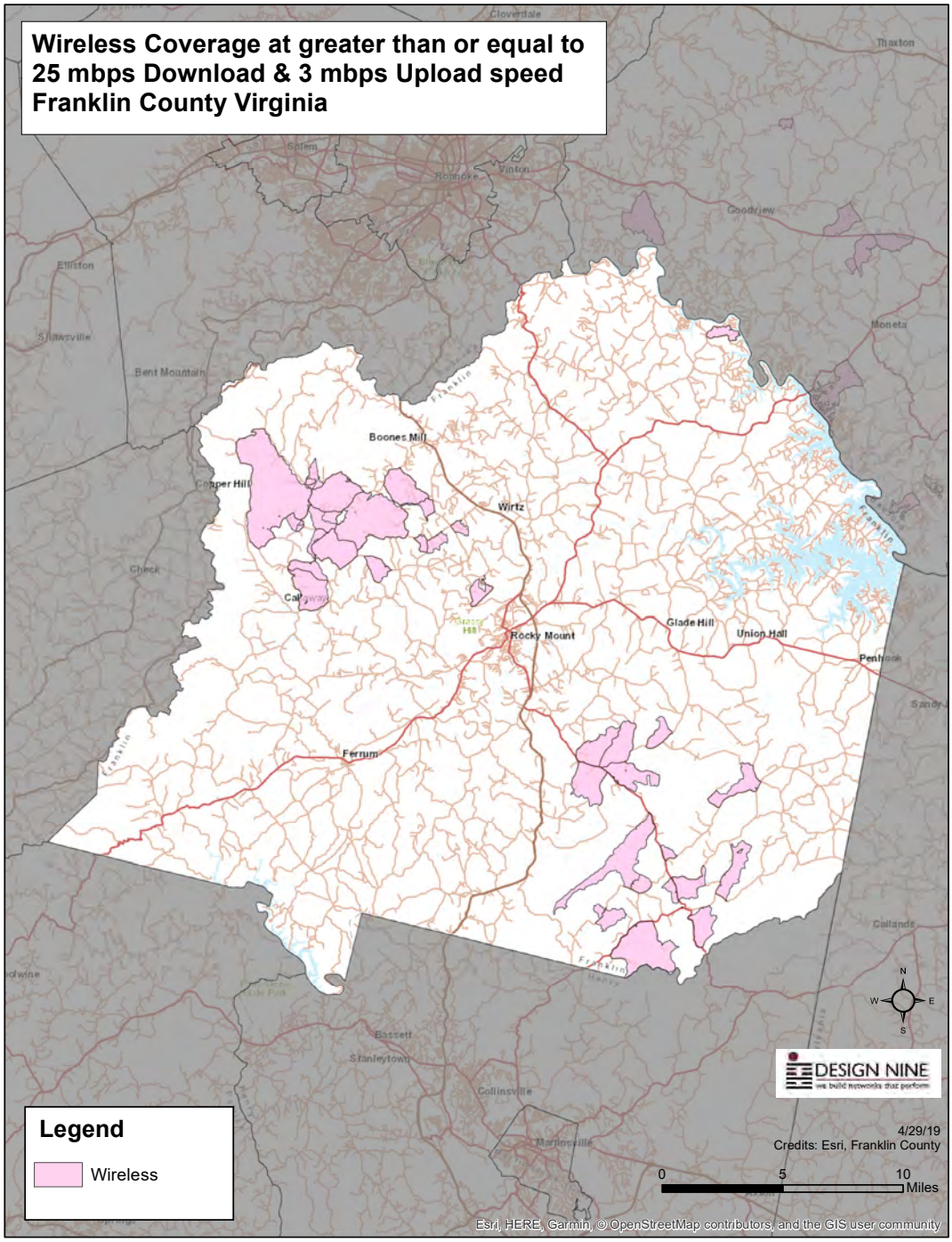
5.2 EXISTING DSL COVERAGE AT 25/3 SPEEDS

Most homes and businesses in the county have access to DSL service, but not all locations can receive DSL service at 25/3 speeds.

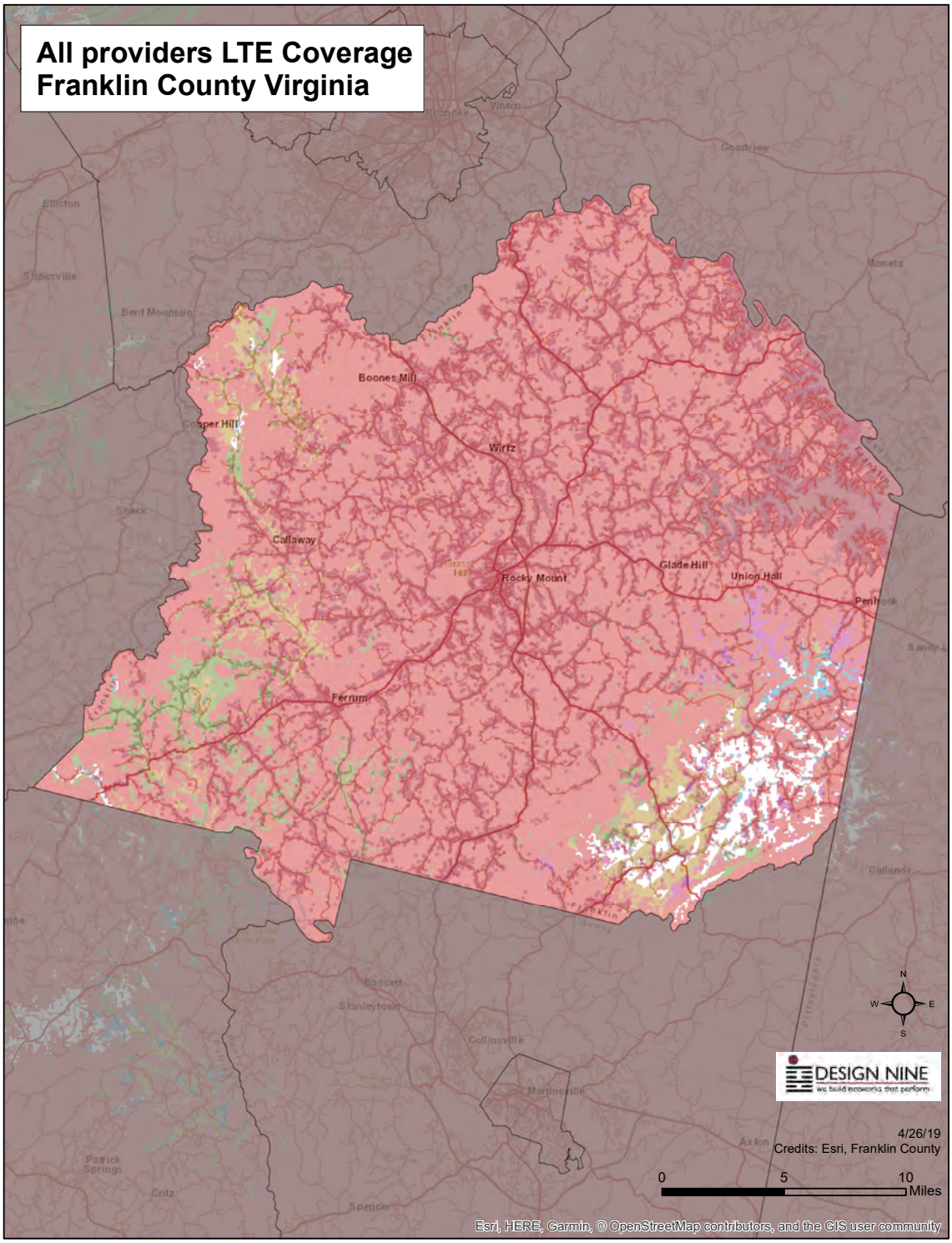


5.3 FIXED POINT WIRELESS AT 25/3 SPEEDS

Fixed point wireless broadband is more widely available in the County than this map indicates, but not all wireless tower sites are able to deliver 25/3 speeds.

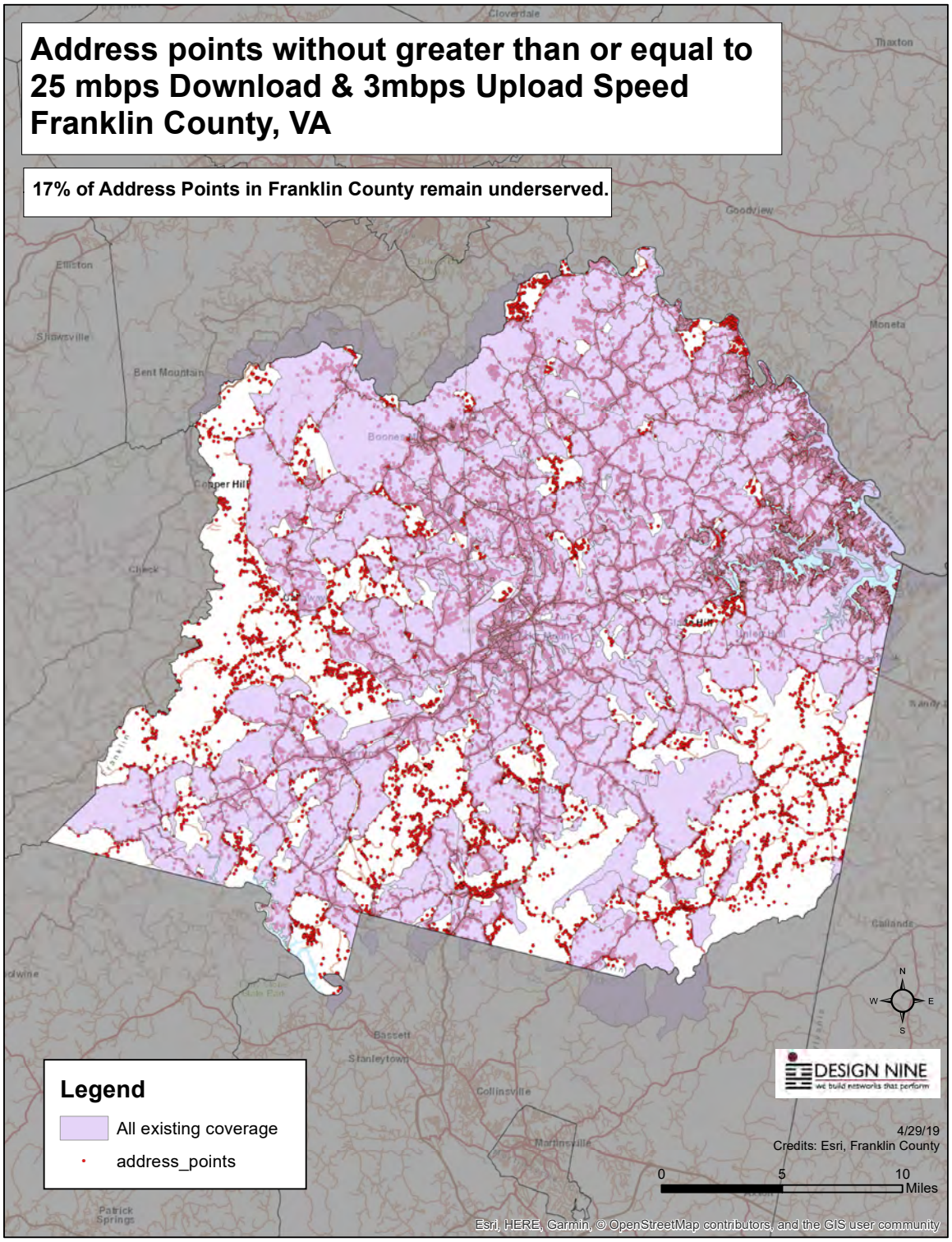


5.4 CELLULAR COVERAGE BY ALL PROVIDERS



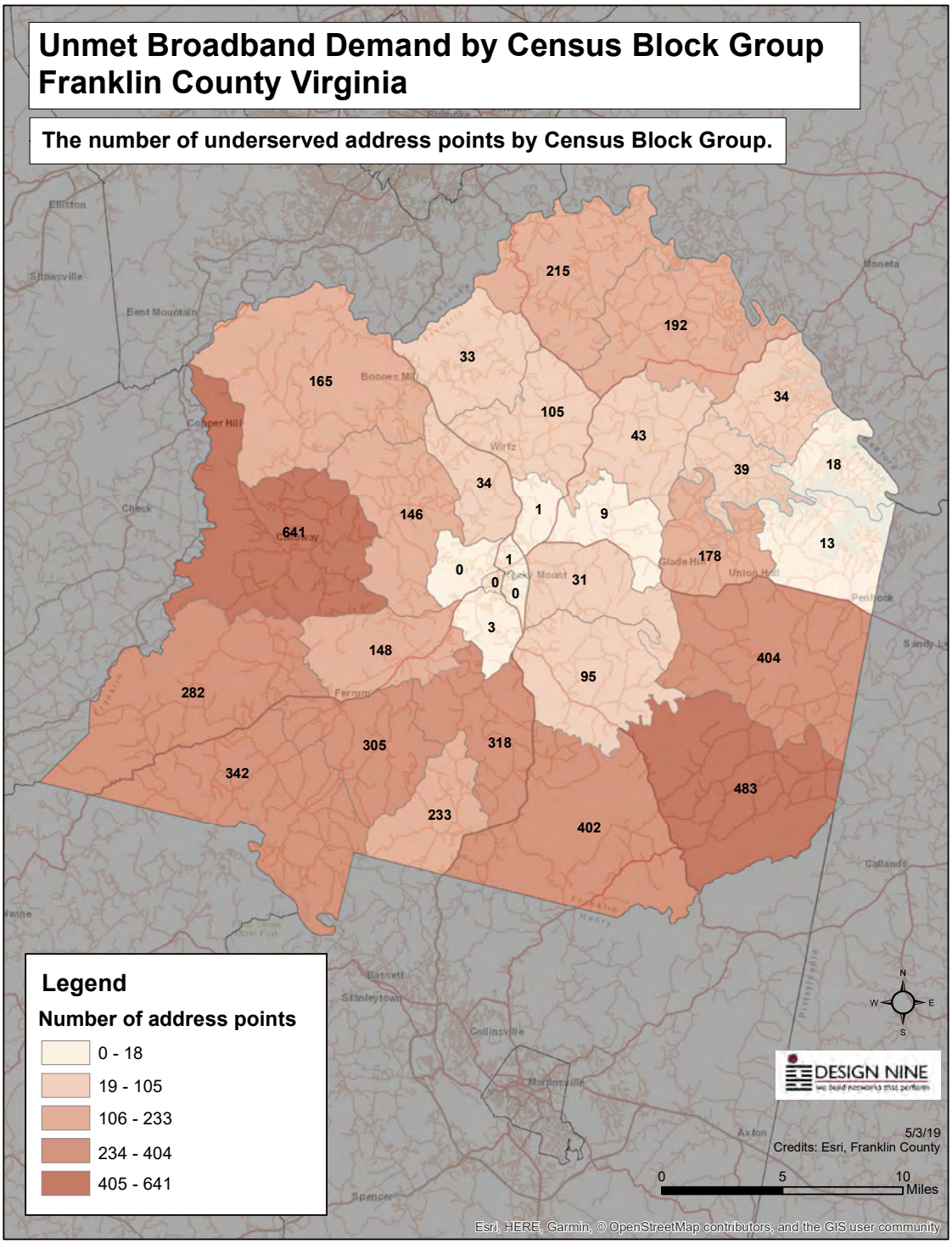
5.5 25/3 COVERAGE WITH ADDRESS POINTS

Broadband wireless, cable and DSL at 25/3 or greater, with17% of locations remain underserved, the actual number of underserved is likely higher.

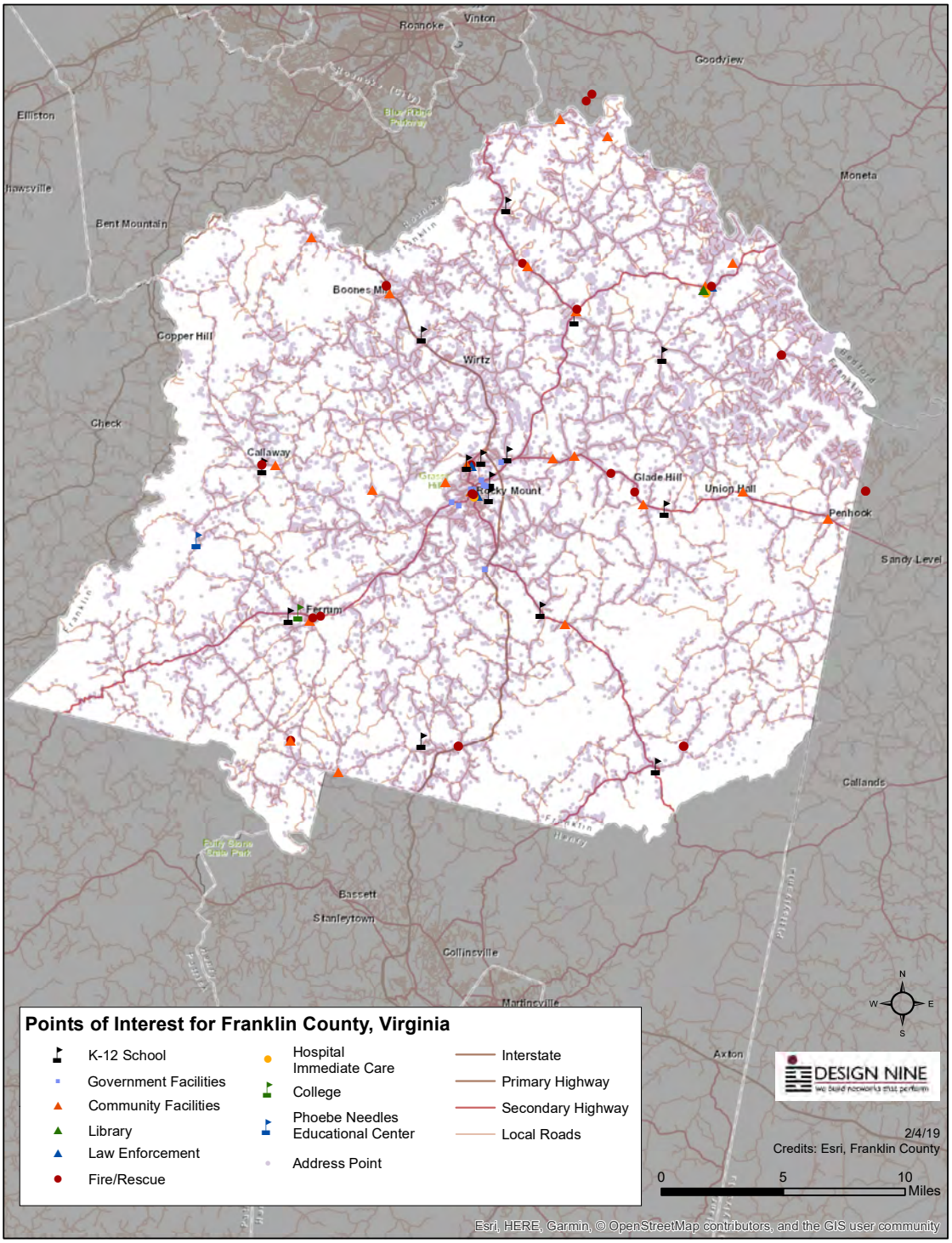


5.6 UNDERSERVED BY CENSUS BLOCK GROUP

At least 4,913 addresses are underserved (less than 25/3 Internet service), mostly in the rural parts of the county.

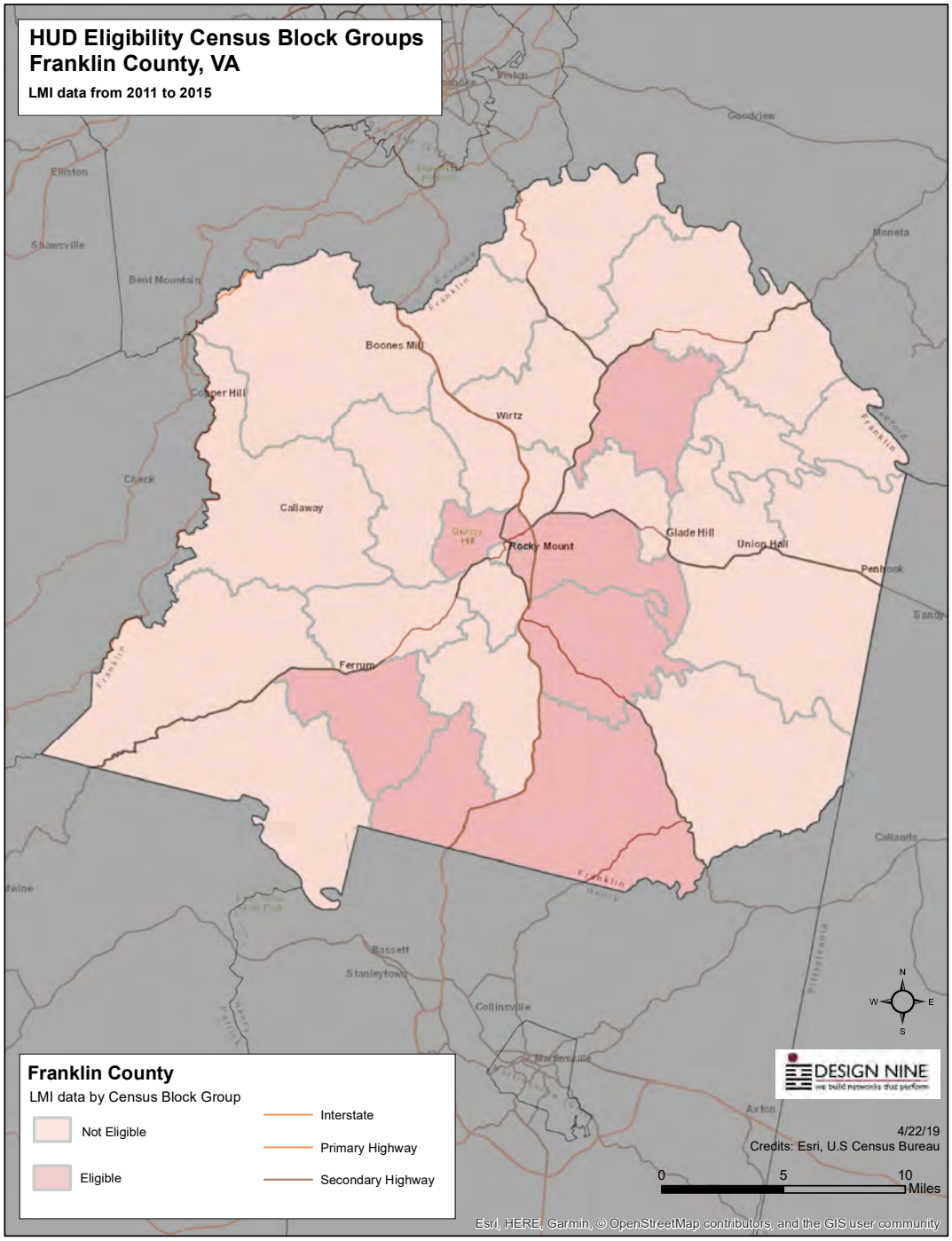


5.7 POINTS OF INTEREST



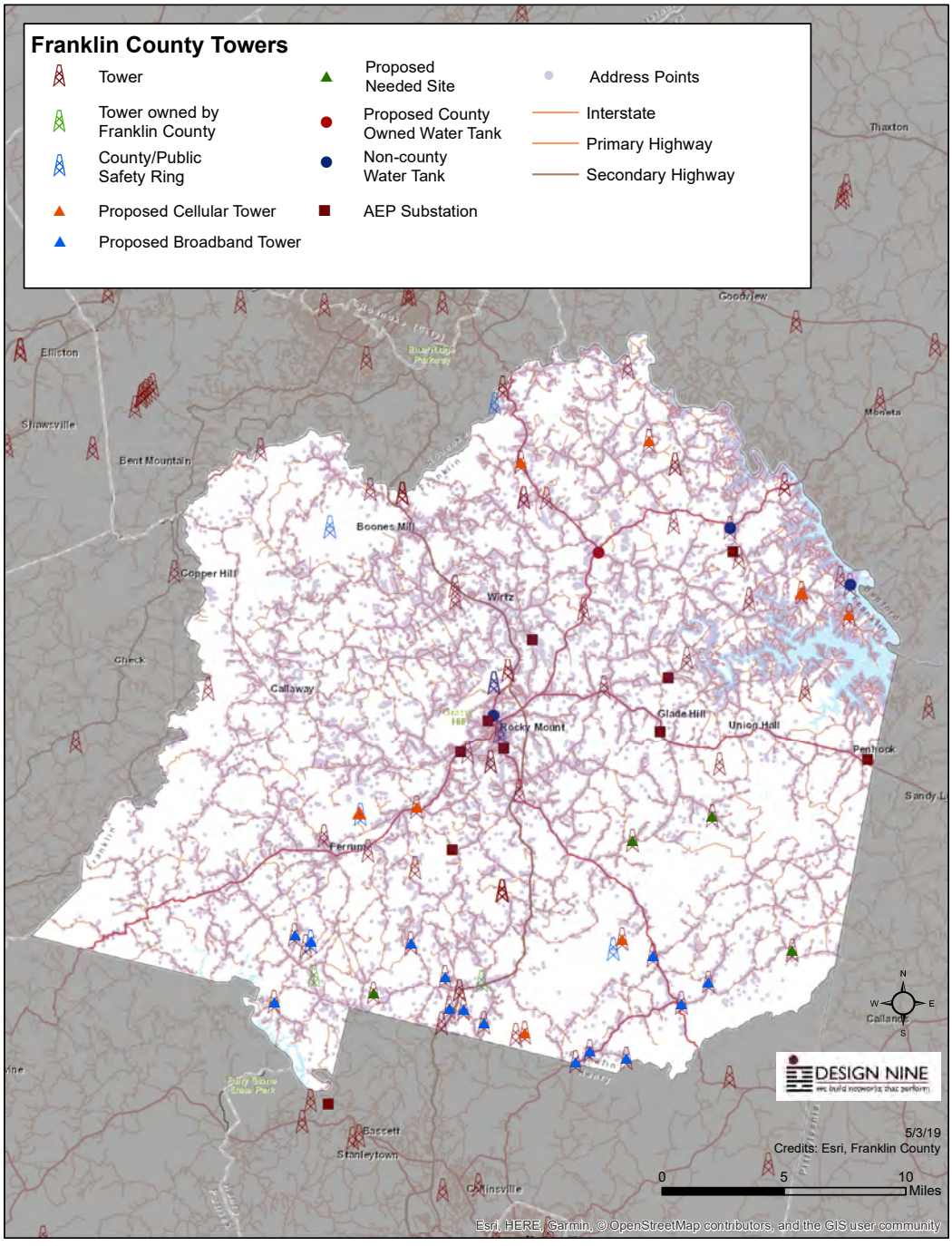
5.8 LMI AREAS OF THE COUNTY

Certain kinds of grants (e.g. CDBG funding) favor LMI (Low and Moderate Income) areas. Large parts of the county would qualify for grants that have a preference for LMI areas.



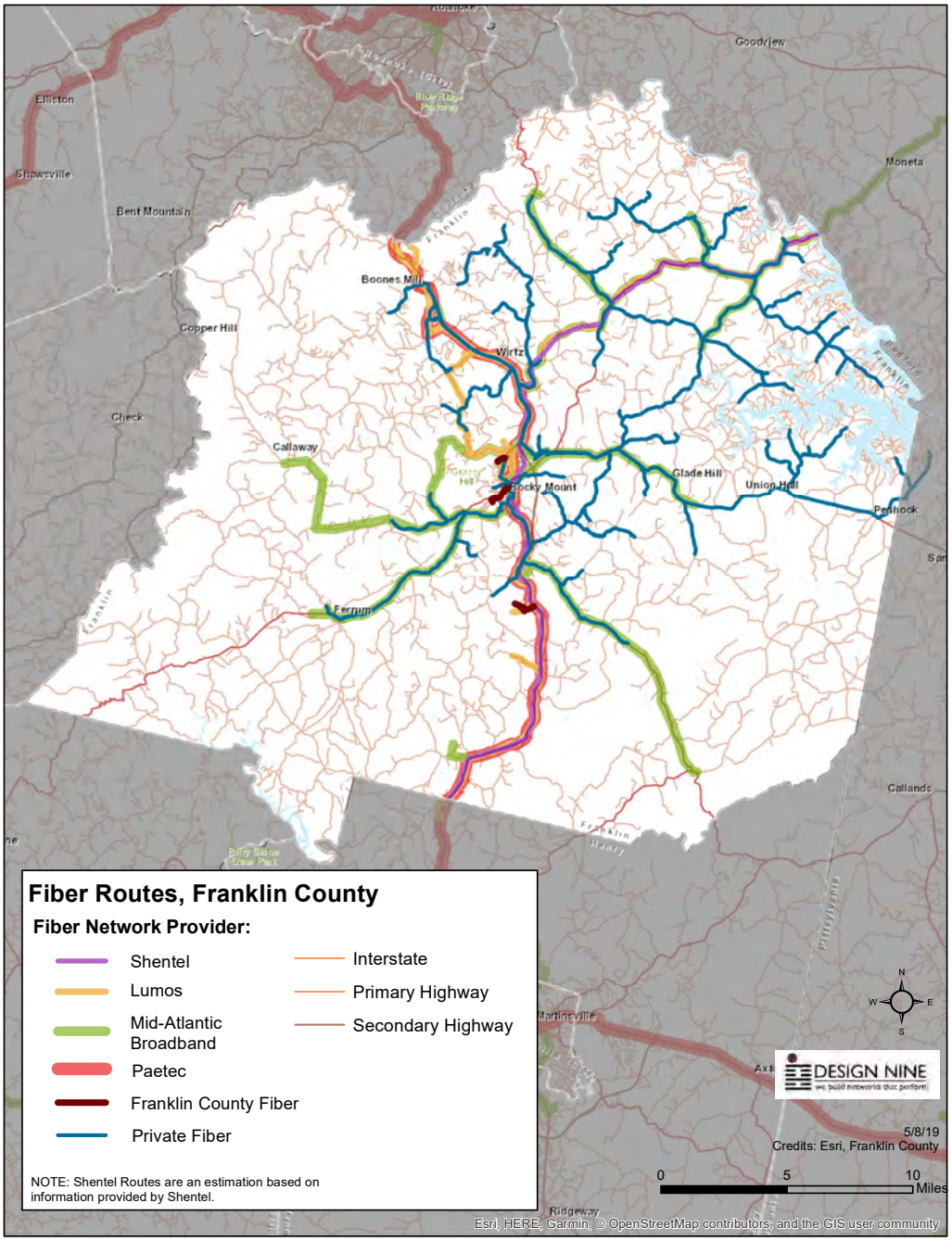
5.9 TOWER ASSETS AND SUB-STATIONS

There are a number of cellular towers in the county. These are clustered along major travel routes, which leaves many areas of the county with marginal or no cellular service. Increased availability of good wireless and/or fiber broadband service would enable many residents and businesses to use inexpensive nano-cell boxes in their home or business. More information on nano-cells is contained in a later section of this report. Appendix B contains a list of known tower owners; this list was developed from the FCC tower registry and from data supplied by Franklin County.



5.10 FIBER ASSETS

Some limited third party (e.g. not incumbent) fiber is in or near the county. These routes are extremely important as more "last mile" broadband improvements are made–competitive ISPs and WISPs can generally get better pricing from companies like Shentel and Lumos than from the telephone or cable companies. Paetec is a long haul fiber firm that is probably leasing fiber pairs from Shentel or Lumos; the company has no apparent service presence in the county (i.e. the fiber just passes through).



6 EXISTING SERVICE AREAS AND SERVICE OPTIONS

Our service provider report provides insights into the services currently available in your county. Our report provides data that show which areas by zip code that are most impacted by poor Internet service and/or the lack of Internet Service Provider options. Because of the unique geography of Franklin County, many Internet Service Providers shown as available online in a particular zip code are likely not available.

NOTE: This data is collected from publicly available data. Service providers often exaggerate their coverage, and the actual availability of some services as represented in the tables below may be lower than the numbers suggest. Two examples would be Cox showing up in zip code 24059 and Consolidated Communications showing in zip code 24137. It is unlikely that any Franklin County residents in those zip codes have access to those services.

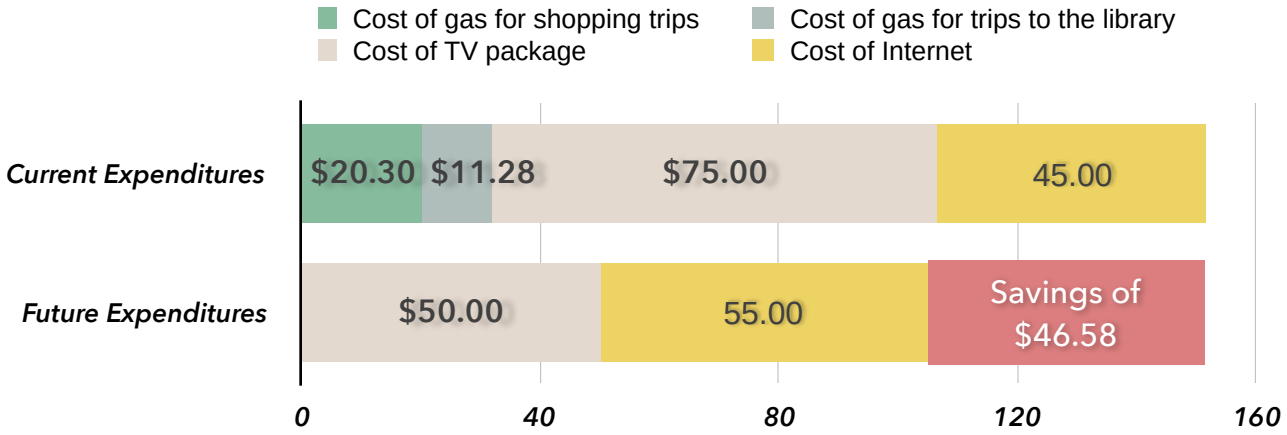
As the following tables and data demonstrate your citizens have the most choice in expensive but slow DSL Internet Service Providers, Most residents have little choice in companies that provide true high-speed Internet. There are eight zip code areas with a high number Franklin County residents dependent on DSL services.

Lack of choice impacts citizens' lives in variety of ways from their budgets to how they spend their time. For the first graph we have used basic CenturyLink DSL at $45 per month with 10 Mbps download as the base service.

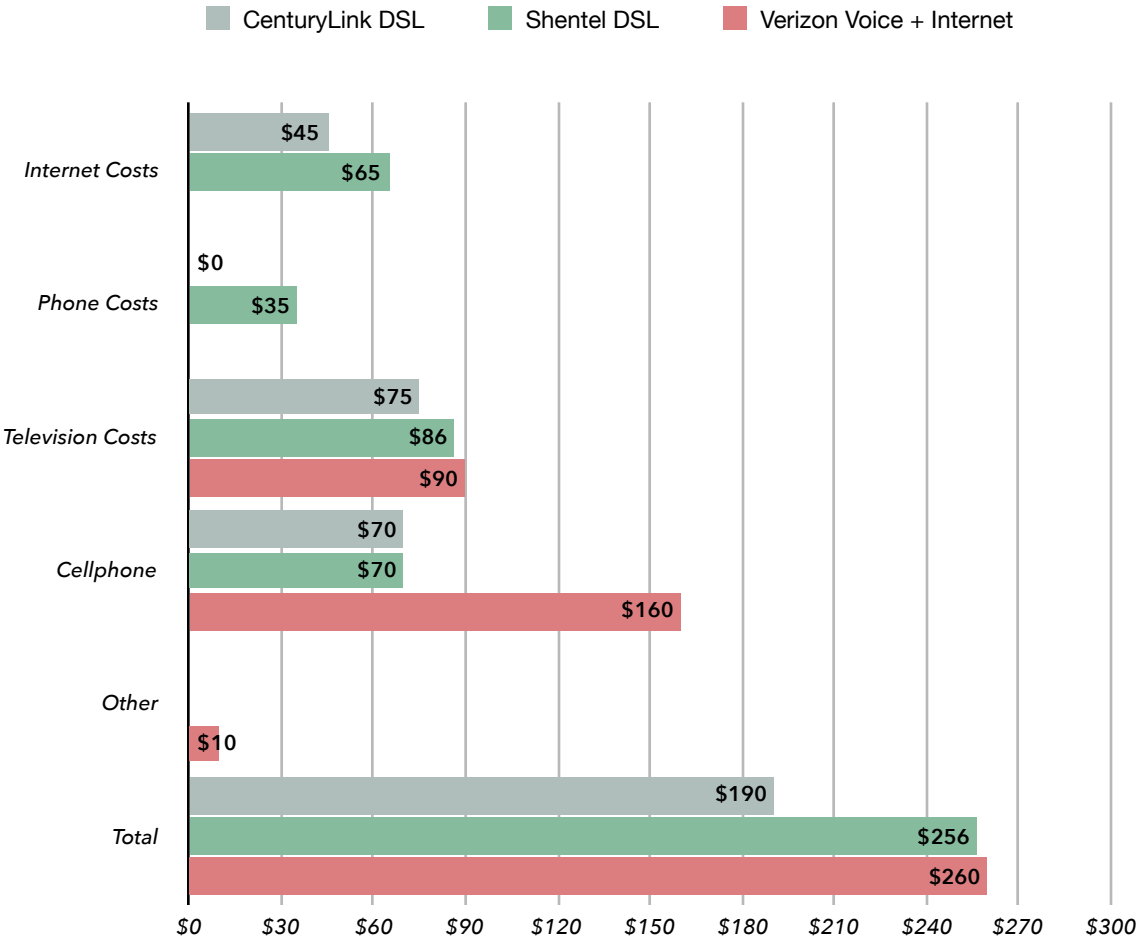
The average household in the United States pays $67 per month for Internet in their home. Smartphones have become an expensive substitute for reasonably priced Internet services. A single smartphone with an unlimited data plan can cost from $60 to $95 per month and adding a single tablet for school work can add an additional $10 to $20 per month before taxes and fees for data. Even "unlimited data" often has limitations after a certain amount of data has been used.

Studies have shown that high-speed broadband can save rural residents up to $754 per year. Our conservative $559 annual savings number illustrated in the chart below is based on actual services available in Franklin County.

Potential Savings with Better Broadband (Phone not included)



Below are graphs showing communication costs for families receiving the Internet in different ways in Franklin County. CenturyLink appears to be the most available service in the County but provides only 10 Mbps download speeds at best and no bundled services. The next most available service is Shentel DSL. Their mid-range bundle package of TV, Internet and phone is $135.90 for the first year with the price going to $185.90 the second year. We have used that Shentel package at its non-promo rate of $185.90 for our base package. For sake of comparison on CenturyLink services without bundling, we have added satellite TV costs. The other costs ($10) provide a tablet for people using their cellphones for Internet needing in order to be able to do school work or other Internet activities. Verizon cellphone Internet costs are based on Verizon's $70 per month 8GB plan with addition 6GB of data purchased at $15 per GB. That totals 14GBs of data with 4 GBs for phone usage and 10 GBs for Internet usage. ***The average monthly cost of these services in Franklin County is $235***.



6.1 ZIP CODE DATA

Zip Code data or Zip Code Tabulation Area information (ZCTA) was compiled using the Melissa website with all population data coming from the 2010 US census which is the most recent for which ZCTA data is available. ZCTA is the geographic unit closest to a zip code for which the US government provides population data. It is a very approximation. Percentages within the county are based on number of US post office addresses that are actually within the county. Maps in the Appendix are from the Melissa site with best effort estimates of area either not in Franklin County or actually in Franklin County.

Franklin Population 2010 by Zip Code- Population Data from US Census

Zip/ ZCTA	USPS Town	% Franklin House-holds in the Zip	DSL	Cable	Fixed Wireless	25 Mbps Coverage	2010 Pop.	Land-Sq-Mi	Density Per Sq Mi
24055	Basset (not a Franklin County town)	5.4%	97%	91%		92%	13,674	86.90	157.35
24059	Fishers Hill (not a Franklin County town)	6.6%	69%	35%	13%	35%	872	23.67	36.85
24065	Boone's Mill	87.7%	84%	63%	31%	68%	6,141	85.33	71.97
24067	Callaway	100%	79%	11%	70%	24%	2,230	56.17	39.70
24088	Ferrum	100%	94%	48%		56%	5,408	117.21	46.14
24092	Glade Hill	100%	77%	94%	26%	94%	3,063	35.55	86.17
24101	Westlake Corner	78.9%	91%	77%	38%	78%	6,132	55.47	110.55
24102	Henry	92.1%	77%	1%	12.7%	57%	1,697	32.08	52.90
24121	Moneta (not a Franklin County town)	37%	72%	46%	50.5%	46%	10,501	94.90	110.65
24137	Penhook	78.9%	57%	42%	29.1%	42%	2,582	74.25	34.78
24151	Rocky Mount	100%	84%	86%	31.8%	90%	20,000	162.52	123.07
24176	Union Hall	100%	77%	84%	11.7%	90%	1,360	21.99	61.86
24184	Wirtz	100%	90%	96%	28.5%	96%	4,705	42.83	109.86

Internet Service Providers & Percent Zip Code Coverage

Zip Code	USPS Town	CenturyLINK DSL	Citizens	Consoli-dated Commun-ications	Verizon	Shentel	Xfinity Cable	Cox	B2X Online Wireles
24055 only 5.4% in Franklin County	Basset (not a Franklin County town)	✔ 97.1%					✔ 95.6%		
24059 No services verified in this area- 6.6% in Franklin County	Fishers Hill (not a Franklin County town)				✔ 69.4%			✔ 79.5%	✔ 13.3%
24065	Boone's	✔ 74.6%			✔ 21.3%	✔ 57.5%		✔ 15.5%	✔ 30.8%
24067	Callaway	✔ 70.1%	✔ 11.8%		✔ 16.4%	✔ 11.1%			✔ 69.9%
24088	Ferrum	✔ 95.2%				✔ 46.8%			
24092	Glade Hill	✔ 72.4%				✔ 92.5%			✔ 26.3%
24101	Westlake Corner	✔ 62.7%			✔ 56.0%	✔ 72.4%	✔ 5.3%		✔ 38.2%
24102	Henry	✔ 84.6%							✔ 12.7%
24121 only 37% in Franklin County	Moneta (not a Franklin County	✔ 33.1%			✔ 45.3%	✔ 48.2%	✔ 11.0%		✔ 50.5%
24137	Penhook	✔ 36.5%		✔ 17.2%		✔ 43.4%			✔ 29.1%
24151	Rocky Mount	✔ 86.4%				✔ 85.1%			✔ 31.8%
24176	Union Hall	✔ 54%				✔ 79.9%			✔ 11.7%
24184	Wirtz	✔ 91.4%				✔ 93%			✔ 28.5%

6.2 LOCAL PRICING DATA

This information provides pricing data and services available from providers in the area for the Franklin County area. Prices, availability and promotional offers change frequently and sometimes vary within a region. Information was compiled using the Broadband Now and the High Speed Internet (.com) websites. Exact availability requires specific street addresses.

Wireline Providers

CenturyLink ✔

$45/mo for 10 Mbps ↓ – Mbps ↑ with 1 TB data cap

$45/mo for 3 Mbps ↓ – Mbps ↑ with 1 TB data cap

Citizens ✔

$79.95/mo for 50 Mbps ↓ 10 Mbps ↑- with no data cap. Setup fee $99.00 includes activation. Installation is free. Modem included. Contract term one year with up to $100 ETF.

$59.95/mo for 25 Mbps ↓ 5 Mbps ↑- with no data cap. Setup fee $99.00 includes activation. Installation is free. Modem included. Contract term one year with up to $100 ETF.

$39.95/mo for 10 Mbps ↓ 2 Mbps ↑- with a 400 GB/month data cap. Setup fee $99.95 installation fee may apply. Modem $8 per month or one-time fee of $99.

Consolidated Communications ✔

$36.70/mo for 15 Mbps ↓ 0.768 Mbps ↑- with no data cap. 1-year promo rate. Regular rate is $75.70. Contract term: 1 year. $1 per month paper invoice fee. Modem with WiFi $8 per month.

$36.70/mo for 20 Mbps ↓ 2 Mbps ↑- with no data cap. 1-year promo rate. Regular rate is $75.70. Contract term: 1 year. $1 per month paper invoice fee. Modem with WiFi $8 per month.

$31.70/mo for 10 Mbps ↓ 0.768 Mbps ↑- with no data cap. 1-year promo rate. Regular rate is $70.70. Contract term: 1 year. $1 per month paper invoice fee. Modem with WiFi $8 per month.

$21.70/mo for 6 Mbps ↓ 0.768 Mbps ↑- with no data cap. 1-year promo rate. Regular rate is $60.70. Contract term: 1 year. $1 per month paper invoice fee. Modem with WiFi $8 per month.

$21.70/mo for 3 Mbps ↓ 0.768 Mbps ↑- with no data cap. 1-year promo rate. Regular rate is $60.70. Contract term: 1 year. $1 per month paper invoice fee. Modem with WiFi $8 per month.

Verizon ✔

$34.99/mo for 3 Mbps 3 Mbps ↓ up to – Mbps ↑

$24.99/mo for 1 Mbps 1 Mbps ↓ up to – Mbps ↑

Shentel ✔

$145.90/mo for 50 Mbps 50 Mbps ↓ 10 Mbps ↑ 500 GB Data Cap. TV 238 channels, Internet and Unlimited Phone. 1- year promo rate. 50 Mbps Internet speed available for $50 per month for 12

months for new Internet customers only. 50 Mbps Internet speeds regularly $99.95. Half Off professional installation with Internet = $49.98 (regularly $99.95)

$135.90/mo for 50 Mbps 50 Mbps ↓ 10 Mbps ↑ 500 GB Data Cap. TV 238 channels, Internet and Phone. 1- year promo rate. 50 Mbps Internet speed available for $50 per month for 12 months for new Internet customers only. 50 Mbps Internet speeds regularly $99.95. Half Off professional installation with Internet = $49.98 (regularly $99.95)

$133.40/mo for 50 Mbps 50 Mbps ↓ 10 Mbps ↑ 500 GB Data Cap. TV 158 channels, Internet and Phone. 1- year promo rate. 50 Mbps Internet speed available for $50 per month for 12 months for new Internet customers only. 50 Mbps Internet speeds regularly $99.95. Half Off professional installation with Internet = $49.98 (regularly $99.95)

Xfinity Cable ✔

$149.99/mo for 1,000 Mbps 1,000 Mbps ↓ and 35 Mbps ↑ with no data cap. TV: Limited Basic + Digital Premier Tier, Xfinity Voice Unlimited, Contract term: 2 years. Setup $0 (Free professional installation. Modem w/WiFi $11 per month

$119.99/mo for 400 Mbps 400 Mbps ↓ and 10 Mbps ↑ with no data cap. TV: Limited Basic + Digital Preferred Tier, Unlimited nationwide calling, Contract term: 2 years. Setup $0 (Free standard shipping of self-install kit. Professional Install is $29.99. Modem w/WiFi $11 per month

$49.99/mo for 100 Mbps 100 Mbps ↓ and 5 Mbps ↑ with no data cap. TV: Choice TV. Setup $0 (Free standard shipping of self-install kit. Professional Install is $29.99. Modem w/WiFi $11 per month

$92.95/mo for 250 Mbps 250 Mbps ↓ and 10 Mbps ↑ with no data cap. Setup $0 (Free standard shipping of self-install kit. Professional Install is $29.99. Modem w/WiFi $11 per month

$89.99/mo for 1,000 Mbps 1,000 Mbps ↓ and 35 Mbps ↑ with no data cap. Setup $59.99 includes professional installation. Modem w/WiFi $11 per month

$89.95/mo for 150 Mbps 150 Mbps ↓ and 5 Mbps ↑ with no data cap. (Free standard shipping of self-install kit. Professional Install is $59.99. Modem w/WiFi $11 per month

$79.99/mo for 400 Mbps 400 Mbps ↓ and 10 Mbps ↑ with no data cap. 1 year promo rate. Regular rate is $99.95. (Free standard shipping of self-install kit. Professional Install is $59.99. Modem w/WiFi $11 per month

$39.99/mo for 60 Mbps 60 Mbps ↓ and 5 Mbps ↑ with no data cap. 1 year promo rate. Regular rate is $74.95. (Free standard shipping of self-install kit. Professional Install is $59.99. Modem w/WiFi $11 per month

Cox Cable ✔

$159.99/mo for 1,000 Mbps 1,000 Mbps ↓ up to 35 Mbps ↑ Unlimited data. TV 250 channels, Internet and Phone. 1- year promo rate, regularly $296.97 per month. Two year contract. Free professional install.

$129.99/mo for 300 Mbps 300 Mbps ↓ up to 30 Mbps ↑ Unlimited data. TV 250 channels, Internet and Phone. 1- year promo rate, regularly $296.97 per month. Two year contract. Free professional install.

$109.99/mo for 300 Mbps 300 Mbps ↓ up to 30 Mbps ↑ Unlimited data. TV 170 channels, Internet and Phone. 1- year promo rate, regularly $278.93 per month. Two year contract. Free professional install.

$89.99/mo for 100 Mbps 100 Mbps ↓ up to 10 Mbps ↑ Unlimited data. TV 140 channels, Internet and Phone. 1- year promo rate, regularly $190.97 per month. Two year contract. Free professional install.

$64.99/mo for 10 Mbps 10 Mbps ↓ up to 1 Mbps ↑ Unlimited data. TV 75 channels, Internet and Phone. 1- year promo rate, regularly $91.98 per month. Two year contract. Free professional install.

Fixed Wireless Providers

B2X Online

Pricing not yet discovered. Speed appears to 4.7 Mbps on the downlink and 1.5 Mbps on the uplink. (Call placed 540 389-7924, No response as of 12/5/18).

Residential Satellite Internet Pricing

HughesNet

$59.99/mo for 25 Mbps ↓ 3 Mbps ↑ 10 GB/mo data cap. Two year contract with up to $400 ETF. Two year prom rate. Speeds will be reduced and will typically be in the range of 1 to 3 Mbps once monthly plan data is use. From 2am-8am, customers have access to 50 GB/month of additional plan data. Setup $99. Modem: $14.99/mo.

$69.99/mo for 25 Mbps ↓ 3 Mbps ↑ 20 GB/mo data cap. Two year contract with up to $400 ETF. Two year promo rate. Speeds will be reduced and will typically be in the range of 1 to 3 Mbps once monthly plan data is use. From 2am-8am, customers have access to 50 GB/month of additional plan data. Setup $99. Modem: $14.99/mo.

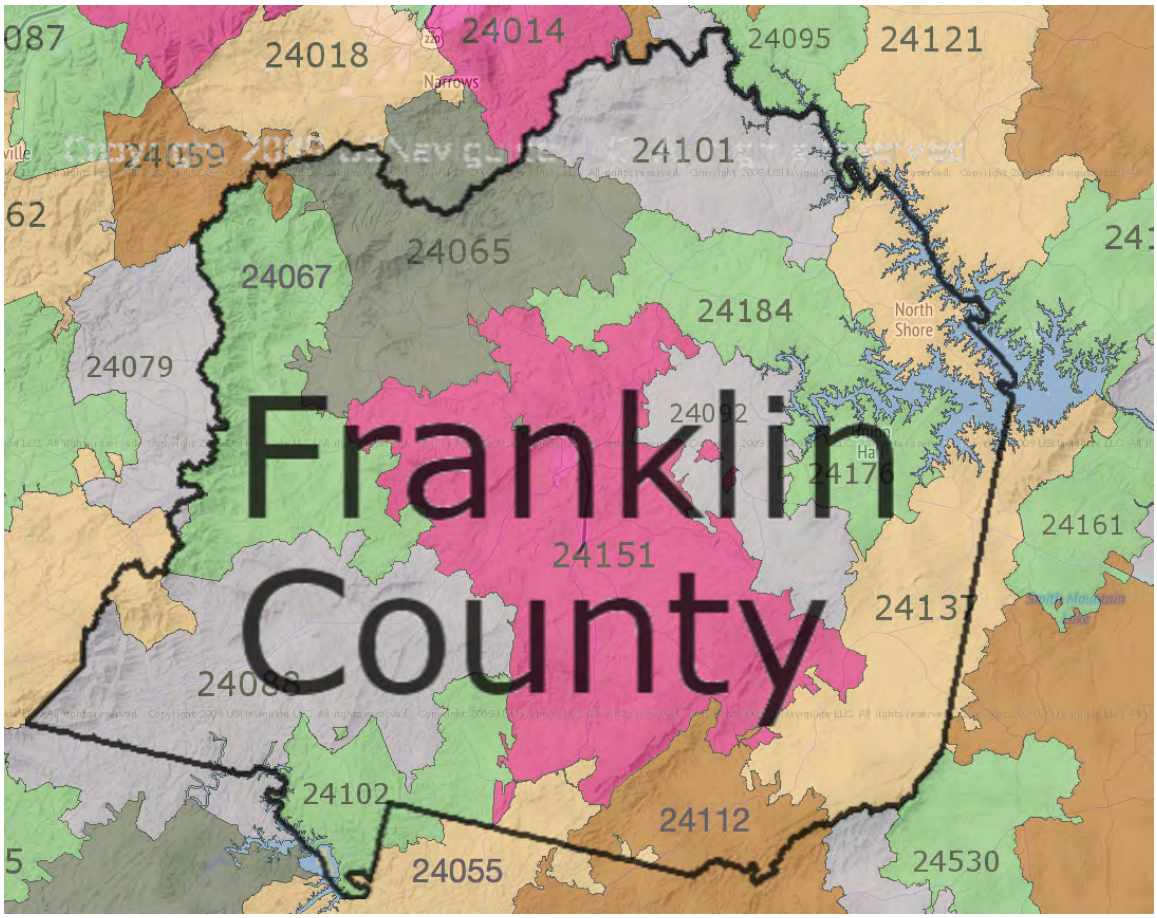
ViaSat/Excede

$50/mo for up to 12 Mbps ↓ Unlimited priority data. $70/mo after three months

$70/mo for 25 Mbps ↓ Unlimited priority data. $100/mo after three months

$100/mo for 25 Mbps ↓ Unlimited priority data. $150/mo after three months

Zip Code Maps



7.1 HOW MUCH BANDWIDTH IS ENOUGH?

Bandwidth needs for the past several years have been growing by an estimated 30% per year, and show no sign of slowing.

This means residential and business bandwidth needs are doubling every three years.

As computers and associated hardware (e.g. video cameras, audio equipment, VoIP phones) become more powerful and less expensive, new applications and services are continually emerging that drive demand for more bandwidth.

In most areas of the county, residents currently have, at best, the FCC 10 Megabits down/1 Megabit up bandwidth. This slow speed service is is impacting economic and community development:

- It limits resident's ability to work from home.
- It limits school children's ability to access the K12 and higher education resources needed to complete homework assignments.
- It limits resident's ability to access cost-saving tele-medicine and tele-health services from home.
- It limits resident's ability shop from home to save money on gas and travel expenses.

"Next generation" is the term used to describe future planning for network connectivity and infrastructure. Next generation broadband reaps substantial benefits. There are several key benefits of "Next-Generation Broadband":

- Dramatically faster file transfer speeds for both uploads and downloads
- The ability to transmit streaming video, transforming the Internet into a far more visual medium
- Means to engage in true-real time collaboration
- The ability to use many applications simultaneously
- Ability to maintain more flexible work schedules by being able to work from home on a part time or full time basis
- The ability to obtain health-related services for an occasional illness and/or long term medical services for chronic illnesses.

Clearly, consumers have a strong interest in a visual medium from when and wherever they are. YouTube is the second most popular search engine after Google, which demonstrates the need to support the infrastructure to transmit streaming video. In addition to video streaming, true-real time collaboration also provides an effective way for people to interact from wherever they are. People can engage in a two-way, real-time collaboration, so that fruitful, visual conversations can be held between friends, family, business associates from the state, country, or internationally.

Because of fiber networks, employees have the capabilities of working from their home. Findings suggest that if all Americans had fiber to the home, this would lead to a 5 percent reduction in gasoline use, a 4 percent reduction in carbon dioxide emissions, $5 billion in lower road expenditures, and 1.5 billion commute hours recaptured.

7.2 RESIDENTIAL BANDWIDTH NEEDS

In Franklin County, most residents and businesses are relying on copper-based services. The table below depicts the bandwidth needed for typical residential services which are available now or will be available in the near future. In a next generation network all services will be delivered over a single network infrastructure which will require a network that can support providing most services to most consumers simultaneously. Today's shared networks (cable and wireless in particular) rely on the "bursty" nature of traffic to provide services to end users. If all end users were consuming their "advertised" bandwidth today's cable and DSL networks would grind to a halt.

Existing cable modem network users are overwhelming the digital cable networks that were upgraded as little as three or four years ago, and the firms have had to artificially reduce the bandwidth available for certain kinds of high bandwidth services (e.g. peer to peer file sharing). Some cable providers have even run into capacity issues with the TV portion of their networks, and some consumers have observed that some HD TV channels have been so highly compressed that picture quality has been noticeably degraded.

	Residential Daytime		**Early Evening**		**Evening and Late Night**		**Snow Day**	
Description	Intermittent Television and Internet use across a small percentage of households.		Increased video, voice and Internet use as children arrive home from school and employees from work.		Peak television and Internet use. Multiple TV's are on, phone and computer being used.		On top of typical daytime traffic children are home from school, and many employees are home working.	
	Concurrent Use	**Mbps**	**Concurrent Use**	**Mbps**	**Concurrent Use**	**Mbps**	**Concurrent Use**	**Mbps**
Telephone	1	0.064	1	0.064	1	0.064	1	0.064
Standard Definition TV	1	2.5	1	2.5	1	2.5	1	2.5
HD TV	1	4	2	8	2	8	3	12
Security System	1	0.25	1	0.25	1	0.25	1	0.25
Internet	1	1.5	1	1.5	2	3	3	4.5
Online Gaming		0.25		0.5		1		1
VPN Connection	0	0	1	2	1	2	2	4
Data Backup		0	1	5	1	5	1	0
Telehealth (subscriber)	1	4	1	4	1	4	0	0
Distance Learning / Workforce Training		0	1	10	1	10	2	20
HD Videoconferencing		0		0		0	1	14
Totals		12.6		33.8		35.8		58.3
5 years from now (Megabits)		**38**		**101**		**107**		**175**
10 years from now (Megabits)		**113**		**304**		**322**		**525**

7.3 ACTIVITIES IN NEIGHBORING COUNTIES

Bedford County recently became the recipient of a substantial VATI (Virginia Telecommunications Initiative) for approximately $1 million. In partnership with Blue Ridge Towers (BRT), the project expects to construct nine new towers the county, and Bedford County will provide space for BRT wireless equipment on two existing county-owned towers. A subsidiary of BRT, BriscNet, will be the ISP for the project. Also included is twenty-one miles of fiber that will be installed by BRT. The fiber will be used to provide connectivity between some of the towers.

In Floyd County, Citizens Telephone Coop has announced a three year plan to install Gigabit fiber to nearly all county homes and businesses. The cost of the project will be financed with Federal funds, one time $199 fees charged to each connected premises, and operating revenue generated by Citizens Coop services.

In Roanoke County, the Roanoke Broadband Authority now has more than sixty miles of middle mile fiber that is marketed primarily to business and wholesale customers.

8.1 CLOSING THE BROADBAND GAP

In most areas of the county, residents and businesses currently have, at best, the FCC 10 Megabits down/1 Megabit up bandwidth. This slow speed service is is impacting economic and community development. Instead, the question is:

"What do businesses and residents of Franklin County need to be able to compete globally over the next thirty years?"

In short, the county today has "little broadband" in the form of DSL, very limited wireless, expensive satellite Internet, and and very limited cable modem service, along with a very limited amount of "big broadband" in the form of fiber to a few businesses and institutions.

If the County and the Authority make investments in broadband and telecommunications infrastructure, it is absolutely critical that those investments are able to scale gracefully to meet business and economic development needs for decades.

To close that gap between the FCC definitions and what the county needs to support future work opportunities and to support K12 and higher education school work, the county needs the following:

Broadband Service	Target Date	Technology	Where Needed
10 Megabits upload/10 Megabits download	2020	Wireless	As much of the county as possible, given funding constraints
20 Megabits upload/10 Megabits download	2020	Wireless	In some locations in the county
50 Megabits upload/10 Megabits download	2021	Wireless, fiber	In some locations in the county
Gigabit upload/Gigabit download	2020	Fiber	In key business and commercial areas
100 Megabits upload/ 100 Megabits download	2021	Fiber	Available to a minimum of 50% of residents in the county

8.2 LIMITING FACTORS

The factors that are limiting broadband availability and affordability in the county includes:

- Low population density - The generally low density of homes and businesses in the the county make it more difficult for competitive service providers (e.g. WISPs) to justify the expense of building towers and offering Internet service.

- Poor service - Like most areas of Virginia, CenturyLink and Verizon have not upgraded infrastructure and DSL service is slow and unreliable.
- Limited cable Internet service - Related to the low density, cable Internet service is very limited.
- Lack of regional entity to manage infrastructure improvements - At the present time, there is no coordinated three county effort to plan broadband infrastructure improvements and coordinate funding and grant applications.
- Difficult terrain for wireless service - The terrain in the county has many low hills, which blocks wireless broadband signals and requires more towers and community poles than some other parts of Virginia.

8.3 CURRENT AND FUTURE USES AND SERVICES

When analyzing future service needs, it is important to take into account ALL services that may be delivered over a broadband connection. "Broadband" is not a service--it is a delivery medium. If we think about broadband using a roads analogy, broadband is the road, not the trucks that use the road. Internet access is a service delivered by a broadband road system, and that Internet service is just one of many services that are in demand. Today, congestion on broadband networks is not due just to increased use of email and Web surfing, but many other services.

This means that current DSL, wireless, and cable modem services are completely inadequate for future needs. Current DSL offerings are in the range of 1 Megabit to 3 Megabits for most residential users, 3 Megabits to 5 Megabits for business DSL users, and there are severe distance limitations on DSL. Higher bandwidth is possible, but as the DSL bandwidth goes up, the distance it can be delivered goes down.

Typical wireless broadband (i.e. not cellular data service) offerings are in the range of 5 Megabit to 10 Megabits. Some wireless providers are rolling out 10-20 Megabit services. As bandwidth increases, the cost of the equipment also increases, and even a 20 Megabit service is well short of the FCC definition of broadband: 25 Megabits down and 3 Megabits up.

Across the U.S., current average bandwidth for cable modem services is typically 10 to 25 Megabits, with cable companies promising much more using the phrase "up to..." to obscure actual bandwidth being delivered.

The challenge for the area is to ensure that the businesses, residents, and institutions have a telecommunications infrastructure in place that will meet future needs.

Distance learning, entertainment, and video conferencing are three major applications of internet video. Distance learning from home with live video feeds requires high performance 2-5 Megabit connections in the near term (next 2-4 years), and over the next 4 to 7 years, there will be many distance learning courses that will incorporate live HD two-way video feeds, enabling students to participate in classroom discussions at a much higher quality level. Distance learning could be an important home-based application for workforce training and retraining.

"U.S. homes now have more than half a billion devices connected to the Internet, according to a study by the NPD Group. Furthermore, the overall number of connected devices per household is 10. This is more than three times the average number of people per household."

The table below lists these and other services that all represent broadband-enabled applications and services that must be available in at least parts of the county if it is to remain economically viable.

Residential and Business	Videoconferencing
	IP TV (Internet Protocol TV)
	HD streaming video
	Ultra hi-def (BluRay) video streaming
	Video on demand (e.g. Netflix)
	Place-shifted video
	Cloud computing services
	Online and cloud-based gaming
	Smart homes, buildings, and appliances, including smart electric meters, AMR (automated meter reading), and AMI (advanced metering infrastructure)
	Remote computer aided design (CAD)
	Work from home jobs
	Business from home
	3D graphic rendering and CGI server farms
	Remote network management and managed services
	Virtual collaboration spaces (e.g. enhanced GoToMeeting, Webex style services)
Public Safety	Intelligent transportation applications (smart road systems)
	Public safety and first responder networks
	Emergency dispatch and coordination
	Webcast agency meetings (e.g. virtual meetings)
	Online training for first responders, fire, and rescue
Society	Broadcast of local sports events
	Videoconferencing of community and town hall meetings for wider participation
	Wider availability of nonprofit and community organization services

Health Care	Teleconsultations
	Telepathology
	Telesurgery
	Remote patient monitoring
	Remote diagnosis
	Remote medical imaging
	Grid computing for medical research
Education and Research	Distance education
	Virtual classrooms
	Remote instrumentation
	Multi-campus collaboration
	Digital content repositories and distribution (digital libraries)
	Data visualization
	Virtual laboratories
	Grid computing for academic research

12 LAST MILE CONNECTIVITY SOLUTIONS

12.1 OVERVIEW OF NETWORK TECHNOLOGIES

In Franklin County, broadband wireless has already become an important strategy for improved Internet access for businesses and residents. But both fiber and wireless technologies and systems are going to be important to meet the goal of improving access to broadband. The rest of this section provides more detail and some specific build out strategies.

Businesses and residents in the county may obtain Internet service:

- With a small radio directly attached to their home or business that receives a signal directly from a towers owned by a private provider, from a County-owned tower (e.g. shared with public safety use), or from a community-owned tower (e.g. a coop).
- With a small radio attached to a utility pole (60 or 70') to improve line of sight to a tower.
- With a small radio directly attached to their home or business that receives a signal from a "community" utility pole. The "community" pole with receive a signal from a distant tower and redistribute it locally to a cluster of customers (typically within a half mile).
- With a fiber connection to the fiber installed in areas where economic development is important, and in other areas as additional fiber network segments are added.

The table below summarizes how fiber and wireless can work together in a variety of ways.

Distribution Type	Access Type	Capacity
Wireless	Wireless	Typical customer connection starting at 5 to 10 Megabits, can be higher, with 50 Meg connections common. More dependent on the capacity of the wireless Distribution link.
Wireless	Fiber	Users can have fiber Gigabit connections locally, but total throughput dependent upon the capacity of the wireless link, which can be up to a Gigabit, depending on distance and budget.
Fiber	Fiber	Any amount of bandwidth needed, with standard connection typically a Gigabit (1,000 Megabits).
Fiber	Wireless	Typical customer connection starting at 5 to 10 Megabits, can be higher, with 50 Meg connections common.

12.2 WIRELESS TECHNOLOGIES

WISPs (Wireless Internet Service Providers) use a wide variety of radio frequencies to deliver fixed point wireless broadband. By "fixed point," this means that these systems are not designed to support roaming in the way that cellular voice/data radios are (that is, mobile phone and data services).

Fixed point broadband is broadcast from a tower to individual homes and businesses (fixed points). Most of the frequencies used require clear line of sight between the tower and the location where service is desired. In Virginia and many parts of the east, tree cover is often an obstacle to getting good service.

The hilly topography of Franklin County can work for or against good wireless broadband service. Towers located on the tops of hills and mountains can provide service over a larger area than a tower in relatively flat terrain, but hills also block the signal. A residence can be a short distance from a large tower, but heavy tree cover or an intervening hill will block service. The solution to this can be addressed in several ways:

More larger towers of 180' to 300'

The taller the tower, the wider the coverage, but as tower height increases, the cost of the tower also increases. Towers taller than 190' require a light at the top to make them visible to low-flying aircraft, and lighted towers are more expensive to erect, and the bulbs have to be changed periodically at significant expense. Many broadband towers are 180' to avoid the additional cost of lighting.

Small cell broadband towers

Small cell broadband towers, often called community poles, are shorter towers or utility poles of typically 60' to 80', located in or very near a cluster of homes. The towers can be wooden utility poles or relatively low cost steel monopoles or steel lattice towers. These towers are located to get above local tree cover so that clear line of sight to a distant taller tower is available. Local access point radios provide service to homes and businesses with line of sight to the pole. In Franklin County, these are going to be an important part of a strategy to get better broadband to rural residents and businesses.

Variety of radio frequencies

WISPs are beginning to deploy a wider range of licensed and unlicensed radio frequencies to overcome distance, bandwidth, and line of sight issues. Traditional 2.4 Ghz and 5.7 Ghz WiFi and WiMax frequencies are being supplemented or replaced with LTE broadband radios that provide better bandwidth and will tolerate light tree cover better (2.5 Ghz, 3.5-3.7 Ghz). Some WISPs are also using lower frequencies (e.g. 900 Mhz) that will travel farther and will also provide better penetration in light tree cover.

12.3 EMERGING WIRELESS TECHNOLOGIES

MIMO Wireless

MIMO (Multiple Input, Multiple Output) describes a variety of technologies that can be summarized as using more than one receive and transmit antenna for wireless data applications. Wireless protocols that are using the MIMO concept include IEEE 802.11n (Wi-Fi), IEEE 802.11ac (Wi-Fi), 4G, LTE (Long Term Evolution), and WiMAX. Each of these protocols use the MIMO technology to increase the amount of available bandwidth in a given section of radio frequency spectrum.

New hardware is required to make effective use of MIMO. While the technology increases wireless bandwidth, the typical amount of bandwidth being used by wireless devices is also increasing

rapidly. Some applications where MIMO is likely to provide noticeable improvements are in home wireless routers, where the effective throughput will be able to better handle the demanding bandwidth requirements of HD and 4K video streams. MIMO is slowly being developed for use with cellular smartphones, but both the phones and the cell tower radios have to be upgraded to support MIMO.

LTE/4G/5G

LTE (Long Term Evolution) is a set of protocols and technologies designed to improve the performance of voice/data smartphones. Like MIMO, both the user phone and the cell tower radios have to be upgraded to support LTE improvements. In 2013, only 19% of U.S. smartphone users were able to take advantage of LTE speeds, although that percentage has been increasing rapidly since then, and more than 85% of the U.S. cellular towers have been upgraded to LTE. As noted previously, the actual bandwidth available to a smartphone user is highly variable and depends on distance from the cell tower, the number of smartphones accessing the same tower simultaneously, and the kinds of services and content being accessed by those users.

The primary purpose of cellular bandwidth caps is to keep cellular users from using too much bandwidth and degrading the overall service. While LTE and MIMO improvements will improve overall cellular service, these technologies are not going to replace fiber to the home and fiber to the business.

In 2017, new fixed broadband wireless systems entered the marketplace using LTE frequencies, and many WISPs have begun to replace existing wireless radio systems with LTE equipment. These LTE systems do not provide any cellular voice services; they are designed specifically to support only broadband/Internet service.

Reports of performance have been mixed. In our conversations with both vendors of these systems and WISPs that have begun testing them, we get two very different stories. The vendors have been conservative in discussing the improvements, while some WISPs have been taking single user test results and suggesting that they will be able to deliver higher speeds at greater distances to all users.

There is little debate that the LTE equipment offers higher bandwidth, at somewhat greater distances, and with somewhat better penetration of light foliage and tree cover. Over the next two to four years, most WISPs will change out most of their existing radio systems for the improved LTE radios.

The much touted 5G wireless technology, as of 2019, is still largely marketing hype. The official standard for 5G radio technologies is planned for release later in 2019, although some companies, like Verizon, have begun trials of the equipment with a few customers.

5G does bring much higher speeds to wireless broadband (e.g. it might be able to deliver 30 to 50 Meg of bandwidth consistently). But 5G has significant limitations that do not make it a good solution in rural areas of the U.S.

The fact that 5G can deliver much higher bandwidth means that 5G cell sites will require fiber connections. This is going to effectively limit 5G deployments to denser urban environments where both customers and fiber are plentiful.

There is no free lunch in the physics of radio frequencies. The higher bandwidth of 5G means that cell sites need to be closer together

To achieve the full benefit of 5G technology, more fiber is needed.

because the 5G frequencies do not travel as far as existing 4G/LTE frequencies currently being used by the cellular industry. Most users will have to be within

Some experts estimate that more than a million miles of new fiber will have to be deployed just to support the 25 largest metro areas in the U.S. 5G will not appear overnight.

As many as 60 cell sites per square mile may be needed to make 5G widely available in a given area. If, as an example, about 25%, or 172 square miles of Franklin County is underserved, a thousand or more cell sites would be needed to provide ubiquitous coverage.

For rural areas, the cost of 5G service may be one of the most significant obstacles. The cellular carriers see the increased customer bandwidth use possible on 5G networks as a major revenue opportunity. While they will increase the "standard" bandwidth package for monthly service, bandwidth caps and rate limiting is likely to keep 5G cellular customers bills high.

White space broadband

White space broadband uses some of the frequencies that were formerly used by analog TV channels. These lower frequencies travel farther and provide better penetration of light foliage. Microsoft has been supporting a number of community white space experiments, and has promised much wider support for this technology, but there are few other users, equipment is still relatively expensive, and few WISPs have ventured into this still largely experimental technology. The Microsoft white space project in southern Virginia, although still underway, serves less than three hundred households and is still regarded as experimental.

12.4 DARK FIBER AND LIT FIBER

About Dark Fiber

Dark fiber is installed in conduit underground and/or hung on utility poles. It is called "dark" because no network electronics are installed to "light" the fiber (using small lasers in a fiber switch). For small municipal/local government fiber installations, dark fiber has a significant advantage in terms of management–very little ongoing operational responsibility is required.

Dark fiber is leased out to service providers, who install their own network electronics in cabinets or shelters attached to the fiber cables. The providers typically lease fiber pairs between the cabinet and their customers, and are responsible for all equipment-related management and maintenance.

Dark fiber networks do not generate large amounts of revenue, but this is offset by very low maintenance costs–primarily an emergency break-fix arrangement with a local or regional firm qualified to splice fiber. Emergency break-fix contracts are usually based on a time and materials basis, so there is little or no expense if there are no fiber breaks.

Other costs include "locates," which are called in to Gopher State One Call (Miss Utility) and are performed by either the local Public Works department or a private sector contractor. For small fiber networks, locate costs are generally modest.

About Lit Fiber

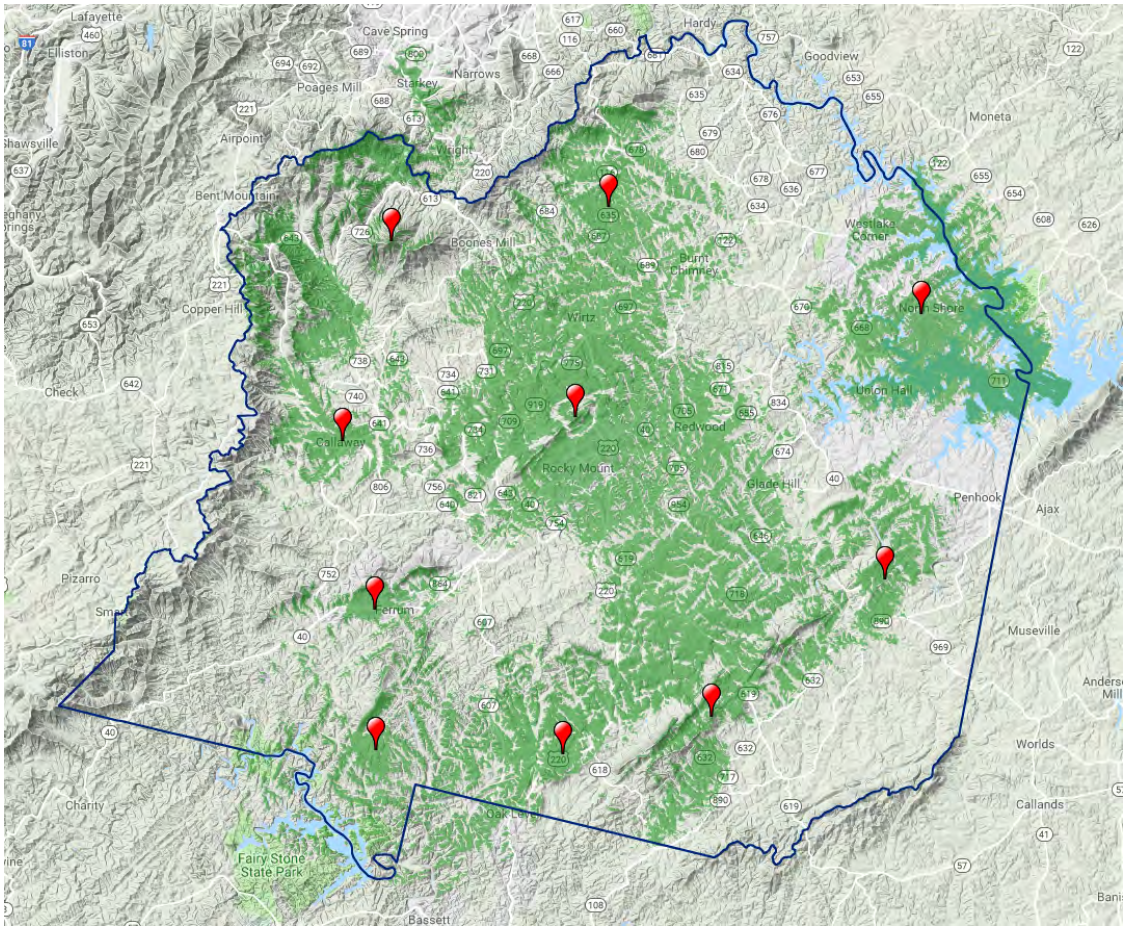
A "lit" fiber network includes the network electronics needed to transmit data over the fiber (using the small lasers in a fiber switch, hence there is light traveling over the fiber cable). In a lit network, "lit circuits" are leased out to service providers rather than fiber pairs. The muni/local government/

community network provides the network electronics, which reduces costs for the service provider –meaning they are able to pay higher lease fees for the circuits they use to deliver services (like Internet) to their customers. Lit networks generate more revenue, but also have higher expenses because the network electronics have to be monitored and managed on a 24/7/365 basis (this task can usually be outsourced at reasonable cost). However, very small fiber deployments often do not pass enough homes or businesses to generate sufficient revenue to cover the higher costs.

Like dark fiber, a lit network incurs break-fix and locate costs as well.

12.5 TERRAIN CHALLENGES

The propagation study map below illustrates the challenge of providing adequate fixed point wireless Internet service in the county. The mountainous terrain, especially in the western portions of the county, shows that even ten towers does not provide an adequate solution. A combination of taller towers (180' in this study) and shorter community poles (as many as 40 or 50) may be needed to provide good service to most areas of the county.

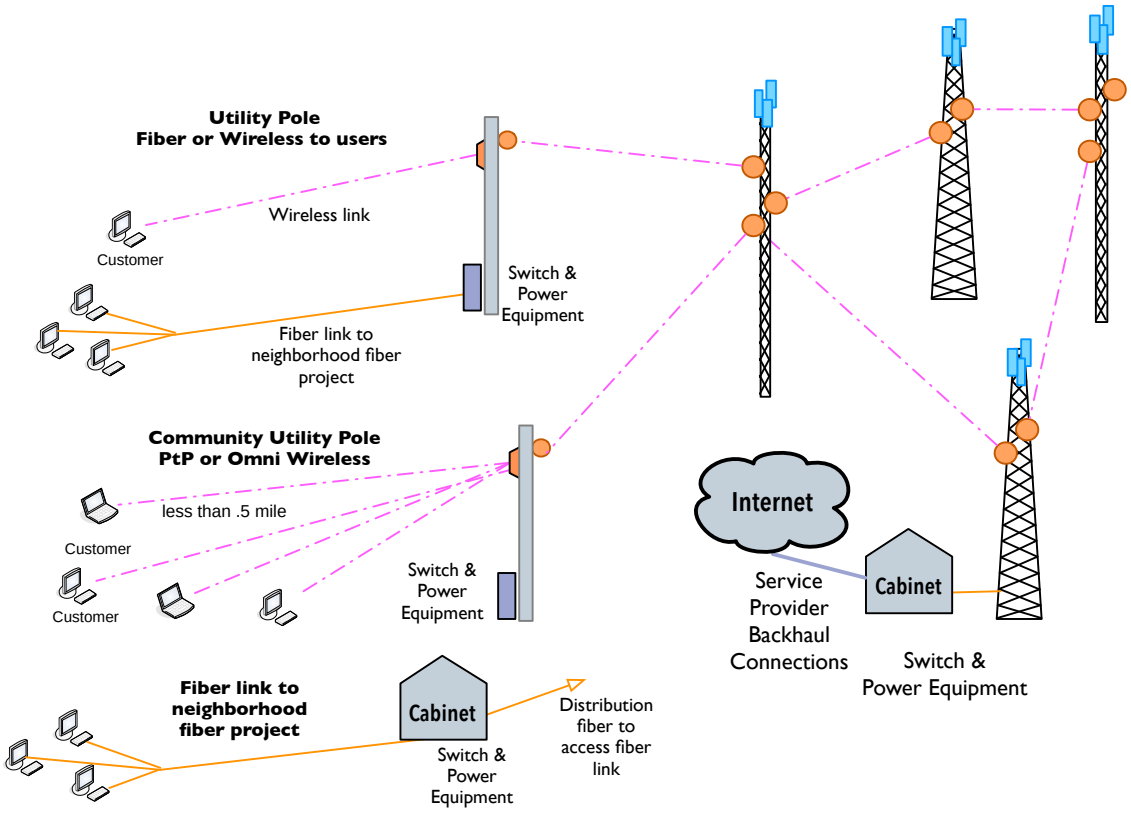


12.6 CONNECTIVITY SOLUTIONS

Both wireless and fiber networks, as well as legacy copper-based networks, all share three primary components. How these are designed and deployed can vary greatly, but all networks have these three parts in some form.

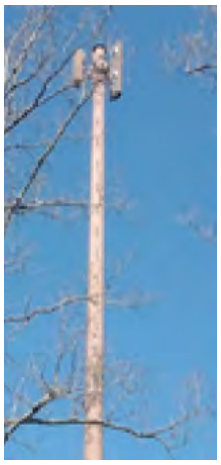
- The **Core Network** provides access to the Internet, a place for service providers (ISPs) to distribute their services locally on the network, and for larger institutional and business customers to meet service providers. The county has both landline and wireless service providers, but there are still areas that are underserved. Each of these providers has their own Core Network, but wireless broadband could be more widely available if additional county-owned towers were available to the private sector providers.
- The **Distribution** portion of the network connects the Core Network with collections of users. A Distribution network can include both fiber and wireless portions of a network.
- The **Access or Last Mile** portion of the network connects residential users and businesses to the network, and like the Distribution network, that connection will be by fiber or by a wireless link.

The illustration below shows the full range of technology options (fiber and wireless) and how they can be connected together in various ways to meet the diverse needs of the county. More detail is provided on the following pages.

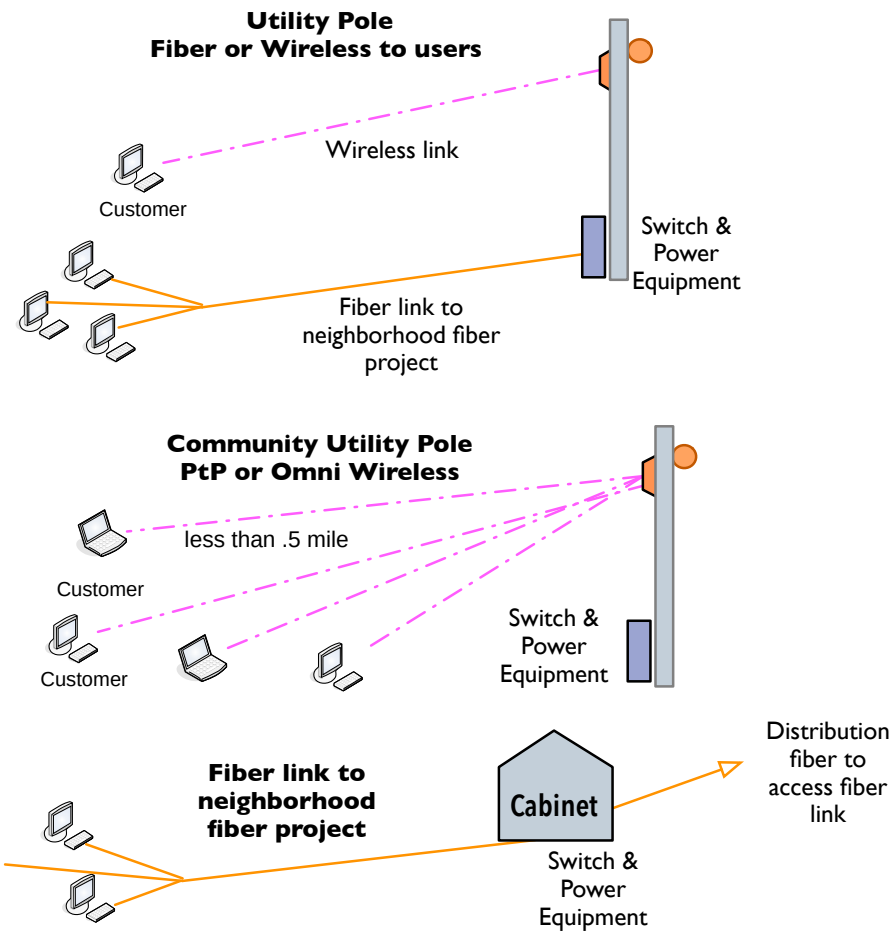


Last Mile Access

The Last Mile Access is the portion of the network that connects customers to their service provider and the Internet. Both broadband wireless and fiber links can be utilized to provide service. There are several ways that customers can receive service:



- Service providers can install their own local access radios on the Distribution towers, using both point to multi-point and point-to-point radios to deliver service to their customers.
- A single user utility pole (or inexpensive steel lattice tower) can be installed on the property of a single resident or business. A radio at the top of the pole receives service from another tower site (typically one of the Distribution towers).
- A utility pole (or inexpensive steel lattice tower) can be installed near a cluster of homes (e.g. a rural residential sub-division, several homes in close proximity on a rural road). Service providers can install their point to multi-point radios on this pole and provide economical service to several customers from a single pole.
- A utility pole (or inexpensive steel lattice tower) can be installed in a rural subdivision. A service provider installs a point to point radio on the pole, and fiber cable can be run from the pole past several homes to offer fiber service with wireless backhaul.
- Customers near existing fiber can have a fiber drop installed directly to their home or business.



Distribution Network

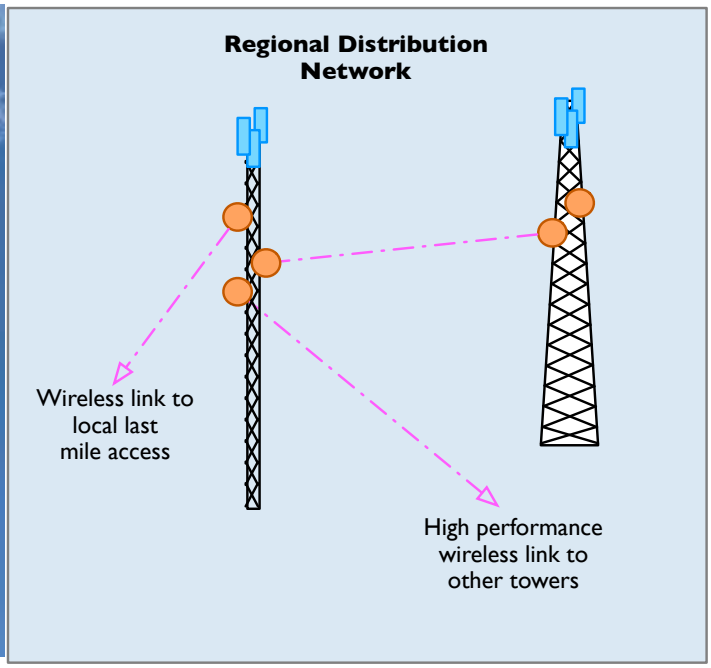
Distribution is the portion of the network between the Distribution sites to the Last Mile Access portion of the network. It is desirable for each distribution site to have a connection back to more than one Distribution site (tower) on a redundant ring. This ring topology protects against hardware failure at the port level and does provide some protection if one of the tower to tower wireless links is disabled by an equipment failure.

These tower sites are typically 120' to 180' tall to provide the height needed to enable Line Of Sight (LOS) between towers, and for local access, to enable service providers to mount point to multi-point radios on the towers.

Towers taller than 199' become subject to FAA regulations because the height can be a potential hazard to airplanes. Towers that exceed 199' usually have to be painted (alternating red/white) and have a blinking light at the top. These requirements increase the long term maintenance costs, but the taller towers can improve line of sight to other towers.

The towers can provide two functions:

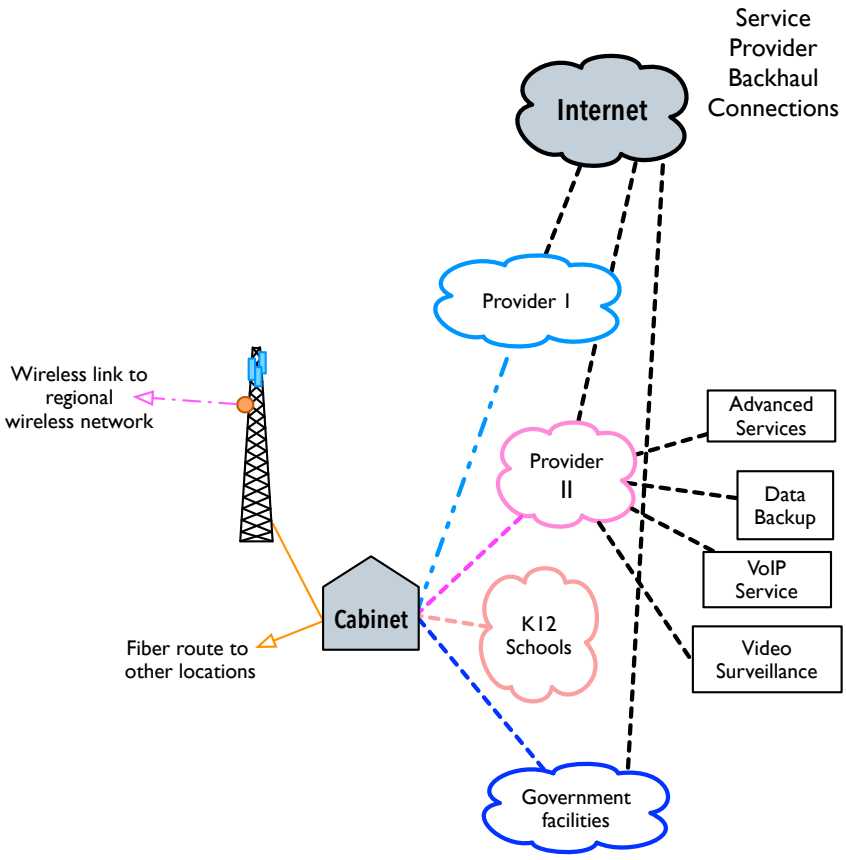
- Space for backhaul connections to other towers in the county.
- Space for local access radios to provide Internet access within 2-3 miles of the tower (or farther with good Line Of Sight).



Core Network and Service Providers

In the past, the telephone company switch office (Central Office, or CO) has provided that function. Today, many communities have either a community-owned data center or a privately owned data center that offers an affordable range of options for customers of broadband services.

The Co-Location facility provides a meet point for various public and private fiber cables and networks to inter-connect. In the county, there are no shared peering points, and a local facility with space available for both public and private uses could help attract additional private sector investments (e.g. a long haul fiber provider builds into the county to connect to this facility because of increased access to customers).



A colocation facility is a controlled environment (i.e. secure, heated, and air-conditioned) room with Internet access through wired and/or wireless systems. The colocation facility is a place where fiber, wireless, and copper-based network facilities meet. It is equipped to house high-end network equipment, servers, and other electronic gear.

A variety of middle layer network components and services can be located within the co-lo including, for example, directory services, replicated content servers, routing services, and other elements needed to deliver new multimedia services to the home and small office from multiple, competing providers.

Characteristics of the colocation facility are:

- A reliable source of AC electric power is required, with backup UPS (Uninterruptible Power Supply) service, and additional power backup available by an onsite generator.
- Controlled access to the facility (e.g. by electronic keycard) 24 hours/day, seven days a week.
- Racks for locating network equipment and servers, and optionally locked cages for equipment racks.
- Sufficient cooling capacity for the network's current and long-term needs.

12.7 SMALL CELL BROADBAND POLES

Line of sight issues are a constant problem for rural residents and businesses, as clear line of sight (or near line of sight) is required for fixed wireless Internet services. Even newer technologies like white space and LTE systems work better with clear line of sight to distant towers.

The increased use of wooden utility poles is already common in some other areas of the country, and increased use of this technique to get the customer CPE radio/antenna above tree cover is a relatively simple solution.

Ownership and Governance

The utility poles would normally be placed on private property, subject to existing or updated ordinances governing the placement of wooden utility poles. The local government would have no responsibility for maintenance and repairs.

Cost Discussion

The cost of placing an eighty foot pole can range from a low of about $2,000 to $7,000 or more, depending on permitting, engineering requirements, and the location of the pole. The Virginia General Assembly recently passed legislation requiring localities to allow small wireless facilities of 50 -feet or less by-right. The County is currently working on amendments to its tower ordinances to allow more flexibility for broadband deployment.

Funding Options

Because these are placed on private land, local government would not have to provide any direct funding. However, the localities could encourage wider use of this option with a public awareness campaign developed in partnership with wireless providers. Local banks could be encouraged to provide low cost financing of the poles so that property owners could make a small interest and principal payment monthly over several years to reduce the financial impact.

Operation and Management Considerations

Local government would incur no ongoing operational or management costs.

Recommendation and Next steps

Given that this strategy requires minimal financial support from the County and that it has the potential of improving broadband access in rural areas of Franklin County quickly, the County should support "by right" permitting of wood utility poles in rural areas, including allowing a minimum of fifteen feet above existing tree cover and subject to a very limited set of restrictions (e.g. a minimum set back from public right of way).

County support for an awareness campaign developed with local wireless service providers would also be beneficial.

12.8 NANO-CELL AND WIFI CALLING SERVICE

A common complaint in the county is the poor cell service in many areas. In some parts of the county, there may be adequate broadband service via DSL or cable modem Internet, but poor cellular phone/data service. There are now two solutions to improving rural cellular service that do not involve the expense or difficulty of attracting and/or building more cellular towers.

WiFi Calling – This approach takes advantage of the WiFi Calling feature that is now common in many late model cellphones. Once the phone is connected to a WiFi network (e.g. in the home using the home's broadband Internet service), the phone will automatically route the call over the WiFi network–phone calls and text work normally, as if the phone is connected to a cellular tower.

Nano-cell Calling – Poor or no cellular service in rural areas can be addressed by promoting the wider use of "nano-cell" devices. These small pieces of equipment are connected to the DSL or wireless broadband connection and provide improved cell service in the home or business. The working distance of these devices is limited, and service generally drops off once you leave the house itself (it may work for some short distance in the yard). These devices work very well and do not require an upgrade to a newer phone. The cellular providers do not always promote the use of these devices, so many cellular users who would benefit from their use are not aware that this option is available. The device averages around $200 retail, but the cellular providers often provide substantial rebates (50% discount or more) and in some cases may provide them at no charge.

If there is success in making more tower space available for WISP use, the improved wireless broadband service will also support use of WiFi calling and/or nano-cell devices.

This strategy is important because improved broadband service can also improve cellular service without the need for more cellular towers, especially in parts of the county where cellular providers have not been able to make the business case for more towers.

Cost Discussion

This strategy does not require any direct funding from the County, but the Broadband Authority should play an active role educating residents and businesses about this option. One strategy would be to prepare a simple one page overview of this option and ask local library branches cot make it available.

Funding Options

No special funding required.

Operation and Management Considerations

None.

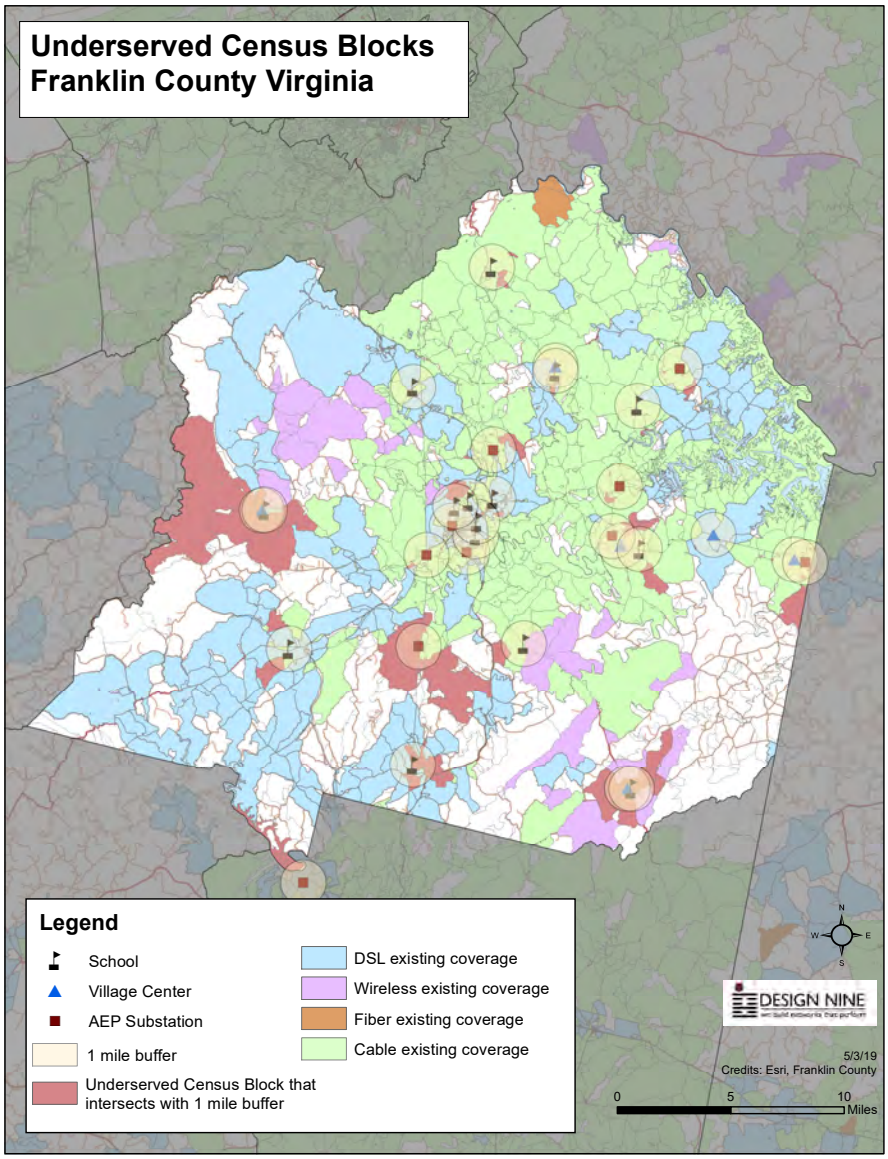
Recommendation and Next Steps

The County could promote awareness of WiFi calling and nano-cell boxes as part of a broader awareness campaign about improving broadband availability.

13 RECOMMENDATIONS FOR IMPLEMENTATION

To develop a county-wide strategy for improving broadband availability, K12 schools, sub-stations, and villages were identified. Fiber is already at all K12 school locations in the county. Sub-stations have been included because of a recent state initiative to encourage AEP and other electric providers in the Commonwealth to build open access fiber to their sub-stations. Fiber availability at sub-stations would allow both the County and/or private sector service providers to expand service in the area around the sub-stations, using the sub-station fiber to support Internet backhaul and to connect the service areas together.

Both wireless service expansion and fiber to the home (FTTH) expansion from the three types of target areas (K12 schools, villages, sub-stations) are possible. The map to the right shows the underserved census block locations in relation to the target areas.



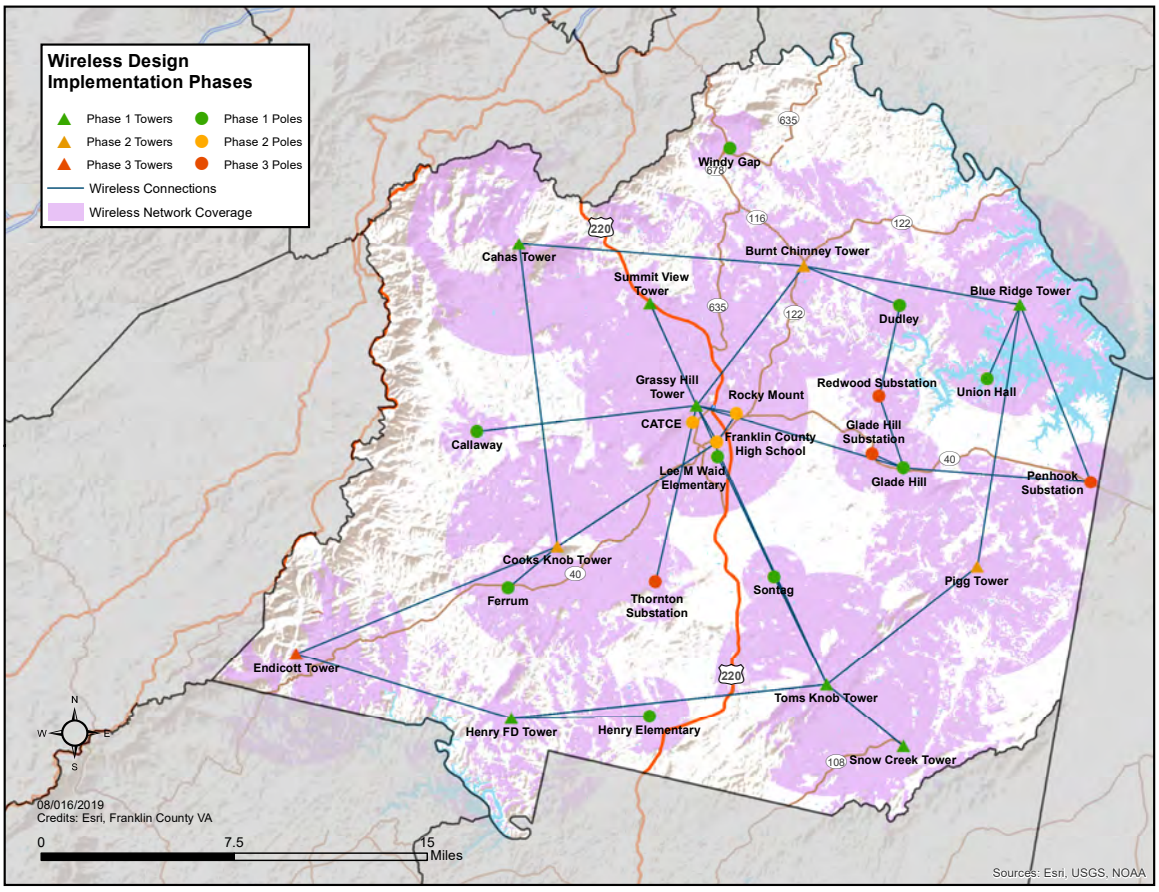
13.1 FIXED POINT WIRELESS EXPANSION

The map below shows the projected wireless broadband coverage in Franklin County, using a network of existing towers, new towers, and shorter community poles. The propagation estimate shows that approximately 65% of the county could receive coverage if clear line of sight or near line of sight is available from a particular home or business.

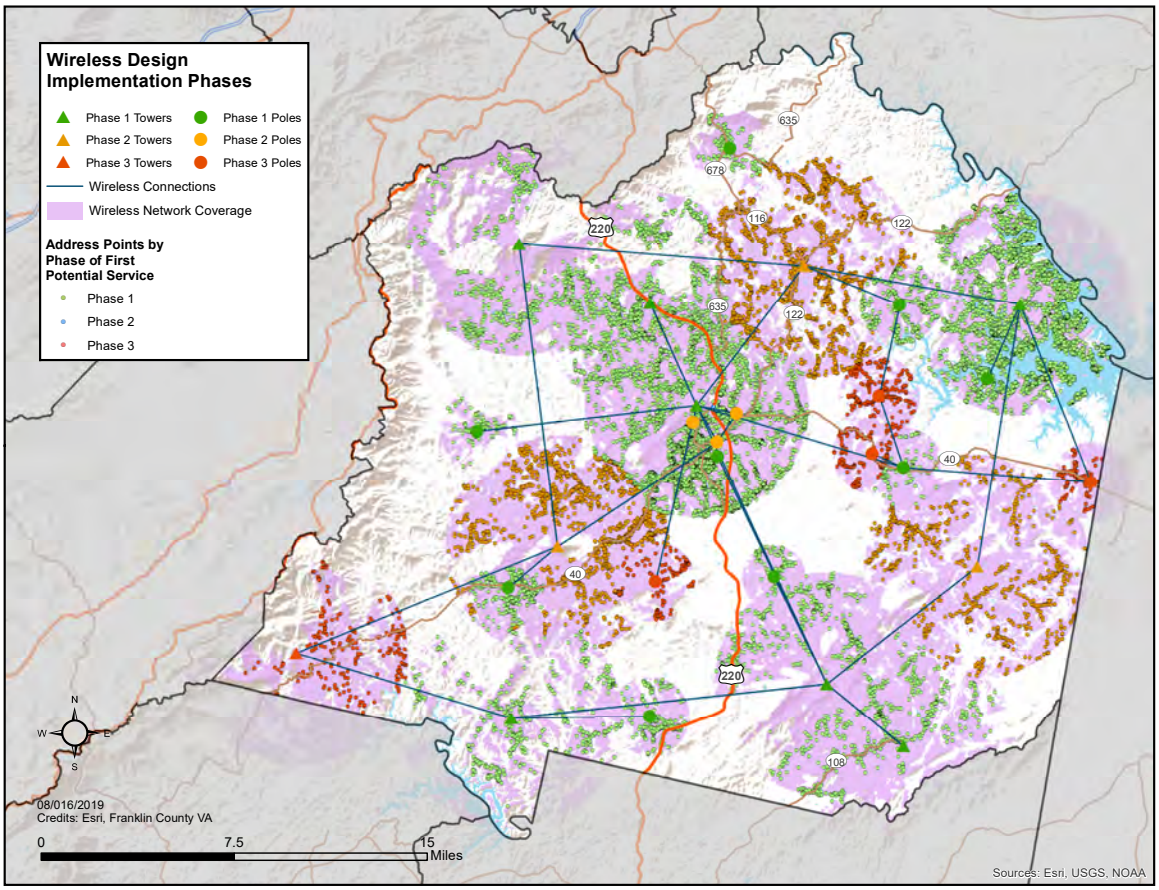
The wireless strategy could be built out in three phases, with the exact phasing of towers and poles somewhat dependent upon the availability of funding. Franklin County intends to apply for VATI funds and Tobacco Commission funds, and may also consider submitting a USDA ReConnect grant application—all of which could support completing some or all of the proposed improvements.

In the map below, the shaded areas show the estimated wireless coverage for each tower or pole. Not all community poles that are recommended in the three phase plan in this chapter are represented on this map—some locations for new community poles should be evaluated after Phase One improvements have been made.

Estimated coverage by fixed point wireless broadband service can vary because of trees, hills, buildings, and other obstacles that may block the line of sight or near line of sight between a customer and a tower or pole.



The map below shows the estimated address points in each propagation survey area.



Phase	Estimated Coverage of Addresses
One	14,237
Two	4,668
Three	910
Total Estimated Coverage	19,815

Phase One Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINT	PROJECT MGMT COSTS	TOTAL COST
1	Blue Ridge Group	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	$11,025.00	$5,000.00	$72,704
1	Cahas	New Tower	$170,000	Sectors, LTE	$30,304	$11,025	$14,500	$225,829
1	Callaway Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Dudley Elementary	New Pole (School)	$7,865	Omni	$7,428.50	$5,512.50	$2,500.00	$23,306
1	Ferrum Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Glade Hill Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Grassy Hill Tower	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	$21,760.20	$5,000.00	$83,439
1	Henry Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Henry Fire Station Tower	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	$5,512.50	$5,000.00	$67,191
1	Lee M Waid	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Snow	New Tower	$170,000	Sectors, LTE	$30,304	$5,512.50	$5,000.00	$210,816
1	Summit View Tower	Tower Improvements	$26,375	Sectors, LTE	$30,304	$5,512.50	$5,000.00	$67,191
1	Sontag Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
1	Toms Knob	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	$14,030.10	$5,000.00	$75,709
1	Union Hall	New Pole (Village)	$7,865	Omni	$7,428.50	$5,512.50	$5,000.00	$25,806
1	Windy Gap Elementary	New Pole (School)	$7,865	Omni	$7,428.50		$2,500.00	$17,794
							Total Wireless Estimated Cost	**$976,546**

Phase Two Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINT COSTS	PROJECT MANAGEMENT COSTS	TOTAL COST
2	Burnt Chimney Elementary	Water Tank Improvement	$26,375.0	Sectors, LTE	$30,303.80		$5,000.00	$61,679
2	CATCE	New Pole (School)	$7,865.00	Omni	$7,428.50	$1,108.80	$2,500.00	$18,902
2	Cooks Knob	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	$11,025	$5,000	$72,704
2	Franklin County High	New Pole (School)	$7,865.00	Omni	$7,428.50		$2,500.00	$17,794
2	Pigg Tower	New Tower	$170,000	Sectors, LTE	$30,303.80	$11,025	$14,500	$225,829
2	Rocky Mount Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	$1,108.80	$2,500.00	$18,902
							Total	$415,810

In Phase 3, the partner ISP will determine the best placement for new poles, based on customer demand.

Phase Three Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINT COSTS	PROJECT MGMT COSTS	TOTAL COST
3	Blain Substation	Covered	—	—	—	—	—	—
3	Endicott	New Tower	$170,000	Sectors, LTE	$30,304	$11,025	$14,500	$225,829
3	Frankin Substation	Covered	—	—	—	—	—	—
3	Glade Hill Substation	New Pole (Substation)	$7,865	Omni	$7,428.50	$6,300.00	$2,500.00	$24,093.50
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	ISP Determines Loc.	New Pole	$7,865	Omni	$7,429	$1,109	$2,500	$18,902
3	Orchard Substation	Covered	—	—	—	—	—	—
3	Penhook Substation	New Pole (Substation)	$7,865	Omni	$7,428.50	$2,217.60	$2,500.00	$20,011.10
3	Redwood Substation	New Pole (Substation)	$7,865	Omni	$7,428.50	$2,217.60	$2,500.00	$20,011.10
3	Tank Hill Substation	Covered	—	—	—	—	—	—
3	Thornton Substation	New Pole (Substation)	$7,865	Omni	$7,428.50	$1,109	$2,500	$18,902
							Estimated Total	$516,772

13.2 FIBER TO THE HOME EXPANSION

Using the K12 school and village locations, fiber to the home project costs were developed. Many of the designated villages in Franklin County overlap with K12 school locations, so a total of twelve fiber studies were developed. The map below shows the areas that set evaluated.

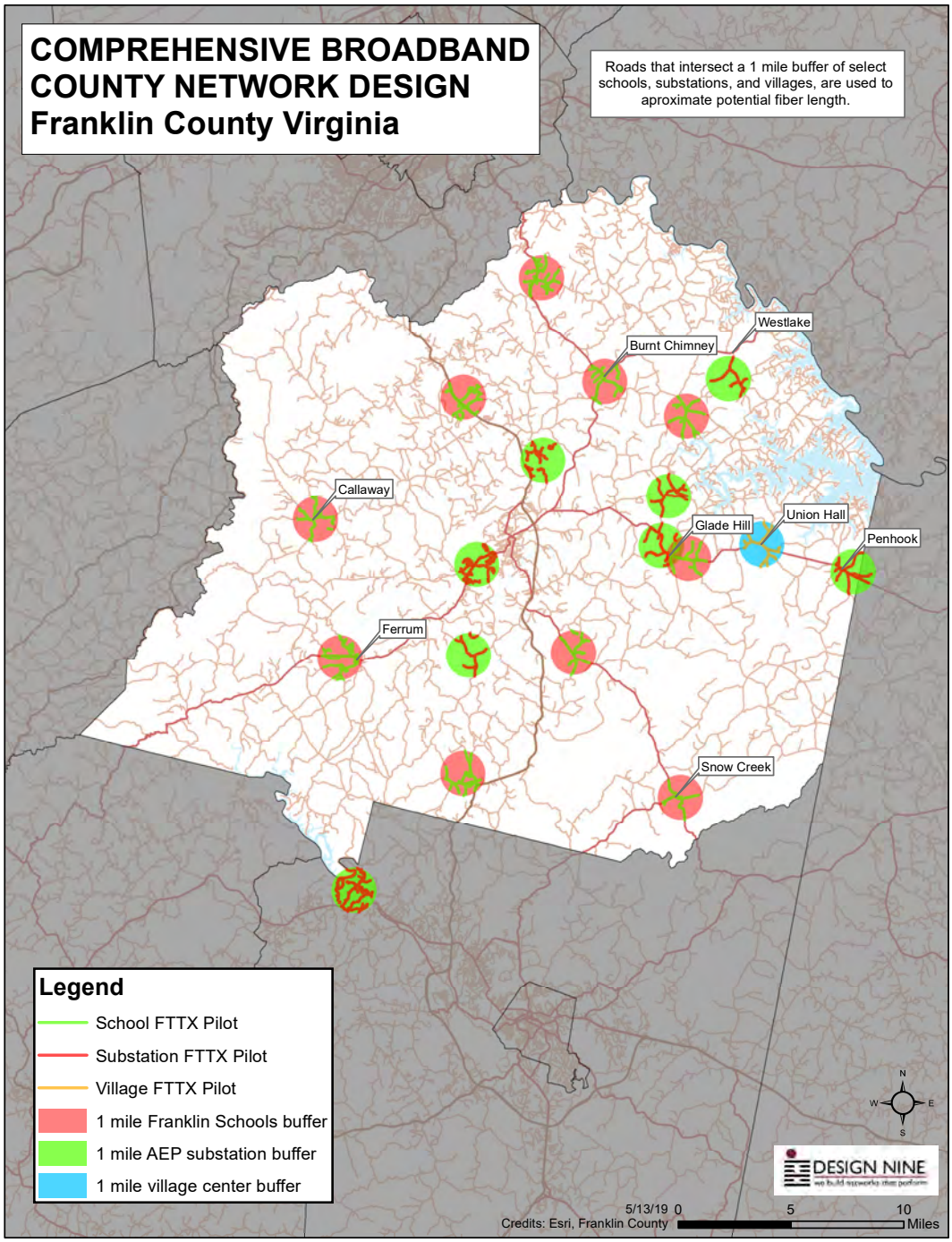
For each location, fiber would be extended from the school or village center to all households within a one mile radius.

Fiber Summary

Phase	Locations	Premises Passed	Premises Connected	Estimated Cost
Phase One	Callaway, Ferrum, Burnt Chimney, Boones Mill	776	467	$5,199,334
Phase Two	Union Hall, Henry, Dudley, Westlake	519	323	$3,699,538
Phase Three	Sontag, Snow Creek, Glade Hill, Windy Gap	390	235	$3,239,451
Totals		**1685**	**1025**	**$12,138,323**
	Notes: **1)** Fiber projects in Villages and near school facilities can be accommodated as funding becomes available. Phasing order may change based on funding. **2)** There are likely to be significant savings if several fiber projects are combined into a single build. Each fiber cost estimate was calculated with the assumption that it was a standalone effort. Budget categories that would see reductions include engineering, project management, and construction.			

The table on the next page shows the summary costs for each of the twelve fiber project areas. The full estimate tables are included in the appendix of this report.

Location	Premises Passed	Premises Connected	Estimated Cost
Union Hall	91	65	$1,009,972
Windy Gap	136	82	$1,140,471
Ferrum	296	178	$1,651,793
Sontag	80	48	$733,291
Snow Creek	86	52	$632,719
Henry	177	106	$1,148,921
Glade Hill	101	61	$946,001
Dudley	118	71	$915,124
Callaway	123	74	$927,440
Burnt Chimney	186	112	$1,072,896
Boones Mill	158	95	$1,334,174
Westlake	133	81	$625,521
	1461	879	$12,138,323


COMPREHENSIVE BROADBAND
COUNTY NETWORK DESIGN
Franklin County Virginia
Roads that intersect a 1 mile buffer of select schools, substations, and villages, are used to aproximate potential fiber length.
Westlake
Burnt Chimney
Callaway
Glade Hill
Union Hall
Penhook
Ferrum
Snow Creek
Legend
School FTTX Pilot
Substation FTTX Pilot
Village FTTX Pilot
1 mile Franklin Schools buffer
1 mile AEP substation buffer
1 mile village center buffer
N
W
E
S
DESIGN NINE
5/13/19
Credits: Esri, Franklin County
0
5
10
Miles

13.3 ABOUT IMPLEMENTATION STUDIES

NOTE: The costs contained in these implementation recommendations represent the best information available, based on similar costs from other projects, from vendor price lists, and/or estimates from contractors and construction firms. These estimates are generally reliable for up to six months. Note also that the time of year that the work is bid out can have a substantial effect on the estimate. We use an average weighted value for most costs to try to compensate for this, but as an example, construction work bid out in spring or early summer may have higher costs than a project bid out in late fall or early winter.

Tower Construction

The line items for each named tower include the cost of the tower, site preparation, estimated cost of electric service, generator cost and placement, cost of the tower, and labor to assemble and erect the tower, and backbone equipment.

13.4 WIRELESS CONSTRUCTION COST FACTORS

The cost estimates are developed using the the categories below. For each category, the items, labor, and activities associated with that category are calculated, using vendor price quotes, prices for labor and materials from previous construction projects, and other sources of cost information.

Buildings, Improvements, and Prefabricated Shelters

This category includes any buildings and shelters constructed as well as improvements to the buildings such as redundant HVAC systems, power improvements, fire suppression systems, security and surveillance systems, etc.

Outside Plant Construction Materials

Network construction includes the outside plant materials needed to build the network. Items like conduit, pedestals, cabinets, hand holes, and splice enclosures are all included in network construction.

Outside Plant Construction Labor

Labor is typically included with network construction for the bidding process but is separated here to help identify money that could be saved by leveraging local labor resources. Labor includes the placement of pedestals and hand holes, the underground or aerial placement of conduit, the construction of foundations (pads) for various structures throughout the network, and more.

Several material costs such as concrete and gravel are included in labor depending on the type of job to be performed.

Network Equipment, Software, and Related Costs

Network equipment includes any network electronics that will be used in the network such as routers, switches, and CPE. Network equipment also includes some items that do not use any AC power but fall into a similar category such as patch panels, and patch cables. The equipment cost will vary widely depending on the type of architecture chosen.

Administrative and Legal

Specialized legal counsel will be required to review contracts with service providers, contractors, and other participants in the project. Legal costs can vary with a particular location and tend to go down over time. The most legal work is needed early in the first construction phase to develop business contracts with service providers, to review construction and vendor contracts, and to broker lease agreements for use of public or private property (where network equipment like cabinets or shelters have to be located).

Leases, permits, and rights of way

Some costs will be incurred based on the permitting requirements of the project. If the County is able to place the colocation facility and any cabinets in public right of way or on County properties at no charge, the cost of leases will be lower. If cabinets or shelters have to be placed on private property, the cost of the land or long term leases will increase. The cost of permits needed for crossing wetlands, streams, other sensitive areas, and VDOT permits are also included in this category. Formal leases and negotiated lease payments are more desirable than providing some form of free access to services.

Project Management

Project management for a community network build requires thorough and detailed planning, experience in procuring construction materials for the project, and the ability to oversee and convey project information to contractors through the duration of the project, including construction inspection work (ensuring construction contractors have done their job properly).

Network Design and Engineering

This work include a full design of the outside plant network, cabinet and shelter specifications, and extensive detail (blueprints) that specifies how all fiber cable, towers, buildings, and network equipment is to be installed. These documents have to be completed prior to bidding out any construction work, and are usually included as part of a construction bid package. The detail includes fiber optic cable route determination and size determination, active and passive network equipment selection and placement planning, splicing layouts and documentation, network configuration planning, and all engineering necessary to complete construction.

Network Integration and Testing

Some configuring and testing will take place after the network is built and before it is ready for use. In a dark network this involves labeling and documenting the routes of individual fiber strands, and testing of any other features of the network such as generators, air conditioners, and locks. In an active network the testing and integration includes integration requirements for a dark

fiber network plus the configuring and installation of switches, routers, and other network equipment. Work in this category requires a skilled professional who is familiar with the network architecture and the business model (e.g. open access).

Miscellaneous

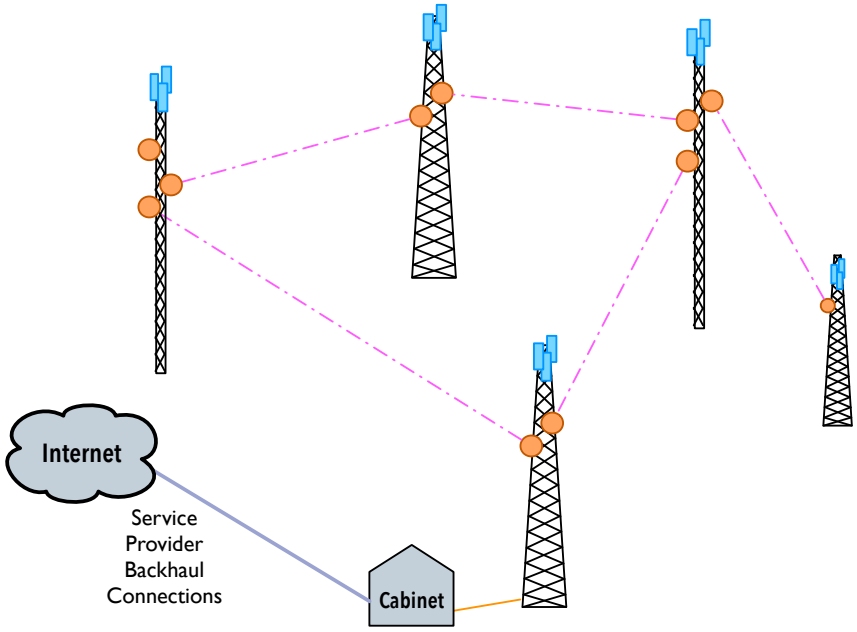
This category provides a small budget for miscellaneous expenses that will arise during the course of construction (e.g., bid advertisement costs, inventory tags, etc.).

Contingencies

The Contingency category is included and calculated as a percentage of the total estimated cost (e.g., 5% of total cost) to provide flexibility in managing the overall budget. Equipment costs can and do change between the time an estimate is made and construction commences. Labor costs can vary depending upon the time of year the work starts, the state of the local economy, and the state of the national economy. Material costs and lead times can vary based on demand on certain industries, energy costs, and location.

13.5 WIRELESS TOWER COST ESTIMATES

This section of the report provides an estimate of the cost of using existing towers to provide improved Internet access. The diagram below shows the logical design of a five tower network. Four of the five towers have adequate line of sight between the towers to build a fully redundant ring between the towers, which will provide much more reliable service (that is, a single tower or equipment failure will not affect service).



Any placement of new towers should be preceded by a careful viewshed analysis (how much area/users are likely to be able to receive service). Site acquisition and site preparation costs can affect the overall cost of such a project. Existing county properties (e.g. fire/rescue stations, county parks, dump transfer sites, etc.) may be candidates for towers. Note that existing towers may require an engineering study to confirm that additional antennas can be added without exceeding the tower load limits.

13.6 TOWER SPACE ONLY COST ESTIMATE

For towers currently owned by the county, and/or State-owned towers (where permission is obtained to lease space) or other stakeholders that might be candidates for project use, modest upgrades to equipment at the base of the tower would make them "broadband-ready."

Upgrades to existing towers typically may include adding or upgrading generators, additional cabinet or shelter space for service provider equipment, and sometime fencing and physical access changes.

Note that this estimate represents a "worst case" scenario. If the site already has a generator that can be used by a new WISP co-locating on the tower, that could reduce the cost by as much as $7,500. If no road improvements are needed and existing electric service does not require a new H-frame and meter, another savings of up to about $3,000 is possible. If the tower has a current certification (i.e. had a formal engineering inspection), additional savings are possible, bringing the 'best case" cost to about $11,000 to $12,000.

TOWER SITE DEVELOPMENT AND IMPROVEMENTS

ITEM/PROJECT	UNITS	UNIT COST (LOW)	UNIT COST (HIGH)	COST (AVG)
Tower Study / Survey	1	$4,500	$7,000	$5,750
Site Development (Clearing, Road Improvements, etc.)	1	$0	$1,500	$750
Small Telecom Cabinet AMPROD AM47P-2636-24RU OR EQUIVALENT, ALUMINUM CABINET - FRONT AND REAR DOORS- HVAC/HEAT - ADJUSTABLE RACK RAILS 19"	1	$6,000	$7,500	$6,750
10kW Liquid Propane Generator	1	$4,000	$6,000	$5,000
Cabinet Foundation and Installation	1	$2,500	$4,000	$3,250
New Power Service / Installation ASSUMES POWER AVAILABLE ON SITE, New meter placement required to support WISP equipment	1	$1,500	$2,500	$2,000
Power System Installation Labor	1	$300	$500	$400
Generator Installation Labor	1	$1,250	$1,700	$1,475
Propane Service Installation TANK FURNISHED / INSTALLED BY LOCAL GAS PROVIDER	1	$750	$1,250	$1,000
Total:				$26,375

13.7 POINT TO POINT BACKHAUL NETWORK

A countywide backhaul network between towers has several desirable characteristics:

- It reduces the cost to providers of being able to affordably offer service on all the towers.
- It increases the reliability and robustness of the WISP services because of the ring design (on at least four of the towers).
- County government data and/or public safety services could also be carried on the backhaul network to provide improved access to some remote facilities.
- K12 schools may be interested in having a redundant network to improve reliability of their existing fiber connections. This can be important during periods when online standardized testing is taking place.

Point to point links are estimated with consideration for the distance required, the bandwidth required, available space on the tower, and frequencies already in use on the tower. In the wireless phase cost estimates equipment is estimated according to the pricing below.

AirFiber 11FX Pair Including Licensing

Item	Units	Unit Cost	Total
AF11X Radio	2	$799.00	$1,598.00
AF11-CA Adapter Kit	2	$49.00	$98.00
AF11FX Duplexer	4	$199.00	$796.00
AF11 X Antenna 11GHz, 35dBi	2	$379.00	$758.00
FCC Licensing	1	$2,000.00	$2,000.00
Shipping @ 5%	1		$262.50
TOTAL			$5,512.50

AirFiber 24 Pair

Item	Units	Unit Cost	Total
AirFiber 24HD	2	$3,000.00	$6,000.00
Shipping at 5%	1		$300.00
TOTAL			$6,300.00

AirFiber 5XHD Pair

Item	Units	Unit Cost	Total
AF5XHD Radio	2	$429.00	$858.00
AirFiber X Antenna 5GHz, 23dBi Slant 45	2	$99.00	$198.00
Shipping at 5%	1		$52.80
TOTAL			$1,108.80

13.8 NEW TOWER ONLY COST ESTIMATE

New towers have a range of configurations and cost options. This estimate is for a new 180' tower with no radio equipment (that is, the cost of the bare tower). If located on existing county properties, the time needed to plan for construction can be shortened. If site acquisition or a site lease (of private property) is required, purchase or lease negotiations can add several months to the process. Note that a full permitting process may be required even if a new tower is placed on existing county-owned property. The permit process can add sixty to one hundred and twenty days to the time needed to put a new tower in service.

ITEM/PROJECT	Units	UNIT COST LOW	UNIT COST HIGH	TOTAL (AVG)
Labor and Contracting: $82,540.00				
Site Development (Clearing, Road Improvements, etc.)	1	$15,000.00	$15,000.00	$15,000.00
New Power Service / Installation	1	$1,250.00	$3,400.00	$2,325.00
180' Guyed Tower Construction Labor & Contracting	1	$50,000.00	$74,750.00	$62,375.00
Cabinet Installation Labor	1	$600.00	$1,000.00	$800.00
Power System Installation Labor	1	$300.00	$575.00	$437.50
Generator Installation Labor	1	$1,250.00	$1,955.00	$1,602.50
Materials: $34,985.00				
180' Guyed Tower Construction Materials	1	$17,000.00	$27,000.00	$22,000.00
Small Telecom Cabinet	1	$4,000.00	$5,500.00	$4,750.00
Cabinet Foundation and Installation Materials	1	$1,000.00	$1,500.00	$1,250.00
10kW Liquid Propane Generator	1	$4,000.00	$6,000.00	$5,000.00
Spare Fuses	1	$10.00	$20.00	$15.00
Power System Installation Materials	1	$20.00	$40.00	$30.00
Samlex 1000W Inverter	1	$350.00	$450.00	$400.00
Samlex SEC1230-UL Battery Charger	1	$200.00	$300.00	$250.00
100ah 12v Non Spillable Backup Battery	4	$250.00	$350.00	$1,200.00
DC Voltage Monitoring Device	1	$40.00	$60.00	$50.00
Unmanaged Rack Mount PDU (6O)	1	$35.00	$45.00	$40.00
Total:				$117,525.00
Project Management, Network Engineering, Testing				$23,505.00
Site Engineering, Surveying, Viewshed Analysis, Etc.				$9,500.00
Misc Fees, Technical Services				$7,500.00
Contingency				$12,000.00
TOTAL (rounded):				$170,000.00

13.9 SMALL CELL BROADBAND UTILITY POLE ACCESS COSTS

A single wooden utility pole with a wireless connection to a 180' tower and local access radios could provide access to any residence with line of sight within a half mile or more. This would spread the cost of pole construction and equipment costs across several households or businesses. There are many areas in the county where there is a cluster of homes along a relatively short stretch of road. All of those homes could share the use of a single local utility pole access site.

V1	VARIABLE	VALUE	NOTES
V2	Weight Variable	5	0-10 scale used in Best Estimate column (10 is best)
V3	Towers	1	Number of Towers
V4	Height	60	Tower Height
V5	Type	Wooden Utility Pole	Tower Type
V7	Backbone Radio System Licensed / Un-licensed	Un-licensed	
V8	Backbone Links	1	
	Site Development (Average)	1,000	

1	ITEM/PROJECT	UNITS	COST (LOW)	COST (HIGH)	TOTAL (LOW)	TOTAL (HIGH)	BEST ESTIMATE
2	Site Development (Clearing, Road Improvements, etc.)	1	- n/a -	- n/a -	- n/a -	- n/a -	$1,000
3	3x3 NEMA Box	1	$300.00	$600.00	$300.00	$600.00	$450
4	New Power Service / Installation	1	$500.00	$1,250.00	$500.00	$1,250.00	$875
5	60' Wooden Utility Pole Construction Materials	1	$2,500.00	$3,500.00	$2,500.00	$3,500.00	$3,000
6	Spare Fuses	1	$10.00	$20.00	$10.00	$20.00	$15
7	Power System Installation Materials	1	$20.00	$40.00	$20.00	$40.00	$30
8	Samlex 1000W Inverter	1	$350.00	$450.00	$350.00	$450.00	$400
9	Samlex SEC1230-UL Battery Charger	1	$200.00	$300.00	$200.00	$300.00	$250
10	100ah 12v Non Spillable Backup Battery	4	$250.00	$350.00	$1,000.00	$1,400.00	$1,200
11	DC Voltage Monitoring Device	1	$40.00	$60.00	$40.00	$60.00	$50
12	Unmanaged Rack Mount PDU (6O)	1	$35.00	$45.00	$35.00	$45.00	$40
13	60' Wooden Utility Pole Construction Labor & Contracting	1	$2,000.00	$3,000.00	$2,000.00	$3,000.00	$2,500
14	Power System Installation Labor	1	$300.00	$500.00	$300.00	$500.00	$400
15	Ubiquiti IsoBeam PTP System	2	$200.00	$400.00	$400.00	$800.00	$600
16	Ubiquiti Access Point + 120° Sector	3	$375.00	$500.00	$1125.00	$1500.00	$1,313
17	Total:				$8,780.00	$13,465.00	$12,122.50

This estimate below includes just the cost of placing the pole and providing electric service to the pole. The WISP leasing the pole would be responsible for providing access radios for local access and for a point to point radio link backhaul connection to another tower (to supply the local Internet service).

1	ITEM/PROJECT	UNITS	COST (LOW)	COST (HIGH)	BEST ESTIMATE
2	Site Development (Clearing, Road Improvements, etc.)	1	0	2000	$1,000
3	3x3 NEMA Box	1	$300.00	$600.00	$450
4	New Power Service / Installation	1	$500.00	$1,250.00	$875
5	60' Wooden Utility Pole Construction Materials	1	$2,500.00	$3,500.00	$3,000
6	Unmanaged Rack Mount PDU (6O)	1	$35.00	$45.00	$40
7	60' Wooden Utility Pole Construction Labor & Contracting	1	$2,000.00	$3,000.00	$2,500
8	Total:				$7,865.00

14 BROADBAND EDUCATION STRATEGIES

Businesses and residents in Franklin County have shared widespread frustration with the current levels of broadband service, especially in the rural areas of the county. The Broadband Authority will have to simultaneously keep all audience segments well-informed with regular updates, but also manage expectations. The Authority is not responsible for a traditional "sales" approach to marketing Internet–that is the job of ISPs and WISPs, but rather the focus must be on "awareness marketing." That is, ensuring that all of the residents, businesses, and various stakeholders and interested parties in the county have enough information to feel like they know what is happening and when, but also understand that this is a problem that has developed over decades, and will take several years to solve.

14.1 RECOMMENDATIONS FOR AN EDUCATION CAMPAIGN

A successful education and awareness plan for the county does not have to be expensive or time consuming. The attributes that need attention are:

- Consistent – Use a single, easy recognized logo, tag line, and message consistently across all platforms–paper, Web, social media, and email.
- Ongoing – Regular updates and news postings on the Authority portion of the County Web site and a complementary Facebook page will keep residents, businesses, and local officials up to date and well-informed about broadband development activities.
- Interesting Content – Posted news items should emphasize quality over quantity. One interesting broadband article per week is better than three marginally interesting articles per week.
- Well-defined Distribution – Distribution of news items should be well understood–as an example, most news items should be posted on the Facebook page.
- Well-defined Goals – The Committee should develop a short list of short term and long term goals that can be described concisely (e.g. one sentence each). Goals should be included as needed and as appropriate on the Web site, on the Facebook page, and on paper media. The goals should also be highlighted in presentations, interviews, and in public meetings.

DISTRIBUTION

Social Media – A dedicated Facebook page is an important part of the education and awareness strategy. Regular posting of news items will keep residents and businesses engaged and seeing those items in their news feeds. Occasional use of "boosted" posts is extremely effective in reaching a wider audience. Boosted posts should be reserved for significant and timely news about the project itself.

Instagram and Twitter can be used occasionally for high profile news announcements.

Perhaps the most important feature of Facebook is the interactivity that is possible between the Broadband Authority and Facebook users. Residents and businesses can "like" and share the

page, but they can also post questions. The Facebook page should be visited regularly by a member of Authority who will review activity, write responses to questions, and pass interesting or important comments on to other Authority members.

Traditional Media – Local newspapers and local radio stations can be a valuable resource for getting news about the work of the Broadband Authority to the wider community, especially for news about work completed (e.g. new WISP coming to the area, new tower completed, etc.).

Web Site – The Authority should consider having an expanded presence on the County Web site. At a minimum, as new infrastructure and service provider agreements are in place, these accomplishments should be described and permanently available via the Web page(s).

Mailing Lists – It will be useful to have one or more "invite only" mailing lists to keep key stakeholders and interested parties informed.

Media Partners – The main Web page on the County Web site and the Facebook page should be linked prominently on partner Web sites (e.g. Chamber of Commerce site, economic development Web pages, etc.).

14.2 MARKETING MATERIALS

The Authority needs only a small amount of printed/PDF materials for distribution. These might include a one page **overview** of the project, **vision and project goals**, and **efforts currently underway**. These materials can be distributed to County Supervisors, placed in libraries, or emailed (as a PDF) to people asking for more information.

Regular posting of news items related to broadband generally and postings related specifically to local broadband efforts can be cross-posted to reach a wider audience. The same news item can be posted to the Facebook page and the Web site.

15.1 JOB AND WORKFORCE CHALLENGES

In most areas of the county, residents and businesses currently have, at best, the FCC 10 Megabits down/1 Megabit up bandwidth. This slow speed service is is impacting economic and community development:

- It limits resident's ability to work from home.
- It limits the ability of the county to retain existing businesses and to attract new businesses and jobs.,

In Franklin County, the real issue as it relates to broadband speeds is the future of work. In eastern Kentucky's rural Jackson and Owsley counties, the People's Rural Telephone Coop has deployed high speed fiber service and the improved infrastructure brought more than 800 new work from home jobs to the two counties. Franklin residents will not have the opportunity to pursue the kinds of jobs that are now available without better and more affordable access to broadband.

A recent study in 95 counties in Tennessee found that improved access to high speed broadband can significantly reduce unemployment rates, especially in rural counties (Broadband Communities, March 2019).

The FCC has defined the next broadband tier (fully served) to be 25 Megabits down/3 Megabits up. The problem with the 25/3 definition is that the upload speed (3 Megabits) is not always going to be adequate to support work from home, especially where home-based workers need to connect to a corporate VPN (Virtual Private Network). Work from home and business from home activities should have, at a minimum, 10 Megabits download and 10 Megabits upload speeds. Higher speed service could include service levels like 25 Megabits down/10 Megabits up. The critical requirement is an upload speed that supports work from home.

If the goal is to enhance business access to broadband, there can be no upper limit on the definition of broadband. Saying that broadband (as an example) is 5 Megabits/second of bandwidth or 10 Megabits/second is to tell the residents and businesses in the county that there will be limits on their work and job opportunities.

Broadband is a community and economic development issue, not a technology issue. The essential question is not, "What system should we buy?" or "Is wireless better or cheaper than fiber?" Instead, the question is:

"What do businesses of Franklin County need to be able to compete globally over the next thirty years?"

In short, the county today has "little broadband" in the form of DSL, very limited wireless, expensive satellite Internet, and and very limited cable modem service, along with a very limited amount of "big broadband" in the form of fiber to a few businesses and institutions.

If the County and the Authority make investments in broadband and telecommunications infrastructure, it is absolutely critical that those investments are able to scale gracefully to meet business and economic development needs for decades.

Two key concepts that should drive community investments in telecom are:

"Broadband" is not the Internet

Bandwidth is not a fixed number

Broadband and "the Internet" are often used interchangeably, but this has led to much confusion. Broadband refers to a delivery system, while "the Internet" is just one of many services that can be carried on a broadband network. The challenge for the County and the Authority is to ensure that businesses and homes have a broadband network with sufficient bandwidth to deliver all the services that will be needed and expected within the next three to four years, including but not limited to "the Internet."

The economic impact on Franklin county can include the following effects:

- Difficulty retaining some existing businesses - As business bandwidth needs continue to increase over the next several years (see Section 8.4), some businesses may need to move out of the area to ensure that they have the right bandwidth to support their business operations.
- Difficulty attracting new businesses - New businesses interested in some of the advantages available in the county (e.g. low cost of living, good recreational opportunities, good workforce ethic, etc.) may be deterred by the cost and limited bandwidth available, and therefore choose other areas to locate.
- Difficulty keeping younger workers and families in the county - Younger workers and families tend to be heavy users of Internet services, and real estate agents are reporting that younger house buyers are reluctant to live in areas with poor Internet service.
- Reductions in real estate value - Homes with poor Internet service are more difficult to sell, leading to reduced prices and then impacting county property taxes negatively.

15.2 BUSINESS BANDWIDTH NEEDS

The table below shows bandwidth consumption for several types of businesses and a projection of the bandwidth needed 5 and 10 years out. The cost of fuel is already affecting business travel decisions, and more and more businesses will invest in HD quality business videoconference systems to reduce the need for travel. These HD systems require substantial bandwidth; a two way HD video conference requires 20-25 Megabits during the conference, and a three way conference requires 30-35 Megabits during the conference. As more workers try to reduce the cost of driving to and from work by working from home, the business location must provide network access (Virtual Private Network, or VPN) to the employees working from home. These home-based workers will make extensive use of videoconferencing to attend routine office meetings remotely and to enhance communications with co-workers, including videoconferences with other home-based workers in the company. A VPN network providing remote access to just two or three home-based employees could require 50 Megabits of bandwidth during normal work hours.

	Large Business		Small Business		Home Based Worker		Business From Home	
Description	A larger business with about 50 workstations.		A small business with 10 to 15 employees, and 7-10 workstations.		A single employee working at home for his/her company.		A home business with one or two employees working at home.	
	Concurrent Use	**Mbps**	**Concurrent Use**	**Mbps**	**Concurrent Use**	**Mbps**	**Concurrent Use**	**Mbps**
Telephone	20	1.28	5	0.32	1	0.064	1	0.064
TV		0		0		0		0
HDTV		0		0		0		0
Credit Card Validation	4	4	1	1		0		0
Security System	1	0.25	1	0.25	1	0.25	1	0.25
Internet	20	30	7	10.5	1	1.5	1	1.5
VPN Connection	5	25		0	1	5		0
Data Backup	5	7.5	1	1.5	1	1.5	1	1.5
Web Hosting	1	2		0		0		0
Workforce Training (online classes)	2	20	1	10	0	0	1	10
HD Videoconferencing	10	100	2	20	1	10	1	10
Telecommuting workers	5	15	2	6	0	0	0	0
Totals		**205.0**		**49.6**		**18.3**		**23.3**
5 years from now (Megabits)	**615**		**149**		**55**		**70**	
10 years from now (Megabits)	**1845**		**446**		**165**		**210**	

16 PARTNERSHIPS AND FUNDING STRATEGIES

16.1 PARTNERSHIP OPPORTUNITIES

The Broadband Authority work will, by necessity, have to include both public and private partners. Among some public and private entities, the common synergies are:

- The need for more bandwidth,
- The need for more affordable bandwidth, and
- The need for more affordable bandwidth to be more widely available.

Potential project partners include:

County government

Franklin County is already a strong supporter of the Broadband Authority, and has been providing staff support, grant application support, and related services.

Public Safety

The Sheriffs departments, fire, and rescue departments all need better access to broadband and improved wireless voice/data communications. Throughout the United States, public safety voice and data communications systems are being upgraded, often at staggering cost. Many of the upgrades include new towers to eliminate "holes" in the served area where first responder, fire, and rescue radios do not work. Combining public safety needs with community broadband needs can bring new sources of funding and cut costs, sometimes dramatically. Elected officials may need to take the lead in this area to ensure that public safety officials work collaboratively with the broadband efforts.

As additional towers and community pole sites are deployed in the county, first responders will benefit from lower Internet costs. Sharing tower space (WISP access and first responder voice/data) is extremely efficient, and all tower improvement and tower construction activities should be coordinated closely. There are some grants and funding sources available for public safety infrastructure like towers that may be available to help support new tower development.

County public safety officials participate regularly in Broadband Authority meetings and are strong supporters of sharing tower space to improve broadband access.

K12 Schools

Franklin County schools have adequate broadband service at existing school locations. But K12 students often lack adequate Internet service at home, and some schools are careful not to assign homework that requires Internet access. Parents consistently report on the burden of having to drive children to a public library or some other WiFi hotspot to get Internet access for school work. Every school in the county should configure a WiFi hotspot outside the building and make it available after school hours, when classroom instruction would be impacted. It would be possible to make this access controlled, so that students would have to a userid/password to use it. The Authority should work with the schools to apply for education grant funds to achieve this goal, and to keep K12 parents informed about broadband activities.

ISPs and WISPs

Internet Service Providers (ISPs) and Wireless Internet Service Providers (WISPs) are important partners, as they will be the companies leasing tower space and/or conduit/fiber infrastructure.

County and Authority telecom investments will be a public/private enterprise, and service providers are the primary customers of the infrastructure. Service providers cannot be taken for granted. Instead, a fair fee structure, high quality infrastructure, excellent maintenance and operations (where needed), and flexibility on business agreements and pricing will be required to recruit and retain service providers.

See the chapter later in this report (***Tower and Service Provider Management***) for more information on how to work with providers. For providers that express interest in using community infrastructure, it will be important to meet with them on a regular basis. These companies may also be partners on grant applications, where it may be required to show that the infrastructure being constructed has a service provider already committed to using it.

Area Businesses

Businesses in the county and the local Chamber of Commerce chapters have an important role to play as advocates for the the work of the Authority. At both the county and state level, businesses that need more affordable and better broadband should ensure that elected officials understand the urgency. The Authority, as part of its marketing program, should ensure that local businesses are kept up to date with work activities, grants, and other efforts (e.g. attend CoC meetings at least quarterly to report on the work of the Broadband Authority).

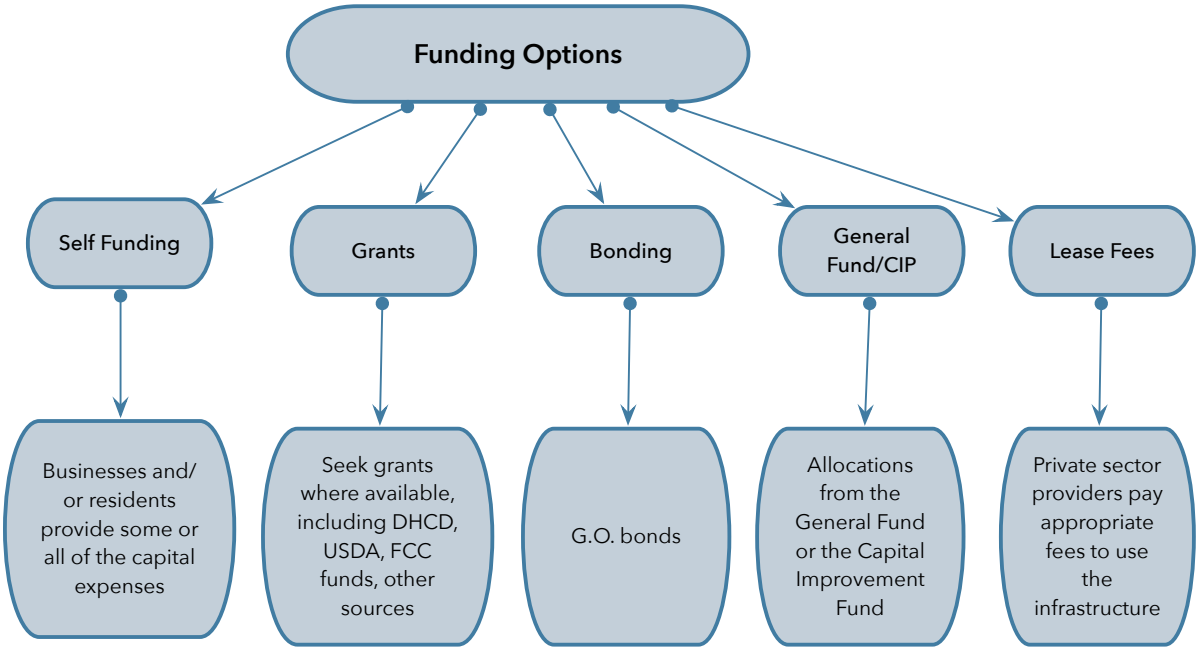
Electric Utilities

Electric utilities are natural partners in any municipal broadband venture. Electric utilities own utility poles, bucket trucks, and the equipment needed to install aerial fiber. Chattanooga's fiber to the premises (FTTx) initiative has enabled millions in savings for the city-owned electric service. When power outages occurs from events like ice storms or tree damage, the utility is able to use the fiber network to very accurately pinpoint where the outage occurs, enabling a more rapid repair of the electric network at less cost.

The Broadband Authority should meet from time to time with AEP to assess their interest in Authority projects, especially if the Authority and the electric utility could collaborate on fiber to electric service substations.

16.2 FUNDING STRATEGIES

It is important to note that any County investment in broadband infrastructure is likely to be passive infrastructure. These assets will have a conservative life span of thirty years or more (e.g. wireless towers, conduit, fiber cable). These types of infrastructure investments create hard assets that have tangible value and can then be leveraged for additional borrowing. The demand for services and the associated fees paid for those services will provide the revenue that will pay back loans over time. There is ample time to recoup not only the initial capital investment, but also to receive regular income from the infrastructure.



The financing of community-owned telecommunications infrastructure faces several challenges with respect to funding.

- Not all local governments are willing to commit to making loan guarantees from other funding sources like property taxes, because the idea of community-owned telecom infrastructure has a limited track record and therefore a higher perceived risk.
- Similarly, citizens are not always willing to commit to the possibility of higher taxes that may be needed to support a telecom infrastructure initiative, for many of the same reasons that local governments are still reluctant to make such commitments: perceived risk and a lack of history for such projects.
- Finally, banks and investors are also more skeptical of community telecom projects because of the relative newness of the phenomenon. By comparison, there are decades of data on the financial performance of water and sewer systems, so the perceived risk is lower.

Somewhat paradoxically, the cost of such a community digital road system is lower when there is a day one commitment to build to any residence or business that requests service. This maximizes the potential marketplace of buyers and attracts more sellers to offer services because of the larger potential market. This is so because:

- Service providers are reluctant to make a commitment to offer services on a network without knowing the total size of the market. A larger market, even if it takes several years to develop, is more attractive.
- Funding agencies and investors that may provide loans and grants to a community network project want to know how the funds will be repaid and/or that grants will contribute to a financially sustainable project. Knowing that the size of the customer base is the maximum possible for a service area helps reduce the perceived risk for providing loans and grants.

Community Reinvestment Act

The Community Reinvestment Act (CRA) was developed forty years ago to encourage banks and savings institutions to help meet the credit needs of their local communities, with a focus on low and moderate income areas of those communities. The Federal agencies that oversee private banks assign a CRA rating to each institution. Banks are often looking for well-planned community efforts that need loans. Such loans can improve a bank's CRA rating.

The CRA was revised in 2016 to encourage banks to support community broadband efforts. A community broadband project may be able to get some loan financing from a local bank that wants to get credit for their CRA work.

HUD Community Development Block Grants

The U.S. Housing and Urban Development CDBG State Program allows the Virginia state government to award grants to smaller units of general local government (e.g. counties, towns) that develop and preserve decent affordable housing, to provide services to the most vulnerable in our communities, and to create and retain jobs. In recent years, CDBG funds have been successfully used for broadband infrastructure development where the local government applicant can show the improvements meet the general guidelines of the program—so grant funds have to spent in low and moderate income areas.

Over a 1, 2, or 3-year period, as selected by the grantee, not less than 70 percent of CDBG funds must be used for activities that benefit low- and moderate-income persons. In addition, each activity must meet one of the following national objectives for the program: benefit low- and moderate-income persons, prevention or elimination of slums or blight, or address community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community for which other funding is not available. More information is available here (https://www.hud.gov/program_offices/comm_planning/communitydevelopment/programs).

Virginia Telecom Initiative (VATI)

The Virginia Telecommunication Initiative (VATI) fund is to provide financial assistance to supplement construction costs by private sector broadband service providers to extend service to areas that presently are ***unserved*** (i.e. less than 10 Meg down/1 Meg up) by any broadband provider. The Department of Housing and Community Development (DHCD) manages the appropriation to eligible applicants to provide Last-Mile services to Unserved areas of the State. The VATI program has a target that unserved areas of the Commonwealth have access to broadband speeds of at least 10 Mbps download and 3 Mbps upload. Projects proposing higher speeds in the most cost efficient manner will receive funding priority.

The Virginia legislature has allocated $18M for 2020, significantly more than in previous years. DHCD has not yet released guidelines for the 2020 funds, but applications will most likely be due very early in 2020. Franklin County has submitted a 2019 request with BRISCNET for $465,000, with a $269,451 match amount.

USDA ReConnect Program

The ReConnect program is a new funding program managed by the USDA Rural Development Office. This program is sometimes called the USDA e-Connectivity pilot program. Grant applications can be a combination of 100% grant, 50% grant/50% loan, or 100% loan. $600

million has been allocated to the program, and a wide variety of entities can apply, including non-profits, coops, and state and local governments. Successful applications will require a very credible business plan that shows the project can be financially sustainable. Up to $25 million is available for a 100% grant application. The application deadline for 2019 has passed, but a second round of funding will be available for 2020. USDA ReConnect grants require extensive preparation time to gather data needed for the application. Planning for submission should start at least four months in advance of the deadline. More information is available here: (reconnect.usda.gov). A mapping tool is available on the Web site to show areas that are eligible. To qualify as an eligible area, households must have less than a minimum of 10 Meg down/1 Meg up broadband service.

911 Fees

Improved broadband access in the county can improve household access to 911 services by using broadband Internet to carry 911 voice calls, using one or more strategies to include:

WiFi calling – now a commonly available feature on new cell phones. WiFi calling switches voice telephone call from the cellular network to a nearby WiFi Internet network seamlessly. The reduces the need for additional large cell towers in low density areas of the county.

Nano-cell Devices – Nano-cells are a small box attached to a home wireless router. The nano-cell, which is typically obtained from the cellular provider, enables a cellphone to operate inside the home or business even if there is no cell tower near by.

A modest increase in the 911 fee to improve 911 access in Franklin County could generate funds to support additional broadband towers and community poles. State level legislation would be required to change the 911 fees, so this is a longer term strategy.

Bonding

Revenue bonds are repaid based on the expectation of receiving revenue from the network, and do not obligate the local government or taxpayers if financial targets are not met. In that respect, they are different from general obligation bonds. Many kinds of regional projects (water, sewer, solid waste, etc.) are routinely financed with revenue bonds. We believe many community projects will eventually finance a significant portion of the effort with revenue bonds, but at the present time, the limited financing history of most community-owned broadband networks has limited using revenue bonds.

Selling revenue bonds for a start up municipal network can be more challenging because there is no financial or management history for the venture. Bond investors typically prefer to see two or three years of revenue and expenses and a track record of management success. It would be advisable for the County to have an early conversation with qualified municipal bond counsel to assess the viability of this approach.

Obtaining funding using revenue bonds requires an excellent municipal credit rating and an investment quality financial plan for the operation and management of the network. Revenue bonds must be used carefully, and a well-designed financial model is required to show investors that sufficient cash flow exists to pay back the loans.

General obligation bonds are routinely used by local governments to finance municipal projects of all kinds. G.O. bonds are guaranteed by the good faith and credit of the local government, and are not tied to revenue generated by the project being funded (i.e. revenue bonds). G.O. bonds

obligate the issuing government and the taxpayers directly, and in some cases could lead to increased local taxes to cover the interest and principal payments. Some bond underwriters have indicated a willingness to include telecom funds as part of a larger bond initiative for other kinds of government infrastructure (e.g. adding $1 million in telecom funds to a $10 million bond initiative for other improvements).

In discussions with bond underwriters, it has been suggested that it would be easier to obtain bond funds for telecom if the telecom bonding amount was rolled into a larger water or sewer bond, or some other type of bond request that are more familiar to the bond market.

CAF 2 Funds

The second round of the FCC Connect America Fund (CAF2) continues to provide funds to incumbent and competitive service providers. The funds must be used in unserved or underserved areas as defined by Federal census blocks. To be eligible, a census block could not have been served with voice and broadband of at least 10/1 Mbps (based on Form 477 data) by an unsubsidized competitor or price cap carrier.

The FCC published the final eligible census blocks for the auction on February 6, 2018. The final areas were based on FCC Form 477 data as of December 31, 2016 (the most recent publicly available FCC Form 477 data at the time). So there is a time lag between the determination of a qualifying census block or blocks and the schedule for submitting a bid to serve those areas.

Because many CAF2 qualifying areas are only served by low performance DSL (e.g. less than 10/1 Mbps service), incumbent carriers use the awards to upgrade DSL switches, which is not a long term solution. More recently, competitive carriers are applying for CAF2 funds to provide higher performance broadband wireless and in some cases fiber to the home. Because the use of CAF2 funds are so restricted, it has not had as much impact as many hoped.

A local (e.g. community) broadband entity could apply for CAF2 funds, but the application must include, at a minimum, two years of experience offering broadband service and one year of audited financials. This underscores the importance of getting some service in place to support a longer term goal of applying for CAF2 funds.

Qualified Opportunity Fund Investments

The 2018 Federal tax changes included a little known item called the Investing in Opportunity Act. Opportunity Zones, designated by each state, are eligible for investments that have very attractive tax benefits. The tax advantages include avoidance of most local, state, and Federal taxes, and the ability to have those investments grow and compound tax-free. The intent of the law is to funnel private sector capital gains into low growth and no growth areas of the U.S. by offering substantial tax benefits.

While Opportunity Zones are most likely to attract real estate investments, it should be possible to create Opportunity Zone projects that include telecom infrastructure improvements. As an example, a manufacturing plant investment is made in an Opportunity Zone, along with broadband fiber improvements needed by the plant to support operations.

Opportunity Zones are defined by census tract, and the Census Bureau's Geocoder online tool can provide census tract ID numbers. A link to the list of currently qualified census tracts can be found on this page (https://www.cdfifund.gov/Pages/Opportunity-Zones.aspx).

Coop Membership Fees

If the Authority deemed it useful to create an independent broadband cooperative, coop members would pay a one time membership fee to join the coop. For fiber and wireless improvements, this fee could be set at a level that pays for part or all of the cost of building the fiber to the business or residential premises and/or placing the towers and equipment to deliver wireless service. It may also be possible to work with local banks to provide a financing option (e.g. the membership fee could be paid monthly over a period of several years to reduce the financial burden on a household or business).

The coop membership fee offers the area a way to self-finance a substantial portion of the initial network, as well as providing a long term framework for expansion. Coop membership fees can be collected in advance of providing service.

Lease Fees

Initiatives like tower access and access to local government-owned conduit and fiber can create long term revenue streams from lease fees paid by service providers using that infrastructure. The City of Danville has recovered their entire initial capital investment from lease fees paid by providers on the nDanville fiber network.

Special Assessment/Service District

Communities like Bozeman, Montana and Leverett, Massachusetts have been funding broadband infrastructure improvements with special assessments (in Leverett, $600/year for five years), and in Bozeman, TIF (Tax Increment Funding) is being used in some areas to add telecom conduit, handholes, and dark fiber. In some localities, it is possible to levy a special assessment in a service district designated for a particular utility (like broadband) or other kind of public service.

Charlemont, Massachusetts intends to add an $11/month assessment to every household to build a town-owned Gigabit fiber network that will pass every household in the community. A town-wide vote supported this funding approach. Put in perspective, the average cost of a large, single topping pizza in the U.S. is currently $9 to $12.

A small city in Utah is currently evaluating the potential of a $7-$10 utility tax levied on every household and business to finance a full fiber to the premises build out, including a modest "free" Internet service that would be adequate for email and light Web use. Most households will probably choose to select a higher performance Internet package from a private provider on the network.

The table below shows the kind of funds that could be generated over several time periods. If ten dollars per month were collected from each household for thirty years, it would easily finance the

Franklin County Special Assessment (all 18,963 households)		
Monthly Assessment Amount	Twenty Year Assessment	Thirty Year Assessment
$1	$4,551,120	$6,826,680
$2	$9,102,240	$13,653,360

Franklin County Special Assessment (all 18,963 households)		
Monthly Assessment Amount	Twenty Year Assessment	Thirty Year Assessment
$5	$22,755,600	$34,133,400
$10	$45,511,200	$68,266,800

Individual Service District Examples				
Monthly Assessment Amount	Fifty Homes Five Year Assessment	Fifty Homes Ten Year Assessment	100 Homes Five Year Assessment	100 Homes Ten Year Assessment
$5	$15,000	$30,000	$30,000	$60,000
$10	$30,000	$60,000	$60,000	$120,000
$25	$75,000	$150,000	$150,000	$300,000
$50	$150,000	$300,000	$300,000	$600,000

immediate build out of Gigabit fiber that would pass nearly all homes and businesses in each county. A less amount (e.g. $2/month over twenty years) would easily finance the immediate build out of a comprehensive wide area wireless tower network in Franklin County, as well as some fiber infrastructure.

Property Tax Increase

While raising taxes can be politically very difficult, a very small incremental increase in property taxes, with the increase clearly earmarked specifically designated for broadband development (.e.g. one-quarter cent) might be possible to sell to citizens and businesses. The table below is adjusted to reflect the cost of borrowing over the listed periods of time.

	Assessed property value	Broadband increment	Annual Broadband Fund	Ten Year Aggregate	Twenty Year Aggregate	Thirty Year Aggregate
1/4 of one cent	$6,679,915,940	$0.0025	$150,298	$1,502,981	$3,005,962	$4,508,943
1/2 of one cent	$6,679,915,940	$0.0050	$300,596	$3,005,962	$6,011,924	$9,017,887
1 cent	$6,679,915,940	$0.0100	$601,192	$6,011,924	$12,023,849	$18,035,773

Connection Fees

Tap fees, pass by fees, and connection fees are already commonly used by local governments for utilities like water and sewer. The revenue share model can be strengthened from additional

sources of revenue, including one time pass by fees, connection fees and sweat equity contributions. It is important to note that the Coop Membership Fee can be treated as a connection fee in whole or in part.

Pass By Fees – Pass by fees could be assessed once the fiber passes by the property, just as some communities assess a pass by fee when municipal water or sewer is placed in the road or street– and the fee is assessed whether or not the premise is connected, on the basis that the value of the property has been increased when municipal water or sewer service passes by. At least one study has indicated that properties with fiber connections have a higher value by $5,000 to $7,000 that similar properties without fiber access.

One Time Connection Fees – A one time connection fee can be assessed to property owners (e.g. residents and businesses) when the fiber drop from the street to the premise is installed. This is similar to the kinds of connection fees that are typically charged when a property is connected to a municipal water or sewer system. The fee is used to offset the cost of the fiber drop and the Customer Premise Equipment (CPE) needed to provide the operational access to the network. The connection fee can be modest (e.g. $100) or it can be a larger percentage of the actual cost of the connection. Fiber CPE may range from $250 to $350 and a fiber drop may cost from $200 for a premise very close to the distribution fiber passing along the property to $1,000 or more if the premise is hundreds of feet from the road. One variant would be to charge a minimum connection fee for up to some distance from the road (e.g. $100 for up to 75' and $2 for each additional foot).

There is already some data that indicates that residential property values increase by as much as $5,000 to $7,000 if fiber broadband services are available, so pass by fees can be justified on the basis of increased property values accruing to the property owner. Given the novelty of this approach, pass by fees may need more time to become an accepted finance approach, but tap fees (for installing the fiber cable from the street or pedestal to the side of the home or business) may be easier to use, especially for businesses that may need improved broadband access. Tap fees have the potential of reducing the take rate in the early phases of deployment, but as the value of the network becomes established, it is likely that there will be much less resistance to paying a connection fee.

Grants

Grant funding should be viewed as part of a larger basket of funding. Federal funds from sources like the USDA and the FCC are highly competitive and often come with substantial limitations on who can qualify and how the funds can be used. CDBG funds can support telecom infrastructure construction but must be tied to job creation and/or job retention.

New Markets Tax Credit

New markets tax credits are a form of private sector financing supported by tax credits supplied by the Federal government. The New Markets Tax Credit (NMTC) Program permits taxpayers to receive a credit against Federal income taxes for making qualified equity investments in designated Community Development Entities (CDEs). The CDEs apply to the Federal government for an allotment of tax credits, which can then be used by private investors who supply funds for qualifying community projects. Substantially all of the qualified equity investment must in turn be used by the CDE to provide investments in low-income communities.

The credit provided to the investor totals 39 percent of the cost of the investment and is claimed over a seven-year credit allowance period. In each of the first three years, the investor receives a credit equal to five percent of the total amount paid for the stock or capital interest at the time of purchase. For the final four years, the value of the credit is six percent annually. Investors may not redeem their investments in CDEs prior to the conclusion of the seven-year period.

Throughout the life of the NMTC Program, the Fund is authorized to allocate to CDEs the authority to issue to their investors up to the aggregate amount of $19.5 billion in equity as to which NMTCs can be claimed.

These tax credits can be quite useful, and there may be some areas that qualify. However, it can take up to a year or more to apply and then finally receive NMTC-related cash. This can be a useful long term source of funds.

17 ORGANIZATION AND NETWORK OPERATIONS

With more than a dozen years of operation for a variety of community-owned network infrastructure projects around the country, there is very little "experimentation" that is still necessary. With more than three hundred communities making investments in broadband infrastructure, there is now enough information about what works and what does not work to be able to identify best practice across nearly all areas of operations, planning, management, and finance.

It is now relatively easy to identify the obstacles, challenges, and opportunities that the County is likely to face if it moves forward.

17.1 WISP TOWER LEASE MANAGEMENT

Once existing and/or new towers have space available to lease to WISPs, there are policy and contract decisions that must be evaluated.

- There should be a single public fee schedule for all providers.
- There should be a single tower space agreement that is used for all providers.
- Tower access should be made available in ten foot vertical segments, as high as possible on the tower without interfering with other uses (e.g. public safety antennas). Note that it is unlikely that any tower will have more than two providers on it.
- Leases should be a minimum of two years and should auto-renew if the ISP is meeting performance requirements.
- It may be more effective to have a single lease agreement with access to all towers, and the contract should require the ISP to put equipment on all towers within a certain period of time (e.g. nine to twelve months). This limits ISPs from "cherry picking" towers with more potential customers and ignoring towers in parts of the county with lower population density.
- Monthly tower lease fees should be on the order of $200 to $250 per tower. Higher fees make it difficult for providers to make a business case for the cost of equipment and the extensive marketing required to develop a customer base around a tower.
- If there are two vertical spaces available for lease, the lower segment could be made more attractive to a WISP by offering a reduced lease fee.
- An initial grace period of three to six month should be offered on fees, and/or offer a one year sliding scale of fees (e.g. first three months, fee waived; months four to six, 25% of normal fee; months seven to nine, 50% of normal fee; months ten to twelve, 75% of normal fee). There are many ways to structure the initial fee period, but it is important to recognize that the WISPs incur substantial early costs to develop revenue and customers for a new tower.

- All tower leases should expire on the same date even if started at different times. This allows the regional enterprise to potentially make a smoother transition to a new provider if there are performance issues, and will give the regional entity more leverage and control over the WISPs.
- In contracts, fee reductions should be worded as discounts that can be revoked if performance requirements are not adequately being met.
- There are considerations for ground-space (e.g. WISP cabinets, shelters, H-frames for electric service) that will have to be evaluated at each tower site. If new shelters will be allowed, the regional entity should set minimum standards for new shelters.

Tower Space Revenue Estimate

Tower revenue opportunities are limited. It takes WISPs many months to acquire enough customers on a new tower to break even, and even longer to begin to show a profit. Fees for tower space need to be modest to attract one or two providers, and it is good practice to offer several months of free service while the WISP markets in the new service area and tries to sign up customers.

Because of interference problems, two providers are the most that are desirable on a tower, and offering towers on an exclusive basis (e.g. an open auction for tower space) could bring in more revenue from a single provider.

Sample Tower Leasing Revenue Projection

Service Item	Description	Monthly Fee	Max Number of WISPs per Tower	Projected Annual Revenue
Tower Space on One Tower	10 feet of vertical space leased to one ISP	$200	1	**$2,400**
Tower Space on Three Towers	10 feet of vertical space leased to one ISP	$200	1	**$7,200**
Tower Space for Six Towers	10 feet of vertical space leased to one ISP	$200	1	**$14,400**

Tower Space Operational Expenses

Assumptions include:

- Each provider on a tower will install their own electric service (meter) and pay their own utility costs.
- Site leases on private land can be negotiated for $1000/year with a single up-front payment of $10,000 (for ten years).

If several towers are available (e.g. three, four), there will be some efficiencies gained in costs so that revenue would likely exceed expenses–costs like legal services and insurance will not increase proportionally with more than one tower.

Tower Lease Annual Expense Projections

Budget Item	Description	Annual
Legal Services	Legal counsel on an as-needed basis for review of construction and service contracts, IRU agreements, and other business documents.	**$1,500**
Accounting	Part time accounting and bookkeeping services will be required	**$2,400**
Generator Maintenance/ Fuel	Generators require periodic maintenance and occasional fuel (propane) tank refills.	**$950**
Site Maintenance	Routine tasks like trimming weeds and grass around the tower.	**$600**
Site Leases	Some towers may be placed on private property which would require annual site leases. This will vary depending on the availability of local government properties that may be available for tower placement.	**$1,000**
Insurance	Some insurance is likely to be needed (general liability, unemployment, asset insurance, umbrella policy).	**$2,500**
Total Costs	**Projected annual expenses**	**$8,950**

17.2 OPERATING A DARK FIBER NETWORK

As the network is completed and customers are connected, the project must have resources in place to maintain and repair the dark fiber and conduit if damage occurs (break-fix repair). A plan for the maintenance of the network will need to be developed.

- Outside Plant Maintenance – The project will be responsible for maintaining the conduit and both the lit and dark fiber that is installed in the conduit. These responsibilities will include utility locates, routine maintenance of conduit/fiber (relatively rare), and emergency break-fix (also rare, but requires immediate response).

Passive equipment is equipment that is not addressable on the network (that is, no network electronics), but still plays an important role.

- Fiber patch cables

- FTU - A Fiber Termination Unit is the enclosure mounted to a customer premise where fiber is terminated. ("Wall Box").
- Closures, Splice Cases, or FOSCs are the enclosures in a handhole that protect the splicing from distribution fiber to drop fiber.
- Patch panels (connector types). In a dark fiber installation of the kind planned for the business park in Rocky Mount, a patch panel would be installed in cabinet. Providers would cross-connect their fiber to the Authority fiber via the patch panel.

- Hand holes and vaults - These are part of the fiber network.
- Cabinets, Shelters - Installed as needed to meet the requirements of the dark fiber design. In most cases, a ground-mounted cabinet will be adequate.
- Equipment Racks - The project may wish to offer rack space for provider equipment. A project patch panel will be used to cross connect leased fibers as needed. All patch cable installs and cross-connects will be performed by project staff.

The conduit (and dark fiber, if included) network will require some limited routine maintenance and some unscheduled maintenance. Routine maintenance could include physical inspection of facilities and equipment, and repairs required by normal wear and tear and weather. Unscheduled maintenance could include repairs due to ice and wind damage, vandalism, or other accidental damage (car/truck accidents, snowplow damage, backhoe and other kinds of damage to underground facilities).

Locates

- The budget allocation for locate services must be part of the network's Operations and Maintenance budget. Note that with the purchase of some relatively inexpensive equipment, locates could be done by project staff at significant cost savings.
- The Network will have a membership in the Virginia 811 (Miss Utility) locate service.
- The Network should maintain a list of qualified locate contractors and engage at least one to perform regular locate services for the network. Optionally, project staff can perform locates at significantly less cost with nominal training.

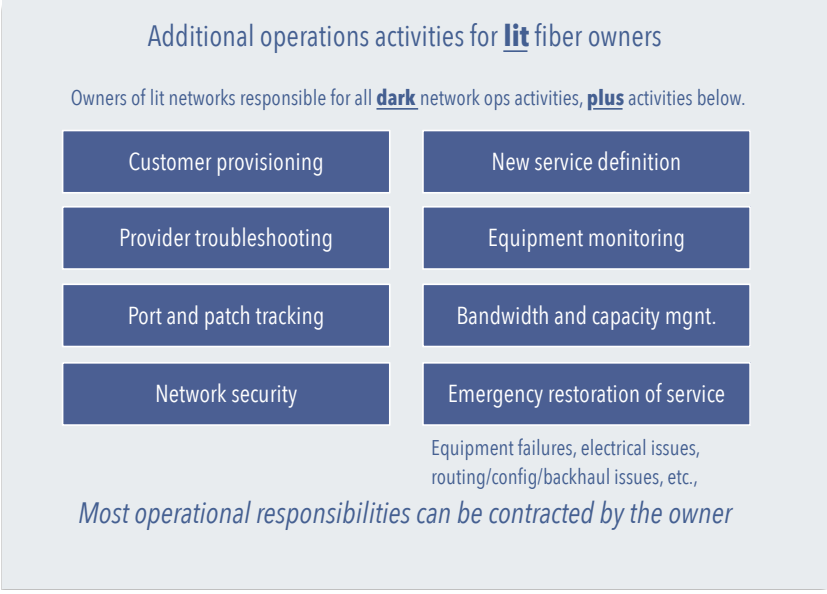
Fiber Strand Management

- Project staff will maintain GIS mapping and documentation of assets for the network.

- If dark fiber has been placed in the conduit network, project staff will track all fiber splices in an appropriate tracking database.
- Project staff can manage break/fix services and procedures with appropriate training and the purchase of a fiber splicing machine.

17.3 OPERATING A LIT FIBER NETWORK

A lit fiber network requires a series of ongoing daily, weekly, and monthly activities. While no lit network is currently under consideration in Franklin County, these activities will not be onerous and can largely be handled on a part time basis.



- Provisioning – When a new customer is connected, a circuit has to be allocated for that customer. Switch configurations have to be updated.
- Troubleshooting – Occasional faults and problems occur, and the source of the issue must be identified and then corrected.
- Port tracking – As customers and services are assigned, the ports and patch panel assignments have to be recorded and tracked.
- Network security – Network switches and services have to be kept up to date with current software patches and security software.
- Service definitions – As customers request new services, these have to be added to the network switches and core network management server.
- Monitoring – Customers expect the network to be available and operational at all times. Automated monitoring alerts and alarms have to be in place to alert network staff of problems. Some one has to be designated to respond to these alerts (i.e. a network problem) around the clock–24/7/365.
- Bandwidth management – Internet backhaul is purchased in increments, and this has to be monitored to ensure that adequate bandwidth is available to customers.
- Emergency restoration – Radios on towers fail due to the harsh environmental conditions: ice, wind, snow, rain, heat, insects, rodents, and birds. Aerial fiber can be damaged by tree limbs, ice, and rodents. Underground

fiber can be damaged by unauthorized digging. A plan has to be in place to address equipment and network failures.

Equipment inventory

- Periodic audits of the network inventory will be especially important during network expansions.

Spares management

- The project will need to store spare equipment, and OSP construction materials in a secure location.
- Non-tagged network inventory such as connectors, patch cables, clamps, and consumables should be included in the spare inventory.

17.4 NETWORK EXPANSION

If the conduit/fiber network is expanded over time, there will be a period of time when some construction is underway. During a network expansion phase, parts and materials have to be ordered, delivered and stored until put into operation. Shipments have to be reconciled with orders prior to payment. The project will construct new conduit segments through the management of contracts with outside firms and contractors.

Construction and Contractor Management Activities

- Build new conduit and install dark fiber as needed.
- Inventory and track all significant equipment, parts, and equipment.
- Reconcile shipped items with shipping tickets and purchase orders.
- Maintain and repair existing fiber facilities as needed.
- Ensure all procurement meets local and state procurement rules.

17.5 TYPICAL CONTRACT SERVICES

Contract services may be used or required as needed, with some services starting prior to service provider or lessee use of the network. For many work roles and responsibilities, this approach helps manage cash flow and will help match revenue and expenses better.

- Project management – Expansion of the network may require the use of a firm to manage the construction process (or the project provides this work).
- Conduit network design and strategy – The project may make occasional use of a network planning firm to help develop expansion routes, assist with pricing strategy, help with service provider negotiation, and other related tasks.
- Conduit network build out – The project, as it expands the network, will typically use a qualified construction firm and/or locally trained and qualified workers to perform the construction.
- Legal services – An attorney will assist as needed with lease agreements and IRU contracts.

- Bookkeeping and accounting – Part time bookkeeping and accounting services will be entirely adequate.
- Marketing services – The project may make occasional use of a local ad agency or marketing firm for assistance with marketing materials (e.g. logo design, Web design, brochure design, etc.).

17.6 OTHER MANAGEMENT ROLES

A wide range of high level activities will take place regularly. Some of the items on this list also appear in other sections of this document, but are listed here to provide a high level overview of key business and management related activities.

Activities

- Provide continuity of leadership and project management.
- Provide monthly reports to grant agencies and other stakeholders and funding sources.
- Meet as needed with interested parties and stakeholders (e.g Chamber of Commerce, Merchants Association, etc.).
- Monitor network performance and assist with customer dispute resolution.
- Manage leases, right of way agreements, and other real estate-related activities.
- Manage contract and work activities of outside plant repair and maintenance contractor.
- Meet with local groups as needed to promote use of the network.
- Represent the project at state level meetings and hearings.
- Meet with visitors and interested parties from other cities and regions.

The project will have the primary responsibility for ensuring that management and administration of the enterprise is handled appropriately.

17.7 ASSET MANAGEMENT

A primary role of the project will be to manage assets owned directly. These assets will include conduit, fiber, cabinets, network electronics, easements, and right of way use. Additionally, these assets have to be managed and tracked during the construction and build out process prior to being put into operation.

The asset management will consist of two primary areas of responsibility:

- Legal contracts, ranging from simple documents of a page or two for property easements, pole attachment rights, or tower access for an antenna to more complex legal documents that might cover twenty or thirty year leases of significant assets. These longer documents will have payment schedules and fee calculations. Legal counsel and review will be required for many if not most of these documents, at least for the first time they are written. Some documents will become "standard" contracts that will likely not require review for each lease unless significant changes are needed.

- Management of hard assets, which will include fiber cable, conduit, and handholes, and other fiber-related materials.

Activities

- Procure and manage leases for access to public right of way, private property
- Select, purchase, and track location and value of passive infrastructure, including fiber, duct, cabinets, and other facilities.

The project will need the help of an attorney to assist with creating leases and other legal documents related to asset management. The network may need additional assistance from qualified legal counsel for occasional review of legal documents. The network will have to maintain a complete inventory of all physical items and real property.

A network inventory management process, which could be as simple as a set of spreadsheets or modest database, with an accompanying process to ensure that data is entered and updated in a timely manner. For all major pieces of equipment (i.e. purchases of more than $100, typically), data like vendor, model number, serial number, date put in service, and service notes will need to be maintained.

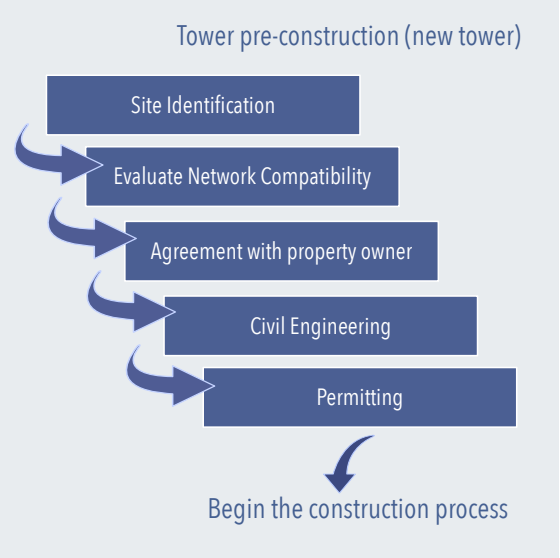
Note that asset management is extremely important, especially fiber strand management. We know of at least one small project that did not maintain adequate strand in-use records and had to install additional fiber cable at significant cost.

17.8 TOWER SITE AND TOWER MANAGEMENT

Tower Site Identification

When a site for a new tower is being considered for use, the diagram below illustrates the steps that need to be followed. For example, if an existing public safety tower or an existing cellular provider tower may have space for fixed point wireless broadband equipment (i.e. co-location).

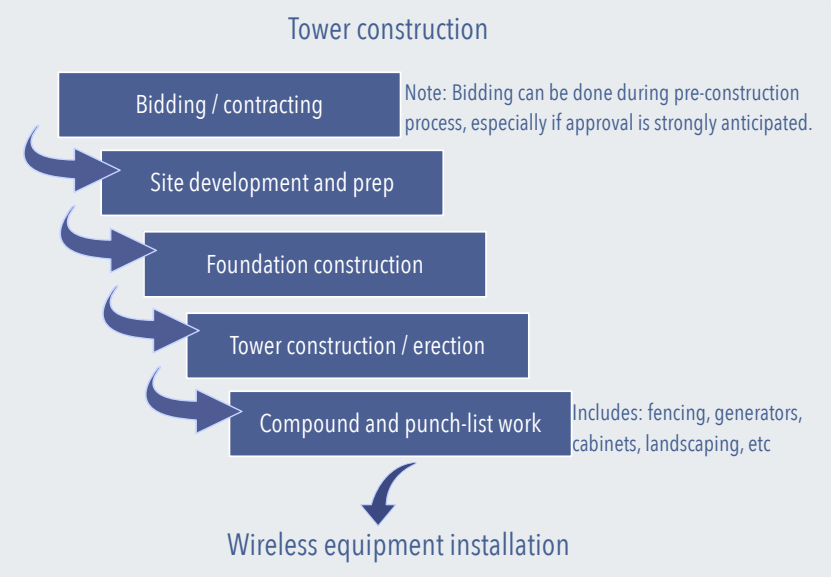
- Site identification – Identify areas of poor service and look for existing towers.
- Network Compatibility – Line of sight to other towers and to key service locations and customers needs to be evaluated. A wireless propagation study and line of sight study will provide the data needed to make this determination.
- Property owner negotiation – A lease has to be negotiated with the property owner. Local government sites (e.g. K12 schools, parks, recreation areas, fire/rescue stations) are candidates for towers because of reduced or no lease fees.



- Engineering – An engineered site plan will be required to as part of the permitting process.
- Leases and permits – A permit to place the tower is required in most localities, and there may be a multi-stage permitting process that can take several months.

Tower Construction

Once the engineering work is completed and a construction permit has been issued, tower construction can proceed. For a typical fixed point wireless tower of 199' feet or less, construction usually takes less than a month, but weather and soil conditions can create delays.



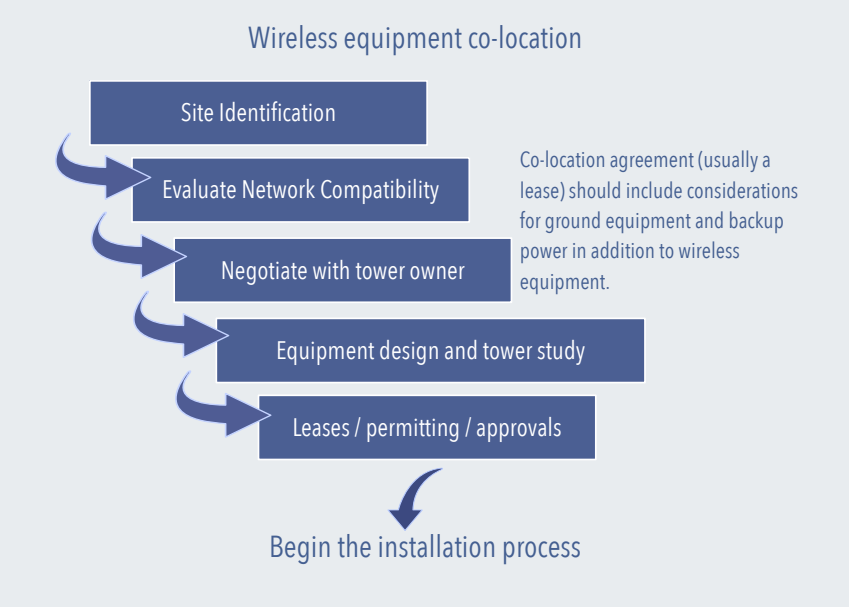
- Bidding and contracting – Bid documents and construction specifications have to be prepared and sent to candidate contractors. Once bids are received, proposals have to be reviewed, and depending upon funding sources, may require review by local government and/or a funding agency prior to awarding a contract.
- Site development – The tower site has to be cleared of trees, brush, and any other obstructions. The area directly around the tower has to be leveled, and electric service (underground or aerial) has be brought to the site. Depending upon the location a road (usually gravel) may have to be placed.
- Foundation construction – Once site clearing and any road work is completed, the foundation for the tower is installed. If it is a guyed tower, guy wire anchors have to be installed.
- Tower construction – Once the foundation is in place, the tower is erected. For towers of 199' or less, this is usually only two days.
- Final work details – Once the tower is in place, final work items are completed, including fencing, generators, fuel tanks, landscaping, and any site restoration work.

Wireless Equipment Co-Location

When an existing tower is being considered for use, the diagram below illustrates the steps that need to be followed. For example, if an existing public safety tower or an existing cellular provider tower may have space for fixed point wireless broadband equipment (i.e. co-location).

- Site identification – Identify areas of poor service and look for existing towers.

- Network Compatibility – If there are towers in the service area, the first step is to determine if a minimum of ten vertical feet of space is available at an appropriate height for broadband wireless equipment. A wireless propagation study will provide the data needed to make this determination.

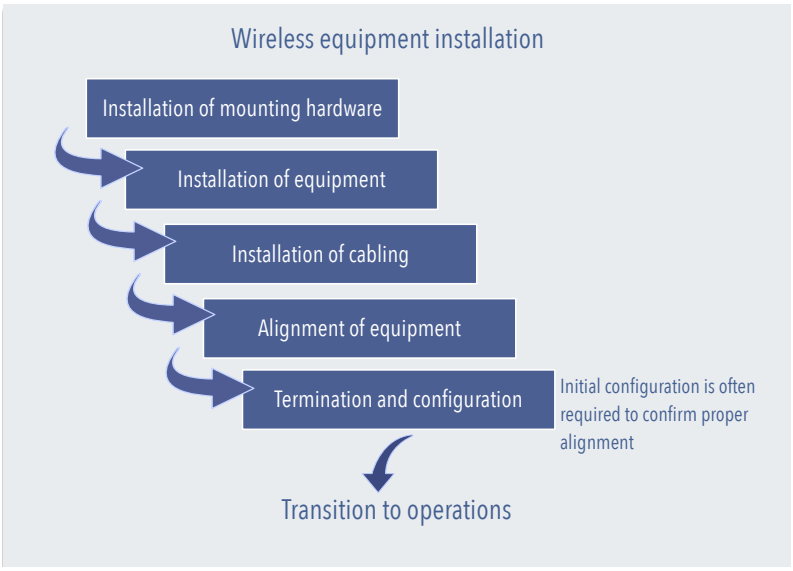


- Tower owner negotiation – If the tower is in a suitable location and if space is available at an appropriate height, a lease has to be negotiated with the tower owner.
- Tower study – An engineering study may be required to determine if the tower is able to support the additional weight and wind load of the equipment. Additional electric service and a cabinet for network electronics may also be needed.
- Leases and permits – If new electric service and/or a cabinet or shelter has to be installed at the sight, local government permits and/or construction approvals may be required.

Wireless Equipment Installation

Wireless equipment installation follows the completion of construction on a new tower or the acquisition of space on an existing tower. Electric power is already in place.

- Mounting hardware – Brackets and other mounting hardware have to attached to the tower at the designated height. This requires a tower climb conducted by a firm with trained tower climbers.
- Equipment installation – Once the mounting hardware is in place, radios are attached to the tower. On the ground, network equipment including



switches, powers supplies, battery backup, and other equipment is installed. A backup generator and fuel tank may also be installed and wired into the equipment cabinet or shelter.

- Cabling installation – Cables are connected between the equipment in the cabinet on the ground to the radios on the tower.
- Alignment of radios – Radios on the tower have to be adjusted. Local access radios that provide service to local customers with line of sight to the tower have to be aligned for optimum coverage. If there are also point to point radios on the tower for connections to other towers or locations, these also have to be aligned. Tower climbers are needed to perform these steps.
- Configuration and testing – Once the physical alignment of the radios is complete and all cabling is connected, the new network equipment is integrated into the rest of the network.

17.9 LEGAL AND REGULATORY

Investments in community telecom infrastructure require attention to local, state, and Federal regulatory issues. The management of telecom infrastructure is a business enterprise that requires a variety of legal contracts, service agreements, maintenance and work agreements, procurement and performance contracts, and corporate legal documents of various kinds.

- Identification of state and Federal laws that may affect operations.
- Development of service provider master agreements and service agreement addendums.
- Leases for easements and rights of way.
- Review of work contracts for consultants, contractors, and engineering firms.
- Review of maintenance and operations agreements.

The project will require the services of an attorney with some demonstrable experience with community telecom agreements. Many attorneys are not familiar with community-owned open access networks, and some time and effort should be made to carefully qualify an attorney or firm prior to hiring them.

18 OBSTACLES, CHALLENGES, AND SUCCESSES

18.1 OBSTACLES AND CHALLENGES

Market Size

Market size is a key consideration for evaluating risk. Market size (called "addressable market," or the number of potential customers) determines the level of interest of service providers, who are the primary customers of an open network. Certain kinds of services are essential to the financial viability of a community network, especially TV and telephone services. While telephone services can be offered affordably in even very small markets, the overhead costs of establishing a local or remote TV head end (equipment that manages and distributes the channels available from a provider) is still relatively expensive compared to providing other services like Internet access. A rule of thumb for evaluating market size is that a minimum of four to five thousand potential residential customers (households) are needed to attract an IP TV provider. Note that fiber is required for adequate TV package offerings.

The county represents a business opportunity for service providers who can make a business case for providing advanced services beyond Internet access, TV, and telephone: home health care, home security monitoring, computer backups, pay per view/video on demand, and other high margin services are going to become increasingly common. Alternatives to existing cable and satellite TV offerings will not become available until fiber connections are more widely available.

Take Rate

Take rate refers to the number of customers that actually subscribe to one or more services. Take rate targets are established in a detailed financial projection, and are adjusted over time as actual take rate data becomes available once the network is in operation. If the take rate is too low, revenues will not meet goals, and lowered revenues may affect the project's ability to pay its bills and maintain and operate the network.

Take rate projections are a significant risk factor in any project of any size, and must be considered carefully. Take rate risk can be managed by only building in areas where businesses or residents (or both) have made a threshold commitment to buy a minimum dollar value of services (e.g. 40% of businesses in a defined area must commit in advance before build out would commence).

For example, if the Authority develops a community pole program in partnership with an ISP, Authority or County funds should not be committed to place a pole until the ISP has collected a specified number of service contracts from residents that could receive service from the community pole.

Funding

Excellent leadership and hard-nosed business management of the enterprise are essential to the project's ability to obtain necessary funding. Although the network may be operated as a government effort, it must be managed with the same attention to costs, revenue, and financial administration as any private sector business. The project must be able to develop and maintain "investment quality" financial reports and business models to attract private sector sources of funding like revenue bonds, municipal leases, commercial loans, and business contributions. If investments are restricted to basic infrastructure like tower sites, fiber, towers, and equipment

shelters, maintenance costs will be relatively low and it should be possible to structure attractive tower space lease rates to cover routine maintenance, minimizing financial risk and requiring limited funding.

Service Providers

While in many respects a community broadband network shares many similarities with other public utilities (e.g. roads, water, sewer) there is one fundamental difference. Other public utilities like water and sewer have a captive audience and the utility is able to operate as a monopoly–meaning the customer base can be taken for granted. Early discussions with service providers have been positive, with at least two providers making requests for additional information about the effort.

A community broadband network is a public/private enterprise, and service providers are the primary customers of the network. Service providers cannot be taken for granted. Instead, a fair fee structure, a high quality network, excellent maintenance and operations processes, and organizational flexibility will be required to recruit and retain service providers.

Projects that are not successful in attracting service providers will fail. Affordable lease rates for tower space and/or fiber connections will attract service providers. Other open access projects(e.g. Danville, VA; New Hampshire FastRoads,; Bozeman Fiber; Utopia/Salt Lake City area) have not had any difficulty getting service providers to use the infrastructure. Indeed, the Utopia project has twenty-three providers on its network.

Franklin County has had a very successful WISP in the county (BitX) for several years, and BriscNet has expressed a strong interest in the Franklin County market. Shentel and Lumos both have fiber in the County and are potential partners, and Mid-Atlantic Broadband (MBC) also has fiber in the county and there are numerous providers on the MBC network that represent additional partner prospects.

Technology

A question that often dominates early discussions of community broadband projects is, "Are we picking the right technology and systems?" Everyone has experienced the rapid obsolescence of computers, cellphones, printers and other IT equipment.

There is always some risk associated with making a substantial investment in a network. However the risk can be managed. In a predominantly fiber network, a large portion of the investment will be dedicated to getting fiber in the ground or on poles throughout the community. Properly installed fiber has a minimum 25 to 30 year useful life, and fiber installed by the telephone companies in the seventies is still in use today. Fiber also has a useful property not shared with other public systems like water, roads, and sewers. The capacity of fiber can be increased without replacing the fiber or adding additional fiber. Instead, fiber capacity can be increased indefinitely by replacing the electronics at each end of the fiber. This means that a community investment in fiber creates a stable, long term asset for the community with long lasting value.

The equipment used to light the fiber has a shorter useful life, and is usually depreciated over a period of 7 to 9 years. Some equipment may remain useful longer than that. Wireless equipment must be replaced much more often (typically 2 to 4 years of useful life) because it is typically exposed to much harsher conditions (extreme heat and cold, lightning strikes, ice, snow, rain, wind).

The primary technology risk is selecting a vendor who provides equipment that does not perform as advertised. This risk can be managed by a careful procurement process which would include a careful analysis of network capacity and features, detailed RFPs that specify equipment features and functions explicitly, and a thorough RFP evaluation process.

Legal and Regulatory Issues

Community-owned broadband projects are subject to state and Federal regulations of various kinds, but unless a project is offering retail services (e.g. the local government is selling Internet, TV, and/or voice services directly to residents and businesses), there are limited regulatory issues. The City of Eagan's AccessEagan Gigabit fiber network has been in operation for seven years, and has four private sector service providers offering services. There has never been an incumbent legal challenge because incumbent providers like Comcast and CenturyLink have been invited to use the network (both have repeatedly declined).

The key strategy is for community-owned projects to adopt the wholesale model of leasing passive infrastructure like towers and dark fiber and for active networks (with network electronics) to lease circuits to providers on a wholesale basis rather than selling retail services. The Utopia project, which offers services in fourteen communities in the Salt Lake City area, has been targeted in the past as a "failed" effort but has overcome some early financial challenges and today has 23 private sector providers offering a wide range of price points and service packages—delivering true choice and competition to citizens and businesses. The wholesale model is not subject to many of the FCC (Federal Communications Commission) regulatory requirements.

18.2 SUCCESSES

Town of Ashland, Virginia

The Town of Ashland recently completed the construction of two miles of conduit and dark fiber that passes by a large number of businesses in the community. The goal is to provide local businesses with more broadband and Internet service options, making more bandwidth available at lower prices. The Town is not going to be an ISP. Dark fiber will be leased out to private sector Internet Service Providers, who will install their own equipment on the fiber network and market directly to businesses in the community. A major regional ISP (Segra) became the first provider on the network, and the Town has begun planning extensions to the network.

Wired Road Broadband Authority

The Wired Road Broadband Authority is owned by Carroll and Grayson counties and the City of Galax, in far southwest Virginia. The enterprise is in its eleventh year. The project started with a single grant of $200,000, and additional state, Federal, and local funds have been used to develop more than $4 million in network assets, including more than 40 miles of fiber and twenty-plus wireless access points. Wireless service covers large areas of the mountainous region, and fiber services are available in the region's business parks and the larger downtown areas. The project continues to develop and evolve, with a major wireless equipment upgrade underway and the completion of a fiber ring between Galax and Hillsville, the two largest towns in the region. Two private sector service providers lease circuits and sell services on the open access network.

Eastern Shore of Virginia Broadband Authority

The ESVBA offers services in Accomack and Northampton counties on the Eastern Shore of Virginia. The Authority, with Federal and state grant assistance, built an 80 mile fiber backbone through both counties in 2009. The network generated modest revenue that provided incremental expansion funds and returned some funds to the two county General Funds. In 2018, the Authority announced a significant expansion plan to bring fiber services to most homes and businesses in the two counties over a period of several years.

Bozeman Fiber

Bozeman Fiber is a community nonprofit formed in 2015 to bring Gigabit fiber services to the business community in the Montana city. The network was completed in 2016, with more than 25 miles of Gigabit fiber constructed to pass many of the city's main business and commercial areas. Five private sector service providers lease capacity on the open access network.

City of Richwood, West Virginia

A water line extension to some rural neighborhoods just outside the City of Richwood has led to a project to leverage the water line work to bring fiber and wireless broadband to those same areas. A nonprofit start up (Richwood Scientific) led by a small group of community leaders has worked with the Region 4 PDC to get a grant to both develop a technical plan and to build a "phase one" portion of the network. The planning work was completed in the fall fo 2018, and construction on the network will begin later in 2019. The project includes two miles of fiber to the home, with a high performance wireless link from the mountain top neighborhood back down into the Richwood Scientific office in town.

Charlemont, MA

The town of Charlemont, Massachusetts has decided to combine a grant from the state with an $11/month/household assessment to build fiber throughout the entire town of 524 households. Comcast had offered to make modest upgrades to the existing copper-based cable network but was asking for nearly half a million dollars from the town. Instead, voters agreed with Town officials to build their own network. Once finished, Internet service will be provided by a private sector ISP. Gigabit fiber Internet service is expected to cost about $80/month with no data caps. Phone service is expected to cost $23 month, and Internet, phone, and several Over The Top (OTT) services like Netflix, Hulu, and YouTube TV is expected to cost around $140/month, or about 15% to 20% less than Comcast service.

Danville, Virginia

The City of Danville, Virginia had high unemployment rates in the early 2000s after most of the city's textile manufacturing jobs had left. City leaders recognized that simply trying to attract traditional manufacturing jobs was not going to be an effective economic development strategy. The City began investing in open access fiber in 2008 and put fiber in five business parks and the downtown area. The City also began working with private developers to re-purpose and rehabilitate empty and underused building in the City's downtown, creating live/work apartments and condos and class A office space. The combination of affordable fiber, improved housing options, class A office space, and a focus on attracting high tech businesses that needed all three (fiber, class A office space, and housing) has revitalized the City and brought hundreds of new jobs to the City's downtown. The fiber network has been in the black for several years, and some revenue is sent to the City's General Fund, while some revenue is used to expand the network into residential areas of the city. Services on the open access network are provided by three private sector ISPs.

Active network: Typically a fiber network that has electronics (fiber switches and CPE) installed at each end of a fiber cable to provide "lit" service to a customer.

Asymmetric connection: The upload and download bandwidth (speed) are not equal. Cable Internet and satellite Internet services are highly asymmetric, with upload speeds typically 1/10 of download speeds. Asymmetric services are problematic for home-based businesses and workers, as it is very difficult to use common business services like two way videoconferencing or to transfer large files to other locations.

Backhaul: Typically refers to a high capacity Internet path out of a service area or locality that provides connectivity to the worldwide Internet.

Colo facility: Colo is short for Colocation. Usually refers to a prefab concrete shelter or data center where network infrastructure converges. A colo or data center can also refer to a location where several service provider networks meet to exchange data and Internet traffic.

CPE: Customer Premises Equipment, or the box usually found in a home or business that provides the Internet connection. DSL modems and cable modems are examples of CPE, and in a fiber network, there is a similarly-sized fiber modem device.

Dark fiber: Dark fiber is fiber cable that does not have any electronics at the ends of the fiber cable, so no laser light is being transmitted down the cable.

Fiber switch: Network electronic equipment usually found in a cabinet or shelter

FTTH/FTTP/FTTx: Fiber to the Home (FTTH), Fiber to the Premises (FTTP), and Fiber to the X (FTTx) all refer to Internet and other broadband services delivered over fiber cable to the home or business rather than the copper cables traditionally used by the telephone and cable companies.

Handhole: Handholes are open bottom boxes with removable lids that are installed in the ground with the lids at ground level. The handholes provide access to fiber cable and splice closures that are placed in the handhole. Handholes are also called **pull boxes**.

IP video: Video in various forms, including traditional packages of TV programming, delivered over the Internet rather than by cable TV or satellite systems.

Latency: The time required for information to travel across the network from one point to another. Satellite Internet suffers from very high latency because the signals must travel a round trip to the satellite in stationary orbit (22,500 miles each way). High latency makes it very difficult to use services like videoconferencing.

Lit network: A "lit"network (or lit fiber) is the same as an active network. "Lit" refers to the fact that the fiber equipment at each end use small lasers transmitting very high frequency light to send the two way data traffic over the fiber.

Passive network: Refers to infrastructure that does not have any powered equipment associated with it. Examples include wireless towers, conduit (plastic duct), handholes, and dark fiber.

Pull boxes: Pull boxes (also called handholes) are used to provide access to fiber cable and splice closures. They are called pull boxes because they are also used during the fiber cable construction process to pull the fiber cable through conduit between two pull boxes.

Splice closures: Splice closures come in a variety of sizes and shapes and are used to provide access to fiber cable that has been cut open to give installers access to individual fiber strands. Splice closures are designed to be waterproof (to keep moisture out of the fiber cable) and can be mounted on aerial fiber cable or placed underground in handholes.

Splicing: The process of providing a transparent joint (connection) between two individual fiber strands so that laser light passes through. A common use of splicing is to connect a small "drop" cable of one or two fiber strands to a much larger (e.g. 144 fiber strand) cable to provide fiber services to a single home or business.

SCADA: Supervisory Control and Data Acquisition. Used by the electric utility industry and some other utilities (e.g. water/sewer) to manage their systems.

Symmetric connection: The upload and download bandwidth (speed) is equal. This is important for businesses and for work from home/job from home opportunities.

Virtual Private Network: A VPN creates a private, controlled access link between a user's computer and a corporate or education network in a different location. VPNs are often encrypted to protect company and personal data. VPNs usually require a symmetric connection (equal upload and download speeds) to work properly.

APPENDIX B: TOWER OWNER DATA

Note that owner locations are different from the actual location of the towers. Franklin County has all towers accurately mapped as to actual location.

CELL_SITE	ADDRESS	CITY	OWNER	STATUS	Map Symbol
Franklin County E911	1247 Summit Drive	Rocky Mount	County of Franklin	Public Safety	Green Tower/County Owned
Fork Mountain Fire Station To			Franklin County	Public Safety	Green Tower/County Owned
Henry Fire Dept	5241 Henry Road	Henry	Franklin County	Public Safety	Green Tower/County Owned
Tom's Knob	1198 Toms Knob Rd	Martinsville	Franklin County	Public Safety	Green Tower/County Owned
Burnt Chimney Water Tank	52 Burnt Chimney Rd Wirtz VA 24184	Wirtz	Franklin County	Proposed	Red Circle/County Watertank
Triton	10704 BOOKER T WASHINGTON HWY	Wirtz	American Tower	In Service	Red Tower/County provided
Hales Ford	16007 BOOKER T WASHINGTON HWY	Moneta	US Cellular	In Service	Red Tower/County provided
Grassy Hill Crown Castle	1245 Summit Drive	Rocky Mount	Crown Castle	In Service	Red Tower/County provided
Briar Mountain Crown Castle	605 BRIARPATCH DR	Rocky Mount	Crown Castle	In Service	Red Tower/County provided
Boones Mill US Cellular	1350 MURRAY KNOB RD	Boones Mill	US Cellular	In Service	Red Tower/County provided
Boones Mill	1350 MURRAY KNOB RD	Boones Mill	Crown Castle	In Service	Red Tower/County provided
Franklin	1889 Brick Church Rd	Rocky Mount	AEP Towers	In Service	Red Tower/County provided
Morningside	148 Northside Dr	Rocky Mount	Crown Castle	In Service	Red Tower/County provided
Briar Mountain US Cellular	605 BRIARPATCH DR	Rocky Mount	US Cellular	In Service	Red Tower/County provided
Windy Gap	1060 Red Valley Rd	Boones Mill	US Cellular	In Service	Red Tower/County provided
Ferrum College	185 FIELDVIEW DR	Ferrum	US Cellular	In Service	Red Tower/County provided
Rocky Mount USCC	135 REDBUD HILL RD	Rocky Mount	US Cellular	In Service	Red Tower/County provided
Cooks Knob	1299 Isolane Road	Callaway	American Electric Power	In Service	Red Tower/County provided
Proposed Verizon Tower	JUBAL EARLY HWY	Boones Mill	Verizon	Proposed	Red Tower/County provided
Highland Paging	1249 Summit Drive	Rocky Mount	Highland Paging	Small	Red Tower/County provided
Valley Communications	1251 Summit Drive	Rocky Mount	Valley Communications	No Carriers	Red Tower/County provided
Valley Communications	1253 Summit Drive	Rocky Mount	Valley Communications	No Carriers	Red Tower/County provided
Proposed nTelos Tower			nTelos	Proposed	Red Tower/County provided
nTelos Tower	1237 Dillards Hill	Union Hall	TowerCo, LLC	In Service	Red Tower/County provided
Oak Level	245 Virgil H. Goode Hwy	Henry	American Tower	In Service	Red Tower/County provided
Fork Mountain		Fork Mountain	Sprint	Public Safety	Red Tower/County provided
Sprint CO Building	South Main Street	Rocky Mount	Sprint	Other	Red Tower/County provided
AEP Transmission	21890 Virgil H. Goode Hwy	Rocky Mount	AEP	In Service	Red Tower/County provided
Roanoke County	11221 SLINGS GAP RD		Unknown	In Service	Red Tower/County provided
Smith Mountain - Bedford			Crown Castle	In Service	Red Tower/County provided
Smith Mountain - Microwave			Unknown	Other	Red Tower/County provided
Smith Mountain -Ranger			Chuck Hurtz	Other	Red Tower/County provided
Smith Mountain - AEP			AEP	Other	Red Tower/County provided

Smith Mountain - Crown			Crown Castle	Other	Red Tower/County provided
US Cellular Burnt Chimney	4312 Booker T. Washington Hwy	Rocky Mount	US Cellular	In Service	Red Tower/County provided
Boardwalk Water Tank	Boardwalk Dr	Moneta	Ron Willard	Proposed	Red Tower/County provided
Fork Mountain Alternate locati			Unknown	Proposed	Red Tower/County provided
US Cellular - Redwood	47 Webster Rd	Glade Hill	US Cellular	In Service	Red Tower/County provided
Nextel Brandy Drive	428 Bandy Drive	Hardy	Nextel	In Service	Red Tower/County provided
Moorman Road nTelos	188 Moorman Road	Hardy	Ntelos	In Service	Red Tower/County provided
CROWELLS GAP	VISTA PARKWAY	Mount Pleasant	Roanoke Co.	Public Safety	Red Tower/County provided
Naff Road Nextel	819 Naff Road	Boones Mill	Nextel	In Service	Red Tower/County provided
Monestry		Callaway	Unknown	Other	Red Tower/County provided
WYTI Radio tower	275 Glenwood Dr	Rocky Mount	Unknown	Other	Red Tower/County provided
Fork Mountain Road	1114 Fork Mountain Road	Bassett	Unknown	Proposed Broadband	Red Tower/County provided
South 220 Broadband	300 Cherokee Hills Rd	Bassett	Unknown	Proposed Broadband	Red Tower/County provided
Gilley's Mountain Ln	351 Gilley's Mountain Ln	Bassett	Unknown	Proposed Broadband	Red Tower/County provided
Henry School	200 Henry School Road	Henry	Unknown	Proposed Broadband	Red Tower/County provided
Providence Church	1993 Providence Church Rd	Henry	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 2	25 James Street	Martinsville	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 1	107 Snow Creek Road	Martinsville	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 3	319 Whittle Lane	Martinsville	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 4	5393 Snow Creek Road	Penhook	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 6	210 Oriole Road	Rocky Mount	Unknown	Proposed Broadband	Red Tower/County provided
Snowcreek 5	7081 Snow Creek Road	Penhook	Unknown	Proposed Broadband	Red Tower/County provided
Henry 1	2376 Horseshoe Road	Henry	Unknown	Proposed Broadband	Red Tower/County provided
Henry 3	975 Brown Hill Drive	Ferrum	Unknown	Proposed Broadband	Red Tower/County provided
Henry 2	825 Republican Church Road	Ferrum	Unknown	Proposed Broadband	Red Tower/County provided
Needed Site			Unknown	Proposed Need Site	Red Tower/County provided
Needed Site			Unknown	Proposed Need Site	Red Tower/County provided
Needed Site			Unknown	Proposed Need Site	Red Tower/County provided
Needed Site			Unknown	Proposed Need Site	Red Tower/County provided
Proposed Mitchell Tower				Proposed	Red Tower/County provided
Philpott 563368	595 Brown Hill Rd	Ferrum	US Cellular	In Service	Red Tower/County provided
WROV	1609 CAHAS MOUNTAIN RD	Boones Mill		In Service	Red Tower/County provided
WAIDSBORO II		FERRUM		Proposed	Red Tower/County provided
	1654 SCUFFLING HILL RD	ROCKY MOUNT	TOWN OF ROCKY MOUNT	In Service	Red Tower/County provided
Middle Creek Triton	20 MIDDLE CREEK CT	Moneta	American Tower	In Service	Red Tower/County provided
Juggs Gap	1831 Virgil H Goode Hwy	Henry	Crown Castle	In Service	Red Tower/County provided
					Red Tower/County provided
AT&T Boones Mill	2900 JUBAL EARLY HWY	BOONES MILL	AT&T		Red Tower/County provided

Ferrum East	2849 Beech Mt. Rd.	Ferrum	Prime Tower Development	Foundation complete	Red Tower/County provided
B99.9 Tower	2160 WAIDSBORO RD	Rocky Mount	B99.9 Radio Tower	Other	Red Tower/County provided
Verizon Wireless	4351 Webster Rd.	Glade Hill	Frances S. Poindexter Child's Trust/ Charle Poindexter, Trus	199' tall tower	Red Tower/County provided
nTelos Tower	170 Edwardsville Rd	Hardy	nTelos	In Service	Red Tower/County provided
Lovely Valley Rd	1351 Lovely Valley Rd	Wirtz	American Tower	In Service	Red Tower/County provided
Jacks Mountain Rd	1177 Jacks Mountain Rd	Union Hall	Apex Towers LLC	Approved 4/24/2017	Red Tower/County provided
Blue Ridge Group LLC Site	2075 Bluewater Dr Hardy VA 24101	Hardy	Leased	Proposed	Red Tower/County provided
Westlake Water Tank	130 Westlake Rd	Moneta	Ron Willard	In Service	Blue Circle/ Non County Watertank
Park Place Water Tank	110 Pacific Ave	Moneta	James McKelvey	In Service	Blue Circle/ Non County Watertank
Rocky Mount Water Tank	44 Pendleton St	Rocky Mount	Town of Rocky Mount	In Service	Blue Circle/ Non County Watertank
Cooks Knob	1299 Isolane Road	Callaway	American Electric Power	In Service	Blue Tower/Radio Site Matrix
Franklin County E911	1247 Summit Drive	Rocky Mount	County of Franklin	Public Safety	Blue Tower/Radio Site Matrix
CROWELLS GAP	VISTA PARKWAY	Mount Pleasant	Roanoke Co.	Public Safety	Blue Tower/Radio Site Matrix
WROV	1609 CAHAS MOUNTAIN RD	Boones Mill		In Service	Blue Tower/Radio Site Matrix
Tom's Knob	1198 Toms Knob Rd	Martinsville	Franklin County	Public Safety	Blue Tower/Radio Site Matrix
Blue Ridge Group LLC Site	2075 Bluewater Dr Hardy VA 24101	Hardy	Leased	Proposed	Blue Tower/Radio Site Matrix
Prillaman?	975 Brown Hill Drive	Ferrum			Blue Tower/Radio Site Matrix
911 Dispatch Center	70 E Court St #101, Rocky Mount, VA 24151	Rocky Mount	Rocky Mount		Blue Tower/Radio Site Matrix
Ferrum Tower	1299 Isolane Road?	Ferrum		Proposed	Blue Tower/Radio Site Matrix
	3 MI WNW OF HOT SPRINGS	ROCKY MOUNT	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	9.9 MI W	Hot Springs	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	ON TOP BRIER MOUNTAIN 7 MI W OF HWY 220	ROCKY MOUNTA	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	275 GLENWOOD DR	ROCKY MOUNT	WYTI, INC.	FCC Registered	Red Tower/FCC
	MURRAY KNOB ROAD	BOONES MILLS	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	Cherokee Rd (Henry Rd)	Juggs Gap	Crown Communication Inc.	FCC Registered	Red Tower/FCC
	245 Virgil Goode Highway (010282)	Bassett	American Towers, Inc.	FCC Registered	Red Tower/FCC
	664 Red Valley Road	Boones Mill	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	Arthur Circle	Ferrum	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	110 PACIFIC AVE	MONETA	BROOMIK, LLC	FCC Registered	Red Tower/FCC
	130 WESTLAKE ROAD	MONETA	County of Franklin	FCC Registered	Red Tower/FCC
	4250 Booker T. Washington Hwy	Rocky Mount	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	1183 Dillards Hill Road	Union Hall	SBA Towers II LLC	FCC Registered	Red Tower/FCC
	55 Webster Road	Redwood	United States Cellular Corporation	FCC Registered	Red Tower/FCC
	0.09 mi North of SSR 678 (Edwardsville Rd)	Hardy	SBA Towers II LLC	FCC Registered	Red Tower/FCC

Phase One Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINTS	PTP BOM	POINT TO POINT COSTS	PROJECT MANAGEMENT COSTS	TOTAL COST
1	Blue Ridge Group Tower	Tower Improvements	$26,375.00	Sectors, LTE	$30,303.80	BH Burnt Chimney PTP Penhook	AF11FX Pair AF11FX Pair	$11,025.00	$5,000.00	$72,704
1	Cahas	New Tower	$170,000.00	Sectors, LTE	$30,304	PTP Cooks PTP Burnt Chimney	AF11FX Pair AF11FX Pair	$11,025	$14,500	$225,829
1	Callaway Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Grassy Hill	√		$2,500.00	$17,794
1	Dudley Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Burnt Chimney	AF11FX Pair	$5,512.50	$2,500.00	$23,306
1	Ferrum Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50				$2,500.00	$17,794
1	Glade Hill Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Grassy Hill PTP Penhook PTP Redwood Substation PTP Glade Hill Substation	√ √ √ √		$2,500.00	$17,794
1	Grassy Hill Tower	Tower Improvements	$26,375.00	Sectors, LTE	$30,303.80	PTP Burnt Chimney Boones Mill Omni PTP Callaway Omni PTP Glade Hill Omni PTP Toms Knob BH Franklin County HS BH Rocky Mount PTP Thornton Substation	AF11FX Pair AF5XHD Pair AF5XHD Pair AF5XHD Pair AF11FX Pair AF24HD Pair AF5XHD Pair √	$21,760.20	$5,000.00	$83,439
1	Henry Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Henry FD	√		$2,500.00	$17,794
1	Henry Fire Station Tower	Tower Improvements	$26,375.00	Sectors, LTE	$30,303.80	PTP Henry ES Omni	AF11FX Pair	$5,512.50	$5,000.00	$67,191
1	Lee M Waid Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Toms Knob	√		$2,500.00	$17,794
1	Snow Creek	New Tower	$170,000.00	Sectors, LTE	$30,304	BH Toms Knob	AF11FX Pair	$5,512.50	$5,000.00	$210,816
1	Summit View Tower	Tower Improvements	$26,375.00	Sectors, LTE	$30,304	BH Grassy Hill	AF11FX Pair	$5,512.50	$5,000.00	$67,191
1	Sontag Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Toms Knob	√		$2,500.00	$17,794
1	Toms Knob	Tower Improvements	$26,375.00	Sectors, LTE	$30,303.80	BH Grassy Hill PTP Snow Creek PTP Sontag PTP Henry FD PTP LM Wade	√ AF5XHD Pair AF24HD AF11FX Pair AF5XHD Pair	$14,030.10	$5,000.00	$75,709
1	Union Hall	New Pole (Village)	$7,865.00	Omni	$7,428.50	BH BRT	AF11FX Pair	$5,512.50	$5,000.00	$25,806
1	Windy Gap Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50				$2,500.00	$17,794
									Total Wireless Estimated Cost	**$976,546**

Phase Two Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINTS	PTP BOM	POINT TO POINT COSTS	PROJECT MANAGEMENT COSTS	TOTAL COST
2	Burnt Chimney Elementary	Water Tank Improvement	$26,375.00	Sectors, LTE	$30,303.80	PTP Blue Ridge PTP Dudley Omni PTP Grassy Hill	√ √ √		$5,000.00	$61,679
2	CATCE	New Pole (School)	$7,865.00	Omni	$7,428.50	PTP Rocky Mount ES	AF5XHD Pair	$1,108.80	$2,500.00	$18,902
2	Cooks Knob	Tower Improvements	$26,375	Sectors, LTE	$30,303.80	PTP Ferrum PTP Grassy Hill	AF11FX Pair AF11FX Pair	$11,025	$5,000	$72,704
2	Franklin County High	New Pole (School)	$7,865.00	Omni	$7,428.50				$2,500.00	$17,794
2	Pigg Tower	New Tower	$170,000	Sectors, LTE	$30,303.80	PTP Blue Ridge PTP Toms Knob	AF11FX Pair AF11FX Pair	$11,025	$14,500	$225,829
2	Rocky Mount Elementary	New Pole (School)	$7,865.00	Omni	$7,428.50	BH Franklin High	AF5XHD Pair	$1,108.80	$2,500.00	$18,902
									Total	$415,810

Phase Three Wireless Improvements

PHASE	ITEM	SITE WORK	SITE COSTS	ACCESS EQUIPMENT	ACCESS EQUIPMENT COST	POINT TO POINTS	PTP BOM	POINT TO POINT COSTS	PROJECT MANAGEMENT COSTS	TOTAL COST
3	Blain Substation	Covered	–	–	–	–	–	–	–	–
3	Endicott	New Tower	$170,000.00	Sectors, LTE	$30,304	PTP Cooks PTP Henry FD	AF11FX Pair AF11FX Pair	$11,025	$14,500	$225,829
3	Frankin Substation	Covered	–	–	–	–	–	–	–	–
3	Glade Hill Substation	New Pole (Substation)	$7,865.00	Omni	$7,428.50	PTP Glade Hill Omni	AF24HD	$6,300.00	$2,500.00	$24,093.50
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	ISP Determines Location	New Pole	$7,865.00	Omni	$7,429	TBD	AF5XHD Pair	$1,109	$2,500	$18,902
3	Orchard Substation	Covered	–	–	–	–	–	–	–	–
3	Penhook Substation	New Pole (Substation)	$7,865.00	Omni	$7,428.50	PTP Blue Ridge Group PTP Glade Hill	AF5XHD AF5XHD	$2,217.60	$2,500.00	$20,011.10
3	Redwood Substation	New Pole (Substation)	$7,865.00	Omni	$7,428.50	PTP Glade Hill Omni PTP Dudley Omni	AF5XHD AF5XHD	$2,217.60	$2,500.00	$20,011.10
3	Tank Hill Substation	Covered	–	–	–	–	–	–	–	–
3	Thornton Substation	New Pole (Substation)	$7,865	Omni	$7,428.50	PTP Grassy Hill	AF5XHD Pair	$1,109	$2,500	$18,902
									Estimated Total	$516,772.10

APPENDIX D: ESTIMATED WIRELESS COVERAGE

Site Name	Estimated Number of New Addresses Served
Phase 1	
towers	
Blue Ridge Tower	3434
Grassy Hill Tower	3717
Cahas Tower	588
Summit View Tower	1375
Snow Creek Tower	490
Toms Knob Tower	568
Henry FD Tower	477
poles	
Glade Hill	93
Callaway	113
Sontag	149
Windy Gap	173
Henry Elementary	263
Dudley	336
Ferrum	402
Union Hall	568
Lee M Waid Elementary	1491
Phase 1 total	**14237**
PHASE 2	
towers	
Burnt Chimney Tower	1665
Cooks Knob Tower	1332
Pigg Tower	753
poles	
CATCE	250
Rocky Mount	325
Franklin County Highschool	343
phase 2 total	**4668**
PHASE 3	
towers	
Endicott Tower	247
poles	
Glade Hill Substation	165
Penhook Substation	113
Redwood Substation	245
Thornton Substation	140
Eleven additional poles TBD	unknown
phase 3 total	**910**
Final County-wide total	**19815**

The Path Forward

A Community Broadband Assessment for Franklin County Virginia

May 2017

CIT
CENTER FOR INNOVATIVE TECHNOLOGY

Topics

- Community Profile
- Current Reported Coverage
- Broadband Demand
- Local Assets
- Review of local policies & fees
- Needs, Future Capacity
- Next Steps

Before We Begin

Positive impacts of broadband on household income:

- gaining 4 Mbps of broadband increases household income by $2,100 per year
- re-employment 25 percent faster than traditional searches
- higher employment rates in rural counties

Positive impacts of broadband on healthcare

- enables solutions that help manage chronic diseases, like diabetes and obesity.
- connecting health and broadband sectors is a path to a more connected, healthier locality.

Reasons for positive impacts

- boosts personal productivity,
- enables more flexible work arrangements
- enables home-based businesses as a replacement, or complement to an ordinary job.
- enables people to be more informed,
- better educated and socially and culturally enriched – fueling a faster career path.
- improves access to health and care

Source: The Appalachian Regional Commission (ARC) Broadband Planning Primer Toolkit
https://www.arc.gov/images/programs/telecom/ARCBroadbandPlanningPrimerToolkit.pdf
Connect2HealthFCC: https://www.fcc.gov.edgekey.net/health/maps
Why broadband matters: http://www2.ntia.doc.gov/files/broadbandmatters_021417.pdf

The Economics of Broadband Deployment

From the provider perspective:

Profit/Sustainability = Revenue - CapEx + OpEx

How do we make the math work for sustainability & future upgrades?

How do we entice the private sector to invest?

INCREASE REVENUES ↑	LOWER COSTS ↓
Adoption and Demand	**Local Assets/Infrastructure** What you have that might be shared
Population Density	**Policies & Fees** Reduce or eliminate fees for partners Streamline permitting
Community Anchor Institutions Residents, businesses, government facilities, healthcare	**Funding Options** Public & Private Investments

***Red indicates variables local governments can affect**

Broadband Perspective

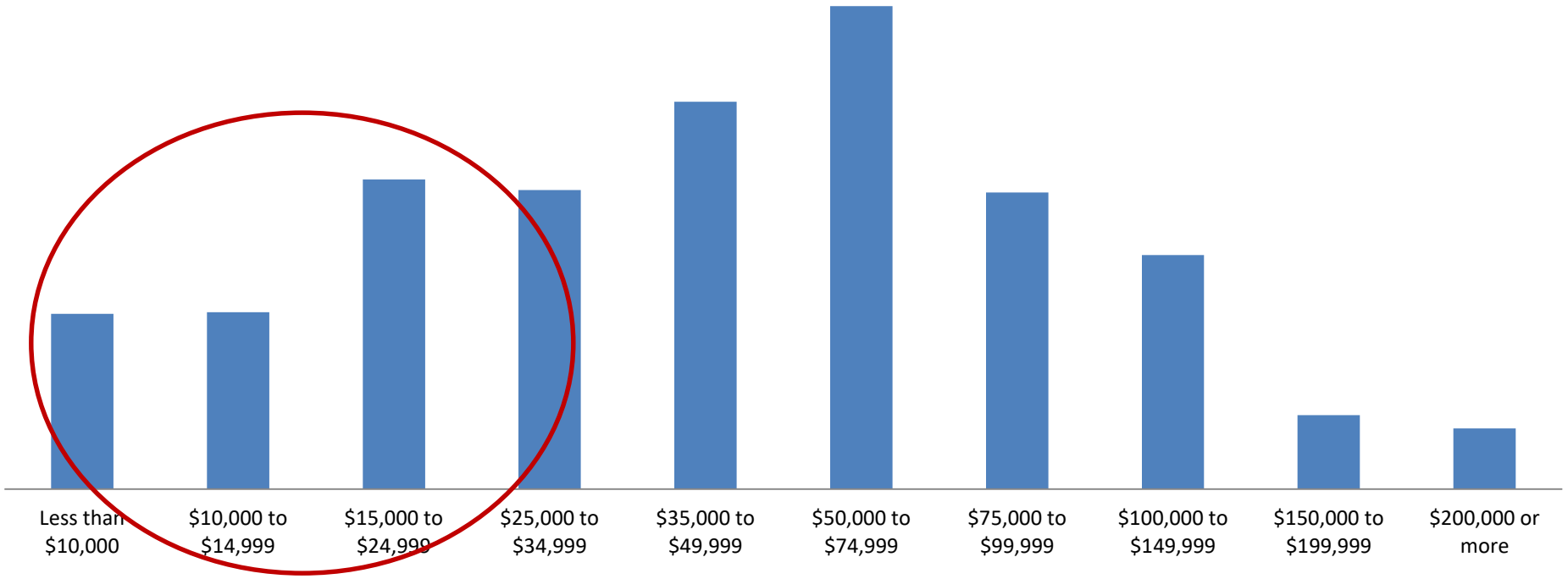
COMMUNITY PROFILE

SOURCE: AMERICAN COMMUNITY SURVEY

HTTPS://WWW.CENSUS.GOV/ACS/WWW/DATA/DATA-TABLES-AND-TOOLS/DATA-PROFILES/2014/

Franklin County Household Income

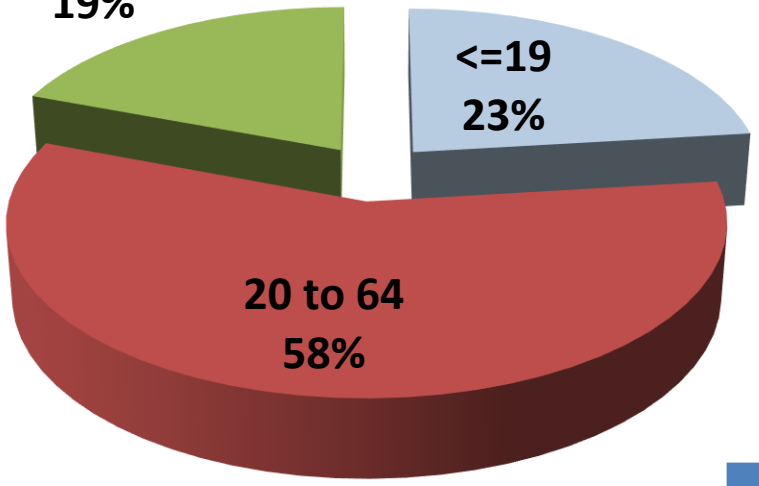
Median Household Income: $44,827
Total Occupied Housing Units: 23,248

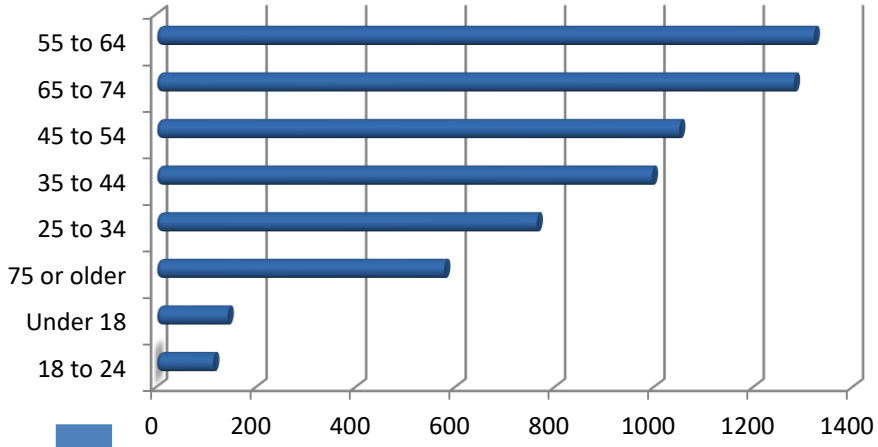


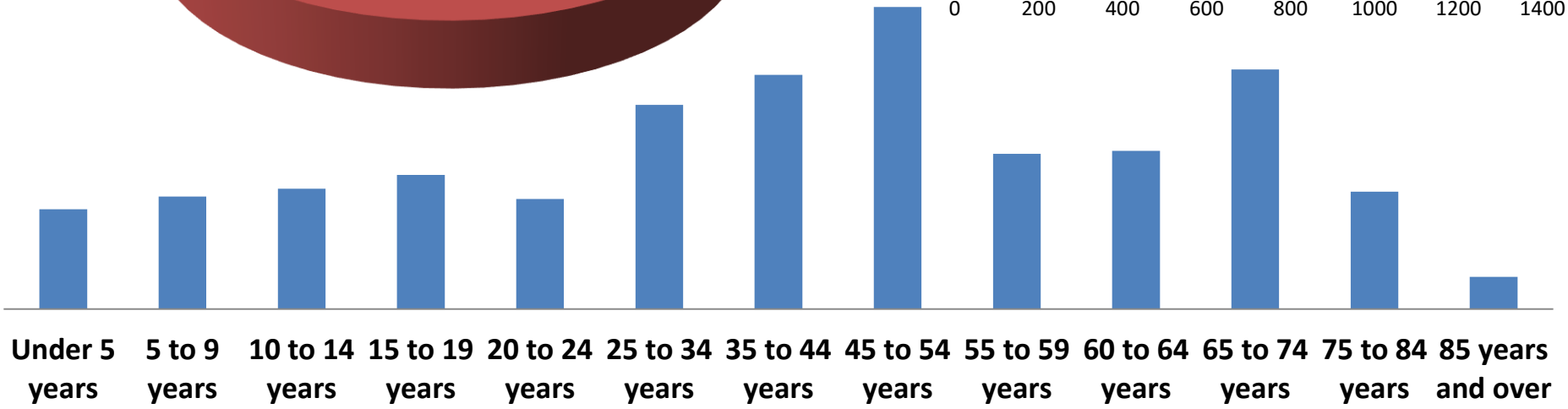
Take Away: ~30% of households may have affordability challenges.

Franklin County Age and Population Groups

Total Population: 56,360

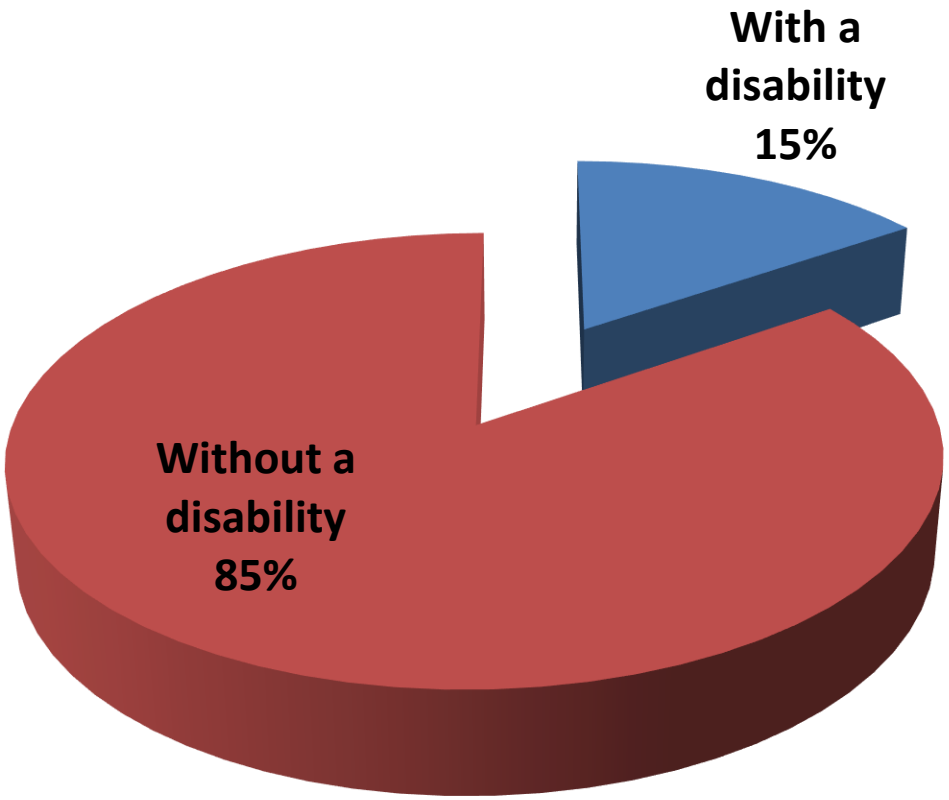






Take away: Good News: Most of the population - 81% - considered technology adopters

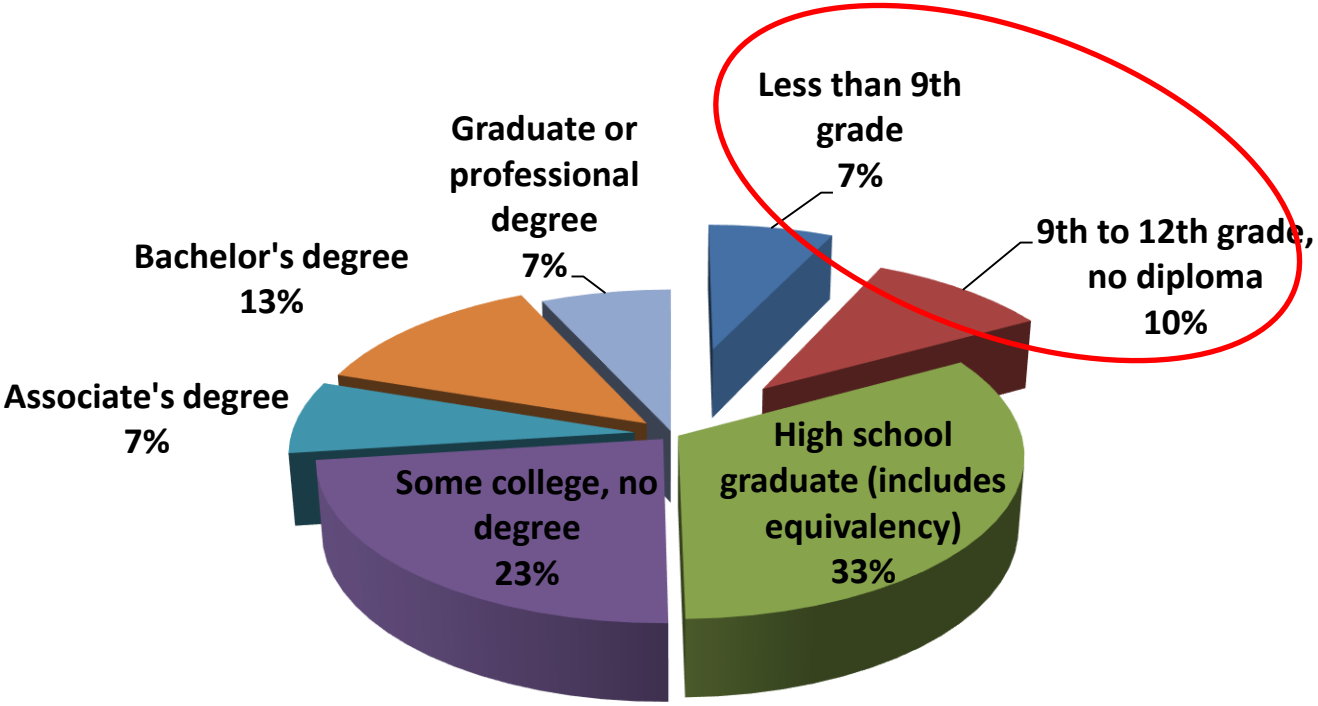
Franklin County Populations with Special Broadband Needs



Take Away: 15% may be slow to adopt technology or need special equipment

Franklin County Educational Attainment Profile

Franklin Population over 25 years: 40,264

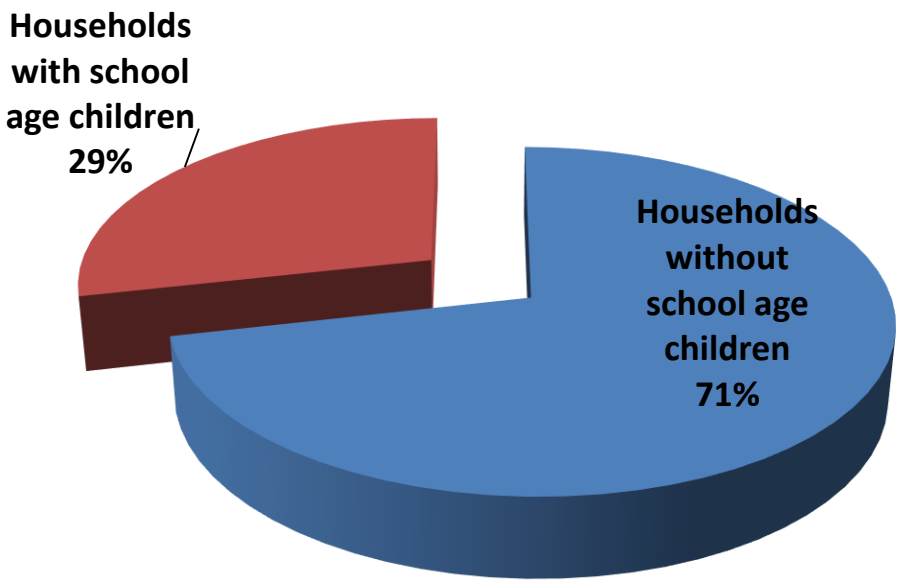


Take Away

17% of adult population may be slow to adopt and/or less likely to subscribe to new services.

Franklin County Households with K-12 Children

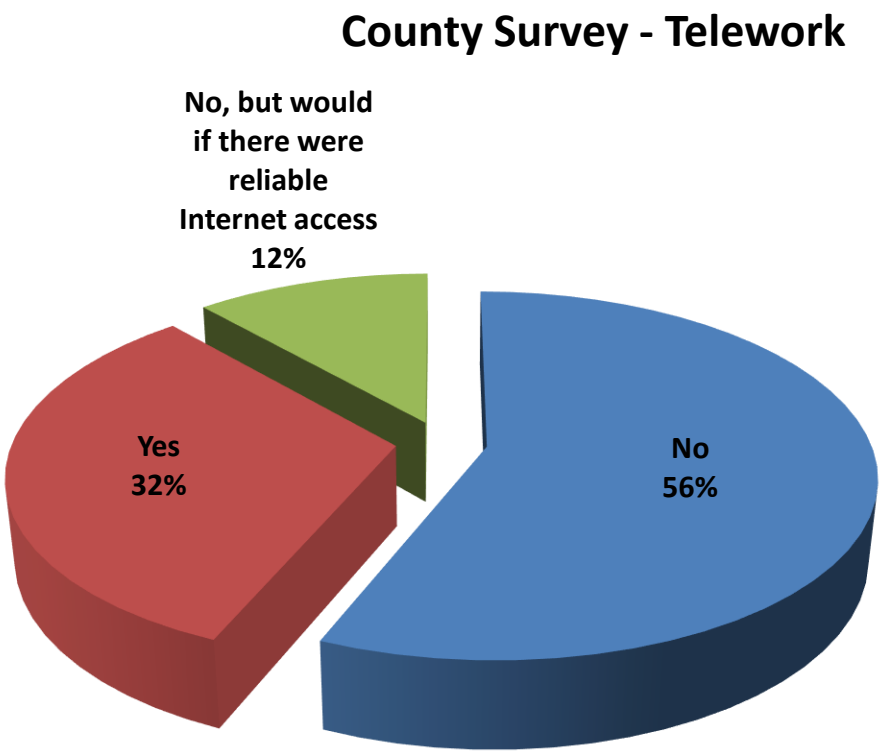
Total Family Households: 16,480

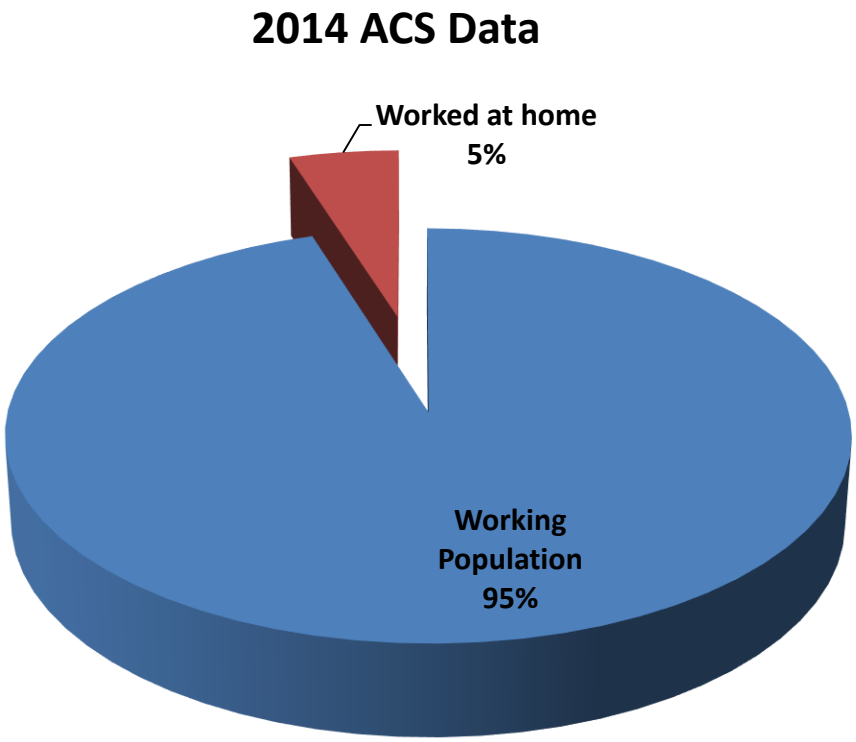


Take Away: According to census, 29% of households need broadband at home to support K-12 education

From Survey: 22% of respondents reported school aged children.
6% of those do not have Internet at home.

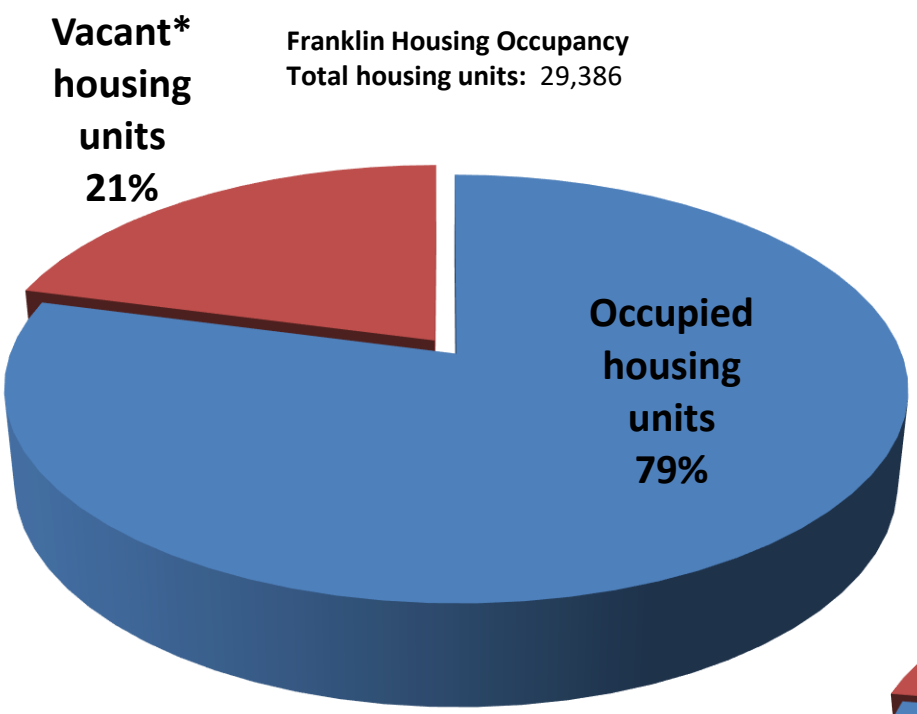
Franklin County Work from Home



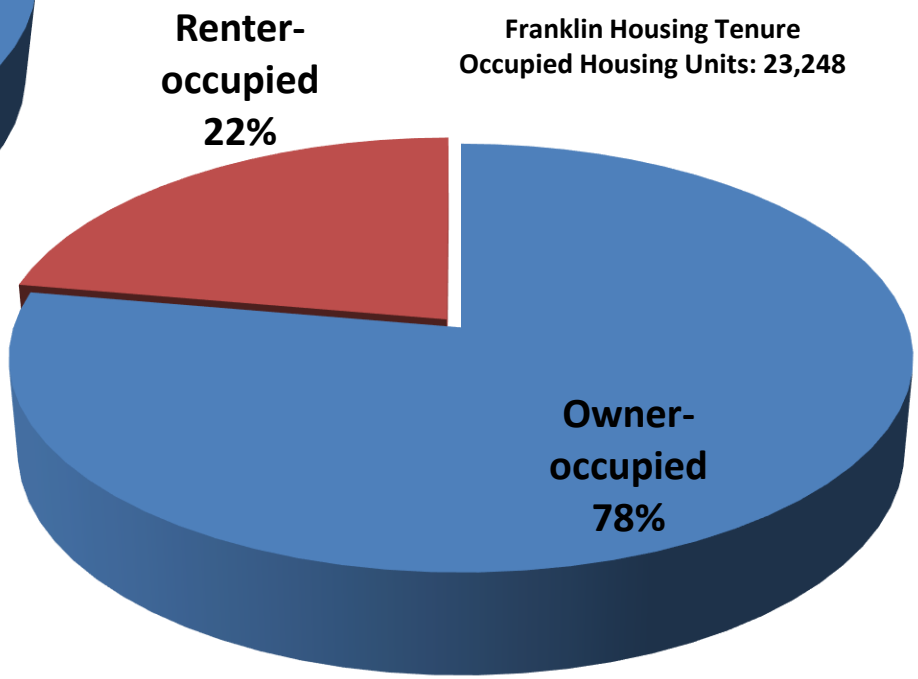


Take away: 12% of respondents would work from home if they could.

Franklin County Housing



Take away: ~1/5 of housing units are vacant or represent seasonal/weekend homes

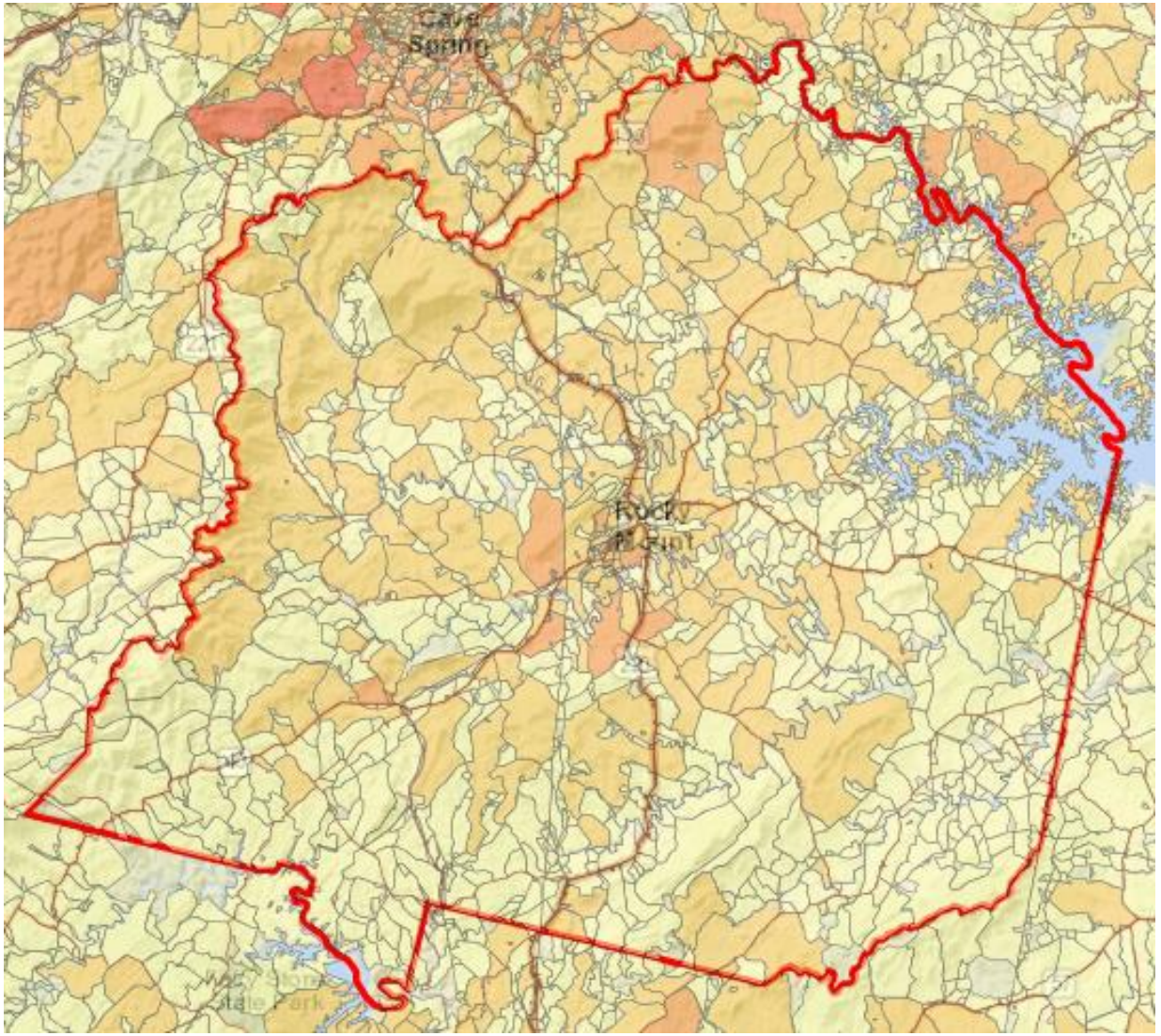


***a vacant unit may be one which is entirely occupied by persons who have a usual residence elsewhere.**
Source:
https://www.census.gov/housing/hvs/definitions.pdf

Population Density

2015 Census Population Estimates
- 0 - 71
- 71 - 307
- 307 - 962
- 962 - 2623
- 2623 - 19352

NOTE: denser areas in the south and west as those will correlate with unserved areas – to note there is population in those areas albeit limited areas.



FCC Provider Reported Data

REPORTED CURRENT COVERAGE

Seriously Important note about FCC reported coverage

All facilities-based broadband providers* **are required** to file data with the FCC twice a year (Form 477) on where they offer Internet access service at speeds exceeding 200 kbps in at least one direction.

Fixed providers file lists of census blocks in which they **can or do offer service** to at least one location, …

Mobile providers file maps of their coverage areas for each broadband technology (e.g., EV-DO, HSPA, LTE).

Block-Level Deployment and Competition

A provider that reports deployment of a particular technology and bandwidth in a particular census block may not necessarily offer that particular service everywhere in the census block. Accordingly, a list of providers deployed in a census block does not necessarily reflect the number of choices available to any particular household or business location in that block, and the number of such providers in the census block does not purport to measure competition.

Source: Source: https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477
***A Facilities-based Broadband Provider** is an entity that provides broadband services over facilities it owns, provisions and/or equips.

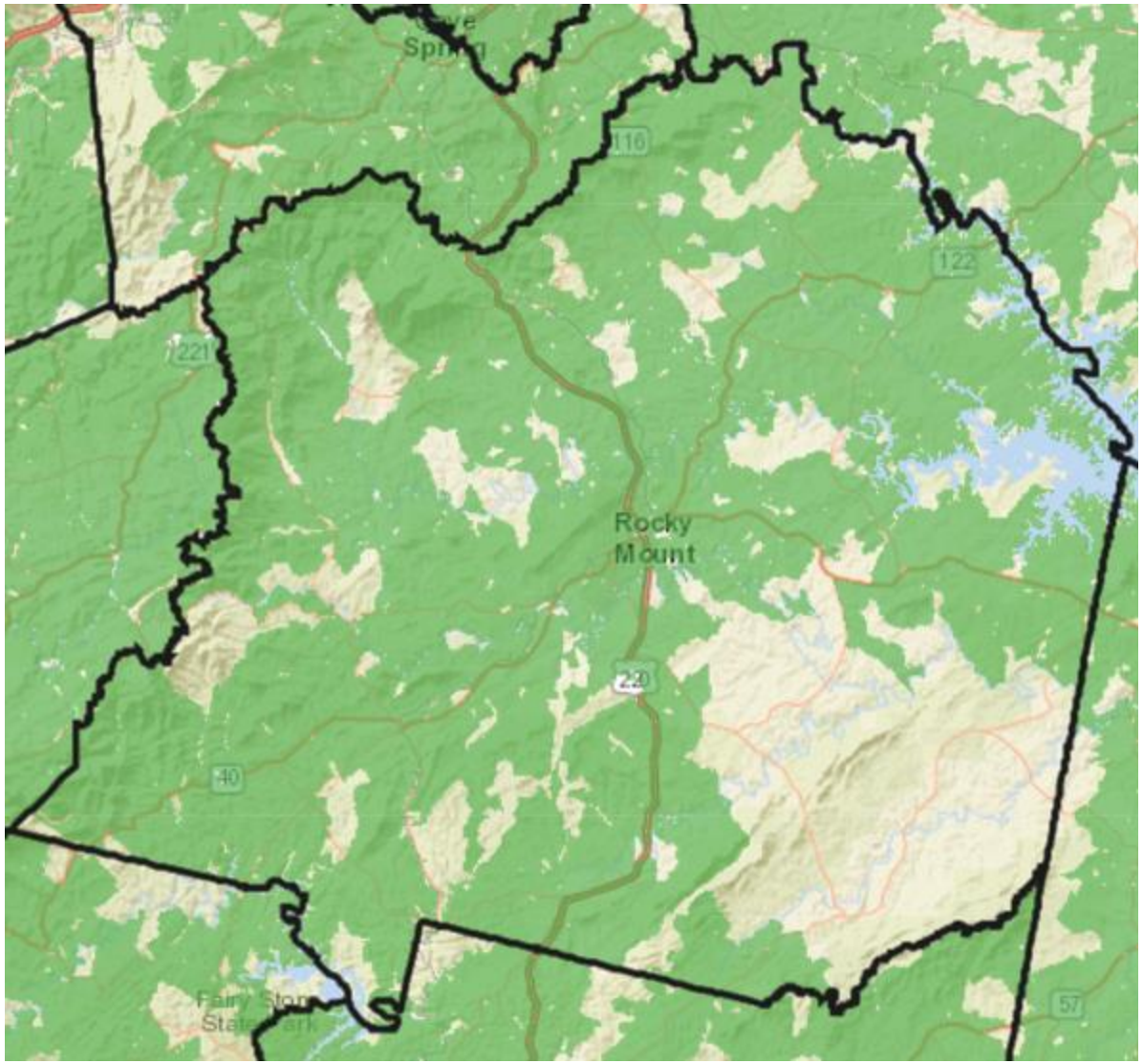
Take away - Coverage maps are generally overstated due to federal reporting rules!

Franklin County Service Providers That Report to the FCC

Business Name	Technology	Number of Blocks	Maximum Download Speed	Maximum Upload Speed
B2X ONLINE	Fixed Wireless	136	20	20
CENTURYLINK	DSL	1,121	25	3
CENTURYLINK	DSL	232	80	40
CITIZENS TELEPHONE COOPERATIVE	DSL	5	6	0.768
COMCAST	Cable	11	150	10
FAIRPOINT COMMUNICATIONS	DSL	11	25	1.5
KINEX TELECOM, INC.	DSL	1	1000	1000
KINEX TELECOM, INC.	Fiber	1	1000	1000
LIGHTOWER	Fiber	107	1000	1000
MCI	Copper Wireline	1	6	6
SHENTEL	Cable	1,377	101	10
SHENTEL	Fiber	628	1000	1000
VERIZON VIRGINIA LLC	DSL	47	15	1

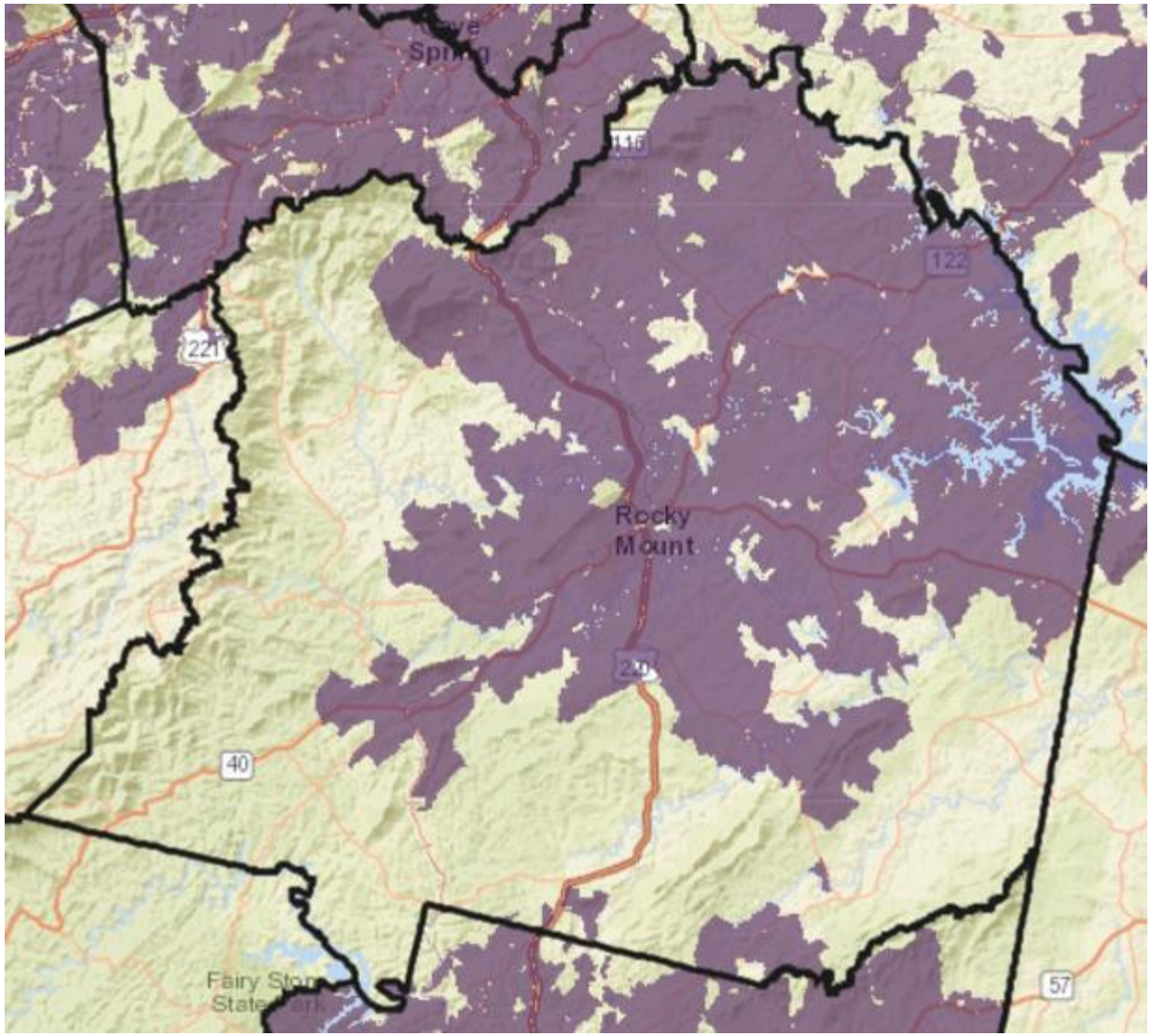
DSL Coverage

(CenturyLink)

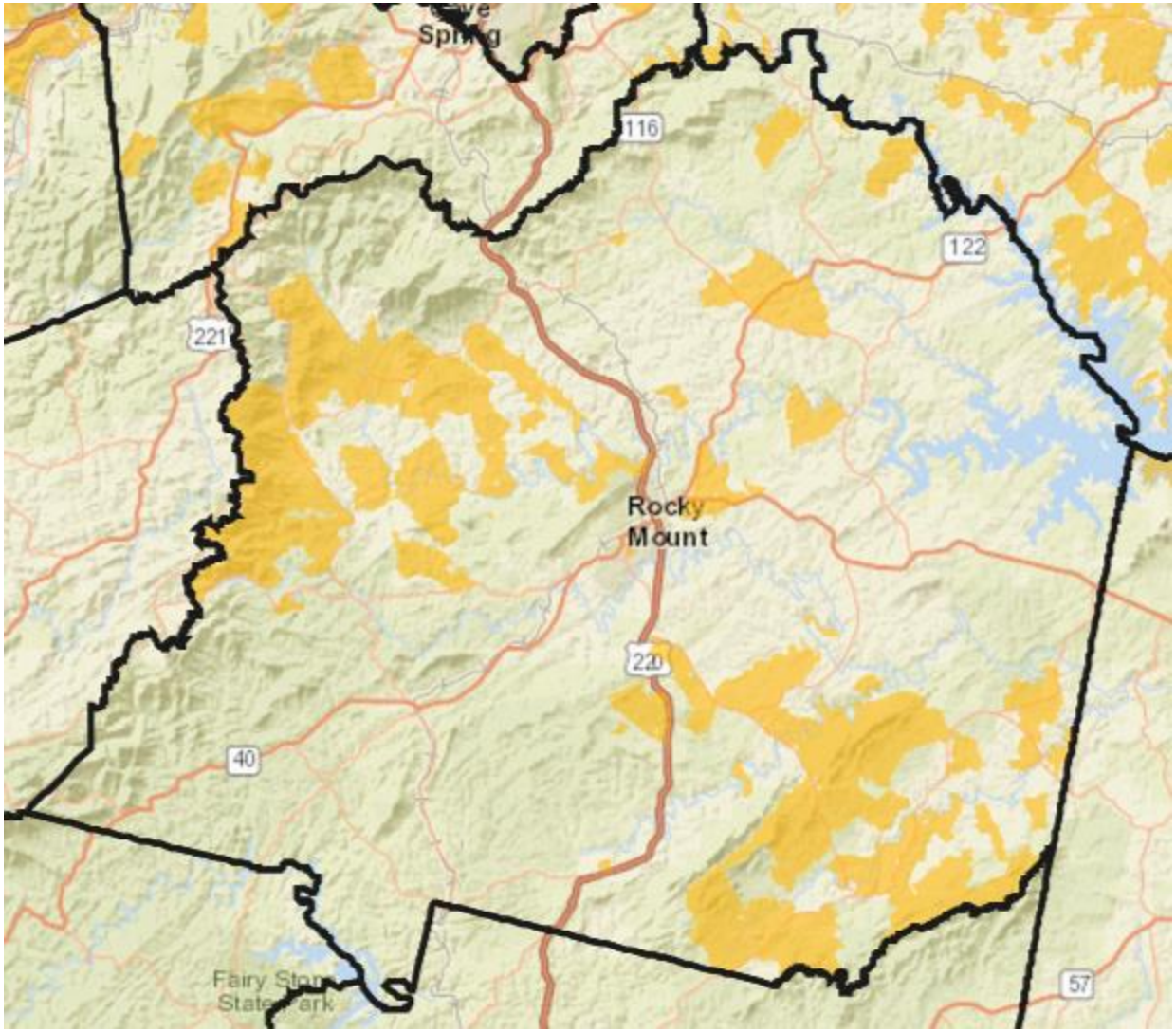


Cable Coverage

(Shentel)



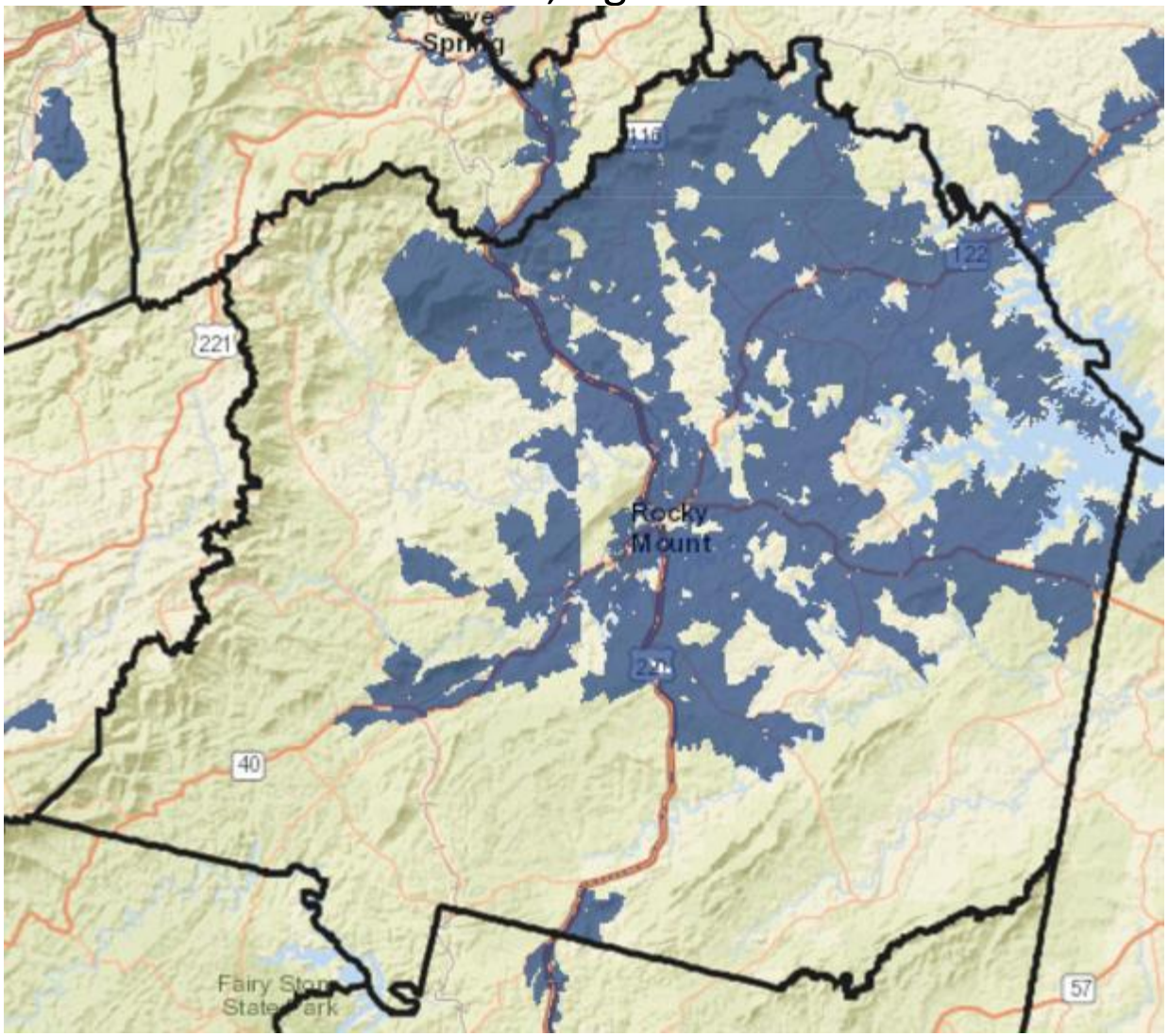
Fixed Wireless Coverage
B2X

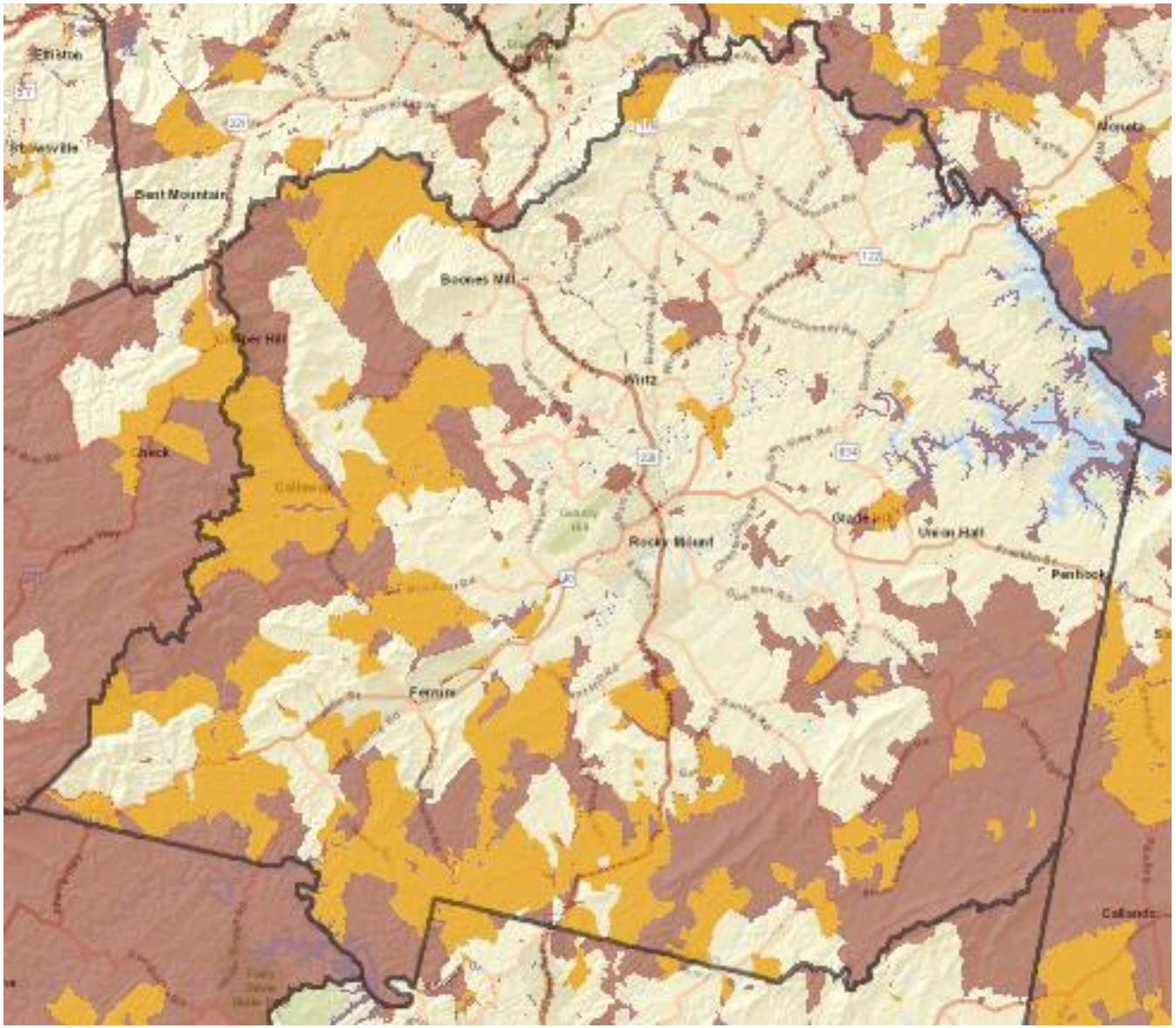


Fiber Service

(Not Commercial Fiber Routes)

Shentel, Lightower





FCC
Consumer Fixed BB
Download Stats

- **>= 4 Mb 93.1%***
- **>= 10 < 25 83.3%***
- **>= 25 Mb 82.4%***

Source: FCC 477 data
Spring 2016
***Percent of total households**

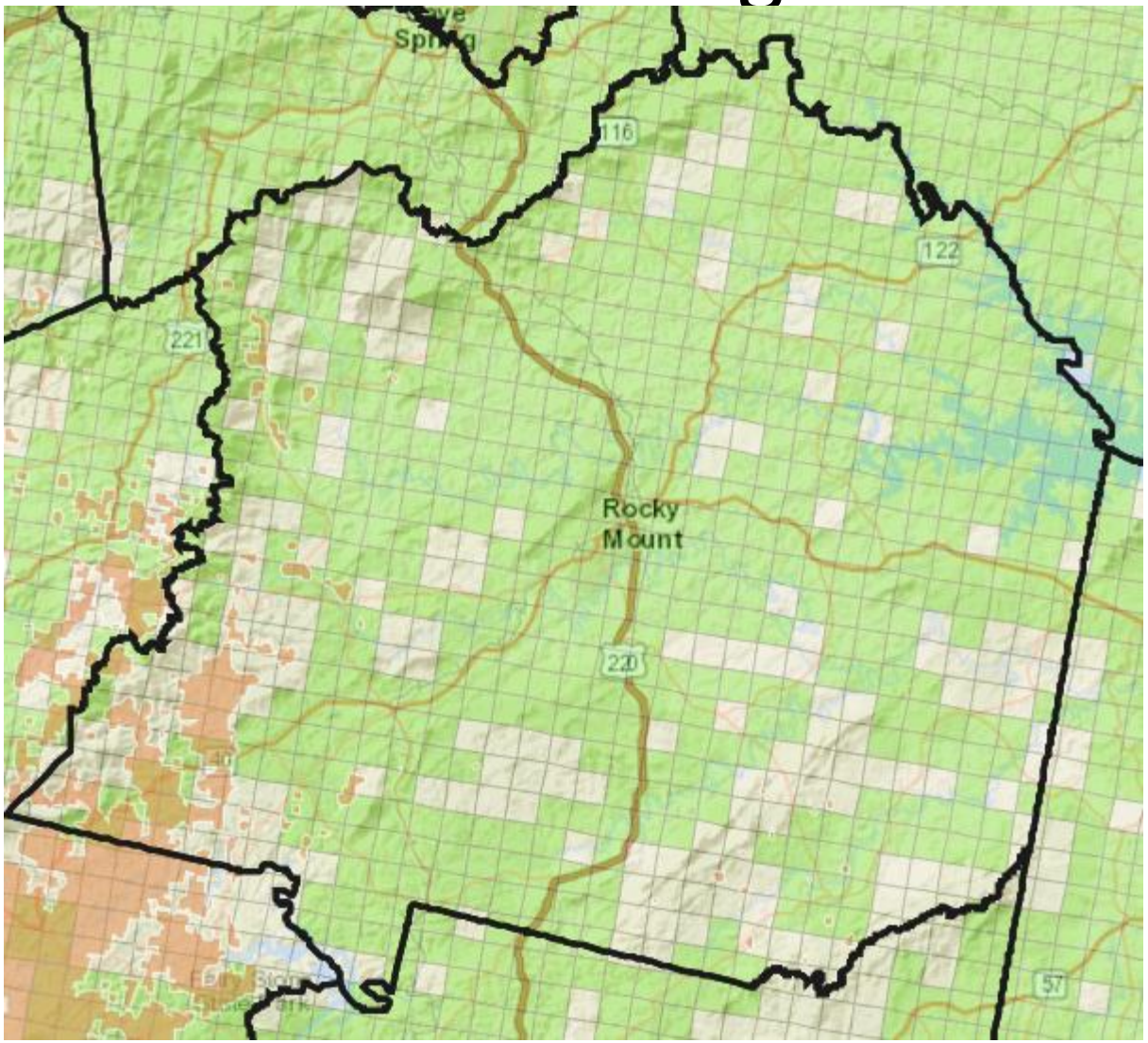
Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

Public Safety
FirstNet & No-LTE Coverage

FirstNet 1x1 mile grids.

- Proposed terrestrial coverage
- Proposed non-terrestrial coverage
- No LTE Coverage



Now and Into the Future

BROADBAND DEMAND

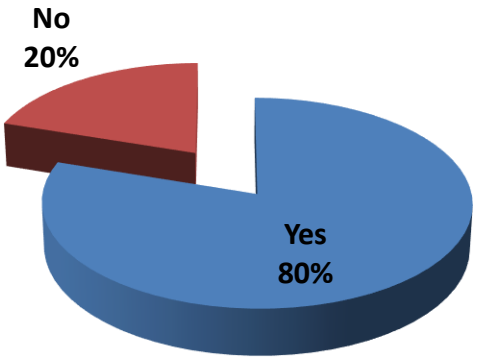
FRANKLIN COUNTY'S BROADBAND SURVEY RESULTS

Franklin County Citizen's Survey

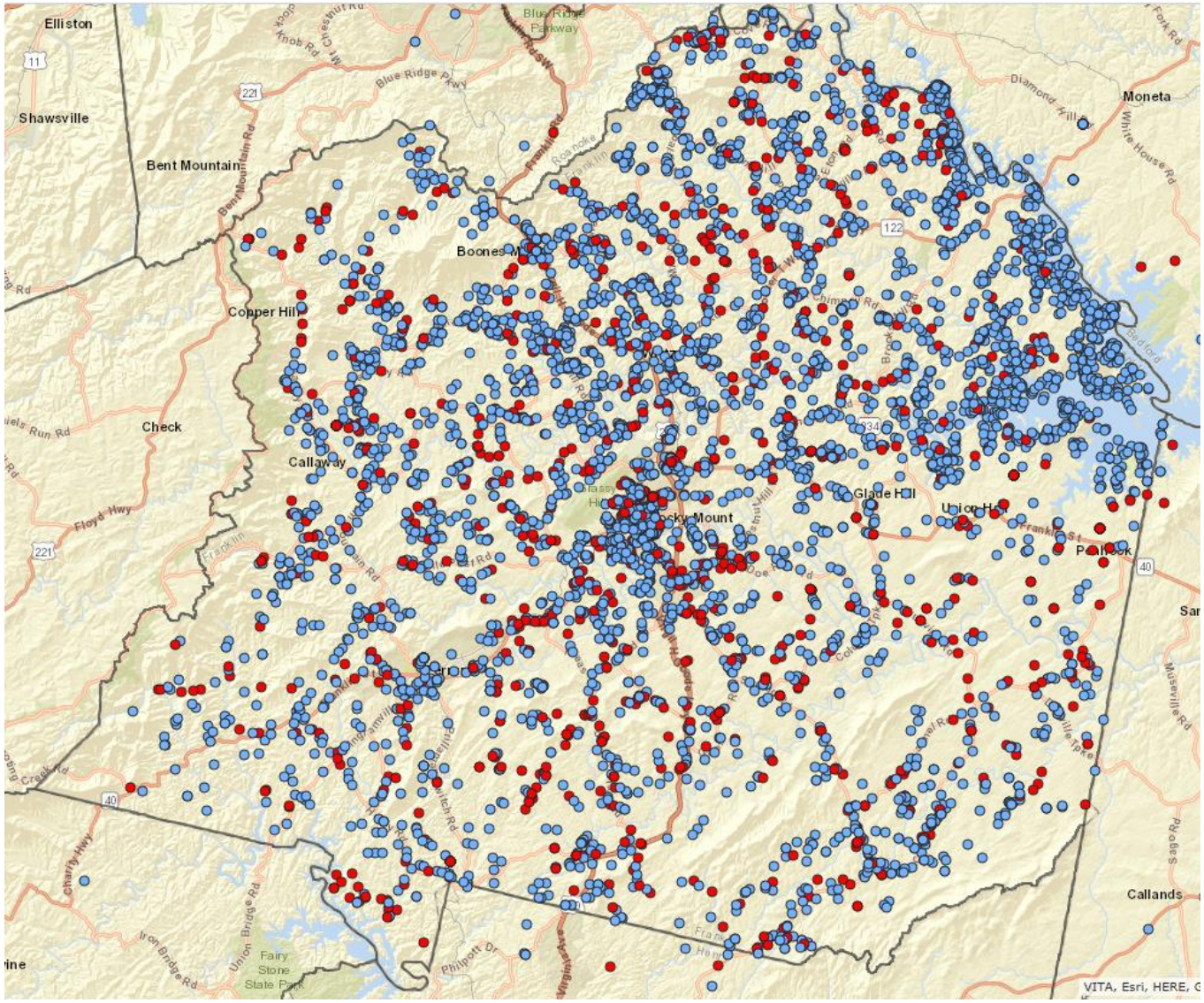
6258 Responses

99% +/- 1.39
based on occupied housing units (23,248)

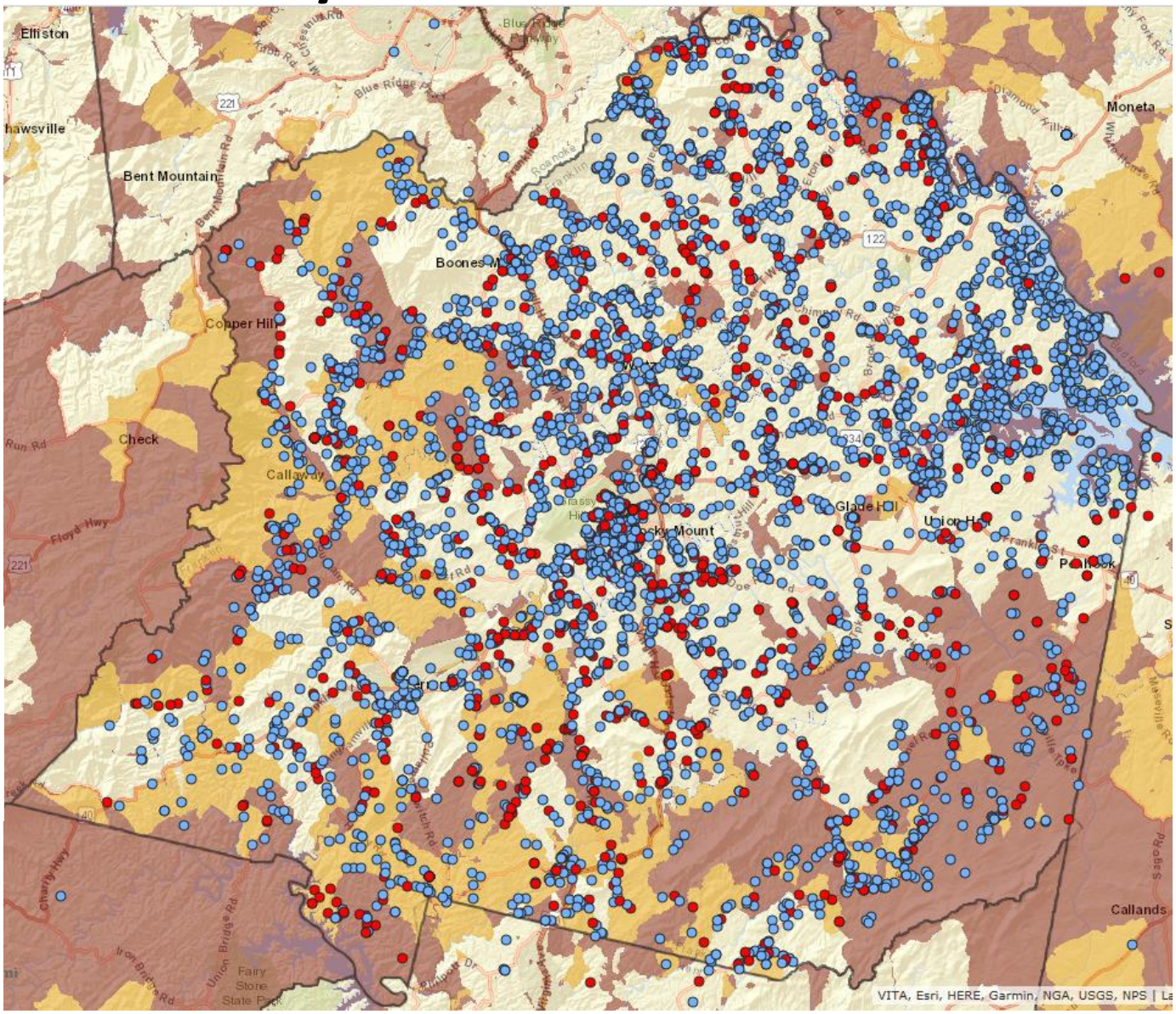
Do you have Internet service at home?



Over 90% of respondents feel the Internet is important.



Franklin County Un/Underserved



● Unserved = Broa*d*band speed below 10 Mbps Download speed

● Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

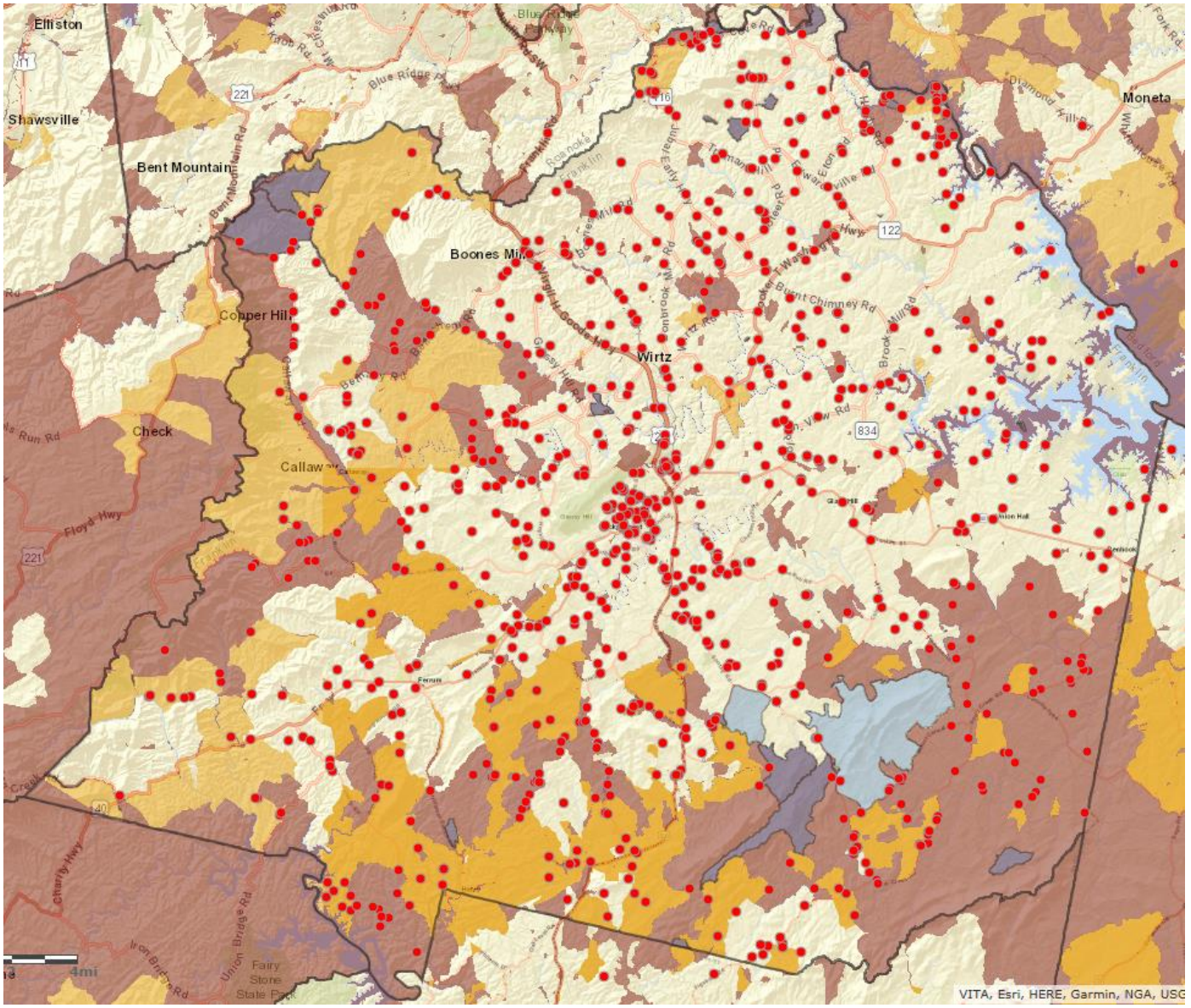
Franklin County Un/Underserved

Do you have Internet Service at Home?

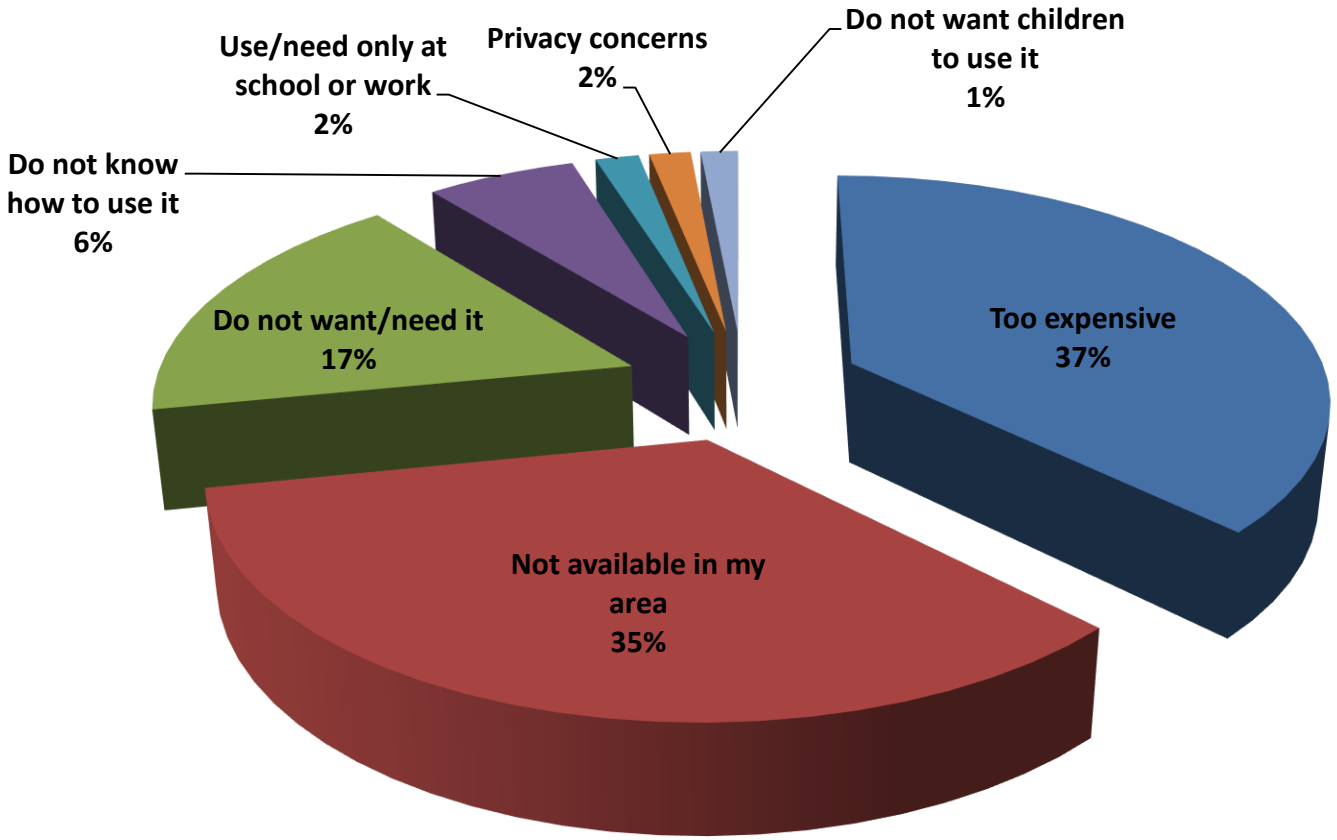
- No.

Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

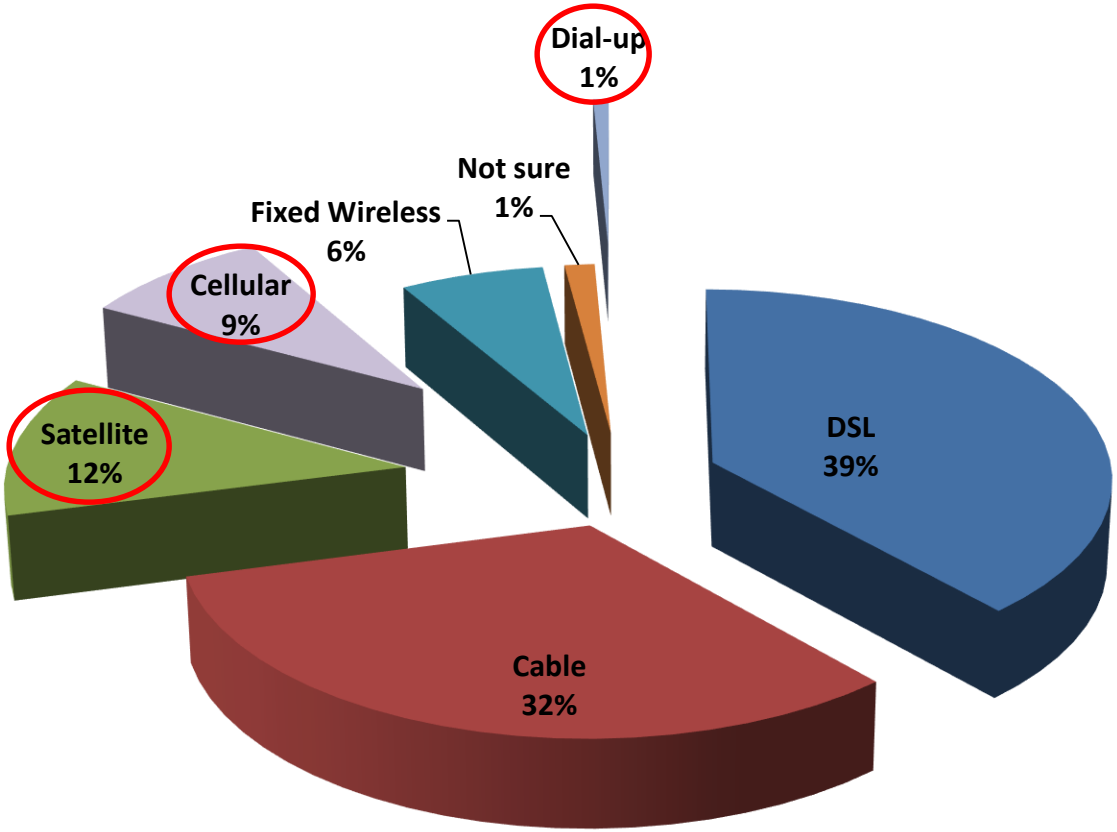


Franklin Co
Reasons 20% do not have Internet



Take away: Over 1/3 without Internet have no access. Over 1/3 of respondents may have affordability challenges.

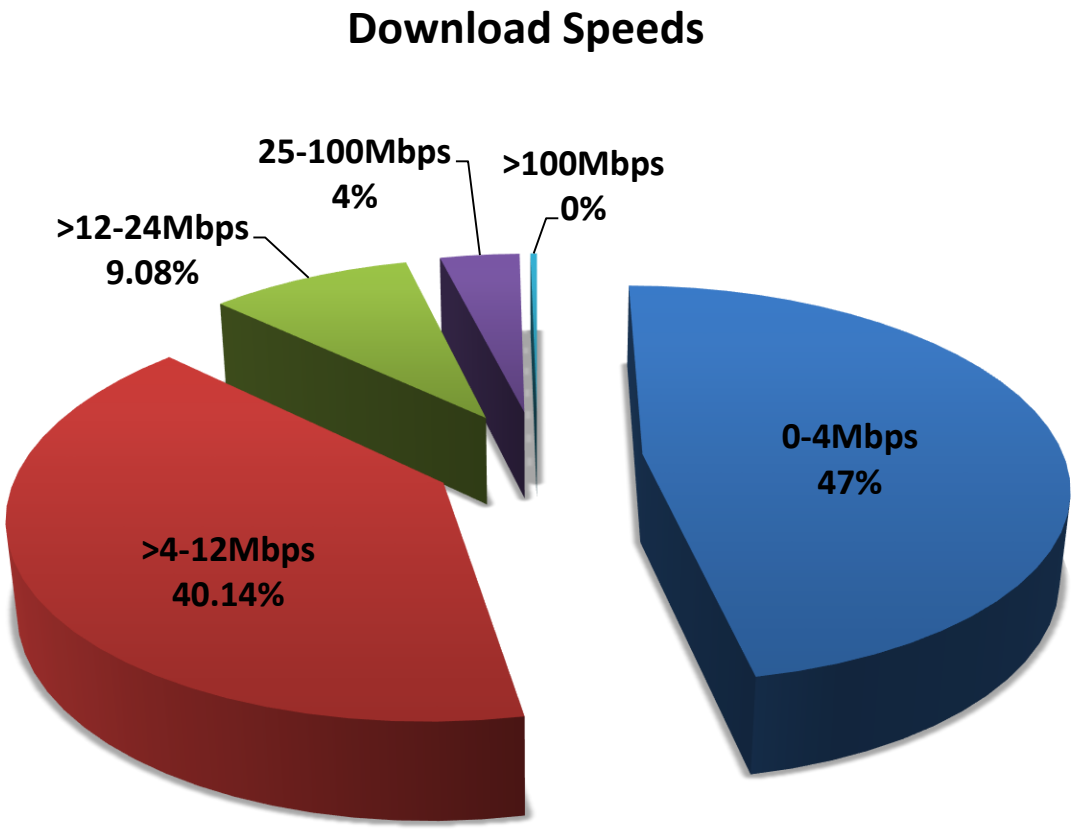
Franklin County
Type of Internet Access



Take away: 22% of respondents depend on inadequate services (circled in red.)
50% of respondents reported they are satisfied with their service, 34% dissatisfied.
Most respondents (78%) consider Internet access very important or critical.

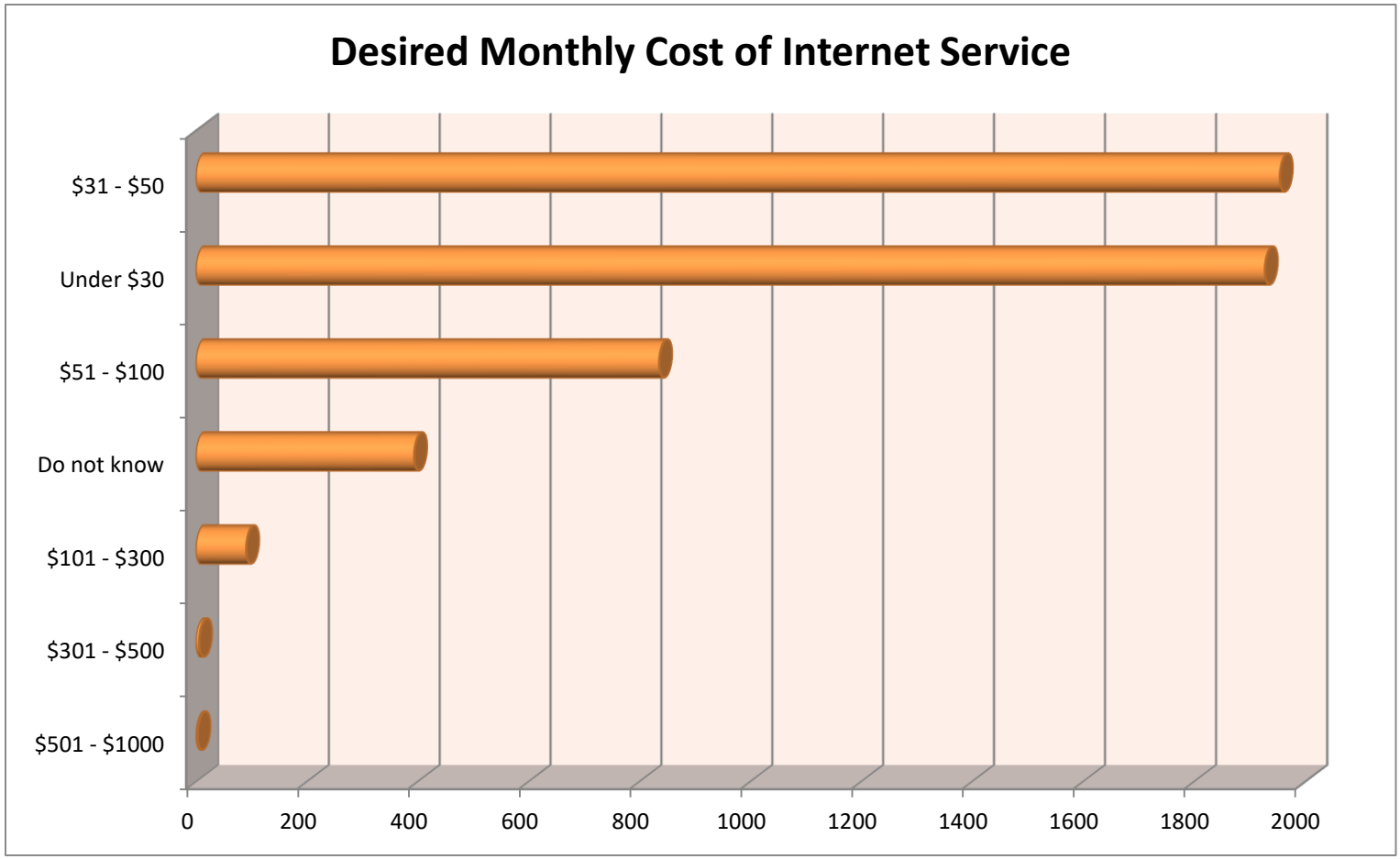
Franklin County Internet Speeds

only valid for online surveys



Take away: The majority of speed tests (47%) registered download speeds between 0-4 Mbps, DSL speeds.

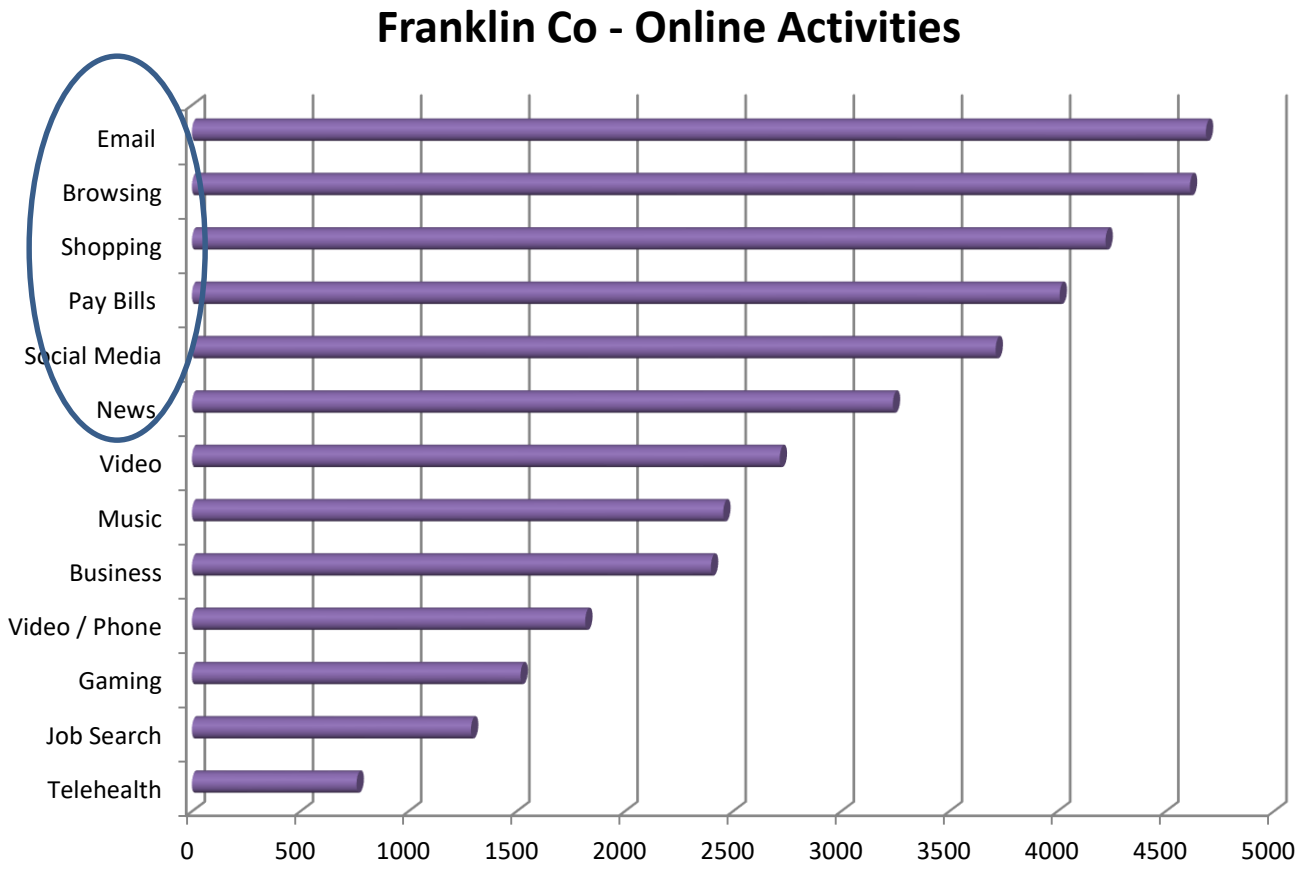
Franklin County Internet Costs



Take Away: Most respondents (48%) report paying $51-$100 per month for Internet service, regardless of speed tier or technology type. **Exception:** Fixed wireless users (27%) report paying between $31-$50 per month.

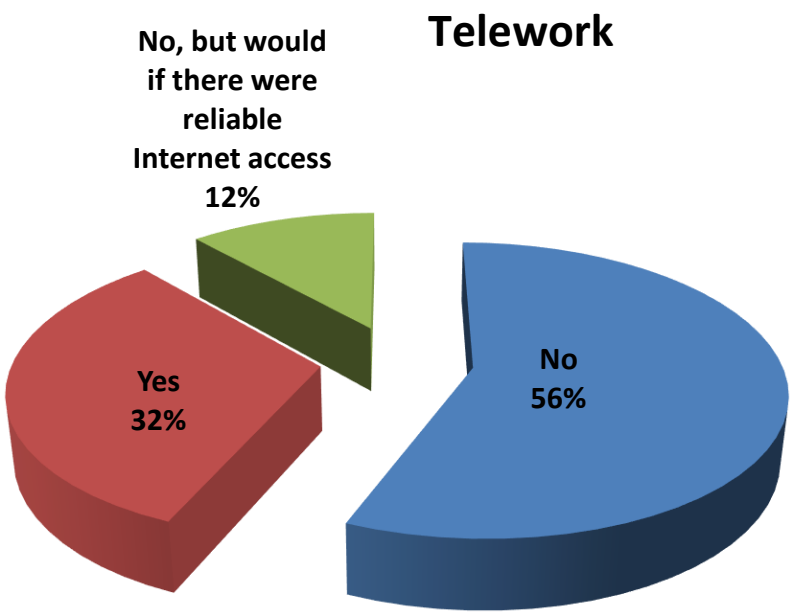
The most desired cost per month for Internet service is between $31-$50 , followed closely by under $30.

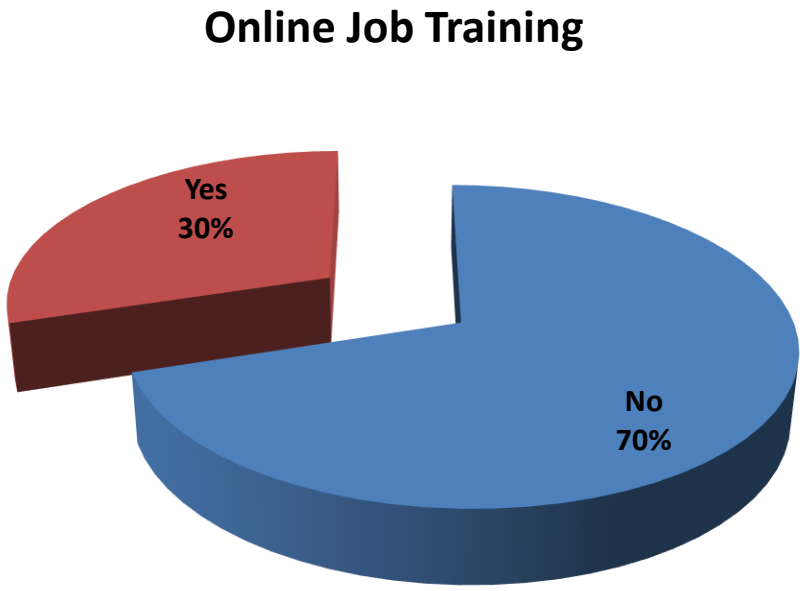
Franklin County Online Activities



Take away: Primarily low bandwidth activities, consistent low bandwidth speeds recorded from speed tests.

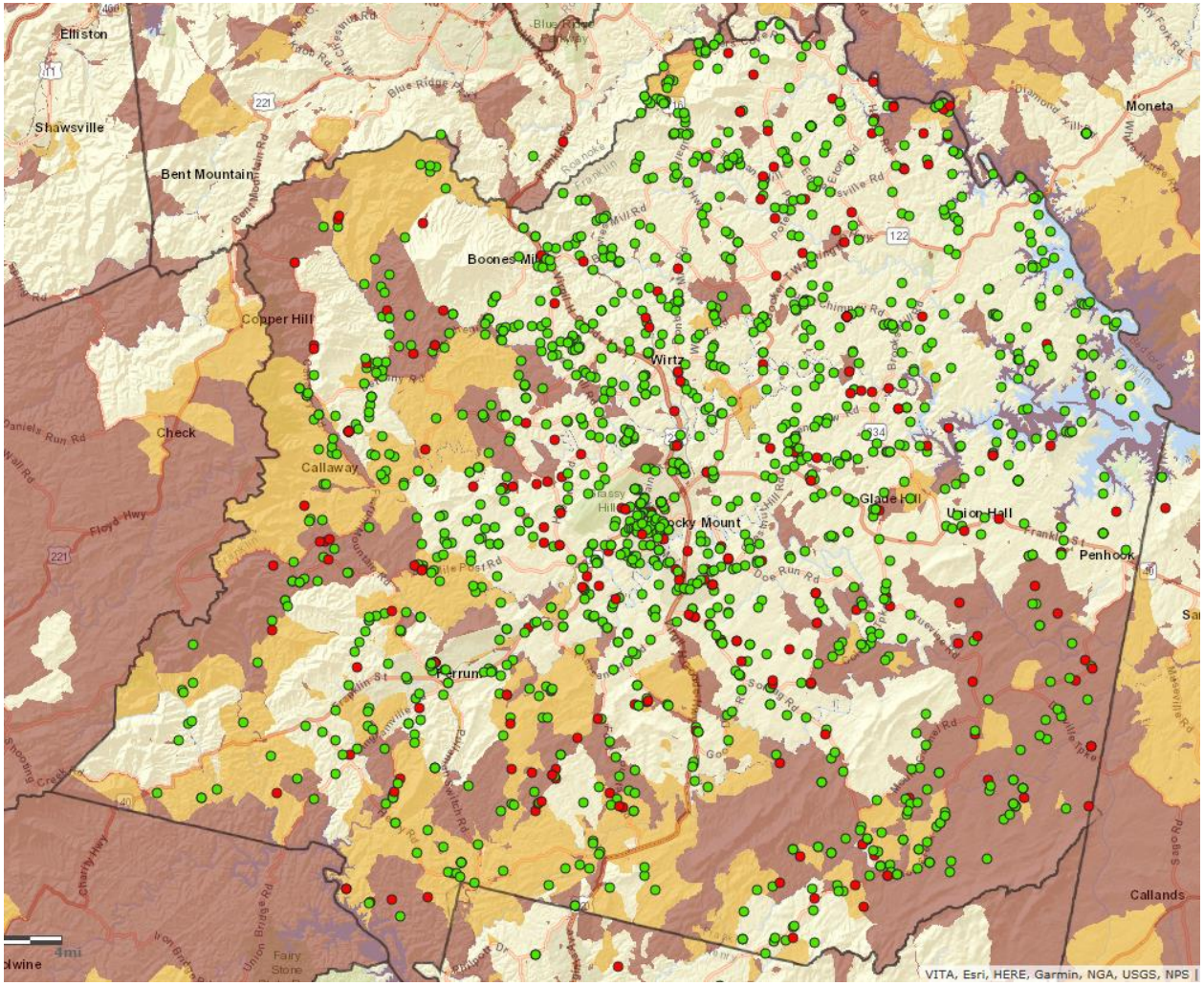
Franklin County – Home Utilization

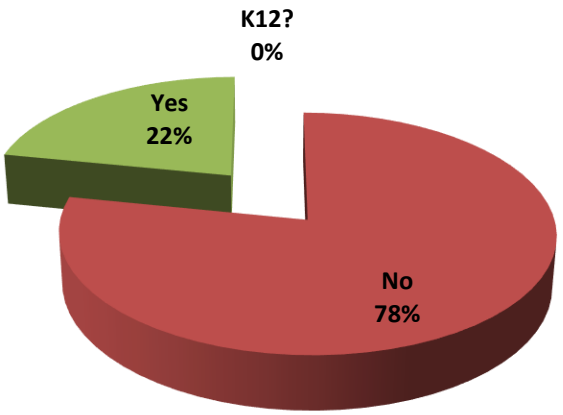




Take Away: 12% of respondents would work from home they had better Internet access.
Approximately 43% of workforce commutes out of the county.
30% report using the Internet for online job training

Franklin County K-12 Households



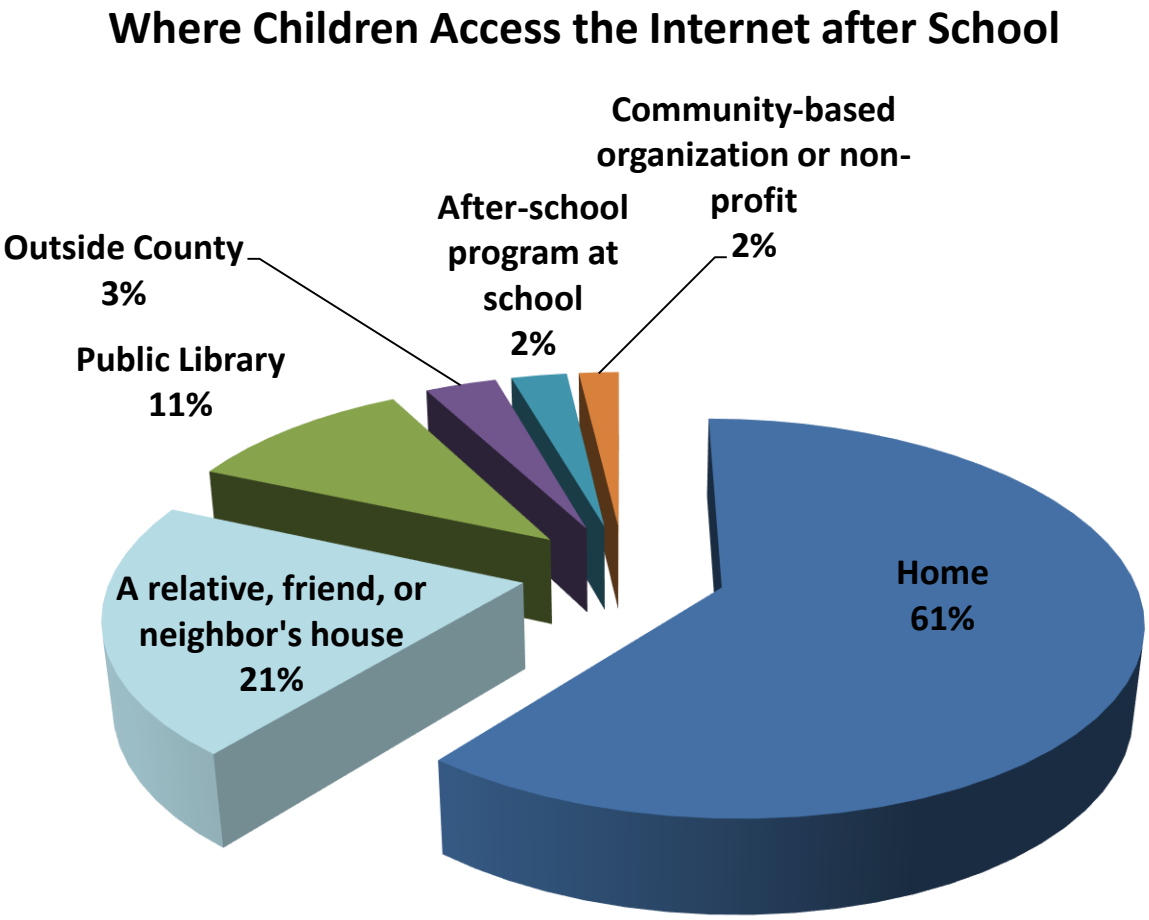


Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

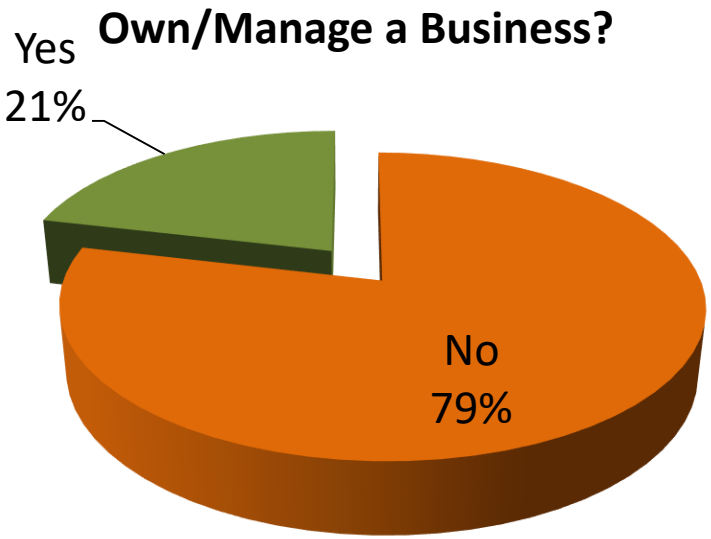
Take away: 1751(22%) reported K-12 students in the household.
6% of those are being home-schooled
15% of K-12 households have no access.

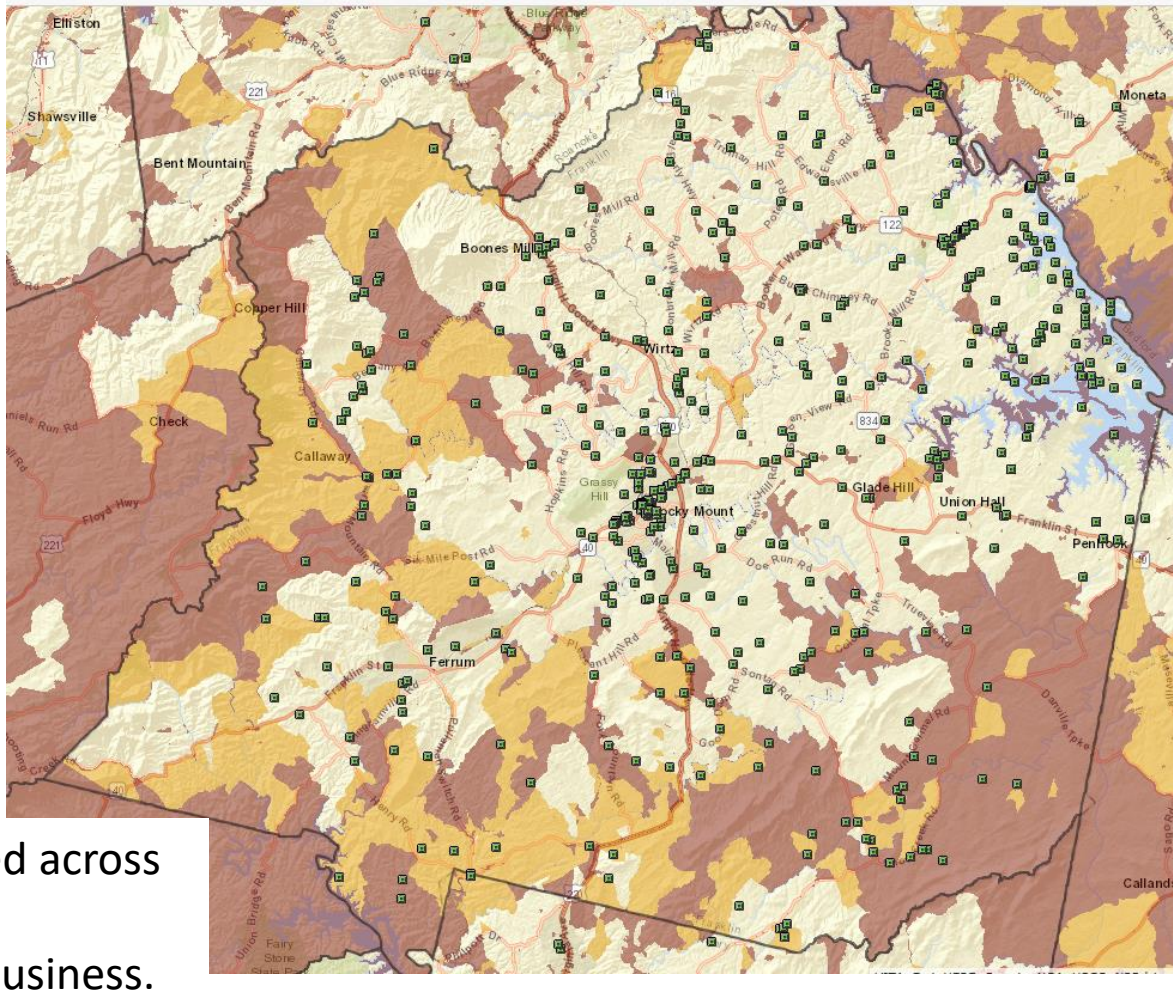
Franklin County



Take Away: Most K-12 students (61%) have access to the Internet at home after school.
11% depend on access a the public library(s)

Franklin County Businesses



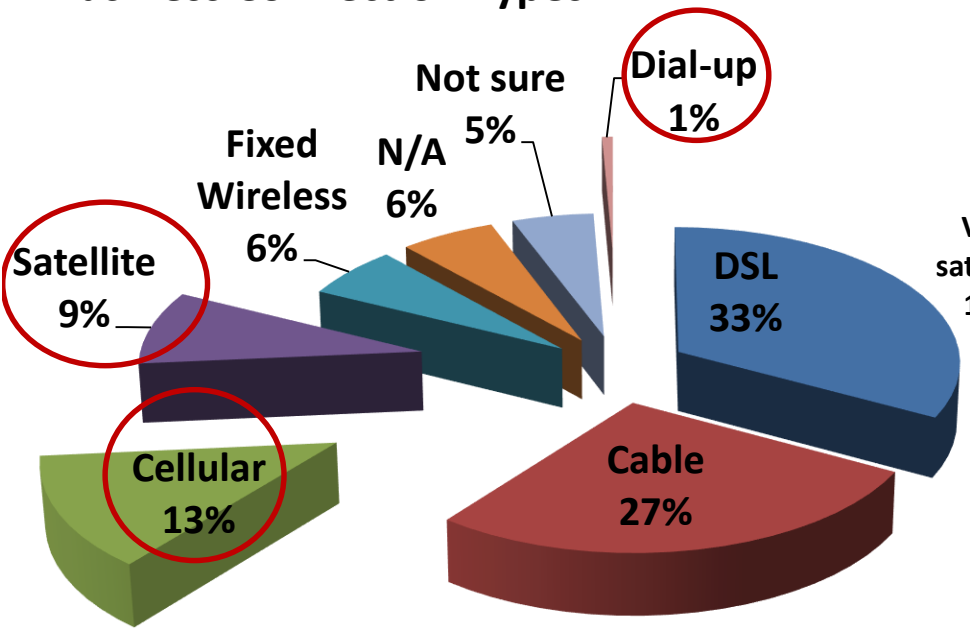


Take Away: 1291 businesses scattered across the county.
21% of respondents own/manage a business.
90% of businesses consider Internet access very important or critical.

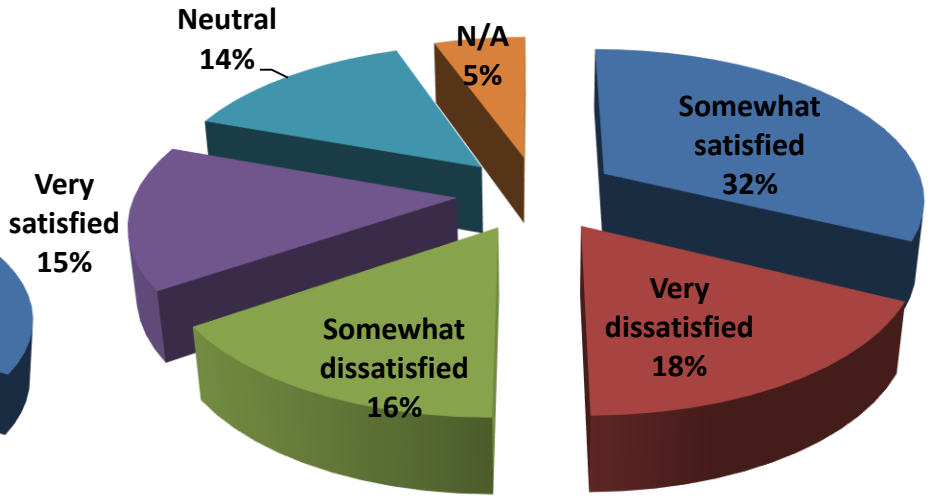
Business Locations:

Franklin County Business Connections

Business Connection Types

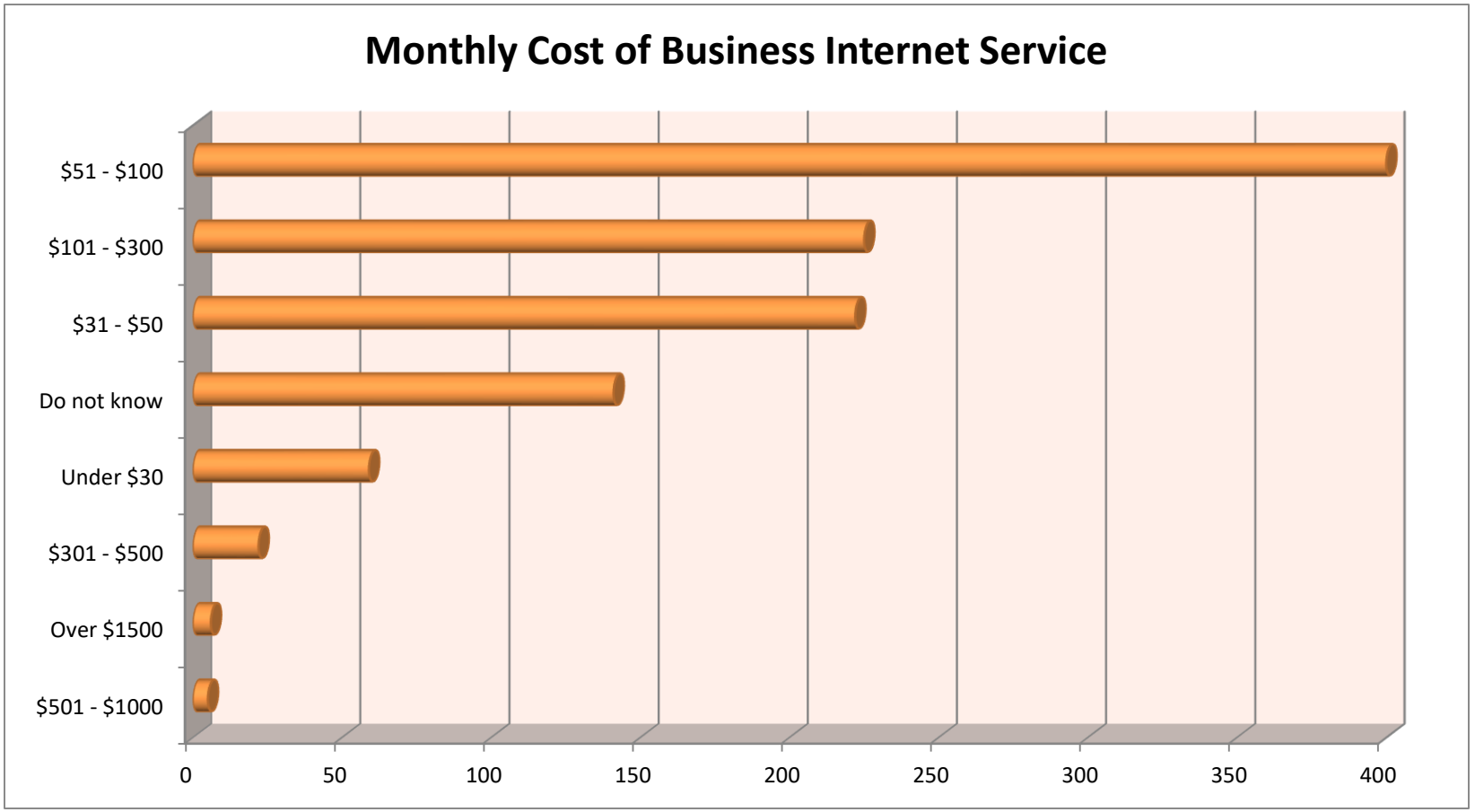


Business Internet Service Satisfaction



Take away: DSL is the most common business connection type, (33%) followed by cable (27%)
23% of businesses depend upon inadequate connection types
34% are dissatisfied with their business Internet service.

Franklin County



Take away: The majority of business owners (37%) pay between $51-$100 per month
Most business owners would prefer to pay $31-$50 and under

Vertical Assets, Fiber, Conduit and Community Anchors

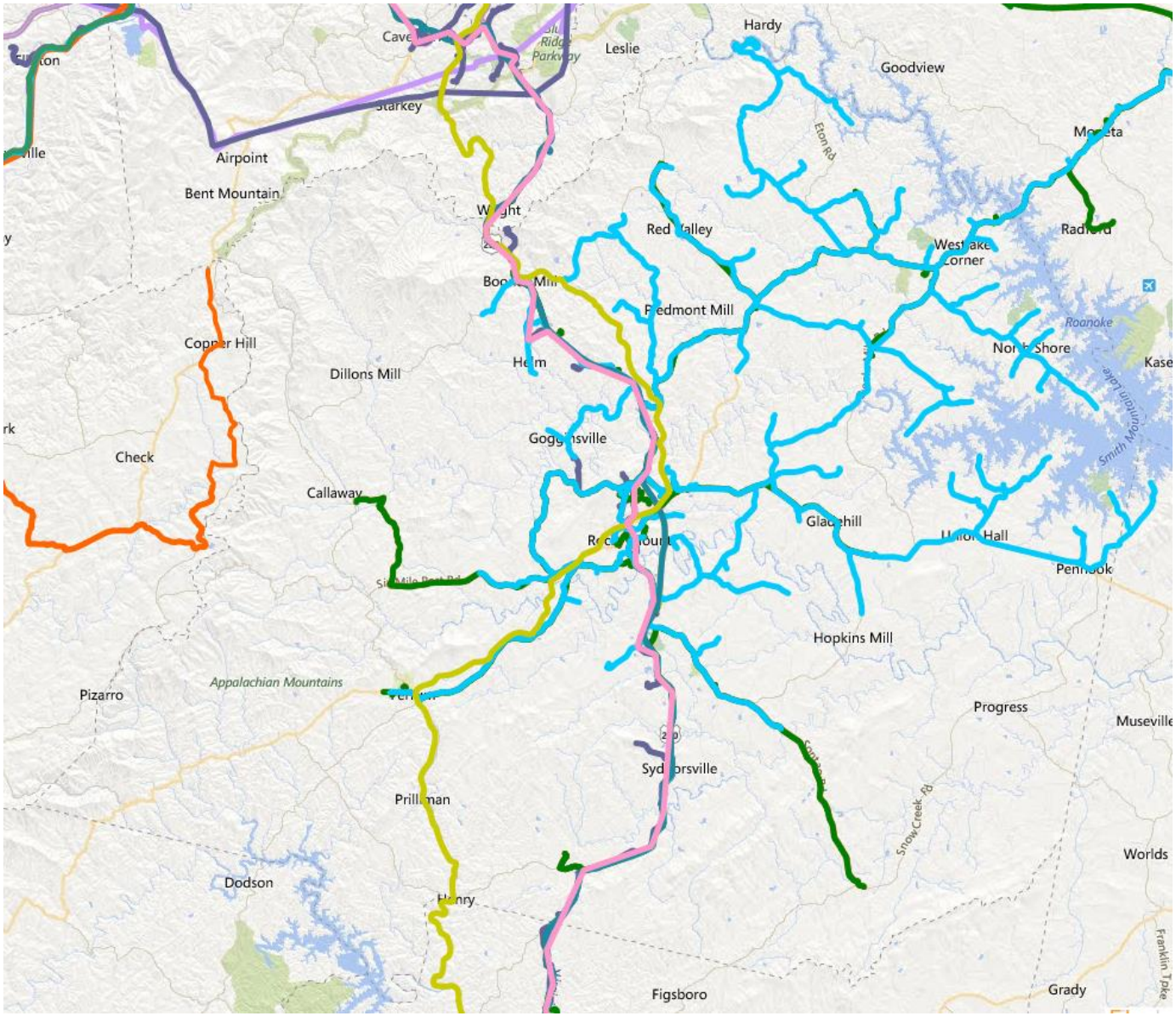
LOCAL ASSETS

All Commercial Fiber Routes

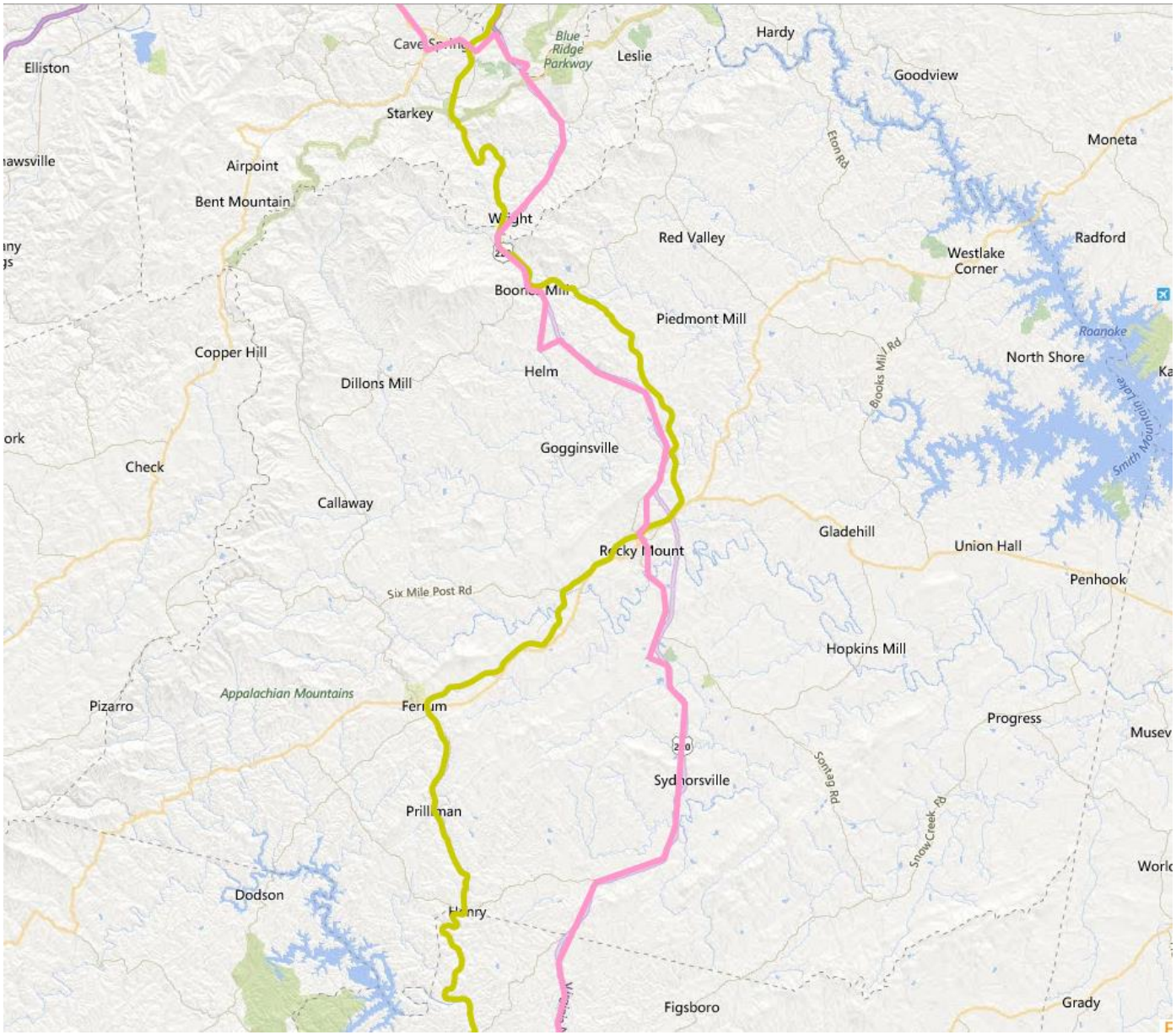
Metro and Long Haul providers

- Conterra
- Level3 Metro
- Lightower
- LIT Networks
- Lumos
- Mid-Atlantic Broadband
- Shentel
- Sunset Digital Com.
- Uniti Fiber
- Windstream

Must ensure conduit is added throughout the new business development location



Commercial Long Haul Fiber

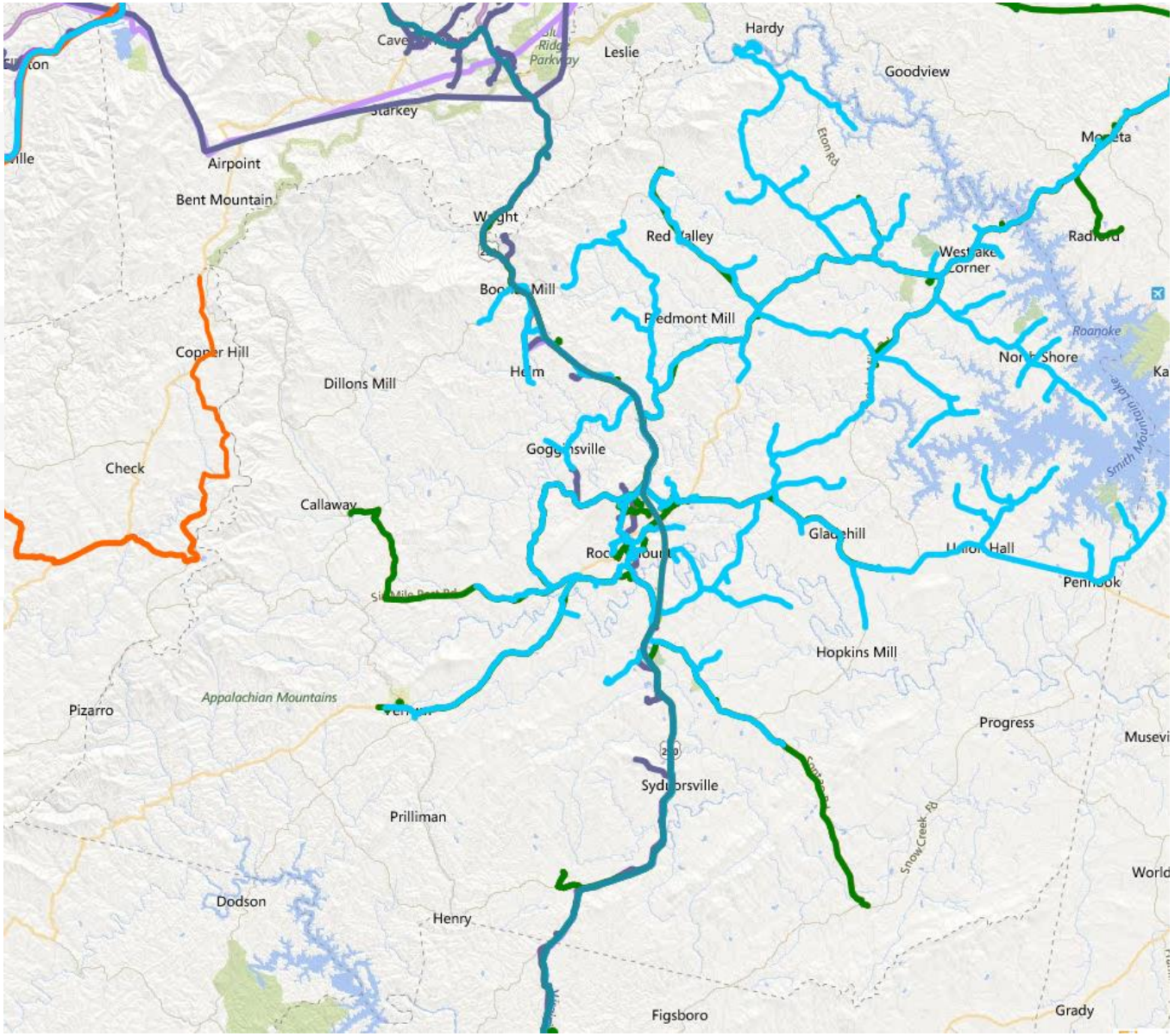


Level 3

Sprint

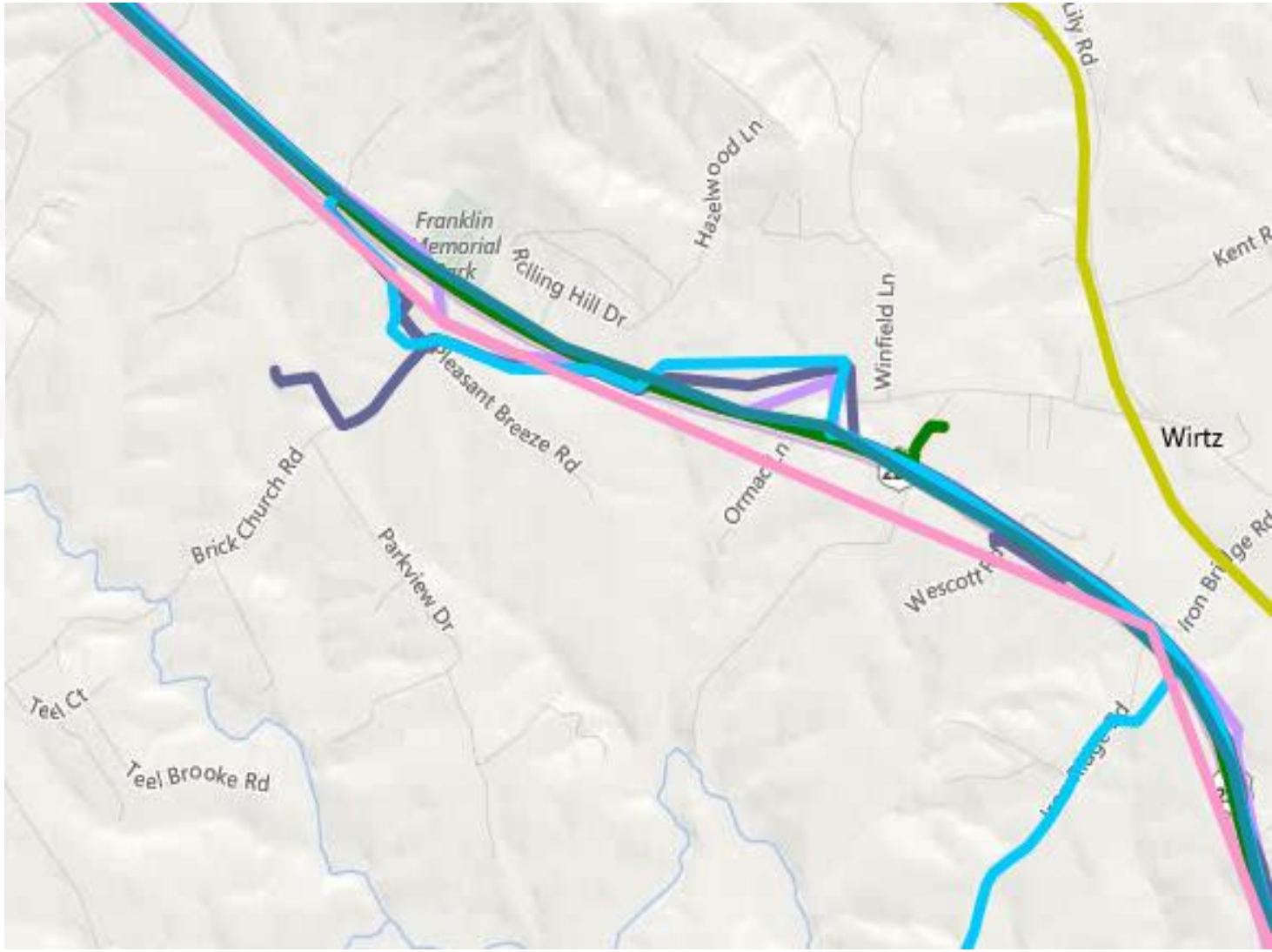
Commercial Metro Networks Fiber

- Conterra
- Level3 Metro
- Lightower
- LIT Networks
- Lumos
- Mid-Atlantic Broadband
- Shentel
- Sunset Digital Com.
- Uniti Fiber
- Windstream



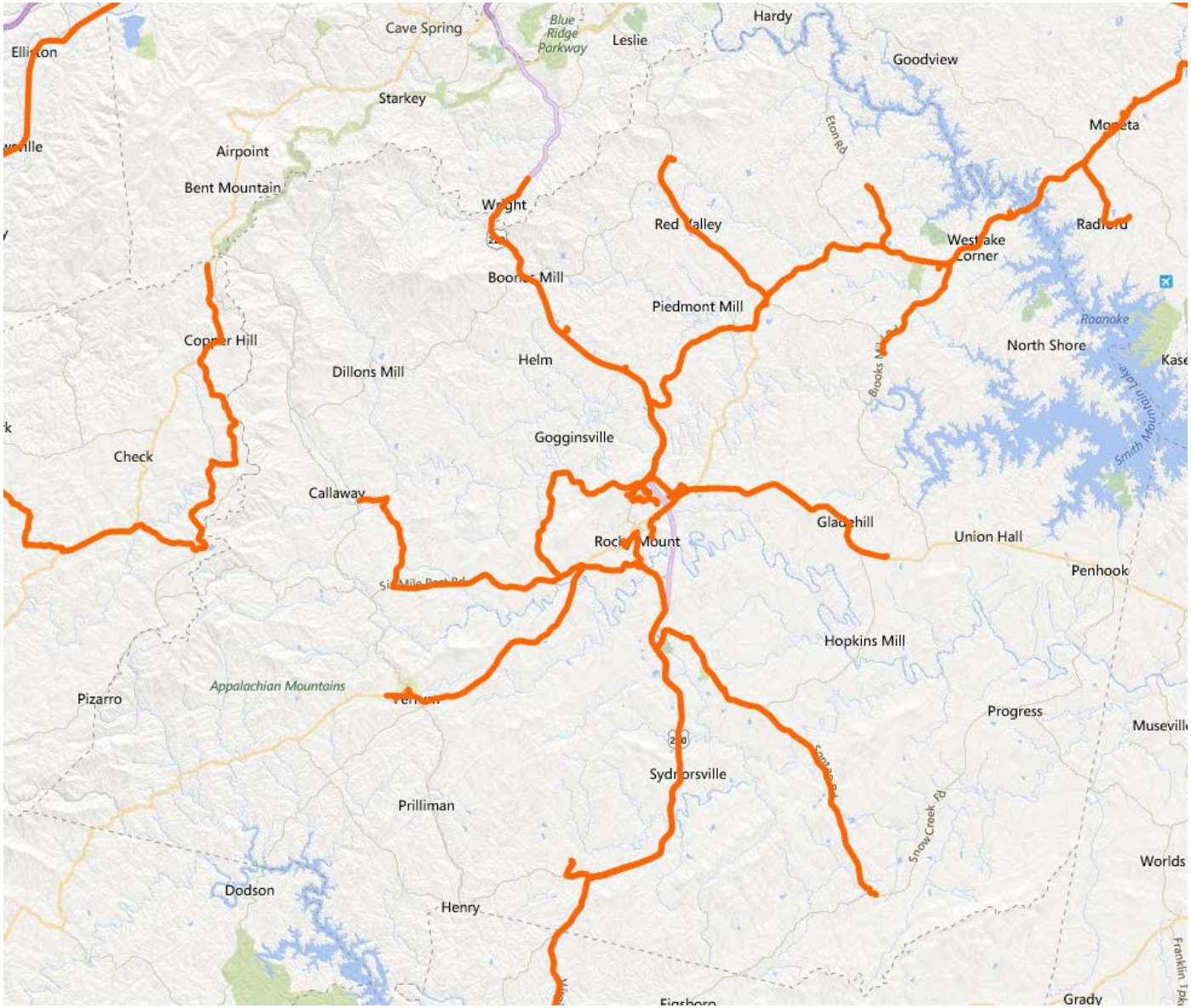
Commercial Fiber at Planned Business Park

- Lightower
- LIT Networks
- Lumos
- Mid-Atlantic Broadband
- Shentel
- Uniti Fiber
- Windstream
- Level 3
- Sprint

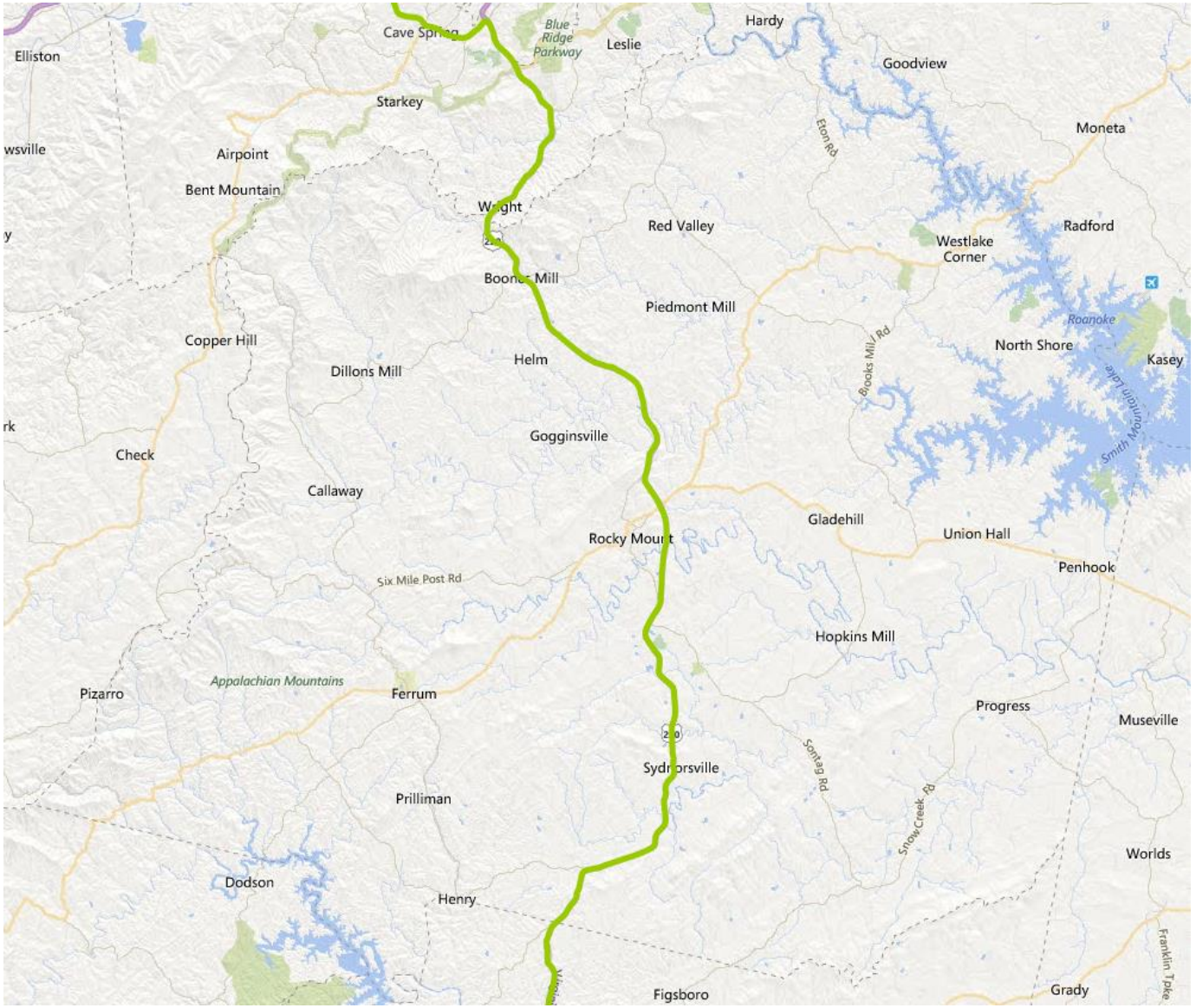


Commercial Metro Networks Fiber

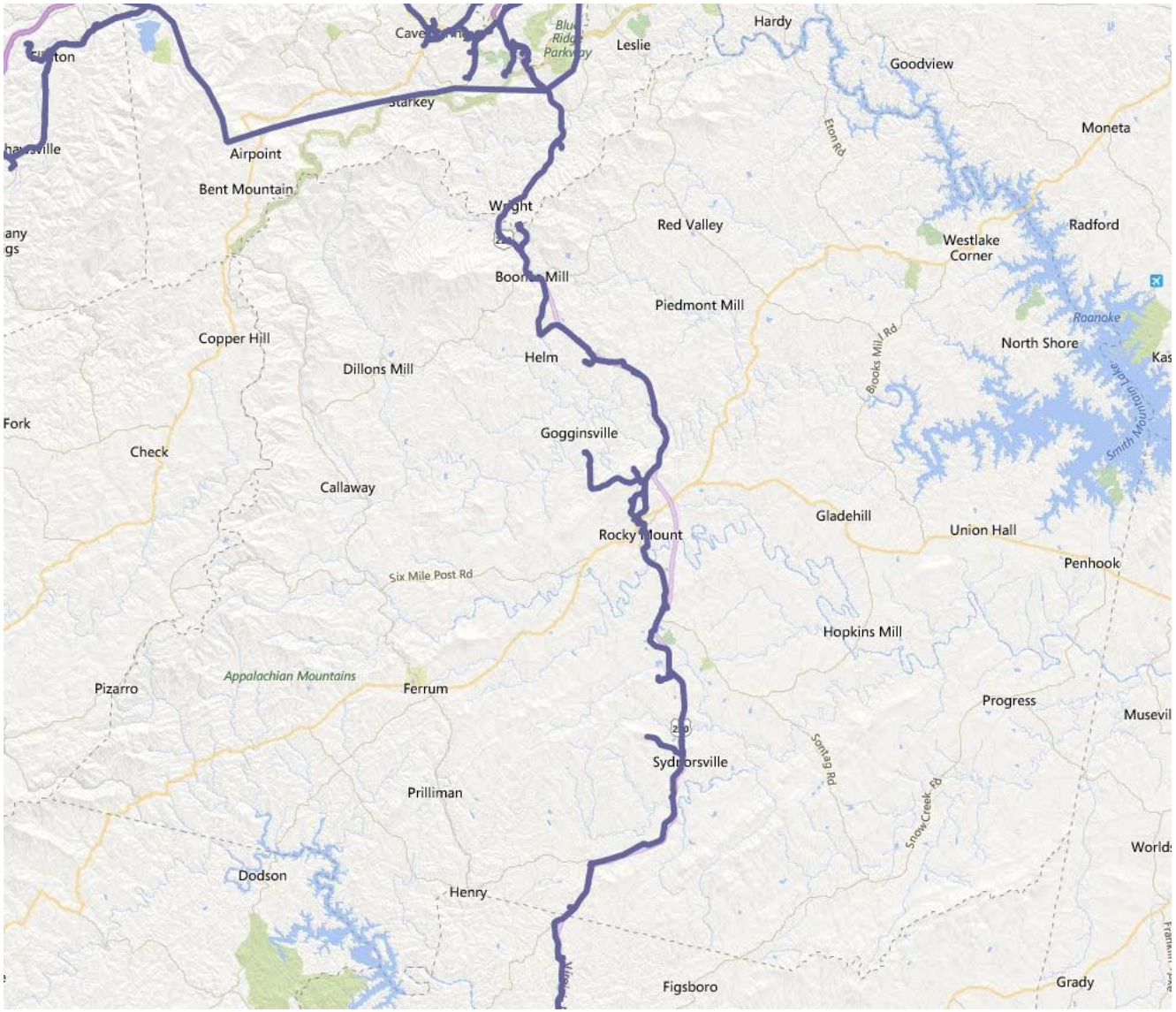
LIT Networks



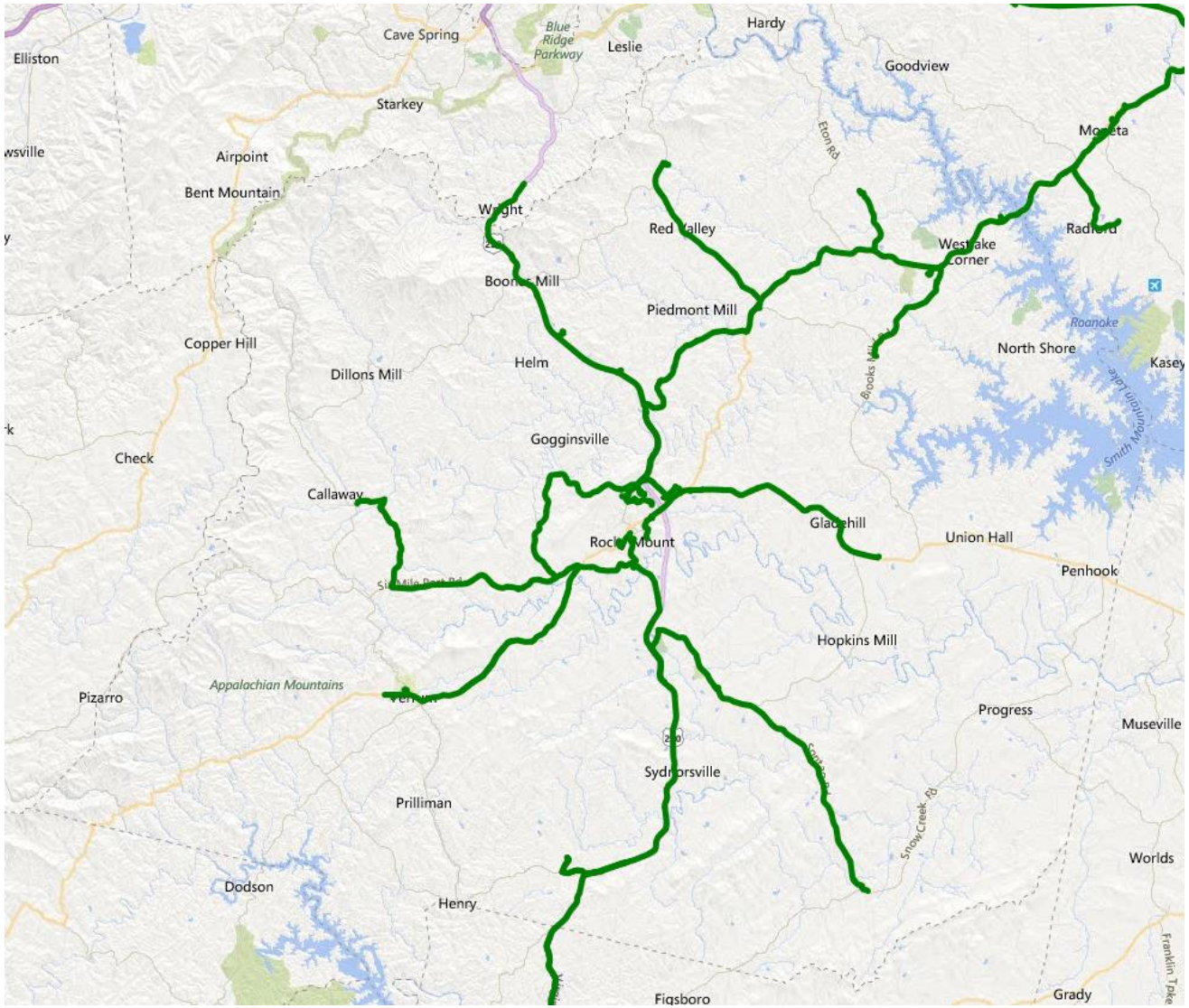
Commercial Fiber

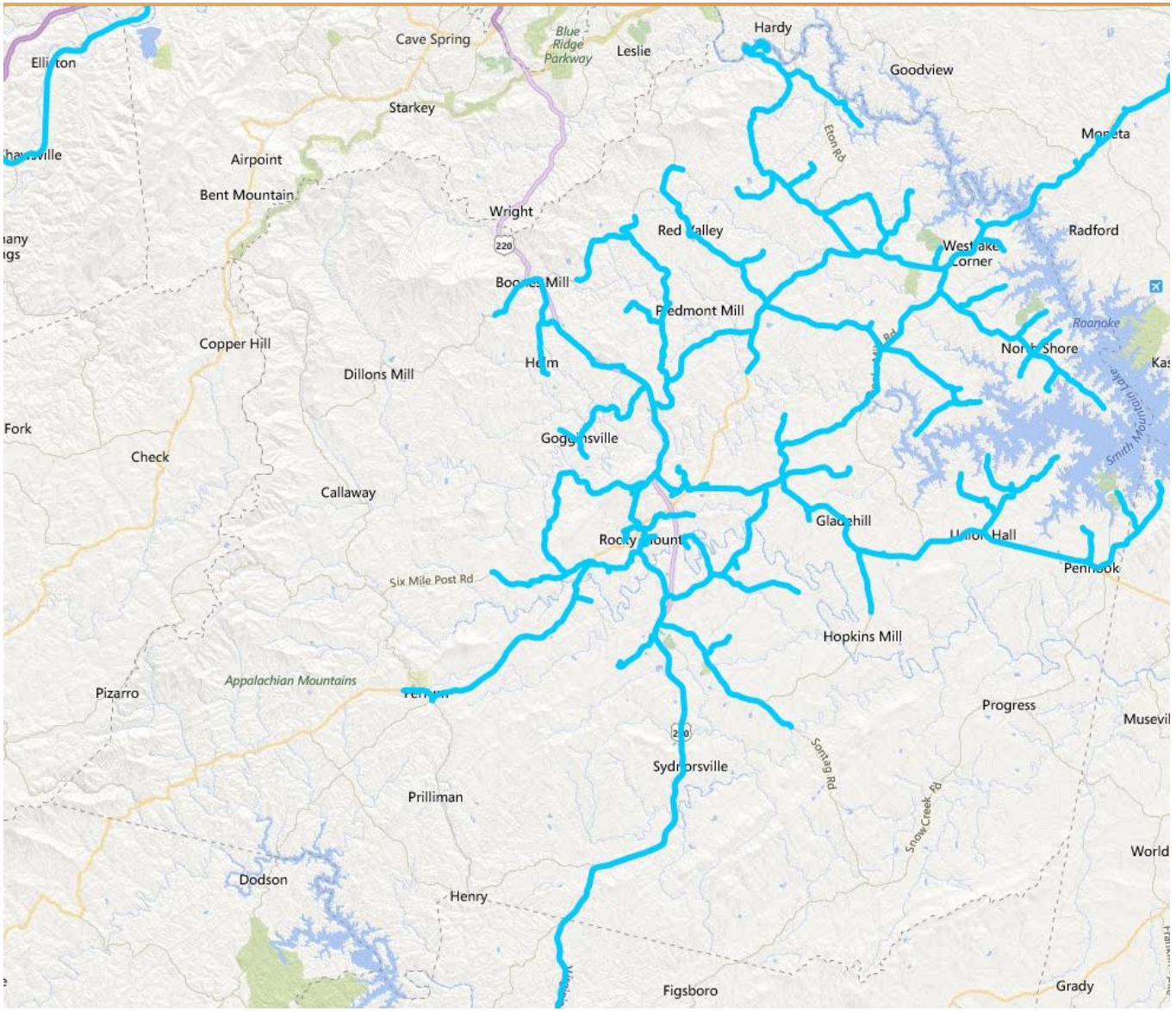


Lumos


Hardy
Leslie
Goodview
Moneta
Starkey
Airpoint
Bent Mountain
Red Valley
Radford
Westlake Corner
Piedmont Mill
Copper Hill
Dillons Mill
Helm
North Shore
Roanoke
Gogginsville
Callaway
Gladehill
Union Hall
Penhook
Six Mile Post Rd
Hopkins Mill
Appalachian Mountains
Pizarro
Ferrum
Progress
Prilliman
Dodson
Henry
Figsboro
Grady
Eton Rd
Brooks Mill Rd
Snow Creek Rd

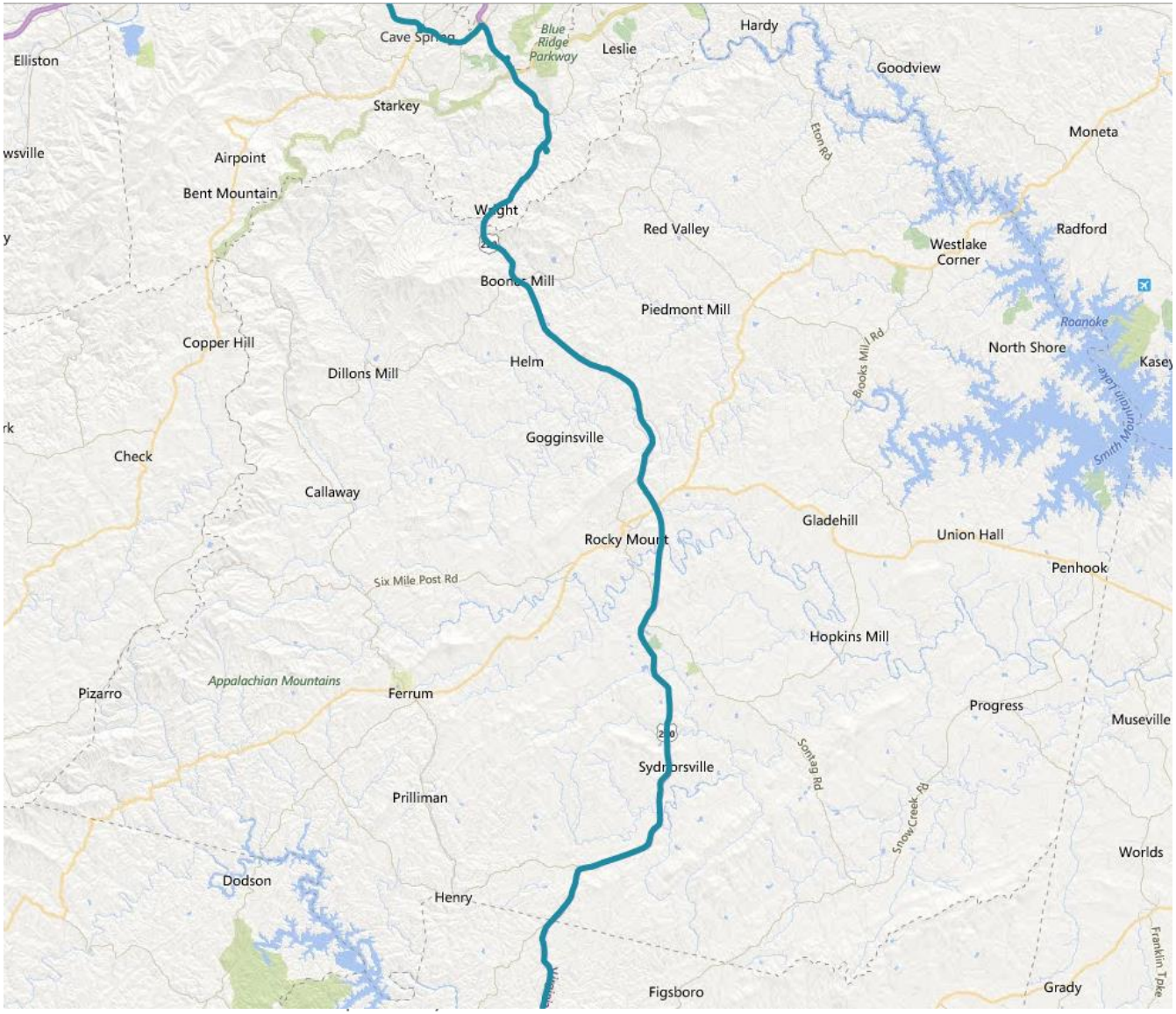
Mid-Atlantic Broadband




Cave Spring
Blue Ridge Parkway
Leslie
Hardy
Goodview
Starkey
Airpoint
Bent Mountain
Wright
Red Valley
Radford
Westlake Corner
Mill
Piedmont Mill
Roanoke
Copper Hill
Dillons Mill
Shore
Fork
Check
Callaway
Six Mile Post Rd
Hopkins Mill
Appalachian Mountains
Pizarro
Progress
Prilliman
Dodson
Henry
Figsboro
Grady

Shentel

Uniti Fiber


Elliston
Cave Spring
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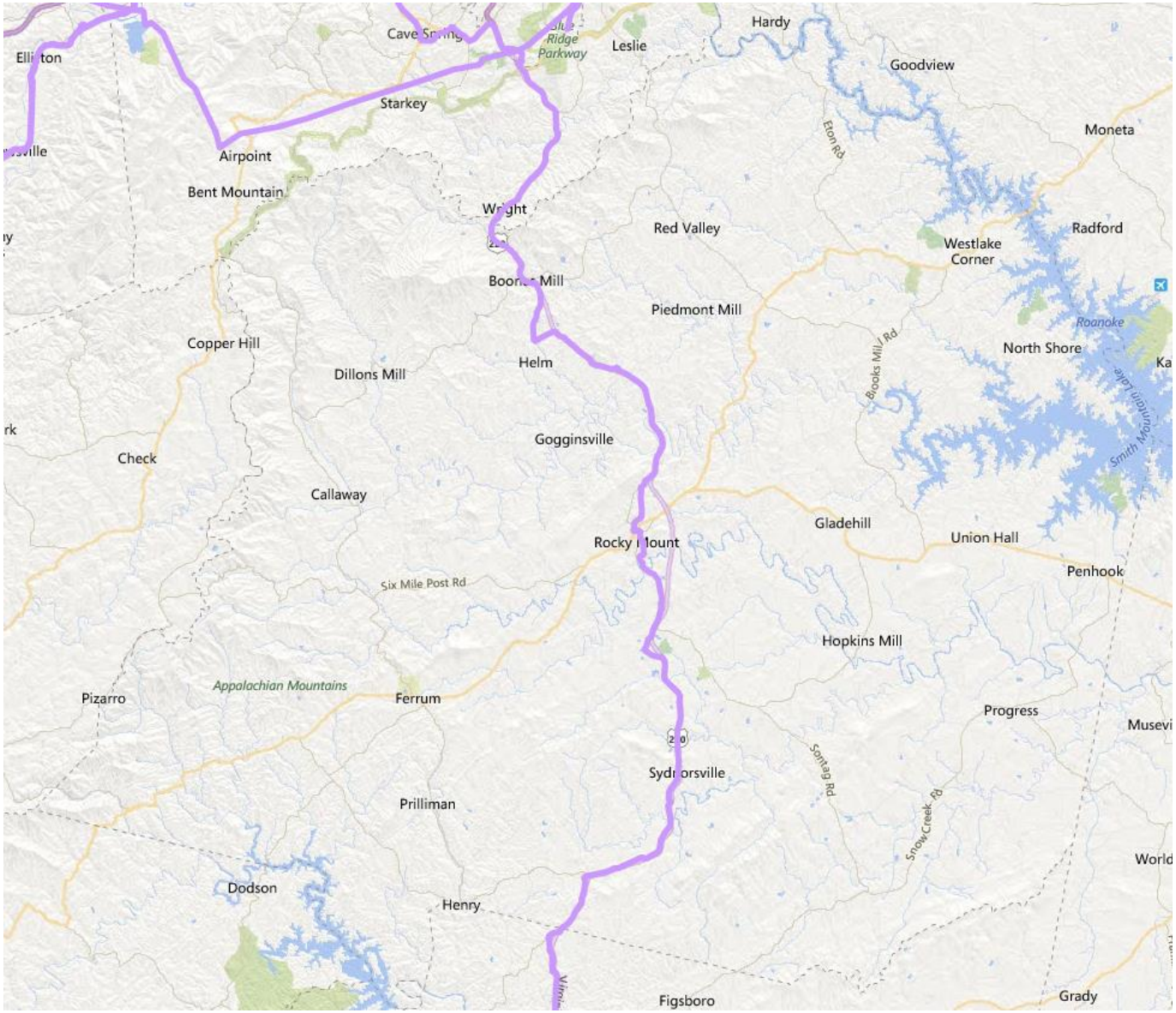
Leslie
Hardy
Goodview
Starkey
Moneta
Airpoint
Bent Mountain
Wright
Red Valley
Westlake Corner
Radford
Boones Mill
Piedmont Mill
Roanoke
North Shore
Copper Hill
Dillons Mill
Helm
Brooks Mill Rd
Check
Goggansville
Callaway
Gladehill
Union Hall
Rocky Mount
Six Mile Post Rd
Penhook
Hopkins Mill
Appalachian Mountains
Pizarro
Ferrum
Progress
Museville
Sontag Rd
Prilliman
Snow Creek Rd
Worlds
Dodson
Henry
Franklin Tpke
Figsboro
Grady

Windstream


Hardy
Leslie
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North Shore
Copper Hill
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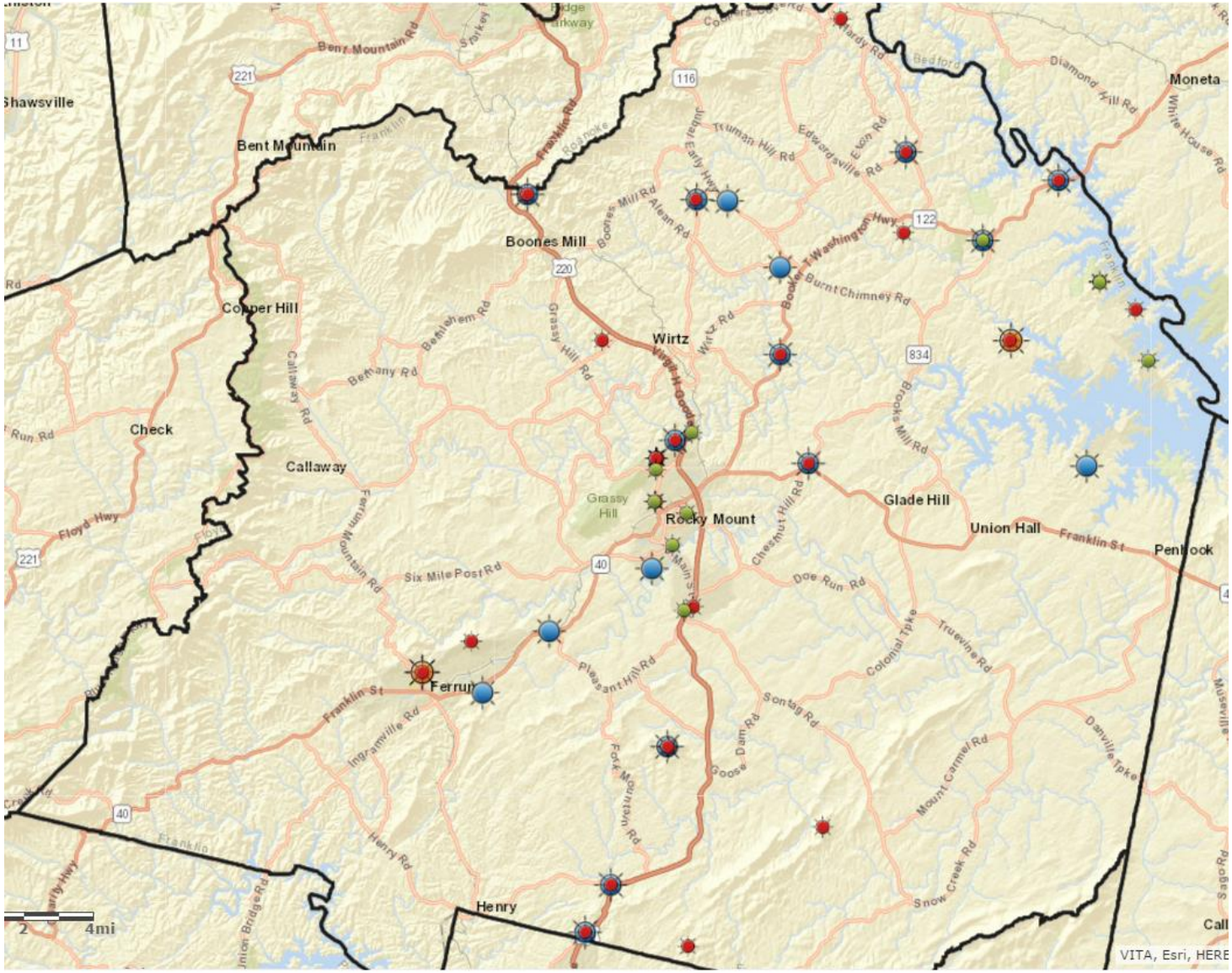
Hopkins Mill
Appalachian Mountains
Pizarro
Ferrum
Progress
Prilliman
Dodson
Henry
Figsboro
Grady
Eton Rd
Brooks Mill Rd
Smith Mountain Lake
Snow Creek Rd

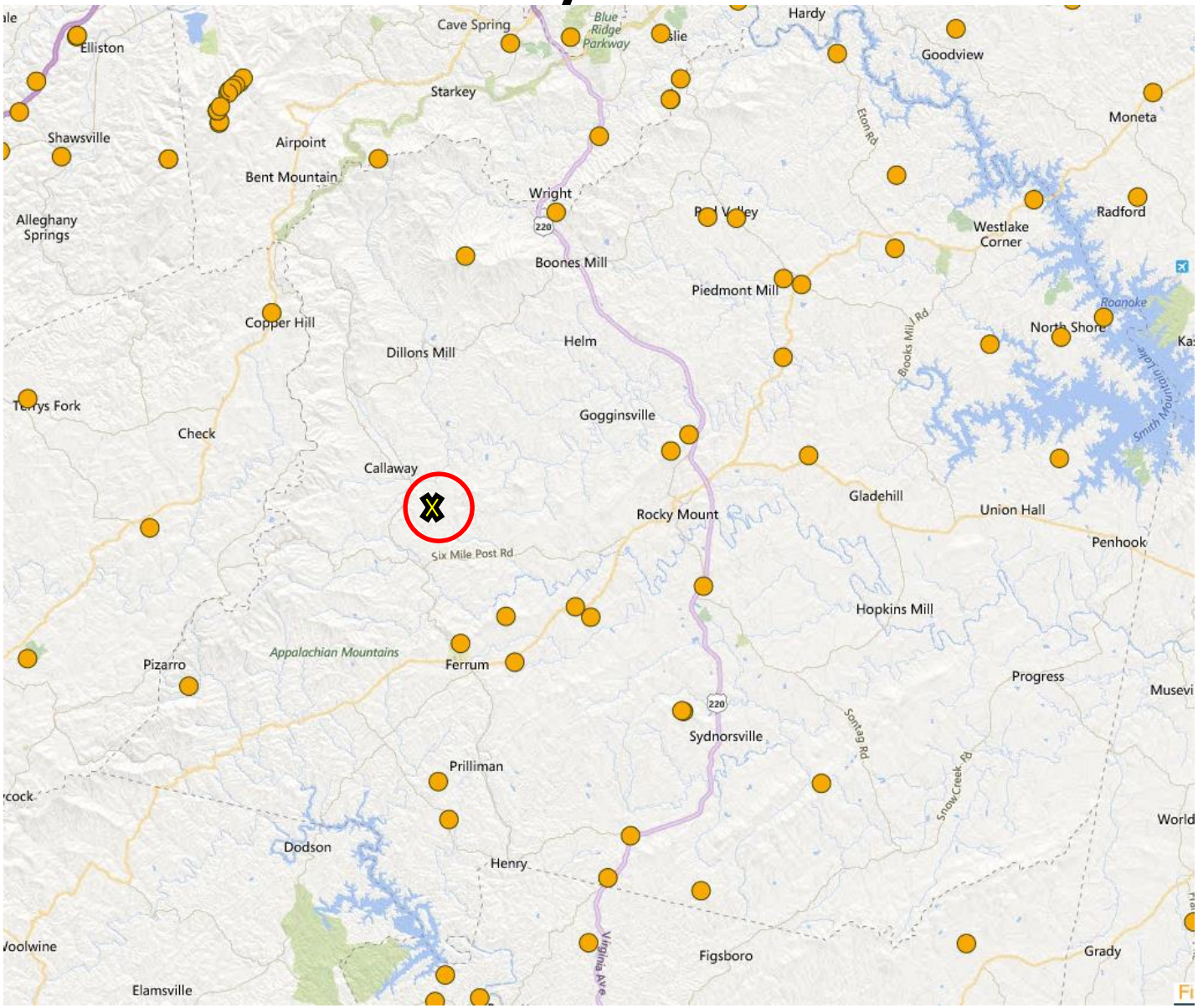
Franklin County Vertical Assets

Data Source:

'Franklin County GIS'	29
'FCC: ASR'	18
'Virginia Municipal League'	10
'FCC: Cellular'	2

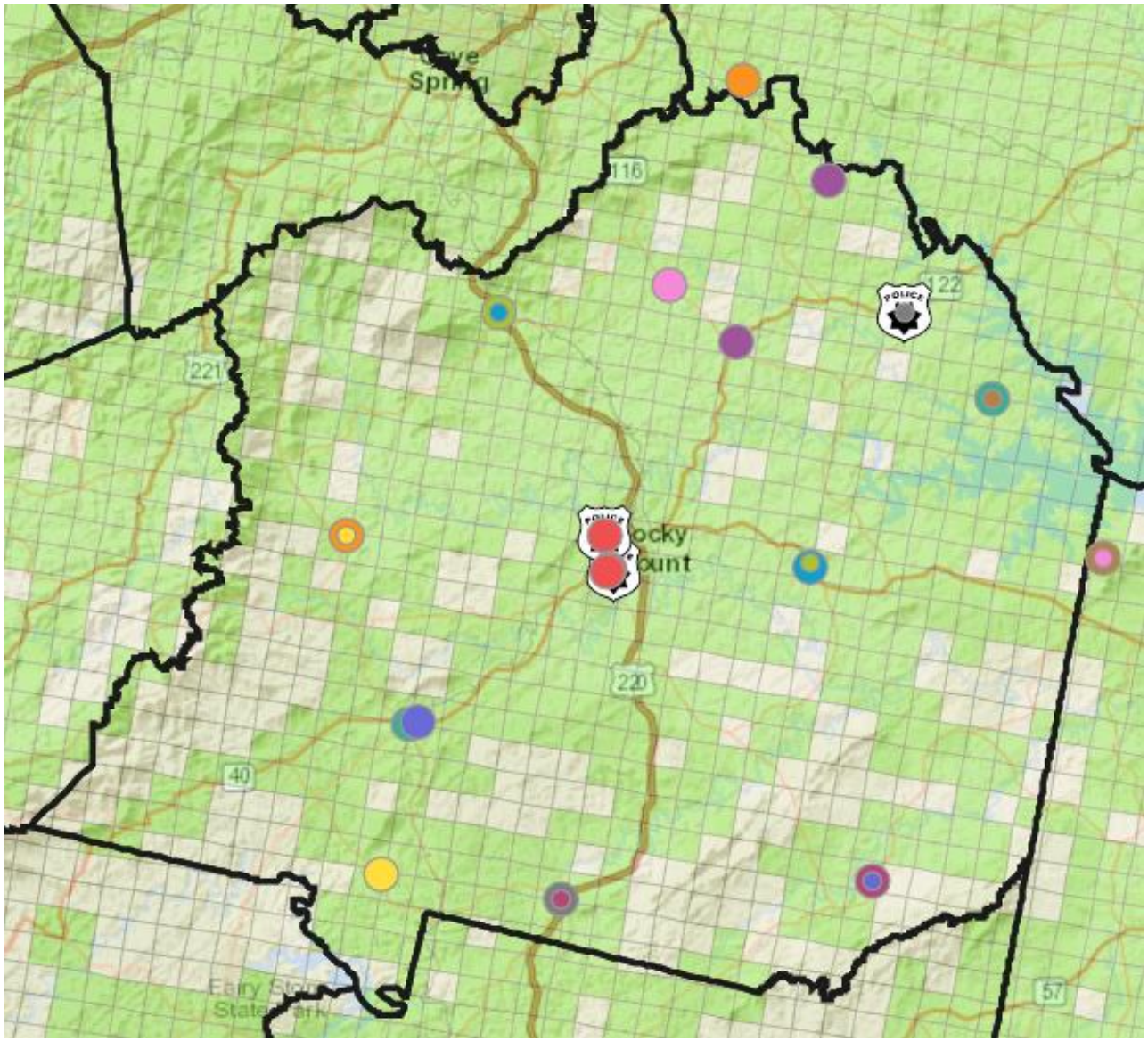


Franklin County Cellular Towers



Franklin County Public Safety

- Law Enforcement
- Rocky Mount Fire Company
- Boones Mill Fire Company
- Boones Mill Rescue Dept
- Burnt Chimney Fire Company
- Callaway Fire Company
- Callaway Rescue Squad
- Cool Branch Fire Company
- Cool Branch Rescue Squad
- Ferrum Fire Company
- Ferrum Recue Squad
- Fork Mtn Fire Company
- Fork Mtn Rescue Dept
- Franklin County Rescue Squad
- Glade Hill Fire Company
- Glade Hill Rescue Dept
- Hardy Fire Company
- Hardy Rescue Dept
- Henry Fire Company
- Red Valley Rescue Dept
- Scruggs Fire Company
- Scruggs Rescue Dept
- Snow Creek Fire Company
- Snow Creek Rescue Dist
- Westlake Fire Station



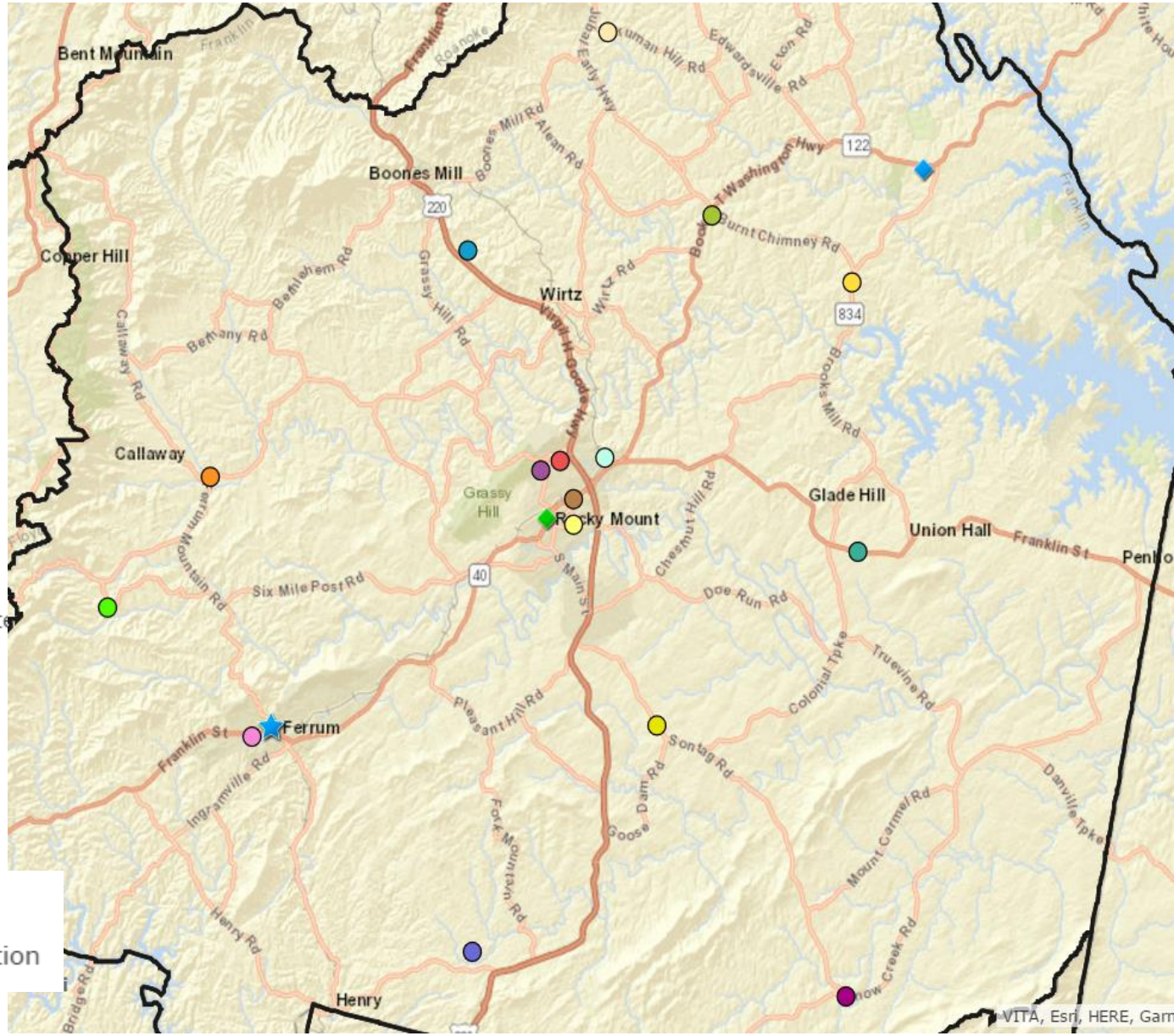
Franklin County Healthcare

Carilion Franklin Memorial Hospital

Westlake Medical Center

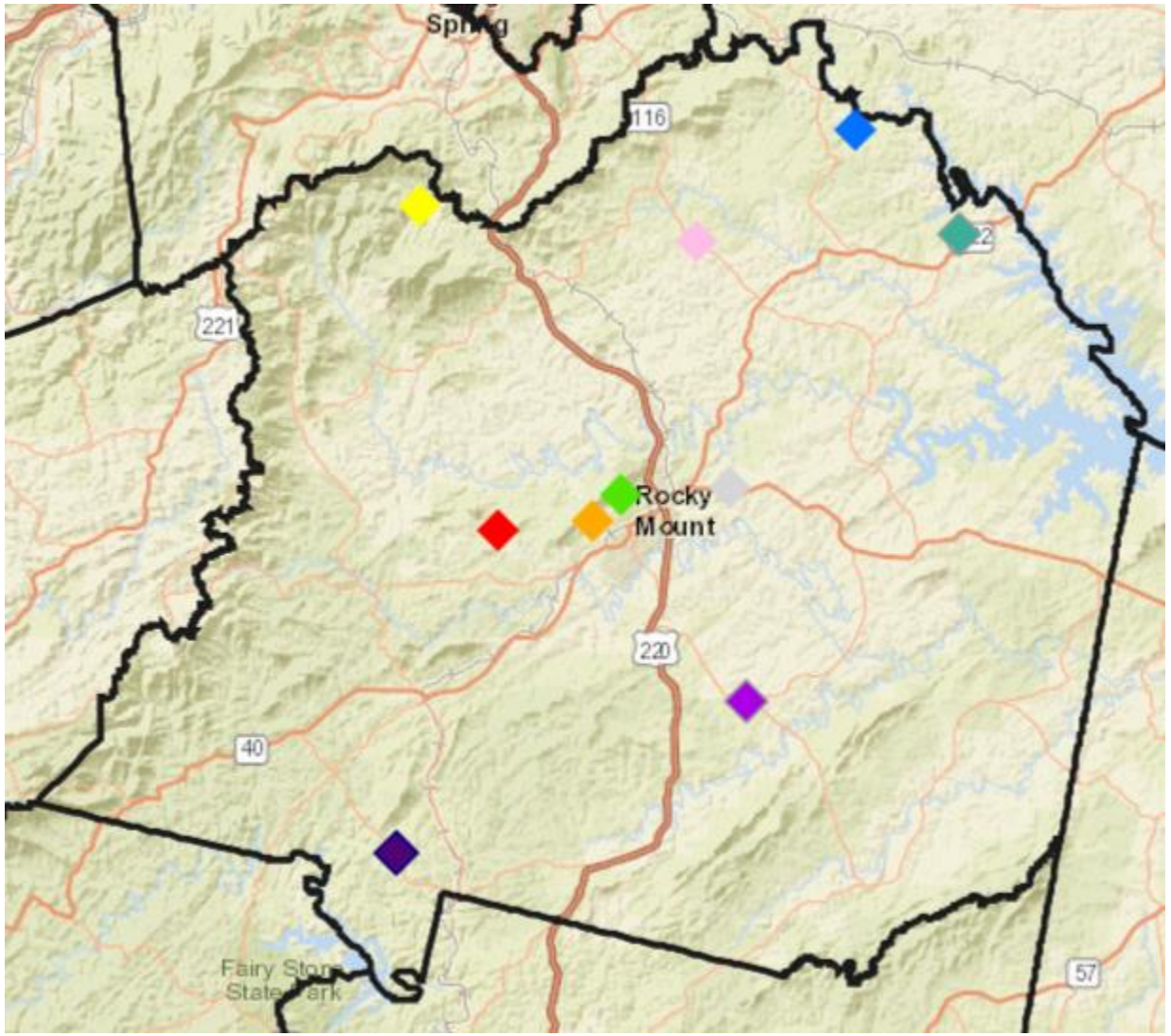
Franklin County K-12 Schools, Libraries, College

- Benjamin Franklin Middle
- Boones Mill Elementary
- Burnt Chimney Elementary
- CATCE (Gereau Center)
- Callaway Elementary
- Dudley Elementary
- Ferrum Elementary
- Franklin County High
- Glade Hill Elementary
- Henry Elementary
- Lee M Waid Elementary
- Phoebe Needles Educational Cente
- Rocky Mount Elementary
- Snow Creek Elementary
- Sontag Elementary
- Windy Gap Elementary School
- County Public Library
- Westlake Branch Library Location
- Ferrum College



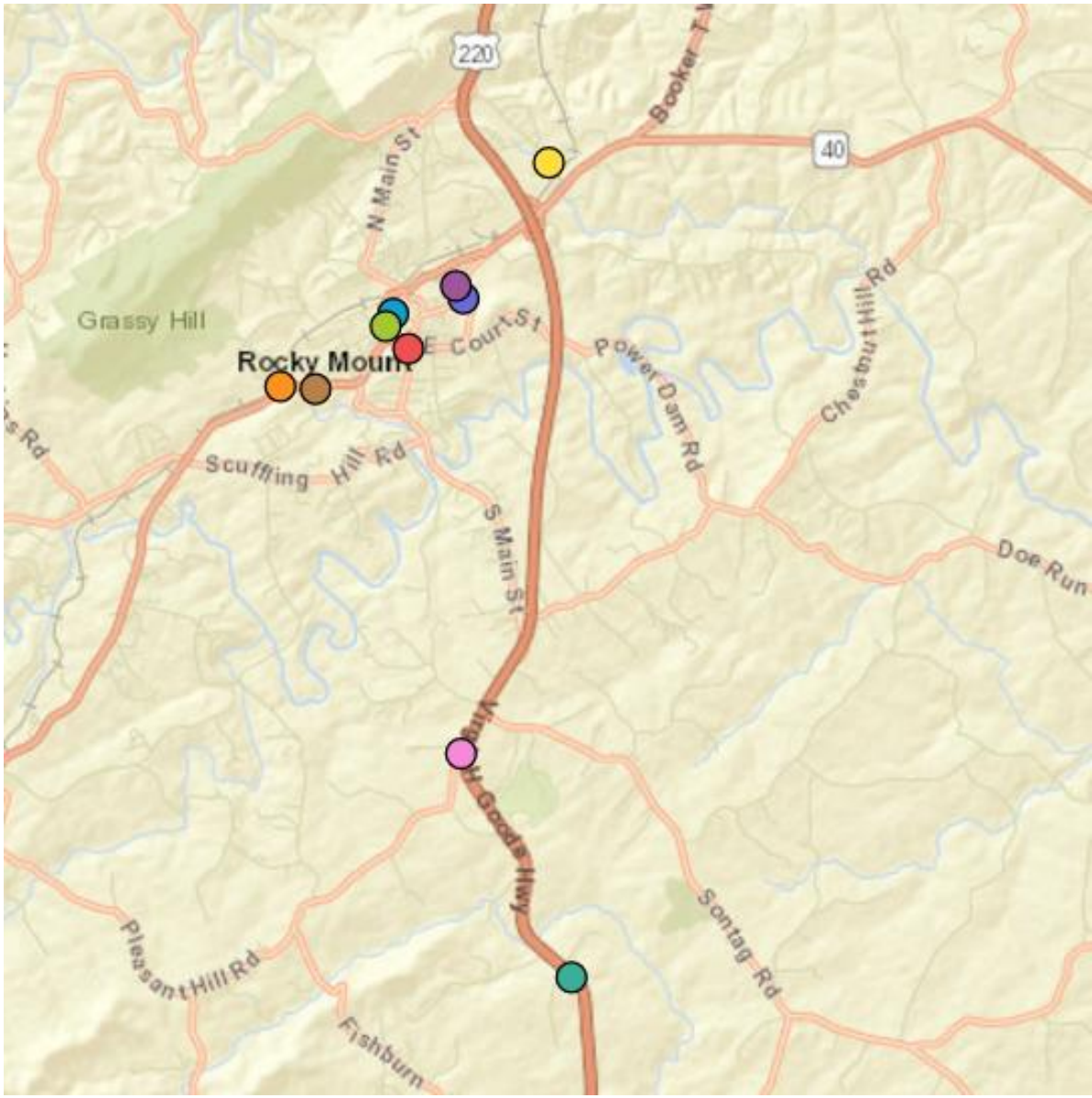
Franklin County Community Centers

- Coles Creek Community Center
- Coopers Cove Cummunity Center
- Franklin County Family YMCA
- Henry Community Center
- Masjid An-nur & Islamic Comminity Center
- Naff Community Center
- Red Valley Community Center
- Redwood Community Center
- Smith Mountain Lake YMCA
- Sontag Community Center



County Government Buildings

- Courthouse
- Franklin Center
- Franklin County Chamber of Commerce
- Franklin County Health Dept
- Franklin County Public Safety
- Franklin County School Board
- Franklin County Social Services
- Government Center
- Landfill
- Rocky Mount Administration Building

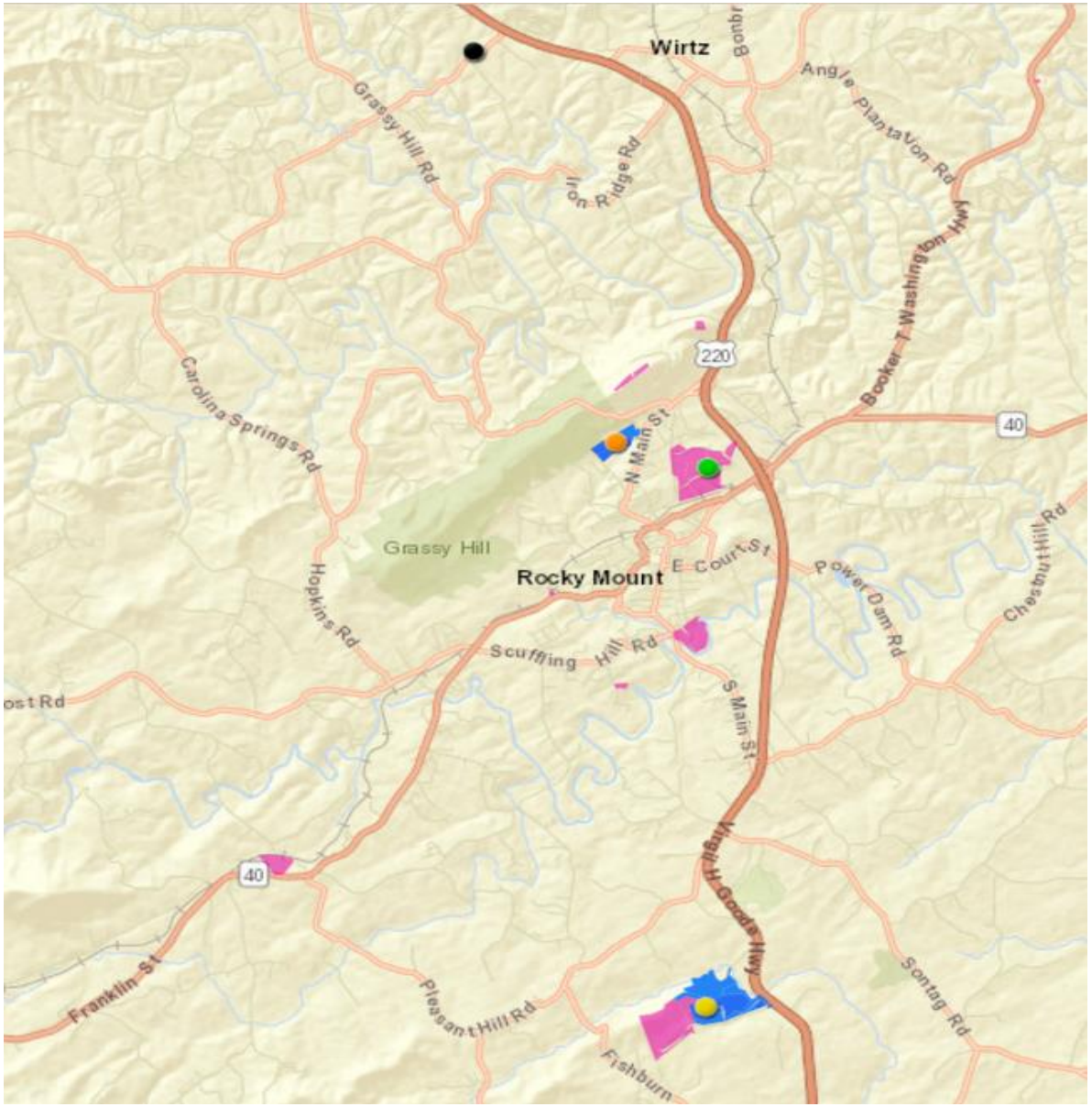


Business Parks, Commercial/Industrial Property

Business Park Parcels

Commercial/Industrial Parcels

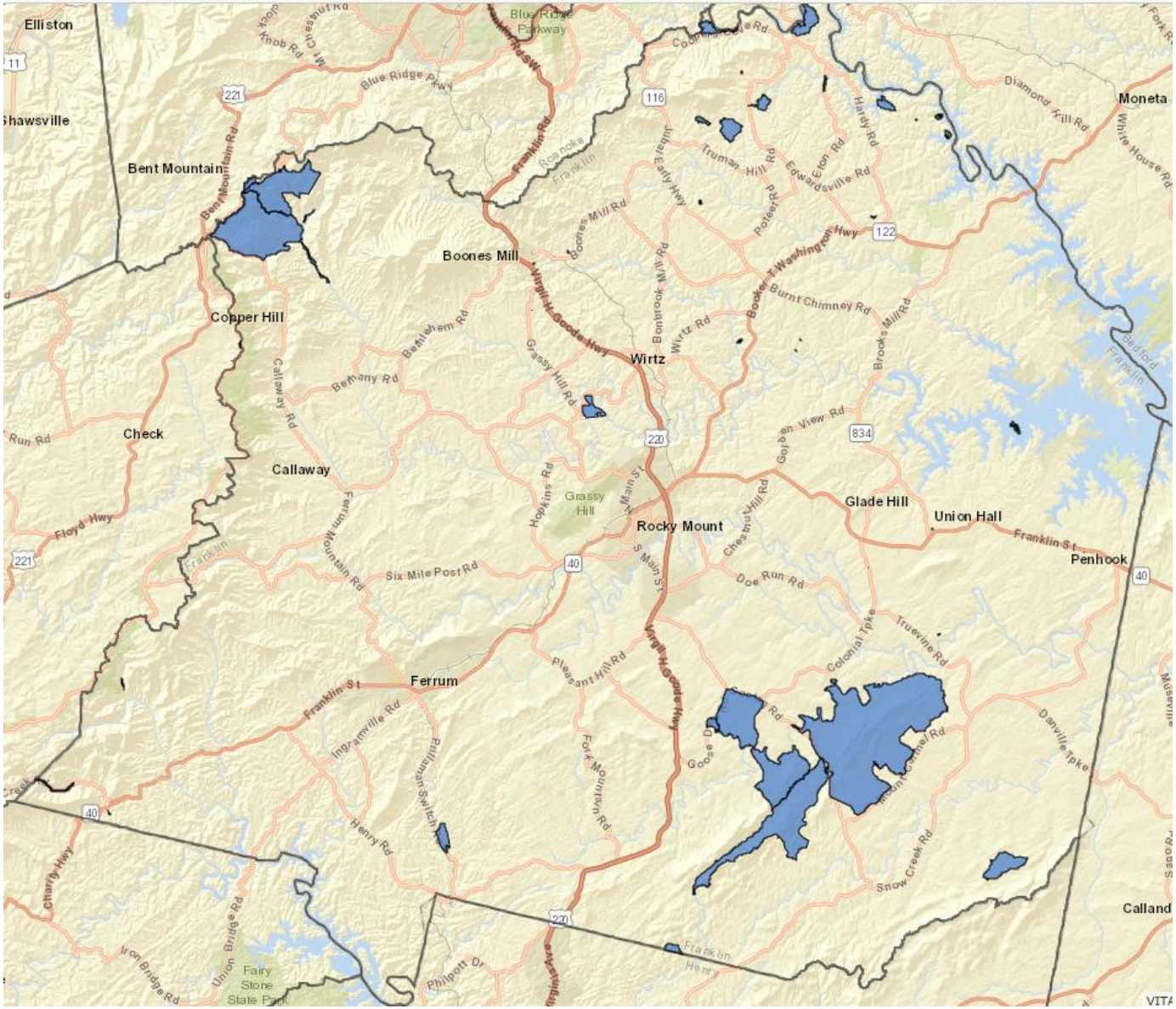
- County Business Park
- Franklin County Commerce Center
- Franklin Rocky Mount Industrial Park
- Technology Park



Franklin County CAFII Funding Areas

Connect America Funds Phase II (CAFII) Eligible Blocks
(Preliminary)

Potential Funding
$80,548.13 per year
over 6 yrs.



Affect the Broadband Economics

REVIEW OF LOCAL POLICIES & FEES

Make sure your policies and procedures are "Broadband Friendly"

Review comprehensive plans, community zoning regulations and process, policies, fees, etc. must **encourage and enable broadband investment**.

Review local franchise agreements for **setback or long-drop** policy. Long-drop policy information should be conveyed to all new homebuilders, and real estate developers.

Adopt Dig Once: Dig Once means less construction disruption, and costs for private providers—who may simply decide not to deploy in an area where the economics don't work.

Policy Considerations for Telecommunications Deployment
https://www.wired.virginia.gov/sites/default/files/Telecom%20Deployment%20Policy%20Recs.pdf

Policy Assessment - Areas to Consider
https://www.wired.virginia.gov/sites/default/files/Policy%20Assessment%20Tool%20Guide_0.pdf

Policy Assessment worksheet:
https://www.wired.virginia.gov/sites/default/files/Policy-Assessment-Tool.xlsx

Google Fiber Checklist:
https://fiber.storage.googleapis.com/legal/googlefibercitychecklist2-24-14.pdf

Remember: to make it "cheap, quick & easy"

Franklin County Local Policies

The following policies may not represent a comprehensive list of potential local Internet related policies. All local Internet related policies should be reviewed with potential partners and adjusted as necessary to explore incentives and identify barriers to broadband expansion

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Source: www.municode.com

Code of Ordinances Chapter 25 - ZONING ARTICLE II. - BASIC REGULATIONS DIVISION 4. - SUPPLEMENTARY REGULATIONS
Sec. 25-128. - *Towers*, antennas, satellite dishes
25-128.a Special Use Permit Requirements Sec..

Franklin County, Virginia - Code of Ordinances Chapter 5 - BUILDING REGULATIONS ARTICLE II. - BUILDING CODE Sec. 5-27. - Permit fees.Sec. 5-27. - Permit fees.
(h)Towers, antennas, and similar regulated structures: Structural fee—$100.00

Code of Ordinances Chapter 25 - ZONING ARTICLE III. - DISTRICT REGULATIONS DIVISION 7. - RESIDENTIAL PLANNED UNIT DEVELOPMENT DISTRICT (RPD)
Sec. 25-306. – Utilities: Within a planned unit development all newly installed utilities, including television cable and electrical systems, shall be installed underground.

Assessment Based

COMMUNITY BROADBAND NEEDS

Franklin County Needs Identified

- **Demand Survey**
  - Residential
    - The majority (39%) of residential respondents are connected by DLS, 32% cable.
    - 34% are dissatisfied with their current service
    - 22% rely in inadequate services; upon cellular, satellite or dial up
    - 20% have NO access at home.
    - 22% of all respondents report school aged children at home, 15% of K-12 households have no Internet access.
    - 32% work from home, 12% would work from home if they had better access.
    - OPTION: Expand access and capacity to county residents – Snow Creek, Penhook, Calloway, Henry, Hardy, Ferrum

Needs Identified (Cont'd)

- Businesses
  - DSL (33%) is the most common business connection type, followed by cable (27%)
  - 90% consider Internet very important or critical to their business.
  - 34% state they are dissatisfied with their business Internet service.
  - 23% of businesses depend on inadequate connection types; cellular, satellite, or dial-up
  - OPTION: Expand access and capacity to county businesses in the following areas; Snow Creek, Penhook, Henry, Calloway, Hardy

Needs Identified (Cont'd)

- **Technology Adoption**
  - Digital Literacy
    - 19% of population are seniors
    - 15% of population have a disability
    - ~30% of population may have affordability challenges

    - OPTIONS:
      - Promote computer literacy classes at libraries, community and senior centers for the populations that may be slow to adopt technology, or need special equipment.
      - Consider a computer refurb/donation program such as Virginia Star - a state-wide Student Training and Refurbishment program; http://vastar.org/ for those with affordability challenges.

Needs Identified (Cont'd)

Libraries

- USAC
  - **Does not participate in eRate.**
  - OPTION: Consider eRate participation, consult with Library of Virginia to maximize/coordinate eRate opportunities.
- LVa speed test:
  - Median Download ~22 Mbps, Upload ~13 Mbps;
    - National recommendation of 1 Gig (1024 Mbps) for libraries serving communities with a population of over 50,000. (Franklin Co. total pop 56,360)
    - Library patrons use 40 Mb connection from B2X. No contract in place
  - OPTION: Increase capacity at libraries to meet national recommendations.

✓ Public computers, workforce development and computer literacy training classes are available at both library branches.

Needs Identified (Cont'd)

Schools

- 1 Gbps lit fiber from Shentel Communications, LLC at ~$6,900 per month, ~$6.70 per Mb. **Contract Expires 06/30/2019**

- (15) 1 Gbps lit fiber WAN connections from Shentel Communications, LLC at $27,600 per month, ~ $27 per Mb **Contract Expires 06/30/2019**

OPTION – most cost on WAN – build your own and include dark fiber – leverage eRate .

From NCES - The National Center for Education Statistics :

- ~141 Kbps per Student/Teacher

✓ **Above national recommendation of 100Mb per 1000 Students + staff**

Some public schools are in noted un/underserved areas;

OPTION - increase access and capacity to Callaway Elementary, Snow Creek Elementary, and Henry Elementary

Needs Identified (Cont'd)

County Government

- Local government facilities connected by B2X, Shentel, an Lumos
- No active contract in place for B2X county connections

Public Safety

- Fire and Rescue stations in the following areas may need increased access and capacity; Snow Creek, Callaway, Fork Mtn and Henry.

Community Centers

- The following community centers may need increased access and capacity; Henry CC, Naff CC, and Coles Creek CC.

Franklin Needs Summary

4 schools, 3 community centers potentially need increased access and capacity

Schools

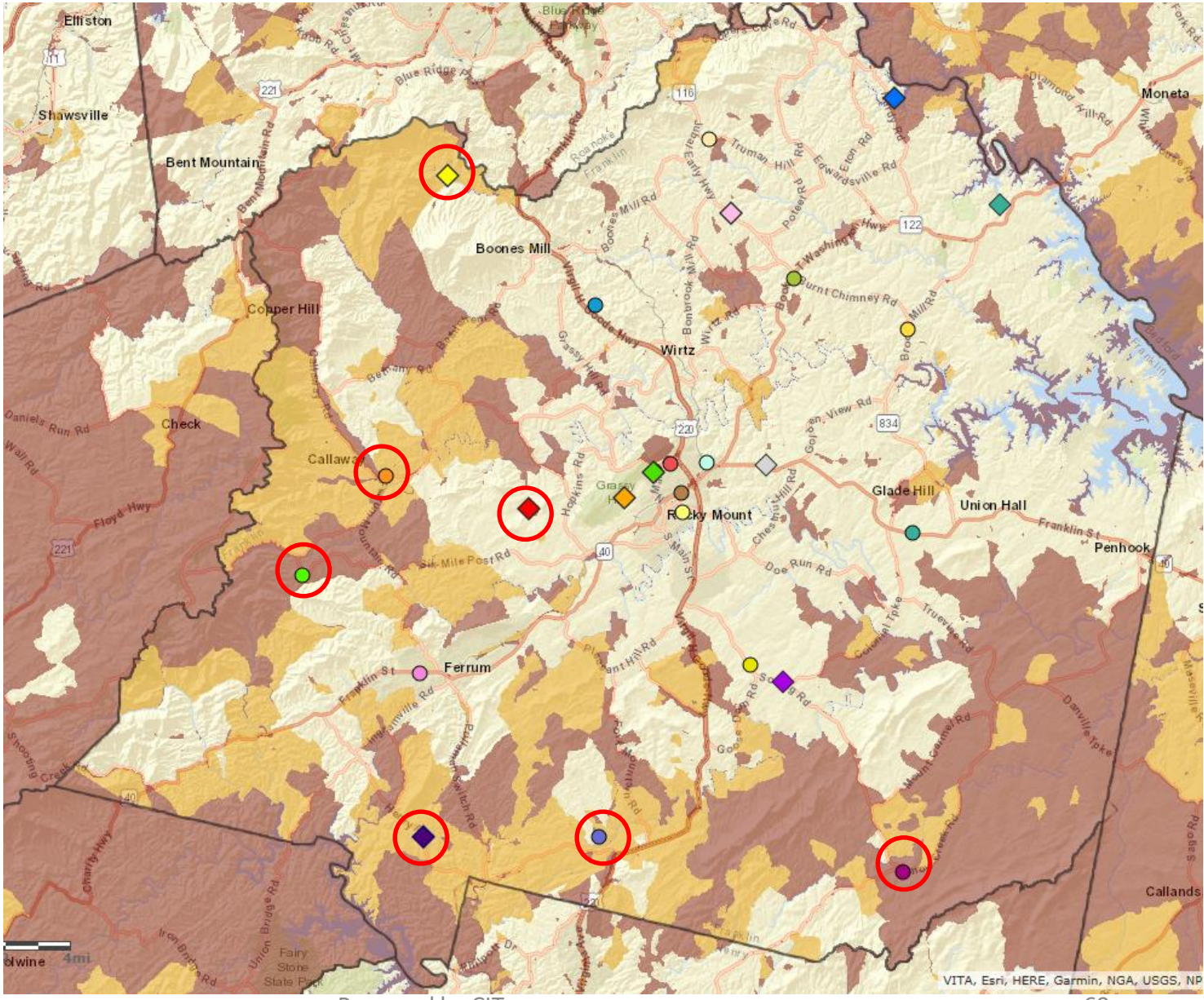
- **Phoebe Needles Educational Center**
- **Callaway Elementary**
- **Snow Creek Elementary**
- **Henry Elementary**

Community Centers

- **Henry CC**
- **Naff CC**
- **Coles Creek**

Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

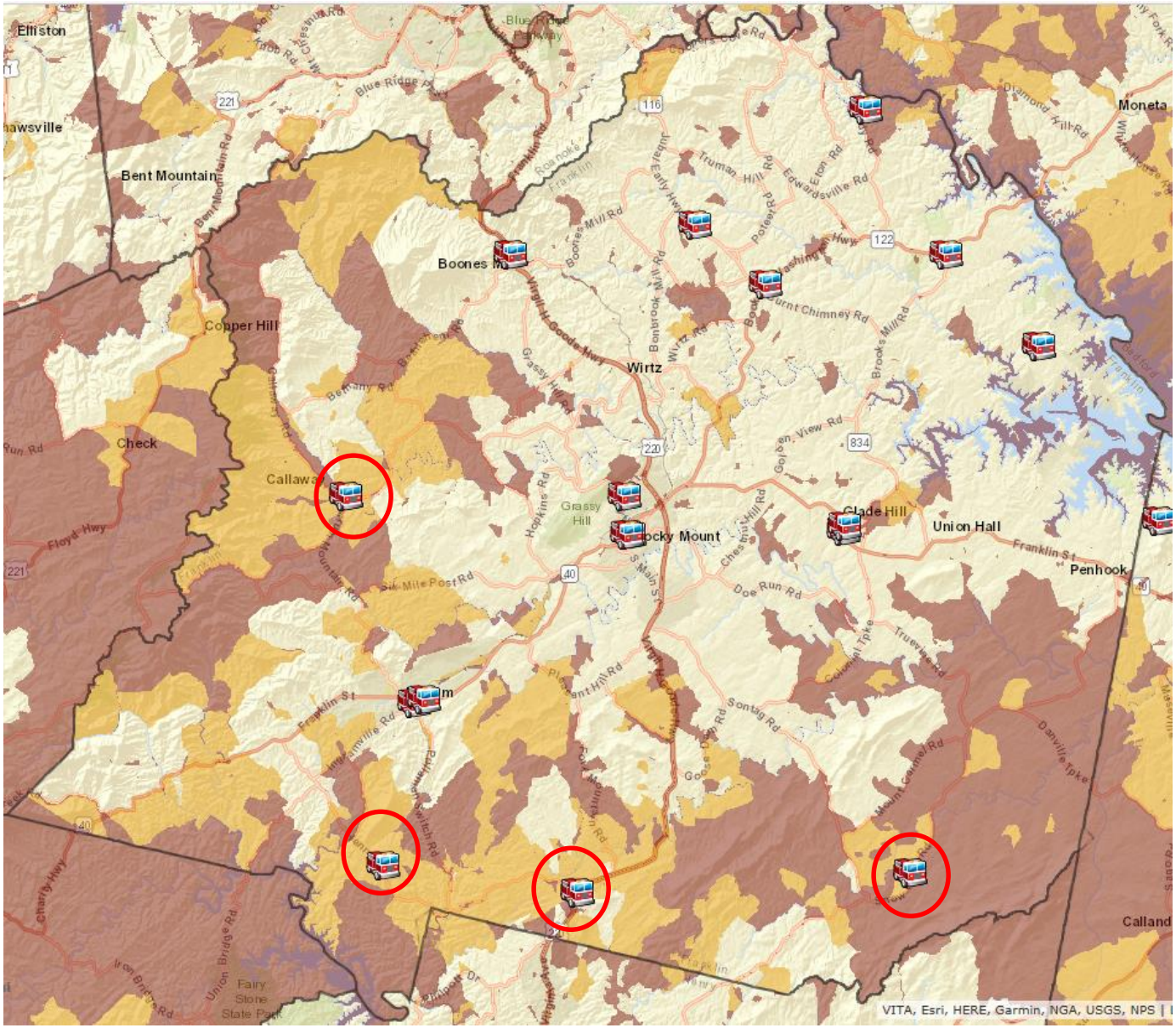


Franklin Needs Summary (Cont'd)

4 Fire/Rescue stations potentially need increased access and capacity

Fire/Rescue Station

- **Snow Creek**
- **Callaway**
- **Henry**
- **Fork Mtn**



Unserved = Broadband speed below 10 Mbps Download speed

Underserved = Broadband speed between 10 Mbps Download speed and 25 Mbps Upload speed

Potential Funding

https://www.wired.virginia.gov/broadband/resources

Look Under Funding Options

E-Rate – already participating: February 3 - May 26 (Schools) or July 21 (Libraries and Consortia)

Lifeline Support http://www.lifelinesupport.org/ls/changes-to-lifeline.aspx - Open all year

NOW USDA accepting applications for the Community Connect Grant Program for FY 2017. These grants may be used to provide broadband service in unserved, lower-income and extremely rural areas.

USDA Distance Learning and Telemedicine Program (DLT)
http://www.rurdev.usda.gov/UTP_DLT.html The application window is announced annually

USDA Telecommunications Infrastructure Loans & Loan Guarantees
http://www.rd.usda.gov/programs-services/farm-bill-broadband-loans-loan-guarantees **NOTE**: These loans are for local incumbent providers. Open annually around April

USDA Distance Learning and Telemedicine Program (DLT)
http://www.rurdev.usda.gov/UTP_DLT.html - The application window is announced annually

NOW USAC Healthcare Connect Fund Program
http://www.usac.org/rhc/healthcare-connect/default.aspx - Filing Window : Mar 1 – June 30, 2017

DHCD VCI/VTI - http://www.dhcd.virginia.gov/ - TBA

Next Steps

- Identify and Prioritize Goals Based on Needs
  - Assessment findings need to be conveyed to the BoS.
  - Committee passes their recommendations to BoS, or leaves the decisions to the BoS.
- Determine the role the local government will assume in achieving the goals
  - Review CIT Partnership Models Handout
  - Decision need to be adopted by the COUNTY
- CIT will prepare the Requirements Document and Draft RFP
  - CIT will formally document chosen goals, role, assets to be shared, local considerations etc. to include in RFP
- Seek private partner(s)
  - The County will publish the RFP, evaluate responses and choose partner(s)

Questions? Comments?

Contact Information

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540-250-2751

Franklin County/Blue Ridge Towers Broadband Milestone Project Tracker

Site Name	Site Address	Tower Type	Landlord	MS1 SCIP	MS2 Site Acq	MS3 Survey/2C	MS4 Zoning Submittal	MS5 Zoning Approval	MS6 FAA TOW AIR Approval	MS7 FCC Tower Registration	MS8 Phase I	MS9 SHPO/NEPA	M10 Geotech Report	MS11 Construction Drawings	MS12 Building Permit Submittal	MS13 Tower Order	MS14 Construction Start	MS15 Foundation Complete	MS16 Tower Delivery	MS 17 Electrical Inspection Passed	MS18 Construction Complete	MS19 SITE ON AIR
Franklin County Summit View	21745 Virgil H Goode, Rocky Mount, VA 24151	175' Monopole	Blue Ridge Tower/FC	3/15/2019	3/15/2019	4/15/2019	4/15/2019	6/27/2019	6/1/2019	6/1/2019	6/15/2019	6/15/2019	7/5/2019	6/27/2019	7/15/19 Start with a 8/15/19 Completion	6/24/2019	8/1/2019	9/1/2019	9/12/2019	9/15/2019	9/30/2019	10/30/2019
Westlake	71 Parkcrest Drive. Hardy,Va 24121	175' Monopole	Blue Ridge Towers	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Snow Creek	6200 Snow Creek Road, penhook, VA 24137	195' Monopole	Blue Ridge Towers/Daniel Smith	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Calloway	8451 Calloway Road Rd. Calloway, Va 24067	195' Monopole	Franklin County School Board	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Henry Volunteer VFD	5241 Henry Road, Henry, VA 24102	195' Monopole	Franklin County/Henry VFD	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Fork Mtn Fire Station	2797 Virgil H Goode Hwy,Rocky Mt, VA 24151	195' Monopole	Franklin County/Fork Mtn VFD	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Glade Hill Elementary School	8081 Old franklin Turnpike, Glade Hill, VA 24092	80' Monopole	Franklin County School Board	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Sontag Elementary School	3101 Sontag Road, rocky Mount, VA 24151	80' Monopole	Franklin County School Board	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Grassy Hill Tower	815 Summit Drive, Rocky Mount, VA 24151	Existing 195' SST	Franklin County	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Scruggs Tower	2075 Blue Water Drive, Moneta, VA 24121	Existing 195' SST	Franklin County	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Tom's Knob Tower	1198 Tom's Knob Road,. Rocky Mount, Va 24151	Existing 150' SST	Franklin County	1/15/2020	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020
Burnt Chimney Water Tank	50 Burnt Chimney Road, Wirtz, VA 24184	Existing 120' watertank	Western Virgnia Water Authority	4/15/2019	3/15/2020	4/15/2020	4/15/2020	6/27/2020	6/1/2020	6/1/2020	6/15/2020	6/15/2020	7/5/2020	6/27/2020	7/1/2020	6/24/2020	8/1/2020	9/1/2020	9/1/2020	9/15/2020	9/30/2020	10/30/2020

Fiber Run Detail Report

Run	Distance	Application for Pole attachement agreement	Pole Attachment Approval	Outside Plant Engineering of Fiber ordered	Outside Plant engineering received	Fiber Install Start	Fiber Install Complete	$67,800/mile
Franklin County Industrial par	1.0 miles	N/A	N/A	Complete	Complete	10/15/2019	11/15/2019	67,800
Westlake	0.5 miles	12/1/2019	1/1/2020	Complete	Complete	12/1/2019	2/1/2020	33,900
Snow Creek	1.5 miles	12/1/2019	1/15/2020	Complete	Complete	2/1/2020	3/1/2020	101,700
Glade Hill Elem School	0.2 miles	2/1/2020	3/1/2020	TBD	TBD	4/1/2020	5/1/2020	13,560
Sontag Elem School	0.2 miles	2/1/2020	3/1/2020	TBD	TBD	4/1/2020	5/1/2020	13,560
Grassy Hill	0.1 miles	2/1/2020	2/1/2020	TBD	TBD	4/1/2020	5/1/2020	6,780
Tom's Knob	2.9 miles	2/1/2020	3/1/2020	TBD	TBD	4/1/2020	5/1/2020	196,620
Total Fiber Run	**6.4 miles**							$433,920

Microwave Backhaul

Microwave Path	Number of Paths	Number of Routers	Install Start	Install Complete
Westlake to Burnt Chimney	1	2	TBD	TBD
Westlake to Scruggs	1	2	TBD	TBD
Industrial park to Calloway	1	2	TBD	TBD
Grassy Hill to Henry	1	2	TBD	TBD
Henry to Fork Mtn	1	2	TBD	TBD
Grassy Hill to Toms knob/Snow creek	2	3	TBD	TBD
Grassy Hill to Industrial park/Westlake	2	3	TBD	TBD

Microwave dishes to be installed in conjuction with each individual tower constructed not to exceed 9/15/2020

Milestone	Definition	Responsible Party
MS1	Site Candidate Package. A basic site information sheet detailing the specifics of the site, to include lattitude and lingitude, tower height, address, ingress eagres, utilitly locations etc..	Blue Ridge Towers
MS2	Site Acquisition Milestone to include all real estate related activities and documents, ie.. Land lease, easments necessary for access and utilities.	Blue Ridge Towers
MS3	2C Survey to be ordered as a part of the submittal documents for all tower due dilligence going forward. The full survey will be ordered simoultaineously. There will be 2 separate pay points for each survey.	Accupoint Surveying and Design, LLC
MS4	Zoning submittal to include complete zoning applicaton and all suporting documents.	Blue Ridge Towers
MS5	Zoning apporval	Franklin County Board of Supervisors
MS6	FAA Tow Air	Blue Ridge Towers
MS7	Phase I - ordered and completed	Blue Ridge Towers
MS8	SHPO - State Historic Preservaton Office and NEPA	Blue Ridge Towers
MS9	Geotechnical report needed to decide sites constructablitiy and foundation design.	Blue Ridge Towers
MS10	Constrcution Drawings/ Foundation design	Engineering Concepts Inc
MS11	Building Permit Submittal	Blue Ridge Towers
MS12	Building Permit Approval	Blue Ridge Towers
MS13	Tower Order - At this time 50% down payment on the tower is due	Blue Ridge Towers
MS14	Construction Start	Blue Ridge Towers
MS15	Foundation Complete	Blue Ridge Towers
MS16	Tower Delivery - Payment in full on tower delivery within 5 business days of delivery	Blue Ridge Towers
MS17	Tower Stack	Blue Ridge Towers
MS18	Electrical Inspection	Franklin County Building Dept
MS19	Constrcution Complete. Final Inspection passed. 100% of Construction payment due within 15 days of MS19 Completion.	Blue Ridge Towers

Color Code

	No action has been taken
	In motion, tracking progress
	Action item Complete
	Action item on hold, seroius issue, requires immediate attention.

Franklin County
A Natural Setting for Opportunity

Capital Improvement Program (CIP)
FY 2019-2020 through FY 2023-2024

The Capital Improvement Program (CIP) is a listing of capital needs projected over a 5-year period for County services. It is a planning document and provides a listing of projects requested by County departments. The CIP is updated annually. Projects are removed from the plan as they are completed or as priorities change. The plan is intended to assist the County Board of Supervisors in the preparation of the County budget.

A capital project is defined as:

- ✓ A tangible asset that has a useful life of at least five years.
- ✓ A tangible asset that costs at least $10,000.

The annual review process begins in the Fall with the submission of capital expenditure requests from County departments. Requests are reviewed by the Finance Department and the County Administrator before being submitted to the Board of Supervisors for review.

To be funded, projects in the CIP must be included in the County's annual capital budget approved by the Board of Supervisors. Following inclusion in the annual capital budget, individual projects may go forward at the direction, approval and appropriation of the Board of Supervisors on a project-by-project basis. Alternatives or other planning considerations may develop over time and affect the need, design, funding mechanism and timetable for specific projects.

It is understood that the CIP remains fluid. Prior to implementation, each project is considered on its own merit and final approval for projects planned or funded on a yearly basis must be considered and approved by the Franklin County Board of Supervisors in the year funding is to begin.

The 5-year CIP totals $82.8 million for all County projects. The major source of funding is General Fund with grants, lease revenue bonds, and fund balance surplus providing the remainder of the funding.

It is important to continue monitoring and planning for the capital needs of the County in order to ensure the maintenance and continued development of facilities and infrastructure. This will help to secure durable, efficient and quality facilities and equipment for the citizens of Franklin County.

Impact of the Capital Program on the Operating Budget: The Capital Program has three direct impacts on the operating budget: Debt Service accounts, General Fund un-appropriated balance and the County operations budget. There was no use of the General Fund unappropriated fund balance in the FY19-20 budget. Funds borrowed in the 2018-19 fiscal year will continue to be used for the development of Summit View Business Park. The second largest project planned is the closure of one cell in the County's landfill. The County is able to fund the $3.5 million cost through a financing. The debt service on the financing will be paid through existing debt service support and repurposing debt drop-off. Every year it is important to plan for the impact on the operating budget that capital projects may have. As projects are completed, there will often be associated operating costs. An example would be the purchase and implementation of a major software system. The large majority of purchased software requires that the user also pay an annual maintenance fee for that software that allows upgrades and enhancements to be received by the user.

As the capital needs of the County grow, the Board of Supervisors has recognized that not all capital projects could be funded from the county's fund balance. For fiscal year 2019-2020 recurring revenue of $2.2 million is proposed as General Fund support to the County Capital Fund. The County does anticipate using a line of credit financing next fiscal year for select capital projects.

The third impact of the CIP on the operating budget is the result of new facilities being completed and the corresponding operating costs that are associated with that facility. These costs could include furnishings, utilities, additional insurance premiums, maintenance costs and additional staff. An example from several years ago was the opening of the Government Center, which required additional operating funds for utilities, property insurance premiums and IT support personnel once it opened.

The five-year CIP is presented on the next several pages. Following the five year summary is a brief description of each project including the impact of each capital project on the current and future operating budgets.

Franklin County
Capital Improvement Program
FY 19-20 Adopted Budget Funding

County Revenue Sources				
Funding Source	**Local**	**Debt**	**Grant**	**FY 19-20 Adopted**
Transfer from General Fund - General Government Projects	2,236,775			2,236,775
Other Carryover Funds				-
Fund Balance Reserves				-
Community Services Revenues				
Village Improvements - Federal/State Funds				-
Westlake Trails - Federal Land Access Program Grant (FLAP)			633,559	633,559
Revenue Sharing Projects				-
Revenue Sharing Private Contributions - Ferrum College				
Revenue Sharing Private Contributions				-
Economic Development - Summit View Bus Park Borrowed Funds		8,172,840		8,172,840
Economic Development - Summit View Bus Park Grants/Contributions			3,029,879	3,029,879
Landfill - Equipment Borrowed Funds		400,000		400,000
Line of Credit Financing - Landfill Closure and Other Various Projects		5,500,000		5,500,000
Parks and Recreation Field Lighting				
Human Services Revenues				
Parks and Rec Grants for New Park Develop/Expansion				-
Internal Services Revenues				
General Properties - Borrowing				
Public Safety Revenues				
E911 Center Renovation/Expansion				
Fire Stations, Vehicles, and Equipment - Borrowed Funds				
Fire Apparatus Replacement Fire Program Funds			170,000	170,000
Total Revenues	**2,236,775**	**14,072,840**	**3,833,438**	**20,143,053**

County Expenditures				
Department/Project	**Local**	**Debt**	**Grant**	**FY 19-20 Adopted**
Franklin County Government Expenditures				
Community Services				
Community Development				-
Revenue Sharing (Transportation Matching Funds)				-
- Goldfinch Circle				-
- Royal Estates Blvd, Crown Point Dr, Crown Point Pl, King's Way				-
- SVBP Rte 220 Two Phase Signal				-
- SVBP Access Road				-
Vehicle Replacement	20,000			20,000
Village Improvements				-
Westlake Trails - FLAP			633,559	633,559

Department/Project	Local	Debt	Grant	FY 19-20 Adopted
Broadband Deployment	75,000			75,000
Total	95,000	-	633,559	728,559
Economic Development				
Summit View Business Park		8,172,840	3,029,879	11,202,719
Job Creation Fund	150,000			150,000
Infrastructure Development Fund	75,000			75,000
Total	225,000	8,172,840	3,029,879	11,427,719
Solid Waste				
Cell 3 New Construction				-
Leachate Tank Repair/Replace				-
Vehicle Replacement	50,000			50,000
Collection Sites				-
- Collection Site New Site Purchase/Development		150,000		150,000
- Collection Site Development - Paving		347,000		347,000
Landfill Closure		3,550,000		3,550,000
Landfill Equipment		400,000		400,000
Landfill Engineering / Compliance / Groundwater	140,000			140,000
Landfill Gas Control	30,000			30,000
Total	220,000	4,447,000	-	4,667,000
Total Community Services	**540,000**	**12,619,840**	**3,663,438**	**16,823,278**
Human Services				
Parks and Recreation				
Capital Maintenance	105,000			105,000
Park Development - Trails and Blueways	10,000			10,000
Smith Mountain Lake Shoreline Stabilization	100,000			100,000
Park Development - Expansion and Improvements	20,000			20,000
Athletic Field Lighting and Improvements				-
Playground Repair, Replacement, and Construction	20,000			20,000
Smith Farm Purchase/VWCC Educational Foundation	100,000			100,000
Vehicle Replacement	35,000			35,000
Equipment Replacement	45,000			45,000
Total	435,000	-	-	435,000
Registrar				
Voting Equipment Replacement	40,000			40,000
Electronic Pollbooks Replacement	5,000			5,000
Voting Booth Replacement				-
Total	45,000	-	-	45,000
Total Human Services	**480,000**	**-**	**-**	**480,000**
Internal Services				
Information Technology				
Network & Server Infrastructure	230,000			230,000
Laptop and Desktop Computer Replacement Program	130,000			130,000
Cybersecurity				-
Office 365 Deployment & Licensing	210,000			210,000
Disaster Recovery & Business Continuity Planning				-
Database Consolidation				-

Department/Project	Local	Debt	Grant	FY 19-20 Adopted
Government Center AV Refreshment				-
Network Remediation				-
Total	570,000	-	-	570,000
Finance				
Finance Software		200,000		200,000
				-
Commissioner of the Revenue				-
Appraisal/Land Records Software		300,000		300,000
				-
General Properties				-
Elevator Upgrades				-
Goode Building Upgrades				-
HVAC Upgrade/Replacement		340,000		340,000
Capital Maintenance Reserve - Roof Replacement	40,000			40,000
YMCA Facility Upgrades		200,000		200,000
Vehicle Replacement		57,000		57,000
Total	40,000	597,000	-	637,000
Total Internal Services	**610,000**	**1,097,000**	**-**	**1,707,000**
Public Safety				
Public Safety				
Radio Communications				-
Fire Apparatus Replacement: Scruggs Quint Lease Purchase	112,504			112,504
Fire Apparatus Replacement: Fork Mtn & Boones Mill Fire	5,044		170,000	175,044
Fire Apparatus Replacement				-
EMS Vehicle Replacement		75,000		75,000
Fire/EMS Equipment		206,000		206,000
EMS Vehicle Refurbishment				-
Fire/EMS Staff Vehicle Replacement		75,000		75,000
Animal Control Vehicle Replacement				-
Summit View Park Fire Station				-
Commerce Park Fire Station				-
Total	117,548	356,000	170,000	643,548
Sheriff				
Vehicle Replacement/Upfit	370,000			370,000
Portable Emergency Radios	24,383			24,383
Mobile Emergency Radios	12,844			12,844
Communication Center Addition				-
Repair/Upgrade Impound Lot	5,000			5,000
Paint Exterior Jail				-
Sheriff In-Car Cameras	30,000			30,000
Taser Replacement	47,000			47,000
Total	489,227	-	-	489,227
Total Public Safety	**606,775**	**356,000**	**170,000**	**1,132,775**
Total CIP Requested	**2,236,775**	**14,072,840**	**3,833,438**	**20,143,053**
CIP Requested less Revenues	**-**	**-**	**-**	**-**

Department/Project	Local	Debt	Grant	FY 19-20 Adopted
				2,236,775
				14,072,840
				3,833,438
				11,202,719
				-
				31,345,772
Franklin County Public Schools				
Funding Sources				
Transfer from General Fund - School Projects	1,220,000			1,220,000
New CTE - Middle School				
School Projects				
School Projects - Total	880,000			880,000
School Bus Replacement	340,000			340,000

Franklin County

Capital Improvement Program
FY 19-20 through FY 23-24

County Revenue Sources						
Funding Source	**FY 19-20 Adopted**	**FY20-21 Proposed**	**FY21-22 Proposed**	**FY22-23 Proposed**	**FY23-24 Proposed**	**5 Year Total Requested**
Transfer from General Fund - General	2,236,775	2,494,827	2,510,715	2,459,424	2,464,588	12,166,329
						-
Community Services Revenues						
Village Improvements - Federal/State	-	-	250,000	250,000	-	500,000
Westlake Trails - Federal Land Access Program Grant (FLAP)	633,559	-	-	-	-	633,559
Revenue Sharing Projects	-	5,640,000	1,100,000	1,100,000	-	7,840,000
Revenue Sharing Private Contributions - Ferrum College		-	1,000,000	1,000,000	-	2,000,000
Revenue Sharing Private Contributions	-	5,640,000	100,000	100,000	-	5,840,000
Economic Development - Summit View Bus Park Borrowed Funds	8,172,840	2,096,564	11,451,258	2,018,250	1,433,928	25,172,840
Economic Development - Summit View Bus Park Grants/Contributions	3,029,879	-	3,240,513	-	-	6,270,392
Landfill - Equipment Borrowed Funds	400,000	-	-	-	-	400,000
Line of Credit Financing - Landfill Closure and Other Various Projects	5,500,000	-	-	-	300,000	5,800,000
Parks and Recreation Field Lighting		-	1,100,000	-	-	1,100,000
Internal Services Revenues						
General Properties - Borrowing		-	1,150,605	1,054,500	53,000	2,258,105
Public Safety Revenues						
E911 Center Renovation/Expansion		-	1,200,000	-	-	1,200,000
Fire Stations, Vehicles, and Equipment - Borrowed Funds		-	4,852,745	3,875,929	2,080,102	10,808,776
Fire Apparatus Replacement Fire Program Funds	170,000	170,000	170,000	170,000	170,000	850,000
Total Revenues	**20,143,053**	**16,041,391**	**28,125,836**	**12,028,103**	**6,501,618**	**82,840,001**

County Expenditures						
Department/Project	**FY 19-20 Adopted**	**FY20-21 Proposed**	**FY21-22 Proposed**	**FY22-23 Proposed**	**FY23-24 Proposed**	**5 Year Total Requested**
Franklin County Government Expen						
Community Services						
Community Development	-					
Revenue Sharing (Transportation Matching Funds)	-	-	2,200,000	2,200,000	-	4,400,000
- Goldfinch Circle	-	30,000				30,000
- Royal Estates Blvd, Crown Point Dr, Crown Point Pl, King's Way	-	250,000				250,000

Department/Project	FY 19-20 Adopted	FY20-21 Proposed	FY21-22 Proposed	FY22-23 Proposed	FY23-24 Proposed	5 Year Total Requested
- SVBP Rte 220 Two Phase Signal	-	500,000				500,000
- SVBP Access Road	-	10,500,000				10,500,000
Vehicle Replacement	20,000	-	-	-	-	20,000
Village Improvements	-	-	300,000	300,000	-	600,000
Westlake Trails - FLAP	633,559	-	-	-	-	633,559
Broadband Deployment	75,000	75,000	75,000	75,000	75,000	375,000
Total	728,559	11,355,000	2,575,000	2,575,000	75,000	17,308,559
Economic Development						
Summit View Business Park	11,202,719	2,096,564	14,691,771	2,018,250	1,433,928	31,443,232
Job Creation Fund	150,000	150,000	150,000	150,000	150,000	750,000
Infrastructure Development Fund	75,000	75,000	75,000	75,000	75,000	375,000
Total	11,427,719	2,321,564	14,916,771	2,243,250	1,658,928	32,568,232
Solid Waste						
Cell 3 New Construction	-	-	-	100,000	100,000	200,000
Leachate Tank Repair/Replace	-	-	-	-	300,000	300,000
Vehicle Replacement	50,000	25,000	-	-	-	75,000
Collection Sites	-	-	-	-	-	-
- Collection Site New Site Purchase/Development	150,000	-	-	-	-	150,000
- Collection Site Development - Paving	347,000	-	-	-	-	347,000
Landfill Closure	3,550,000	-	-	-	-	3,550,000
Landfill Equipment	400,000	-	-	-	-	400,000
Landfill Engineering / Compliance / Groundwater	140,000	130,000	170,000	135,000	170,000	745,000
Landfill Gas Control	30,000	-	-	-	-	30,000
Total	4,667,000	155,000	170,000	235,000	570,000	5,797,000
Total Community Services	**16,823,278**	**13,831,564**	**17,661,771**	**5,053,250**	**2,303,928**	**55,673,791**
Human Services						
Parks and Recreation						
Capital Maintenance	105,000	105,000	105,000	105,000	105,000	525,000
Park Development - Trails and Blueways	10,000	10,000	10,000	10,000	10,000	50,000
Smith Mountain Lake Shoreline Stabilization	100,000	100,000	100,000	100,000	100,000	500,000
Park Development - Expansion and Improvements	20,000	20,000	20,000	20,000	20,000	100,000
Athletic Field Lighting and Improvements	-	-	1,100,000	-	-	1,100,000
Playground Repair, Replacement, and Construction	20,000	20,000	20,000	20,000	20,000	100,000
Smith Farm Purchase/VWCC Educational Foundation	100,000	100,000	100,000	100,000	100,000	500,000
Vehicle Replacement	35,000	35,000	35,000	35,000	35,000	175,000

Department/Project	FY 19-20 Adopted	FY20-21 Proposed	FY21-22 Proposed	FY22-23 Proposed	FY23-24 Proposed	5 Year Total Requested
Equipment Replacement	45,000	45,000	45,000	45,000	45,000	225,000
Total	435,000	435,000	1,535,000	435,000	435,000	3,275,000
Registrar						
Voting Equipment Replacement	40,000	40,000	40,000	40,000	40,000	200,000
Electronic Pollbooks Replacement	5,000	5,000	5,000	5,000	5,000	25,000
Voting Booth Replacement	-	-	-	-	-	-
Total	45,000	45,000	45,000	45,000	45,000	225,000
Total Human Services	**480,000**	**480,000**	**1,580,000**	**480,000**	**480,000**	**3,500,000**
Internal Services						
Information Technology						
Network & Server Infrastructure	230,000	200,000	200,000	200,000	200,000	1,030,000
Laptop and Desktop Computer Replacement Program	130,000	130,000	130,000	130,000	130,000	650,000
Cybersecurity	-	-	-	-	-	-
Office 365 Deployment & Licensing	210,000	210,000	220,500	220,500	220,500	1,081,500
Disaster Recovery & Business Continuity Planning	-	-	15,750	-	-	15,750
Database Consolidation	-	-	-	-	-	-
Government Center AV Refreshment	-	105,000	-	-	-	105,000
Network Remediation	-	-	-	-	-	-
Total	570,000	645,000	566,250	550,500	550,500	2,882,250
Finance						
Finance Software	200,000	-	-	-	-	200,000
	-					
Commissioner of the Revenue	-					
Appraisal/Land Records Software	300,000	-	-	-	-	300,000
	-					
General Properties	-					
Elevator Upgrades	-	-	280,000	-	-	280,000
Goode Building Upgrades	-	-	-	700,000	-	700,000
HVAC Upgrade/Replacement	340,000	-	-	354,500	53,000	747,500
Capital Maintenance Reserve - Roof Replacement	40,000	40,000	40,000	40,000	40,000	200,000
YMCA Facility Upgrades	200,000	-	870,605	-	-	1,070,605
Vehicle Replacement	57,000	-	-	-	-	57,000
Total	637,000	40,000	1,190,605	1,094,500	93,000	3,055,105
Total Internal Services	**1,707,000**	**685,000**	**1,756,855**	**1,645,000**	**643,500**	**6,437,355**
Public Safety						-
Public Safety						-
Radio Communications	-	-	-	-	1,200,000	1,200,000
Fire Apparatus Replacement: Scruggs Quint Lease Purchase	112,504	112,504	112,504	112,504	112,504	562,520

Department/Project	FY 19-20 Adopted	FY20-21 Proposed	FY21-22 Proposed	FY22-23 Proposed	FY23-24 Proposed	5 Year Total Requested
Fire Apparatus Replacement: Fork Mtn & Boones Mill Fire	175,044	175,044	175,044	175,044	175,044	875,220
Fire Apparatus Replacement	-	-	1,004,250	503,500	599,500	2,107,250
EMS Vehicle Replacement	75,000	75,000	264,495	272,429	280,602	967,526
Fire/EMS Equipment	206,000	200,000	200,000	200,000	200,000	1,006,000
EMS Vehicle Refurbishment	-	-	-	-	-	-
Fire/EMS Staff Vehicle Replacement	75,000	67,279	69,297	71,376	73,518	356,470
Animal Control Vehicle Replacement	-	-	34,598	-	-	34,598
Summit View Park Fire Station	-	-	3,584,000	-	-	3,584,000
Commerce Park Fire Station	-	-	50,000	3,100,000	-	3,150,000
Total	643,548	629,827	5,494,188	4,434,853	2,641,168	13,843,584
Sheriff						
Vehicle Replacement/Upfit	370,000	370,000	370,000	370,000	370,000	1,850,000
Portable Emergency Radios	24,383	-	8,128	-	8,128	40,639
Mobile Emergency Radios	12,844	-	9,894	-	9,894	32,632
Communication Center Addition	-	-	1,200,000	-	-	1,200,000
Repair/Upgrade Impound Lot	5,000	5,000	5,000	5,000	5,000	25,000
Paint Exterior Jail	-	-	-	-	-	-
Sheriff In-Car Cameras	30,000	40,000	40,000	40,000	40,000	190,000
Taser Replacement	47,000	-	-	-	-	47,000
Total	489,227	415,000	1,633,022	415,000	433,022	3,385,271
Total Public Safety	**1,132,775**	**1,044,827**	**7,127,210**	**4,849,853**	**3,074,190**	**17,228,855**
Total CIP Requested	**20,143,053**	**16,041,391**	**28,125,836**	**12,028,103**	**6,501,618**	**82,840,001**
CIP Requested less Revenues	-	-	-	-	-	-
Franklin County Public Schools						
Funding Sources						
Transfer from General Fund - School P	1,220,000	1,220,000	1,220,000	1,220,000	1,220,000	6,100,000
New CTE - Middle School						

SMITH MOUNTAIN LAKE
Regional Chamber of Commerce

August 26, 2019

Virginia Department of Housing & Community Development
Attn: Mr. Erik Johnston, Director
600 E. Main Street #300
Richmond, VA, 23219

RE: Letter of Support of the Franklin County
2020 VATI Broadband Application

Dear Mr. Johnston:

I am writing to express the support of Smith Mountain Lake Regional Chamber of Commerce for the Franklin County 2020 VATI application. This broadband project is vital to the citizens and businesses in Franklin County. The County's Broadband Authority has gathered input from its citizens and consultant to develop a proposal that will meet some of the greatest needs in the County. Therefore, we support the County's request for funding the necessary broadband improvements in Franklin County.

We request that DHCD also support this request and provide the requested funding to make this project a reality for Franklin County.

Sincerely,

Lindsey Coley
SMLRCC Board Chairman

Cc: Christopher Whitlow, Franklin County
Steven Sandy, Franklin County