Application to DHCD Submitted through CAMS

Bedford County

Bedford County Shentel broadband 2022

Application ID:	86508202021155637
Application Status:	Pending
Program Name:	Virginia Telecommunications Initiative 2022
Organization Name:	Bedford County
Organization Address:	122 E. Main St., Suite 202 Bedford, VA 24523
Profile Manager Name:	
Profile Manager Phone:	
Profile Manager Email:	
Project Name:	Bedford County Shentel broadband 2022
Project Contact Name:	John Putney
Project Contact Phone:	(540) 586-7601
Project Contact Email:	jputney@bedfordcountyva.gov
Project Location:	122 East Main Street Bedford, VA 24523-2000
Project Service Area:	Bedford County
Total Requested Amount:	$8,642,313.00
Required Annual Audit Status:	No Current Audits Found

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Budget Information:

Cost/Activity Category	DHCD Request	Other Funding	Total
Telecommunications	**$8,642,313.00**	**$17,546,515.00**	**$26,188,828.00**
Construction	$8,642,313.00	$0.00	$8,642,313.00
Other: County Contribution	$0.00	$5,237,766.00	$5,237,766.00
Other: Shentel Contribution	$0.00	$12,308,749.00	$12,308,749.00
Total:	**$8,642,313.00**	**$17,546,515.00**	**$26,188,828.00**

Budget Narrative:

Please see Attachment 12 - Derivation of Costs for a more full and complete description of Project Budget

Questions and Responses:

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1. **Project Description and Need**

   Describe why and how the project area(s) was selected. Describe the proposed 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:

This project is designed to accomplish universal coverage in Bedford County. The project area therefore, is anywhere where there are unserved homes which are not part of another VATI grant and which have no federally funded coverage commitment. The area was determined through a collaborative, multi-stage approach drawing on many different sources of data to identify all existing unserved homes without a federally funded coverage commitment. Local knowledge, historical service requests, surveys, 477 data, and engineering estimates were all used to estimate remaining unserved addresses, irrespective of drop length.

Because part of this project area is in and around Shentel's existing footprint, they have extremely detailed information on the locations of many unserved homes based off of existing service data and historic service requests. County staff have also routinely interacted with residents and released a broadband survey in February, 2021 to help identify unserved homes. The broadband survey received 1,625 responses and 64% of respondents stated that they had insufficient internet access or no access at all. This local knowledge was paired with 477 data and internal engineering estimates. Due to the nature of the 477 data which counts a census block as served if there is even one home in that block with service, thoughtful analysis allows more granular coverage estimates to be developed from the 477 data. Census blocks with no broadband coverage reported and no federal funding commitment were considered to be truly unserved. For census blocks that were reported as served, especially those on the edge between served and unserved areas, were analyzed for home density and distance from the roadway. Homes that were far enough away from the roadway to require special construction costs were considered unserved. Additionally, for cable providers with franchise agreements that stipulate coverage at certain density levels, anything below those density levels was also considered unserved. Together, Shentel and County local knowledge along with 477-based density analysis yielded an estimate of all unserved locations lacking a federal or state funding commitment. Both parties felt it was in the community's best interest to take a conservative estimate so that no unserved homes are left out. The unserved locations then determined the project area. See Attachment 1 – Project Area Map for greater detail, Attachment 20 – Bedford County Story Map https://arcg.is/19vzy40

2. List existing providers in the proposed project area and the speeds offered. Please do not include satellite. Describe your outreach efforts to identify existing providers and how this information was compiled with source(s).

Answer:

Shentel has worked closely with the county to ensure there is minimal overlap with other providers that offer reliable broadband speeds of 25/3 or greater in the project area. The county has helped to coordinate communication with existing providers and other VATI grant applicants to achieve the most efficient path to universal coverage with respect to existing service areas as well as other federal, state, and local grant projects. For most wireless internet service providers Shentel was unable to determine actual service areas, and so they are largely unaccounted for in the unserved analysis. As noted in question 1 this approach was taken to ensure true universal coverage in Bedford County rather than ignoring potentially unserved homes in general areas where wireless service providers advertise service. When possible, Shentel utilized its wireless expertise to create a conservative estimate for areas where wireless service providers likely provide 25/3 service, and removed those homes from its application. Briscnet (advertised up to 25Mbps), B2X (advertised up to 25Mbps), Infinasky (advertised up to 100 Mbs), and SML Wireless (advertised up to 100Mbps) all advertise operations in Bedford county, but without detailed propagation data it is impossible to discern specific service areas. Verizon advertises DSL speeds up to 15Mbps in portions of the project area, and Centurylink advertises up to 10Mbps. Other than that, there are no known wireline providers in the project area.

3. Describe if any areas near the project have received funding from federal grant programs, including but not limited to Connect America Funds II (CAF II), ACAM, ReConnect, Community Connect, and Rural Digital Opportunity Funds (RDOF). If there have been federal funds awarded near the project area(s), provide a map showing these areas, verifying the proposed project area does not conflict with these areas. Do not include areas awarded to satellite broadband providers. Label Map: Attachment 2 – Documentation on Federal Funding Area.

Answer:

Given the universal nature of this project and the extensive federal grant funding that has already been awarded across the country, there are naturally areas adjacent to this project area with federal grant program awards. As noted in question 1, the goal of this project is to provide functional universal coverage in keeping with the Virginia Governor’s goal. Therefore, some unserved locations which are in close proximity to areas which have received federal funding are included in this project. Not only did Shentel back out all federal grant award locations from this project, they also typically created a buffer around these federal grant areas to remove homes immediately adjacent to federal grant areas, so long as the federal grant awardee worked with the county to include those adjacent locations in their coverage plans. Per the VATI guidelines, we did not consider satellite awards as overlap. These Federal Awards are shown in Attachment 2 and were removed from the project area.

4. Describe if any blocks awarded in Rural Digital Opportunity Fund (RDOF), excluding those awarded to satellite internet service providers, are included in the VATI application area. If RDOF areas awarded to terrestrial internet service providers are included in the VATI application, provide a map of these areas and include information on number of passings in RDOF awarded areas within the VATI application area, and Census Block Group ID number for each block group in the project area. Label Attachment: Attachment 3 – RDOF Awarded Areas Form in VATI Area

Answer:

There are no RDOF funded blocks awarded to Shentel included in this VATI application. As noted in question 3, we identified all RDOF awarded locations and removed them from our analysis. Shentel is not seeking additional funding for its own RDOF award areas, as they did not commit to cover areas they could not afford to cover. Therefore, Shentel will continue its timely RDOF deployments without seeking additional funding. Upon final award from the FCC, Shentel will immediately commence the detailed engineering, planning, and construction work needed to complete its RDOF build, which is anticipated to be completed within 3 years of final award. This construction work will happen simultaneously with this proposed VATI project and Shentel will seek any and all efficiencies between the two projects to accelerate their planned buildout.

5. Overlap: 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 below 25/3 mbps and with less than 25% service overlap within the project area for wireless projects and 10% for wireline projects. Describe any anticipated service overlap with current providers within the project area. Provide a detailed explanation as to how you determined the percentage overlap. Label Attachment: Attachment 4 – Documentation Unserved Area VATI Criteria.

Answer:

The anticipated service overlap within this project area will be below the allowable 10% for wireline and 25% for wireless. As noted in question 1, Shentel has gone through a lengthy process for identifying unserved locations and has designed its network to cover those unserved homes, which form the project area for this project. Due to the fact that the unserved areas are estimates in some cases, and the nature of wireless technology, Shentel estimates a 5-10% margin of overlap, and remains committed to keeping overlap below the allowable thresholds. If any additional incidental overlap emerges, Shentel has many different options to ameliorate it. As detailed engineering design and site acquisition is carried out, Shentel has flexibility in the placement of wireless sites so as to minimize overlap. Shentel may also utilize directional antennas to target unserved homes and eliminate overlap. Furthermore, there may be opportunities to substitute wireless for wireline service, as new efficiencies emerge through the unique partnerships Shentel is exploring with local power companies and co-ops. Please see Attachment 4 – Documentation Unserved Area VATI Criteria.

6. Total Passings: Provide the number of total serviceable units in the project area. Applicants are encouraged to prioritize areas lacking 10 Megabits per second download and 1 Megabits per second upload speeds, as they will receive priority in application scoring. For projects with more than one service area, each service area must have delineated passing information. Label Attachment: Attachment 5 – Passings Form.
   a. Of the total number of VATI passings, provide the number of residential, business, non-residential, and community anchors in the proposed project area. (Up to 10 points for businesses and community anchor institutions)

   b. If applicable, of the total number of RDOF passings, provide the number of residential, business, non-residential, and community anchors in the proposed project area.

   c. If applicable, provide the number of passings that will require special construction costs, defined as a one-time fee above normal service connection fees required to provide broadband access to a premise . Describe the methodology used for these projections.

   d. If applicable, provide the number of passings included in the application that will receive broadband access because special construction costs have been budgeted in the VATI application. Describe the methodology used for determining which passings with special construction costs were budgeted in the application.

   e. Provide the number of passings in the project area that have 10/1 mbps or less. Describe the methodology used for these projections. (up to 15 points)

Answer:

A.
Residential: 5,349
Businesses (non-home): 128
Businesses (home): 0
Community Anchors: 72
Non-Residential: 16
Total Passings: 5,565

B. As noted in question 4, Shentel did win some census blocks in Bedford County, but they are not included in this application because Shentel was unwilling to bid below what they knew they would cost to provide coverage to these areas. As such, Shentel does not need to ask for additional funding to cover their commitments, and will proceed with their plans to serve their RDOF locations without any additional VATI or County funding. After final award, Shentel anticipates having service live in their RDOF award areas within 3 years.

C. There are 1,323 homes included with fiber drops in excess of 300 feet. Based on historical FTTH builds in unserved and underserved areas, Shentel assumed that 65% of homes requiring long-drops will take service. The costs for that 65% of the fiber long drops is reflected in the overall cost of the project and captured in the cost breakout in Attachment 13. In order to create as comprehensive a project as possible, Shentel included unserved homes within 2,000 feet of their fiber route as part of this project and included the necessary cost to serve these homes with long drops above standard installation rates. Of the 65% of long drops anticipated to take service, an estimated 206 of them are estimated to be low to moderate income households.

D. There are an estimated 4,616 homes in the project area with access to speed of less than 10/1 in Bedford County. This estimate is based off of 477 data for DSL providers. As already discussed, without detailed information is it impossible to accurately predict wireless coverage.

7. **For wireless projects only:** Please explain the ownership of the proposed wireless infrastructure. Please describe if the private co-applicant will own or lease the radio mast, tower, or other vertical structure onto which the wireless infrastructure will be installed.

Answer:

The fixed wireless portion of this application will utilize a carrier-grade, standards-based wireless network utilizing up to 60 MHz of both licensed and Generally Authorized Access 3.5 GHz spectrum in a dense, fiber-fed, small cell network. Rather than a macro site architecture, this project utilizes a wireless drop methodology where fixed wireless is only relied upon for connections of a mile or less from a fiber-fed small cell where FTTH is cost-prohibitive. These small cells will be placed on wooden utility poles between 50 and 120 feet tall, depending on the geography and topography, utilizing existing infrastructure (utility poles, water towers, tall buildings, etc) wherever practicable. Shentel conservatively estimates however, that for the majority of the small cells it will need to build new wood poles. In these instances, Shentel would own the pole, but whenever it is able to attach to existing infrastructure, it will enter into a lease agreement with the asset owner. The wireless equipment placed on the new poles or existing infrastructure will be owned by Shentel.

8. Speeds: Describe the internet service offerings, including download and upload speeds, to be provided after completion of the proposed project. 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. List the private co-applicant's tiered price structure for all speed offerings in the proposed project area, including the lowest tiered speed offering at or above 25/3 mbps. (up to 10 points)

Answer:

As already noted, this project will adopt a hybrid fiber/fixed wireless approach to maximize cost-efficiency and speed to market, while maintaining a clear upgrade path to full FTTH. Shentel estimates that approximately 60% of the proposed locations will be served by FTTH and the remaining 40% will be served by wireless drops. The below table lays out the speeds and prices for both service offerings. These prices represent a current status and may change over time.

The fiber to the home and wireless network will use shared bandwidth. In the FTTH architecture, customers will share a 10Gpbs port amongst 64 customers. The network is scalable and will be able to upgrade to 32 customers per 10Gbps port in the near future. The wireless drop customers will also receive shared bandwidth from each small cell. Total capacity will vary, but through the final design process every site will be designed with more than enough bandwidth to cover all targeted homes.

Shentel Fiber Speed (Pre-Paid)

25Mbps/25Mbps	$50.00
50Mbps/50Mbps	$65.00
150Mbps/150Mbps	$80.00
1Gbps/1Gbps	$110.00

Wireless Drop (Pre-Paid)

25Mbps/3Mbps	$60.00
50Mbps/5Mbps	$80.00
100Mbps/20Mbps	$110.00

Shentel plans to offer its services as prepaid plans to better reach those customers who may be credit challenged. No credit check will be required and the service is for 30 days with an option to auto-renew.

9. Network Design: 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. Provide a detailed explanation of how this information was determined with sources. Provide information on how capacity for scalability, or expansion, of how the network can adapt to future needs. If using a technology with shared bandwidth, describe how the equipment will handle capacity during peak intervals. For wireless projects, provide a propagation map for the proposed project area with a clearly defined legend for scale of map. Label Map: Attachment 6 – Propagation Map Wireless Project.

Answer:

Overview: Shentel is proposing a hybrid solution that will deploy a fiber network that expands to within a mile of the unserved homes in Bedford County. The homes not passed by fiber, typically either those with long-drops well in excess of 2,000 ft or in scenarios or where density falls below 5 homes per mile, will be reached via a wireless drop. This approach creates a scalable, cost-effective solution with superior speed to market. The wireless drop methodology allows Shentel to realistically deploy its service within a 24 month window to get critical broadband service to residents that cannot wait another 3 or more years to receive service. Furthermore, relying on a wireless drop where it is most practical reduces costs and allows Bedford to achieve universal broadband coverage within existing budget constraints. Taken together, this hybrid approach is a fast and efficient way to deliver high-quality broadband to the entire county. Additionally, this project is scalable. As fiber is pushed further and further into the unserved areas, Shentel and Bedford will be in an excellent position to continue expanding that fiber to additional homes through both natural growth and future federal, state, and local subsidy opportunities. The technology used for both the FTTH network and the wireless drop are more fully described in ATTACHMENT 17.

10. Explain how the proposed project achieves universal broadband coverage for the locality or fits into a larger plan to achieve universal broadband coverage for the locality. If applicable, explain the remaining areas of need in the locality and a brief description of the plan to achieve universal broadband coverage. (up to 50 points)

Answer:

This project achieves universal broadband coverage by designing a network to reach the unserved locations that lack existing service or federal, state, or locally funded coverage commitments. Broadband development is the top policy priority of the Board of Supervisors (Broadband Authority) and they view this as absolutely essential infrastructure for our citizenry and business community. As noted in question 1, community survey was released February 2021 and 64% of respondents indicated they either have no viable internet service or are underserved with non-functional broadband. Thru this data, the County learned much more broadband infrastructure was needed and existing supply was vastly inadequate.

After hearing a desire from ISP's to further partner and invest in Bedford County; in May, 2021, the County released an RFP requesting ISP's to propose projects to help achieve functional universal coverage, especially those who are unserved and underserved. In conjunction with Bedford's VATI applications with Zitel and Riverstreet, this project will bring the county to universal coverage. Leveraging the joint unserved analysis outlined in question 1, the Shentel, Zitel, and Riverstreet projects are designed to achieve functional universal coverage. These three VATI projects will cover nearly 20,000 unserved addresses. These build on existing Comcast and Shentel coverage as well as Bedford's previous VATI grant with Briscnet, and Cares Act projects with B2X and Zitel. Throughout these iterations of private and public funding broadband expansion, Bedford County, in conjunction with its private-sector partners, has developed a more robust understanding of its broadband needs and has collaboratively developed this set of VATI projects to fill the remaining broadband gaps.

Specifically, Shentel's project, rather than being tied to a specific geographic area, is designed to reach the remaining identified unserved homes. While a small number of homes will likely remain unreached, these homes are the extreme outliers where density falls below 5 homes per mile, long drops are required well in excess of 2,000 ft, and/or terrain makes even a wireless drop untenable. That being said, Bedford's goal in continuing collaboration with its private-sector partners is to continue to drive fiber further into remote areas to reach even these remaining homes. This effort will build off existing expansion projects in the County as well as refined broadband maps being developed at the federal and state level. The Shentel, Zitel, and Riverstreet projects will address Bedford's known broadband needs, and as more information is obtained in the future, the County will be excellently positioned with an extensive and competitive set of fiber networks that will be able to address any further broadband holes that emerge.

11. **Project Readiness**

Describe the current state of project development, including but not limited to: planning, preliminary engineering, identifying easements/permits, status of MOU or MOA, and final design. Prepare a detailed project timeline or construction schedule, identifying specific tasks, staff, contractor(s) responsible, collection of data, etc., and estimated start and completion dates. Applicants must include Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) between applicants (drafts are allowable). Label Attachments: Attachment 7 – Timeline/Project Management Plan; Attachment 8 – MOU/MOA between Applicant/Co-Applicant; (up to 20 points)

Answer:

Based on Shentel's existing assets and relationships, this project is in a very favorable state of development. A high level network design is in place with planned fiber routes and small cell search rings. This network design is bolstered by Shentel's existing infrastructure, which will facilitate both project construction and management. A significant portion of the fiber that Shentel plans to deploy will be overlashed to existing infrastructure. This overlash opportunity reduces construction costs and risk in the overall build timeline for these portions since make-ready work and permitting is not required, as it merely requires a modification to what is already in place. Shentel's typical permitting and easement process is as follows.

- Shentel will complete a full detailed review of the planned fiber route to validate and refine the route to include determining feasibility, costs, and challenges for construction. Review will consist of Shentel personnel visually inspecting the entire planned fiber route. Shentel typically follows utility routes such as power or telephone, and permits with those utilities for new pole attachments when there is not existing Shentel attachments to allow for overlash.
- Shentel will adhere to the existing attachment guidelines and permit all utility pole owners for any overlash when required and for new pole attachments. For any utility pole that is located on private property and requires a new permit, Shentel would follow the Virginia and Federal codes that would allow Shentel to use existing like-kind utility easements. Shentel may engage the appropriate County staff for any questions that arise around such easements.
- VDOT permits would be submitted in those locations where Shentel plans to place fiber in the VDOT ROW. All other permits such as city, town, railroad, or VMRC would permitted as required.
- Shentel will provide contact information to any agency that will be permitted for the project.

Furthermore, Shentel's long-term presence in Bedford County and strong partnership with County staff, VDOT, and utility pole owners means that the needed easements and permitting processes are all well understood and can be processed in a timely manner. Shentel is already positioned with required attachment agreements with the existing pole owners and bond securities established with VDOT. Shentel's longstanding relationships with qualified contractors coupled with the large volume of both aerial and underground work Shentel has proposed across Campbell, Bedford, and Franklin counties places Shentel in an ideal position to bid for these contracting resources.

Across its cable, fiber, and fixed wireless services, Shentel has expanded broadband service to over 58,000 homes in the last 12 months, and that number is constantly growing. This robust proven growth, along with Shentel's long history in Bedford County clearly demonstrates Shentel's ability to design and deploy a wide array of broadband networks.

This project was designed with an innovative hybrid FTTH/wireless drop architecture to provide robust universal broadband connectivity in a quick, efficient, and affordable manner. This architecture allows Shentel to deploy broadband service across significant areas quickly. As such, Shentel estimates, in conjunction with its proposals in Campbell and Franklin Counties, that the project will be completed within 24 months from contract execution, and requests to be allowed. A detailed project timeline can be found in attachment 7.

An MOU between Bedford County and Shentel has been executed and can be found in Attachment 8 - MOU/MOA between Applicant/Co-Applicant.

12. Has the applicant or co-applicant received any VATI grants? If so, provide a list of these grants, with a detailed summary of the status of each.

Answer:

Previous Applicant VATI Grants

In 2019, Bedford County received a VATI grant for $1,040,000. This grant was awarded to construct four 200' fixed wireless towers which was part of a greater network of another six 200' towers and one water tower co-location. This project was part of PPEA agreement with Blue Ridge Towers and Briscnet. The construction phase of this grant was completed in the fall of 2020. Briscnet has been providing wireless internet service from all tower locations, but is only reporting about 230 subscribers in nearly 12 months of operation. Bedford County has not closed out this grant with VATI.

Previous Co-Applicant VATI Grants

Shentel has applied for grants through both VATI and TRCC. In 2020, Shentel applied to VATI for three grants in Bedford, Campbell, and Franklin Counties. Shentel's application was not approved by VATI. Shentel used this experience to develop a better understanding of VATI's goals, and to develop a universal broadband plan for these counties for the 2021 VATI submission. Shentel is a trusted partner in the communities that we serve based on our history of delivering on our commitments, while always continuing to invest in our network, customer service, and community partnerships.

The following is a summary of Shentel's grant awards at the state level. All of the projects listed below deliver Internet, video, and phone through either a coax or fiber extension. The Internet speed packages offered in these extensions include a Gigabit option in addition to lower speed options.

In addition, Shentel has been awarded several grant awards directly with a locality (Campbell County and Albemarle County through CARES funding). All grants, both at the state, and local levels have been successfully closed out, and are delivering broadband to unserved locations.

Walnut Run, Franklin County: Funding Source: TRRC; Award Date: 6/6/2019; Status: Active

Old Salem School Road, Franklin County: Funding Source: VATI; Award Date: 7/21/2020; Status: Active

Windy Gap, Franklin County: Funding Source: TRRC; Award Date: 6/6/2019; Status: Active

Burnt Chimney, Franklin County: Funding Source: TRRC; Award Date: 6/6/2019; Status: Active

The Retreat, Franklin County: Funding Source: CARES; Award Date: 12/25/20; Status: In Process

Parkway Ave, Franklin County: Funding Source: CARES; Award Date: 12/25/20; Status: In Process

Cedar Bay Road, Franklin County: Funding Source: CARES; Award Date:12/25/20; Status: In Process

New Chapel, Campbell County: Funding Source: CARES; Award Date: 12/25/20; Status: In Process

The four active projects have seen incredible early success. In the projects that have been completed, Shentel has seen take rates from 30-70% less than year after project completion.

13. Matching funds: Complete the funding sources table indicating the cash match and inkind resources from the applicant, co-applicant, and any other partners investing in the proposed project (VATI funding cannot exceed 80 percent of total project cost). In-kind resources include, but are not limited to: grant management, acquisition of rights of way or easements, waiving permit fees, force account labor, etc. Please note that a minimum20% match is required to be eligible for VATI, the private sector provider must provide10% of the required match. If the private co-applicant cash match is below 10% of total project cost, applicants must provide financial details demonstrating appropriate private investment. Label Attachments: Attachment 9 - Funding Sources Table; Attachment 10 – Documentation of Match Funding

Answer:

As in-kind match, the County Finance staff will serve as the financial review team of the VATI grants. John Putney will devote many hours of in-kind work in coordinating with ISP's on project delivery, reporting to the Broadband Authority, and preparing status reports to VATI and the public at large. Approximately 90% of Mr. Putney's job will be devoted to broadband resulting in a value add of approximately $75,000. The County permitting office will fast-track all ISP permitting submissions and will create a protocol to facilitate this process to ensure success with not only the County procedures but also any required coordination with VDOT. The goal will be to avoid lengthy processing delays understanding there may be a large volume of mapping and permitting data submitted. Finally, County GIS will continue to map the fiber and wireless builds as data is received to accurately portray the County and VATI investment in achieving universal coverage. These maps can also be used publicly to explain to citizens and businesses what ISPs are operating in their general vicinity.

14. Leverage: Describe any leverage being provided by the applicant, co-applicant, and partner(s) in support of the proposed project. (up to 10 points)

Answer:

Applicant-Provided Leverage

Bedford County and Shentel will be utilizing the Central Virginia Planning District Commission as lead grant facilitator, specifically the services of Special Projects Manager Matt Perkins who has extensive experience in managing a variety of professional level projects and assignments that benefit the CVPDC and member localities. Additionally, during the preliminary stages of exploring potential regional/multi-locality public sector and private sector partnerships and recruiting stakeholder support, the county conducted regular Zoom meetings with the Lynchburg Regional Business Alliance and other regional localities. Our application team will also leverage our strong relationships with our community college system, public school system, and public library system to assist with distance learning, workforce development, and digital literacy opportunities.

The County GIS staff have been invaluable throughout the RFP review and VATI application development. They have spent many hours, 200+ hours (approx. $6,000) working on project shape files, reviewing overlap data, assisting with passing counts, and corresponding with County Administration and ISP's on specific requests. Second, the County paid Atlantic Technology Consultants, Inc. (George Condyles) $8,212.50 to assist in reviewing the Phase III RFP, providing county staff with technical advice and input, and serving as a neutral subject matter expert for both the County and ISPs. The County also hired a full-time Broadband Project Manager, John Putney, to assist with finalizing the grant application and if awarded, coordinating with external agencies, legislators, and VATI, and to work as project manager from the County to see the project delivered to a successful completion. This is an extraordinary move by the Board of Supervisors, undoubtedly unique to counties similar to Bedford County, and further illustrates how serious the Board is towards achieving universal broadband coverage.

Co-Applicant-Proposed Leverage

Shentel will provide leverage in several different forms to support this project. Shentel has a local office location and customer support center located in Rustburg, VA. This office will provide convenience to customers who prefer to do business in-person and excellent local customer support to all customers across the Bedford, Campbell and Franklin County area. This existing resource will allow Shentel to effectively manage the network and serve the customers in the project area. Shentel's existing local support and management capabilities also reduce fixed costs, as these important business elements to not need to be newly developed.

Another significant benefit to Shentel's existing local presence is the significant amount of infrastructure already in place. As noted in question 9, Shentel will be able to leverage its existing pole attachments to attach via overlash, rather than having to go through the entire permit and make ready process for the whole project. This will both reduce costs and increase deployment speed. Shentel will also be able to leverage its existing PoP in Bedford, further decreasing costs and increasing deployment speed. This PoP connection will also ensure high quality services by linking this network to Shentel's existing fiber network with redundant Tier 1 peering points located in Ashburn, VA and Atlanta, GA.

15.

Marketing: Describe the broadband adoption plan.

a. Explain how you plan to promote customer take rate, including marketing activities, outreach plan, and other actions to reach the identified serviceable units within the project area. Provide the anticipated take rate and describe the basis for the estimate. (up to 10 points)

b. Describe any digital literacy efforts to ensure residents and businesses in the proposed project area sufficiently utilize broadband. Please list any partnering organizations for digital literacy, such as the local library or cooperative extension office.

Answer:

A. Shentel has a strong and constantly improving marketing strategy, driven by its expansive growth in recent years. Our marketing plan utilizes public relations, mass media, social media, digital advertising, direct mail, email, printed collateral and merchandising pieces. All of these tactics are reinforced by a robust website, a dedicated customer service team and Sales & Marketing representatives on the ground, in market.

Shentel's existing Fiber to the Home business involves many customer touchpoints both before and after construction. Before construction begins, Shentel uses staged digital and direct mail announcements to alert customers of the upcoming service. This advance notice serves to both alert residents to the service that will be available to them and to give them advance warning of impending construction.

Advertising then continues through the construction phase. These construction alerts and coming soon ads help to continue to keep residents aware of the reason for the construction work that may involve work in the rights of way or easements near their home. They also bolster awareness and excitement surrounding new services being delivered. Throughout this process, door to door sales will be employed to maintain clear communication with residents.

All contacts or pre-registrations that take place during and before the construction phase will then be followed up with after construction is complete and service is available. At that time, installations will begin, which will continue to drive increased awareness of available services. As time goes on, take rates will be closely monitored and further advertising will be developed and deployed as needed. Shentel believes 50% to 70% of the homes passed will subscribe to internet service within 5 years of availability. Shentel has seen similar take rates in underserved areas with our current offerings. In Frederick County, VA, for example Shentel has an area of prior unserved homes where they have seen a 69% take rate after 7 months of service being made available.

For the wireless drop component of the service that Shentel plans to make available, a more targeted advertising approach is taken. Shentel plans to promote customer take rate through an integrated marketing plan that utilizes multiple reinforcing tactics that are deployed well before & after a new coverage area goes "live".

- **30 - 60 days prior to launch:** PR outreach to local media outlets & social media posts on local pages announcing coverage areas that will soon be launched.
- **30 days prior to launch:** Digital ad campaign geo-fenced to focus on the coverage area, utilizing a "Coming Soon" theme. Social Media also shifts in its messaging to reinforce the digital ad messaging. Shentel targets mobile phones, tablets, laptops & traditional desktop computers within the coverage area. All ads link to the Beam website, where address

serviceability may be checked and pre-registration can take place.

- **At launch:** Direct mail letters are sent, targeting serviceable households in the new coverage area. Digital ads, social media, online search terms, billboards, updated press release and local marketing representatives place flyers and signs in public areas and local businesses. Where possible, 30 second ads are run on small local radio stations that have tight broadcast coverage to the new Beam coverage area.
- **Post launch:** In the weeks and months that follow, a second direct mail campaign is launched targeting the new coverage area, digital ads and social media ads and posts continue, as does the placement of posters, flyers and yard stake signs and marketing materials in local businesses and other public gathering places. Local events are also researched to evaluate if they may provide a good venue to further drive awareness and interest in Beam.

For examples of marketing material and processes that Shentel employs in other markets today, see Attachments 19.

B. The County and the ISP will coordinate outreach efforts with schools, libraries, and other county offices that routinely correspond with the public (Cooperative Extension, Recreation, Social Services, and select non-profits). The County will create a VATI broadband page on our website to provide project status reports and post specific outreach points of contact for citizens interested in contacting ISPs about broadband availability near their residences and businesses. The County will partner with Shentel on any requested town hall style HOA meetings (in community anchors such as fire department community rooms or libraries) that are needed for certain neighborhoods.

Shentel is a certified ETC carrier, and is actively participating in the Emergency Broadband Benefit (EBB) Program, which offers up to $50 off broadband costs for low income homes. Shentel is therefore ideally positioned and fully intends to continue its participation in the replacement programs currently being considered in the pending Infrastructure Bill. As an ETC carrier, Shentel is able to offer a $10 lifeline discount to eligible homes, and, in concert with its EBB participation, is developing several different subsidy options for low income homes.

16. Project Management: Identify key individuals who will be responsible for the management of the project and provide a brief description of their role and responsibilities for the project. Present this information in table format. Provide a brief description of the applicant and co applicant's history and experience with managing grants and constructing broadband communication facilities. Please attach any letters of support from stakeholders. If the applicant is not a locality(s) in which the project will occur, please provide a letter of support from that locality. Attachment 11 – Letters of Support.

Answer:

County Grant Management Team:

- John Putney will be our Broadband Project Manager (POC, liaison with ISPs, prepare reports to VATI and Broadband Authority, assist with project logistics and outreach efforts).
- Eric Smedley (County Engineer) will serve as the construction inspector and coordinate with the Project Manager on ISP pay applications.
- Ashley Anderson (Finance Director) will provide financial oversight, pay invoices, and request VATI reimbursements.
- Patrick Skelley (County Attorney) will draft and review agreements with ISPs and provide legal direction as needed.
- Carl Levandowski (GIS Coordinator) will provide GIS mapping assistance.
- County Administrator Robert Hiss and Deputy County Administrator Amanda Kaufman will

provide general oversight, coordination, and direction to the project team.

Co-Applicant management team and experience

Shentel is one of the largest regional internet service providers in the Mid-Atlantic. They have a 119 year operating history and an extensive fiber network that spans more than 7,000 miles and supports its rapidly growing and multi-faceted broadband services in Virginia, West Virginia, Maryland, Kentucky, and Pennsylvania. With broadband service delivered to more than 58,000 homes in the past 12 months and nearly 600 miles of fiber laid so far in 2021, Shentel has the clear and tangible financial and operational experience to not only construct, but also operate and manage the project proposed in this grant application.

Shentel is currently operating and expanding its legacy cable markets, while also managing two highly successful broadband initiatives in its GloFiber FTTH service and its Beam fixed wireless service. Launched in 2019, GloFiber is an XGS-PON FTTH network that is currently live and serving customers with symmetrical multi-gigabit speeds in Harrisonburg, Winchester, Front Royal, Staunton, Lynchburg, Roanoke, and Salem, with engineering and construction underway in several more markets in Virginia, West Virginia, Maryland, and Pennsylvania.

Meanwhile, Shentel launched its Beam fixed wireless service in 2020 and now has service live in Albemarle, Augusta, Buckingham, Clarke, Frederick, Goochalnd, Greene, Louisa, Orange, Nelson, Page, Rockingham, Shenandoah Counties in VA and Barbour and Randolph Counties in WV. This service is targeted to bring broadband access to unserved homes in rural hard to reach portions of these states and currently provides that access to over 24,000 of previously unserved homes.

The Shentel team that will manage this project is as follows:

Harris Duncan, Vice President Wireline Engineering & Planning

Role: Executive Oversight of the Fiber to the Home deployment and Core integration & support

Qualifications: Executive with over twenty years of diverse telecommunications management experience inclusive of wireline fiber networks, fixed and cable television.

Dan Meenan, Vice-President Wireless Engineering & Construction, Fixed Wireless Network

Role: Executive oversight of the Fixed Wireless deployment and support

Qualifications: Executive with over twenty years of diverse telecommunications management experience inclusive of wireless mobility networks, fixed wireless networks, and cable television.

Brith Osinkosky, Sr. Manager OSP Engineering & Construction

Role: Responsible for Fiber to the Home engineering, permitting, and construction

Qualifications: Accomplished leader with 20 years of experience in Outside Plant engineering, construction, and operations, specializing in large-scope projects, and broadband acquisitions/overbuilds/upgrades. Currently managing 20,000+ miles of Shentel's OSP network. Extensive experience with FTTH designing and implementation.

Paul Lopez, Director of RF Engineering

Role: Responsible for all RF Engineering related to Fixed Wireless deployment and support

Qualifications: Director of FR Engineering, currently managing a wireless CDMA-EVDO-LTE network of approximately 2,000 cell sites in seven states. Throughout his career has designed and optimized more than 2,000cell sites and managed more than 7,000.

Bill Gilliam, Director of Broadband Operations

Role: Responsible for all customer installation and support for both Fiber to the Home and Fixed Wireless

Qualifications: Industry leader with over 20 years of diverse telecommunications management experience. Former Vice President and General Manager for Time Warner Cable and Bright House Networks in Central Florida. Responsible for the upgrade, launch, and ongoing operations of the company's Broadband service networks across Virginia, West Virginia, Maryland, Pennsylvania, and Kentucky.

Jessica Wilmer, Site Acquisitions Manager

Role: Responsible for pre-construction deployment of Fixed Wireless cell Sites

Qualifications: 20 years of wireless telecommunications industry real estate acquisition and site development experience. Currently managing a wireless mobility network comprised of approximately 2,000 cell sites in seven states. In her career, has developed over 500 new cell sites. Former Zoning Administrator in Augusta County. Extensive experience with Zoning and Planning, the Wireless Industry, and governmental affairs.

Brad Bays, Construction Manager

Role: Responsible for construction deployment of Fixed Wireless cell sites

Qualifications: Currently managing a wireless mobility network if approximately 2,000 cell sites in seven states. In my career have built and managed 6,000 wireless sites since 1999.

17. **Project Budget and Cost Appropriateness**

Budget: Applicants must provide a detailed budget that outlines how the grant funds will be utilized, including an itemization of equipment, construction costs, and a justification of proposed expenses. If designating more than one service area in a single application, each service area must have delineated budget information. For wireless projects, please include delineated budget information by each tower. Expenses should be substantiated by clear cost estimates. Include copies of vendor quotes or documented cost estimates supporting the proposed budget. Label Attachments: Attachment 12 – Derivation of Costs; Attachment 13 - Documentation of Supporting Cost Estimates. (up to 10 points)

Answer:

As noted in questions 11 and 16, Shentel is a 119 year old telecommunications company that has served Campbell, Bedford, and Franklin Counties for many years. Shentel is currently laying hundreds of miles of fiber per year to support its expanding Cable, FTTH, and Fixed Wireless services. As shown in attachments 12 and 13, all cost estimates are based off of a long and active history in both the wireless and wireline industry. While attachment 12 shows a high level roll up of costs in alignment with DHCD guidance, attachment 13 provides detailed cost breakouts and supporting documentation from various vendor relationships for both wireline and wireless services.

18. The cost benefit index is comprised of state cost per unit passed. Individual cost benefit scores are calculated and averaged together to create a point scale for a composite score. Provide the following:
a. Total VATI funding request

b. Number of serviceable units
(up to 125 points)

Answer:

A. Total VATI funding request: The total VATI funding request is $8,642,313

B. Number of serviceable units: The total number of serviceable units covered is 5,565

19. **Commonwealth Priorities (Up to 40 points)**

Additional points will be awarded to proposed projects that reflect Commonwealth priorities. If applicable, describe the following:
a. Businesses, community anchors, or other passings in the proposed project area that will have a significant impact on the locality or region because of access to broadband.

b. Unique partnerships involved in the proposed project. Examples include electric utilities, universities, and federal/state agencies.

c. Digital equity efforts to ensure low to moderate income households in the proposed project area will have affordable access to speeds at or above 25/3 mbps.

Answer:

A. Access to quality broadband internet services in rural areas like Bedford County is a significant economic development tool for small businesses, farmers and ranchers, and community anchors, driving innovation, cost reductions, and market expansion. Broadband also fosters economic

development by enabling telecommuting, e-education, and telemedicine in these areas, an even more pronounced reality during the pandemic. Bedford Economic Development Director Pam Bailey insists, when attracting businesses to the county, broadband is a critical part of the infrastructure companies expect to have readily available. Bedford County is one of the fastest growing localities in Virginia, yet only certain pockets are available to be developed for business due to lack of quality, high-speed internet. This applies to a major sector of the economy for both the Commonwealth and the County: agriculture.

Owner and operator of Wilmont Farms and Bedford Agricultural Extension Agent W.P. Johnson contends the County's producers need the ability to use the latest technology to be successful – whether it is checking the price of a commodity, marketing their products online (locally, nationally and globally), purchasing livestock through an online sale, or participating in an online seminar, broadband internet is crucial for today's modern agriculture business. Not having reliable, high-speed internet connectivity places rural farmers and ranchers, like all other small businesses, at a significant disadvantage.

According to Fire and EMS Chief Jack Jones, the benefits of reliable broadband for first responders include being able to use mobile data terminals in public safety vehicles to provide real-time call date and reporting, as well as allowing for mapping functions. It also allows members in vehicles to perform license and record checks and complete reports. EMS agencies may transmit and submit their reports and EKG tracings directly to the hospital. For a more detailed and enhanced visual illustration the lack of high-speed, reliable internet connectivity on other community anchors and impacted passings in these project areas of the county, please click the link to the provided Story Map.

B. Shentel has a variety of unique partnerships planned to cost effectively construct the proposed network. For example, over the past 15 years, Shentel has developed an extensive partnership with MBC (https://mbc-va.com/), and is one of the largest customers of MBC fiber. For both Bedford County schools, and Franklin County schools, Shentel and MBC designed a "joint network" that leveraged existing assets to cost effectively serve all school locations. As part of this grant, Shentel will leverage a similar contractual relationship to share fibers with MBC. Shentel also looks forward to working with Appalachian Electric Power (AEP). They have signed an NDA with AEP, and are collaborating on network plans and designs.

Shentel also serves the entire Bedford County library system (seven locations) through the E-Rate program.

In addition, Shentel has fiber into the GigaPark in Bedford, and provides connectivity to several businesses in the park. Shentel has always partnered with the local communities through investment in organizations like the Lynchburg Regional Alliance (https://www.yeslynchburgregion.org/), and the local Chamber of Commerce.

C. The importance of Virginia's Community College system cannot be overstated. That certainly applies to CVCC's Bedford's campus. According to CVCC President, Dr. John Capps, during spring 2020, CVCC was forced to suspend all face-to-face programming and move all its courses and services to a remote environment. Those with access to broadband were able to continue their educations; those who lacked access were relegated to patching together temporary access points

or, worse, abandoning their education altogether. The statistics speak for themselves. Enrollments at CVCC among Bedford County students fell from 948 in fall 2019—a pre-pandemic period—to 768 in fall 2020 when the college was still operating primarily in a virtual environment. Enrollments still have not recovered, for Bedford County students number 702 in fall 2021. Dr. Capps insists limited access to broadband and technology was a major factor. The inequities stemming from uneven access to broadband are especially detrimental to students from underserved populations, who already face significant barriers to their education. That is an issue of special import at CVCC. Of the 31,206 households in Bedford County, 46%--almost half—fall below the United Way's ALICE (Asset Limited Income Constrained Employed) threshold. That statistic reflects the percentage of county residents who live in poverty or who qualify as the working poor (https://unitedforalice.org/virginia). Of the 1,968 African-American households in the county, 60% fall below the ALICE threshold (https://unitedforalice.org/demographics/virginia). Please see Dr. Capps' letter to understand his immense support for this grant and the proposed project.

Bedford County has also partnered with the County School System and Library system to help fund more technology dependent programming for students and patrons. From learning devices, to hotspots, and eBooks, the County has been a willing partner to bring new products to those who utilize educational services. Finally, Bedford County has been working with three Internet Service Providers to further expand broadband in the community. DHCD is already familiar with the County's PPEA effort with Blue Ridge Towers and Briscnet. However, using CARES Act dollars, the County worked with B2X and Zitel to enhance availability to the community. In total, the County allocated $1,784,625 towards projects with each of these entities to either upgrade fixed wireless service or provide reliable fiber to unserved neighborhoods. In total, the B2X and Zitel projects have the potential to serve 3,162 households.

As discussed in question 6, Shentel is also leveraging this project to bring service to Low-to-Moderate residents who may not otherwise be able to receive it. Long drops are a notorious roadblock for low to moderate income residents to receive broadband service. Shentel has included as part of the cost of this project long drop capital for approximately 206 long drops for homes that are believed to be Low to Moderate Income.

Application to DHCD Submitted through CAMS

Bedford County

Bedford County Shentel broadband 2022

20. **Additional Information**

Provide the two most recent Form 477 submitted to the FCC, or equivalent, as well as point, polygon, and, for wireless providers, RSSI shapefiles for the project area **in .zip file form**. With attachments 17 through 20, attach any other information 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 - Point and Polygon shapefiles, in.zip file form, showing proposed passings and project area

c. Attachment 16 - For wireless applicants: shapefiles, in .zip file form, indicating RSSI projections in the application area

d. Attachment 17 – XXXXXXX

e. Attachment 18 – XXXXXXX

f. Attachment 19 – XXXXXXX

g. Attachment 20 – XXXXXXX

Answer:

Attachments 14 -20 are included in this application.

Attachments:

Map(s) of project area, including proposed infrastructure

Attachment1ProjectAreaMap913202160510.pdf

Documentation of Federal Funding (CAF/ACAM/USDA/RDOF, etc…) in and/or near proposed project area.

Attachment2DocumentationofFederalFundingArea913202160427.pdf

RDOF Awarded Areas included in VATI Application (Use template provided)

Attachment3DocumentationofRDOFAwardedAreaIncludedinVATIApplication913202160535.pdf

Documentation that proposed project area is unserved based on VATI criteria

Attachment4DocumentationUnservedAreaVATICriteria913202160554.pdf

Application to DHCD Submitted through CAMS

Bedford County

Bedford County Shentel broadband 2022

Passings Form (Use template provided)

Attachment5PassingsForm914202111128.pdf

Propagation Map if Wireless Project

Attachment6PropagationMap913202160637.pdf

Timeline/Project Management Plan

Attachment7TimelineProjectManagementPlan913202160653.pdf

MOU/MOA between applicant/co-applicant (can be in draft form)

Attachment08MOUMOABetweenApplicantCoapplicant913202160711.pdf

Funding Sources Table (Use template provided)

Attachment9BedfordFundingSourcesTable913202160736.pdf

Documentation of Match Funding

Attachment10DocumentationofMatchFunding913202160801.pdf

Letters of Support

Attachment11LettersofSupportShentel9132021112805.pdf

Derivation of Cost/Project Budget (Use template provided)

Attachment12DerivationofCosts913202160826.pdf

Documentation of Supporting Cost Estimates

Attachment13DocumentationofSupportingCostEstimatesFOIA914202110527.pdf

Two most recent Form 477 submitted to the FCC or equivalent

Attachment14TwomostrecentForm477submittedtoFCC913202161019.pdf

Point and Polygon shapefiles, in.zip file form, showing proposed passings and project area

Attachment15PointandPolygonShapefiles914202111704.zip

Application to DHCD Submitted through CAMS

Bedford County

Bedford County Shentel broadband 2022

For wireless applicants: shapefiles, in .zip file form, indicating RSSI projections in the application area

Attachment16RSSIProjectionShapefilesFOIA914202110749.pdf

Optional

Attachment17TechnologyUsedforFTTHNetworkandWirelessShentel914202113749.pdf

Optional

Attachment18ShentelFootprintInternetSurvey914202120838.pdf

Optional

Attachment19MarketingandCitizenEngagementPlan913202161313.pdf

Optional

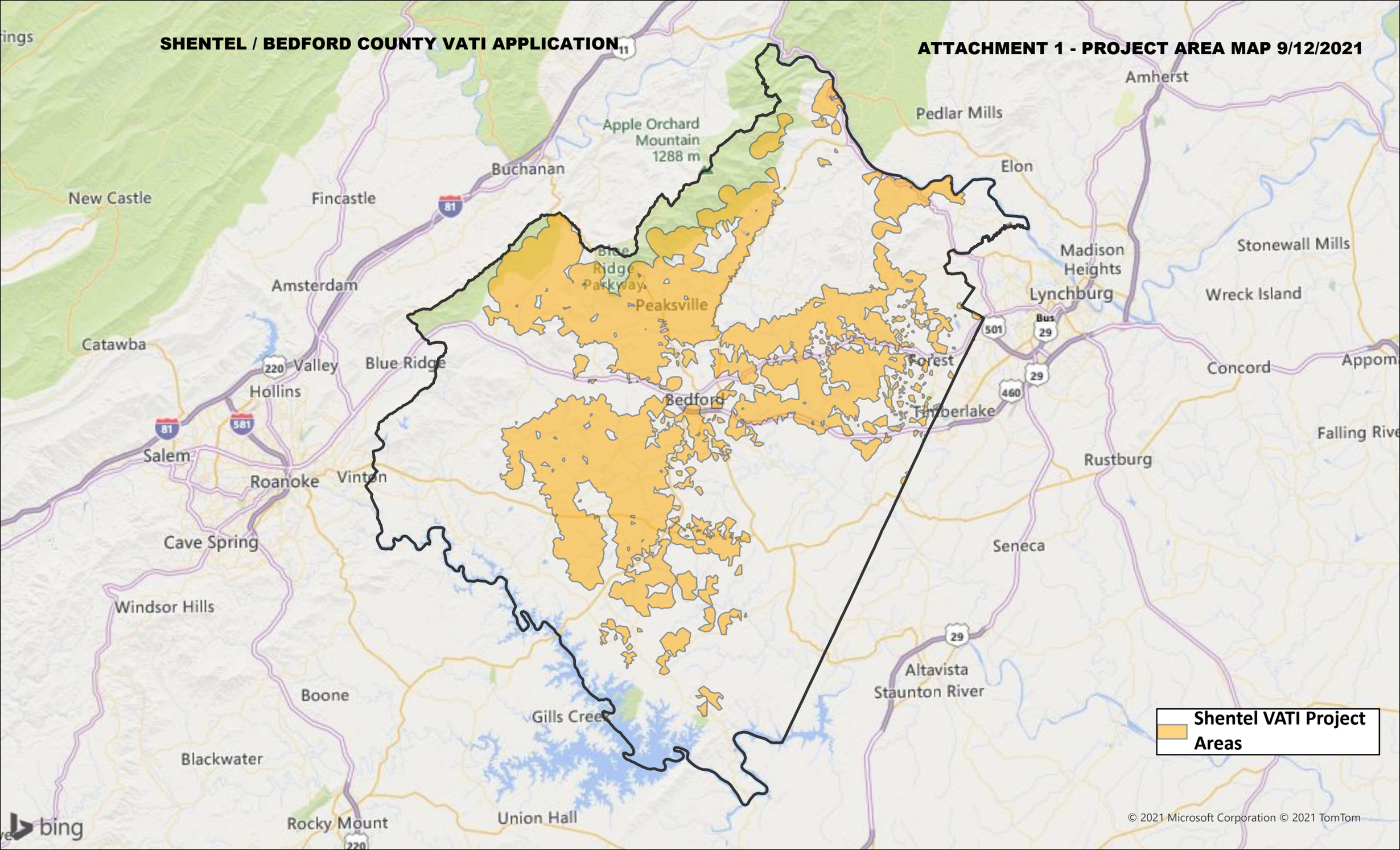
Attachment20BedfordCountyStoryMap914202114546.pdf

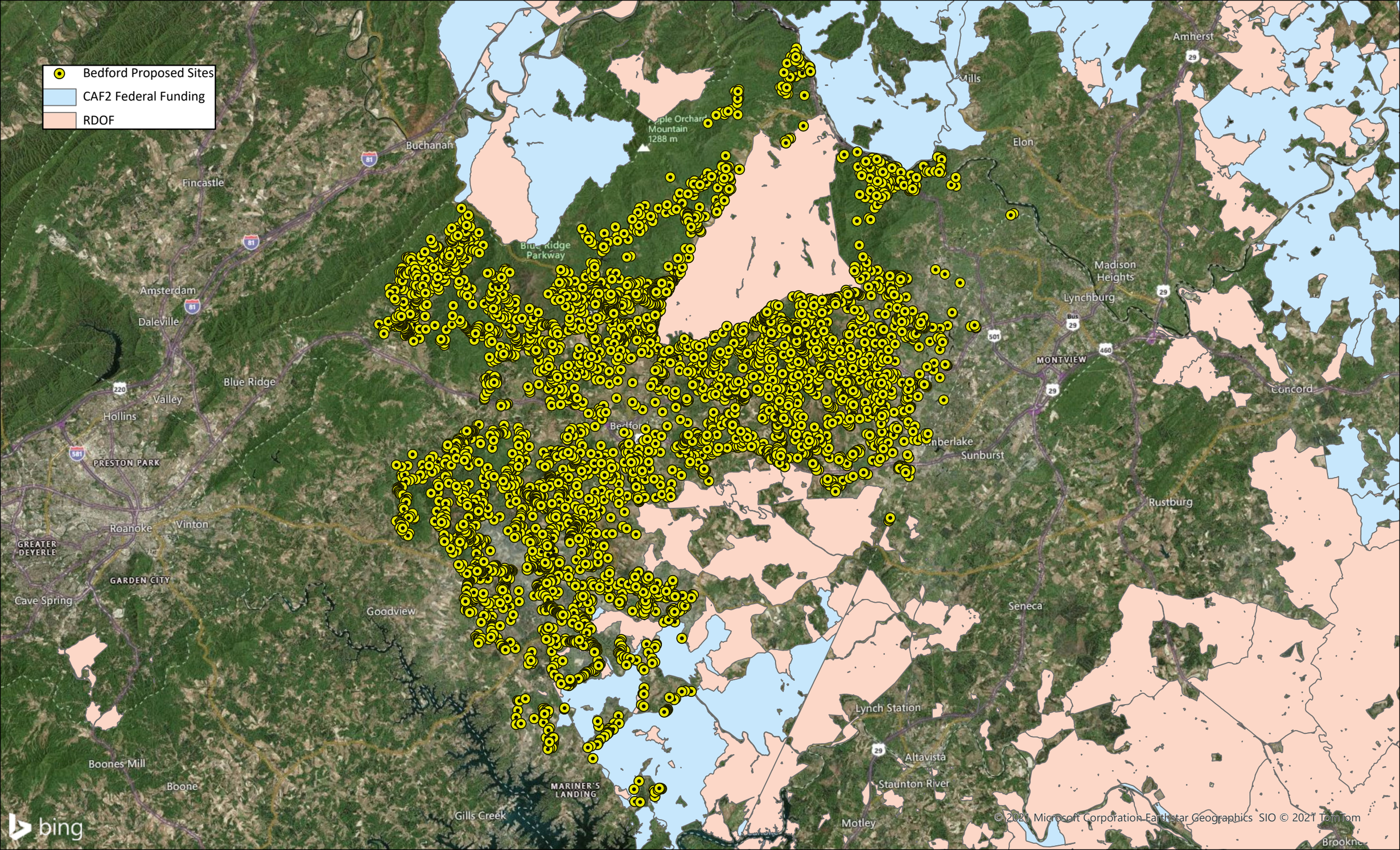
Notes:

This grant application to achieve functional universal broadband is the top policy and infrastructure priority for the Bedford County Board of Supervisors and Broadband Authority. Your serious consideration of this application and the benefits it will provide the citizens of Bedford County is greatly appreciated.

SHENTEL / BEDFORD COUNTY VATI APPLICATION

ATTACHMENT 1 - PROJECT AREA MAP 9/12/2021




Bedford Proposed Sites
CAF2 Federal Funding
RDOF
Buchanan
Fincastle
Amsterdam
Daleville
Blue Ridge
Valley
Hollins
PRESTON PARK
Roanoke
Vinton
GREATER DEYERLE
GARDEN CITY
Cave Spring
Goodview
Boones Mill
Boone
MARINER'S LANDING
Gills Creek
Motley
Lynch Station
Altavista
Staunton River
Seneca
Rustburg
Sunburst
MONTVIEW
Madison Heights
Lynchburg
Elon
Amherst
Concord
Blue Ridge Parkway
bing
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ATTACHMENT 3 – DOCUMENTATION OF RDOF AWARDED AREA INCLUDED IN VATI APPLICATION

Not applicable to this project.

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9/13/2021

ATTACHMENT – 4 Documentation of Unserved Area VATI Criteria

Shentel has defined its project area through an iterative and collaborative process of identifying unserved homes. The only homes included in Shentel's VATI application are believed to be unserved. As such, Shentel anticipates no overlap other than possible incidental overlap for two reasons. First, the process for identifying unserved is complicated and involves several different data sources as well as local knowledge and citizen feedback. As such, there are possible holes in the estimate that may lead to a small amount of overlap. Second, the nature of the wireless drop portion of Shentel's proposed project naturally leaves room for incidental overlap. Wireless technology is not as precise and controllable as wireline technology. Cell site location can be constrained by available infrastructure, such as utility poles, fiber connectivity, and utility power, as well as geography, terrain, and topology considerations. Because of these constraints, there may be situations where the only way to reach unserved locations is to place a site that has some incidental service overlap. Due to these considerations, Shentel has estimated a 5-10% overlap percentage.

Furthermore, Shentel is committed to continuing to minimize overlap throughout the life of this project. As the high-level design is refined and planned out in detail, there will be many opportunities to improve the accuracy of Shentel's wireless drop service. Specific cell sites will be determined based on existing search rings, and there is flexibility in this process to determine sites that will minimize overlap. Shentel may also use directional antennas to further target only unserved locations and avoid overlap. Finally, there may be opportunities to substitute wireless connections with wireline connections, eliminating overlap concerns. Shentel has gone through an extensive process to identify unserved addresses and worked with County partners to minimize overlap in keeping with VATI guidance. Shentel is furthermore committed to reasonably closing any gaps where previously unidentified overlap comes to light, and remaining below the allowable VATI overlap threshold.

2022 Virginia Telecommunication Initiative (VATI)
Passing Form

Type of Passings	Total Number of Passings in the Project Area [1]	Passings in the Project Area, without Special Construction Costs Required[2]	Passings with Special Construction Costs budgeted in the Application [3]	Number of Passings with Speeds at 10/1 or below in Project Area [4]
Residential	5,349	3,313	2,036	4,616
Businesses (non-home based)	128	128	0	0
Businesses (home-based)	0	0	0	0
Community Anchors	72	72	0	0
Non-residential	16	16	0	0
Total	5,565	3,529	2,036	4,616

***Note**: The Total Number of Passings **MUST** be equal to the Residential, Business (non-home based), Non-residential and Community Anchors sum.*

***Note**: Do not include passings in RDOF awarded areas that were awarded to the co-applicant; these passings should be included in the RDOF Passings Form. Passings included in this application in RDOF awarded areas that were not awarded to the co-applicant, unless successfully challenged, are considered unserved and should be counted as passings in this form.*

[1] The total number of structures in the project area that can receive service. See definition of passing below for more detail.
[2] The number of structures in the project area that will not require special construction costs to provide service to. These passings fall within the broadband provider's standard service connection drop length and do not require nonstandard equipment or any additional fees above normal service connection fees required to provide broadband access to a premise.
[3] The number of structures in the project area with all construction costs budgeted in the application. These passings will not require any additional special construction costs beyond those budgeted for in the VATI application.
[4] The number of structures in the project area that do not have access to internet at speeds of at least 10 mbps download and 1mbps upload.

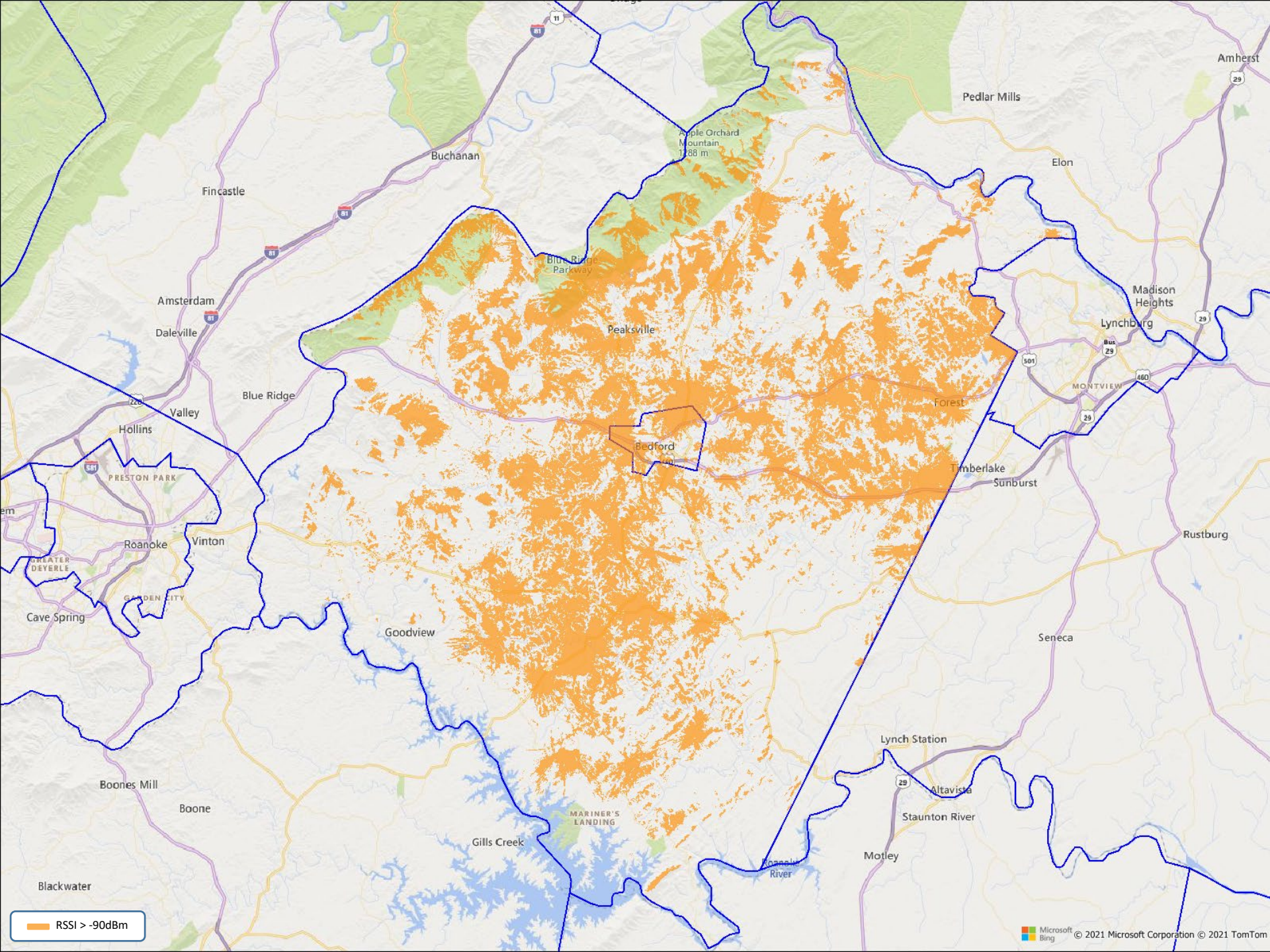
Definitions

Passing – any structure that can receive service. Multi-unit structures may be counted as more than 1 passing, provided individual connections and account are planned at that structure.

Business – An organization or entity that provides goods or services in order to generate profit. Businesses based in residential homes can count if they are a registered business (BPOL, LLC, etc.).

Community Anchor - schools, libraries, medical and health care providers, public safety entities, community colleges and other institutions of higher education, and other community support organizations and agencies that provide outreach, access, equipment, and support services to facilitate greater use of broadband service by vulnerable populations, including low-income, unemployed, and the aged.

Non-Residential Passing – places of worship, federal, state, or local facilities or other potential customers that are neither a residence, business or a community anchor as defined above.


Amherst
Pedlar Mills
Apple Orchard Mountain 1288 m
Buchanan
Elon
Fincastle
Blue Ridge Parkway
Madison Heights
Lynchburg
Amsterdam
Daleville
Peaksville
Blue Ridge
Valley
Hollins
Forest
Bedford
Timberlake
Sunburst
PRESTON PARK
Roanoke
Vinton
Rustburg
GREATER DEVERLE
GARDEN CITY
Cave Spring
Goodview
Seneca
Lynch Station
Boones Mill
Boone
Altavista
MARINER'S LANDING
Staunton River
Gills Creek
Motley
Blackwater
RSSI > -90dBm
Microsoft Bing
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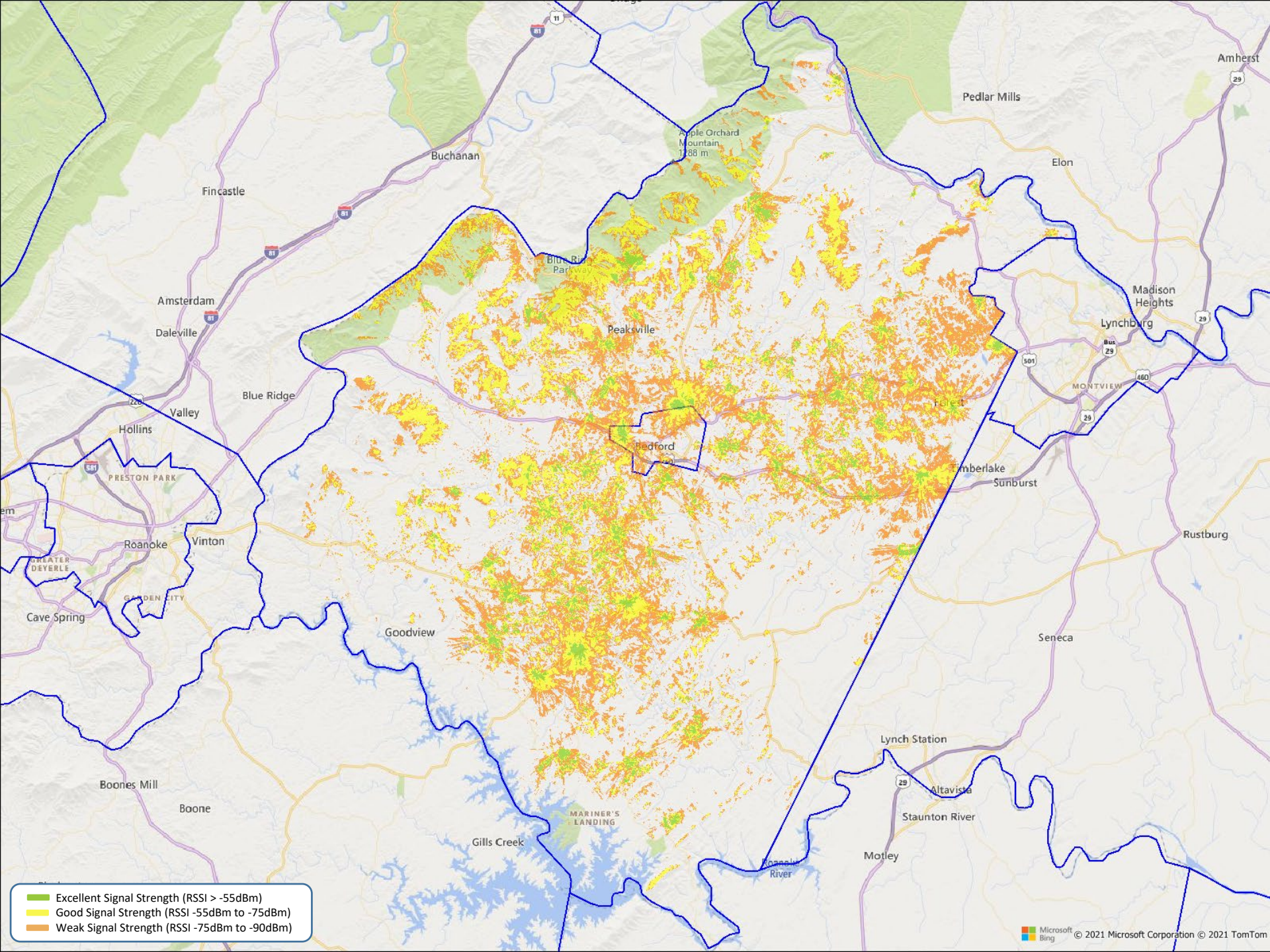

Excellent Signal Strength (RSSI > -55dBm)
Good Signal Strength (RSSI -55dBm to -75dBm)
Weak Signal Strength (RSSI -75dBm to -90dBm)
Amherst
Pedlar Mills
Apple Orchard Mountain 1288 m
Buchanan
Elon
Fincastle
Amsterdam
Daleville
Peaksville
Madison Heights
Lynchburg
Blue Ridge
Valley
Hollins
Bedford
Timberlake
Sunburst
PRESTON PARK
Roanoke
Vinton
Rustburg
GREATER DEYERLE
GARDEN CITY
Cave Spring
Goodview
Seneca
Lynch Station
Boones Mill
Boone
Altavista
MARINER'S LANDING
Staunton River
Gills Creek
Motley
Roanoke River
Microsoft Bing
© 2021 Microsoft Corporation © 2021 TomTom

ATTACHMENT 7 (Question 11 Project Readiness)

Project Timeline

Month 1 = Contract Award Notification and Contract Fully Executed
Project Deadline = December, 2024 (24 months)

Hybrid Broadband (includes FTTH and Fixed Wireless)

Performance Milestones	Month 1 Jan-22	Month 2 Feb-22	Month 3 Mar-22	Month 4 Apr-22	Month 5 May-22	Month 6 Jun-22	Month 7 Jul-22	Month 8 Aug-22	Month 9 Sep-22	Month 10 Oct-22	Month 11 Nov-22	Month 12 Dec-22	Month 13 Jan-23	Month 14 Feb-23	Month 15 Mar-23	Month 16 Apr-23	Month 17 May-23	Month 18 Jun-23	Month 19 Jul-23	Month 20 Aug-23	Month 21 Sep-23	Month 22 Oct-23	Month 23 Nov-23	Month 24 Dec-23
Field Engineering - Phased	■	■	■	■	■																			
Design Engineering - Phased			■	■	■	■	■																	
Search Ring Release - Phased				■	■	■	■	■	■															
Site Acquisition - Phased					■	■	■	■	■	■	■	■	■	■	■	■	■	■						
Permitting - Phased						■	■	■	■	■	■	■	■	■	■	■	■	■	■					
Final Project Review - Phased							■	■	■	■	■	■	■	■	■	■	■	■	■	■				
Construction - Phased								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Customer Installation Commencement - Phased															■	■	■	■	■	■	■	■	■	■
Project Close-out - Phased																■	■	Target Completion	■	■	■	■	■	Project Deadline

Detailed description of each of the aforementioned Performance Milestones for both Fiber to the Home and Fixed Wireless technologies are as follows:

Performance Milestones – Fiber to the Home

Field Engineering – Phased

- Outside Plant:
  - Shentel shall complete a full review of the planned fiber route to determine feasibility, costs, and challenges for construction. This review shall consist of Shentel personnel visually inspecting the entire planned fiber route. Shentel typically follows utility routes

such as power or telephone, with those utilities for new pole attachments when there is not existing Shentel attachment to allow overlash.
- Shentel shall make a determination to go underground if the utility routes are deemed unfavorable or contain challenges that would result in high costs to construct.
- Shentel shall collect all pole information and route information and prepare the proper permits to pole owners and VDOT.

Design Engineering – Phased

- Outside Plant:
  - Shentel shall complete a detailed Engineering Package that includes the entire defined fiber build route, as well as a complete list of all required materials to complete the fiber build.
  - Engineering Package shall consist of geospatial drawings of the physical route (aerial versus buried), list all physical structures and other possible obstructions, provide required materials and their physical placement, and note key requirements that construction is required to follow to complete the project.

- Inside Plant:
  - Shentel shall complete a full design and procure all required equipment and ancillary hardware to support all planned services.

Permitting – Phased

- Outside Plant:
  - Shentel shall permit all utility pole owners for any overlash or new pole attachments.
  - For any new permitted utility pole that is located on private property, Shentel shall follow the Virginia and Federal code that would allow Shentel to utilize existing like-kind utility easements. Shentel shall engage the County to aid in any dispute that would arise from a landowner denying Shentel access to utility easements.
  - Shentel shall submit all other permits such as city, town, railroad, or VMRC permits as required.

Construction – Phased

- Outside Plant:
  - Shentel shall complete all construction requirements as outlined and defined in the Engineering Package once all permits have been approved.
  - Required changes during construction shall be communicated and approved before construction can be completed.

  - Shentel shall complete end-to-end fiber characterization and testing of fiber to determine if fiber passes all defined criteria. Any noted problems are corrected at the time of testing.

- Inside Plant:
  - Shentel shall configure, deploy, and install all equipment and ancillary hardware.
  - Shentel shall complete end-to-end testing and certification to validate the service.

Customer Installation Commencement – Phased

- Operations:
  - Release of addresses to sales database
  - Shentel shall complete the installation, test, and turn-up of all customer CPE (Customer Premise Equipment) at the home/business to support the service.

Project Close-Out – Phased

  - Shentel shall complete a full review of the completed construction against the Engineering Package to verify that all requirements have been completed.
  - Shentel shall complete a full review of all received equipment and ancillary hardware to complete verify that all materials have been received and placed into service.
  - Shentel shall complete a full review of all vendor invoices against their completed work and materials to verify billing accuracy.
  - Shentel shall complete all financial true-ups and closeouts to complete the project.

<u>Performance Milestones – Fixed Wireless</u>

Field Engineering – Phased

- Reconfirm previous analysis of unserved or underserved homes
- Competitive analysis of other providers

Design Engineering – Phased

- Prediction modelling using InfoVista Planet platform
- Targeted coverage review/analysis

- Site configuration – macro vs. small cell
- Prediction and analysis of home counts

Search Ring Release – Phased

- Creation of designated search ring area

Site Acquisition – Phased

- Property Acquisition
- Prediction modelling using InfoVisto Planet platform of specific site candidates
- Regulatory Review/Title Review
- Lease/Easement acquired
- Construction Drawings
- Structural Analysis Review
- Environmental Review

Permitting – Phased

- Zoning/Permitting with jurisdiction
- Land Use Permit filing with VDOT

Final Project Review – Phased

- Notice to proceed issued
- Materials and equipment order finalized

Construction – Phased

- Civil construction (includes backhaul, power and BTS set)
- Tower construction
- Integration of equipment/activation of site

Customer Installation Commencement – Phased

- Release of addresses to sales database

- CPE (Customer Premise Equipment) installation at home/business

Project Close-out – Phased

- Shentel shall complete a full review of the completed construction against the Engineering Package to verify that all requirements have been completed.
- Shentel shall complete a full review of all received equipment and ancillary hardware to complete verify that all materials have been received and placed into service.
- Shentel shall complete a full review of all vendor invoices against their completed work and materials to verify billing accuracy.
- Shentel shall complete all financial true-ups and closeouts to complete the project.

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding ("MOU") entered into on this 9th day of September, 2021, by and between Shenandoah Telecommunications Company, located at 500 Shentel Way, Edinburg, VA 22824 hereinafter referred to as "Shentel", and the County of Bedford, Virginia, a political subdivision of the Commonwealth of Virginia, located at 122 East Main Street, Bedford, Virginia 24523, hereinafter referred to as the "County" (Shentel and County are collectively referred to as the "Parties"), for the purpose of establishing and achieving various goals and objectives relating to the project contemplated by the Parties.

WHEREAS, the Parties are desirous to enter into this Memorandum to set forth the working arrangements that both Parties agree shall be necessary to pursue their efforts to bring the Project to fruition;

MISSION

The Project is intended to provide the areas of the County with access to broadband Internet service ("Broadband"), in order to meet the future needs of residents and businesses in those areas of the County.

PURPOSE AND SCOPE

The Parties intend for this Memorandum to outline the structure for any binding contracts which the Parties may enter into in the future related to the Project.

OBJECTIVES

The Parties agree to work together to attempt to secure funding and establish policies and procedures that will promote and sustain a market for Broadband availability and intend to work toward delivering a product and/or services that meet or exceed business and industry standards.

RESPONSIBILITIES AND OBLIGATIONS OF THE PARTIES

The Parties agree to work together in good faith and collaboratively in an effort to bring the Project to successful completion. This Memorandum does not create any legal or equitable obligations or rights on the part of either Party and no such obligations or rights shall exist unless and until such time as the Parties may enter into a written agreement signed by both Parties.

SERVICES COOPERATION

The goal of the Project is to provide the following services in the areas of the County contemplated in the Project, which services include, but are not necessarily limited to:

Broadband Internet access services

Phase 1 (beginning after MOU execution): The Parties will work together to apply for Virginia Telecommunication Initiative ("VATI") grant(s). The Parties anticipate that VATI guidelines will require contributions by Shentel and by the County as matching funds to secure a FY2022 VATI Grant through the Virginia DHCD. DHCD funding shall not exceed 80% of Project costs.

> The total budget for the Project is expected to be $24,758,728. The County agrees to provide a total match of $5,446,920 in funding for the Project. Shentel agrees to provide a minimum match of $6,932,444 in funding for the Project. The amount of the VATI Grant to be requested for the Project will be at least $12,379,364 and the total number of homes projected to be passed by the Project shall be at least 5,590.

Phase 2 (beginning after Phase 1): Shentel will work with the County to continue Project planning and the Parties will seek additional Federal, State and local funding to expand the availability of Broadband service in the County.

TIMELINE

The above outlined scope and objective shall be contingent on the Parties' ability to obtain the necessary funding required for the Project, as described in any applicable grant or business loan application. Responsibilities with regard to commencement and completion of the Project will be established in any future agreement between the Parties, and may coincide with the period specified in connection with any grants awarded in connection with the Project.

TERM

This MOU shall remain in effect, subject to the termination provisions in this MOU, up until the Parties mutually determine whether they are able to move forward with the Project.

If the Parties are successful in securing sufficient grant funding that they are both willing to move forward with the Project, then they agree to use good faith efforts to negotiate, execute and deliver a formal contract regarding the Project ("Project Agreement"). The Parties contemplate that a Project Agreement will contain terms and conditions, representations, warranties, covenants, and other provisions that are customary in service arrangements of the sort contemplated in this MOU. If the Parties are unable to agree on the terms and conditions of a Project Agreement within 60 days of receiving notice of the award of such grant funding, then either Party may give notice of the termination of this MOU. In that event, the Parties shall have no further obligations to each other under this MOU except for any obligations which are specifically provided to survive a termination of this MOU. This MOU does not create any legal or equitable obligations or legal rights.

AMENDMENT OR CANCELLATION OF THIS MEMORANDUM

This Memorandum may be amended or modified at any time in writing by mutual agreement of both Parties.

In addition, this MOU may be cancelled by either Party without cause on sixty (60) days advance written notice. This MOU may be terminated for cause, where cause for termination may include, but is not limited to, a material breach of any of the provisions contained herein, upon delivery of written notice of such termination to the other Party.

GENERAL PROVISIONS

The Parties acknowledge and understand that they must be able to fulfill their responsibilities under this MOU in accordance with the provisions of the law and regulations that govern their activities. Nothing in this Memorandum is intended to negate or otherwise render ineffective any such provisions or operating procedures. The Parties assume full responsibility for their performance under the terms of this Memorandum.

If at any time either Party is unable to perform its duties or responsibilities under this MOU consistent with such Party's statutory and regulatory mandates, the affected Party shall immediately provide written notice of such to the other Party and, if possible, establish a date for such performance.

LIMITATION OF LIABILITY

No rights or limitation of rights shall arise or be assumed between the Parties as a result of the terms of this MOU.

ARBITRATION/MEDIATION DISPUTE RESOLUTION

The Parties to this MOU agree that should any dispute arise regarding any aspect of their relationship or the Project, including, but not limited to, any matters, disputes or claims, the Parties shall confer in good faith to promptly resolve any such dispute. In the event that the Parties are unable to resolve the issue or dispute between them, then the matter shall be subject to non-binding mediation in an attempt to resolve any and all issues between the Parties.

The Parties agree that venue for any claim or dispute that arises from or through this MOU shall be in the state and Federal courts for Bedford County, Virginia.

NOTICE

Any notice or communication required or permitted under this MOU shall be sufficiently given if delivered in person or by certified mail, return receipt requested, to the address

set forth in the opening paragraph or to such address as one may have furnished to the other in writing.

GOVERNING LAW

This MOU shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, exclusive of its conflicts of laws rules.

SEVERABILITY CLAUSE

In the event that any provision of this Memorandum shall be deemed to be severable or invalid, and if any term, condition, phrase or portion of this Memorandum shall be determined to be unlawful or otherwise unenforceable, the remainder of the Memorandum shall remain in full force and effect, so long as the clause severed does not affect the intent of the Parties. If a court should find that any provision of this Memorandum to be invalid or unenforceable, but that by limiting said provision it would become valid and enforceable, then said provision shall be deemed to be written, construed and enforced as so limited.

ASSIGNMENT

Neither Party may assign this Memorandum without the prior written consent of the non-assigning Party, whose approval shall not be unreasonably withheld or conditioned. Notwithstanding the foregoing, Shentel shall have the right to assign this MOU without the County's consent to any parent, subsidiary, affiliate, or any person, firm, or corporation that shall control, be under the control of, or be under common control with Shentel, or to any entity into which Shentel may have merged or consolidated or which purchases all or substantially all of the assets of Shentel.

ENTIRE UNDERSTANDING

This MOU reflects the entire understanding and agreement of the Parties pertaining to all matters contemplated hereunder.

MOU SUMMARIZATION

The Parties to this MOU have mutually acknowledged and agreed to the following:

- The Parties to this MOU shall work together in a cooperative and coordinated effort, and in a manner and fashion intended to bring about the achievement and fulfillment of the goals and objectives of the Project.

- It is not the intent of this MOU to restrict the Parties from their involvement in or participation with any other public or private individuals, agencies or organizations or opportunities.

- The Parties to this MOU shall mutually contribute and take part in any and all phases of the planning and development of the Project, to the fullest extent possible.

- This MOU is not a binding contract, and it is not the intent or purpose of this MOU to create any rights, benefits, obligations and/or trust responsibilities by or between the Parties.

- This MOU shall in no way hold or obligate either Party to supply or transfer funds to maintain and/or sustain the Project or the effort to bring it to fruition.

- Should there be any need or cause for the reimbursement or the contribution of any funds to or in support of the Parties' efforts relating to the Project, then such shall then be done in accordance with applicable Virginia laws, regulations and/or procedures, and any Project Agreement which the Parties may enter into in the future.

- In the event that it should become necessary to provide funding for the effort to develop the Project, then any such endeavor shall be addressed in a separate and mutually agreed upon written agreement signed by the Parties or their representatives, in accordance with applicable laws and regulations, and in no way does this MOU provide such right or authority or obligate any Party to provide any such funding.

- The Parties have the right to individually or jointly terminate their participation in this MOU provided that advanced written notice is delivered to the other Party as provided for herein.

AUTHORIZATION AND EXECUTION

The signing of this Memorandum of Understanding does not constitute a formal undertaking, and as such it simply reflects the intentions of the Parties to undertake preliminary efforts to achieve the goals and objectives stated in this MOU.

IN WITNESS WHEREOF, the Parties hereto have set their hands as of the day and year first above written.

Shentel

By: 

Title: Vice President

BEDFORD COUNTY, VIRGINIA

By: _____

Robert Hiss

County Administrator

ATTACHMENT 9 – FUNDING SOURCES TABLE

VATI FUNDING SOURCES TABLE

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	$ 8,642,313	33%	Pending
SHENTEL	$ 12,308,749	47%	SECURED
BEDFORD COUNTY	$ 5,237,766	20%	SECURED
	$		
	$		
	$		
	$		
TOTAL	**$ 26,188,828**	**100 %**	

COUNTY OF BEDFORD, VIRGINIA
County Administration Building
122 East Main Street, Suite 202
Bedford, Virginia 24523
Tel: (540) 586.7601

ROBERT HISS
COUNTY ADMINISTRATOR

OFFICE OF THE COUNTY ADMINISTRATOR

September 8, 2021

Virginia DHCD
600 E. Main Street, Suite 300
Richmond, VA 23210

RE: VATI 2022 Application - Attachment 10 Documentation of Matching Funding

DHCD Staff:

During a special called meeting on September 7, 2021, the Bedford County Board of Supervisors (the "BOS") appropriated the full local match in the amount of **$5,446,920** for our VATI 2022 Application in conjunction with Shentel. The funds will be made available as required by Shentel to pay for the construction of a hybrid fiber to the home (FTTH) and small cell fixed wireless project. These funds will be considered appropriated by the Board for once the grant is approved and awarded.

We are very pleased to be associated with this application and feel that it will help us reach our goal of ubiquitous broadband service in our County.

Thank you for your consideration and potential partnership with Shentel and Bedford County.

Regards,

Robert Hiss
County Administrator

Resolution #R 090721-01

At a Special Called Meeting of the Board of Supervisors and the Broadband Authority of the County of Bedford, Virginia held at the Bedford County Administration Building on the 7th day of September 2021, beginning at 5:00 pm:

MEMBERS:	**VOTE:**
Tommy W. Scott, Chair	Yes
Tammy Parker, Vice-Chair	Yes
Mickey Johnson	Yes
Edgar Tuck	Yes
Charla Bansley	Yes
John Sharp	Yes
Bob Davis	Yes

On motion of Vice-Chair Parker, which carried by a vote of 7-0, the following was adopted:

A RESOLUTION

WHEREAS, broadband is a critical piece of necessary infrastructure and significant gaps remain in Bedford County for those who are unserved or underserved with broadband; and

WHEREAS, the County received American Rescue Plan Act (ARPA) funds and CARES Act funds in which broadband is an eligible expense; and

WHEREAS, the County desires to receive a grant from the Virginia Telecommunications Initiative (VATI) to leverage further broadband development; and

WHEREAS, thru a request for proposals, Zitel, Riverstreet, and Shentel were selected as internet service providers the County desires to partner with to achieve universal broadband coverage in conjunction with a VATI grant.

NOW, THEREFORE, BE IT RESOLVED, by the Bedford County Broadband Authority, that the County Administrator is authorized to submit a VATI application in partnership with Zitel, Riverstreet, and Shentel; approved to sign a memorandum of understanding with Zitel, Riverstreet, and Shentel; and appropriates the following to serve as the County cash match for each respective VATI grant: $5,525,283.46 to Zitel and $5,446,920 to Shentel from ARPA funds, and $2,014,874 to Riverstreet from general fund balance previously identified as recovered salaries from the CARES Act.

A Copy-Teste:

Robert Hiss
County Administrator

SHENTEL®
Always connected to you

Shentel is prepared to provide all necessary match funding in alignment with this grant application. All VATI grant projects will be accounted for in the annual budget and funded to the necessary level. Furthermore, Shentel iscommitted to the proposed projects and has more than adequate financial backing to support their completion.

Chris Kyle
Vice President, Industry Affairs & Regulatory

ITEM 6. **SELECTED FINANCIAL DATA**

The following table sets forth selected consolidated financial data for the years presented and at the dates indicated below. Our historical results are not necessarily indicative of our results in any future periods. The summary of our consolidated financial data set forth below should be read together with our consolidated financial statements and related notes, as well as the sections entitled "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations," included elsewhere in this Annual Report on Form 10-K. All periods reflect the operating results, cash flows, and financial position, related to our Wireless operations as discontinued operations. Additionally, those assets and liabilities which are expected to transfer in the sale of our discontinued Wireless operations are presented as held for sale in our Consolidated Balance Sheets.

(in thousands, except share and per share amounts)	Years Ended December 31, 2020	2019	2018
Revenue	$ 220,775	$ 206,862	$ 192,683
Operating expenses	221,922	207,581	195,652
Operating loss	(1,147)	(719)	(2,969)
Income tax (benefit) expense	(586)	173	(1,343)
Income from continuing operations	2,626	2,388	2,077
Income from discontinued operations, net of tax	124,097	53,568	44,518
Net income	$ 126,723	$ 55,956	$ 46,595
Shareholder Information:			
Shares outstanding	49,867,676	49,670,603	49,630,119
Net income per share, basic and diluted:			
Basic - Income from continuing operations	$ 0.05	$ 0.05	$ 0.04
Basic - Income from discontinued operations, net of tax	$ 2.49	$ 1.07	$ 0.90
Basic net income per share	$ 2.54	$ 1.12	$ 0.94
Diluted - Income from continuing operations	$ 0.05	$ 0.05	$ 0.04
Diluted - Income from discontinued operations, net of tax	$ 2.48	$ 1.07	$ 0.89
Diluted net income per share	$ 2.53	$ 1.12	$ 0.93
Cash dividends per share	$ 0.34	$ 0.29	$ 0.27

	Years Ended December 31, 2020	2019	2018
Cash and cash equivalents	$ 195,397	$ 101,651	$ 85,086
Assets held for sale	$ 1,133,294	$ 1,196,575	$ 910,596
Total assets	$ 2,031,707	$ 1,898,902	$ 1,487,488
Liabilities held for sale	$ 452,202	$ 422,335	$ 46,487
Total liabilities	$ 1,449,313	$ 1,426,474	$ 1,043,254
Capital expenditures	$ 120,450	$ 67,048	$ 56,631

COMMONWEALTH OF VIRGINIA

HOUSE OF DELEGATES
RICHMOND

TERRY L. AUSTIN
POST OFFICE BOX 400
BUCHANAN, VIRGINIA 24066
NINETEENTH DISTRICT

COMMITTEE ASSIGNMENTS:
TRANSPORTATION
APPROPRIATIONS
RULES

August 27, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Dear Dr. Holmes:

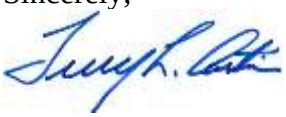
I write in support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have long been at a disadvantage with little to no internet service in many of its rural areas, a reality that quickly became apparent during the COVID-19 pandemic. Students and teachers were unable to effectively conduct their lessons and classwork virtually, with some having to park in public library parking lots just to get internet service. Businesses who needed to continue operations were hamstrung by the fact that their employees did not have the broadband connections necessary to work remotely. School boards, local governments and other public entities who were mandated to conduct public business virtually struggled to reach large number of their constituents who did not have enough bandwidth to livestream meetings. Telemedicine, which would have provided much need relief to the overburdened health care industry, was not feasible.

We all recognize the incredible importance of broadband to the citizens in Bedford County. Strong, reliable internet connectivity is no longer a want, it is now a need. Improving broadband access will increase educational opportunities, enable economic growth, and close the digital divide that is so apparent between rural communities and more populated areas. Like water and electricity, broadband connectivity is an essential utility, and this VATI Grant will bring our rural areas into the 21st century.

I ask that you strongly consider this application and the benefits and opportunities it will create for Bedford County.

Sincerely,



Delegate Terry L. Austin
19th House District

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

KATHY J. BYRON
MINORITY CAUCUS CHAIR

POST OFFICE BOX 900
FOREST, VIRGINIA 24551

TWENTY-SECOND DISTRICT

COMMITTEE ASSIGNMENTS:
FINANCE
LABOR AND COMMERCE
COMMUNICATIONS, TECHNOLOGY AND INNOVATION

September 8, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
600 E Main St Ste 300
Richmond VA 23219-2430

Dear Dr. Holmes:

I am writing to encourage the approval of the VATI grant application, filed jointly by Bedford County and Shentel Telecommunications Company, to expand broadband service in Bedford's rural areas.

Having sponsored the successful legislation that accelerated the expansion of broadband to unserved and underserved portions of the Commonwealth, I know the cost per household of these expansions is much greater due to the topographical challenges. Having spearheaded a solution that involved those most qualified and experienced at meeting such challenges, private communications firms, I also know that a public-private approach produces the best results at the lowest cost with no deficiencies.

Now, with the unprecedented levels of funding these projects are receiving from the federal government, I would hope applications are being approved promptly. Expeditiously approving these grants will quickly ameliorate the "digital divide" long afflicting rural areas of the commonwealth.

Those living in the rural areas of Bedford County have long experienced the effects of this inequity. That situation has become more pronounced during the COVID pandemic, with many businesses requiring employees work from home and most schools requiring remote learning. In rural regions, the disruption occurring throughout America because of the pandemic was exacerbated by the lack of access to reliable broadband service. Ultimately, this deficiency affected every aspect of life in unserved regions, making a difficult situation nearly impossible to address.

DISTRICT: (434) 582-1592 • RICHMOND: (804) 698-1022 • E-MAIL: DELKBYRON@HOUSE.VIRGINIA.GOV

The prompt approval of the Bedford County/Shentel joint VATI grant application will be of tremendous benefit to the people of Bedford. I ask that you give it your serious consideration for approval.

Sincerely,

Kathy J. Byron, Member
Virginia House of Delegates
22nd District

Central Virginia Community College
Where your future begins
3506 Wards Road, Lynchburg, VA 24502-2498
434-832-7601 • FAX: 434-386-4600 • www.centralvirginia.edu

OFFICE OF THE PRESIDENT

September 3, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Dear Dr. Holmes:

I am writing to endorse Bedford County's VATI application to expand broadband internet service. Broadband availability is critical to individuals, households, and businesses; it is key to community and economic development. As a community college educator, however, I am especially concerned with its importance to educational accessibility, advancement, and equity—all of which depend upon access to broadband.

COVID-19 has magnified the inequities that exist among our students and in our communities, Bedford County included. The gaps in broadband coverage, in particular, have created a chasm that puts large groups of students at a disadvantage and disrupts their progress—in some cases, even preventing them from pursuing a higher education. While broadband may have been advantageous to students before, it is essential to students today.

The truth of that statement is reflected in enrollment statistics. During spring 2020, Central Virginia Community College (CVCC) was forced to suspend all face-to-face programming and move all its courses and services to a remote environment. Those with access to broadband were able to continue their education; those who lacked access were relegated to patching together temporary access points or, worse, abandoning their education altogether. The statistics speak for themselves. Enrollments at CVCC among Bedford County students fell from 948 in fall 2019—a pre-pandemic period—to 768 in fall 2020 when the college was still operating primarily in a virtual environment. No doubt other factors contributed to that decrease; however, we can be sure that limited access to broadband was a major factor.

With online access to higher education being so important, citizens without broadband are at a profound disadvantage as they strive to further their education. It is a disadvantage that has employment consequences for individuals and economic consequences for communities. Students from low-income households and rural areas that lack broadband are especially vulnerable. Increasing coverage to these households creates an on-ramp to higher education, making community college more affordable and accessible. From that standpoint, access to broadband is not a merely luxury. It is a necessity—an imperative that is crucial to personal, community, and economic development.

The "new normal" is going to be our familiar reality for a long time to come, resulting in far-reaching and transformational effects on how we approach teaching and learning in the years ahead. Online learning—and the access that broadband affords to online learning platforms—will become more and more important as more coursework is adapted to virtual delivery. Universal access to broadband is therefore not just a practical issue, critical to educational and economic advancement. It is also a moral mandate since it promotes equity and inclusion among all citizens. For all these reasons, I endorse Bedford County's proposal to expand broadband internet service throughout the county.

Sincerely,

John S. Capps
President

BEDFORD COUNTY PUBLIC SCHOOLS
School Administration Building

Empowering Learners for Future Success

Office of the Chief Operations Officer

August 29, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Dr. Holmes,

I am writing to express my enthusiastic support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have struggled with a patchwork infrastructure that has provided little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually rather than doing so in the classroom. Businesses needed employees to work entirely or partially remotely. School boards, local governments and other public entities needed to conduct public business; however, they were unable to do so in-person. They, too, needed to do so via the internet.

Students in Bedford County Public Schools have been affected directly by the lack of broadband internet access in parts of our county, during and prior to the COVID pandemic. We are in the fifth year of a 1:1 device program in grades 6-12. This program started in the fall of 2017, and currently we have 13,055 Chromebooks available for our students. These devices are crucial for continuity of instruction for in person and remote learning formats. In 2020-21, over 20% of our students opted for a remote learning format, and while that number is much smaller this year, most school work is assigned electronically. A Chromebook has very little benefit without internet access, and in approximately 30% of Bedford County homes, access is poor or non-existent. Students who do not have a good internet connection are forced to go to school parking lots or local places of business to access their learning materials.

We recognize the vital importance of broadband to the citizens in our county. Such improvements will increase both educational opportunities and economic growth in the area. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility. The residents of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. I hope you give strong consideration to this application, and, if needed, I would be happy to give additional information about the needs our students have for affordable, reliable broadband internet access. I can be reached at (540) 586-1045, x10708 and mduis@bedford.k12.va.us.

Sincerely,

Mac Duis
Chief Operations Officer

STAUNTON RIVER
Middle School

1293 Golden Eagle Drive
Moneta, VA 24121-5563
Office: (540) 297-4152
Fax: (540) 297-4076

September 10, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Dear Dr. Holmes:

I am writing in support of Bedford County's VATI application and their joint grant application with Shentel for building improved internet in rural areas of Bedford County.

The citizens of Bedford County have long suffered from little to no internet service in many of our rural areas. During the recent COVID-19 pandemic this has become a necessity. As an administrator, I have witnessed firsthand the struggles for many students and families with the lack of broadband internet access across Bedford County. All students at Staunton River Middle School have been provided with a Chromebook that has many capabilities; however, many capabilities are driven by the internet. While students are able to upload assignments prior to leaving school for the day, various tools require internet access. Many students are limited in their ability to utilize these tools. Now more than ever, students need access to the internet otherwise they must seek other avenues such as local libraries, restaurants, parking lots, etc in order to access instructional material. Additionally, some students require paper copies of assignments. Learning opportunities are limited when paper copies are provided. Bedford County Public Schools has worked to provide hot spots to students without internet access. However, there is a limited number of hot spots available, not nearly enough to support the required need. There is no question that implementing broadband access where all community members of Bedford County have access will only enhance educational experiences. Now more than ever, broadband connectivity is imperative in Bedford County.

We recognize the importance of broadband to citizens, businesses, schools, and other important institutions in our county. Such improvements will increase educational opportunities and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. The citizens of Bedford County in the covered region will have access to broadband equal to citizens in larger cities and more populated areas. I hope you give strong consideration to this letter of support, and, if needed, I will be happy to provide additional information about the needs our students have for affordable, reliable broadband internet access. I can be reached at (540) 297-4152.

Sincerely,

Jessica H. Geyer

Jessica H. Geyer
Principal

VIRGINIA CAREER WORKS
CENTRAL REGION

August 30, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Subject: Letter of Support for Bedford County's VATI grant for rural broadband expansion

Dear Dr. Holmes,

I am pleased to provide this letter of support for Bedford County's joint VATI application with Shentel to achieve universal broadband coverage. As the Executive Director of the Virginia Career Works – Central Region, I know first-hand the struggles that job seekers have in researching and applying for jobs when they don't have adequate high-speed Internet at home. Additionally, we saw great difficulty for those employees who received stay at home work orders during the height of the Covid pandemic, yet didn't have adequate broadband to do business. There were extensive attempts by this workforce office to set up hotspots where people could connect at a church or library just to be able to conduct business and keep their job. As you can imagine, that situation is not ideal and is not sustainable.

The Central Virginia Workforce Development Board recently conducted a SWOT analysis for our region which includes Bedford County, and identified the lack of access to broadband as a limiting factor for educational opportunities, as well as business growth, customer engagement, and workforce mobility. The Board also found that limited or lack of access to broadband has accelerated the equity gap.

In the Federal Reserve Board's recent report, "Broadband in the Labor Market", "Home Internet can reduce the time and monetary costs of working by allowing individuals to work from home, reduce search frictions in the labor market by connecting potential employees to employers, and save users time in home production tasks like shopping and paying bills, freeing up time to engage in market work."

High Speed Internet to all areas of Bedford County will allow residents to engage in telework, whether conducting some or all of their work remotely. Telework can reduce commute times and increase wages by reducing absenteeism and increasing worker productivity.

On behalf of the Virginia Career Works – Central Region office and the Central Virginia Workforce Development Board, we appreciate your consideration to approve VATI funding for this critical need in Bedford County.

Thank you. I can be reached at 434-818-7612 if you have any questions.

Traci Blido, Executive Director
Virginia Career Works – Central Region

COUNTY OF BEDFORD, VIRGINIA

COUNTY ADMINISTRATION BUILDING
122 EAST MAIN STREET, SUITE 202
BEDFORD, VIRGINIA 24523

ECONOMIC DEVELOPMENT AUTHORITY

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Letter of Support for Bedford County, VA 2022 VATI Grant

Dear Dr. Holmes:

We are writing in enthusiastic support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have long suffered with little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually rather than doing so in the classroom. Businesses needed employees to work entirely or partially remotely. School boards, local governments and other public entities needed to conduct public business; however, they were unable to do so in-person. They, too, needed to do so via the internet. Similarly, the health care industry needed to conduct appointments online as well.

When attracting businesses to the county, Broadband is a critical part of the infrastructure companies expect to have readily available. For businesses, robust bandwidth is the foundation for innovation and is a critical part of the infrastructure needed for success. Bedford County is one of the fastest growing localities in Virginia, yet only certain pockets are available to be developed for business due to lack of quality, high-speed internet. With today's economy more dependent on innovation and connectivity to survive and thrive, providing high-speed Internet is critical to bringing business to the county and keeping them competitive.

We recognize the incredible importance of broadband to all the citizens in our County. Such improvements will both increase educational opportunities and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

The residents and businesses of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

James T. Messier
Board Chairman
Bedford County Economic Development Authority

COUNTY OF BEDFORD, VIRGINIA

COUNTY ADMINISTRATION BUILDING
122 EAST MAIN STREET, SUITE 202
BEDFORD, VIRGINIA 24523

OFFICE OF ECONOMIC DEVELOPMENT

August 30, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Letter of Support for Bedford County, VA 2022 VATI Grant

Dear Dr. Holmes:

We are writing in enthusiastic support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have long suffered with little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually rather than doing so in the classroom. Businesses needed employees to work entirely or partially remotely. School boards, local governments and other public entities needed to conduct public business; however, they were unable to do so in-person. They, too, needed to do so via the internet. Similarly, the health care industry needed to conduct appointments online as well.

When attracting businesses and a strong workforce to the county, Broadband is a critical part of the infrastructure people expect to have readily available. For businesses, robust bandwidth is the foundation for innovation and is a critical part of the infrastructure needed for success. Bedford County is one of the fastest growing localities in Virginia, yet only certain pockets are available to be developed for business due to lack of quality, high-speed internet. Our workforce also requires broadband as became more apparent over the last year with more people working from home. With today's economy more dependent on innovation and connectivity to survive and thrive, providing high-speed Internet is critical to bringing business to the county and keeping them competitive.

We recognize the incredible importance of broadband to all the citizens in our County. Such improvements will both increase educational opportunities and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

The residents and businesses of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

Pam Bailey
Acting Economic Development Director

DEPARTMENT OF SOCIAL SERVICES

Burks Scott Building
Post Office Box 1187
119 East Main Street
Bedford, Virginia 24523
Tel: (540) 586.7750

August 25, 2021

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Letter of Support for 2021 NTIA Grant for Bedford County, VA

Dear Dr. Holmes:

We are writing in enthusiastic support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia. The citizens of Bedford County have long suffered with little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic.

All Virginia Department of Social Services computer systems are now web based, making internet a critical infrastructure for our citizens and staff. Our citizens use the internet to apply for benefits, report changes, and to communicate with our staff either my email or video calls. Citizens need access to the quality internet to find resources for their family, to apply for jobs, and to have access to training. Likewise our staff need access to quality internet to complete their work in the field or when teleworking. The Department has employees who currently drive to local churches or businesses, to complete mandated work, as these organizations have better Wi-Fi speed than what they can access at the office or at home.

We recognize the incredible importance of broadband to the citizens in our County. Such improvements will both increase educational opportunities and economic growth. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

The residents of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

Andrew Crawford, LCSW
Director

Bedford County Sheriff's Office

Sheriff Michael W. Miller

1345 Falling Creek Road
Bedford, Virginia 24523
www.bedfordcountysheriff.org

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Re: Letter of Support for 2021 VATI Grant for Bedford County, VA

Dear Dr. Holmes:

We are writing in enthusiastic support of Bedford County's joint VATI grant application with **SHENTEL** for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have long suffered with little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually rather than doing so in the classroom. Businesses needed employees to work entirely or partially remotely. School boards, local governments and other public entities needed to conduct public business; however, they were unable to do so in-person. They, too, needed to do so via the internet. Similarly, the health care industry needed to conduct appointments online as well.

In today's mobile world, universal broadband is critical in the infrastructure of public safety. Our citizens increasingly need mobile capability to bring equity in public safety services to those who need it most. Apps which allow mobile/remote reporting and text-to-911 capabilities are now "must-haves" for public safety organizations and allows ease of communications, particularly for those in our community who suffer from some form of physical or mental impairment. Additionally, public safety agencies are almost universally suffering from manpower shortages. This results in "mutual-aid" situations in which multiple agencies will respond to handle a large-scale operation. Universal broadband will be a force-multiplier, adding the abilities to coordinate and communicate through a common app, easily downloaded in the field, without being tied to a hot-spot at a command post, and provide real-time data which will most certainly save lives.

We recognize the incredible importance of broadband to the citizens in our County. Such improvements will both increase educational opportunities and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

Bedford County Sheriff's Office

Sheriff Michael W. Miller
1345 Falling Creek Road
Bedford, Virginia 24523
www.bedfordcountysheriff.org

The residents of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

/s/: Michael W. Miller

Michael W. Miller
Sheriff of Bedford County

COUNTY OF BEDFORD, VIRGINIA

COUNTY ADMINISTRATION BUILDING
122 EAST MAIN STREET, SUITE 202
BEDFORD, VIRGINIA 24523

AGRICULTURE ECONOMIC DEVELOPMENT ADVISORY BOARD

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Letter of Support for Bedford County, VA 2022 VATI Grant

Dear Dr. Holmes:

We are writing in enthusiastic support of Bedford County's joint VATI grant application with Shentel for building improved internet in rural areas of Bedford County, Virginia.

The citizens of Bedford County have long suffered with little to no internet service in many of our rural areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually rather than doing so in the classroom. Health care appointments needed to be conducted online. Businesses needed employees to work entirely or partially remotely. School boards, local governments and other public entities needed to conduct public business; however, they were unable to do so in-person. They, too, needed to do so via the internet. Similarly, our agriculture community was forced to conduct online sales.

With more than 211,000 acres of farmland and 1,418 farms, Bedford County is home to a strong agriculture industry and a growing local food movement. Farm sales account for $26.4 million in annual farm sales and 1,547 ag-based jobs. The County's most valuable commodity is beef cattle and calves, and our producers need the ability to use the latest technology to be successful. Whether it is checking the price of a commodity, marketing their products online, purchasing their next herd sire through an online sale, or participating in an online seminar, broadband internet is crucial for today's modern agriculture business.

We recognize the incredible importance of broadband to all the citizens in our County. Such improvements will increase wellness, educational opportunities, and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

The residents and businesses of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

Jeff Powers
Board Chairman
Bedford County Agriculture Economic Development Advisory Board

BEDFORD CHRISTIAN MINISTRIES ASSOCIATION, INC.

An outreach ministry of some 25 churches and service organizations
A member of the United Way of Central Virginia

540-586-2633 **217 W. Washington Street** **540-586-7313 (Fax)**

August 26, 2021

Dr. Tamarah Holmes
Director of Broadband
Virginia Department of Housing and Community Development
VATI Program
600 East Main St., Suite 300
Richmond, VA 23219

SUBJECT: Bedford County VATI

Dear Dr. Holmes:

This is a letter of support for Bedford County's joint VATI grant application with Shentel for building improved internet in the County.

I am the Director of Bedford Christian Ministries, a 501(c) (3) non-profit founded in 1984 to serve low-income, senior and disabled residents. I have been a Financial Aid Counselor at BCM for 11 years, providing rent and utility assistance to those who are behind in their payments. Between 9/30 and 12/31/2020, BCM distributed CARES Act utility assistance funds to 205 individuals whose income was adversely impacted by the pandemic. This letter of support addresses the importance of reliable internet access to those individuals and families we have assisted over the years and especially during the pandemic.

I estimate that fully 60% of those we assist financially are unemployed or underemployed for either of two reasons: limited job skills for available jobs and limited jobs available. Most of those we see only have the skills to work in personal care, food service, or construction. As adult education moves more and more toward the online learning platforms, these individuals will need internet access to develop the job skills necessary enter, stay in, and advance in a more technologically-based workplace. The lack of this access leaves them falling farther and farther behind and thus inevitably out of the workforce.

If the enhancement of community-wide broadband access attracts more businesses to the County, there will be more employment opportunities for those who can obtain the work skills to fill those jobs. It will be easier to motivate unemployed and underemployed individuals to improve their skills if they believe that there are more jobs that will pay better for those improved skills.

Applying for assistance and benefits from governmental agencies has gone "online" for virtually every form of assistance. Information that the people we serve need is now digital. For many low-income, disabled and senior individuals, applying for assistance or getting information has become a nightmare. Their difficulties navigating the internet and governmental web pages are largely the result of

inexperience with using the internet and infrequent use: in many cases because of lack of internet access. Only a few people know how to use the Public Library computers to use the internet.

Equal opportunity for rural residents of all ethnicities is very much about income opportunity. As we know in this county, income opportunity is very much about educational opportunity for youth and for adults. Increased broadband access can significantly impact each of these areas in Bedford County.

Sincerely,

HOUSTON L. CRUM, JR., MSW
Director

Bedford Public Library System

Serving Our Community Since 1900

321 North Bridge Street
Bedford, VA 24523
www.bplsonline.org

Dr. Tamarah Holmes
Director, Office of Broadband
Virginia Department of Housing & Community Development
VATI Program
600 East Main Street, Suite 300
Richmond, Virginia 23219

Letter of Support for 2021 NTIA Grant for Bedford County, VA

Dear Dr. Holmes:

We are writing in continued support of Bedford County's joint VATI grant application with Shentel for building improved internet in underserved areas of Bedford County, Virginia.

The citizens of our county have long suffered with little to no reliable, broadband internet service in many of our rural and suburban areas, a reality that became immediately prevalent during the recent COVID-19 pandemic. Students and teachers were trying to conduct their classwork virtually and families were trying use the Library's streaming resources and electronic book collections to supplement the school's online learning paradigm. Many citizens were unable to access these services because of insufficient or nonexistent broadband infrastructure at their houses.

County businesses and the local government needed employees to work entirely or partially remotely. School boards, and other public entities needed to conduct public business; however, they were unable to do so in-person. The digital divide in our county only grew worse. The pandemic continued to disenfranchise our citizens, who lacked home broadband internet, from those essential government and healthcare services that were only being offering online.

Because of a lack of broadband infrastructure in much of the county, the public library's WIFI was in very high demand. At the 6 public library facilities, it was not uncommon to see as many as 10 cars idling in the parking lot before and after operating hours, so citizens could use the limited, public WIFI to conduct their online business or school work. Students huddled near exterior electrical outlets during off-hours when their laptop batteries died. People competed for limited table space inside the Libraries, due to social distancing protocols, as soon as the doors opened each morning. The Library's WIFI usage increased at all 6 County facilities from the pre-pandemic year, 2019, to the pandemic year 2020 and has remained high. Furthermore, this indictor of community need (WIFI usage) increased almost 200% at one of our most rural and Internet-starved areas, Stewartsville, Virginia, during that time period.

The Bedford Public Library purchased and started circulating mobile hotspots, so that people who lacked home internet, did not have to come to the buildings in order to get online. We would hear stories from frustrated parents that the only signal they could get at home was through their cellular provider, there was no internet provider in the area to offer access. After the kids finished their

schoolwork, there would be little data left on the family's cellular plans to do much else that month. Other families bemoaned the fact that the lines stopped short of their physical address, "my neighbor is the last house on this street who can get internet, right there, only one house down, it is not fair." The fact that Bedford County is such a mountainous area, for many families, there is no direct line of sight to a delivery tower, so not even fixed wireless access is available at this time. In many cases, that last mile internet gap is all that prevents families from getting online at home and being able to do everyday things like, order groceries from Walmart for pick up or use online banking or check out an electronic book from the library.

We recognize the incredible importance of broadband to the citizens in our County. Such improvements will both increase educational opportunities and economic growth in the area. Their proposed investment in broadband infrastructure utilizing a VATI Grant would bring our community into the 21st century. Strong, reliable internet connectivity is no longer a want; it is now a need. Like water and electricity, broadband connectivity is an essential utility.

The residents of Bedford County in this covered region will have access to broadband equal to citizens in larger cities and more populated areas, thereby helping to bridge the digital divide. Please give all due consideration to this application and know we will stand in strong support of their efforts.

Sincerely,

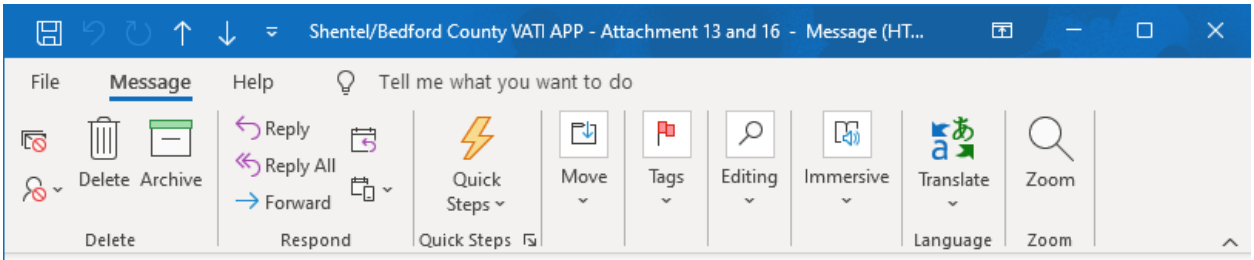
Jenny Novalis, MLIS
Director
Bedford Public Library System

ATTACHMENT 12 - Derivation of Costs

	Total	VATI	Non-VATI		
Product	100%	33%	67%	Source of Estimate	Date
Fiber Plant Build	$ 15,731,100	$ 5,191,263	$ 10,539,837	Shentel - please see Attachment 13 for supporting documentation	9/12/2021
Fixed Wireless Small Cells	$ 6,930,000	$ 2,286,900	$ 4,643,100	Shentel - please see Attachment 13 for supporting documentation	9/12/2021
Long Drops at Customer Premise	$ 2,977,728	$ 982,650	$ 1,995,078	Shentel - please see Attachment 13 for supporting documentation	9/12/2021
Core Network Capacity Additions	$ 550,000	$ 181,500	$ 368,500	Shentel - please see Attachment 13 for supporting documentation	9/12/2021
	$ -	$ -	$ -		
PROJECT TOTAL	**$ 26,188,828**	**$ 8,642,313**	**$ 17,546,515**		
	100%	**33%**	**67%**		

SHENTEL

ATTACHMENT 13 – Documentation of Supporting Costs Estimates



Shentel/Bedford County VATI APP - Attachment 13 and 16

Reply | Reply All | Forward

Christine Fisher <Christine.Fisher@emp.shentel.com>

To Matt Perkins; Robert Hiss (rhiss@bedfordcountyva.gov); Amanda Kaufmann (akaufman@bedfordcountyva.gov); John Putney (jputney@bedfordcountyva.gov)

Tue 9/14/2021 12:13 PM

Cc Dan Meenan; Stuart French

Action Items + Get more add-ins

Good afternoon,

Per the email below received this morning Attachment 16 – RSSI Projection Shapefiles and Attachment 13 – Documentation of Supporting Costs will be emailed by Shentel on the County's behalf. They should not be submitted through CAMS.

Good morning VATI Applicant:

You are receiving this email as a requestor of FOIA exemption for Virginia Telecommunication Initiative (VATI) application materials, or if you have been approved for FOIA exemption for materials you plan to submit as a part of your VATI application.

This email serves as a reminder that all materials that have been approved for FOIA exemption should not be submitted through CAMS. Instead, these documents must be submitted to DHCD at vati@dhcd.virginia.gov, with a subject line denoting FOIA exempt materials.

Please do not hesitate to ask questions for clarification,

DHCD Team

Thank you,
Christine

Federal Communications Commission

(RETAIN FOR YOUR RECORDS)

Form 477 Filing Summary

FRN: **0002064145** | Data as of: **Dec 31, 2020** | Operations: **Non-ILEC** | Submission Status: **Original - Submitted** | Last Updated: **Mar 12, 2021 14:44:20**

Filer Identification

Section	Question	Response
Filer Information	Company Name	Shentel
	Holding Company Name	Shenandoah Telecommunications Company
	SAC ID	
	499 ID	
Data Contact Information	Data Contact Name	Christina Price
	Data Contact Phone Number	(540) 984-5350
	Data Contact E-mail	christina.price@emp.shentel.com
Emergency Operations Contact Information	Emergency Operations Name	Shentel NOC
	Emergency Operations Phone Number	(540) 984-5531
	Emergency Operations E-mail	shentel-noc@shentel.net
Certifying Official Contact Information	Certifying Official Name	Ed McKay
	Certifying Official Phone Number	(540) 984-5303
	Certifying Official E-mail	ed.mckay@emp.shentel.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	CLEC_Broadband_Coverage.csv	Mar 12, 2021 08:39:53	40195
Fixed Broadband Subscription	CLEC_Broadband_Subscription.csv	Mar 10, 2021 19:01:30	2625
Fixed Voice Subscription	CLEC_Voice_Subscription.csv	Mar 10, 2021 18:57:27	321

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Kentucky	Shentel	Cable Modem – DOCSIS 3.1	369
		Optical Carrier/Fiber to the End User	238
Maryland	Shentel	Cable Modem – DOCSIS 3.1	578
		Optical Carrier/Fiber to the End User	784
Pennsylvania	Shentel	Optical Carrier/Fiber to the End User	1375

State	DBA Name	Technology	Blocks
Virginia	Beam	Terrestrial Fixed Wireless	4530
	Glo Fiber	Optical Carrier/Fiber to the End User	1690
	Shentel	Cable Modem – DOCSIS 3.1	9320
		Optical Carrier/Fiber to the End User	8520
West Virginia	Canaan Cable TV	Cable Modem – DOCSIS 3.0	141
	Shentel	Cable Modem – DOCSIS 3.0	298
		Cable Modem – DOCSIS 3.1	6099
		Optical Carrier/Fiber to the End User	6253
Total			**40195**

Fixed Broadband Subscription

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

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Kentucky	Cable Modem	41	2160	88	2248
Maryland	Cable Modem	45	2205	228	2433
	Optical Carrier/Fiber to the End User	19	0	38	38
Pennsylvania	Optical Carrier/Fiber to the End User	15	0	29	29
Virginia	Cable Modem	1023	62554	6337	68891
	Optical Carrier/Fiber to the End User	606	6103	870	6973
	Terrestrial Fixed Wireless	28	80	0	80
West Virginia	Cable Modem	650	17824	2260	20084
	Optical Carrier/Fiber to the End User	198	3249	382	3631
Total		**2625**	**94175**	**10232**	**104407**

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
1.000	0.512	5	0	5
1.000	1.000	0	3	3
1.500	0.512	0	28	28
3.000	0.768	2813	3	2816
4.000	1.500	64	0	64
5.000	1.000	9336	639	9975
5.000	5.000	0	9	9
6.000	1.000	4	0	4

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
8.000	1.500	115	0	115
10.000	2.000	7369	1910	9279
10.000	5.000	36	0	36
10.000	10.000	1608	1554	3162
15.000	3.000	0	107	107
15.000	10.000	2	1138	1140
15.000	15.000	383	10	393
20.000	20.000	0	57	57
22.000	5.000	244	0	244
25.000	3.000	28	0	28
25.000	5.000	3909	903	4812
25.000	10.000	0	1360	1360
25.000	25.000	418	65	483
30.000	30.000	0	28	28
40.000	40.000	0	7	7
50.000	5.000	229	0	229
50.000	10.000	36131	1164	37295
50.000	50.000	343	216	559
60.000	60.000	0	2	2
70.000	70.000	0	3	3
75.000	75.000	0	6	6
80.000	80.000	0	2	2
95.000	95.000	0	1	1
100.000	10.000	2	0	2
100.000	100.000	133	243	376
101.000	10.000	277	382	659
150.000	10.000	22473	93	22566
150.000	150.000	0	44	44
200.000	200.000	47	76	123
250.000	250.000	0	22	22
300.000	10.000	3652	0	3652
300.000	300.000	2480	13	2493
350.000	350.000	0	2	2

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
400.000	400.000	0	3	3
500.000	500.000	0	20	20
700.000	700.000	0	1	1
750.000	750.000	0	4	4
1000.000	10.000	401	15	416
1000.000	1000.000	1672	58	1730
2000.000	2000.000	1	6	7
3000.000	3000.000	0	6	6
5000.000	5000.000	0	7	7
6000.000	6000.000	0	2	2
7000.000	7000.000	0	2	2
10000.000	10000.000	0	18	18
Total		**94175**	**10232**	**104407**

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

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Cable Modem	1.000	0.512	5	0	5
	1.500	0.512	0	24	24
	3.000	0.768	2721	3	2724
	4.000	1.500	64	0	64
	5.000	1.000	8855	577	9432
	5.000	5.000	0	5	5
	6.000	1.000	4	0	4
	8.000	1.500	115	0	115
	10.000	2.000	6973	1894	8867
	10.000	5.000	36	0	36
	10.000	10.000	1608	1398	3006
	15.000	3.000	0	106	106
	15.000	10.000	1	1068	1069
	15.000	15.000	383	0	383
	22.000	5.000	244	0	244
	25.000	5.000	3637	901	4538
	25.000	10.000	0	1291	1291

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
	25.000	25.000	418	24	442
	50.000	5.000	1	0	1
	50.000	10.000	33852	1134	34986
	50.000	50.000	342	15	357
	100.000	100.000	132	14	146
	101.000	10.000	251	356	607
	150.000	10.000	21212	85	21297
	200.000	200.000	47	0	47
	250.000	250.000	0	7	7
	300.000	10.000	3462	0	3462
	1000.000	10.000	380	11	391
Optical Carrier/Fiber to the End User	1.000	1.000	0	3	3
	1.500	0.512	0	4	4
	3.000	0.768	92	0	92
	5.000	1.000	481	62	543
	5.000	5.000	0	4	4
	10.000	2.000	396	16	412
	10.000	10.000	0	156	156
	15.000	3.000	0	1	1
	15.000	10.000	1	70	71
	15.000	15.000	0	10	10
	20.000	20.000	0	57	57
	25.000	5.000	272	2	274
	25.000	10.000	0	69	69
	25.000	25.000	0	41	41
	30.000	30.000	0	28	28
	40.000	40.000	0	7	7
	50.000	5.000	178	0	178
	50.000	10.000	2279	30	2309
	50.000	50.000	1	201	202
	60.000	60.000	0	2	2
	70.000	70.000	0	3	3

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
	75.000	75.000	0	6	6
	80.000	80.000	0	2	2
	95.000	95.000	0	1	1
	100.000	100.000	1	229	230
	101.000	10.000	26	26	52
	150.000	10.000	1261	8	1269
	150.000	150.000	0	44	44
	200.000	200.000	0	76	76
	250.000	250.000	0	15	15
	300.000	10.000	190	0	190
	300.000	300.000	2480	13	2493
	350.000	350.000	0	2	2
	400.000	400.000	0	3	3
	500.000	500.000	0	20	20
	700.000	700.000	0	1	1
	750.000	750.000	0	4	4
	1000.000	10.000	21	4	25
	1000.000	1000.000	1672	58	1730
	2000.000	2000.000	1	6	7
	3000.000	3000.000	0	6	6
	5000.000	5000.000	0	7	7
	6000.000	6000.000	0	2	2
	7000.000	7000.000	0	2	2
	10000.000	10000.000	0	18	18
Terrestrial Fixed Wireless	25.000	3.000	28	0	28
	50.000	5.000	50	0	50
	100.000	10.000	2	0	2
Total			**94175**	**10232**	**104407**

Fixed Voice Subscription

VGE Lines and VoIP Subscriptions by State and End-user Type

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Kentucky	0	0	800	724

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Maryland	0	0	833	502
Pennsylvania	0	0	133	0
Virginia	0	0	18683	8122
West Virginia	0	0	11138	8339
Total	**0**	**0**	**31587**	**17687**

Fixed Voice Subscription (iVoIP)

Over-the-top VoIP Subscriptions by State and End-user Type

State	Total	Consumer	Business / Govt
Kentucky	0	0	0
Maryland	0	0	0
Pennsylvania	0	0	0
Virginia	0	0	0
West Virginia	0	0	0
Total	**0**	**0**	**0**

All other VoIP Subscriptions by State, End-user Type, Bundle and Last-mile Medium

		by End-user Type		by Bundle		by Last-mile Medium			
State	Total	Consumer	Business / Government	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Kentucky	800	724	76	712	88	0	800	0	0
Maryland	833	502	331	637	196	0	833	0	0
Pennsylvania	133	0	133	133	0	0	133	0	0
Virginia	18683	8122	10561	10869	7814	238	18445	0	0
West Virginia	11138	8339	2799	9276	1862	1140	9998	0	0
Total	**31587**	**17687**	**13900**	**21627**	**9960**	**1378**	**30209**	**0**	**0**

OMB 3060-0816

Form 477 Filing Summary

FRN:	Data as of:	Operations:	Submission Status:	Last Updated:
0002064145	Jun 30, 2021	Non-ILEC	Original - Submitted	Aug 30, 2021 04:04 PM

Filer Identification

Section	Field	Response
Filer Information	Company Name	Shentel
	Holding Company Name	Shenandoah Telecommunications Company
	Filing Type	Non-ILEC
	SAC ID	N/A
	499 ID	829505
Data Contact Information	Data Contact Name	Christina Price
	Data Contact Phone Number	(540) 984-5350
	Data Contact E-mail	christina.price@emp.shentel.com
Emergency Operations Contact Information	Emergency Operations Name	Shentel NOC
	Emergency Operations Phone Number	(540) 094-5531
	Emergency Operations E-mail	shentel-noc@shentel.net
Certifying Official Contact Information	Certifying Official Name	Rick Mason
	Certifying Official Phone Number	(540) 984-5164
	Certifying Official E-mail	rick.mason@emp.shentl.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	CLEC Broadband Coverage.csv	Aug 30, 2021 09:02 AM	45,616
Fixed Broadband Subscription	CLEC Broadband Subscription.csv	Aug 29, 2021 03:26 PM	2,953
Fixed Voice Subscription	CLEC Voice Subscription.csv	Aug 29, 2021 03:27 PM	330

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks

State	DBA Name	Technology	Blocks
Kentucky	Shentel	Cable Modem – DOCSIS 3.1	369
		Optical Carrier/Fiber to the End User	238
Maryland	Shentel	Cable Modem – DOCSIS 3.1	578
		Optical Carrier/Fiber to the End User	787
Pennsylvania	Shentel	Optical Carrier/Fiber to the End User	1,437
Virginia	Beam	Terrestrial Fixed Wireless	7,453
	Glo Fiber	Optical Carrier/Fiber to the End User	2,473
	Shentel	Cable Modem – DOCSIS 3.1	9,348
		Optical Carrier/Fiber to the End User	9,868
West Virginia	Beam	Terrestrial Fixed Wireless	204
	Shentel	Cable Modem – DOCSIS 3.0	439
		Cable Modem – DOCSIS 3.1	6,103
		Optical Carrier/Fiber to the End User	6,319
Total			**45,616**

Fixed Broadband Subscription

Fixed Broadband Subscriptions by State, Technology and End User Type

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business/Govt.	Total
Kentucky	Cable Modem	46	2,172	85	2,257
Maryland	Cable Modem	46	2,294	226	2,520
	Optical Carrier/Fiber to the End User	23	0	33	33
Pennsylvania	Optical Carrier/Fiber to the End User	21	0	23	23
Virginia	Cable Modem	1,079	62,352	8,425	70,777
	Optical Carrier/Fiber to the End User	749	9,717	997	10,714
	Terrestrial Fixed Wireless	81	488	0	488
West Virginia	Cable Modem	693	18,660	2,360	21,020
	Optical Carrier/Fiber to the End User	215	3,398	415	3,813
Total		**2,953**	**99,081**	**12,564**	**111,645**

Fixed Broadband Subscriptions by Bandwidths and End User Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
1.000	0.512	5	0	5
1.000	1.000	0	2	2
1.500	0.512	0	28	28
3.000	0.768	2,464	3	2,467
4.000	1.500	104	0	104
5.000	1.000	8,337	568	8,905
5.000	5.000	0	5	5
6.000	1.000	3	0	3
8.000	1.500	102	0	102
10.000	2.000	6,438	3,032	9,470
10.000	10.000	0	2,240	2,240
15.000	3.000	368	96	464
15.000	10.000	3	1,075	1,078
15.000	15.000	0	9	9
20.000	20.000	0	52	52
22.000	5.000	359	0	359
25.000	5.000	4,712	1,212	5,924
25.000	10.000	0	1,344	1,344
25.000	25.000	0	21	21
30.000	30.000	0	29	29
40.000	40.000	0	6	6
50.000	5.000	197	0	197
50.000	10.000	39,242	1,373	40,615
50.000	50.000	6	217	223
60.000	60.000	0	2	2
70.000	70.000	0	8	8
75.000	75.000	0	5	5
80.000	80.000	0	2	2
95.000	95.000	0	1	1
100.000	10.000	10	142	152
100.000	20.000	156	14	170
100.000	100.000	1	248	249
101.000	10.000	198	364	562

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
150.000	10.000	24,299	86	24,385
150.000	150.000	0	63	63
200.000	20.000	0	6	6
200.000	25.000	53	0	53
200.000	200.000	0	81	81
250.000	20.000	0	43	43
250.000	250.000	0	20	20
300.000	10.000	4,355	2	4,357
300.000	300.000	3,851	16	3,867
350.000	350.000	0	1	1
400.000	400.000	0	5	5
500.000	20.000	0	10	10
500.000	500.000	0	31	31
700.000	700.000	0	1	1
750.000	750.000	0	7	7
1,000.000	10.000	526	13	539
1,000.000	1,000.000	3,289	48	3,337
2,000.000	2,000.000	3	7	10
2,500.000	2,500.000	0	1	1
3,000.000	3,000.000	0	5	5
5,000.000	5,000.000	0	5	5
6,000.000	6,000.000	0	2	2
7,000.000	7,000.000	0	3	3
10,000.000	10,000.000	0	10	10
Total		**99,081**	**12,564**	**111,645**

Fixed Broadband Subscriptions by Technology, Bandwidths and End User Type

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
Cable Modem	1.000	0.512	5	0	5
	1.500	0.512	0	24	24
	3.000	0.768	2,385	3	2,388
	4.000	1.500	104	0	104
	5.000	1.000	7,905	506	8,411

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
	5.000	5.000	0	4	4
	6.000	1.000	3	0	3
	8.000	1.500	102	0	102
	10.000	2.000	6,083	2,962	9,045
	10.000	10.000	0	2,097	2,097
	15.000	3.000	368	95	463
	15.000	10.000	3	1,001	1,004
	22.000	5.000	359	0	359
	25.000	5.000	4,207	1,185	5,392
	25.000	10.000	0	1,276	1,276
	50.000	10.000	36,329	1,311	37,640
	100.000	10.000	0	133	133
	100.000	20.000	155	14	169
	101.000	10.000	180	337	517
	150.000	10.000	22,638	77	22,715
	200.000	20.000	0	6	6
	200.000	25.000	53	0	53
	250.000	20.000	0	41	41
	300.000	10.000	4,102	2	4,104
	500.000	20.000	0	9	9
	1,000.000	10.000	497	13	510
Optical Carrier/Fiber to the End User	1.000	1.000	0	2	2
	1.500	0.512	0	4	4
	3.000	0.768	79	0	79
	5.000	1.000	432	62	494
	5.000	5.000	0	1	1
	10.000	2.000	355	70	425
	10.000	10.000	0	143	143
	15.000	3.000	0	1	1
	15.000	10.000	0	74	74
	15.000	15.000	0	9	9
	20.000	20.000	0	52	52

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
	25.000	5.000	353	27	380
	25.000	10.000	0	68	68
	25.000	25.000	0	21	21
	30.000	30.000	0	29	29
	40.000	40.000	0	6	6
	50.000	5.000	197	0	197
	50.000	10.000	2,596	62	2,658
	50.000	50.000	5	217	222
	60.000	60.000	0	2	2
	70.000	70.000	0	8	8
	75.000	75.000	0	5	5
	80.000	80.000	0	2	2
	95.000	95.000	0	1	1
	100.000	10.000	0	9	9
	100.000	100.000	1	248	249
	101.000	10.000	18	27	45
	150.000	10.000	1,655	9	1,664
	150.000	150.000	0	63	63
	200.000	200.000	0	81	81
	250.000	20.000	0	2	2
	250.000	250.000	0	20	20
	300.000	10.000	252	0	252
	300.000	300.000	3,851	16	3,867
	350.000	350.000	0	1	1
	400.000	400.000	0	5	5
	500.000	20.000	0	1	1
	500.000	500.000	0	31	31
	700.000	700.000	0	1	1
	750.000	750.000	0	7	7
	1,000.000	10.000	29	0	29
	1,000.000	1,000.000	3,289	48	3,337
	2,000.000	2,000.000	3	7	10

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
	2,500.000	2,500.000	0	1	1
	3,000.000	3,000.000	0	5	5
	5,000.000	5,000.000	0	5	5
	6,000.000	6,000.000	0	2	2
	7,000.000	7,000.000	0	3	3
	10,000.000	10,000.000	0	10	10
Terrestrial Fixed Wireless	25.000	5.000	152	0	152
	50.000	10.000	317	0	317
	50.000	50.000	1	0	1
	100.000	10.000	10	0	10
	100.000	20.000	1	0	1
	150.000	10.000	6	0	6
	300.000	10.000	1	0	1
Total			**99,081**	**12,564**	**111,645**

Fixed Voice Subscription

VGE Lines and VoIP Subscriptions by State and End User Type

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Kentucky	0	0	783	700
Maryland	0	0	842	503
Pennsylvania	0	0	169	0
Virginia	0	0	20,339	8,200
West Virginia	0	0	11,162	8,339
Total	**0**	**0**	**33,295**	**17,742**

Fixed Voice Subscription (iVoIP)

Over-the-Top VoIP Subscriptions by State and End User Type

State	Total	Consumer	Business/Govt.
Kentucky	0	0	0
Maryland	0	0	0
Pennsylvania	0	0	0

State	Total	Consumer	Business/Govt.
Virginia	0	0	0
West Virginia	0	0	0
Total	**0**	**0**	**0**

All Other VoIP Subscriptions by State, End User Type, Bundle and Last-Mile Medium

State	Total	by End User Type		by Bundle		by Last-Mile Medium			
		Consumer	Business/Govt.	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Kentucky	783	700	83	614	169	0	783	0	0
Maryland	842	503	339	673	169	0	842	0	0
Pennsylvania	169	0	169	169	0	169	0	0	0
Virginia	20,339	8,200	12,139	17,868	2,471	1,456	18,883	0	0
West Virginia	11,162	8,339	2,823	7,673	3,489	2,038	9,124	0	0
Total	**33,295**	**17,742**	**15,553**	**26,997**	**6,298**	**3,663**	**29,632**	**0**	**0**

Reminder: You must continue to use Census 2010 geographic codes in FCC Form 477.

For help or assistance, please contact (877) 480-3201 or (717) 338-2834 (TTY) or you may submit an online e-support ticket.

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(RETAIN FOR YOUR RECORDS)
Form 477 Filing Summary

FRN: **0002072668** | Data as of: **Dec 31, 2020** | Operations: **ILEC** | Submission Status: **Revised - Submitted** | Last Updated: **Mar 8, 2021 13:49:25**

Filer Identification

Section	Question	Response
Filer Information	Company Name	Shenandoah Telephone Company
	Holding Company Name	Shenandoah Telecommunications Company
	SAC ID	190250, 197251
	499 ID	802200
Data Contact Information	Data Contact Name	Danielle Brooks
	Data Contact Phone Number	(540) 984-5389
	Data Contact E-mail	danielle.brooks@emp.shentel.com
Emergency Operations Contact Information	Emergency Operations Name	Harris Duncan
	Emergency Operations Phone Number	(540) 984-5838
	Emergency Operations E-mail	Harris.Duncan@emp.shentel.com
Certifying Official Contact Information	Certifying Official Name	Ed McKay
	Certifying Official Phone Number	(540) 984-5303
	Certifying Official E-mail	ed.mckay@emp.shentel.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	ILEC Broadband Coverage_Deployment.csv	Mar 8, 2021 13:41:33	4997
Fixed Broadband Subscription	ILEC Broadband Subscription.csv	Mar 8, 2021 13:46:36	160
Fixed Voice Subscription	ILEC Voice Subscription.csv	Mar 8, 2021 13:41:33	16

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Virginia	Shentel	ADSL2	2012
		Optical Carrier/Fiber to the End User	973
		Other Copper Wireline	2012
Total			**4997**

Fixed Broadband Subscription

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

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Virginia	Asymmetric xDSL	94	6620	463	7083
	Optical Carrier/Fiber to the End User	65	191	118	309
	Other Copper Wireline	1	0	1	1
Total		**160**	**6811**	**582**	**7393**

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
0.384	0.128	29	3	32
0.768	0.512	58	2	60
1.500	0.512	393	18	411
1.500	1.500	0	1	1
3.000	0.768	1665	104	1769
5.000	0.768	1249	204	1453
5.000	1.000	8	0	8
10.000	1.000	1609	107	1716
10.000	10.000	0	21	21
15.000	1.000	1654	25	1679
15.000	15.000	0	11	11
20.000	20.000	0	22	22
25.000	5.000	10	0	10
25.000	25.000	0	10	10
30.000	30.000	0	1	1
50.000	10.000	111	0	111
50.000	50.000	0	28	28
70.000	70.000	0	1	1
100.000	100.000	0	13	13
101.000	10.000	18	0	18
125.000	125.000	0	1	1
150.000	10.000	6	0	6
200.000	200.000	0	5	5
300.000	300.000	0	1	1
1000.000	10.000	1	0	1

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
1000.000	1000.000	0	4	4
Total		**6811**	**582**	**7393**

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

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Asymmetric xDSL	0.384	0.128	29	3	32
	0.768	0.512	58	2	60
	1.500	0.512	393	18	411
	3.000	0.768	1665	104	1769
	5.000	0.768	1249	204	1453
	10.000	1.000	1583	107	1690
	15.000	1.000	1643	25	1668
Optical Carrier/Fiber to the End User	5.000	1.000	8	0	8
	10.000	1.000	26	0	26
	10.000	10.000	0	21	21
	15.000	1.000	11	0	11
	15.000	15.000	0	11	11
	20.000	20.000	0	22	22
	25.000	5.000	10	0	10
	25.000	25.000	0	10	10
	30.000	30.000	0	1	1
	50.000	10.000	111	0	111
	50.000	50.000	0	28	28
	70.000	70.000	0	1	1
	100.000	100.000	0	13	13
	101.000	10.000	18	0	18
	125.000	125.000	0	1	1
	150.000	10.000	6	0	6
	200.000	200.000	0	5	5
	300.000	300.000	0	1	1
	1000.000	10.000	1	0	1
	1000.000	1000.000	0	4	4
Other Copper Wireline	1.500	1.500	0	1	1
Total			**6811**	**582**	**7393**

Fixed Voice Subscription

VGE Lines and VoIP Subscriptions by State and End-user Type

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Virginia	12070	8749	0	0
Total	**12070**	**8749**	**0**	**0**

Fixed Voice Subscription (VGE Lines)

VGE Lines Provided to Unaffiliated Providers by State

State	Wholesale	UNE-L
Virginia	0	0
Total	**0**	**0**

VGE Lines Provided to End Users by State, Bundle and Product Type

		by Bundle		by Product Type			
				Consumer		Bus-Govt	
State	Total	Sold w/ Internet	Sold w/o Internet	& No PIC	& PIC	& No PIC	& PIC
Virginia	12070	4473	7597	1656	7093	628	2693
Total	**12070**	**4473**	**7597**	**1656**	**7093**	**628**	**2693**

VGE Lines Provided to End Users by State, Ownership and Last-mile Medium

		by Ownership			by Last-mile Medium			
State	Total	Owned	UNE-L	Resale	FTTP	Coax	Fixed Wireless	Copper
Virginia	12070	12070	0	0	1753	0	0	10317
Total	**12070**	**12070**	**0**	**0**	**1753**	**0**	**0**	**10317**

OMB 3060-0816

Form 477 Filing Summary

FRN:	Data as of:	Operations:	Submission Status:	Last Updated:
0002072668	Jun 30, 2021	ILEC	Revised - Submitted	Aug 31, 2021 09:56 AM

Filer Identification

Section	Field	Response
Filer Information	Company Name	Shenandoah Telephone Company
	Holding Company Name	Shenandoah Telecommunications Company
	Filing Type	ILEC
	SAC ID	190250,197251
	499 ID	802200
Data Contact Information	Data Contact Name	Danielle Brooks
	Data Contact Phone Number	(540) 984-5389
	Data Contact E-mail	danielle.brooks@emp.shentel.com
Emergency Operations Contact Information	Emergency Operations Name	Shentel NOC
	Emergency Operations Phone Number	(540) 984-5531
	Emergency Operations E-mail	shentel-noc@shentel.com
Certifying Official Contact Information	Certifying Official Name	Rick Mason
	Certifying Official Phone Number	(540) 984-5164
	Certifying Official E-mail	rick.mason@emp.shentel.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	ILEC Broadband Coverage.csv	Aug 31, 2021 09:49 AM	5,016
Fixed Broadband Subscription	ILEC Broadband Subscription.csv	Aug 31, 2021 09:52 AM	158
Fixed Voice Subscription	ILEC Voice Subscription.csv	Aug 31, 2021 09:49 AM	16

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks

State	DBA Name	Technology	Blocks
Virginia	Shentel	ADSL2	2,012
		Optical Carrier/Fiber to the End User	992
		Other Copper Wireline	2,012
Total			**5,016**

Fixed Broadband Subscription

Fixed Broadband Subscriptions by State, Technology and End User Type

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business/Govt.	Total
Virginia	Asymmetric xDSL	92	6,398	440	6,838
	Optical Carrier/Fiber to the End User	66	230	124	354
Total		**158**	**6,628**	**564**	**7,192**

Fixed Broadband Subscriptions by Bandwidths and End User Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
0.384	0.128	25	3	28
0.768	0.512	52	2	54
1.500	0.512	347	14	361
1.500	1.500	0	1	1
3.000	0.768	1,463	99	1,562
5.000	0.768	1,132	189	1,321
10.000	1.000	1,621	108	1,729
10.000	10.000	0	17	17
15.000	1.000	1,758	25	1,783
15.000	15.000	0	6	6
20.000	20.000	0	21	21
25.000	5.000	20	2	22
25.000	25.000	0	5	5
30.000	30.000	0	5	5
50.000	10.000	183	0	183
50.000	50.000	0	35	35
70.000	70.000	0	1	1

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
100.000	100.000	0	17	17
101.000	10.000	21	1	22
125.000	125.000	0	1	1
200.000	200.000	0	6	6
300.000	10.000	3	0	3
300.000	300.000	0	3	3
1,000.000	10.000	3	0	3
1,000.000	1,000.000	0	3	3
Total		**6,628**	**564**	**7,192**

Fixed Broadband Subscriptions by Technology, Bandwidths and End User Type

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
Asymmetric xDSL	0.384	0.128	25	3	28
	0.768	0.512	52	2	54
	1.500	0.512	347	14	361
	3.000	0.768	1,463	99	1,562
	5.000	0.768	1,132	189	1,321
	10.000	1.000	1,621	108	1,729
	15.000	1.000	1,758	25	1,783
Optical Carrier/Fiber to the End User	1.500	1.500	0	1	1
	10.000	10.000	0	17	17
	15.000	15.000	0	6	6
	20.000	20.000	0	21	21
	25.000	5.000	20	2	22
	25.000	25.000	0	5	5
	30.000	30.000	0	5	5
	50.000	10.000	183	0	183
	50.000	50.000	0	35	35
	70.000	70.000	0	1	1
	100.000	100.000	0	17	17
	101.000	10.000	21	1	22
	125.000	125.000	0	1	1
	200.000	200.000	0	6	6

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business/Govt.	Total
	300.000	10.000	3	0	3
	300.000	300.000	0	3	3
	1,000.000	10.000	3	0	3
	1,000.000	1,000.000	0	3	3
Total			**6,628**	**564**	**7,192**

Fixed Voice Subscription

VGE Lines and VoIP Subscriptions by State and End User Type

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Virginia	11,659	8,468	0	0
Total	**11,659**	**8,468**	**0**	**0**

Fixed Voice Subscription (VGE Lines)

VGE Lines Provided to Unaffiliated Providers by State

State	Wholesale	UNE-L
Virginia	0	0
Total	**0**	**0**

VGE Lines Provided to End Users by State, Bundle and Product Type

State	Total	by Bundle		by Product Type			
				Consumer		Business/Govt.	
		Sold w/ Internet	Sold w/o Internet	& No PIC	& PIC	& No PIC	& PIC
Virginia	11,659	4,158	7,501	1,580	6,888	596	2,595
Total	**11,659**	**4,158**	**7,501**	**1,580**	**6,888**	**596**	**2,595**

VGE Lines Provided to End Users by State, Ownership and Last-Mile Medium

State	Total	by Ownership			by Last-Mile Medium			
		Owned	UNE-L	Resale	FTTP	Coax	Fixed Wireless	Copper
Virginia	11,659	11,659	0	0	1,839	0	0	9,820
Total	**11,659**	**11,659**	**0**	**0**	**1,839**	**0**	**0**	**9,820**

Reminder: You must continue to use Census 2010 geographic codes in FCC Form 477.

For help or assistance, please contact (877) 480-3201 or (717) 338-2834 (TTY) or you may submit an online e-support ticket.

Federal Communications Commission
445 12th Street SW, Washington, DC 20554
Phone: 1-888-225-5322

TTY: 1-888-835-5322

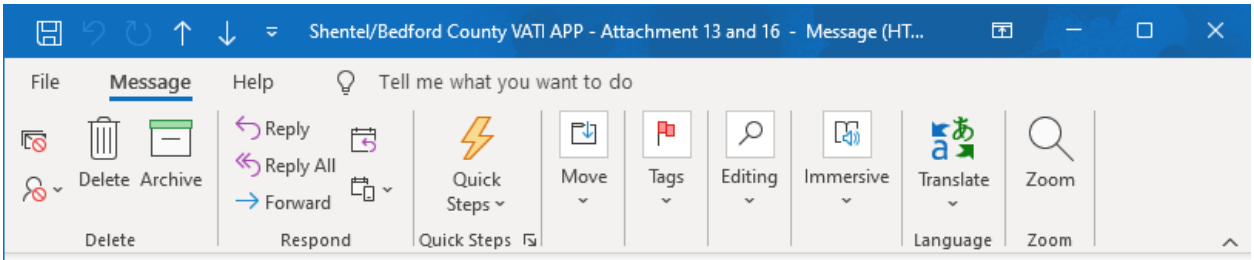
Videophone: 1-844-432-2275

Fax: 1-866-418-0232

Contact Us

SHENTEL

ATTACHMENT 16 – RSSI Projections in the Application Area



Shentel/Bedford County VATI APP - Attachment 13 and 16

CF

Christine Fisher <Christine.Fisher@emp.shentel.com>

Reply | Reply All | Forward | ...

To Matt Perkins; Robert Hiss (rhiss@bedfordcountyva.gov); Amanda Kaufmann (akaufman@bedfordcountyva.gov); John Putney (jputney@bedfordcountyva.gov)

Tue 9/14/2021 12:13 PM

Cc Dan Meenan; Stuart French

Action Items + Get more add-ins

Good afternoon,

Per the email below received this morning Attachment 16 – RSSI Projection Shapefiles and Attachment 13 – Documentation of Supporting Costs will be emailed by Shentel on the County's behalf. They should not be submitted through CAMS.

Good morning VATI Applicant:

You are receiving this email as a requestor of FOIA exemption for Virginia Telecommunication Initiative (VATI) application materials, or if you have been approved for FOIA exemption for materials you plan to submit as a part of your VATI application.

This email serves as a reminder that all materials that have been approved for FOIA exemption should not be submitted through CAMS. Instead, these documents must be submitted to DHCD at vati@dhcd.virginia.gov, with a subject line denoting FOIA exempt materials.

Please do not hesitate to ask questions for clarification,

DHCD Team

Thank you,
Christine

Attachment 17
Technology Used for Both FTTH Network and Wireless Drop - SHENTEL

Overview *Shentel is proposing a hybrid solution that will deploy a fiber network that expands to within a mile of the unserved homes in Bedford County. The homes not passed by fiber, typically either those with long-drops well in excess of 2,000 ft or in scenarios or where density falls below 5 homes per mile, will be reached via a wireless drop. This approach creates a scalable, cost-effective solution with superior speed to market. The wireless drop methodology allows Shentel to realistically deploy its service within a 24 month window to get critical broadband service to residents that cannot wait another 3 or more years to receive service. Furthermore, relying on a wireless drop where it is most practical reduces costs and allows Bedford to achieve universal broadband coverage within existing budget constraints. Taken together, this hybrid approach is a fast and efficient way to deliver high-quality broadband to the entire county. Additionally, this project is scalable. As fiber is pushed further and further into the unserved areas, Shentel and Bedford will be in an excellent position to continue expanding that fiber to additional homes through both natural growth and future federal, state, and local subsidy opportunities. The technology used for both the FTTH network and the wireless drop are described below.*

Fiber To The Home Network Description Shentel intends to develop a new fiber network in Bedford County in support of its residential Fiber to the Premise (FTTP) service. Just like its existing cable network, this FTTH network will be connected to Shentel's expansive multi-state fiber network with redundant Tier 1 peering points located in Ashburn, VA and Atlanta, GA.

Shentel deploys XGS-PON for its FTTP product. XGS-PON is an advanced standard for Passive Optical Networks (PON). This network can provide multi-gig speeds today and is scalable to support 10Gbps symmetrical data. As such it provides more than enough bandwidth to meet current needs and is able to scale up to stay ahead of demand for many years to come. By contrast, earlier PON networks are extremely limited in the amount of downstream and upstream capacity available to the end user. Although XGS-PON requires significant investment, the growing demand for symmetrical broadband makes the investment in XGS-PON the best choice. XGS-PON deployments are built around centralized fiber split topology and designed to allow a single fiber the ability to maintain an efficient point-to-multipoint broadband connection for multiple end users.

Shentel typically utilizes a dedicated fiber split from the Local Convergence Point (LCP) out to the Customer Premise. Each LCP is fed with feeder fiber from a Central Office (CO) or Point of Presence (POP). Shentel will leverage their existing PoP in Bedford. This robust fiber infrastructure allows us to accommodate commercial sales opportunities and provide improved service to businesses and community anchor institutions within the project area. A centralized fiber split also provides a more dedicated and direct approach to ensuring that fiber capacity, technology, and plant records can be easily managed.

Primary Network Vendors – FTTP

1. LCP – Nokia 7360 Optical Line Terminal (OLT) - Each FTTP market is deployed with a dedicated Nokia 7360 OLT and connected back to Shentel's dedicated multiple 100Gbps core network that is powered by Cisco's NCS-55A/5501 platforms.

2. Optical Network System (ONS) - Cisco's ONS 15454 Series Multiservice Transport Platform and the Network Convergence System (NCS) 2000. The coherent ONS provides the transport layer of Shentel's backbone Network with 100Gbps and 200Gbps wavelengths.

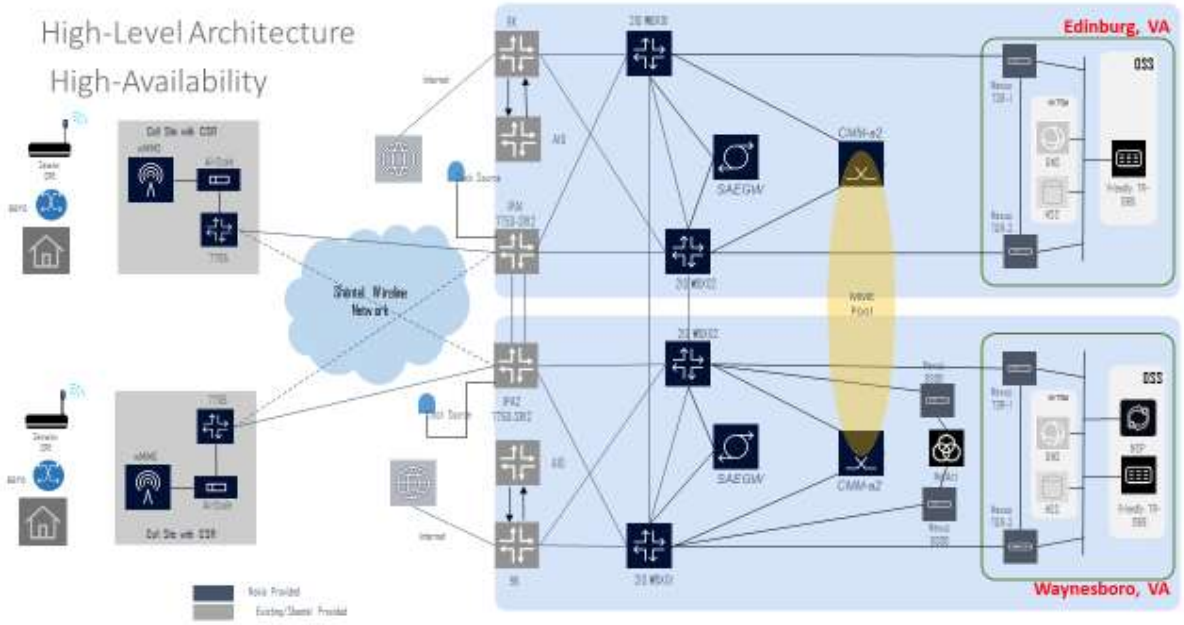
3. Optical Fiber - Shentel will utilize G.625.D compliant optical fiber. Shentel's preferred suppliers are Commscope, Corning and OFS.
4. P-Route Core - Cisco's NCS-55A and NCS-5501 platforms. The Core network is composed of ten Core devices and two 100Gbps paths between each device. The dual 100Gbps architecture provides both physical diversity and resiliency if a network failure or fiber cut occurs. This is extended to the PE network as well. Each device interfaces with two separate P routers, which provides Shentel the best option for diversity.
5. PE-Route Distribution Network - Cisco's ASR-90xx and ASR-99xx platforms. The Distribution Network is made up of many platforms deployed throughout Shentel's service footprint. Although the Core is the primary element within Shentel's topology, it is the actual Distribution network that is the workhorse of the network.

Customer Premise Equipment – FTTP At the Customer Premise, a Network Interface Device (NID) is placed on the outside of the residence to serve as a transition point between Outside Plant Fiber and Inside Plant Fiber. For FTTP broadband services, a Nokia XS-250X-A or Nokia XS-020X-A Optical Network Terminal (ONT) is utilized. Customers have the option of purchasing wall to wall WiFi service which utilizes a wireless mesh network to provide coverage and in home WiFi speeds nearing 1Gbps over WiFi and multi-gigabit when using cat 5.

Wireless Drop Network Description

Scalability- Building for the Future The Shentel Fixed Wireless network focuses on these components when it contemplates capacity and scalability: Evolved Packet Cores, Spectrum, Cell Site Backhaul, and Radio Access Network (RAN). Shentel uses currently measurable performance (not theoretical performance) of these components for capacity planning. This highly conservative approach helps ensure that network capacity will exceed demand.

Evolved Packet Cores Shentel's two geo-redundant Evolved Packet Cores (EPC's) were built to exclusively support our Beam Fixed Wireless cell sites. One EPC is located in Waynesboro, VA and the other EPC is located in Edinburg, VA. These two EPS's support 4G LTE via the 3GPP standard, and these EPC's gracefully scale to support 5G with a simple software upgrade when capacity or functionality require. Please see a depiction of Shentel's EPC topology as follows:



Spectrum Shentel recently acquired valuable 3.5 GHz licensed wireless spectrum commonly referred to as Citizens Band Radio Service or CBRS (specifically, 3550-3700 MHz). Shentel acquired this 3.5 GHz mid-band spectrum to support its Beam Fixed Wireless Broadband network. Total purchase price of this spectrum was approximately $16 million. This acquired spectrum covers Bedford County, VA, as well as 73 other counties across rural parts of Virginia, West Virginia, Maryland and Pennsylvania. Shentel has priority access to use 40 MHz of this licensed spectrum in Bedford County, VA. Coupled with 20 MHz of Generally Authorized Access channels, Shentel can dedicate a full 60 MHz of 3.5 GHz CBRS spectrum to cell sites. Shentel firmly believes that its priority right to use this vast amount of robust spectrum is a key differentiator from other Fixed Wireless providers.

Radio Access Network (RAN) Shentel's cell site deployment plan includes the following for small cell sites:

- 4G LTE Small Cell (Nokia FW2QQF) – this self-contained unit is carrier-grade and standards based.
- Omni High-Gain Antennas (Alpha Wireless AW3825)
- Cell Site Router (Nokia 7705 Service Aggregation Router) - this ground-based equipment is carrier-grade and standards based. The router can support up to 10G of throughput traffic connecting each cell site to Shentel's EPC's.

Backhaul The Fixed Wireless small cells will connect directly back to the EPC's via Shentel Fiber. Each cell site will initially enjoy over 1G of backhaul capacity, and can easily scale to 10G with simple back-office provisioning changes.

Customer Premise Equipment At the customer premise location, Shentel will professionally install a directional exterior antenna (Outdoor Unit or "ODU"), and up to two interior WiFi units. The ODU will be approximately 12" x 12" and will be typically mounted near the eave of the customer's roof.

The ODU's are manufactured by Seowon Intech, a South Korean company. The ODU's comply with the 3GPP 4G LTE Advanced standard, and feature a 15 dBi high gain antenna resulting in EIRP of 39 dBm. These LTE Category 15 ODUs support the very latest in customer premise equipment advances:

Downlink

- Up to 580 Mbps
- 4x4 MIMO
- Up to 4 Carrier Aggregation (both intra and inter)
- 256 QAM
- Transmission Mode 8 (multi-user MIMO)

Uplink

- Up 30 Mbps
- Up to 2 Carrier Aggregation (intra)
- 64 QAM
- Transmission Mode 8 (multi-user MIMO)

The in-home WiFi units are produced by Eero, an Amazon company, and support unlicensed WiFi in the 2.4 GHz and 5.8 GHz spectrum bands. Specifically, Shentel's Beam customers enjoy the Eero 6 dual-band WIFI routers. Each Eero 6 unit in the wireless mesh network covers up to 1,500 square feet inside the home. These Eero devices offer a fast and easy set-up process - the Eero app walks the customer through setup and empowers the customer to manage the home network from anywhere. The Eero 6 connects compatible devices on the customer's home network with Alexa, so there is no need to buy a separate smart home hub for each device. The Eero 6 uses a TrueMesh technology, which optimizes connections and reduces drop-offs. Eero devices also get better over time - they have automatic updates that bring the latest Eero features while also keeping the home network safe and secure.

Advanced RF Engineering - Targeting the Underserved Small cell tower locations are planned with highly accurate propagation models down to 10-meter accuracy. Actual locations to be served are derived from building footprints that are extracted from LiDAR or photogrammetry with rooftop-level accuracy. Leveraging our mobility wireless experience, Shentel has empirical propagation data covering more than 7 years of 4G LTE operational history.
The accurately predicted Reference Signal Receive Power (RSRP) and Signal to Interference and Noise Ratio (SINR) translate directly to 3GPP Modulation and Coding Schemes (MCS) which correlate to actual down link and uplink throughput. The Beam network is designed to support the Beam service plans with a margin of error sufficient to overcome historically observed

seasonal propagation changes, weather impact, and the propagation model's observed error margin.

Defining Homes Passed and Wireless Risk

It is important to note that Wireless Networks differ from a traditional fiber or coaxial cable networks (a/k/a "Wireline Networks"). While comparably more costly to build, Wireline Networks rarely have "serviceability risk" with respect to targeted households – if they plan to build to a household, they can usually always get service to the household. By contrast, Wireless Networks are comparably less costly to build and have much faster speed to market, but they have a higher "serviceability risk" because computer simulations of radio frequency propagation can never be 100% accurate given foliage and other last mile variables. However, to minimize "serviceability risk" in our Beam Fixed Wireless Network, Shentel uses advanced engineering technologies (e.g., Light Detection and Ranging a/k/a LiDAR, InfoVista Planet Radio Frequency modelling platform, etc.), advanced and carrier-grade 4G LTE cell site equipment (e.g., massive and multi-user MIMO, antenna beam forming, carrier aggregation, etc.) and highly trained local engineers. Shentel has taken a conservative position in designating serviceable homes in this proposal. As an example, Shentel has conservatively assumed that only 85% of the wireless long drop homes will actually be serviceable. This 15% fallout assumption is already reflected in the projected passings.

Fixed Wireless Small Cell Equipment (Nokia FW2QQF)

Outdoor Multi Band TD LTE Small Cell

Specification	First Band Details	Second Band Details
TDD LTE Access	Band Class 48: UL: 3550 – 3700 MHz DL: 3550 – 3700 MHz	Band Class 48: UL: 3550 – 3700 MHz DL: 3550 – 3700 MHz
RF Output Power	100mW to 2W per Tx Path	100mW to 2W per Tx Path
Bandwidth Support	10, 15, 20 MHz	10, 15, 20 MHz
LTE Carriers	Up to 3 Carriers (60 MHz DL / 40 MHz UL) Max 2 carriers per RF Module	
Physical Size	Volume: ~12L / Mass: ~12 Kg 220 x 380 x 153 mm	
Optional	Optional dual-band integrated Nokia Wi-Fi access 2.4GHz / 5GHz 802.11b / g / n / ac	
Synchronization	RF GPS, 1588v2 (frequency, time, phase), SyncE	
Backhaul	4 Ports, combination of copper/fiber	
Antenna	Configuration: 2 Tx / 2 Rx per band Types: Remote (Customer Provided Antennas)	
Operating Temperature	-40°C to +55°C	
Input Power	90-264VAC	
3GPP Specification	TS36.104 Rev13 Medium Area	

FW2QQF LTE Only
FW2QQWF LTE + WiFi

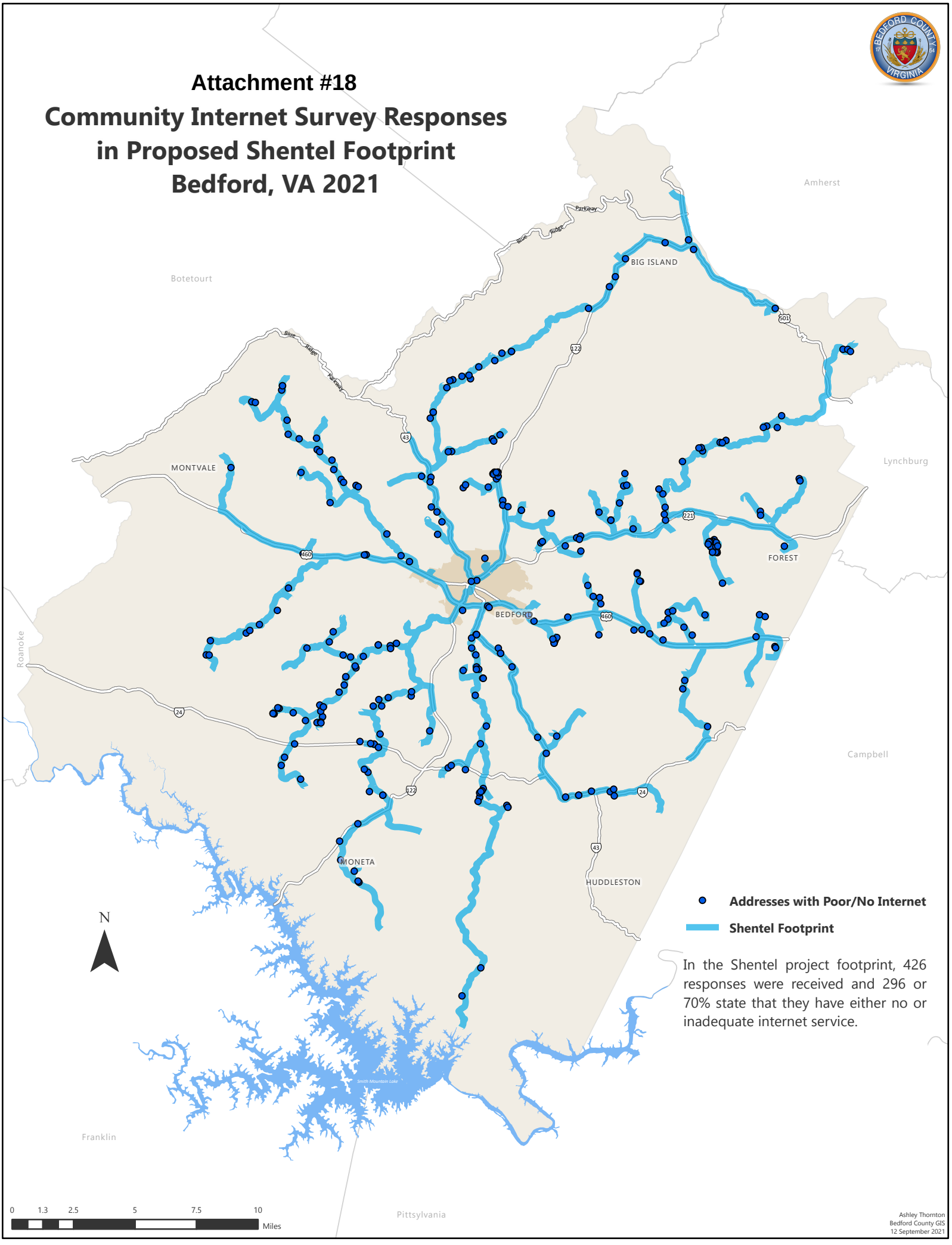
RAN Capacity & Performance

- The RAN equipment and CPE are both capable of 2-carrier aggregation in the downlink (40 MHz channel) and 2-carrier aggregation in the uplink (40 MHz channel). Carrier aggregation is both contiguous and non-contiguous.
- With carrier aggregation of 40 MHz of spectrum in the downlink and 40 MHz of spectrum in the uplink, the network is capable of more than 200 Mbps downlink and 40 Mbps uplink to a single user.

- Current latency is in the 30-50ms range and declining as 5G standards evolve.
- Shentel uses currently measurable performance (not theoretical performance) for capacity planning. This highly conservative approach helps ensure that network capacity will exceed demand.

Attachment #18

Community Internet Survey Responses in Proposed Shentel Footprint Bedford, VA 2021



Ashley Thornton
Bedford County GIS
12 September 2021

Marketing & Citizen Engagement Plan

Marketing & Citizen Engagement Plan

Timeline

Franchise agreement signed: Press Release
90 Days prior to construction: post on our Glo Fiber social media pages
60 Days prior to construction: Direct Mail to LCPs announcing Glo Fiber beginning construction
60 Days prior to construction: Media efforts
30 Days prior to construction: Launch Press Release
30 Days prior to construction: Construction door tags
3-Days prior to construction: Construction imminent door tags
Construction Start Date: Coming Soon Digital Ads
Construction Start Date: Email to pre-registered leads
30 Days before LCP is Active: Direct Mail to LCPs with special offer
Construction progress: Email to pre-registered leads
Service Available: Email to pre-registered leads
Installation: Yard stake

Marketing & Citizen Engagement Plan

90 days prior to construction

Social Media

- Post on Glo Fiber Facebook and Instagram pages
- Text with post would provide more detail of availability
- Image provided to municipality to post on their social media pages

Sample

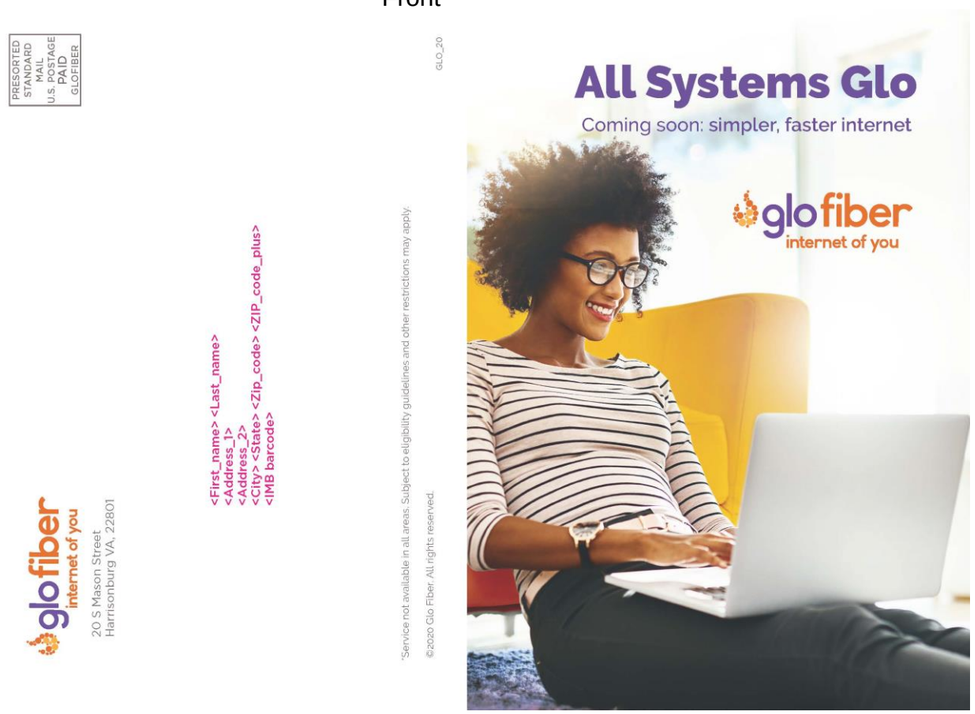
Marketing & Citizen Engagement Plan

60 days prior to construction

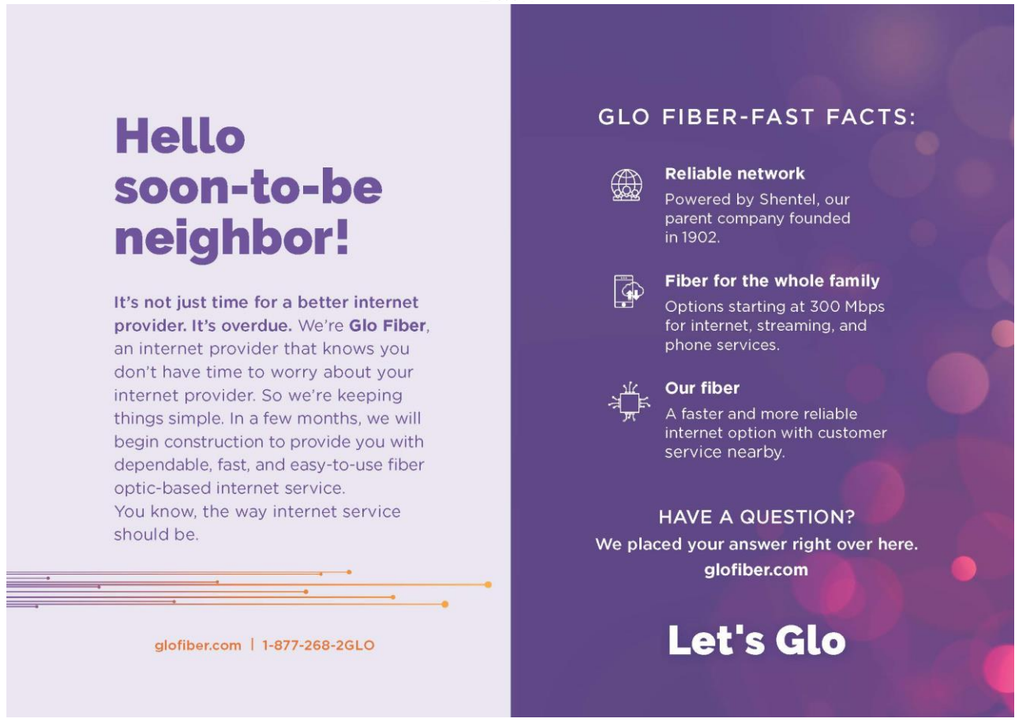
Direct Mail

- Sent to all households in the LCP slated for construction in the next 60 days
- Introduction to Glo Fiber
- 6x9 double-sided, folded mail piece

Front



Back

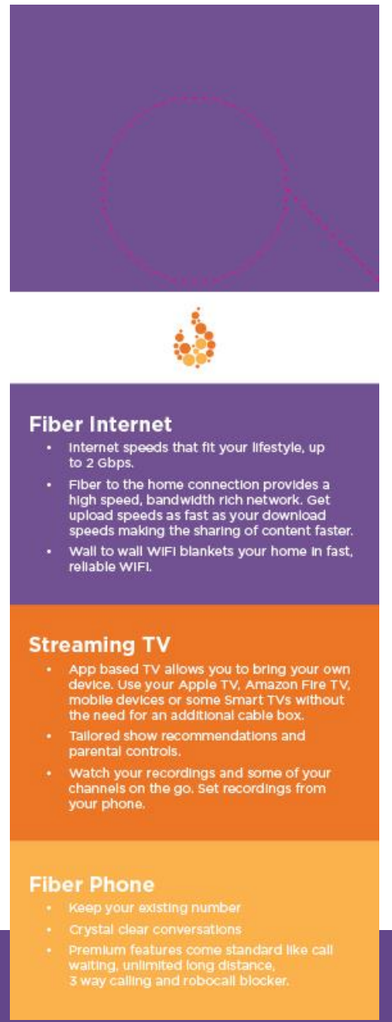


Marketing & Citizen Engagement Plan

30 days prior to construction

Door Tags

- Deployed by D2D team
- All households in the LCP slated for construction in the next 30 days are tagged
- Provides basic overview of construction process and service offerings
- Website listed on door tag will provide more detailed information

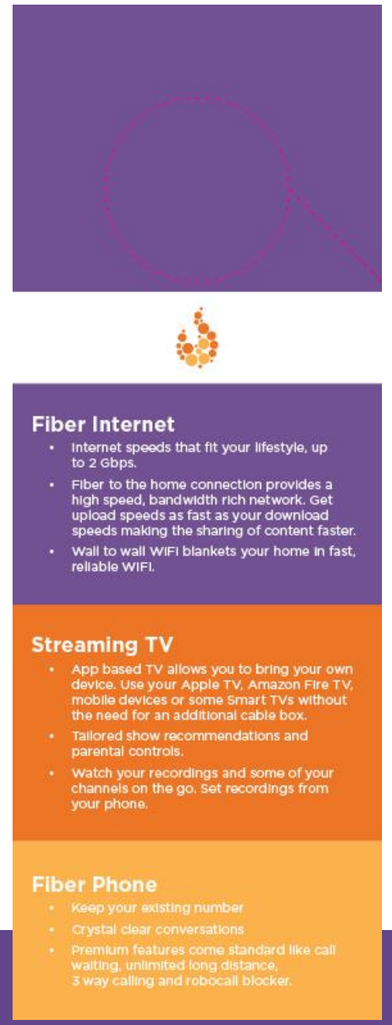


Marketing & Citizen Engagement Plan

3 days prior to construction

Door Tags

- Deployed by Construction team
- All households in the LCP slated for construction in the next 3 days are tagged
- Provides update construction process and what to expect during that time
- Website listed on door tag will provide more detailed information



Marketing & Citizen Engagement Plan

Construction start date

Coming Soon Digital Ad

- Geotargeted to zip codes/neighborhoods that will be getting Glo Fiber
- Learn more button linked to Glo Fiber website for more information. User can check for serviceability and pre-register for updates

Digital Ad - Sample

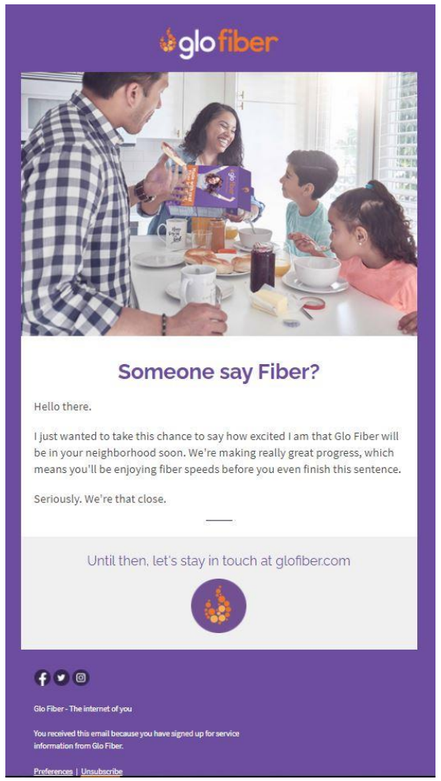
Marketing & Citizen Engagement Plan

Various stages throughout construction process

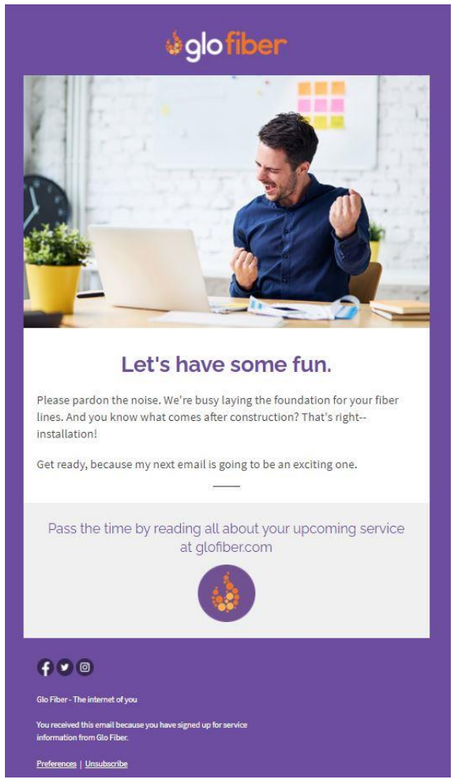
Email notifications

- Sent to those that pre-register on Glo Fiber website informing of construction progress

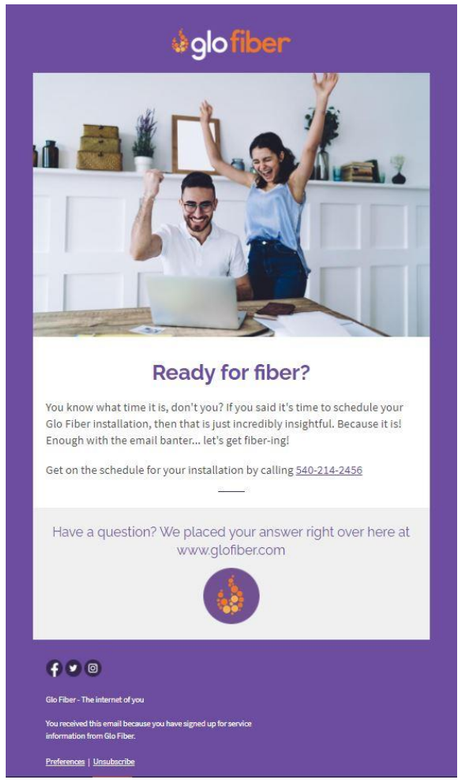
Construction start date



Construction in progress Email



Service Available



Marketing & Citizen Engagement Plan

30 days before LCP is active

Direct Mail

- Sent to all households in the active LCP
- Special offer as incentive to try Glo Fiber
- 6x9 double-sided, folded mail piece

Front

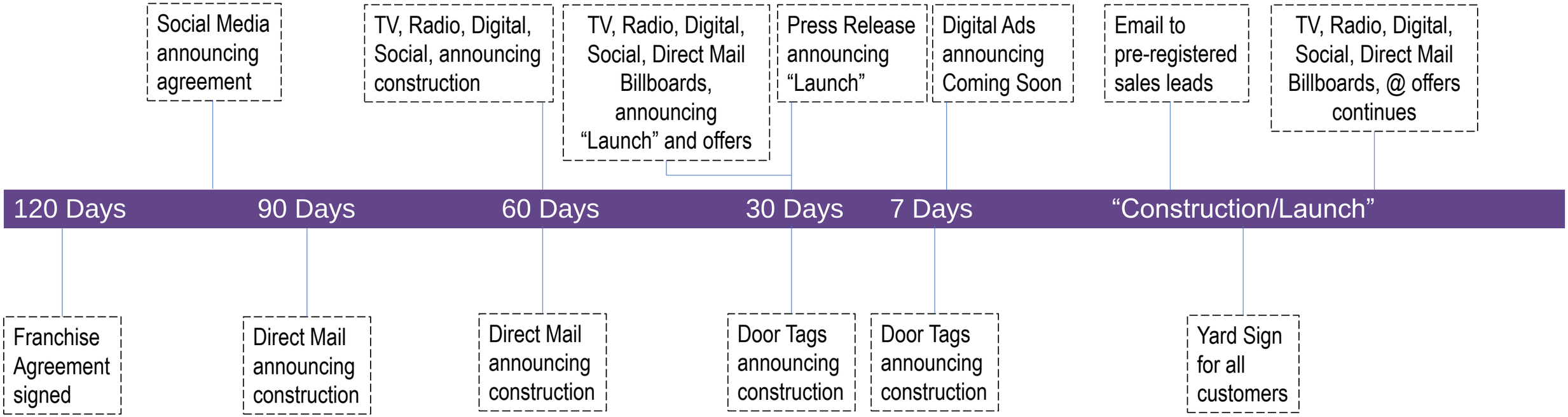
Back

Marketing & Citizen Engagement Plan

Installation

Yard Stake

- Used after installation in homeowner’s yard
- Homeowner approval required


Social Media announcing agreement
TV, Radio, Digital, Social, announcing construction
TV, Radio, Digital, Social, Direct Mail Billboards, announcing "Launch" and offers
Press Release announcing "Launch"
Digital Ads announcing Coming Soon
Email to pre-registered sales leads
TV, Radio, Digital, Social, Direct Mail Billboards, @ offers continues
120 Days
90 Days
60 Days
30 Days
7 Days
"Construction/Launch"
Franchise Agreement signed
Direct Mail announcing construction
Direct Mail announcing construction
Door Tags announcing construction
Door Tags announcing construction
Yard Sign for all customers

Marketing & Citizen Engagement Plan

beam
internet by shentel

Marketing & Citizen Engagement Plan

Timeline

- **30 - 60 days prior to launch:** PR outreach to local media outlets & social media posts on local pages announcing coverage areas that will soon be launched.

- **30 days prior to launch:** Digital ad campaign geo fenced to focus on the coverage area, utilizing a “Coming Soon” theme. Social Media also shifts in its messaging.

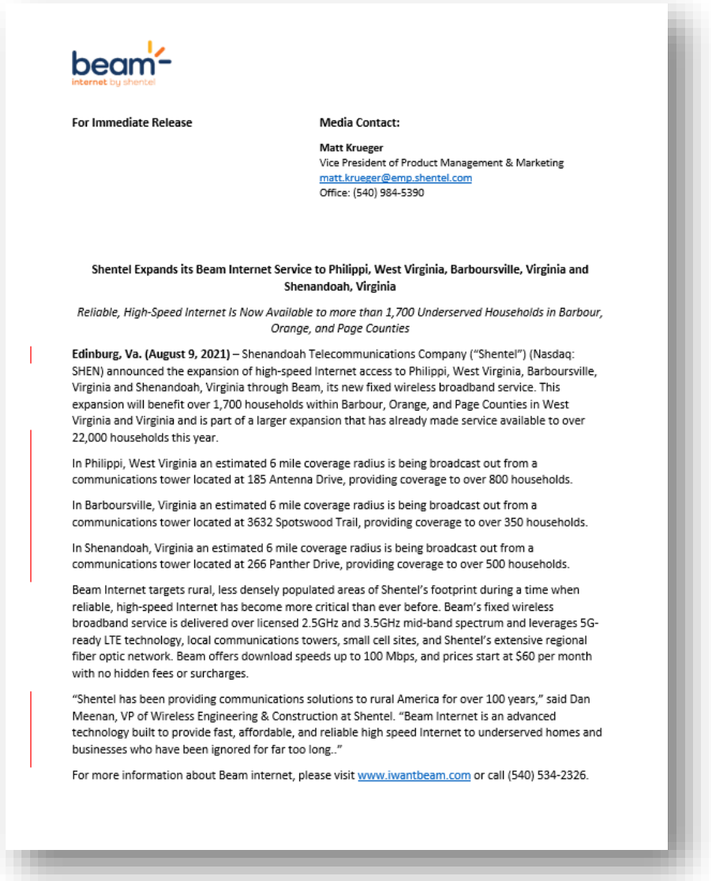
- **At launch:** Direct mail letters are sent, targeting serviceable households in the new coverage area. Digital ads, social media, Online search terms, billboards, updated press release and local marketing representatives place flyers and signs in public areas and businesses.

- **Post launch:** In the weeks and months that follow, a second direct mail campaign is launched targeting the new coverage area, digital ads and social media continue, as does the placement of yard stake signs and marketing materials in local businesses and other public gathering places.

Marketing & Citizen Engagement Plan

30 - 60 Days prior to launch

- **Public Relations Local Outreach**
- PR agency reaches out to local media outlets with pre-launch information about Beam.
- PR agency also pitches providing access to key Subject Matter Experts at Shentel for follow-up questions and additional news content and articles.
- Local newspaper(s), TV, radio stations, Chamber of Commerce, etc.



beam
internet by shentel

For Immediate Release

Media Contact:

Matt Krueger
Vice President of Product Management & Marketing
matt.krueger@emp.shentel.com
Office: (540) 984-5390

Shentel Expands its Beam Internet Service to Philippi, West Virginia, Barboursville, Virginia and Shenandoah, Virginia

Reliable, High-Speed Internet Is Now Available to more than 1,700 Underserved Households in Barbour, Orange, and Page Counties

Edinburg, Va. (August 9, 2021) – Shenandoah Telecommunications Company ("Shentel") (Nasdaq: SHEN) announced the expansion of high-speed Internet access to Philippi, West Virginia, Barboursville, Virginia and Shenandoah, Virginia through Beam, its new fixed wireless broadband service. This expansion will benefit over 1,700 households within Barbour, Orange, and Page Counties in West Virginia and Virginia and is part of a larger expansion that has already made service available to over 22,000 households this year.

In Philippi, West Virginia an estimated 6 mile coverage radius is being broadcast out from a communications tower located at 185 Antenna Drive, providing coverage to over 800 households.

In Barboursville, Virginia an estimated 6 mile coverage radius is being broadcast out from a communications tower located at 3632 Spotswood Trail, providing coverage to over 350 households.

In Shenandoah, Virginia an estimated 6 mile coverage radius is being broadcast out from a communications tower located at 266 Panther Drive, providing coverage to over 500 households.

Beam Internet targets rural, less densely populated areas of Shentel's footprint during a time when reliable, high-speed Internet has become more critical than ever before. Beam's fixed wireless broadband service is delivered over licensed 2.5GHz and 3.5GHz mid-band spectrum and leverages 5G-ready LTE technology, local communications towers, small cell sites, and Shentel's extensive regional fiber optic network. Beam offers download speeds up to 100 Mbps, and prices start at $60 per month with no hidden fees or surcharges.

"Shentel has been providing communications solutions to rural America for over 100 years," said Dan Meenan, VP of Wireless Engineering & Construction at Shentel. "Beam Internet is an advanced technology built to provide fast, affordable, and reliable high speed Internet to underserved homes and businesses who have been ignored for far too long.."

For more information about Beam internet, please visit www.iwantbeam.com or call (540) 534-2326.

Marketing & Citizen Engagement Plan

30 Days prior to launch

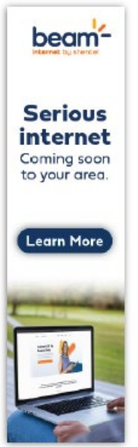
- **Social Media**
- Post on Beam Facebook and Instagram pages.
- Posts would provide additional details regarding benefits and availability.
- Posts can link to the Beam website, where local addresses can be checked for serviceability and pre-registration.

Pre-launch graphic example.

Marketing & Citizen Engagement Plan

30 Days prior to launch

- **Coming Soon Digital Ads**
- Geo-targeted to zip codes/neighborhoods that will be getting Beam.
- Learn more button linked to the Beam website for more information. User can check for serviceability and pre-register.



Marketing & Citizen Engagement Plan

30 Days prior to launch

- **Coming Soon Social Media Posts**
- Geotargeted to zip codes/neighborhoods that will be getting Beam
- Learn more button linked to the Beam website for more information. User can check for serviceability and pre-register

Pre-launch graphic example.

Marketing & Citizen Engagement Plan

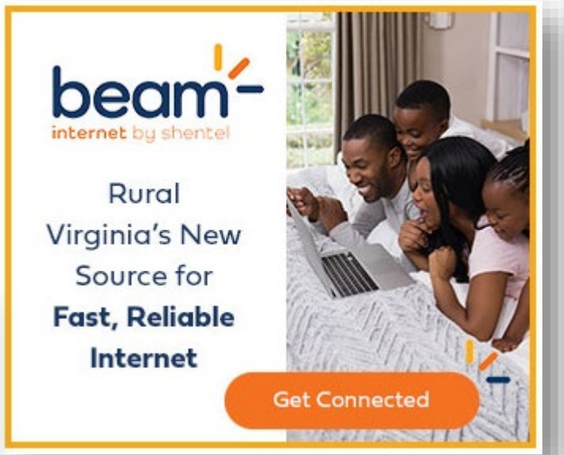
At launch

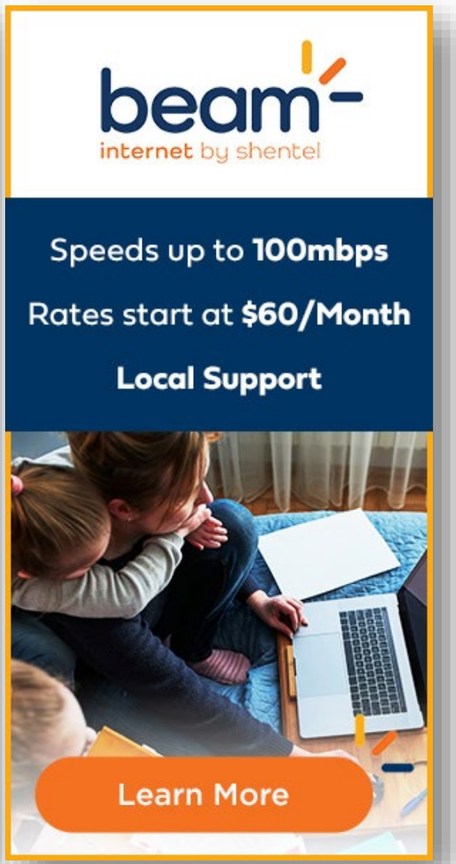
- **Direct Mail**
- Traditional letter to provide thorough content and frequently asked questions & answers.
- Sent to all households in the new coverage area.
- Provides a strong call to action and follow-up contact information.

Marketing & Citizen Engagement Plan

At launch

- **Digital Ads**
- Geo-targeted to zip codes/neighborhoods that will be getting Beam.
- Learn more button linked to the Beam website for more information. User can check for serviceability and pre-register.

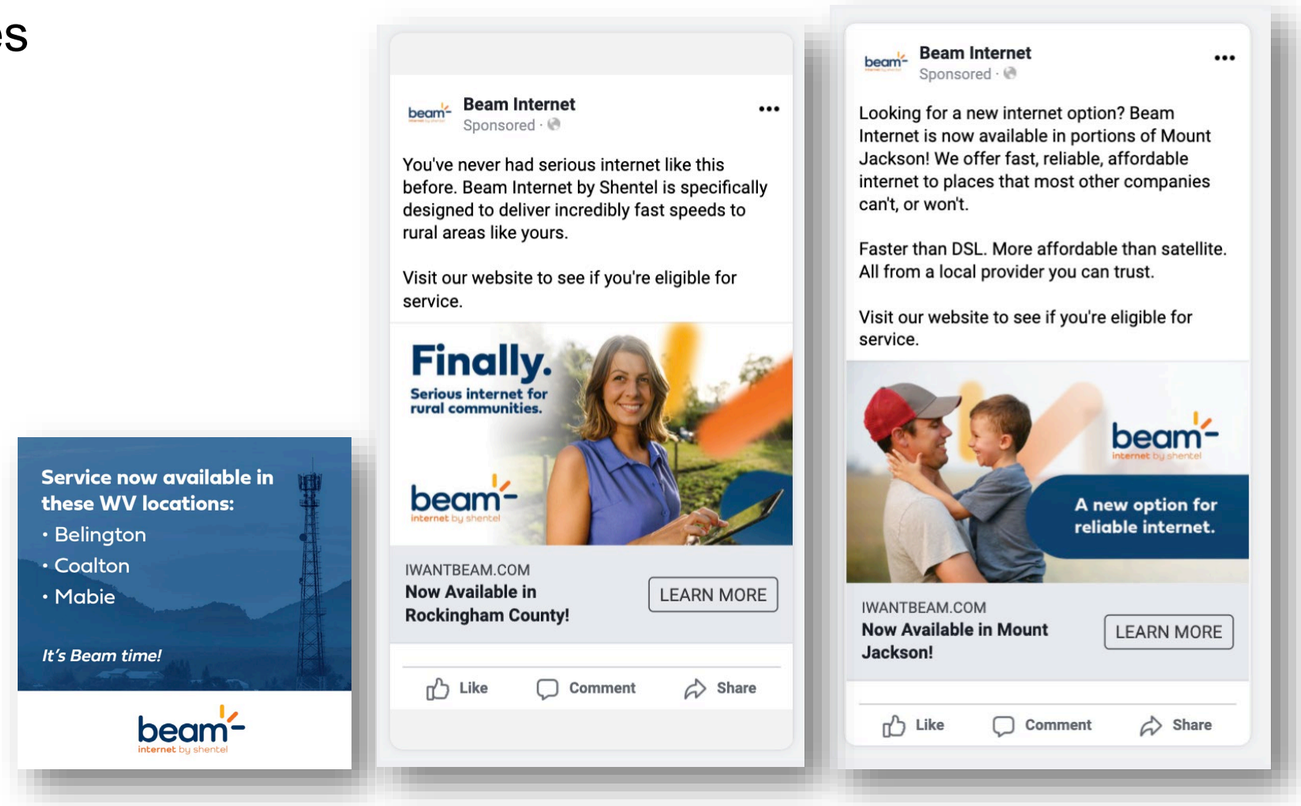




Marketing & Citizen Engagement Plan

At launch

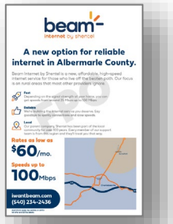
- **Social Media**
- Post on the Beam Facebook and Instagram pages as well as paid advertising through Facebook.
- Posts would provide more details regarding benefits and availability.
- Posts can link to the Beam website, where local addresses can be checked for serviceability and pre-registration.



Marketing & Citizen Engagement Plan

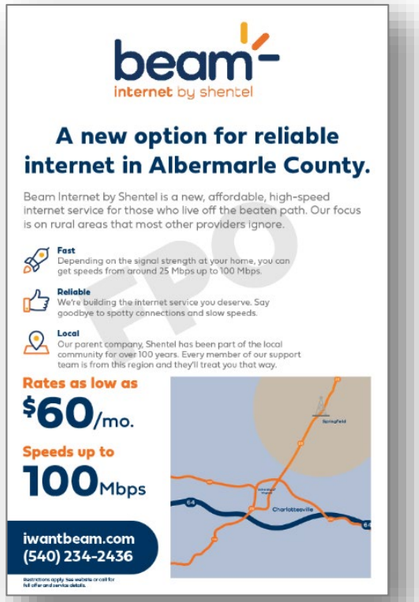
At launch

- **Local Marketing**
- Visit local businesses and common gathering places to introduce them to Beam and ask for permission to leave local marketing materials:
  - Flyers
  - Table Tents
  - Small Posters
  - Yard Signs



- 5”x7” Flyer, for local business countertops, pizza box toppers, etc.

- Table Tent for restaurants and local business countertops



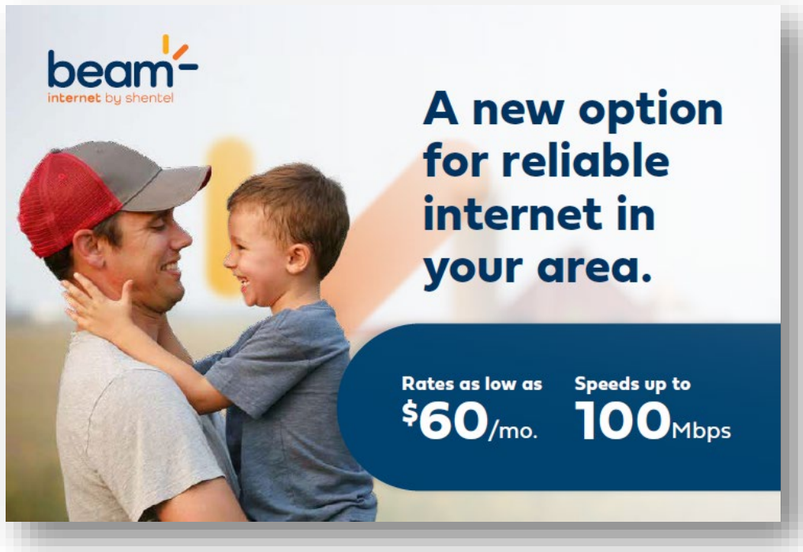
- 11”x17” Customizable Poster

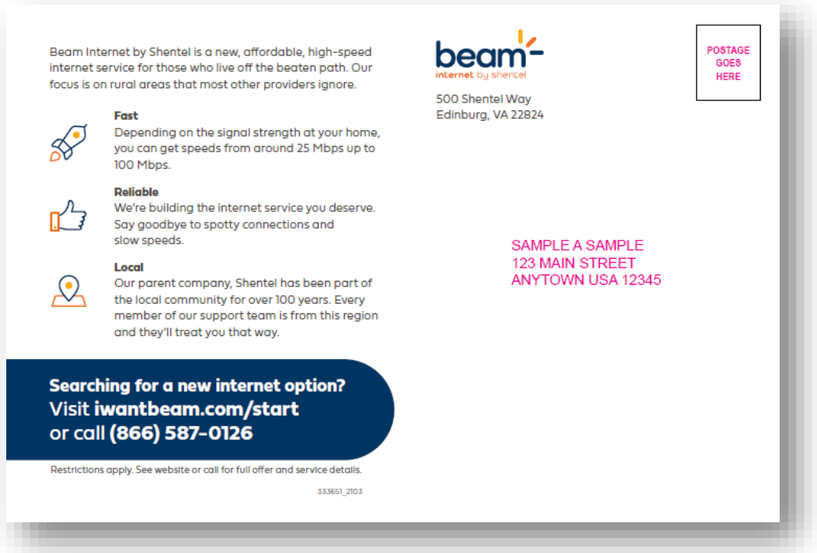
- 24”x48” Yard Stake Signs

Marketing & Citizen Engagement Plan

Two weeks after launch

- **Direct Mail**
- Sent to all households in the active coverage area as a follow-up reminder of Beam service being available
- 6x9 postcard

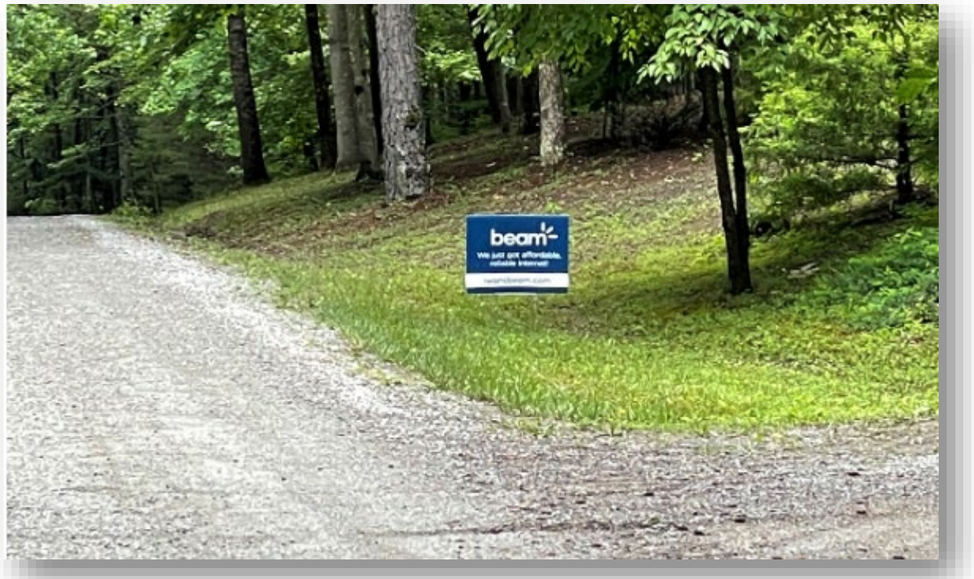




Marketing & Citizen Engagement Plan

90 Days prior to launch

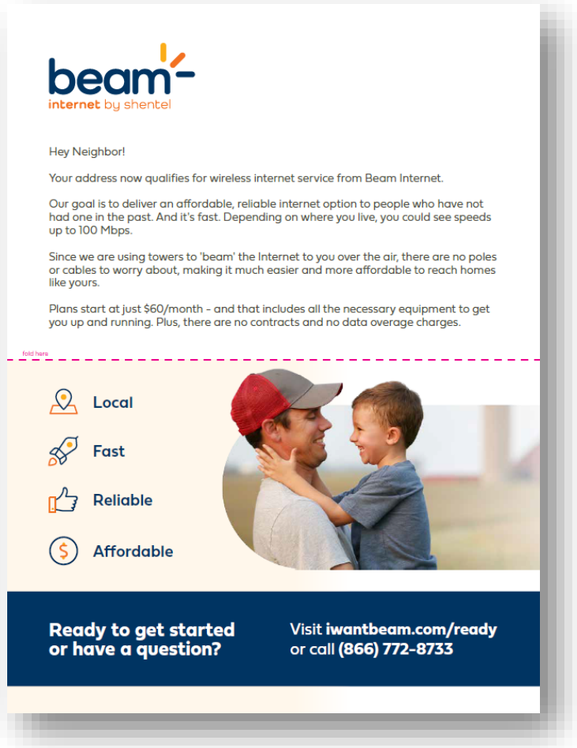
- **Yard Stake**
- Placed in the homeowner’s yard after service installation in is complete.
- Promotes Beam to both the neighbors & all local traffic.
- Homeowner approval required.



Marketing & Citizen Engagement Plan

Post launch

- **Direct Mail**
- Sent to all households in the new coverage area around 90 days after launch.
- Introduction to Beam, the service benefits and the next steps to take to learn more & sign up.
- Large folded postcard that merges the primary content from the traditional Beam letter and the Beam postcard.



Attachment 20

Bedford County GIS created the following story map to aide in understanding the proposed project scope to achieve universal broadband.

https://arcg.is/19vzy40

The story map shows the proposed broadband coverage to the block group level and has the following illustrations:

FCC broadband score

Community anchors

Agriculture impact

Citizen feedback

Educational attainment

Median household income

Poverty level

We believe this story map will be helpful in illustrating how the goal of universal broadband coverage is achieving digital equity in Bedford County.