Application to DHCD Submitted through CAMS

Shenandoah County Public Schools/ Shenandoah County of Virginia

Shenandoah County VATI Broadband Grant Application 2023

Application ID:	95708252022075705
Application Status:	Pending
Program Name:	Virginia Telecommunication Initiative 2023 - Application
Organization Name:	Shenandoah County Public Schools/ Shenandoah County of Virginia
Organization Address:	600 N Main St, Ste 200 Woodstock, VA 22664
Profile Manager Name:	Doug Culler
Profile Manager Phone:	(540) 459-6709
Profile Manager Email:	dlculler@shenandoah.k12.va.us
Project Name:	Shenandoah County VATI Broadband Grant Application 2023
Project Contact Name:	Doug Culler
Project Contact Phone:	(540) 459-6709
Project Contact Email:	dlculler@shenandoah.k12.va.us
Project Location:	600 N Main St, Ste 200 Woodstock, VA 22664-1855
Project Service Area:	Shenandoah County
Total Requested Amount:	$4,936,968.00
Required Annual Audit Status:	Accepted

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Budget Information:

Cost/Activity Category	DHCD Request	Other Funding	Total
Telecommunications	**$4,936,968.00**	**$9,168,655.00**	**$14,105,623.00**
Construction	$797,953.00	$1,481,913.00	$2,279,866.00
Construction Related Soft Costs	$3,705,931.00	$6,882,443.00	$10,588,374.00
Other: Long drop core network	$433,084.00	$804,299.00	$1,237,383.00
Total:	**$4,936,968.00**	**$9,168,655.00**	**$14,105,623.00**

Budget Narrative:

Questions and Responses:

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 Shenandoah County. Therefore, the proposed project area is anywhere there are unserved homes. This project differs from the County's 2022 VATI application because it encompasses homes that were defined as served via Shentel's fixed wireless service, Beam, last year but are now deemed unserved under the updated 100/20Mbps Broadband definition in this 2023 VATI cycle. The grant area was determined through a collaborative, multi-stage approach drawing on many different sources of data to identify all existing unserved homes without an existing funded coverage commitment. Local knowledge, historical service requests, Shentel serviceability databases, 477 data, and internal engineering estimates were used to estimate all unserved addresses, irrespective of drop length. Because this project area is in a county where Shentel is headquartered and has been active for 120 years, they have extremely good information on where the unserved locations are. See Attachment 1 – Project Area Map for greater detail.

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2. List existing providers in the proposed project area and the speeds offered. Describe your outreach efforts to identify existing providers and how this information was compiled with source(s).

Answer:

Aside from satellite providers and Shentel's own fixed wireless and DSL, the only existing providers in the project area are a few fixed-wireless operators including:

- High Speed Link – Advertised up to 25Mbps

- LiveStream – Advertised speeds up to 225Mbps

- T-Mobile – Advertised speeds up to 25 Mbps

As noted above, Shentel has done extensive analysis to identify and certify unserved addresses in Shenandoah County. Shentel has worked closely with County staff to ensure minimal overlap with any existing providers. However, without extensive knowledge of tower locations, spectrum, and equipment used, it is impossible to accurately verify wireless internet service providers' service area. While the above WISPS advertise service in select areas that may exceed 100/20Mbps, these speeds and service areas cannot be verified.

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. Label Map: Attachment 2 – Documentation on Federal Funding Area.

Answer:

Shentel is unaware of any areas near the project area that have received funding from federal grant programs that meet Broadband requirements.

4. 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 100/20 Mbps and with less than 25% service overlap within the project area for wireless projects and 20% 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 3 – Documentation Unserved Area VATI Criteria.

Answer:

The anticipated service overlap for this project is below the allowable 20% for existing wireline facilities. This project is designed to provide FTTH to the remaining unserved locations in Shenandoah County. 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 in some cases requires building near the borders of other providers' service territory. Significant efforts have been made, however, to limit the overlap as much as possible. Despite the analysis that has gone into identifying unserved homes, Shentel estimates that there may be a small margin of error where incidental overlap may arise. Given the full FTTH nature of this build, however, any identified overlap can be easily controlled.

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5. Total Passings: Provide the number of total serviceable units in the project area. Applicants are encouraged to prioritize areas lacking 25 Megabits per second download and 3 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 4 – 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.

    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 25/3 Mbps or less. Describe the methodology used for these projections. (up to 15 points)

Answer:

    a. Total Passings: 2,447
    Residential Passings: 2,416
    Business Passings (Non-Home Based): 8
    Business Passings (Home Based): 0
    Community Anchor Passings: 1
    Non-Residential Passings: 22

    b. There are no RDOF passings in this project area.

    c. There are 874 passings in this project area that are estimated to require special construction costs.

    d. Of the 874 passings estimated to require special construction costs, we estimate that 548 of them will take service. This estimate represents a 65% take rate on residential locations based on Shentel's historical experience.

    e. There are estimated to be 1,363 locations with speeds below 25/3 in this project area. This estimate was constructed primarily through comparisons against publicly available Broadband maps. However, wireless providers, other than Shentel's own fixed wireless service, were not included due to the sporadic nature of wireless coverage and the lack of precision involved in estimating wireless propagation.

6. Describe if any blocks awarded in Rural Digital Opportunity Fund (RDOF) are included in the VATI application area. If RDOF areas 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 5 – RDOF Awarded Areas Form in VATI Area

Answer:

    There are no RDOF blocks included in this project area.

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:

    Not Applicable.

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8. 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:

Shentel will be building a new Wireline solution leveraging XGS-PON Fiber to the Home ("FTTH") technology via the ITU G.9807.1 standard to the VATI locations within this proposed project area. This 100% FTTH solution will involve building new fiber extensions in the County. These new fiber extensions will connect to Shentel's existing fiber plant within this same County. Because Shentel already has an existing Broadband Network in this same County (inclusive of existing Core Network access and existing Distribution Network), this proposed project will simply be an extension of existing Broadband services to the proposed VATI locations. Further, Shentel will maintain end-to-end ownership of its entire Broadband Network within the County and will not be sharing resources.

Shentel deploys XGS-PON for its FTTH product. XGS-PON (X=10, G=Gigabit, S=Symmetrical, PON = Passive Optical Network) is an advanced standard for Passive Optical Networks (PON). XGS-PON is scalable to support up to 10 Gbps symmetrical data.? By contrast, earlier PON networks are extremely limited in the amount of downstream and upstream capacity available to the end user.? Although XGS-PON required significant additional Shentel investment, the growing demand for symmetrical Broadband made the investment in XGS-PON the best choice.?

Shentel will initially provide speed tiers of up to 1 Gbps. However, the network is scalable to provide symmetrical data speeds of up to 10Gbps.

XGS-PON deployments are designed as both centralized and distributive fiber split topology, depending on the geography of the network.? A single fiber from the service provider provides an efficient point-to-multipoint Broadband connection for multiple end users. In this rural VATI project area, Shentel will use a Distributed Split architecture to provide a more direct approach to ensuring that fiber capacity, technology, and plant records can be easily managed and scaled for growing Broadband demands.

Shentel typically initiates the fiber split from the Optical Line Terminal (OLT) out to the Customer Premise.? Each OLT is fed with dedicated fiber(s) from a Central Office (CO) or Point of Presence (POP). Shentel leverages these fibers to easily expand its fiber presence in each of the FTTH markets, and scale to future bandwidth requirements.? This robust fiber infrastructure also allows us to accommodate commercial sales opportunities within the same areas.

PLEASE SEE Attachment 17 for the complete answer - *Shentel Shenandoah 2023 Attachment 17 - Narrative Question 8 Complete Answser*

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9. 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 100/20 Mbps. (up to 10 points)

Answer:

As already noted, this project is based on a full Fiber to the Home (FTTH) network design.

The speeds that Shentel currently plans to offer in the project are shown in the table below.

This proposed rate structure is subject to change and reflects base pricing only. Promotions and periodic rate structure changes will be carried out at Shentel's sole discretion. Though this project is planned as 100% FTTH, there may arise certain instances homes within this project area can much more efficiently be reached with a small extension of our DOCSIS system. In these instances, though speeds will far exceed the 100/20 definition of Broadband, the upload speeds will not be fully symmetrical.

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. There are no other projects in the County that involve federal, state, or locally funded coverage commitments. Specifically, Shentel's project, rather than being tied to a specific geographic area, is designed to reach the remaining identified unserved homes. While there may be a small number of homes that will likely remain unreached, these homes are the extreme outliers with long drops well in excess of 2,000 ft. (e.g., where several miles of fiber are needed to reach a small handful of homes, etc.). That being said, Shenandoah County's goal in continuing collaboration with its private-sector partners is to continue to drive fiber further out 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 project will address Shenandoah's known Broadband needs, and as time goes on and more information is gained, the County will be well positioned with a vast fiber network that will be able to address any further Broadband holes that emerge. Shentel is under an NDA and in regular discussions with the local utility providers, Shenandoah Valley Electric Company (SVEC) and Dominion, to continue analyzing opportunities to partner and reach any remaining unserved homes that may be identified in a collaborative, cost-efficient way.

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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 are encouraged to extensively discuss, where applicable, easements relating to railroad crossings, federally-owned lands and parks, partnerships with the Virginia Department of Transportation, and mobile home parks. 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 10 points)

Answer:

Based on Shentel's existing assets and relationships, this project is in a very favorable state of development. A FTTH network design is in place with planned fiber routes comprising nearly 600 miles of fiber. 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 the need for make-ready work and permitting, as it merely requires a modification to what is already in place. Shentel's typical permitting and easement process is as follows.

- Ride out the planned service areas to validate and refine the fiber route design. Shentel typically follows existing utility routes (e.g., power, telephone, etc.), and permits with those utilities for new pole attachments when there is no existing Shentel attachment to allow for overlash.
- VDOT permits will be submitted in those locations where we plan to place our facilities in the VDOT ROW.
- Shentel will permit all utility pole owners for any overlash or new pole attachments. Any new permitted utility pole that is located on private property, Shentel would follow the Virginia code that would allow Shentel to ask the incumbent utility to utilize their existing easement on private property. Shentel would ask the County to help facilitate this process in the rare occurrence of any easement disputes with land-owners. Shentel has had a long history with SVEC, Dominion, and local VDOT offices, and is well acquainted with the people and processes that will be followed for all permitting activity along its planned fiber routes.
- All other permits, such as city, town, railroad or VMRC, would be permitted as required.
- Shentel will provide contact information to any agency that will be permitted for the project.

Furthermore, Shentel's long-term presence and headquarters in Shenandoah County and strong partnership with County staff, VDOT, and utility pole owners (Dominion and SVEC) means that the needed easements and permits are all well understood and can be processed in a timely manner. Shentel's longstanding relationships with qualified contractors, coupled with the large volume of both aerial and underground work they have proposed, put them in an ideal
position to bid for these contracting resources. Across its various service offerings (e.g., CATV, FTTH, etc.), Shentel has expanded Broadband service to over 67,000 homes in the last 12 months - and that number is constantly growing. In Shenandoah County alone, Shentel delivered Broadband to hundreds of new unserved homes in 2021 without the assistance of any subsidies. This robust, proven growth, along with Shentel's long history in Shenandoah County, clearly demonstrates its ability to design and deploy a wide array of Broadband networks. This project was designed with a FTTH architecture to provide robust universal Broadband connectivity. As such, Shentel estimates that the project will be completed within 24 months from contract execution. A detailed project timeline can be found in Attachment 7 – Timeline/Project Management Plan. The executed MOU can be found in attachment 8.

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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:

Shentel has been awarded five (5) VATI grants. The following is a summary of Shentel's grant awards. All of the projects listed below will 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 grants directly with a locality (Campbell County and Albemarle County through CARES funding). All grants at the local level have been successfully closed out and are delivering Broadband to unserved locations. The status of the VATI grants awarded through the 2022 VATI cycle are listed below.

County: Bedford County
ISP: Shenandoah Cable Television, LLC
Passings: 4,734
VATI Award: $9,148,553
Status: Contracting

County: Campbell County
ISP: Shenandoah Cable Television, LLC
Passings: 3,509
VATI Award: $6,442,563
Status: Contracting

County: Franklin County
ISP: Shenandoah Cable Television, LLC
Passings: 3,508
VATI Award: $11,832,456
Status: Contracting

County: Roanoke County
ISP: Shenandoah Cable Television, LLC
Passings: 213
VATI Award: $500,098
Status: Contracting

County: Shenandoah County
ISP: Shenandoah Cable Television, LLC
Passings: 4,139
VATI Award: $12,176,662
Status: Contracting

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 minimum 20% match is required to be eligible for VATI, the private sector provider must provide 10% 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. If applicants and co-applicants are seeking to include prior expended funds as matching funds, Attachment 11 must be completed. Label Attachments: Attachment 9 - Funding Sources Table; Attachment 10 – Documentation of Match Funding; Attachment 11 - Prior Expended Match Form

Answer:

As detailed in attachment 9, the matching funds for this project are as follows:

Requested VATI: $4,936,968
Shentel: $9,168,655

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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

Shenandoah County has committed staff hours 40, as well as coordination with the local towns, to ensure this project plan is as effective long-term. County staff have supported Shentel's planning by providing key demographic, financial, and economic development data. This data has ensured Shentel's project will accurately address the remaining digital divide in the County.

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 in Edinburg, VA. This office will provide convenience to customers who prefer to do business in-person. It will provide excellent local customer support to all customers across Shenandoah County. 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 do not need to be newly developed.

Another major benefit to Shentel's existing local presence is the significant amount of infrastructure already in place. As noted, Shentel will be able to leverage its existing cable and fiber assets to attach new fiber via overlash, rather than having to go through the entire permit and make ready process for the whole project. Shentel is additionally able to recognize significant efficiencies from the work being done as part of its FY2022 VATI grant. Shentel has already begun work on a nearly $33M project in Shenandoah County that will reduce the engineering, design, and construction burden for this project. This ongoing project will also greatly reduce the time needed to develop new contracts, as well as new monitoring and reporting processes which will already be in place. This will both reduce costs and increase deployment speed. Shentel will also be able to leverage its existing PoP and Central Offices (Cos) in Shenandoah County, 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. Communications Plan: Describe efforts to keep the public informed of project progress and the broadband adoption plan.

    a. Explain how you plan on communicating the project status to stakeholders, including but not limited to County leadership, project areas residents, etc. (Up to 10 points)

    b. 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)

    c. 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. Shenandoah County and Shentel will continue to work collaboratively to ensure that all stakeholders, including the Board of Supervisors, residents, business owners, and community anchors, are kept apprised of project developments. As part of the management of the project, the County will have access to the monthly progress reports that will be submitted to DHCD. Additionally, Shentel and the County will work together to establish an appropriate cadence on which to present updates to the Board of Supervisors. Residents and business owners will also be able to check their address on Shentel's website to determine if they are included in the project and to get an estimate of when service is expected to be live at their location.

b. Shentel will engage in a targeted and iterative marketing effort during and after its construction to ensure awareness of this project and its benefits. In addition to providing regular updates to County Officials and working with the County to notify residents of project status, Shentel will carry out its own direct marketing outlined below.

45 Days prior to construction: Direct Mail to targeted service area announcing beginning construction.

3 Days prior to construction: Construction imminent door tags of affected homes
Construction Start Date: Email to pre-registered leads

30 Days before DCP is Active: Direct Mail to targeted service area with special offer to sign-up early

Construction progress: Email to pre-registered leads

Service Available: Email to pre-registered leads, Direct Mail postcard announcing order availability

Installation: Yard stake

Note: Direct marketing will include information informing long-drop eligible residents of their limited-time opportunity to have their long-drop costs covered through grant funding.

Shentel is also a participant in the Federal Affordable Connectivity Program which provides a discount of up to $30.00 monthly to qualifying households. One of the best decisions Shentel project management team made was soliciting the ongoing and considerable input from the County Board of Supervisors. Maintaining the involvement of the Board has not only helped keep the Board apprised of the status of these projects, but doing so has also allowed our project team to continue to meet scheduling milestones as we transition into the construction phase of the project. This project is one of the County's absolute top priorities.

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 based on experience in similar unserved areas.

c. The Shenandoah County Library System and Shenandoah County Public Schools promote digital literacy in the Shenandoah County community.

Shenandoah County Library System worked with Shenandoah County Public Schools to offer opt-in digital library cards to all students who wanted one. This allowed students to use all of the library's online information resources, including a research database, and full access to their collection of downloadable e-books and e-audiobooks through the Overdrive/Libby service. Over the course of the pandemic, the library invested heavily in downloadable content in an attempt to increase the number of titles available and the variety of formats (print/audio) they are available in. Shenandoah County Public Schools promotes digital literacy efforts for students, staff, families, and the community primarily through the use of its website and social media. There is a dedicated Digital Citizenship Resources page on the division website (https://www.shenandoah.k12.va.us/en-US/technology-245228d7/digital-citizenship-resources-2f6c5986) to help parents understand how to keep themselves and their children safe on the internet. Shenandoah County Public Schools also shares resources found on Common Sense Education (https://www.commonsense.org/education/digital-citizenship) and EverFi (https://everfi.com/k-12/).

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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.

Answer:

County grant management team and experience

Douglas Culler – Director of IT, Shenandoah County Public Schools/Shenandoah County Government
Role: Grant and personnel coordination

Jenna French – Director of Tourism & Economic Development, Shenandoah County
Role: Working with the local business community and residents to determine current and future needs as they relate to enhanced quality of life and future economic growth. Coordinating with partners such as Shenandoah Memorial Hospital, Chamber of Commerce and Department of Social Services.

Evan Vass – County Administrator, Shenandoah County
Role: Administrative Overview of the grant process

Mandy Belyea – Deputy County Administrator
Role: Administrative overview of the grant process.

Shenandoah County has extensive experience managing both state and federal grants, including grants administered by DHCD. Most recently, the County received a $550,000 Community Development Block Grant (CDBG) through DHCD to assist small businesses who had been impacted by the COVID-19 Pandemic. This grant enabled us to serve 47 small businesses in addition to several others who received similar grants through The County utilizing CARES Act money. You will find that our management of that grant was both organized and efficient in meeting deadlines and filing necessary reports. Jenna French, Mandy Belyea, and Evan Vass also serve on the management team for this grant.

The County also received another DHCD Grant in partnership with People Incorporated several years ago and has been the recipient of numerous other grants from various state agencies including VEDP, Virginia Department of Emergency Management, VDACS, VDOT, Virginia Tourism Corporation, Virginia Department of Criminal Justice Services, and Department of Social Services.

Co-Applicant management team and experience

Shentel is one of the largest regional internet service providers in the Mid-Atlantic. They have a 120-year operating history and an extensive fiber network that spans more than 7,900 miles and supports its rapidly growing and multifaceted Broadband services in Virginia, West Virginia, Maryland, Kentucky, and Pennsylvania. With Broadband service delivered to more than 67,000 homes in the past 12 months and nearly 900 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 its highly successful and new Glo Fiber FTTH service. Launched in 2019, Glo Fiber is an XGS-PON FTTH network that is serving customers with symmetrical multi-gigabit speeds in more than a dozen communities across Virginia, West Virginia, Maryland and Pennsylvania. Shentel currently covers more than 112,000 homes with this service, bringing its total broadband footprint to over 324,000 homes, with 378,000 more planned by 2026.

Shentel Project Management Team

Dan Meenan – Vice President, Operations
Role: Executive oversite of Fiber to the Home deployment for the VATI projects
Qualifications: Executive with over twenty years of diverse telecommunications management experience inclusive of wireless mobility networks, fixed wireless networks, and cable television.

Harris Duncan – Vice President, Network Engineering

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Role: Executive oversite of Core integration & support for the VATI projects
Qualifications: Executive with over twenty years of diverse telecommunications management experience inclusive of wireline fiber networks and cable television.

Brith Osinkosky – Director OSP Engineering & Construction
Role: Responsible for Fiber to the Home engineering and construction for the VATI projects
Qualifications: Accomplished leader with twenty 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.

Paul Lopez – Director of Broadband Operations
Role: Responsible for all customer installation and support for Fiber to the Home

Jessica Wilmer – Manager, Project Management
Role: Responsible for the coordinated deployment of Fiber to the Home and for project management updates and cost reimbursement related to the VATI projects
Qualifications: 20 years of wireless telecommunications industry real estate acquisition and site development expertise. Previously project managed Shentel's Wireless Mobility network comprised of approximately 2,000 cell sites in seven states, including developing over 500 new cell sites. Former Zoning Administrator in Augusta County. Extensive experience with Zoning and Planning, the Wireless industry, and government affairs.

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 120-year-old telecommunications company that has served Shenandoah County for over a century. Shentel is currently laying hundreds of miles of fiber per year to support its expanding Cable, and FTTH. As shown in attachments 12 and 13, all cost estimates are based off a long and active history in the Broadband 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.

At a high level, Shentel's proposed cost breakout is as follows:

Requested VATI: $4,936,968
Shentel: $9,168,655

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 $4,936,968

b. Number of serviceable units - The total number of serviceable units covered is 2,447

19.

Application to DHCD Submitted through CAMS

Shenandoah County Public Schools/ Shenandoah County of Virginia

Shenandoah County VATI Broadband Grant Application 2023

Commonwealth Priorities (Up to 50 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 100/20 mbps, include information regarding the internet service provider's participation in the Affordable Connectivity Program

d. The co-applicant's efforts to mitigate supply chain constraints, including labor shortages and order-to-delivery delays on telecommunications materials required to construct broadband networks.

e. The applicant's and co-applicant's efforts to promote broadband adoption, including, but not limited to: telehealth, smart farming, e-entrepreneurship, and distance learning.

Answer:

a. Shentel has designed this grant to provide the best technology (FTTH) at an excellent cost to both the state and County. In addition, this grant will align with the other efforts of the Northern Shenandoah Valley.

b. Shentel has a variety of unique partnerships planned for this project. Some of the partnerships will lower costs, or enable increased availability of Internet access. Shentel and SVEC have signed an NDA and are working together to analyze possible means to extend Broadband to both the unserved and underserved areas of Shenandoah County as part of Shenandoah County's VATI grant application. Shentel also has an NDA in place with and is exploring similar opportunities with Dominion. Shentel is a leading E-Rate provider, and has a long history as a partner with school systems across our service footprint. Shentel also has a formalized "resource sharing agreement" with VDOT. In exchange for right of way easements, and other efficiencies for Shentel's construction, Shentel provides fiber to VDOT that is utilized for cameras, and other safety and monitoring efficiencies for VDOT. Shentel also has all of the Valley Health locations connected with fiber. Recently, Shentel also connected a new Sentara rural health location in Mount Jackson with fiber. This location offers primary care services and telemedicine, a vital health care tool for rural communities. Sentara has a targeted goal within their medical group to increase telemedicine services across their entire network. As a result, Shentel and Sentara are evaluating other joint, collaborative projects to increase the level, access, and quality of health care delivery in the Shenandoah Valley. Shentel has designed this grant to provide the best technology (FTTH) at an excellent cost to both the state and County. In addition, this grant will align with the other efforts of the Northern Shenandoah Valley.

c. Shenandoah County Public Schools and Shentel have a long history of partnership to promote digital equity. Before the pandemic, Shentel provided a discount to families that were economically disadvantaged. Any household whose student was eligible for free and reduced-price meals according to the guidelines of the National School Lunch Program received the discounted rate. (More information: https://district.schoolnutritionandfitness.com/shenandoahschoolfoodservices/files/2021-2022%20SSO%20Media%20Release.pdf) During the pandemic, Shenandoah County Public Schools worked diligently with its partners, including Shentel, to ensure that each student had some form of internet access in order to access virtual instruction. If a family did not have internet prior to the pandemic, hotspots were utilized in areas where cellular coverage was available. Where it was not, Shentel offered highly discounted rates to SCPS to provide internet access to students. SCPS also shared information from Shentel regarding the Emergency Broadband Benefit (http://www.schoolnutritionandfitness.com/district/shenandoahschoolfoodservices/files/EBB_Notification%20Letter_21-07.pdf). Through these partnership efforts, all but 2 households had internet access during the year of virtual and hybrid learning. However, due to the lack of high-speed internet throughout rural areas of Shenandoah County, some students had more reliable, faster internet access than others. The 2023 VATI grant will lead to increased digital equity in Shenandoah County and will provide greater opportunities for Shenandoah County Public Schools students. Shentel also participates in the Affordable Connectivity Program and offers a $30 discount on all Internet packages for any user that qualifies.

d - PLEASE SEE Attachment 18 - *Shentel Shenandoah 2023 Attachment 18 - Narrative Question 19 Complete Answer*

e - PLEASE SEE Attachment 18 - *Shentel Shenandoah 2023 Attachment 18 - Narrative Question 19 Complete Answer*

Shenandoah County Public Schools/ Shenandoah County of Virginia

Shenandoah County VATI Broadband Grant Application 2023

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20. **Additional Information**

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 14 – Letters of Support.

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 15 –Two most recent Form 477 submitted to the FCC or equivalent

b. Attachment 16 - Point and Polygon shapefiles, in.zip file form, showing proposed passings and project area

c. Attachment 17 - For wireless applicants: shapefiles, in .zip file form, indicating RSSI projections in the application area

d. Attachment 18 – XXXXXXX

e. Attachment 19 – XXXXXXX

f. Attachment 20 – XXXXXXX

Answer:

Attachment 18 - Shentel Shenandoah 2023 Attachment 18 - Narrative Question 8 Complete Answer

Attachment 19 - Shentel Shenandoah 2023 Attachment 19 - Narrative Question 19 Complete Answer

Attachments:

Map(s) of project area, including proposed infrastructure

ShentelShenandoah2023Attachment1ProjectAreamap8252022113310.pdf

Documentation that proposed project area is unserved based on VATI criteria

ShentelShenandoah2023Attachment3DocumentationUnservedAreaVATICriteria8252022113325.pdf

Passings Form (Use template provided)

ShentelShenandoah2023Attachment4PassingsForm8252022113336.pdf

Application to DHCD Submitted through CAMS

Shenandoah County Public Schools/ Shenandoah County of Virginia

Shenandoah County VATI Broadband Grant Application 2023

Documentation of RDOF awarded area in VATI project Area (Use template provided)

ShentelShenandoah2023Attachment5RDOFPassingsForm8252022113343.pdf

Timeline/Project Management Plan

ShentelShenandoah2023Attachment7ProjectManagementPlan8252022113353.pdf

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

ShentelShenandoah2023Attachment8MOUMOAbetweenApplicantCoApplicant825202215037.pdf

Funding Sources Table (Use template provided)

ShentelShenandoah2023Attachment9FundingSourcesTable8252022113432.pdf

Documentation of Match Funding

ShentelShenandoah2023Attachment10DocumentationofMatchFunding8252022113439.pdf

Derivation of Cost/Project Budget (Use template provided)

ShentelShenandoah2023Attachment12DerivationofCosts8252022113454.pdf

Documentation of Supporting Cost Estimates

ShentelShenandoah2023Attachment13DocumentationofSupportingCostEstimates8252022113503.pdf

Letters of Support

ShentelShenandoah2023Attachment14LettersofSupport825202230707.pdf

Two most recent Form 477 submitted to the FCC or equivalent

ShentelShenandoah2023Attachment15TwoMostRecentForm477SubmittedtotheFCCorEquivalent8252022113512.zip

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

ShentelShenandoah2023Attachment16PointandPolygonShapefiles8252022113520.zip

Optional

ShentelShenandoah2023Attachment18NarrativeQuestion8CompleteAnswer825202263905.pdf

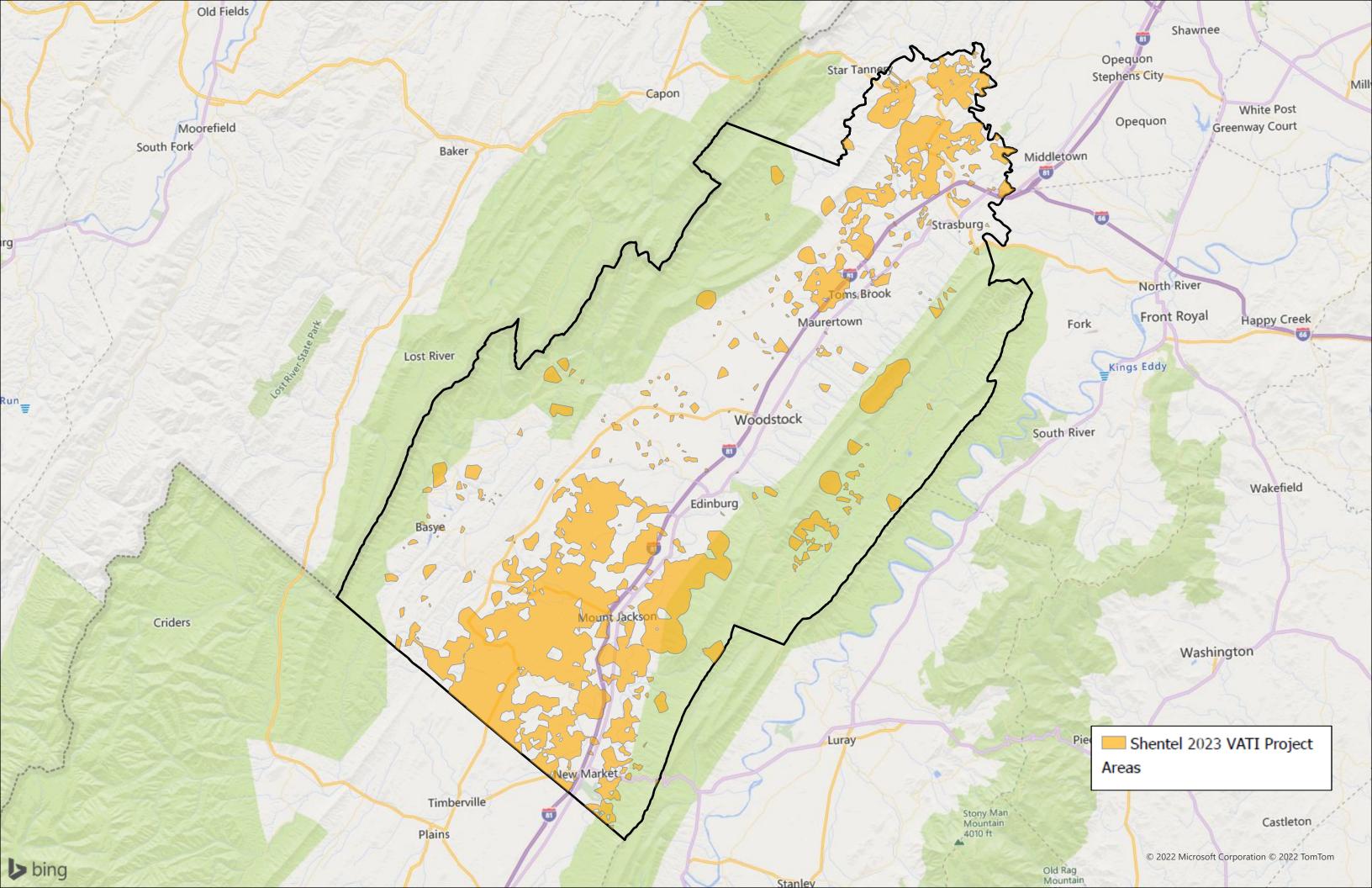Shenandoah County Public Schools/ Shenandoah County of Virginia

Shenandoah County VATI Broadband Grant Application 2023

Optional

ShentelShenandoah2023Attachment19NarrativeQuestion19CompleteAnswer825202263911.pdf

Shentel 2023 VATI Project Areas

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. The process for identifying unserved homes 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. It is also important to note that Shentel did not consider any fixed wireless services in its analysis of existing broadband coverage. Wireless coverage is often spotty and inconsistent, making it impossible to accurately measure. More importantly, Shentel has seen no evidence that the wireless service providers in its project areas can provide speeds at or above 100/20 speeds to qualify for broadband.

Furthermore, Shentel is committed to continuing to minimize overlap throughout the life of this project. Rather than preemrpively remove unserved homes, Shentel will cooperatively participate in the challenge process and work with DHCD and any providers than can adequately demonstrate that they provide broadband services to enough locations to sustain a valid challenge.

2023 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 25/3 or below in Project Area [4]
Residential	2,416	1,573	548	1,342
Businesses (non-home based)	8	0	0	5
Businesses (home-based)	0	0	0	0
Community Anchors	1	0	0	1
Non-residential	22	0	0	15
Total	2,447	1,573	548	1,363

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 25 mbps download and 3 mbps 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.

2023 Virginia Telecommunication Initiative (VATI)
RDOF Passings Form

Type of Passings	Total Number of Passings in the Project Area that lie within Preliminarily Awarded RDOF Areas [1]
Residential	0
Businesses (non-home based)	0
Businesses (home-based)	0
Community Anchors	0
Non-residential	0
Total Number of RDOF Passings	0

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

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.

Project Management Plan

Project Timeline

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

Wireline

Performance Milestones	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24
	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
Field Engineering - Phased	█	█	█	█	█																			
Design Engineering - 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 Project Tasks are as follows:

Project Tasks

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.

Shenandoah County grant management team:

- **Douglas Culler** – Director of IT, Shenandoah County Public Schools/Shenandoah County Government
  Role: Grant and personnel coordination

- **Jenna French** – Director of Tourism & Economic Development, Shenandoah County
  Role: Working with the local business community and residents to determine current and future needs as they relate to enhanced quality of life and future economic growth. Coordinating with partners such as Shenandoah Memorial Hospital, Chamber of Commerce and Department of Social Services.

- **Evan Vass** – County Administrator, Shenandoah County
  Role: Administrative Overview of the grant process

- **Mandy Belyea** – Deputy County Administrator
  Role: Administrative overview of the grant process

Shentel Project Management Plan

Shentel's project will build on its existing infrastructure and will be managed by many individuals that have been doing work in this area for many years. The Shentel project will be managed by the following individuals.

Employee	Title	Role	Qualifications
Dan Meenan	Vice President, Operations	Executive oversite of Fiber to the Home deployment for the VATI projects.	Executive with over twenty years of diverse telecommunications management experience inclusive of wireless mobility networks, fixed wireless networks, and cable television.
Harris Duncan	Vice President, Network Engineering	Executive oversite of Core integration & support for the VATI projects.	Executive with over twenty years of diverse telecommunications management experience inclusive of wireline fiber networks and cable television.
Brith Osinkosky	Director OSP Engineering & Construction	Responsible for Fiber to the Home engineering and construction for the VATI projects.	Accomplished leader with twenty 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 Broadband Operations	Responsible for all customer installation and support for Fiber to the Home.	Strategic and solutions-oriented leader with more than twenty years in the Telecommunications Industry. Responsible for the ongoing operations and maintenance of the Broadband Network as well as the installation and support of customers.
Jessica Wilmer	Manager, Project Management	Responsible for the coordinated deployment of Fiber to the Home and for project management updates and cost reimbursement related to the VATI projects.	20 years of wireless telecommunications industry real estate acquisition and site development expertise. Previously project managed Shentel's Wireless Mobility network comprised of approximately 2,000 cell sites in seven states, including developing over 500 new cell sites. Former Zoning Administrator in Augusta County. Extensive experience with Zoning and Planning, the Wireless industry, and government affairs.

Project Management Team Signatures

_____   _____

_____   Date

Shenandoah County, VA

_____   _____

Dan Meenan, Vice President, Operations   Date

Shentel

MEMORANDUM OF UNDERSTANDING
BETWEEN SHENANDOAH COUNTY AND
SHENTEL FOR APPLYING FOR VIRGINIA
TELECOMMUNICATIONS INITIATIVE
FUNDING FOR PROVIDING BROADBAND
SERVICES

I.   PARTIES AND PURPOSE

This Memorandum of Understanding (MOU) is made and entered into this _____ day of _____, 20___ by and between Shenandoah County, a political subdivision of the Commonwealth of Virginia and Shenandoah Cable Television, LLC, hereinafter referred to as "Shentel," for the purpose of creating a partnership to prepare and submit an application for grant funding through the FY 2023 Virginia Telecommunications Initiative (VATI) the Virginia Department of Housing and Community Development in an effort to expand and improve broadband services to the citizens of Shenandoah County, Virginia.

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

II.   SCOPE OF WORK

Shenandoah County and Shentel desire to cooperatively work together to prepare and apply for grant funding through the 2023 VATI Funding Program managed by the Virginia DHCD to provide universal wireline broadband service to the unserved areas of the County by extending their existing network. The application for funding anticipates coverage to be made available to 2,447 currently unserved/underserved locations in the County.

Shenandoah County and Shentel agree to provide the necessary funding to construct the universal broadband project to deliver Internet service to the homes/businesses in these areas by providing minimum average Internet speeds ranging from 100 Mbps/20 Mbps to 1 Gbps.

To obtain necessary project funding, Shenandoah County agrees to complete a grant funding application in collaboration with Shentel through the DHCD 2022 VATI Funding Program on or before August 25, 2022. Shenandoah County agrees to provide administrative and grant management support towards the project with the project costs being borne by Shentel and State funding through the VATI program.

Both parties confirm that a detailed agreement shall be executed if funding is approved to outline all the obligations of Shenandoah County and Shentel and provide performance guarantees for service delivery and maintenance. If funding is approved from DHCD, both parties confirm and understand that Shentel will be responsible for providing its portion of funding necessary, per the grant funding application, to complete the project for which DHCD funding was received.

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

FOR SHENANDOAH COUNTY:

Approved as to Form:

By:_____ _____
Jason J. Ham
County Attorney
SHENANDOAH COUNTY, VIRGINIA

By: _____ _____
Steven A. Baker
SHENANDOAH COUNTY BOARD OF SUPERVISORS CHAIRMAN

STATE OF VIRGINIA
COUNTY OF SHENANDOAH, to wit:

The foregoing instrument was acknowledged before me this ____ day of _____, 20__, by XXX, on behalf of the Shenandoah County.

Registration #: _____   My Commission expires: _____

_____Notary Public

FOR SHENTEL:

.

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

STATE OF VIRGINIA
COUNTY OF SHENANDOAH, to wit:

The foregoing instrument was acknowledged before me this ____ day of _____, 20__, by Christopher S. Kyle, Vice President of Shenandoah Telecommunications Company (Shentel).

Registration #: _____   My Commission expires: _____

_____Notary Public

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	$ 4,936,968	35%	Pending
Shentel	$ 9,168,655	65%	Pending
TOTAL	$ 14,105,623	100%	

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.

SHENANDOAH TELECOMMUNICATIONS COMPANY AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
Years Ended December 31, 2021, 2020 and 2019

(in thousands, except per share amounts)		2021		2020		2019
Service revenue and other	$	245,239	$	220,775	$	206,862
Operating expenses:						
Cost of services		102,299		89,657		83,572
Selling, general and administrative		82,451		85,016		77,846
Restructuring expense		1,727		—		—
Impairment expense		5,986		—		—
Depreciation and amortization		55,206		48,703		46,786
Total operating expenses		247,669		223,376		208,204
Operating loss		(2,430)		(2,601)		(1,342)
Other income, net		8,665		3,187		3,280
Income before income taxes		6,235		586		1,938
Income tax (benefit) expense		(1,694)		(990)		6
Income from continuing operations		7,929		1,576		1,932
Discontinued operations:						
Income from discontinued operations, net of tax		94,667		124,097		53,568
Gain on the sale of discontinued operations, net of tax		896,235		—		—
Total income from discontinued operations, net of tax		990,902		124,097		53,568
Net income		998,831		125,673		55,500
Other comprehensive income:						
Net gains (losses) on interest rate swaps, net of tax		4,706		(5,014)		(7,972)
Comprehensive income	$	1,003,537	$	120,659	$	47,528
Net income per share, basic and diluted:						
Basic - Income from continuing operations	$	0.16	$	0.03	$	0.04
Basic - Income from discontinued operations, net of tax	$	19.81	$	2.49	$	1.07
Basic net income per share	$	19.97	$	2.52	$	1.11
Diluted - Income from continuing operations	$	0.16	$	0.03	$	0.04
Diluted - Income from discontinued operations, net of tax	$	19.76	$	2.48	$	1.07
Diluted net income per share	$	19.92	$	2.51	$	1.11
Weighted average shares outstanding, basic		50,026		49,901		49,811
Weighted average shares outstanding, diluted		50,149		50,024		50,101
Cash dividends declared per share	$	18.82	$	0.34	$	0.29

See accompanying notes to consolidated financial statements.

Chris Kyle
Vice President, Industry Affairs & Regulatory

ATTACHMENT 12 - Derivation of Costs

Product	Total 100%		VATI 35%		Non-VATI 65%		Source of Estimate	Date
Plant Build	$	12,868,240	$	4,503,884	$	8,364,356	Shentel - please see Attachment 13 for supporting documentation	8/19/2022
Long Drops at Customer Premise	$	737,383	$	258,084	$	479,299	Shentel - please see Attachment 13 for supporting documentation	8/19/2022
Core Network Capacity Additions	$	500,000	$	175,000	$	325,000	Shentel - please see Attachment 13 for supporting documentation	8/19/2022
	$	-	$	-	$	-		
PROJECT TOTAL	$	**14,105,623**	$	**4,936,968**	$	**9,168,655**		
	100%		**35%**		**65%**			

August 26, 2022

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

Re: Attachment 13 – Documentation of Supporting Cost Estimates

Dr. Holmes:

The purpose of this letter is to provide information regarding Shentel's Attachment 13 – Documentation of Supporting Cost Estimates for its 2023 Virginia Telecommunications Intiative (VATI) applications in partnership with Bedford, Franklin, Roanoke, and Shenandoah Counties. On August 24, 2022, Shentel submitted a FOIA Exemption Request for its Attachment 13 information. On August 25, 2022, your office granted this FOIA Exemption Request. Shentel has a long history of accurately and conservatively estimating broadband deployment projects. To this end, we submitted confidential, detailed costing documentation as a part of our 2023 VATI applications under the FOIA Exemption we were granted.

If and when necessary, Shentel is willing to share additional cost information. If you or your office requires any additional information, please let me know.

Sincerely,

Chris Kyle
Vice President, Industry Affairs & Regulatory

Shenandoah County
Department of Social Services
494 N Main Street Suite 200
Woodstock, Virginia 22664

Beth DeLullo, LCSW
Director

540.459.6226
540.459.6223 fax

August 23, 2022

Chandler Vaughan
Department of Housing and Community Development

Dear Mr. Vaughan,

I am writing this letter to show support for the VATI Grant to bring broadband to underserved areas within Shenandoah County.

As an agency who serves our most vulnerable citizens, broadband access for every member of our community is crucial. Many of our citizens, due to either their remote location or economic hardship, do not have access to the internet. This lack of access adversely affects our citizens' ability to fully engage in essential functions such as school, work, and medical care.

In addition, access to public Wi-Fi would enable our citizens who cannot afford internet service in their homes the same service as those who can.

As schools, medical practices and places of employment move to a virtual platform, access to the internet has never been more important for our families. Equal access regardless of where you live or your socioeconomic status is paramount to the health and well-being of our citizens as well as our community.

Thank you for your time and please do not hesitate to contact me should you have any questions.

Sincerely,

Beth DeLullo, LCSW
Director

C. TODD GILBERT
SPEAKER

SPEAKER'S ROOM
STATE CAPITOL
POST OFFICE BOX 406
RICHMOND, VIRGINIA 23218

~~FIFTEENTH DISTRICT~~

COMMITTEE ASSIGNMENTS:
RULES (CHAIR)

August 23, 2022

Tamarah Holmes, Ph.D.
Director, Office of Broadband
Virginia Department of Housing and Community Development
600 East Main Street, Ste 300
Richmond, VA 23219

Dear Dr. Holmes:

I am writing this letter in full support of the application for grant funding through the 2023 Virginia Telecommunication Initiative (VATI) of the Virginia Department of Housing and Community Development, submitted by Shenandoah County and Shenandoah Cable Television LLC (Shentel), to expand and improve broadband services to the citizens of Shenandoah County, Virginia.

The expansion of broadband internet access throughout the rural areas of Shenandoah County will be of great benefit to county residents and businesses alike. Shenandoah County is known for its outdoor recreation and agritourism attractions. These businesses are often located in rural areas that currently lack the high-speed internet necessary for many essential business functions. Expanded broadband access will benefit current businesses along with economic development and growth.

Thank you kindly for your consideration.

Sincerely,

C. Todd Gilbert, Speaker
Virginia House of Delegates

August 25, 2022

Chandler Vaughan
Department of Housing and Community Development

Dear Mr. Vaughan,

I am writing this letter to show support for the VATI Grant to bring broadband to underserved areas within Shenandoah County.

As an agency who serves the broader community, including individuals and families in remote parts of Shenandoah County, we can attest that broadband access for every member of our community is crucial. Many residents within Shenandoah County, due to either their remote location or economic hardship, do not have reliable and efficient internet access and in many cases, lack access all together. This lack of access adversely affects people's ability to fully engage in essential functions such as school, work, and medical care.

In addition, access to public Wi-Fi that would be made available through this grant would enable those who cannot afford internet service in their homes the same service as those who can. This would allow individuals access to remote learning, work and telemedicine opportunities.

As schools, medical practices and places of employment move to a virtual platform, access to the internet has never been more important for our families. Equal access, regardless of where you live or your socioeconomic status, is paramount to the health and wellbeing of our citizens as well as our community.

Thank you for your time and please do not hesitate to contact me if you have questions.

Sincerely,

Tammy L. Landes, FACHE
Vice-President

540-459-1100
759 South Main Street • Woodstock, Virginia 22664

August 23, 2022

Tamarah Holmes, Ph.D
Director, Office of Broadband
Department of Housing and Community Development
600 East Main Street, Ste 300
Richmond, VA 23219

Re: 2023 Virginia Telecommunication Initiative (VATI) Grant

Dear Dr. Holmes,

I am writing this letter in full support of the application for grant funding through the 2023 Virginia Telecommunication Initiative (VATI) of the Virginia Department of Housing and Community Development, submitted by Shenandoah County and Shenandoah Cable Television LLC (Shentel), to expand and improve broadband services to the citizens of Shenandoah County, Virginia.

Shenandoah County Public Schools serves approximately 5600 students across ten schools. Digital equity continues to be a high priority for the division. Every Shenandoah County Public Schools student is issued a Chromebook to access resources and assignments through the division's online learning management system. COVID-19 continues to cause absences from school. To access their assignments at home, it is imperative that students have access to high-speed, reliable internet.

Shenandoah County Public Schools has worked diligently with its partners, including Shentel, to ensure that each student had some form of internet access in order to access instruction and resources. However, due to the lack of high-speed internet throughout many of the rural areas of Shenandoah County, some students have more reliable, faster internet than others. Expanding and improving broadband service across Shenandoah County will help overcome the digital divide and offer more equitable access for our students and their families.

Sincerely,

Melody Sheppard, Superintendent
Shenandoah County Public Schools
600 N. Main Street, Suite 200
Woodstock, VA 22664

County of Shenandoah

BOARD OF SUPERVISORS

DISTRICT 1 – JOSH STEPHENS
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600 N. Main Street, Ste 102
WOODSTOCK, VA 22664

Tel: 540.459.6165   Fax: 540.459.6168
www.shenandoahcountyva.us

OFFICE OF COUNTY ADMINISTRATION

EVAN L. VASS
COUNTY ADMINISTRATOR

MANDY R. BELYEA
DEPUTY COUNTY ADMINISTRATOR

August 19, 2022

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

Dr. Holmes,

Shenandoah County supports the submission of an application in partnership with Shentel to the Virginia Department of Housing and Community Development's (DHCD) Virginia Telecommunications Initiative (VATI) program for the FY2023 grant cycle. The proposed project will build on the longstanding partnership between Shenandoah County and Shentel and expand our FY2022 VATI grant, achieving functional universal wireline coverage.

This project is in keeping with VATI's goal of bringing broadband to the entire Commonwealth. Bringing broadband to all residents will ensure that all people have access to education, health, and economic opportunities that are vital to human flourishing in the 21st Century. Shenandoah County is excited to continue its partnership with Shentel and DHCD to continue to bridge the digital divide.

Sincerely,

Evan Vass

County Administrator

August 26, 2022

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

Re: Attachment 15 – Two Most Recent Form 477 Submitted to the FCC or Equivalent

Dr. Holmes:

The purpose of this letter is to provide information regarding the recent Form 477 submissions or equivalent by Shentel to the Federal Communications Commission. Data from Shentel's submissions can be located at
https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477

Should you have any questions regarding this information listed above, please do not hesitate to contact me.

Sincerely,

Chris Kyle
Vice President, Industry Affairs & Regulatory

8. 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.

Shentel will be building a new Wireline solution leveraging XGS-PON Fiber to the Home ("FTTH") technology via the ITU G.9807.1 standard to the VATI locations within this proposed project area. This 100% FTTH solution will involve building new fiber extensions in the County. These new fiber extensions will connect to Shentel's existing fiber plant within this same County. Because Shentel already has an existing Broadband Network in this same County (inclusive of existing Core Network access and existing Distribution Network), this proposed project will simply be an extension of existing Broadband services to the proposed VATI locations. Further, Shentel will maintain end-to-end ownership of its entire Broadband Network within the County and will not be sharing resources.

Shentel deploys XGS-PON for its FTTH product. XGS-PON (X=10, G=Gigabit, S=Symmetrical, PON = Passive Optical Network) is an advanced standard for Passive Optical Networks (PON). XGS-PON is scalable to support up to 10 Gbps symmetrical data. By contrast, earlier PON networks are extremely limited in the amount of downstream and upstream capacity available to the end user. Although XGS-PON required significant additional Shentel investment, the growing demand for symmetrical Broadband made the investment in XGS-PON the best choice.

Shentel will initially provide speed tiers of up to 1 Gbps. However, the network is scalable to provide symmetrical data speeds of up to 10Gbps.

XGS-PON deployments are designed as both centralized and distributive fiber split topology, depending on the geography of the network. A single fiber from the service provider provides an efficient point-to-multipoint Broadband connection for multiple end users. In this rural VATI project area, Shentel will use a Distributed Split architecture to provide a more direct approach to ensuring that fiber capacity, technology, and plant records can be easily managed and scaled for growing Broadband demands.

Shentel typically initiates the fiber split from the Optical Line Terminal (OLT) out to the Customer Premise. Each OLT is fed with dedicated fiber(s) from a Central Office (CO) or Point of Presence (POP). Shentel leverages these fibers to easily expand its fiber presence in each of the FTTH markets, and scale to future bandwidth requirements. This robust fiber infrastructure also allows us to accommodate commercial sales opportunities within the same areas.

Equipment Vendors

Shentel maintains a diverse, geo-redundant core network using currently available hardware and software from the industry's leading vendors to provide infrastructure support and service assurance to all networks and customers. Internal controls maintain policies and procedures that dictate network management, performance criteria, and preventive maintenance. Strict guidelines and procedures ensure that Shentel's existing network continues to operation efficiently. For this project, Shentel will install new Calix Access Edge Optical Line Terminals (OLT) at strategic locations to feed end-user customers. At these same OLT sites, Shentel will also install out-of-band routers and console servers for remote management of our equipment.

Shentel's decision to utilize the industry's leader technology vendors has created an ecosystem whereas Shentel's ability to meet all current and future service requirements is guaranteed. Shentel has also partnered with its technology partners to determine, implement, and support the adherence to stringent standards that support specific requirements to be positioned to provide best-in-class services to all customers.

Shentel's Core Network is built on Cisco's NCS-55A and NCS-5501 platforms. The Core Network is built around diversity and resiliency in mind, with a dual 100 Gbps or 200 Gbps architecture providing both physical diversity and resiliency if a network failure or fiber cut occurs. The Core Network is composed of ten Core devices and two 100 Gbps or 200 Gbps paths between each device. These Core devices are located in Hagerstown, Maryland; Beckley, West Virginia; and Ashburn, Virginia; Harrisonburg, Virginia; and Redwood, Virginia.

Shentel's Access Distribution Network is built on Cisco's ASR-90xx, ASR-99xx, NCS-5001, and NCS-540 platforms. The Distribution Network is made up of many platforms deployed throughout Shentel's existing service footprint. Although the Core Network is the primary element within Shentel's topology, it is the actual Distribution Network that is the workhorse of the network.

Shentel's XGS-PON Network is built on Calix's Access Edge Optical Line Terminal (OLT). The Calix Access Edge systems is available in several variants to allow Shentel the versatility to install the units in Central Offices, outside plant cabinets, or other remote environments. The Calix E7-2 system is a single-chassis system which can host up to 2,048 Optical Network Terminals (ONTs) with two 8-port XGS-PON cards operating up to a 1:128 split ratio. Several Calix E7-2 OLT systems will be deployed to support the rural customer base including systems located in both existing Shentel POPs, as well as in remote cabinets. Using a Distributed Split architecture, our implementation will begin with a per port split ratio of 1:64 through a distributed split architecture with a combination of cascaded 1x2, 1x4, and 1x8 optical splitters. The splitters will be placed such that future capacity upgrades can be easily accommodated through a combination of XGS-PON port additions and split ratio reductions by way of splitter removals. Each Calix E7-2 OLT system will operate at layer-2 (802.1q) and will be dual-homed to two separate Distribution-layer Cisco NCS-540s. A dual 20GE LAG utilizing LACP in an active/standby configuration will be employed for the dual-homing.

The Calix E7-2 OLT system is designed with redundant links to the two Cisco NCS-540 routers. Network links are provisioned between the routers for redundancy and throughput reliability.

The routers are interconnected in a sub-ring configuration with 20 Gbps LAG interfaces to our geo-diverse routing platforms in the Distribution layer. Each of the routers in the Distribution and Core Network layers are configured in a ring/sub-ring configuration utilizing IS-IS and MPLS. The routers are fully redundant with processor cards, line cards, and power supplies. In addition to equipment and fiber diversity, Shentel has hardened switching and collocation facilities inclusive of generators, and battery backup of 8-hour capacity.

Customer Premise Equipment – FTTH

At the Customer Premise, a Network Interface Device (NID) is installed to serve as a transition point between Outside Plant Fiber and Inside Plant Fiber. For FTTH Broadband services, a Calix GP1100X or GP11001X Optical Network Terminal (ONT) is utilized. The type of ONT deployed is determined by the service ordered. Both Voice and Internet Data services will be separated on to two separate VLANs from the ONT, through the OLT and onto the Distribution-layer routers. AES encryption is employed on the XGS-PON layer between the ONT and OLT to safeguard the customer's network. The ONT will be engineered to not exceed 22 km's from the OLT.

Core - Transit

Transit is Shentel's paid service that allows Shentel's network to connect to an upstream Internet provider. Shentel has established physical collocations in two major Internet Exchange Points (IXP) data centers. Shentel is currently using NTT and Arelia (formally, Telia Carrier) as its upstream Internet providers. Shentel is connected to NTT and Arelia in the Ashburn, VA and Atlanta, GA IXP's via 3 x 100 Gbps links to each upstream provider. At each IXP and in strategic locations on the Shentel network, private peering, public peering, and edge cache systems are deployed to increase capacity and lower latency with a total capacity of 1.31 Terabits per second. Actual addresses of these two IXPs are as follows:

> Equinix Data Center
> 21715 Filigree Ct
> Ashburn, Virginia
>
> Digital Realty
> 56 Marietta St
> Atlanta, Georgia

Shentel's transport network includes:
- Extensive Dense Wavelength Division Multiplexing (DWDM) network
- 200Gbps core routed network with distribution and access layers
- Metro Ethernet Forum (MEF) 3.0 certified network
- And the aforementioned Transit connections in Ashburn, VA and Atlanta, GA.

Core - Private Peering

Shentel has taken an aggressive approach to peer with Content and Service Providers to migrate internet traffic from Transit Links. This improves Shentel's ability to deliver content and reduce access costs. These critical network locations have allowed Shentel to support three tiers of peering. Private Peering is Shentel's dedicated peering links to specific Content Providers that allow traffic specifically belonging to them to route between the networks without using the Transit network. In addition to these Private Peering links, Shentel has also placed the Content Provider's Content Delivery Network (CDN) appliances within the network. This strategy has allowed Shentel to originate content from within the network without having to depend on the Internet. If content is not available via the CDN appliances, the content is sourced over the Private Peering links. The Content Providers also use these Private Peering links for nightly content fills and updates on the CDN appliances.

Content Providers CDN Appliances

- Amazon
- Apple
- Facebook
- Google
- Netflix
- Akamai
- Verizon Media
- Twitch
- StackPack

Capacity Management

Network utilization for Border Routers, Core Routers, Edge Routers, Access Switches, Optical Line Terminals (OLT) are reviewed on a weekly basis. Shentel utilizes server tools with SNMP polling to report the maximum utilization of key network elements and link interfaces in 1-minute intervals. This data is transformed into the criteria shown below for visual representation. Once link utilization reaches the monitor stage, a high-level augment plan is created in preparation for increasing capacity. As traffic increases above the augment threshold, further analysis is performed to determine if the increase is a result of a one-time event or a result of growth. If the increase is determined to be normal growth, the augment plan is executed.

	Core Network	Border Network	Edge Router	Access Switch	CMTS/OLT Network Uplink
Good	<40%	<60%	<60%	<60%	<60%
Monitor/Plan	40%-60%	60%-90%	60%-80%	60%-80%	60%-80%
Investigate/Augment	>60%	>90%	>80%	>80%	>80%

Downstream and upstream utilization is reviewed on a weekly basis. A threshold report is utilized from Shentel's internal tools to report on any downstream and upstream interfaces that

exceed 80% and 90% utilization. This report records the amount of time above the threshold during the previous week. This data is transformed into the criteria below to provide visual representation for the downstream and upstream interfaces that require research. If no other resolution can be used to reduce the utilization, an augment will be planned.

>80% Criteria
- >1 Hour = Highlighted in YELLOW
- <1 Hour = Flagged with GREEN flag
- >1<2.5 Hours = Flagged with YELLOW flag
- >2.5 Hours = Flagged with RED flag

>90% Criteria
- Yes = Highlighted in RED
- <1 Minute = Flagged with NO flag
- >1 Minute = Flagged with RED flag

Managing network resources based on an oversubscription method is an antiquated view. It becomes challenging to properly plan network resource usage because the users of network resources are a diverse group of users. Instead, Shentel manages network resources based on peak utilizations against the established criteria. Shentel will use some general oversubscription practices such as 2:1 oversubscription on 1 Gbps links and 6:1 oversubscription on 10 Gbps links, however. These general practices are intended to start the planning process when sizing the links between users of network resources and Shentel's network.

Finally, the aforementioned information was sourced by internal Shentel engineering resources and existing Shentel vendor relationships, and ultimately reviewed and approved by Harris Duncan, Vice President Network Engineering and Dan Meenan, Vice President Operations.

1. Additional points will be awarded to proposed projects that reflect Commonwealthpriorities. 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 toBroadband.

There are 9 community anchor institutions and businesses within the proposed project area. Of these businesses, there are a few that are of specific note.

Shrine Mont is a retreat center that serves as a major tourism attraction in Shenandoah County. This institution particularly draws religious organizations, nonprofits, and family retreats. Additionally, Shrine Mont is the home of the Shenandoah Valley Music Festival and is currently evaluating the addition of a regional arts center to serve adults and youth on arts related programming and is looking to partner with regional k-12 public schools and JMU.

Bryce Resort is one of the largest tourist attractions in the County and a major economic boost to the County. Though the resort is largely served today, the area has seen extreme growth over the last two years, partly driven by the COVID Pandemic. As new home construction continues to explode and the demand for remote work increases, the Resort and the surrounding area's needs continue to grow dramatically. This project will bring service to new homes in the Bryce resort area as well as to resort land that does not currently have service and can be more fully utilized as part of this grant.

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

Shentel has a variety of unique partnerships planned for this project. Some of the partnerships will lower costs, or enable increased availability of Internet access.

Shentel and SVEC have signed an NDA and are working together to analyze possible means to extend Broadband to both the unserved and underserved areas of Shenandoah County as part of Shenandoah County's VATI grant application. Shentel also has an NDA in place with and is exploring similar opportunities with Dominion.

Shentel is a leading E-Rate provider, and has a long history as a partner with school systems across our service footprint.

Shentel also has a formalized "resource sharing agreement" with VDOT. In exchange for right of way easements, and other efficiencies for Shentel's construction, Shentel provides fiber to VDOT that is utilized for cameras, and other safety and monitoring efficiencies for VDOT.

Shentel also has all of the Valley Health locations connected with fiber. Recently, Shentel also connected a new Sentara rural health location in Mount Jackson with fiber. This location offers primary care services and telemedicine, a vital health care tool for rural communities. Sentara has

a targeted goal within their medical group to increase telemedicine services across their entire network. As a result, Shentel and Sentara are evaluating other joint, collaborative projects to increase the level, access, and quality of health care delivery in the Shenandoah Valley.

Shentel has designed this grant to provide the best technology (FTTH) at an excellent cost to both the state and County. In addition, this grant will align with the other efforts of the Northern Shenandoah Valley.

    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 100/20mbps.

Shenandoah County Public Schools and Shentel have a long history of partnership to promote digital equity. Before the pandemic, Shentel provided a discount to families that were economically disadvantaged. Any household whose student was eligible for free and reduced-price meals according to the guidelines of the National School Lunch Program received the discounted rate. (More information: https://district.schoolnutritionandfitness.com/shenandoahschoolfoodservices/files/2021-2022%20SSO%20Media%20Release.pdf)

During the pandemic, Shenandoah County Public Schools worked diligently with its partners, including Shentel, to ensure that each student had some form of internet access in order to access virtual instruction. If a family did not have internet prior to the pandemic, hotspots were utilized in areas where cellular coverage was available. Where it was not, Shentel offered highly discounted rates to SCPS to provide internet access to students. SCPS also shared information from Shentel regarding the Emergency Broadband Benefit (http://www.schoolnutritionandfitness.com/district/shenandoahschoolfoodservices/files/EBB_Notification%20Letter_21-07.pdf).

Through these partnership efforts, all but 2 households had internet access during the year of virtual and hybrid learning.

However, due to the lack of high-speed internet throughout rural areas of Shenandoah County, some students had more reliable, faster internet access than others. The 2023 VATI grant will lead to increased digital equity in Shenandoah County and will provide greater opportunities for Shenandoah County Public Schools students.

Shentel also participates in the Affordable Connectivity Program and offers a $30 discount on all Internet packages for any user that qualifies.

Edinburg has 507 households with some form of a computing device in them yet only 357 households in Edinburg have access to broadband levels of internet capacity with cable, fiber optic, or DSL. This means that there are 150 households who would benefit from access to broadband levels of internet capacity but currently do not have access to broadband levels of internet capacity. With an average household size of 2.39 we can estimate that there are close to 359 individuals who would benefit from access to broadband levels of internet capacity. We can estimate that 20 of those households have an annual household income less than $20,000 and the

remaining 130 households have an annual household income between $20,000 and $74,999. With an average household income of $77,948 in Edinburg, we can estimate that majority of the households that would benefit from access to broadband levels of internet capacity would be households making less than the average local household income. Further information shows that at least half of those who would benefit from the expanded access have children under the age of 18 as families with children have a median annual income of $37,212 whereas families without children have a median annual income of $83,625. This means that an investment in broadband infrastructure in Edinburg would not only expand access to an economically marginalized population, but also benefit the children of said population in order to expand their access to educational resources and materials.

Sources:
American Community Survey DP02 SELECTED SOCIAL CHARACTERISTICS IN THE UNITED STATES 2020
American Community Survey S1901 INCOME IN THE PAST 12 MONTHS (IN 2020 INFLATION-ADJUSTED DOLLARS) 2020
American Community Survey S1903 MEDIAN INCOME IN THE PAST 12 MONTHS (IN 2020 INFLATION-ADJUSTED DOLLARS)
American Community Survey S2801 TYPES OF COMPUTERS AND INTERNET SUBSCRIPTIONS 2020

      d. The co-applicant's efforts to mitigate supply chain constraints, including labor shortages and order-to-delivery delays on telecommunications materials required to construct Broadband networks.

Shentel has an established supply chain with trusted and diversified vendors, a mobilized workforce, a dedicated Purchasing team, an extremely strong balance sheet, and a highly experienced management team. Notably:

- Shentel currently has over 1,700 miles of fiber already in inventory.

- To avoid risks associated with timely delivery, Shentel has an   additional 3,500 miles of fiber on order for confirmed delivery in 2022 and 2023. Further, Shentel is in the process of ordering an additional 4,000 miles of fiber   for 2024 delivery.

- Shentel has completed over 1,500 miles of new fiber dedicated to Fiber to the Home over the last several years.

- Shentel currently has over 5,000 miles of new fiber in various stages of development .

- Shentel has constructed and certified over 125,000 new fiber to the home passings in the last several years.

- Shentel is actively engaged with over 35 outside plant contract   companies currently building fiber to the home across four states. These contractors want

to work with Shentel because we treat them with   respect, because we have materials when they need them, we are exceedingly organized and don't waste their time, because we believe in very safe working conditions, and because we pay them more efficiently than our competitors.

e. The applicant's and co-applicant's efforts to promote Broadband adoption, including, but not limited to: telehealth, smart farming, e-entrepreneurship, and distance learning

Shenandoah County and Shentel have taken significant steps to help promote broadband use and adoption. As noted above, through Shentel and the County's collaboration, there were only two households that could not get some sort of internet connection when kids had to attend school virtually due to the COVID-19 pandemic. Though not all of these connections meet the updated definition of Broadband, this project will build on the strong foundation of broadband adoption and utilization that already exists.

One other area that has built on the strong broadband foundation that exists in Shenandoah County is telehealth. With a Valley Health presence in Shenandoah County, the medial community has been able to take advantage of increasing telehealth opportunities to better serve their patients with vital healthcare. This is especially important for patients whose health situations increase their risk of complications if exposed to the contagions present in all hospitals or whose mobility is severely limited.

Another area where Shenandoah County and Shentel promote broadband adoption is through agriculture. Shenandoah County is a largely agricultural county, and Shentel's expanding service helps support farmers in their effort to adopt smart-farming techniques. Farms often represent connectivity challenges as they tend to have large land areas the increase the costs of connectivity. This application would help to reduce those connectivity costs and facilitate Shentel's ongoing efforts to bring better services to Shenandoah County's agricultural community.