

# Application to DHCD Submitted through CAMS

HALIFAX COUNTY

Liberty Store Along Hwy 57 - EMPOWER Broadband

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**Application ID:** 59812122018143014  
**Application Status:** In Progress - DHCD  
**Program Name:** Virginia Telecommunications Initiative 2019  
**Organization Name:** HALIFAX COUNTY  
**Organization Address:** 134 S MAIN STREET  
HALIFAX, VA 24558-0699  
**Profile Manager Name:** STEPHANIE JACKSON  
**Profile Manager Phone:** (434) 830-3302  
**Profile Manager Email:** SCJ@CO.HALIFAX.VA.US

**Project Name:** Liberty Store Along Hwy 57 - EMPOWER Broadband  
**Project Contact Name:** Kimley Blanks  
**Project Contact Phone:** (434) 476-3300  
**Project Contact Email:** kimley.blanks@co.halifax.va.us  
**Project Location:** P.O. Box 699  
Halifax, VA 24558-3213  
**Project Service Area:** Halifax County

**Total Requested Amount:** \$372,037.00  
**Required Annual Audit Status:** Accepted

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## Budget Information:

Cost/Activity Category	DHCD Request	Other Funding	Total
Telecommunications	\$372,037.00	\$401,271.00	\$773,308.00
Other: All Costs	\$372,037.00	\$401,271.00	\$773,308.00
<b>Total:</b>	<b>\$372,037.00</b>	<b>\$401,271.00</b>	<b>\$773,308.00</b>

Budget Narrative:

Project Area will target the last mile portion of the broadband infrastructure with MEC providing the construction of the “backbone” portion of the infrastructure. The backbone infrastructure is estimated at a cost of \$401,271 (51.9 percent) versus the estimated drop cost of \$372,037 (48.1percent).

## Questions and Responses:

### 1. Project Area

Provide a map and description of the proposed geographic area including specific boundaries of the project area e.g.; street names, local and regional boundaries, etc. Explain why and how the project area(s) was selected. Attach a copy of your map(s).

**Answer:**

This project is in the northwestern portion of Halifax County; Halifax is in the heart of Southside Virginia along the border of North Carolina. Fiber deployment will begin at the intersection of L.P. Bailey Memorial Highway/501 North, and continue along Meadville Road/Route 642, until it reaches the intersection with Chatham Road/Highway 57. The fiber backbone then continues along Highway 57 west to the Halifax and Pittsylvania county line. The MEC backbone extends 9.72 miles with EMPOWER Broadband extending fiber-to-the-premises for those within 1,000 feet of both sides of the backbone extension. This area was selected to maximize the advantage of being adjacent to MEC’s Substation Fiber Backbone that is being constructed with matching funds through a 2018 TRRC Grant. Additionally, Highway 57 is a major thoroughfare and, accordingly, this route passes several rural residents. Perhaps most important to this grant, this area is unserved and is not part of any other existing or proposed high-speed system buildout. Relatively low-speed mobile and high-latency satellite are currently available to all in this area.

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2.

Describe your outreach efforts to identify existing providers in the selected project area. Provide a map and list of all existing providers (fixed and wireless), and speeds offered within the project area. Provide a detailed explanation of how this information was compiled and the source(s).

**Answer:**

Halifax County and its residents were substantially engaged in the Center for Innovative Technology broadband survey; the results are documented in the Virginia Broadband Availability Map. The included coverage map documents the need in this area and the outcry from members within the county overall. Teachers within a local school indicate only 50 percent of students have broadband at home, which is an encumbrance to learning in today's technology-driven society.

3. Project Need/Description

To be eligible for VATI, applicants must demonstrate that the proposed project area(s) is unserved. An unserved area is defined as an area with speeds of 10 Mbps/1 Mbps or less, and with less than 10% service overlap within the project area. Describe the anticipated service overlap with current providers within the project area.

**Answer:**

Even though the coverage map indicates most of the area is completely unserved, there is a visible section east in the proposed construction area that shows DSL and an isolated spot of cable coverage. After discussing this with members along the line, the cable area is shown in error and DSL speeds are below 10/1 and are unavailable to new customers as the system is overtaxed. Subsequently, the area must be regarded as unserved.

4. Describe population both in terms of absolute numbers within the project area and the eligible users that will be served by the proposed project. Describe the basis for these projections.

**Answer:**

According to maps from internal GIS systems, the area proposed has 172 accounts within 1,000 feet of the proposed fiber line. Converting this to actual population using an estimated 2.5 consumers per household, this grant area encompasses an estimated population of 430 rural residents.

5. Indicate the numbers of businesses and community anchor institutions the proposed project will pass in the project area.

**Answer:**

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Along the proposed route there are eight churches, four stores / businesses, two school structures and one public / community facility.

6. Provide the anticipated take rate for the proposed service within one year of project completion and describe the basis for the estimate. Also provide all actions to be implemented to reach the identified potential customers within the project area.

**Answer:**

The feasibility conducted by Pulse broadband for the entire MEC area, based on National statistics from cooperative areas like ours with similar service offerings in a rural setting estimates the take rate for this area to be 45 percent. Accordingly, from the 172 accounts passed, there will be 77 that would take service. We believe, however, after Broadband discussions with multiple subdivisions in our service area and the interest generated by our announcement, that the 45 percent take rate is both easily obtainable and conservative.

7. A statement whether the proposed project is targeting the “last mile,” “middle mile,” or “backbone” portion of the broadband infrastructure.

**Answer:**

Project Area will target the last mile portion of the broadband infrastructure with MEC providing the construction of the “backbone” portion of the infrastructure. The backbone infrastructure is estimated at a cost of \$401,271 (51.9 percent) versus the estimated drop cost of \$372,037 (48.1percent).

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

**Answer:**

N/A -Only applies to Wireless projects

9. Provide a description of the broadband service to be provided, including estimated download and upload speeds, whether that speed is based on dedicated or shared bandwidth, and the technology that will be used. This description can be illustrated by a map or schematic diagram, as appropriate.

**Answer:**

EMPOWER Broadband, Inc. is using the Calix implementation of Gigabit Passive Optical Network (GPON). GPON is a fiber-to-the-premises (FTTP) technology that implements point-to-multipoint architecture to serve residential and business customers and provide up to 1 Gbps service per subscriber. This technology utilizes fiber optic splitters to enable up to 64 customer locations to be served by a single optical line terminal (OLT) port. Below is an example of how the bandwidth is shared utilizing the preferred 1:32 fiber split:

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

**Answer:**

Last Mile Service Delivery will use Calix customer premise equipment. The fiber drop terminates to a Network Interface Device (NID) outside the premises. From there, single-mode fiber with Angled Physical Connectors (APC) is used to connect to a Calix 803G Optical Network Terminal (ONT) device inside the premises. The 803G in turn uses an Ethernet port with inside wiring of a standard Ethernet cable to connect the ONT to an Calix Model 844e Gigacenter. The 844e provides wired and Wi-Fi connections inside the premise for internet service. The Gigacenter's Wi-Fi service uses both 2.4 Ghz and 5.0 Ghz bands. An optional wireless mesh device, the 804 Mesh Extender, can be used in large homes or businesses to extend the range of the wireless service. The 803G ONT also contains a voice port, which connects to an existing telephone NID via RJ-11 cable for the optional Voice over IP (VoIP) service. The ONT is powered from either a standard AC wall outlet, or also can be connected to an optional Lithium-ion battery back-up unit. The last mile network uses an overall tree and branch design for the access network. Each end customer has a fiber connection in their home or business. Layer2 switching connects the end user back to a Calix e7-2 access device which transmits light on the fiber with a GPON small form-factor plug (SFP). E7 C+ SFP's have a 32- way split capable of reaching 32km, which puts all accounts within range of the Crystal Hill substation serving the area and is also the location of the e7-2's and an edge router. Layer 2 segments are trunked up to the edge router and then one of the centralized aggregation routers. Aggregation routers are being installed in Chase City and Gasburg. Aggregation routers are connected to a redundant Internet Data Provider using multiple 10Gb connections across a Mid-Atlantic Broadband (MBC) open-access network. The diagram above is the physical infrastructure and long-term plan, ultimately showing the location of all major network nodes, creating a highly redundant network. Each of the nine (9) larger highlighted substations contain a major network node with a layer 3 router that is locally ringed together with 10Gb fiber uplinks.

11. Project Readiness

What is the current state of project development (i.e. planning, preliminary engineering, final design, etc.)? Prepare a detailed project timeline or construction schedule, which identifies specific tasks, staff, contractor responsible(s), collection of data, etc., and estimated start and completion dates. The timeline should include all activities being completed within 12 months of contract execution with DHCD.

**Answer:**

1. Currently, the project is in planning and pre-engineering phase:
  - a. Month 1 – Field Staking and engineering
  - b. Months 2 to 6 – Construction of main line from Highway 501 to Halifax line on Highway 57
  - c. Month 7 – Staking of FTTP service drops
  - d. Months 8 to 12 - Construction of FTTP drops within 1,000 feet of main line.

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12. Matching funds: Provide a description of the matching funds the applicant and co-applicant will invest in the proposed project, (VATI funding cannot exceed 80% of total project cost). The Funding Sources Table should be completed.

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

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

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

**Answer:**

1. Matching funds are being provided by co-applicant MEC in the form of Construction of a fiber “Backbone.” The backbone fiber infrastructure will provide connectivity for the MEC electrical grid and will have excess fiber to be used to serve drops and is estimated to cost \$401,271 (51.9 percent). The drops being built off of said backbone are estimated at a cost \$372,037 (48.1 percent). See attachment "Documentation supporting project costs"

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

**Answer:**

1. The executive team at Mecklenburg Electric Cooperative is responsible for the management of the project. This team is well-positioned and prepared to implement, manage, operate, and sustain the services proposed. Members of the team are included in attachment: Halifax MEC, Liberty Store, Project-ManagementTeam.pdf

<p>John C. Lee, Jr., President and CEO</p>	<p>Began his career at Mecklenburg Electric Cooperative on January 1, 2008. He is a graduate of Mississippi State University with a BS degree in Business. He brings with him over 25 years of management experience in the electric cooperative industry. John began his cooperative career as Old Dominion Electric Cooperative’s (ODEC) Community Relations Specialist for the Clover Power Station in 1992. While at ODEC, he had the opportunity to serve as Director of Economic Development, Manager of Administration, and lastly, Vice President of Member and External Relations.</p>
<p>R. Glenwood (Glen) Gillispie, Jr., Chief Operating Officer</p>	<p>Began his career at Mecklenburg Electric Cooperative in 1980. He was born in Farmville, Virginia, and holds a BS degree in Business Administration and Management from Virginia Commonwealth University, in Richmond, Virginia.</p>

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David H. Lipscomb, Vice President of Member and Energy Services	Began his career with Mecklenburg Electric Cooperative in 1989. He was born in South Boston, Virginia and holds an AAS degree in Drafting and Design and a BS degree in Electrical Engineering Technology from Old Dominion University. David is active in Gideon's International.
Leilani L. Todd, Vice President of Human Resources	Began her career at Mecklenburg Electric Cooperative in 2008. She was born in Maryville, Missouri and has a BS degree in Accounting from Northwest Missouri State University. She attained her Senior Professional in Human Resources (SPHR) in January 2006. She has seven years of experience from the Statewide Association, Kansas Electric Cooperative, as the director of finance and human resources.
Dwayne Long, Vice President of Information Technology	Began his career at Mecklenburg Electric in April of 2017. He is a graduate of Louisiana State University in Shreveport Louisiana with a Master of Science degree and is a veteran of the United States Air Force. He grew up in Hayesville NC and brings with him over 20 years of utility technology experience.
B. J. Seamans, Vice President of Engineering and Operations	Began his career at Mecklenburg Electric Cooperative in May of 2003. He grew up in the Chase City area and graduated from Bluestone High School. He received his Bachelor of Science degree in Electrical Engineering from Virginia Tech in Blacksburg and received his Professional Engineer's License in 2008.

14. Applicant and Co-Applicant: A description of the public-private partnership involved in the project. Detail the local government assistance: Local government co-applicants should demonstrate assistance to project that will lower overall cost and further assist in the timely completion of construction, including assistance with permits, rights of way, easement and other issues that may hinder or delay timely construction and increase cost.
- i. If the partnership is formalized in a written agreement provide a copy of that agreement.
  - ii. If the partnership has not been formalized, provide a short description of the project management role, financial commitment, or other contribution to the project for the applicant and co-applicant and any additional partners.

**Answer:**

Applicant is Halifax County with Co-Applicants MEC and Empower Broadband, Inc. Approval is documented in letter from the County Administrator dated December 12, 2018 reflecting the minutes from the December 3, 2018 Board of Supervisors meeting.

15. Project Budget and Cost Appropriateness

Applicants shall provide a detailed budget as to how the grant funds will be utilized, including an itemization of

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equipment and construction costs and a justification of proposed expenses. Expenses should be substantiated by clear cost estimates.

**Answer:**

1. Budget Attached: (Supporting documentation for cost estimates – Halifax – Liberty.pdf)
16. The cost benefit index is comprised of three factors: (i) state share for the total project cost, (ii) state cost per unit passed, and (iii) the internet speed. From these statistics, individual cost benefit scores are calculated. Finally, the three component scores are averaged together and converted to a 30 point scale to form a composite score.

**Answer:**

## Cost Benefit Index Calculation

Following are the three Cost Benefit Factors required to calculate the Index for the Liberty Store along Highway 57 Fiber Project.

i) State Share for total project cost: \$372,037

ii) State Cost per unit passed: \$2163.01

$172 \text{ units passed} / \$372,037 = \$2163.01 \text{ per unit}$

iii) Internet Speed: The maximum available speed is One Gigabit per second upload and download.

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

**Answer:**

1. Experience –Mecklenburg Electric Cooperative and Empower Broadband Inc. are currently administering a grant for the TRRC's R&D Last-Mile Broadband Project sponsored by Mecklenburg County. Mecklenburg Electric Cooperative was also a recipient of grant funds in partnership with Greensville County, whereby the county was the administrator of the grant. Mecklenburg Electric Cooperative has extensive experience in managing projects similar in scope to the project being proposed in this application. As a current provider of utility services, Mecklenburg Electric Cooperative is required to maintain detailed records and is expected to be held accountable for proper data management and project management on the electric side due to its being a current borrower in good standing with USDA's RUS (Rural Utilities Service). Mecklenburg Electric Cooperative will be enforcing similar accountability and due diligence with the DHCD grant program as well.

18. Service

Describe the Internet service offerings to be provided after completion of this project and your price structure for these services. The service offerings should include all relevant tiers.

**Answer:**



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EMPOWER Broadband, Inc. (“EMPOWER Broadband”) plans to deploy fiber-to-the-premises (“FTTP”) along all areas where MEC is building backbone within the service territory. With MEC’s plans to expand its “backbone” across portions of Pittsylvania, Halifax, Charlotte, Mecklenburg, Brunswick and Greensville counties, EMPOWER Broadband will offer a low-latency all-fiber connection with up to one Gigabit per second tier speed to customers within 1,000 feet of said backbone. EMPOWER Broadband has chosen a third-party vendor to provide white label interconnected VoIP voice services throughout its network. The speeds and prices being offered are listed below:

50Mbps symmetrical service \$69.95 per month including a Wi-Fi enabled router

100Mbps symmetrical service \$119.95 per month including a Wi-Fi enabled router

1 Gbps symmetrical service \$269.95 per month including a Wi-Fi enabled router

## 19. Additional Information

Any other equitable factor that the applicant desires to include.

### Answer:

1. Any other equitable factors:
  - a. According to a 2014 Weldon Cooper Center for Public Service Demographic Study, Southside Virginia was the only region of eight (8) that lost overall population. Our region, our Cooperative, must strive to retain our youth and our employers, and create an environment to utilize our significant natural resources. Broadband is a significant factor in leveling the playing field for our rural communities.
  - b. Broadband internet access is a necessity of life. Every aspect of modern life—from homework, to banking, to emergency services—now depends on it. Sadly enough, approximately 925,000 Virginians lack reliable broadband access.
  - c. There is a stark “digital divide” in Virginia, separating the regions that have broadband availability from those that do not. Electric Cooperatives serve over 1.3 million Virginians, most in rural areas, and most without adequate broadband service.
  - d. If traditional providers had the desire to serve rural Virginia, they would already be doing so—the past decade has revealed that there is clearly a limit to what traditional providers are willing to do.
  - e. As member-owned businesses, Cooperatives are willing and able to help members gain access to fiber broadband service, and all the benefits that accompany fiber technology.
  - f. Our funding proposals—which will be more than matched dollar for dollar by Cooperative investments—will significantly increase the deployment of fiber broadband service into unserved and underserved areas of the Commonwealth and will do so in a manner that can be measured...to determine a return on the state’s investment.
  - g. With limited resources, Electric Cooperatives already provide broadband service to hundreds of Virginians.
  - h. Already, Virginia’s Cooperatives have invested over \$8 million in fiber broadband service, deploying miles of fiber-optic cable across rural Virginia within reach of thousands of potential households. Over the next year, that investment will increase substantially.
  - i. Several Cooperatives already have middle-mile fiber backbones connecting their substations, deploying stretches of fiber that pass through rural areas in dire need of internet access. Cooperatives that have not yet deployed a fiber backbone for their systems will be doing so in the very near future.

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## **Attachments:**

Derivation of Cost (Project Budget)

DerivationofCostsWorksheetProjectBudgetHalifaxCountyLiberty12142018100213.pdf

Project Management Plan

ProjectManagementPlanHalifaxCountyLiberty12142018100302.pdf

Supporting documentation for costs estimates

supportingdocumentationforcostsestimatesHalifaxLiberty12142018100451.pdf

Map(s) of project area, including proposed infrastructure

ProjectAreaInfrastructuremapHalifaxLiberty12142018100655.docx

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

BroadbandprovidermapHalifaxLiberty12142018101014.jpg

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

LetterfromHalifaxCountyAdministrator12142018101403.docx

Two most recent Form 477 submitted to FCC

Form477HalifaxLiberty12142018104721.pdf

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

DocumentationofinkindcontributionsHalifaxLiberty12142018104755.pdf

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

DocumentationsupportingprojectcostHalifaxLiberty12142018104840.pdf

Documentation of source of match funding

DocumentationofSourceMatchingHalifaxLiberty12142018104923.pdf

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Documentation that proposed project area is unserved based on VATI criteria

HalifaxUnserved12142018105052.pdf

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

DocumentationforprojectareanotdesignatedforCAFHalifaxLiberty12142018105334.pdf

Funding Sources Table

VATIFundingSourcesTableHalifaxCountyLiberty12142018105446.pdf

(Optional)

QuestionAnswersHalifaxLiberty12142018110157.docx

(Optional)

OptionalKeyProjectStatisticsHalifaxLiberty112142018110505.jpg

CDBG Derivation of Cost

Product	Total	VATI	Non-VATI	Source of Estimate	Date
<b><u>Construction Costs (Aerial Construction)</u></b>	\$ -	\$ -	\$ -		
<i>Plant Labor</i>	\$ 238,675	\$ -	\$ 238,675	Mecklenburg Electric Cooperative (MEC)	12/13/2018
<i>Technical Labor</i>	\$ 31,571	\$ -	\$ 31,571	MEC	12/13/2018
<i>Fiber</i>	\$ 81,351	\$ -	\$ 81,351	MEC	12/13/2018
<i>Aerial Materials</i>	\$ 10,515	\$ -	\$ 10,515	MEC	12/13/2018
<i>Technical Design</i>	\$ 11,479	\$ -	\$ 11,479	MEC	12/13/2018
<b><u>Construction Costs (Underground Construction)</u></b>					
<i>Plant Labor</i>	\$ 17,453	\$ -	\$ 17,453	MEC	12/13/2018
<i>Technical Labor</i>	\$ 2,488	\$ -	\$ 2,488	MEC	12/13/2018
<i>Fiber</i>	\$ 3,955	\$ -	\$ 3,955	MEC	12/13/2018
<i>UG Materials</i>	\$ 2,689	\$ -	\$ 2,689	MEC	12/13/2018
<i>Technical Materials</i>	\$ 905	\$ -	\$ 905	MEC	12/13/2018

CDBG Derivation of Cost

<b><u>Drop Construction Costs</u></b>					
<i>Plant Labor</i>	\$ 219,373	\$ 219,373		MEC	12/13/2018
<i>Fiber</i>	\$ 39,578	\$ 39,578		MEC	12/13/2018
<i>Materials</i>	\$ 9,625	\$ 9,625		MEC	12/13/2018
<i>NID Enclosure</i>	\$ 1,848	\$ 1,848		MEC	12/13/2018
<b><u>Network and Access Equipment</u></b>		\$ -			
<i>Headend Router</i>	\$ 60,629	\$ 60,629		MEC	12/13/2018
<i>Headend ethernet Access Cabinet and Chassis</i>	\$ 40,984	\$ 40,984		MEC	12/13/2018

Task	Responsible Person
Field Staking and Engineering	B.J. Seamans
Mainline Construction Highway 501 to Halifax Line on Hwy. 57	B.J. Seamans
Staking FTTP service drops	B.J. Seamans
FTTP Construction w/in 1000' of main line	B.J. Seamans







**Mecklenburg  
Key Project Statistics**

**Liberty to County Line**

**Plant Statistics**

**Quantitative Estimates**

Homes Passed	172	Aerial Miles	9.01	92.7%	Avg. Drop Length	1,054
Small Bus Passed		Underground Miles	0.71	7.3%	Constr. Timeline	12 mos
Large Commercial	0	Total Miles	9.72		Home Density	17.7

Estimated Take Rate 45%

**Capital Expenditures**

**Summary of Total Capital Required**

<b>Construction Costs</b>	\$773,308
<b>Ongoing Capital Costs at Launch</b>	\$29,985
<b>Total Project Capital Costs</b>	<u><u>\$803,293</u></u>

<b>Operating Expenses Invested at Launch</b>	\$0
<b>Operating Funds Cushion</b>	\$24,528
<b>FCC CAF or Other Revenue from Grants</b>	\$0
<b>Total Investment/Loan Required</b>	<u><u>\$827,821</u></u>

**Construction Costs**

	Unit Cost	x Quantity	=	Total
Headend/Office Space	\$60,629	1.00		\$60,629
Cabinet Equipment	\$40,984	1.00		\$40,984
Aerial Construction (A)	\$41,464	9.01		\$373,591
Underground Construction (B)	\$38,986	0.71		\$27,680
Drop Construction (C)	\$3,512	77		\$270,424
<b>Total Construction</b>				<u><u>\$773,308</u></u>

*Details for construction costs above:*

**(A) Aerial Cost Per Mile**

**(B) Underground Cost Per Mile**

**(C) Drop Cost Per Home**

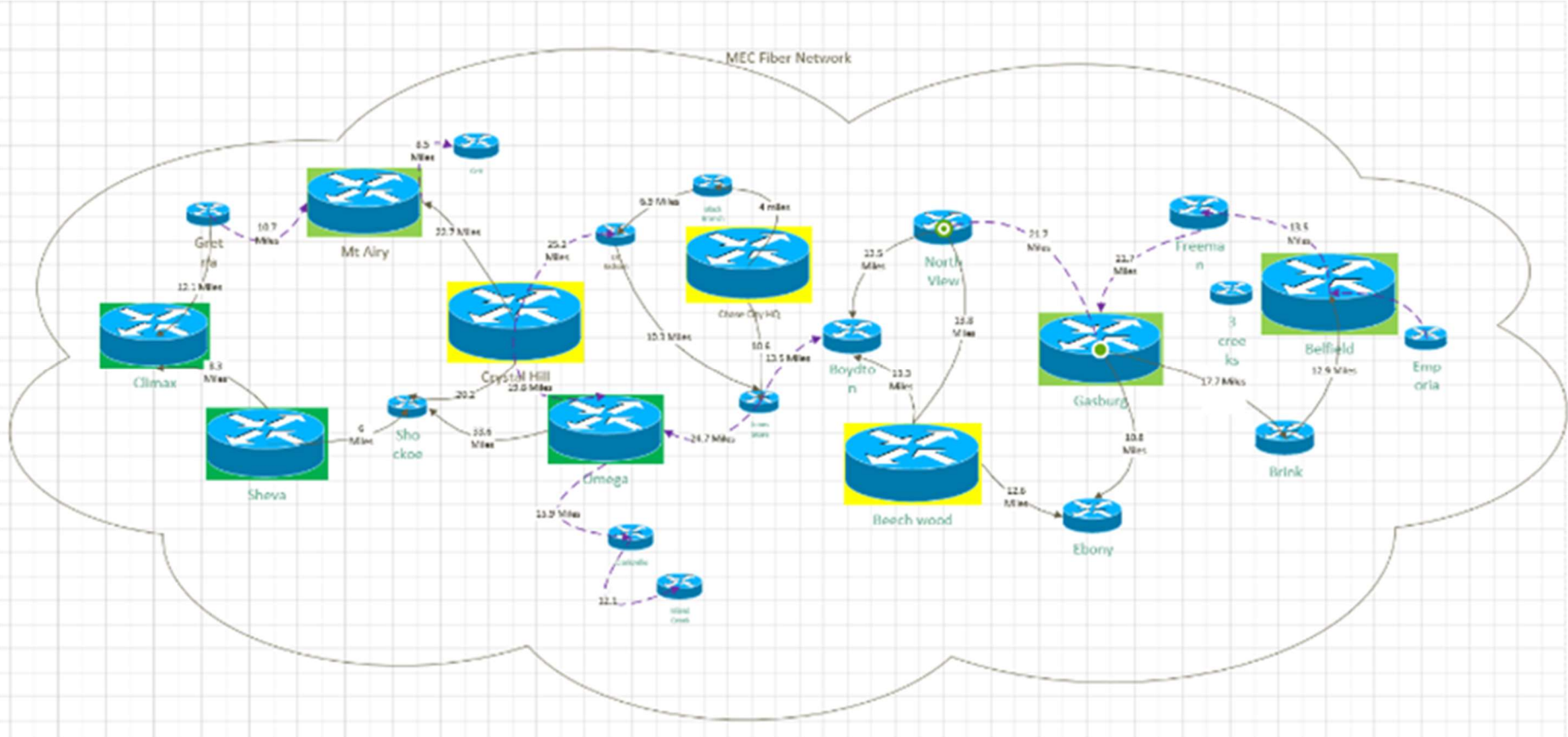
Plant Labor (inc. Make Ready)	\$26,490	CAF II	Plant Labor	\$24,851	144 ct	Plant Labor	\$2,849	144 ct
Technical Labor	\$3,504	144 ct	Technical Labor	\$3,504	144 ct	Tech. Labor	\$0	144 ct
Fiber	\$9,029	144 ct	Fiber	\$5,570	144 ct	Fiber	\$514	144 ct
Aerial Materials	\$1,167	144 ct	UG Materials	\$3,787	144 ct	Materials	\$125	144 ct
Technical Mat.	\$1,274	144 ct	Technical Mat.	\$1,274	144 ct	NID Enclosure	\$24	144 ct
Design	\$0	144 ct	Design	\$0	144 ct	Design	\$0	144 ct
Constr. Mgmt	\$0	144 ct	Constr. Mgmt	\$0	144 ct	Constr. Mgmt	\$0	144 ct
<b>Total Aerial</b>	<u><u>\$41,464</u></u>		<b>Total UG</b>	<u><u>\$38,986</u></u>		<b>Total Drop</b>	<u><u>\$3,512</u></u>	

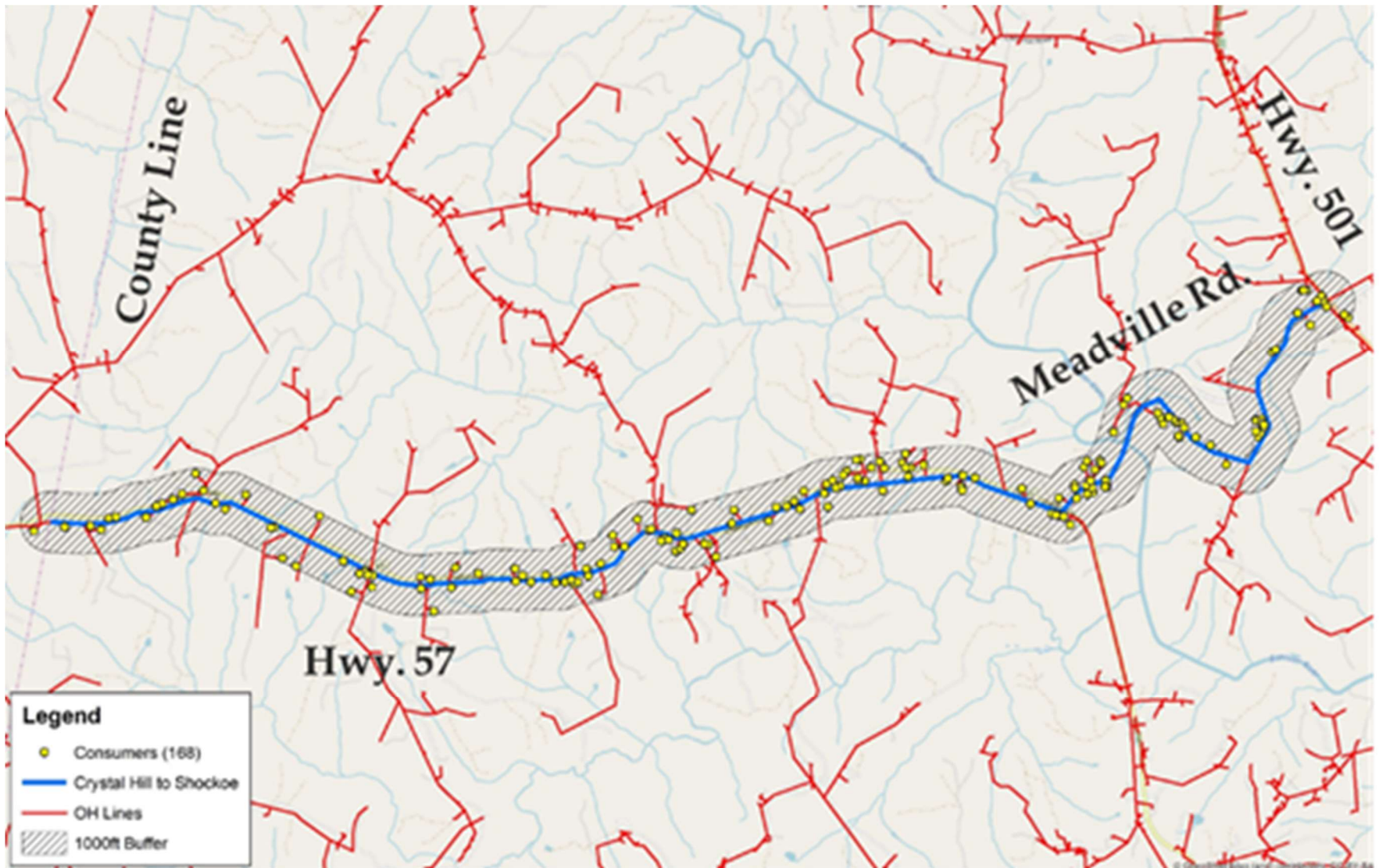
**Ongoing Capital Costs at Launch**

	Cost	x Quantity	=	Total
External Installation	\$0	0		\$0
ONT	\$216	77		\$16,596
Set Top Boxes	\$0	0		\$0
Installation Materials	\$38.00	77		\$2,926
Equipment	\$0	0		\$0
Plant Maintenance Materials	\$10,464	1		\$10,464
				<u><u>\$29,985</u></u>

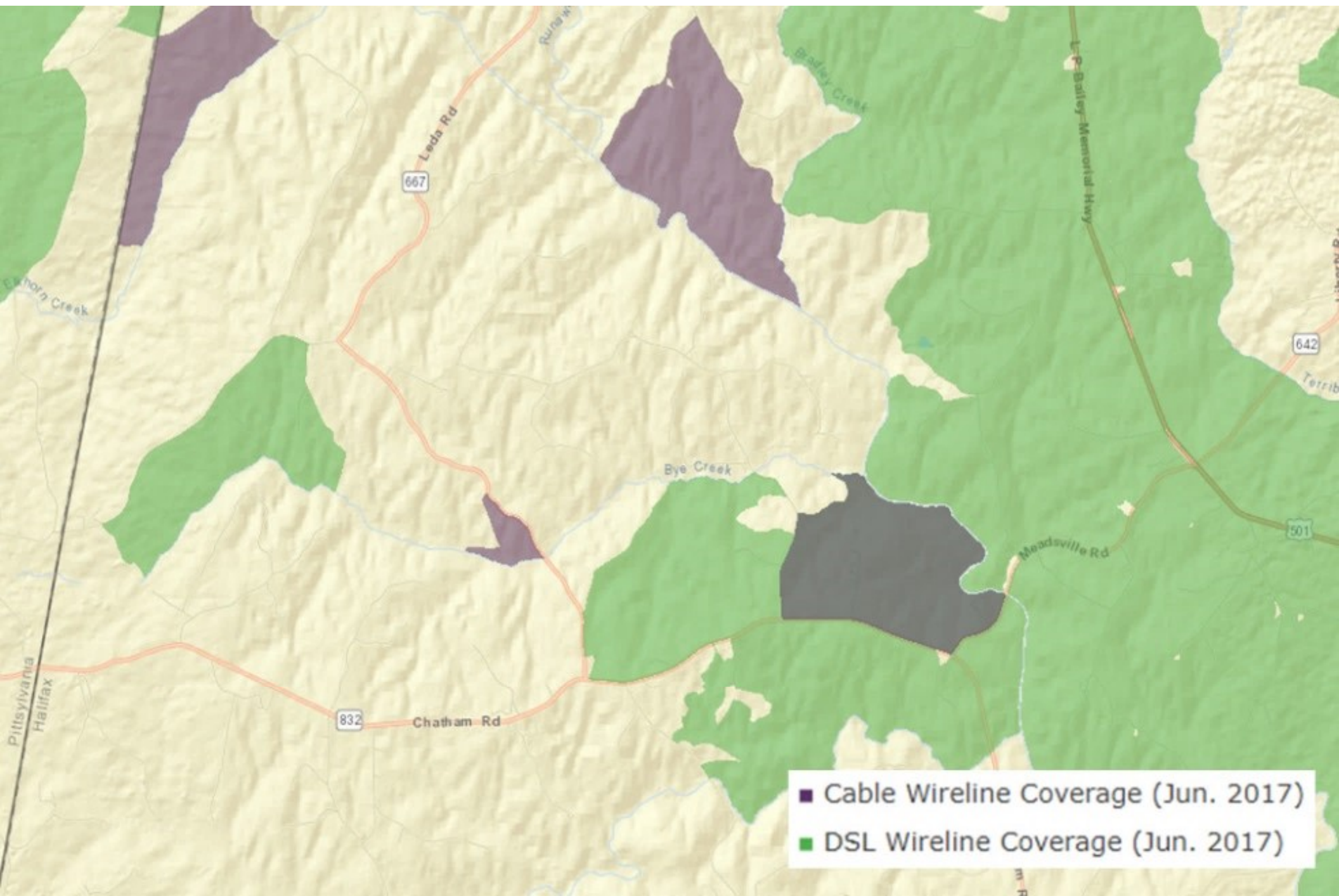
Drops \$372,037  
 Backbone \$401,271

# Proposed Infrastructure





**Project Area**



■ Cable Wireline Coverage (Jun. 2017)  
■ DSL Wireline Coverage (Jun. 2017)



WILLIAM D. SLEEPER  
Interim County Administrator  
[wds@co.halifax.va.us](mailto:wds@co.halifax.va.us)

# HALIFAX COUNTY BOARD OF SUPERVISORS

1030 Mary Bethune Street, Suite LL1  
P. O. Box 699  
Halifax, VA 24558-0699  
(434) 476-3300  
Fax: (434) 476-3384  
[www.halifaxcountvva.gov](http://www.halifaxcountvva.gov)

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December 12, 2018

Mr. John C. Lee, Jr.  
Mecklenburg Electric Cooperative / EMPOWER Broadband  
P.O. Box 2451  
Chase City, VA 23924

Re: DHCD VATI Grant Applications

Dear Mr. Lee:

At the request of Mecklenburg Electric Cooperative / EMPOWER Broadband, the Halifax County Board of Supervisors has approved submission of two Virginia Telecommunication Initiative (VATI) grant applications being offered through the Department of Housing and Community Development (DHCD) at the December 3, 2018 regular monthly meeting.

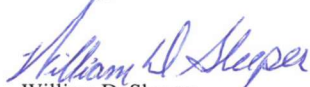
Please find attached copies of the potential project coverage maps for the two areas indicated in the grant applications:

- Liberty Store along Hwy 57 to the county line, and
- Smiley's Store along Virgie Cole Road to Alphonse Dairy Road.

Per our agreement, the preparation and completion of grant documentation will be supplied to Halifax County in a timely manner in order to meet the grant deadline of December 14, 2018. Additionally, per our agreement MEC / EMPOWER will cover all costs for the grant application and for the implementation of the grant projects. In conclusion, no funding for either project is required from Halifax County.

I look forward to a successful outcome for our grant applications. Please let me know if you have any questions.

Sincerely,

  
William D. Sleeper  
Interim County Administrator

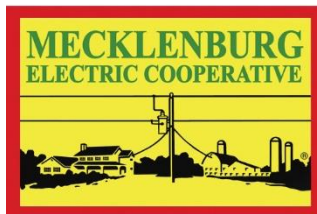
Enclosures

## HEADQUARTERS

P. O. Box 2451  
Chase City, VA 23924  
Phone: 434-372-6100/Fax: 434-372-6101

## CHASE CITY DISTRICT

P. O. Box 2451  
Chase City, VA 23924  
Phone: 434-372-6200/Fax: 434-372-6201



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## EMPORIA DISTRICT

P. O. Box 427  
Emporia, VA 23847  
Phone: 434-634-6168/Fax: 434-348-7100

## GRETNA DISTRICT

P. O. Box 617  
Gretna, VA 24557  
Phone: 434-656-1288/Fax: 434-656-9200

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### Form 477 Statement

Mecklenburg Electric Cooperative nor EMPOWER Broadband has previously filed a Form 477; however, each has a mission, the financial wherewithal, and expertise to serve; especially, those who are unserved in and around our service area. Currently, EMPOWER serves multiple residential test sites and has applied for ETC (Eligible Telecommunications Carrier) status. Accordingly, EMPOWER will file a Form 477 during the first quarter of 2019.

Construction of MEC's fiber optic network to connect our three district offices, 26 electric distribution substations and downline equipment to support our existing electric system is well underway. Grant funds from VATI will enable EMPOWER to deliver additional high-speed broadband internet service to the last mile in our service area.

The backbone fiber will be utilized to connect substations and downline devices, but other strands within this backbone will be utilized to serve homes, farms and businesses with high-speed broadband service. Substations are the starting point to distribute electricity along feeders and taps leading directly to consumers' premises. This is also a natural starting point for a Fiber To The Premise (FTTP) offering. Utilizing Gigabit Passive Optical Network (GPON) technology, our rural areas will no longer be at a disadvantage for connectivity.

The ability for electric cooperatives to serve Broadband in rural areas could be as transformative as Executive Order 7037 signed by President Roosevelt in May of 1935 establishing the Rural Electrification Act (REA) to initiate, formulate, and administer electricity in these same rural areas.

MEC manages a \$192M electric distribution system and is well qualified in building and maintaining rural infrastructure. Additionally, MEC has built and maintains an extensive communications network in operating over 4,475 miles of electric line.

It should be further noted, that Virginia Electric Cooperatives have been awarded both Tobacco Region Revitalization Commission and Connect America Fund grants based on their time-tested capabilities. Further, Electric Cooperatives across the nation are successfully building and operating retail broadband systems.

With over 80 years of experience in line construction, line maintenance, operating utility tools and equipment, cultivating the skills of numerous line personnel, and serving as a resource to serve the rural community, Mecklenburg Electric Cooperative meets the objectives of the Form 477.

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*Mecklenburg Electric Cooperative is an equal opportunity provider and employer.*

### Mecklenburg Electric Cooperative's In-Kind Contributions

Description	Total	Source of Funding
<b><u>Construction Costs (Aerial Construction)</u></b>		
<i>Plant Labor</i>	\$ 238,675	<b>Mecklenburg Electric Cooperative (MEC)</b>
<i>Technical Labor</i>	\$ 31,571	<b>MEC</b>
<i>Fiber</i>	\$ 81,351	<b>MEC</b>
<i>Aerial Materials</i>	\$ 10,515	<b>MEC</b>
<i>Technical Design</i>	\$ 11,479	<b>MEC</b>
<b><u>Construction Costs (Underground Construction)</u></b>		
<i>Plant Labor</i>	\$ 17,453	<b>MEC</b>
<i>Technical Labor</i>	\$ 2,488	<b>MEC</b>
<i>Fiber</i>	\$ 3,955	<b>MEC</b>
<i>UG Materials</i>	\$ 2,689	<b>MEC</b>

CDBG Derivation of Cost

<i>Technical Materials</i>	\$ <b>905</b>	<b>MEC</b>
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December 13, 2018

Mr. Erik C. Johnston  
Virginia Department of Housing and Community Development  
600 East Main Street, Suite 300  
Richmond, VA 23219 Virginia Telecommunications Initiative

Dear Mr. Johnston,

This letter is to document Mecklenburg Electric Cooperative's (MEC) supporting project costs for the two proposed Virginia Telecommunications Initiative Last Mile Grant applications submitted by our affiliate EMPOWER Broadband, INC. The referenced attachment "Mecklenburg Key Project Statistics," shows the totals for each project budget separated into the following categories: Summary of Total Capital Required, Construction Costs and Ongoing Capital Costs at Launch.

The financial amounts listed in the previously mentioned attachment were derived from recently completed projects serving fiber to the home customers. Actual build costs for backbone and drops from these completed projects were used as the basis to construct each of the budgets listed in the Key Project Statistics. The areas, one located in Northern Halifax County along Hwy. 501, Meadville Rd. and Hwy. 57 to the Halifax/Pittsylvania County line and the other being in the southern portion of Halifax County in the Omega area are very similar to the previously mentioned actual construction costs.

Sincerely,



Dwayne L. Long  
Vice President of Information Technology

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December 13, 2018

Erik C. Johnston  
Virginia Department of Housing and Community Development  
600 East Main Street, Suite 300  
Richmond, VA 23219 Virginia Telecommunications Initiative

Dear Mr. Johnston,

This letter is to document Mecklenburg Electric Cooperative's (MEC) in-kind match for two Virginia Telecommunications Initiative Last Mile Grant Applications submitted by our affiliate EMPOWER Broadband, INC.

MEC will fund and construct a fiber optic backbone and these backbone investments are being presented for the in-kind match for each application, respectively. The project area, MEC's match, and EMPOWER's VATI request are listed below.

<u>Project Area</u>	<u>MEC Match</u>	<u>EMPOWER VATI Request</u>
Liberty Store along Highway 57 to the county line	\$401,271	\$372,037
Smiley's Store along Virgie Cole Road	\$296,008	\$396,621

The Cooperative has approved these expenditures as in-kind matching funds upon a successful grant award.

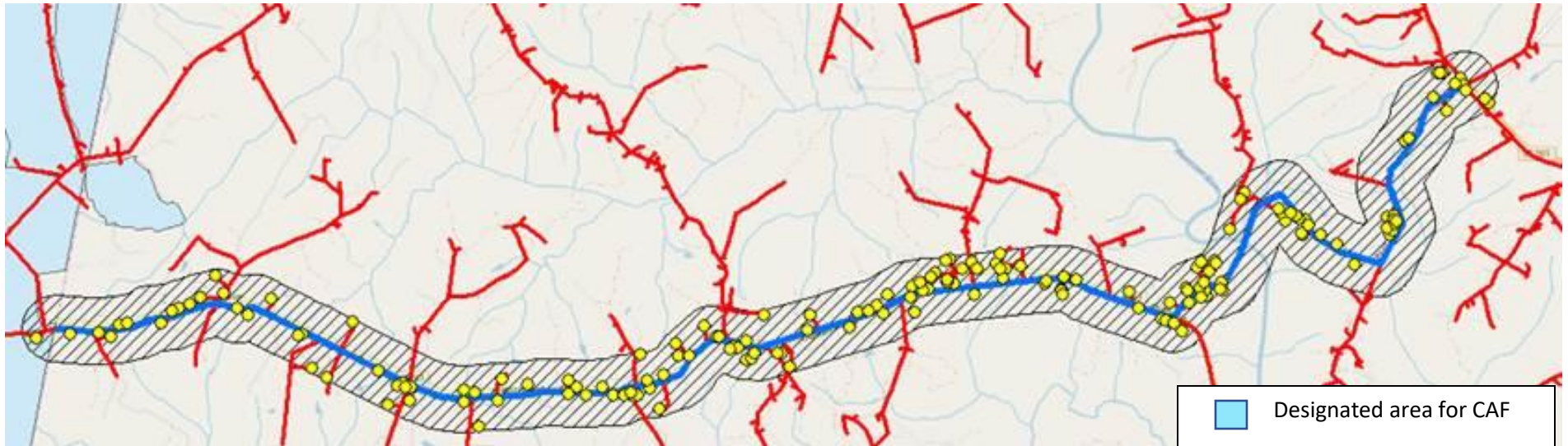
Respectfully,

John C. Lee, Jr.  
President and CEO  
Mecklenburg Electric Cooperative



# Connect America Funding Locations

**Project Area: Hwy 501, Meadville Rd. and Hwy. 57 to county line**



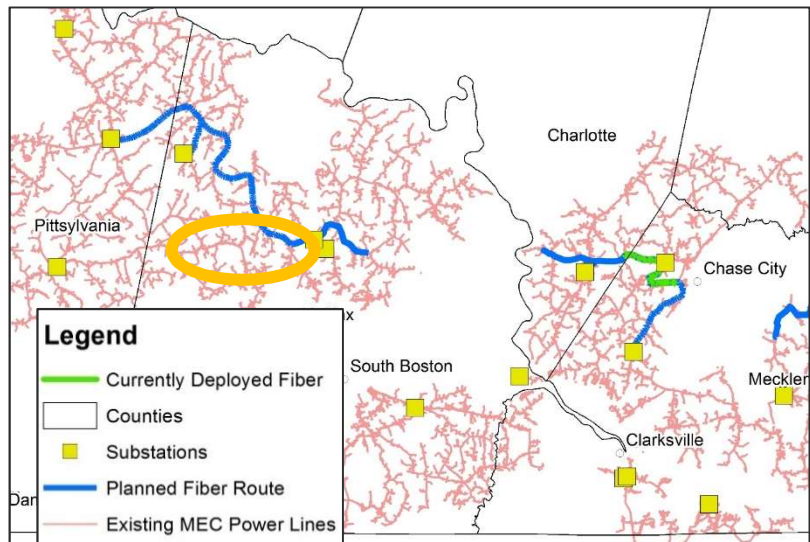
VATI FUNDING SOURCES TABLE

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.).

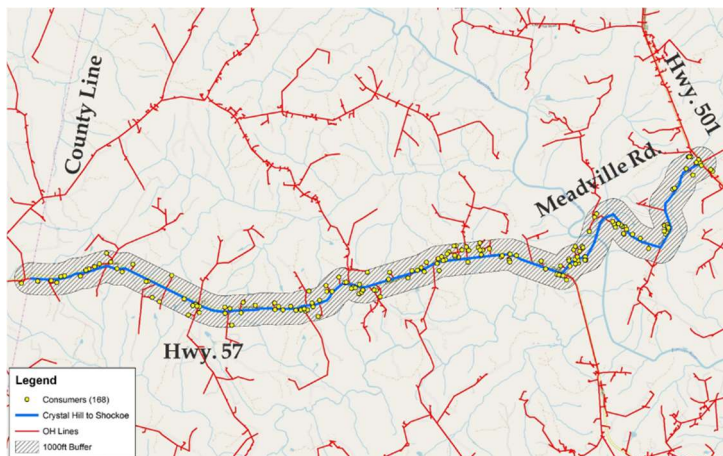
Source	Amount	%	Status
REQUESTED VATI	\$ 372,037	48.1	Pending
MEC (private)	\$ 401,271	51.9	APPROVED
	\$		
	\$		
	\$		
	\$		
	\$		
<b>TOTAL</b>	<b>\$ 773,308</b>	<b>100 %</b>	

## Halifax County-Mecklenburg Elec. Coop.-Liberty Rd. Project

1. This project is in the northwestern portion of Halifax County; Halifax is in the heart of Southside Virginia along the border of North Carolina. Fiber deployment will begin at the intersection of L.P. Bailey Memorial Highway/501 North, and continue along Meadville Road/Route 642, until it reaches the intersection with Chatham Road/Highway 57. The fiber backbone then continues along Highway 57 west to the Halifax and Pittsylvania county line. The MEC backbone extends 9.72 miles with EMPOWER Broadband extending fiber-to-the-premises for those within 1,000 feet of both sides of the backbone extension.

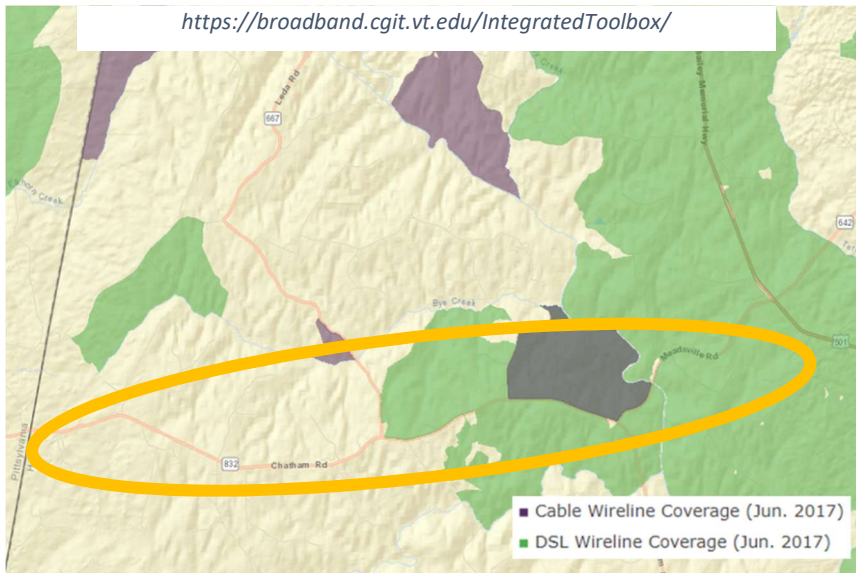


This area was selected to maximize the advantage of being adjacent to MEC's Substation Fiber Backbone that is being constructed with matching funds through a 2018 TRRC Grant.



Additionally, Highway 57 is a major thoroughfare and, accordingly, this route passes several rural residents. Perhaps most important to this grant, this area is unserved and is not part of any other existing or proposed high-speed system buildout. Relatively low-

speed mobile and high-latency satellite are currently available to all in this area.



2. Halifax County and its residents were substantially engaged in the Center for Innovative Technology broadband survey; the results are documented in the Virginia Broadband Availability Map. The included coverage map documents the need

in this area and the outcry from members within the county overall. Teachers within a local school indicate only 50 percent of students have broadband at home, which is an encumbrance to learning in today's technology-driven society.

3. Even though the coverage map indicates most of the area is completely unserved, there is a visible section east in the proposed construction area that shows DSL and an isolated spot of cable coverage. After discussing this with members along the line, the cable area is shown in error and DSL speeds are below 10/1 and are unavailable to new customers as the system is overtaxed. Subsequently, the area must be regarded as unserved.

4. According to maps from internal GIS systems, the area proposed has 172 accounts within 1,000 feet of the proposed fiber line. Converting this to actual population using an estimated 2.5 consumers per household, this grant area encompasses an estimated population of 430 rural residents.

5. Along the proposed route there are eight churches, four stores / businesses, two school structures and one public / community facility.

6. The feasibility conducted by Pulse broadband for the entire MEC area, based on National statistics from cooperative areas like ours with similar service offerings in a rural setting estimates the take rate for this area to be 45 percent. Accordingly, from the 172 accounts passed, there will be 77 that would take service. We believe, however, after Broadband discussions with multiple

subdivisions in our service area and the interest generated by our announcement, that the 45 percent take rate is both easily obtainable and conservative.

7. Project Area will target the last mile portion of the broadband infrastructure with MEC providing the construction of the “backbone” portion of the infrastructure. The backbone infrastructure is estimated at a cost of \$401,271 (51.9 percent) versus the estimated drop cost of \$372,037 (48.1percent).

8. N/A -Only applies to Wireless projects

9. EMPOWER Broadband, Inc. is using the Calix implementation of Gigabit Passive Optical Network (GPON). GPON is a fiber-to-the-premises (FTTP) technology that implements point-to-multipoint architecture to serve residential and business customers and provide up to 1 Gbps service per

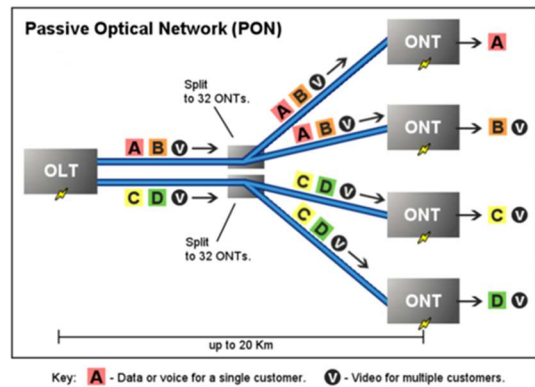


Figure 1

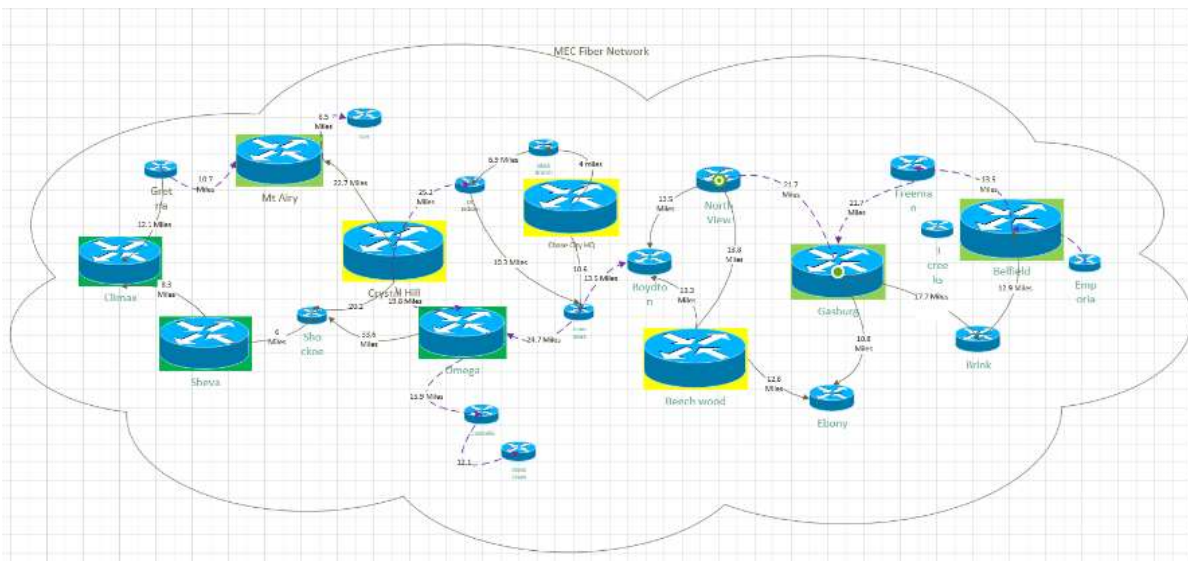
subscriber. This technology utilizes fiber optic splitters to enable up to 64 customer locations to be served by a single optical line terminal (OLT) port. Below is an example of how the bandwidth is shared utilizing the preferred 1:32 fiber split:

$$\begin{aligned} \text{Upstream} & \quad 37.5 \text{ Mbit/customer} = (1.2 \text{ Gbps}) / (32 \text{ customers}) \\ \text{Downstream} & \quad 75 \text{ Mbit/customer} = (2.4 \text{ Gbps}) / (32 \text{ customers}) \end{aligned}$$

10. Last Mile Service Delivery will use Calix customer premise equipment. The fiber drop terminates to a Network Interface Device (NID) outside the premises. From there, single-mode fiber with Angled Physical Connectors (APC) is used to connect to a Calix 803G Optical Network Terminal (ONT) device inside the premises. The 803G in turn uses an Ethernet port with inside wiring of a standard Ethernet cable to connect the ONT to an Calix Model 844e Gigacenter. The 844e provides wired and Wi-Fi connections inside the premise for internet service. The Gigacenter’s Wi-Fi service uses both 2.4 Ghz and 5.0 Ghz bands. An optional wireless mesh device, the 804 Mesh Extender, can be used in large homes or businesses to extend the range of



the wireless service. The 803G ONT also contains a voice port, which connects to an existing telephone NID via RJ-11 cable for the optional Voice over IP (VoIP) service. The ONT is powered from either a standard AC wall outlet, or also can be connected to an optional Lithium-ion battery back-up unit. The last mile network uses an overall tree and branch design for the access network. Each end customer has a fiber connection in their home or business. Layer2 switching connects the end user back to a Calix e7-2 access device which transmits light on the fiber with a GPON small form-factor plug (SFP). E7 C+ SFP's have a 32- way split capable of



reaching 32km, which puts all accounts within range of the Crystal Hill substation serving the area and is also the location of the e7-2's and an edge router. Layer 2 segments are trunked up to the edge router and then one of the centralized aggregation routers. Aggregation routers are being installed in Chase City and Gasburg. Aggregation routers are connected to a redundant Internet Data Provider using multiple 10Gb connections across a Mid-Atlantic Broadband (MBC) open-access network. The diagram above is the physical infrastructure and long-term plan, ultimately showing the location of all major network nodes, creating a highly redundant network. Each of the nine (9) larger highlighted substations contain a major network node with a Layer 3 router that is locally ringed together with 10Gb fiber uplinks.

11. Currently, the project is in planning and pre-engineering phase:

- a. Month 1 – Field Staking and engineering

- b. Months 2 to 6 – Construction of main line from Highway 501 to Halifax line on Highway 57
- c. Month 7 – Staking of FTTP service drops
- d. Months 8 to 12 - Construction of FTTP drops within 1,000 feet of main line.

12. Matching funds are being provided by MEC in the form of Construction of a fiber “Backbone.”

The backbone fiber infrastructure will provide connectivity for the MEC electrical grid and will have excess fiber to be used to serve drops and is estimated to cost \$401,271 (51.9 percent). The drops being built off of said backbone are estimated at a cost \$372,037 (48.1 percent).

13. Applicant is Halifax County with Co-Applicants MEC and Empower Broadband, Inc. Approval is documented in the December 3, 2018, minutes of the Halifax County Board meeting (attached).

14. The executive team at Mecklenburg Electric Cooperative is responsible for the management of the project. This team is well-positioned and prepared to implement, manage, operate, and sustain the services proposed. Members of the team are included in attachment: Halifax MEC, Liberty Store, Project-ManagementTeam.pdf

15. Budget Attached: (Supporting documentation for costs estimates – Halifax – Liberty.pdf)

16. Cost Benefit Index Calculation

Following are the three Cost Benefit Factors required to calculate the Index for the Liberty Store along Highway 57 Fiber Project.

i) State Share for total project cost: \$372,037

ii) State Cost per unit passed: \$2163.01

$172 \text{ units passed} / \$372,037 = \$2163.01 \text{ per unit}$

iii) Internet Speed: The maximum available speed is One Gigabit per second upload and download.

17. Experience –Mecklenburg Electric Cooperative and Empower Broadband Inc. are currently administering a grant for the TRRC’s R&D Last-Mile Broadband Project sponsored by Mecklenburg County. Mecklenburg Electric Cooperative was also a recipient of grant funds in partnership with Greensville County, whereby the county was the administrator of the grant.

Mecklenburg Electric Cooperative has extensive experience in managing projects similar in scope to the project being proposed in this application. As a current provider of utility services, Mecklenburg Electric Cooperative is required to maintain detailed records and is expected to be held accountable for proper data management and project management on the electric side due to its being a current borrower in good standing with USDA's RUS (Rural Utilities Service). Mecklenburg Electric Cooperative will be enforcing similar accountability and due diligence with the DHCD grant program as well.

18.

EMPOWER Broadband, Inc. ("EMPOWER Broadband") plans to deploy fiber-to-the-premises ("FTTP") along all areas where MEC is building backbone within the service territory. With MEC's plans to expand its "backbone" across portions of Pittsylvania, Halifax, Charlotte, Mecklenburg, Brunswick and Greenville counties, EMPOWER Broadband will offer a low-latency all-fiber connection with up to one Gigabit per second tier speed to customers within 1,000 feet of said backbone. EMPOWER Broadband has chosen a third-party vendor to provide white label interconnected VoIP voice services throughout its network. The speeds and prices being offered are listed below:

50Mbps symmetrical service \$69.95 per month including a Wi-Fi enabled router

100Mbps symmetrical service \$119.95 per month including a Wi-Fi enabled router

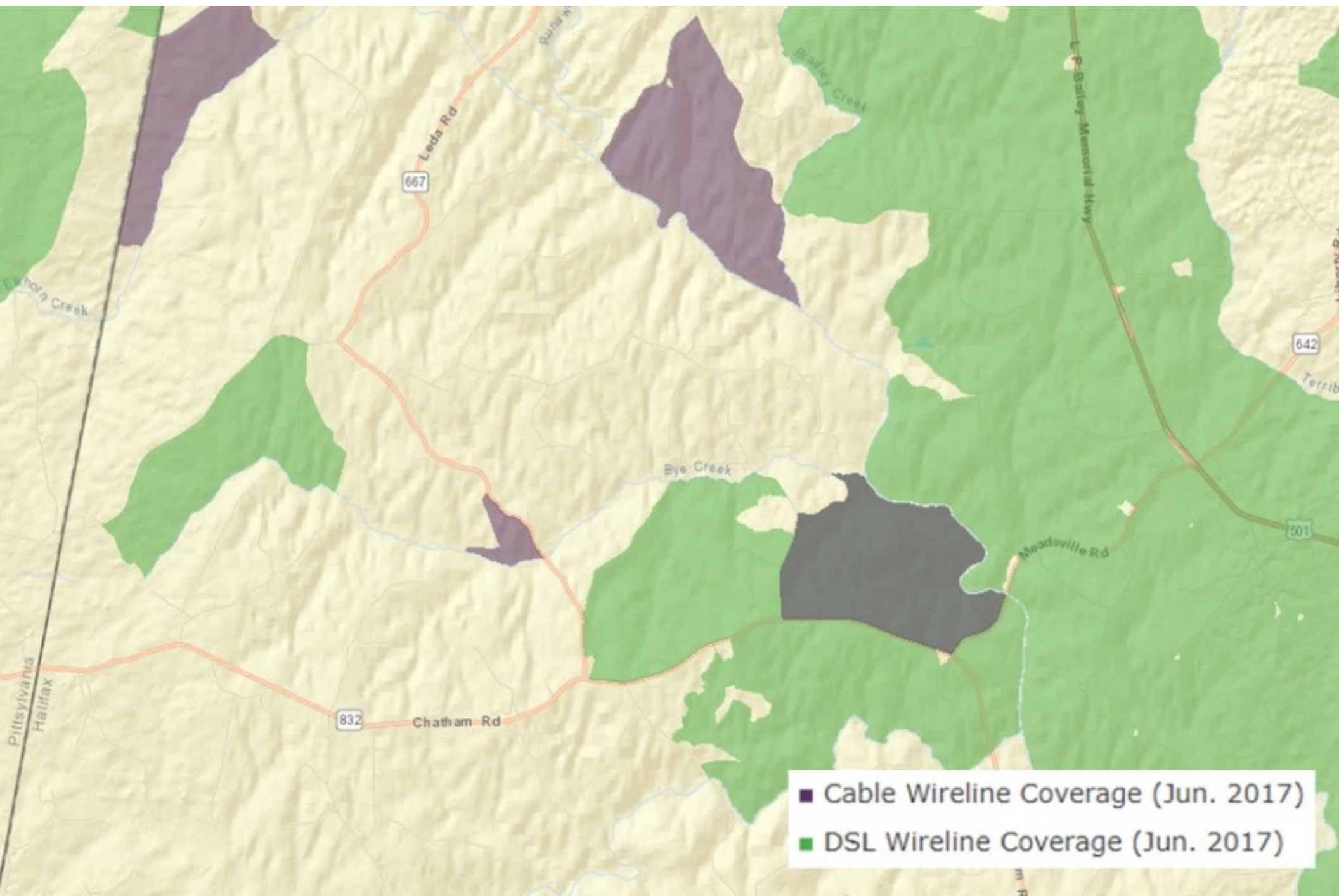
1 Gbps symmetrical service \$269.95 per month including a Wi-Fi enabled router

Residential Pricing		
<b>Premium Package</b>	<b>Ultra Package</b>	<b>Lightning Package</b>
<b>\$69.<sup>95</sup> Month</b>	<b>\$119.<sup>95</sup> Month</b>	<b>\$269.<sup>95</sup> Month</b>
Add home phone for \$30.00	Add home phone for \$30.00	Add home phone for \$30.00
<b>Total \$99.95</b>	<b>Total \$149.95</b>	<b>Total \$299.95</b>
<b>50/50 Mbps</b>	<b>100/100 Mbps</b>	<b>1Gbps</b>
*All prices include in-home Managed Wireless Router		

19. Any other equitable factors:

- a. According to a 2014 Weldon Cooper Center for Public Service Demographic Study, Southside Virginia was the only region of eight (8) that lost overall population. Our region, our Cooperative, must strive to retain our youth and our employers, and create an environment to utilize our significant natural resources. Broadband is a significant factor in leveling the playing field for our rural communities.
- b. Broadband internet access is a necessity of life. Every aspect of modern life—from homework, to banking, to emergency services—now depends on it. Sadly enough, approximately 925,000 Virginians lack reliable broadband access.
- c. There is a stark “digital divide” in Virginia, separating the regions that have broadband availability from those that do not. Electric Cooperatives serve over 1.3 million Virginians, most in rural areas, and most without adequate broadband service.
- d. If traditional providers had the desire to serve rural Virginia, they would already be doing so—the past decade has revealed that there is clearly a limit to what traditional providers are willing to do.

- e. As member-owned businesses, Cooperatives are willing and able to help members gain access to fiber broadband service, and all the benefits that accompany fiber technology.
- f. Our funding proposals—which will be more than matched dollar for dollar by Cooperative investments—will significantly increase the deployment of fiber broadband service into unserved and underserved areas of the Commonwealth and will do so in a manner that can be measured...to determine a return on the state’s investment.
- g. With limited resources, Electric Cooperatives already provide broadband service to hundreds of Virginians.
- h. Already, Virginia’s Cooperatives have invested over \$8 million in fiber broadband service, deploying miles of fiber-optic cable across rural Virginia within reach of thousands of potential households. Over the next year, that investment will increase substantially.
- i. Several Cooperatives already have middle-mile fiber backbones connecting their substations, deploying stretches of fiber that pass through rural areas in dire need of internet access. Cooperatives that have not yet deployed a fiber backbone for their systems will be doing so in the very near future.



■ Cable Wireline Coverage (Jun. 2017)  
■ DSL Wireline Coverage (Jun. 2017)