



## APPLICATION

# South Carolina 2021 Rural Broadband Grant Program

### Applicant Information

Applicant Name/Organization

Applicant FCC Registration Number (FRN)

Primary Contact Name

Title

Mailing Address

Phone Number

City, State, Zip

Email

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### Broadband Service Provider Experience

Date of Applicant's Initial FCC Form 477 Submission

Date of Applicant's Most Recent FCC Form 477 Submission

Applicant and/or Project Partner has Experience:

- Delivering broadband service via fiber and/or hybrid fiber-coax infrastructure
- Delivering broadband service via fixed wireless infrastructure
- Building and operating broadband networks in rural areas
- Operating broadband networks in low-moderate income areas

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### Project Area Information

#### Eligible County Impact

Counties  
(list)

Cities/Towns/Municipalities  
(list)

Households

Businesses

Health Care Facilities

Community Anchor Institutions

Educational Institutions

## Contiguous County Impact

Counties  
(list)

Cities/Towns/Municipalities  
(list)

Households

Businesses

Health Care Facilities

Community Anchor Institutions

Educational Institutions

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## Broadband Infrastructure Information

Indicate the type(s) of broadband infrastructure technology to be deployed in the project area.

- Fiber to the Premises* Minimum Sustainable Download/Upload Speeds
- Hybrid fiber-coax* Minimum Sustainable Download/Upload Speeds  
(*symmetrical upload/download speeds*)
- Hybrid fiber-coax* Minimum Sustainable Download/Upload Speeds  
(*non-symmetrical upload/download speeds*)
- Fixed wireless* Minimum Sustainable Download/Upload Speeds

### Broadband Pricing Schedules or Tiers

Indicate all rate tiers for wireline projects of at least 100/20 Mbps or fixed wireless at 50/5 Mbps or faster that will be offered to customers in the project area:

- |   |   |
|---|---|
| <input type="checkbox"/> Rates less than \$10/month         | <input type="checkbox"/> Rates between \$20 - \$24.99/month |
| <input type="checkbox"/> Rates between \$10 - \$14.99/month | <input type="checkbox"/> Rates between \$25 - \$34.99/month |
| <input type="checkbox"/> Rates between \$15 - \$19.99/month |   |

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### Project Timeline

Project Start Date	Customer Premises
Project Construction Activity Begins	<i>Installations Begin</i>
Project Construction Activity Complete	<i>Installations End</i>
	Overall Project Completion Date

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### Project Cost Information

Total Project Cost	Average Cost per Location Served <i>(all locations or structures)</i>
Upfront Cost Requirements	
Cost of Building and/or Extending Infrastructure to Customer Premises	Average Cost per Housing Unit
	Average Cost per Business

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### Project Funding Information

South Carolina Rural Broadband Grant Program Funds requested (\$)

Applicant-Provided Funding (\$)

#### Non-Public Funding

Amount (\$)

Source(s)

## Additional Information

- 1) Describe Applicant's and/or project Partner's experience building and/or operating broadband networks.
- 2) Describe how your proposal meets the needs of the community to be served as described in the "Guidelines."
- 3) Describe any plans or programs you have developed to improve adoption in the community described in this proposal. Please include letters of support from key community partners that indicate their awareness of your project.
- 4) Provide documents that demonstrate your organization currently has the necessary funds (50% of total project cost) to complete this project/proposal. List documents here and attach documents to this proposal.
- 5) List any lease, franchise agreement, interconnection agreement, authorization, permit, or other items needed to complete this project.

## Attachments and Exhibits

Please attach the following items to application:

- Map of project area (PDF and Shapefile formats)
- Letters of support evidencing community need and strategic partnerships
- Any additional information evidencing community need for project
- Most recent FCC Form 477 filing

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## Certification and Signature

**CERTIFICATION:** The Applicant certifies that information included in this application is factual to their knowledge.

Signature:

*Harold M. Young*

Print Name of Signatory:

*Harold M. Young*

Title of Signatory:

*County Administrator*

Date:

*5/12/21*

All questions and completed applications should be submitted to [Broadband@ORS.SC.GOV](mailto:Broadband@ORS.SC.GOV)

Facsimile signatures and email signatures shall be as effective as original signatures to bind any party.



**South Carolina**  
Department of Commerce  
*Just right for business.*



# SECTION A

## **Statement of Experience – Orangeburg County Broadband and W. Metts Engineering Co., Inc. – OCBB Operations Partner**

Orangeburg County Broadband (OCBB) currently provides broadband internet service to 1300 rural households that did not have access to broadband. Gigabit service is available at every home in the project area. In addition to residential service, OCBB makes broadband internet service available to a 500 unit assisted living retirement community, three industrial parks, six schools, 45 businesses and two medical facilities.

The FTTP System includes 785 miles of underground fiber construction. The architecture is designed with a 10Gbps backbone ring with 50mS failover. The network has redundant links to upstream internet providers with border control protocol to manage failover. The network is designed to support upgrades with a single fiber capable of carrying 400Gbps of traffic.

Orangeburg County has been awarded three grants for its serving area: an ARRA/BIP grant for \$18M, a Community Connect grant for \$1M, and a 2019 Reconnect Award for \$13 million.

OCBB is a standalone enterprise component of Orangeburg County. The OCBB System is self-sufficient, being operated independently outside of County government. The System returns a portion of the revenue to the County.

The Orangeburg County was awarded an ARRA/BIP grant for \$18M with a 3-year schedule. The County procured the services of W. Metts Engineering (Metts Eng) to provide engineering and project management services. The ARRA/BIP project was of similar size and scope. The management teams from Orangeburg County and Metts Eng successfully completed the ARRA/BIP project on schedule and under budget. There have been no significant changes in organizational structure, and the Reconnect Project for \$13M would be complete within the required 5-year schedule. In the proposed timeline, service is available in all six PFSA's in less than 4 years.

Orangeburg County entered into a Maintenance and Operating agreement with Metts Eng for the OCBB system. Metts Eng provides billing, technical support, installation/repair and network operation services. Metts Eng operates a billing and technical support office at 140 Bridge St, Branchville, SC within the original project area. Metts Eng sends bills and collects payments for OCBB on a monthly cycle. All collections are deposited in a County bank account daily. Metts Eng provide technical support by phone and makes service visits when needed.

Dedicated resources for OCBB include 3 customer service representatives, 1 network engineer, 2 network technicians, 2 installation and repair technicians, and an office manager. In addition to the dedicated resources, the Metts Eng provides overhead support as needed. This support includes management, drafting for drawing maintenance, accounting, human resources, etc. Also, a fiber optic construction company, Southern Fiber Construction and Management, is on retainer to assist with placing cable and splicing for fiber restoration or additions.

The Maintenance and Operating Agreement has previously been transmitted to RUS and a copy is uploaded in the document section.

# SECTION A

As indicated, OCBB is an enterprise component of Orangeburg County. OCBB is operated independently of County Government. It is self sufficient and does not need any operational subsidy from Orangeburg County Metts Eng, as the Operator of OCBB, provides maintenance and operations support for the System.

W. Metts Engineering Co., Inc. is in its 19th year of business. With over 4,500 miles of FTTP Construction management experience, W. Metts Engineering's Management Team has the know-how and experience to efficiently manage the construction of this project.

W. Metts Engineering 's Management Team has many years of combined job experience as shown below.

The years of experience by position are listed below.

President- William Metts 25 years  
Chief Technical Officer - Ethan R. Beeks 16 years  
Chief of Design- M. Adam Murray 13 years  
Senior Project Manager- Tripp Johnson 13 years  
Project Manager- Trenton Wiles 14 years  
Project Manager- Edward Godfrey 12 years

## **Total Years of Experience 103 years**

W. Metts Engineering has been designing and constructing FTTP projects for Scott County Telephone Cooperative and Orangeburg County that are identical to the structure of this project. All members of W. Metts Engineering listed above have played a major role in the design, construction management, operational management, and closeout of each of these fiber construction projects.

1. Each project at SCTC and Orangeburg has been an FTTP project. The Pleasant Branch FTTP project is identical to these projects and is a practical approach for this construction corridor.
2. W. Metts Engineering has direct experience with multiple RUS programs with participation in the design, operations, and construction of Multiple Grant Awards at Scott County Telephone. W. Metts Engineering has played a major role in the successful planning, design and construction of more than 8 separate SCTC awards and 3 separate Orangeburg County awards.
3. Operations of OCBB. W. Metts Engineering has operated the OCBB fiber network for the past 6 years. This management has included:
  - Customer Billing
  - Customer Support
  - Payment Receipt
  - OSP construction
  - I&R services
  - Budget & Planning
  - Audits
  - Central Office provisioning

# SECTION B

The Orangeburg County Broadband Network will encompass approximately ~30 miles of new fiber optic cable construction to serve more than ~850 potential broadband subscribers in unserved portions of Orangeburg county. NEW PFSA- The proposed PFSA is shown in attached diagram. This area was identified as unserved based on previous community meetings, surveys, local knowledge, FCC Broadband Maps 477, and ORS Unit Maps, current providers data for rate plans, and availability.

The proposed network addition will tie into existing Orangeburg County Broadband fiber at multiple locations to the middle mile fiber shown in attached documents. Initially it will be configured as a collapsed ring for electronics redundancy. a. The proposed network will use a NG PON2 Ethernet topology. Broadband service will be offered. Voice and video service will not be offered initially. b. The PFSA will be provided service using NG PON2 FTTP. Schedule D-1 shows the proposed network topology. c. The PFSA includes ~850 housing units and the projected penetration rate is 55%. The system will be designed with a 10km plant, meaning there will be electronics/splitter cabinets within 10km of each housing unit.

## Description of Design Parameters

a. The proposed FTTP system is designed with fiber constructed from each subscriber to an electronics or PON cabinet. The system is designed with a 10km fiber loop. The system will be constructed with ribbon fiber to reduce construction cost and reduce recovery time in the event of a fiber cut.

b. From an historic perspective, an oversubscription ratio of 4:1 is anticipated. Orangeburg County will monitor bandwidth usage and add upstream bandwidth when bandwidth consumption reaches 75% of upstream capacity. This approach ensures a non-blocking, non-congested network.

c. Standard network FTTP optics have a 10km design. The proposed ftp project will be designed with 10km local loops. Problems with link budgets are not anticipated.

d. The electronics will be on a 10Gbps geographic diverse ring using ERPS or like failover protocol. ERPS will provide 50ms failover in the event of an electronics failure. As the Orangeburg County strategic plan is realized, the ring will evolve to have multiple points of presence and upgrade WDM transport capable of 400Gig.

e. The local loop from the electronic cabinet to the subscriber will be a 1Gbps interface to be offered to each subscriber.

The home run fiber design includes a dedication fiber to each subscriber from the electronics/PON cabinet ONT-Orangeburg County broadband will deploy indoor, powerful, dual mode service delivery center The FTTP System will include the construction of up to ~15 miles of underground fiber to the home construction. The architecture is designed with a 10Gbps backbone ring with 50mS failover. The network has redundant links to upstream internet providers with border control protocol to manage failover. Service is provided over a layer 2 network capable of 1 Gigabit symmetric service to the customer premises. The network is designed to support upgrades with a single fiber



# SECTION B

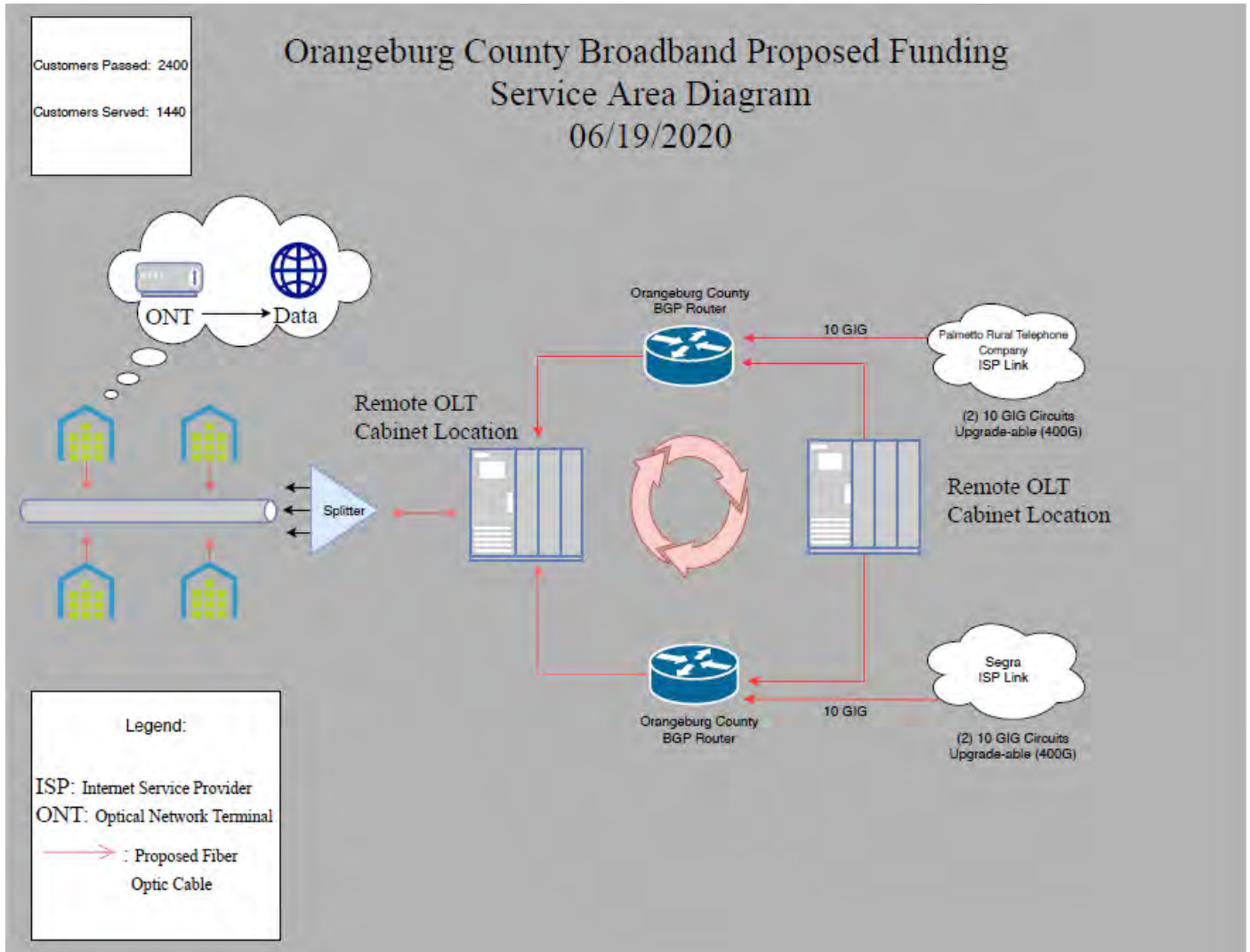
capable of carrying 400Gbps of traffic. ACCESS Technology NG-PON2 (also known as TWDM-PON), Next-Generation Passive Optical Network 2 The standard was developed by ITU and details an architecture capable of total network throughput of 40 Gbit/s, corresponding to up to 10 Gbit/s symmetric upstream/downstream speeds available at each subscriber. The architecture calls for Time- and Wavelength-Division Multiplexing (TWDM) in the upstream and downstream directions. Wavelength-division multiplexing is provided in the downstream direction by combining light from four fixed wavelength OLT lasers with a wavelength mux. Each upstream/downstream wavelength is capable of providing up to 10 Gbit/s symmetric bandwidth to each subscriber if the channel is not time-division multiplexed between several ONTs. With wavelength-division multiplexing on four available wavelengths, NG-PON2 can provide up to 40 Gbit/s throughput to the entire optical network. NG-PON2 was designed to include backwards-compatibility, or coexistence, with previous architectures to ease deployment into existing optical distribution networks. Wavelengths were specifically chosen to avoid interference with GPON, 10G-PON, RF Video, and OTDR measurements.

The standard provides spectral flexibility to occupy reserved wavelengths in deployments devoid of legacy architectures.

- Based on ITU G.989 NG-PON2 family of standards
- 9.953 Gbps downstream, 9.953 Gbps upstream
- Supports multiple TWDM wavelengths
- Supports NG-PON2 wavelength mobility
- Leverages Ethernet based provisioning model as GPON
- Capable of high link budgets
- Up to 1:128 splits
- Integrated 10GE aggregation and transport
- Hardened for central office and remote terminals
- Built on a core Layer 2 and Layer 3 switching the network will be capable of full-duplex, line rate forwarding at all frame sizes and traffic types across all interfaces.
- Each PON port will have a dedicated 10 Gbps switch interface. • 10 GE XFP uplinks will provide support for backhaul

# SECTION B

## Service Area Diagram



### Project Location

Located in the Lowcountry Region of South Carolina, Orangeburg County is centrally located between Columbia, Charleston, and Augusta GA. The Rural Broadband Response Project is located in 3 identified ORS areas on need in Orangeburg County, and represents a large portion of the unserved portions of the county. These areas include the communities of Bolentown, Santee, and Vance. Communities in Orangeburg County South Carolina.

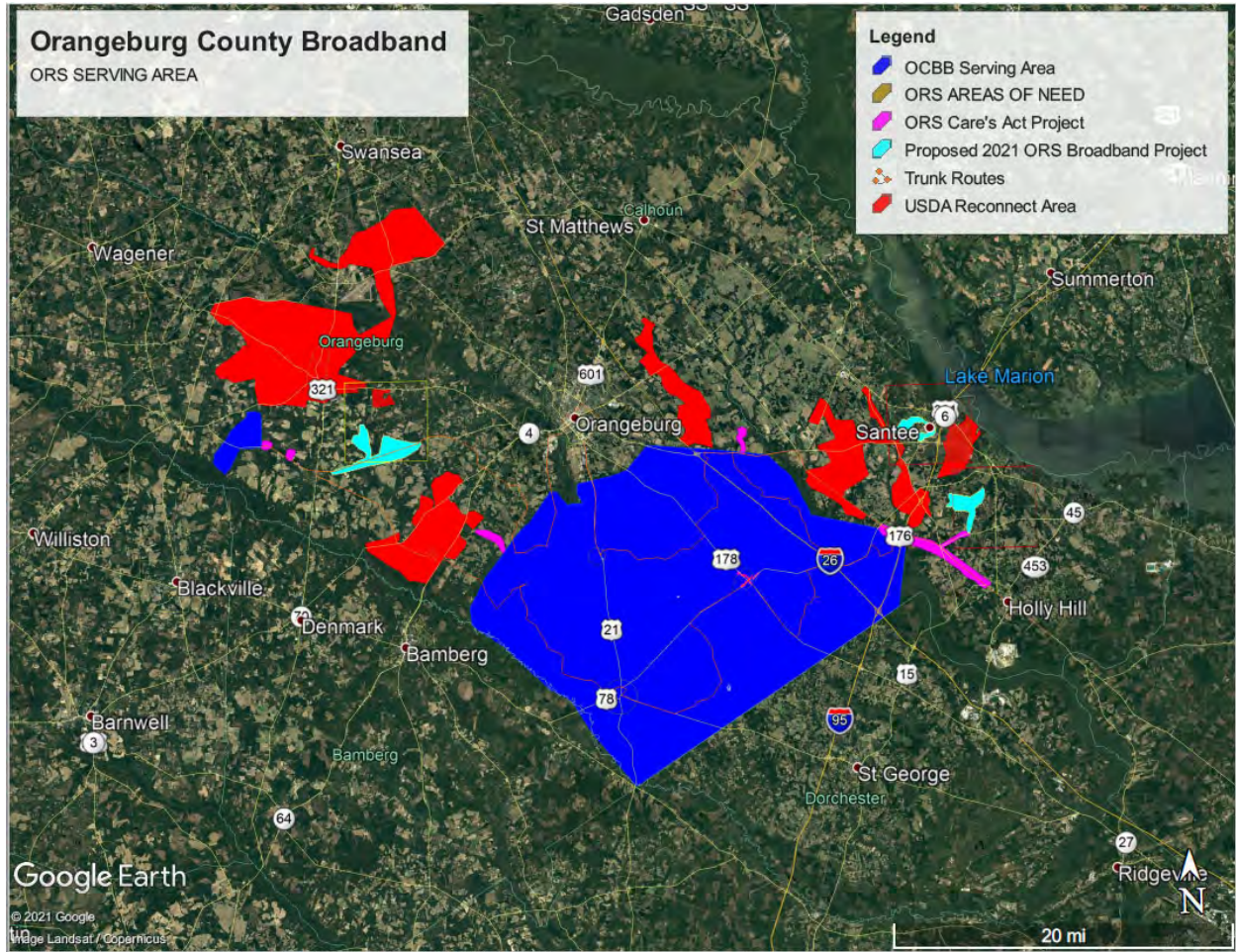
Santee- 231 Unserved Customers – **Orangeburg**

Vance - 320 Unserved Customers – **Orangeburg**

# SECTION B

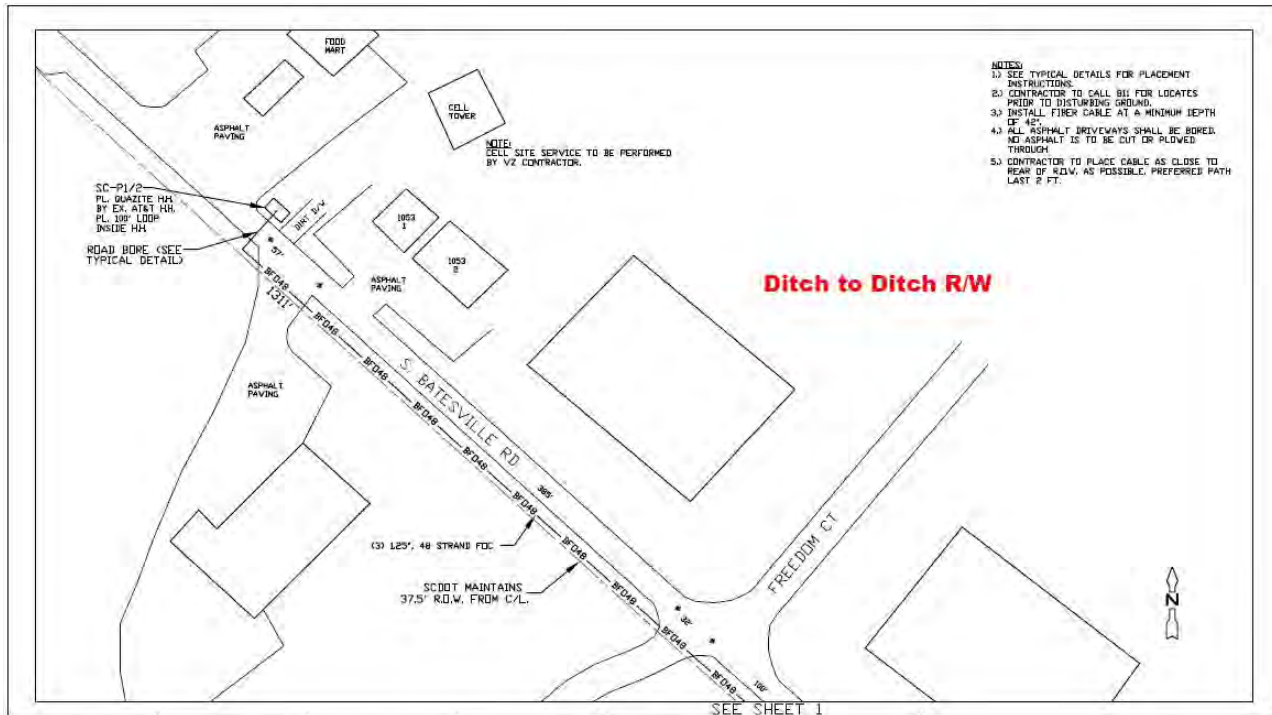
Boletown – 299 Unserved Customers

## ORS SERVING AREA



# SECTION B

## SAMPLE STAKING



### Functional Classification

Construction descriptions, asset locations, field measurements and construction notes are all placed on staking sheets. Quantities of materials, routes, customer interactions are all documented and shown on the sheets for contractors to best perform construction activities.

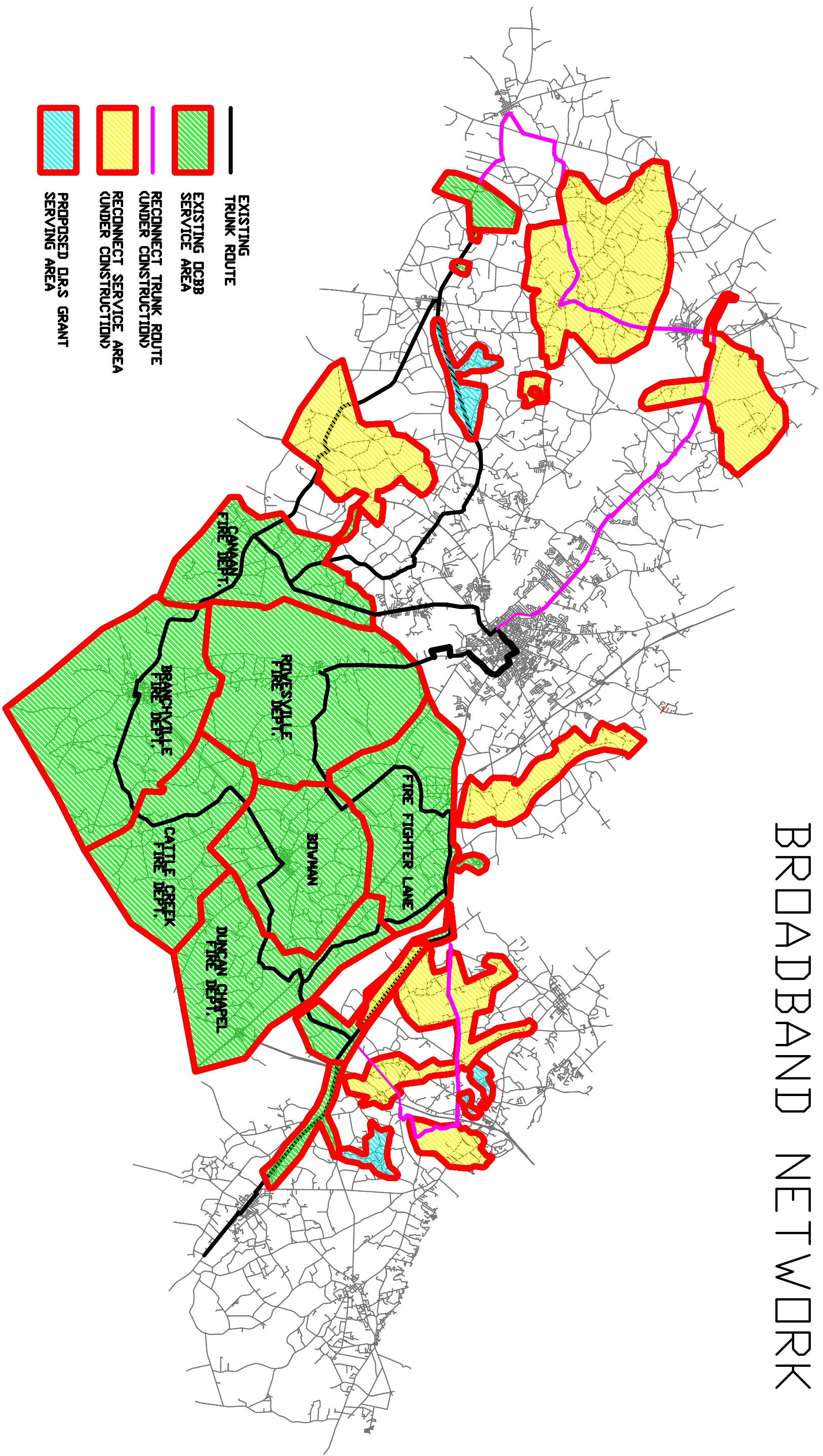
### Right-of-Way

Staking Sheets are utilized to show permitting agencies the design construction proposal within the existing Right of Way. All construction will be placed in the SCDOT right of way, and utility placement will additionally show right of ways.

### Utilities and Drainage

In addition to showing the road right-of-way, sheets will show existing utilities where known. It also accommodates a variety of underground and aboveground utilities, which are owned by private and public entities. Since the horizontal and vertical locations of these utilities must be coordinated with the improvements during the design and construction, it is important to identify these existing and proposed utilities in the early stages of the project development

# ORANGEBURG COUNTY BROADBAND NETWORK



- EXISTING TRUNK ROUTE
- █ EXISTING DCBB SERVICE AREA
- █ RECONNECT TRUNK ROUTE (UNDER CONSTRUCTION)
- █ RECONNECT SERVICE AREA (UNDER CONSTRUCTION)
- █ PROPOSED DRS GRANT SERVING AREA

PROJECT: 2021 O.R.S.  
 DRAWN BY: MAM  
 CHECKED BY: ERB  
 DATE: 5-14-21

**W. METTS  
 ENGINEERING CO., INC. ©**  
 121 BRIDGE ST.  
 BRANCHVILLE SC, 29432  
 (803) 274-4242

2021 O.R.S. GRANT  
 PROPOSED  
 SERVICE AREA

SHEET  
 1

# SECTION C

## Community-Oriented Connectivity Plan

1. There are multiple critical community facility in the serving area. The facilities include fire stations/community centers, a medical facility, and Town Administration Offices. It is one of the goals of this project, to bring broadband facilities to the area that will increase the value of living and potentially allow for growth with respect to these facilities. The introduction of broadband provides a limitless future for the expansion and support of specialized services such as EMS/OMC and distance learning facilities.
2. The residents and Critical Community Facilities will be offered:
  - a. The network will be equipped with Active Ethernet equipment. This equipment will provide an Ethernet connection with up to 1 Gb of Bandwidth to each location. This network will be an IP network (Internet Protocol).
  - b. The Community Centers and fire stations will be provided free wi-fi broadband service.
  - c. W. Metts Engineering intends to use RUS standards for all central office, special equipment, and outside plant construction projects associated. W. Metts Engineering intends continued use of these tools when engineering central office and outside plant projects. For central office or special equipment contracts W. Metts Engineering will use procurement processes consistent with 7 CFR 1753. RUS approved products will be utilized from potential vendors during the planning phase of this project. Engineering field crews will use RUS staking and design criteria based on published bulletins 1751F-626 through 1751F-670, among many others, on aerial, buried, and underground plant. The same design criteria will be used by the design engineer to identify units and prepare the design for a 515 contract. Drafting technicians will use specialized computer assisted design software and equipment to prepare engineering and design documents. This software is a telecommunications assist module StellarRad that runs alongside a base AutoCAD program. This product gives design technicians the necessary tools to draft design plans and schematics efficiently with unparalleled accuracy. GPS location devices will potentially be utilized for establishing a GPS based mapping system for future operational efficiencies.
  - d. The community center computers will be set up on a LAN (Local Area Network) connected to a VLAN for Internet access. The server will be used for central user management and policy implementation. The network will have three layers of protection via a hardware firewall, local anti-mail software, and locally enforced computer policies. User software will include the latest version of Microsoft Office, Internet Explorer, and other common windows software.

## SECTION C

- e. W. Metts Engineering intends to deploy a Calix E7 Active architecture for service in the PFSA. The customers will be receiving a signal capable of delivering 1Gb/sub.
3. Local residents will be able to take advantage of numerous services not previously available to them. Not only will high speed services be available at the subscriber's home, but the community center will support high speed access for the public. The access will also come with first hand training classes and expertise to support access to the internet. Hands-on assistance is a necessary tool for the growth of individual independence and confidence in a new technology.
4. The Bolen Town FTTP Project area is located in a corridor that is presently destitute with respect to broadband service. Adjacent to the serving area is the ability to have redundant connections to Orangeburg County Broadband which has constructed an ARRA stimulus project, USDA Reconnect, and the Rocky Swamp Community Connect projects that provided access to subscribers in additionally unserved areas. The ability to have access through an additional RUS broadband project, offers the residents of Bolen Town, Vance, and Santee an opportunity to experience the best of technology and cost that is available.

# SECTION F



HENRY McMASTER  
GOVERNOR

May 29, 2019

The Honorable Sonny Perdue, Secretary  
United States Department of Agriculture  
1400 Independence Ave., S.W.  
Washington, DC 20250

RE: USDA ReConnect Program

Dear Secretary Perdue,

On behalf of the State of South Carolina, I would like to thank you for your efforts to increase investment in rural broadband, as detailed in your letter to my office regarding the United States Department of Agriculture's ReConnect Program.

As America has transitioned to a digital economy, over 19 million Americans – nearly 25% of rural residents – have been left behind, and currently lack adequate Internet access. In South Carolina, over 450,000 residents and approximately 170,000 homes fail to meet recommended service levels.

I strongly support efforts by South Carolina counties and service providers to meet this critical need. Accordingly, I am writing to express my support for the USDA Reconnect Grant Program and potential recipients within our state. As governor, I am committed to ensuring the effectiveness of these grants in increasing both private and municipal investments for broadband services in rural South Carolina.

In your March letter, to assist with application scoring, you asked for specific responses regarding three policy issues. Here are my responses:

- 1. Broadband Plan:** In 2009, the South Carolina Governor's Office addressed the issue of broadband deployment by endorsing the creation of Connect South Carolina (CSC), a public-private partnership created pursuant to the National Telecommunications and Information Administration's State Broadband Initiative. CSC published its state broadband plan in January 2015 (available at <https://www.connectsc.org/sc-final-grant-report>). This report now serves as the benchmark for state broadband expansion. It is my intention to expand on this plan in the near future.



# SECTION F

The Honorable Sonny Perdue  
May 29, 2019  
Page Two

2. **Elimination of Restrictions on Non-Broadband Utilities:** In 2012, Governor Nikki Haley signed into law H.3508, which prohibits the Office of Regulatory Staff from: (1) imposing any requirements related to the terms, conditions, rates or availability of broadband service; or (2) otherwise regulated broadband service.
  
3. **Expedited Rights-of-Way and Environmental Processing:** The South Carolina Department of Transportation (SCDOT) and South Carolina Department of Health and Environmental Control (SCDHEC) have given me their commitment that they will ensure efficient right-of-way and environmental permitting so that USDA projects can achieve their intended timelines and objectives. Enclosed, find memos from SCDOT and SCDHEC affirming that commitment.

I thank you for your leadership on this innovative program which will be instrumental for rural connectivity throughout the United States. I am confident that an investment in South Carolina's rural communities will enhance health care access, as well as bolster the educational and workforce resources needed to ensure our state's continued prosperity.

Should you have any questions or concerns, or if I can be of any further assistance, please do not hesitate to call.

Yours very truly



Henry McMaster

HDM/jm

enc: SCDOT Memorandum  
SCDHEC Memorandum

# SECTION F



Christy A. Hall, P.E.  
Secretary of Transportation  
803-737-0874 | 803-737-2038 Fax

May 29, 2019

The Honorable Henry D. McMaster  
Governor  
State of South Carolina  
1100 Gervais Street  
Columbia, South Carolina 29201

Dear Governor McMaster:

The South Carolina Department of Transportation understands the importance of expanding broadband to our state's rural communities. We believe that the United States Department of Agriculture's (USDA) ReConnect Program is an excellent opportunity for South Carolina to improve education, healthcare, and economic development via the investment in broadband expansion.

The South Carolina Department of Transportation has state-owned rights-of-way in all 46 counties, which provides potential access for the installation of broadband infrastructure. As such, I stand committed to work with you and all eligible entities to expedite the encroachment permitting on the state-owned rights-of-way to meet the USDA's build-out timelines associated with their ReConnect Program.

Please let me know if I can be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Christy A. Hall".

Christy A. Hall, P.E.  
Secretary of Transportation

Post Office Box 191  
955 Park Street, Room 309  
Columbia, SC 29202-0191



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# SECTION F



## MEMORANDUM

**Date:** May 30, 2019  
**To:** Office of the Governor  
**From:** Myra C. Reece, Director, Environmental Affairs  
**Subject:** USDA ReConnect Program  
SCDHEC Environmental Permitting Commitment

*Myra C. Reece*

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The South Carolina Department of Health and Environmental Control strongly supports the referenced program for improvement of infrastructure in rural areas of the state. The Department unequivocally commits to ensuring efficient and timely environmental permitting decisions to facilitate project success.

We look forward to being a meaningful contributor to such a worthwhile project. If you have any questions or if we can be of further service at this time, please let us know.

**SCHEDULE C -1**  
**COMMUNITY PARTICIPATION**