



Broadband Implementation Committee

Berryville/Clarke County Government Center, 2nd Floor
101 Chalmers Court, Berryville, Virginia 22611
Main Meeting Room

Wednesday, August 19, 2020 2:00 pm

- A. Call to Order
- B. Minutes:
 - December 2, 2019
 - July 22, 2020
- C. Open House Discussion
- D. Study Update
- E. Virginia Telecommunications Initiative (VATI) Update
- F. NOVEC Update
- G. Clarke Connect Update
- H. Next Meeting - October 21, 2020, 2 pm, main meeting room
- I. Adjournment

Additional Information

- Go/No Go is retail broadband right for your CO-OP
- Commonwealth Connect August Meeting
- BARC Connect: Grant Awards for Broadband Expansion Announced for Bath and Rockbridge
- Fauquier NOW: Supervisors back ambitious broadband incentive plan

Clarke County

BROADBAND IMPLEMENTATION COMMITTEE MEETING MINUTES -- DRAFT MONDAY, DECEMBER 2, 2019



A meeting of the Broadband Implementation Committee was held at the Berryville/Clarke County Government Center, Berryville, Virginia, on Monday, December 2, 2019.

ATTENDANCE

Present: Robina Bouffault, Mary Daniel, Douglas Kruhm, Bev McKay

Absent: None

Staff Present: Brandon Stidham, Planning Director; Cathy Kuehner, Public Information Director

CALLED TO ORDER

Mr. Stidham called the meeting to order at 2:00PM.

AGENDA

Committee members approved the agenda by consensus.

APPROVAL OF MINUTES

The Committee approved the May 14, 2019 meeting minutes as presented.

Yes: Bouffault (moved), Daniel, (seconded), Kruhm, McKay

No: none

Mr. Kruhm said that resident Dick Drake is in attendance to hear today's presentation.

NEW BUSINESS

Appearance by Mark Bayliss (Visual Link)

Mr. Stidham introduced Mark Bayliss from Visual Link. Mr. Bayliss stated that in addition to his role with Visual Link he is also entering his tenth year as a member of the Federal Communications Commission's (FCC) technological advisory council. He said that the council's charter is to identify new and cutting-edge technologies, remove barriers to get those technologies to move forward, and to promote global dependence on U.S. technology. He said the council has been working on advanced antenna systems, 5G, and internet of things (IOT) technology. He noted that T-Mobile is expected to roll out 5G service on December 6 and said that 5G technology is in a controlled shared spectrum. He said that a controlled shared spectrum is the same concept that he has proposed the internet service providers (ISPs) to collaborate on developing but added that the WISPs are not interested in working together. He said that in a controlled shared spectrum, all providers would be allowed to

operate in the spectrum and that controllers would be used to manage when the ISPs would be broadcasting. He said that the shared spectrum would allow providers to have access to a greater amount of broadcast frequency than they currently have operating within their assigned frequencies. He explained that this would be accomplished by making frequency guard bands available for use and the controllers would manage how the frequencies are used by the ISPs. Ms. Bouffault asked if there are capacity limits. Mr. Bayliss responded yes but the capacity would be greater because the frequency guard bands are used.

Mr. Bayliss stated that there is a finite amount of spectrum that can be used for broadband and that the FCC is currently working to reallocate spectrum. He discussed the latency issues associated with satellite broadband and noted that new technology proposed to use low earth orbit satellites to address latency would require 66,000 satellites in orbit for the system to function. He added that there are currently 1,700 satellites in orbit. He said that we look at valuing spectrum in a completely different way than in the past and instead look for groups that can provide the most megabits of capacity per megahertz of spectrum. Ms. Bouffault asked if this is all separate from fiber optic and Mr. Bayliss replied yes. Mr. McKay asked if you can do 5G backhaul with microwave and Mr. Bayliss replied yes but you will not be able to meet the 5G capacities. Ms. Bouffault said that you need to have fiber backhaul for 5G and Mr. Bayliss agreed. Mr. Bayliss noted that most 5G service will be available only in cities as the range of the 5G antennas is limited. He also said that there are expected to be over 40 billion internet-connected devices worldwide in homes, vehicles, and structures within the next three years accounting for one-third of the global gross domestic product (GDP). He said that these devices only send out small bits of information so it would not be a good use of 5G service to convey it. He said that conveying this information over a narrower frequency band would allow it to be sent over much greater distances.

Mr. Bayliss said that he has applied this work to develop a new Visual Link service. He said instead of broadcasting broadband internet on one set of contiguous channels, it would be broadcast on multiple channels across the spectrum to provide greater distance and greater capacity. He then demonstrated his new tabletop "Tower Beam" device that provides internet connectivity without an external antenna. He noted that the device can be used with an external antenna if there are problems with connectivity. Ms. Bouffault asked if the tabletop device is the only equipment providing internet connectivity and Mr. Bayliss replied yes. Ms. Bouffault asked if this would work if you are in Shenandoah Retreat with lots of trees. Mr. Bayliss replied that the external antenna would probably be needed. Mr. Stidham asked which tower the device is connected to and Mr. Bayliss replied that it is connected to the Mt. Weather tower. Mr. Stidham then asked for confirmation that the connection is made through the building to the broadcast tower on the ridge and Mr. Bayliss replied yes. Mr. McKay asked if you can use your existing antenna with this device and Mr. Bayliss replied that you would have to replace it. Ms. Bouffault asked what is the maximum distance from a broadcast tower that the Tower Beam device can receive signals and Mr. Bayliss replied about 25 miles. Mr. Stidham asked if the external antenna needs to have line of sight and Mr. Bayliss replied no and that it only has to be aimed well at the broadcast tower. Mr. Bayliss also said that this product will help provide internet access in areas that could not previously be served, adding that if you already have a good signal with a line of sight system then the Tower Beam product will probably not be an improvement. Mr. Stidham asked if it no longer matters if you have a wooded lot. Mr. Bayliss replied not really although you will have some signal degradation. Ms. Bouffault asked about

topography and Mr. Bayliss replied that the product cannot go through dirt and rock. Ms. Bouffault asked if it would not work in a hollow and Mr. Bayliss replied that it depends on the site. Mr. Stidham asked if it depends on your angle to the broadcast tower if you are located on the mountain and Mr. Bayliss replied yes. Ms. Bouffault asked if small-scale antenna support structures which are now allowed under our Zoning Ordinance would help and Mr. Bayliss replied yes. Mr. Stidham added that with this product, you may not need to build as tall of a tower to get a signal as you just need to get the antenna above the obstructing terrain. Mr. Bayliss noted that pine trees can cause the significant signal degradation. Mr. McKay asked if this product can be moved around to achieve a better signal and Mr. Bayliss replied yes. Mr. Bayliss added that one of the biggest business advantages with this product is that there will potentially be no installation required. He said customers would be given a unit to take home and if a satisfactory signal cannot be found, then they would go onsite and install an external antenna. Ms. Bouffault asked if they will be generating more literature on where the product will work and Mr. Bayliss said that they plan to do more mapping. Mr. McKay asked if this product would work with neighborhood repeaters. Mr. Stidham asked if this product would actually do away with some neighborhood repeaters and Mr. Bayliss replied yes. Mr. Bayliss also said that they can now carry wired internet access over a greater distance with ethernet cable which would reduce the cost of some build-outs because it costs a lot less to bury ethernet cable than it does to bury fiber optic cable. Ms. Daniel asked what the price of the service would be and Mr. Bayliss said that it would be the same cost as their current service. Ms. Bouffault asked if this would be an improvement for current Visual Link customers who feel like their speeds are being choked in the evening and Mr. Bayliss replied yes. She also asked if there would be a new equipment fee and Mr. Bayliss replied yes. Mr. Bayliss added that there would be more capacity but the challenge for his company is in maintaining the broadcast equipment on the mountain due to the environmental conditions. He noted that there are a lot of dead trees that can fall or explode at any point in time creating a hazardous situation. He said that ice storms can cause the biggest problems for broadcast towers.

Mr. Kruhm asked what internet speeds Visual Link is pushing out now with current technology. Mr. Bayliss replied that they are on capacity caps and that current technology is at about 50 MB per second. Mr. McKay said that his internet speeds slow down at peak use periods. Mr. Bayliss said that capacity of backhaul to the broadcast towers is an issue and that they are always working on ways to get more capacity. Mr. Kruhm asked what the speed of the Tower Beam product is and Mr. Bayliss replied that it is the same as current technology. Mr. Bayliss noted that they offer a 50MB burst for the first 30 seconds of downloads for customers at all speeds and Mr. Stidham replied that the burst makes a huge difference for streaming. Mr. Bayliss also explained how AT&T now offers DirecTV streaming service and demonstrated how it works with the Tower Beam product. He said that wireless internet will never be able to compete with wired broadband speeds but that it works well enough to support streaming. Mr. Drake asked if the service is true unlimited data and Mr. Bayliss replied yes but that there will likely be speed reductions during peak periods due to capacity limits of the technology. Mr. Drake asked if Visual Link will have to do site surveys to determine whether a property can be served. Mr. Bayliss replies that he intends to start by having customers take a Tower Beam device home to see if they can get it to work first before going to the properties. Mr. Bayliss then discussed the security measures and remote access features that Visual Link has for customers.

Ms. Bouffault asked what information we can provide to citizens about Visual Link's services. Mr. Bayliss replied that for anyone who had a site survey in the past and were told they could not be served, there is now a 90% chance that they can be served with the new Tower Beam product. Mr. Drake asked when the product will be available. Mr. Bayliss replied probably by second or third week of December. Mr. Stidham replied to Mr. Bayliss that Staff can post his information to the County Facebook page and the broadband website to help get word out to citizens. Ms. Daniel added that we offer this to all businesses.

The meeting was adjourned by consensus at 2:57PM.

Brandon Stidham, Planning Director

Broadband Implementation Committee
July 22, 2020 Regular Meeting 2:00 pm

At a regular meeting of the Broadband Implementation Committee held on Wednesday, July 22, 2020, at 2:00 pm in the Meeting Room AB, Berryville Clarke County Government Center, 101 Chalmers Court, 2nd Floor, Berryville, Virginia.

Members Present: Bev McKay, Dr. William Houck, Doug Lawrence

Members Absent: Buster Dunning, Doug Kruhm

Staff Present: Dr. Chuck Bishop, Clarke County Public Schools Superintendent; Chris Boies, Clarke County Administrator; Felicia Hart, Director of Economic Development and Tourism; Brandon Stidham, Director of Planning and Zoning; and Brianna Taylor, Deputy Clerk to the Board of Supervisors

Others Present: Robina Rich Bouffault, Keith Tubandt

A. Introductions

At 2:02 pm, the meeting was called to order. Committee members introduced themselves. Chris Boies explained that Felicia Hart is in attendance because broadband was shifted to fall under Economic Development, and she will be the point person for the project.

B. Selection of Chair

Chris Boies opened the floor for nominations of Chair for 2020.

Bev McKay, seconded by Dr. William Houck, moved to appoint Doug Lawrence for Broadband Implementation Committee Chair for 2020. The motion carried by the following voice vote:

Buster Dunning	- Absent
William Houck	- Aye
Doug Kruhm	- Absent
Doug Lawrence	- Aye
Bev McKay	- Aye

C. School Update

Superintendent Chuck Bishop gave the following update:

- When the Broadband Implementation Committee was initially formed, Dr. Bishop had many discussions with a previous member, Robina Rich Bouffault, to help the committee by pinpointing locations of students in the school district without access to internet service.
- The first year this was discussed, there were well over 200 students without broadband internet access.
- The most recent data collected last fall, there were 199 students and 119 households that did not have access to broadband internet. We are serving different families now than when discussions of internet access first came up.
- March closure forced the schools to shift to an online model within a few weeks of the Governor's mandate; this was not very robust. There were some online, face-to-face instructional opportunities for students, mainly to complete programing responsibilities and requirements. There were also virtual conferences with guidance counselors and other school employees, but in terms of face to face instruction, that was not the case.
- Primarily students were learning and doing work that supported what the teachers had already taught, with some new material mixed in.
- Dr. Bishop, on July 22, 2020, received an estimated 200 emails that were meant for the School Board regarding the lack of reliable broadband internet in the area. Dr. Bishop passed those messages along to the School Board as he is not a voting member but wanted them to have all the information he received.
- Included in the 199 students and 119 households, those numbers include some folks with dial-up access, specifically looking at those without access to broadband.
- Brandon Stidham inquired if, in the survey, families were asked if they had access to Comcast but chose not to have it? Dr. Bishop responded that information was not explicitly requested.
- Felicia Hart inquired as to how the survey was done? Dr. Bishop responded it was an online survey with part of the online enrollment process, not a stand-alone survey, so he feels very confident of the data collected.
- Bev McKay voiced most would have to do a WISP. That service is not the most reliable because when it works, it works, but when it doesn't, it doesn't. If people know which options are closest to their homes, they would know who to call to get the best possible service.
- Johnson-Williams Middle School was made into a public hotspot location this past spring. Through the foundation and monies set aside in Dr. Lewis' name, the school was able to purchase hotspots. Still, it is essential to remember those are

- not always reliable in many locations. If there is poor cell service, then there will be poor hot spot service too.
- CAGETS are specific educational hotspots through a company that works primarily with schools and filters through Verizon.
 - Buses could be configured and used as a hotspot location around the County.
 - Cell Providers do not work in all areas.
 - There are fewer people in the White Post area that indicated they do not have access to reliable internet; that could be because some have graduated out of the system.
 - Brandon Stidham stated if Comcast is available in certain areas, it may be less monthly cost than the WISP due to installation costs and higher costs for the bandwidth needed for distance learning.
 - Chris Boies though no decision has been finalized, we know there will be some learning at home, but what speeds will they need? Dr. Bishop replied that students would need to be able to live-stream, download, and upload assignments. Two models are being presented; one is a hybrid two days of in-person learning per week, and three days learning virtually (independent practice), the second is all virtual learning. In either case, there will be some downloading and then in classes virtually with teachers.
 - Chris Boies requested clarification that poor or slow service would not be helpful. Dr. Bishop, yes – with the Chrome books, you can download the assignments from a hotspot location, such as Johnson-Williams Middle School, then come back and upload once complete.
 - Bev McKay asked if Boyce could become an access point. Dr. Bishop - yes, also looking at that and possibly Blue Ridge Fire Company for those living on the mountain. There are some options.
 - Felicia Hart inquired how the teachers know what the status of assignments for their students is. Dr. Bishop stated that children in grades six (6) – twelve (12) have a school-issued Chrome book. The school has issued more devices. Once students upload their assignments, that is how we know the work is being done.
 - Some of the students did not have devices, whether it be parents didn't have multiples to dedicate to their child while also working from home or none in the home period. The next step will be addressing this issue.
 - Brandon Stidham asked if the school has purchased any Chrome books that came with a cellular card. Dr. Bishop looked into those but are back-ordered through half a dozen different vendors.
 - Robina Rich Bouffault asked to speak – She noted that Brandon Stidham had worked hard to create a map with the existing towers. Could the school make a comparison by pinpointing what areas of families without access and mapping that against the map of the current towers? We would have a visual of the worst service areas compared to students' needs. Dr. Bishop indicated the information

had to have been sent to County Administration. Chris Boies said we have not yet added that data to the GIS mapping but will, and noted, the data was sent to Comcast to see if they would have an interest in working with the County.

- Bev McKay maintained citizens need to be in contact with all WISP providers to see if they could be of assistance. Just because one or two say they can't help doesn't mean someone else couldn't. The number and locations of towers are always changing.
- Chair Lawrence asked if any of the teachers had any problems this past spring. Dr. Bishop detailed there were a few teachers that had issues and had to be allowed into the building to be able to assist the students.
- Chair Lawrence was hopeful we could be of some help once we figure out the next course of action. Dr. Bishop thanked the Committee and recognized this is a problem not just for the schools but for the entire community.
- Chair Lawrence suggested having an open house to show the community the work that has already been completed on this project. There could be a round table discussion on the users and how it works. Would the school be available to use one evening for something like this? Dr. Bishop agreed and stated they would help in any way possible on this issue.
- Chair Lawrence felt it was essential to explain technology in laymen's terms. Helping the community understand their obstacles and making people aware of different ideas and what else can be done for them.

Dr. Chuck Bishop left the meeting at 2:27 pm.

D. Approval of Minutes

The Approval of Minutes was tabled until the next meeting.

E. Committee History & Orientation for new members

Brandon Stidham gave the following report:

- The Planning Commission had always had a committee working on telecommunication issues.
- There was a small committee of three (3) when Brandon Stidham first started that came up with the original amendment to our zoning ordinance to let owners put up a structure to facilitate wireless internet. That committee went by the wayside a few years later.
- The need for reforming the committee was brought to our attention from an attorney inquiring if we were complying with the federal mandate for co-locating

- antennas on existing structures. Also, there were other concerns from the industry, specifically, Verizon, about the then-current tower ordinance and matters relating to that ordinance
- The Planning Commission reformed a telecommunications subcommittee to address these concerns. The first thing they did was to address the federal law changes related to co-location. Then, a few years ago, there was an overhaul done to the tower ordinance to go to a more conventional approach to allow towers up to a max of 199 feet with a special use permit. They no longer have to be located within a stand of trees.
 - When moving from the more restricted approach to a more conventional approach, there was a need for a study to identify key locations where these towers could be situated and under what circumstances those would be approved versus what circumstances those towers would not be accepted.
 - The Board of Supervisors authorized a telecommunications/broadband study. The Atlantic Group conducted that survey, and George Cadilliasias served as the telecommunication engineer.
 - The most important part of the study was the development of a map of existing towers put together by The Atlantic group, who also provided recommendations for new towers. The Study, Permitted Communication Tower Development Areas, provided a map of areas where, if a permit were put in for a new tower in or around an area recommended by The Atlantic Group, that would check off a box in the application process.
 - This study also provided many other recommendations in addition to changing the zoning ordinance. The Board of Supervisors formed this committee, Broadband Implementation Committee, which includes two members of the Board of Supervisors, and two (2) members of the Planning Commission.
 - One of the first projects this committee had was to issue the request for information from different industry providers to meet and discuss the challenges in expanding broadband in the County.
 - In 2017 a round table with wireless providers, Shentel, Verizon, and New Moss who came to talk about what the County can do to help to remove barriers to help providers better serve the County.
 - Besides networking and getting to know the appointed contact for each group, the only substantive action was the WISP wanted the flexibility to allow small-scale support structures by right; structures that leave a small footprint as opposed to a large scale tower. These structures can also be used for more connection with neighbors.
 - Since the ordinance went into effect, Brandon Stidham is aware of two (2) structures that have been built, looking for others to take advantage of that.
 - The Broadband Committee met last year with representatives from Rappahannock Electric Company (REC), which was prompted by the Central Virginia Electric Cooperative (CVEC). CVEC created a spinoff company, Firefly, to

- provide its "Fiber to the Home" program of its customers. Clarke County inquired with REC to see if there were similar plans. Last year REC had plans to update its Microwave Point-to-Point Network with a full fiber network for its internal use. REC had an interest in being Middle Mile Providers but, as of last year, were not interested in being Last Mile Providers, the one who hooks fiber up to the homes.
- In December, the Broadband Implementation Committee met with the president of VisualLink, who came to demonstrate a new project called Tower Beam. Tower Beam is a stand-alone device that can better connect to their wireless access points through just about everything except topography. During the demonstration, a device was set on the table, which was able to get a signal in the direction of the ridge without the use of external antennas. We've not heard from any current customers that use this method so far, so we can see how they work in real life.
 - Chair Lawrence inquired as to whether Firefly is a co-op? Brandon Stidham indicated the charters for the Electric Cooperative do not allow them to be direct providers of internet service because they are charged with running an electric service. They created a subsidiary to do the broadband for the home. REC staff if, in the future, they will look at that to use.
 - Bev McKay voices his opinion that the elect co-ops that own the poles make it difficult for other providers to use the pole because of the high fees associated with them.
 - Robina Rich Bouffault detailed they charge a fee to have a cable put on their poles. Shentel and Comcast have wires on the poles from Route 522 to VA Route 7. It's a question of making a profit for the WISP companies. We have a low population, so it's not worth their while to spend money on expensive fiber for so few customers.
 - Chair Lawrence read in legislation and code regarding the cost associated with the installation of wires and the transparency needed. Robina Rich Bouffault agreed they are not very transparent.

Chris Boies provided a brief update on provider communications:

- Chris Boies reached out to Shentel, Comcast, Rappahannock, and a few others.
- Rappahannock has been very responsive. From the discussion with them, they have preliminary plans to provide backbone infrastructure into the County. The County then has to decide to extend that further.
- Shentel was also very responsive. They indicated an interest in providing broadband to Clarke County as we are an "untapped resource." It is important to note that Shentel is known for working in rural areas and areas with low population density and has made a name for themselves.
- We have continued conversations with Comcast regarding a VATI grant. We submitted the letter of intent for Wildcat Hollow. Comcast has not yet gotten

back to Chris Boies as to whether they are interested in that project or not. We will follow up with them to see if they made a decision.

F. Discussion of Study Update

- Chair Lawrence asked whether Mr. Condillias is still available; Chris Boies confirmed that the study allows for him to be on call without a further procurement process. Thought that if we looked at updating to put a new end date to get a better chance at grants, Chair Lawrence feels it would be great to see what he says.
- Bev McKay pointed out the topo has not changed, but technology has. Mr. Condillias may be able to help us some without it costing more money.
- Brandon Stidham also believes this was done before the VATI program came out.
- Chris Boies getting prepared for VATI should be happening well in advance of the actual due date.
- Chair Lawrence asked if Mr. Condillias would be available to address any questions should an open house be conducted. Brandon Stidham and Chris Boies expressed confidently he would be open to that.
- Brandon Stidham stated WISP providers were not interested in doing the leg work themselves to build those neighborhood networks. If the homeowner is involved and is willing to go door to door, then the WISP providers would be agreeable to set something up.
- Brandon Stidham stated the towers were not the problem. The WISP providers spoken to in the past have said if four to six neighbors came together and all would sign up, you as a homeowner could then go to the providers who can then do cost a cost analysis.
- Chair Lawrence inquired into the current tower height limits for residents of Clarke County; Brandon Stidham responded it depends on if it is free-standing or attached to a structure for support, and what zoning ordinances are in place for the requested tower location.
- The cost of building a tower depends on the height and width of the structure. The maximum footprint for a tower is eight (8) feet across and would have to be connected to power. There is permitting associated with it as well. Guestimates discussed during the meeting into the cost of building a tower is a few thousand dollars.
- Chris Boies clarified part of our issue is how to fix the problem of the private sector not being responsive? How much should the local government be involved?

- Brandon Stidham made a point that the advice given in 2015 by the Center for Innovative Technology, Clarke County needs to find a dependable, reliable industry partner to go through this. Are any of these partners ones Clarke County would consider partnering with?
- Bev McKay opined the problem is that all have a lot of customers and a lot of work.
- Chair Lawrence stated that 58 of 62 localities that are eligible for the VATI Grant are applied for, so that means we are not the only ones in this predicament; the entire country is.

Bev McKay moved for Chris Boies to look into the study update options and the costs associated and report back to the Broadband Implementation Committee.

- Chair Lawrence likes the idea of hosting an open house to provide options for the community to hear what the County is working on concerning broadband. Host this type of event in a large location, such as a school auditorium. Invite providers to hand out information to citizens.
- Bev McKay reminded this would have to follow Social Distancing guidelines though he is a bit leary of doing this during Covid-19. It is a great idea, though.
- Chris Boies stated we need to set the expectations with the agenda, so homeowners know what information is going to be provided; we can find a way to hold something.
- Dr. William Houck suggested holding the event outdoors.
- Chris Boies stated there would be a craft fair at the park so we can have an idea of how an outdoor event would possibly work. There isn't a presentation happening, but the setup and distancing would be able to be tested.
- Robina Rich Bouffault said the new high school seats roughly 400.
- Bev McKay suggested the Fair Grounds as a location option.

By consensus, all members agreed for staff to get more details and look into options doing an open house event.

G. Virginia Telecommunications Initiative (VATI) Update

- Rural Digital Opportunity Fund is similar to the VATI grant- have to fall within a certain census block, but Chris Boies does not believe Clarke is eligible for that funding.
- Chair Lawrence voiced that maybe other regions would help Rappahannock qualify.

- Chris Boies clarified that the State sees this as a way to get this done. General Assembly may reconvene on August 18, which could provide more options for Broadband.
- Chair Lawrence mentioned the fact that the Board of Supervisors has set aside CARES Act funding of 100K to see what we can do. Chris Boies said we might be eligible to use those funds, but the way the rules are worded is that it needs to be a specific problem from COVID-19. Chair Lawrence inquired whether adding a WISP to create a hot spot would qualify. Chris Boies stated a permanent infrastructure would serve the long term, not just the needs during the pandemic; we are not sure how they will look at something like this. If we proceed and then find out we shouldn't have used the funds for that, we would have to pay the money back.
- Chair Lawrence questioned in previous years how much discussion was done about the "lemon" spots and putting towers there to improve the service; how was the grant opportunity for White Post found? Brandon Stidham indicated that Comcast approached us. We have one potential scenario on creating a County wide tower network; it is driven heavily by rooftop installation. There has been only one application from Mt. Carmel Road to replace a new tower from short to taller, which was ultimately denied. We do not see an interest in coming into Clarke County because of our population density.

H. Next Meeting

To Be Determined

- Brianna Taylor will reach out to all members and determine a date for the next meeting.

I. Adjournment

At 3:11 pm, Chair Lawrence adjourned the meeting.

Minutes Recorded and Transcribed by Brianna R. Taylor and Tiffany R. Kemp

GO / NO-GO

IS RETAIL BROADBAND RIGHT FOR YOUR CO-OP?

A comprehensive look at key considerations
when deciding on a high-speed internet project



Inside

Business Models
Dark Fiber
Middle Mile
Federal Money
VoIP
and more

The FCC is investing more than **\$20 BILLION** in rural broadband

Join the leading Rural Electric Cooperative RDOF Consortium

OUR PROCESS IS PROVEN

In 2018, the FCC awarded **more than \$186 million** in broadband funding to a consortium of electric cooperatives to build out gigabit- capable networks. It was the **largest and most successful** bidding consortium in FCC history- one assembled, designed and led by Conexon.

Contact us to find out how much funding will be available in your service territory.

Cooperative Funding Success Story

East Central Oklahoma Electric Cooperative (ECOEC) was one of the members of the Rural Electric Cooperative Consortium, which bid in last year's Connect America Fund II auction. Conexon prepared a full business plan for ECOEC, projected that the co-op's fiber business would break even in its eighth year, and calculated the potential impact of the CAF II auction. The board elected to make a decision on the fiber project after the auction. Conexon qualified ECOEC to bid, designed the bidding strategy, and placed all the bids in the auction, which secured over \$22 million for ECOEC. That funding improved the co-op's fiber project breakeven point from the eighth year to the first year, and the board voted to move forward to build fiber-to-the-home to 100% of its members. The project is on schedule, under budget and will be profitable in its first year of operations.

"Conexon knows how the auction works, which meant we didn't have to learn all of the aspects. All the legal and advisory services were part of the process with Conexon. It was nice not having to worry about the mechanics of the auction, Jonathan Chambers and the team knew how it works, so there was no learning curve. Had we done it by ourselves, I'm not sure we could have gotten our paperwork ready and participated, given our late start. As a result of having a feasibility study both pre-auction and post-auction, it was made clear to us that the win will allow us to cash flow in one year. We will not be subsidizing on the electric side."

Tim Smith, General Manager
CAF II Award: \$22.2 M



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WELCOME TO THE *RE MAGAZINE* SPECIAL BROADBAND INSERT

Electric cooperative broadband is an ever-present topic lately. Not only are co-ops building it or studying it; over the past few years, government agencies, politicians, community leaders, and the media have increasingly recognized the potential of co-op-provided broadband to bridge the digital divide.

It's a testament to the strong community focus and problem-solving that have defined co-ops since the beginning.

But is retail broadband right for *your* cooperative?

It's a question that any co-op leaders with unserved or underserved members are likely pondering.

In this special broadband insert, our focus is presenting the key considerations for making a go/no-go decision on broadband. Each article and graphic is aimed at helping you strategically assess the many issues at play. Links and referrals will guide you to more in-depth information online.

As my colleague Brian O'Hara says in our lead article, "The [broadband] equation is far from straightforward." I hope you find this content both informative and useful.



Scott Peterson
Senior Vice President-Communications
NRECA

TABLE OF CONTENTS

Go/No-Go A2

The story of two neighboring co-ops whose unique circumstances led them in different directions on providing retail broadband.

Business Models A4

A look at the many business options available when considering a broadband project.

Milestones A6

A walk-through on key steps and decision points on the path to broadband.

Middle Mile A8

G&Ts are stepping up to make long-distance connections between data hubs and co-op territories.

Dark Fiber A10

Excess fiber capacity can be leveraged in different ways to offset costs and increase revenue.

VoIP A10

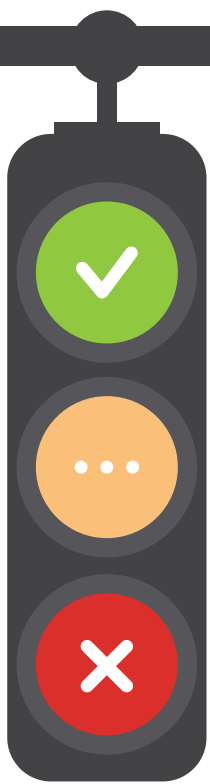
If you're taking certain federal broadband money, you'll need to have a voice over internet plan.

Federal Money A11

A list of federal programs offering loan and grant money for rural broadband.

Glossary A12

Key broadband terms.



GO

Making the right decision on broadband for your co-op
By Cathy Cash

NO-GO

Less than 25 miles separate them, but two small rural electric cooperatives in Southeast Virginia are a world apart when it comes to internet access and all the opportunities it brings.

Electric cooperatives across the country have taken up the cause of rural broadband, finding ways to provide high-speed, reliable access to their communities when no other provider would. Dozens have already begun build-outs. Hundreds more are considering it.

But for all the value co-op broadband brings, making the “go/no-go” call can be complicated. Essential factors like calculating total cost, state laws and regulations, financing options, geography, available technology, member interest, pricing, and actual take rate can quickly muddy what might at first seem like a simple business decision.

“The equation is far from straightforward,” says Brian O’Hara, NRECA’s senior director of regulatory issues for telecom and broadband. “A co-op has to meticulously look at all the factors individually and in relation to their own unique situation.”

What follows are the stories of two Virginia co-ops that took divergent paths on providing retail internet access.

PRINCE GEORGE ELECTRIC COOPERATIVE: ‘THEY ASKED FOR THIS’

It began with a goal and a partnership. And a lot of money.

Prince George Electric Cooperative (PGEC) wanted to deliver broadband internet access through fiber-optic cable to every member in its Southeast Virginia service territory.

Leaders in Prince George County believed in the co-op’s vision and, in 2017, provided \$1 million for a pilot program to connect 500 members by 2021.

PGEC got the job done two years ahead of schedule.

More government partnerships emerged with more grant money, and the co-op solidified its decision to step into broadband. Now its subsidiary, RURALBAND, is well on its way to delivering the highest internet speed available to its rural members.

“We are building a fiber network like we did electricity 80 years ago: Start in a core location and build out to central points to serve everybody,” says Casey Logan, president and CEO of the 12,000-meter co-op based in Waverly, Virginia.

“As more members came on, we

were able to take electricity farther and farther out to rural areas to have everybody served in 1950s. With broadband, we’re going to do it in four to five years versus 20.”

Logan, the co-op’s chief engineer during the pilot, recalls how PGEC helped spotlight the need for rural broadband at a 2018 gathering of 200 state legislators, members of the governor’s cabinet, and state agency officials.

In the Prince George Central Wellness Center—an early recipient of the co-op’s broadband service—PGEC livestreamed Ted Raspillar, president of John Tyler Community College, 20 miles away, as he spoke on the importance of broadband to rural America.

Raspillar talked about “the opportunity to bring education to rural America, to bring certification training to firehouses and in public buildings, and how that would allow students to acquire degrees much closer to home,” Logan says. “That seemed to spur a lot of energy on how electric cooperatives could meet the needs of our communities, where no other solution has been provided.”

After the meeting, more funding followed, and PGEC prepared to expand fiber-to-the-home service across its electric service territory.

Sussex County and the Virginia Tobacco Region Revitalization Commission gave RURALBAND a \$1.2-million grant in 2018 to connect 500 homes. This year, Surry County offered \$1 million over two years to hook up 500 homes by 2020.

PGEC also won \$15.4 million from the Connect America Fund II (CAF), a Federal Communications Commission (FCC) program that incentivizes broadband providers to serve specific rural areas. The 2018 CAF auction was the first time the FCC opened the fund to electric co-ops, and 32 co-ops won 35 bids, securing more than \$250 million over 10 years.

“We were one of the fortunate winners in Virginia as far as the

CAF auction goes,” Logan says. “We are very excited about this project and look forward to serving the community and our members.”

The co-op’s foray into broadband began with a fiber-optic backbone network for communications among its substations. RURALBAND leases unused bandwidth, or dark fiber, from this loop and connects it to a “middle mile” built by a state and private consortium that links to the internet through a data center in Ashland, Virginia.

RURALBAND plans to deliver broadband to all PGEC members even though the co-op averages between four and eight meters per mile.

“It’s the electric co-ops being put in a situation to create opportunities for rural America, just like the Rural Electrification Act” of 1936, Logan says. “Eighty percent of our members have no high-speed option available to them. Our members need this. They asked for this. Our response as the electric co-op in their community is to give it to them.”

COMMUNITY ELECTRIC CO-OP: OVERWHELMING COSTS

For Community Electric Cooperative (CEC), the decision to forego providing broadband came down to dollars and cents.

The estimated cost of deploying high-speed internet access to unserved members was too high to justify CEC’s investment, says Jonathan Thompson, chief operations officer at the 11,000-meter co-op, tucked in bustling Tidewater, Virginia.

“We operate in a somewhat conservative mindset when it comes to utilizing members’ money,” Thompson says. “When we plugged the [operations and maintenance] costs in, it was too much to recover considering the volume. That ultimately set us on the track of not doing it.”

The co-op serves the suburbs of the state’s largest urban centers: Virginia Beach, Norfolk, and Hampton Roads to its east and Richmond, the state capital, to its north. Many sprawling new neighborhoods there get their broadband from national, for-profit providers. Only the most rural or remote members lack an internet connection.

But when Isle of Wight County inquired if the co-op could bring broadband to its unserved residents, CEC put pencil to paper and began a feasibility study.

The co-op had been eyeing the progress of other electric cooperatives deploying broadband. It considered a hybrid model that would run fiber across its overhead electric system, build fiber to the curb and then shoot wireless “last mile” connections for residential areas in its service territory.

The price tag for Isle of Wight broadband came in at \$11.2 million, and a “rough extrapolation” for CEC’s entire service territory reached \$35 million to \$40 million, Thompson says.

“We would have had to build out five to 10 miles to get to the first customer,” he says. “That was going to cost quite a bit.”

And those costs skyrocketed when factoring the region’s low density.

CEC determined that 18 percent of the county’s population was without internet access. It then applied the national average take rate for broadband of 29 percent.

“We had 900 people we felt confident would pay for the service,” Thompson says.

Even if the co-op picked up more subscribers along the way, the take rate would remain below 2,000, he says. At that level, subscribers would have to pay \$250 per month for “the bare bones cost of service” and getting the equipment up and running.

“From a business standpoint, the return on that was going to be very thin,” he says. “At \$250, there is no

way the take rate would be 29%. It would be a lot lower.”

The wireless equipment the co-op was considering would have met the FCC’s minimum requirements for broadband—25 megabits per second (Mbps) to download data and 3 Mbps to upload. But running 100 percent fiber would have been prohibitive.

“We don’t have a clean connection in our service territory to connect our substations” with fiber, Thompson says. “The cost to get through our connection points would be very expensive.”

Further, Thompson explains, CEC’s “chopped-up” service territory would complicate a broadband build-out and add costs for negotiating access to customers of an investor-owned utility and a municipality in the area.

“We would have to cut joint-use agreements [with the other utilities] and pay joint-use costs to go across their territories and get to their customers who fell into the unserved areas,” he says.

The co-op’s research also found that building a fiber network from its facilities to members’ homes would consume about 10 percent of CEC’s capital costs.

The co-op’s board was “in total agreement that we couldn’t risk that volume of money with such a high retail rate number and for such a low rate of return,” Thompson says.

For now, CEC is keeping an open mind for delivering rural broadband. If prices fall on technology and equipment to get the job done at less cost, the co-op would reconsider taking on the task, Thompson says.

In addition, CEC would “happily partner with anyone willing to own the risk,” such as neighboring co-ops or incumbent providers.

“We are shutting the door for now, but if anything changes with the calculations, we definitely will be interested in exploring it again,” he says. “But until we see a drastic change, we are done.”

ELECTRIC CO-OP BROADBAND BUSINESS MODELS

By Cathy Cash

Electric cooperatives entering the retail broadband space have experimented with business model options, which vary according to state law and local circumstances:

Wholly owned, for-profit subsidiary

- Electric co-op owns the fiber assets and network and leases them to a subsidiary, or a subsidiary owns the fiber and leases access to the parent co-op to support electric operations.
- Subsidiary operates the fiber network and delivers communication services to members.
- Subsidiary collects payment from broadband service subscribers.
- Net profits from broadband service are allocated to electric co-op members as capital credits.
- Subsidiary has its own manager, engineers, and other staff, including customer service professionals. Some staff may be shared with the parent company, requiring the proportional allocation of cost.
- Depending on state law, firewalls may be required to prevent anti-competitive activities.

Not-for-profit subsidiary

- Co-op owns the broadband network, assets, and other infrastructure or the fiber is owned by the subsidiary, which leases access back to the co-op to support electric operations.
- Staff hired to deliver broadband services are employees of the electric cooperative.
- Subsidiary generally begins operations with a focus on serving customers within the co-op's service territory.

Operating division of the cooperative

- Co-op owns the broadband network, assets, and other infrastructure.
- Some co-op employees' duties span both electric and broadband businesses.
- Electric and broadband divisions generally require separate accounting records.
- Marketing the broadband business to co-op

members may be simplified, given the established relationship between co-op and members.

- Broadband take rate may be higher based on members' established relationship with the co-op.

Acquire or partner with an existing internet service provider (ISP)

- Electric co-op acquires a local ISP. Partnerships take several forms, including entering a managed services agreement, fiber/asset swap, one entity handling customer service, or creation of a new entity as a joint venture.
- May quickly expand broadband build.
- ISP brings internet network assets, expertise, and services, such as fiber, circuits, data center colocation, VoIP, design, and implementation.
- May reduce risk of co-op entering broadband business.
- May facilitate gaining non-member broadband subscribers.

Certified competitive local exchange carrier (CLEC)

- Electric co-op spins off a CLEC that will deliver broadband to its territory and beyond.
- The CLEC may be regulated by the state and Federal Communications Commission (FCC).
- The CLEC may be designated as an eligible telecommunications carrier and qualify to seek financial support from the FCC and certain universal service funds.

Some state laws prohibit cross-subsidization between entities or lines of business. For all business models, cross-subsidization should be avoided. NRECA recommends that co-ops work with their attorneys and tax professionals to determine the business model that works best for their systems.

For more information on electric co-ops in broadband, see NRECA Broadband: Co-op Case Studies at cooperative.com/programs-services/bts/Pages/Broadband-Co-op-Case-Studies.aspx.



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Broadband Decision Milestones

Many elements go into a co-op's decision on whether to provide broadband to its members. Below are examples of significant due diligence milestones.



1. Initial research

- Senior leadership launches research on technology options, potential community partners, business model, etc.
- Discuss findings.
- Senior leadership and board make a decision to move to the next step or halt the process based on the findings.



2. Survey members and other stakeholders on whether they want broadband access

- Hold public discussions with members and community leaders on the topic at annual meetings and other venues.



3. Legislative and regulatory assessment

- What do state laws and regulations say about co-ops providing broadband? Do co-ops have the authority? Is a separate entity required?
- If state law needs to be changed to allow co-ops to pursue broadband, when could that occur?
- Do easements need to be updated, renegotiated, or overhauled to allow the hanging of fiber or allow the use of excess capacity for broadband purposes?
- Do any co-op governance issues stand in the way or need to be addressed? A co-op might have to change its articles or bylaws to conform with state laws.



4. Feasibility study that will inform the board's decision by providing information in key areas

- Project cost.
- Schedule to complete total build or each phase.
- What is the expected number of initial subscribers? What is the critical mass needed to cover the cost of providing broadband?
- Are there other broadband service providers in the area? If so, what are they offering in terms of speed, technology, and pricing?
- Which federal or state grants or loans are available for broadband?



5. Determine the appropriate business model

- The co-op should decide how it will build its broadband business from various models, as permitted by state law. Some options are:
 - Spinoff subsidiary to build the network.
 - LLC.
 - Partnership arrangement with a telco, another electric co-op, or other business partner.
 - All within the co-op.
 - Co-op deploys fiber and leases to subsidiary to do fiber-to-the-home or wireless.

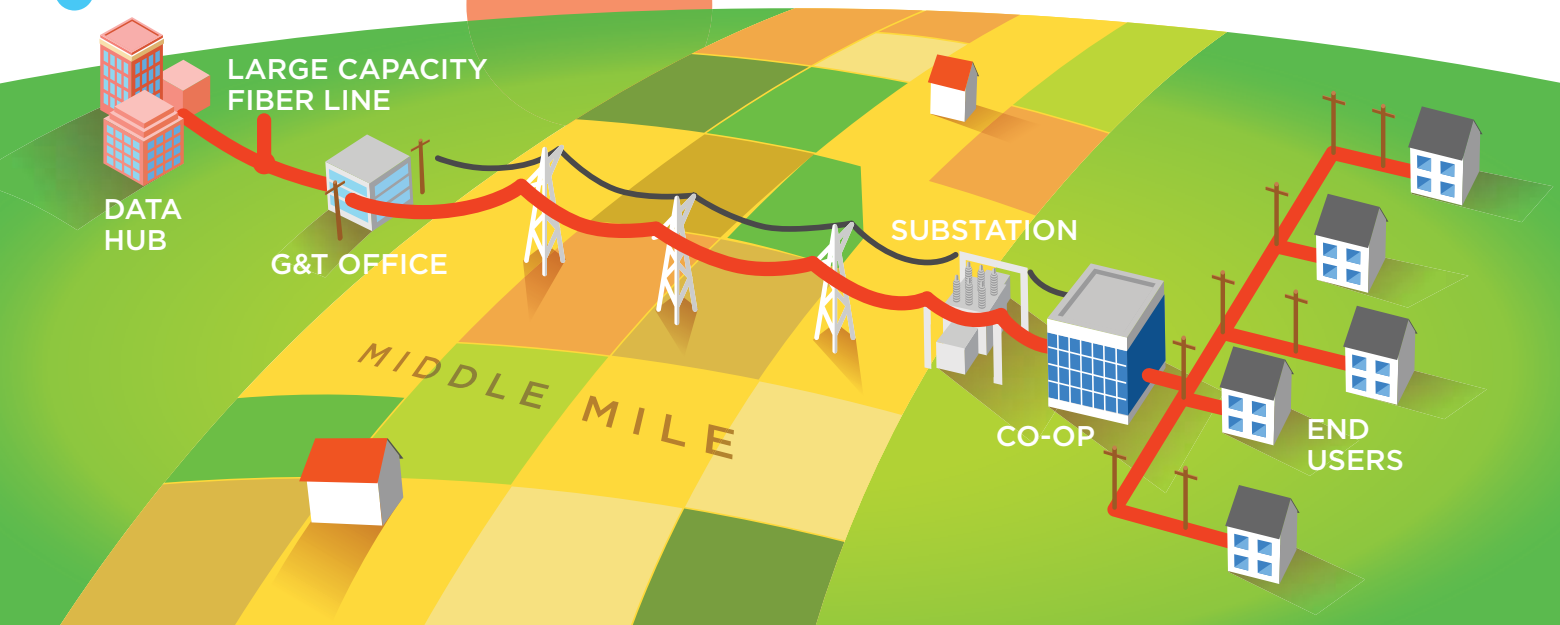


6. Board of directors vote on whether the co-op should pursue broadband

- After initial approval, more decisions are necessary:
 - Conduct another feasibility study on the business model, structure, and cost updates.
 - Determine network design.
 - Select vendors for voice and video.
 - Select contractors for hanging line and building the network.
 - Hire additional staff for a subsidiary or in-house broadband business.
- The board might need to consider other issues after ground is broken:
 - Phases of construction, allocation of funds for fiber and equipment.
 - Decisions to ensure the co-op is not overleveraged with broadband.
 - Network design changes or updates to the build-out plan based on the first phase of deployment.

THE MIDDLE MILE

G&Ts use their resources to make long-distance connections
By Cathy Cash



When Sho-Me Power Electric Cooperative began building an ambitious fiber-optic backbone in the early days of the internet, becoming a “middle-miler” wasn’t necessarily part of the plan.

But once the Marshfield, Missouri-based G&T finished connecting its 150 substations and nine member co-ops in 1996, the co-op’s leadership began seeing an interesting trend: A high-speed communications network provides enormous value to a rural area.

“People have to be connected outside their service area for internet or phone service,” says Mark Keeling, Sho-Me Power’s chief technology officer. “That’s where the middle-mile guy comes into play.”

A middle-mile provider is a critical part of the internet equation, linking internet service providers that serve homes and businesses with the hubs that allow access to the web. In rural regions, middle-mile connections between end users and a data hub can cover hundreds of miles.

More and more, G&Ts with fiber backbones are making those connections.

In 1997, Sho-Me Power launched Sho-Me Technologies, a for-profit subsidiary to build and operate its fiber assets. Today, the company manages 8,000 miles of line

that connects co-ops as well as telecom companies, hospitals, banks, courthouses, schools, and large industrial clients that pay leasing fees to access the co-op’s network and reach data hubs in St. Louis and Kansas City.

Wabash Valley Power Alliance (WVPA), the Indianapolis-based G&T, took a different middle-mile tack.

When it decided to improve communications with its member distribution co-ops in 2016, it contracted with Intelligent Fiber Network (IFN), an established middle-mile provider. IFN built a private network for the G&T and its member co-ops in Indiana, Illinois, and Missouri.

In April, WVPA became a part owner of IFN, a move that will decrease costs for the G&T and its members as the company monetizes the co-ops’ available fiber. Of the 23 co-ops WVPA serves, half have an internal fiber communications system and half of those are developing fiber-to-the-home.

“It’s all about the opportunity,” says Gregory E. Wagoner, WVPA executive vice president. “As a G&T, we are not going to get into the broadband business; we’re not going to take fiber to the home. As a G&T, we hang fiber on facilities. IFN can help maximize that facility for us and our distribution co-ops. We found a real benefit from middle-mile.”



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DARK FIBER

Dark fiber.

It's an ominous-sounding concept with a potential bright side.

When utilities build a fiber backbone to enable high-speed communications on their system, there is often excess capacity in the network.

These unused, or "unlit," fibers may offer a valuable business opportunity to the network owner.

"In certain parts of the country, particularly rural areas, companies that need access to a high-speed connection would much rather pay to lease space on your

network than build their own infrastructure," says Russell Tucker, NRECA's chief economist. "Leasing dark fiber is a way to possibly defray costs for a fiber-to-the-home buildout."

Such arrangements can be made with communications companies looking to extend their networks or build in redundancies or with small companies and universities who want to create a private fiber network.

Fiber backbone owners can command upwards of

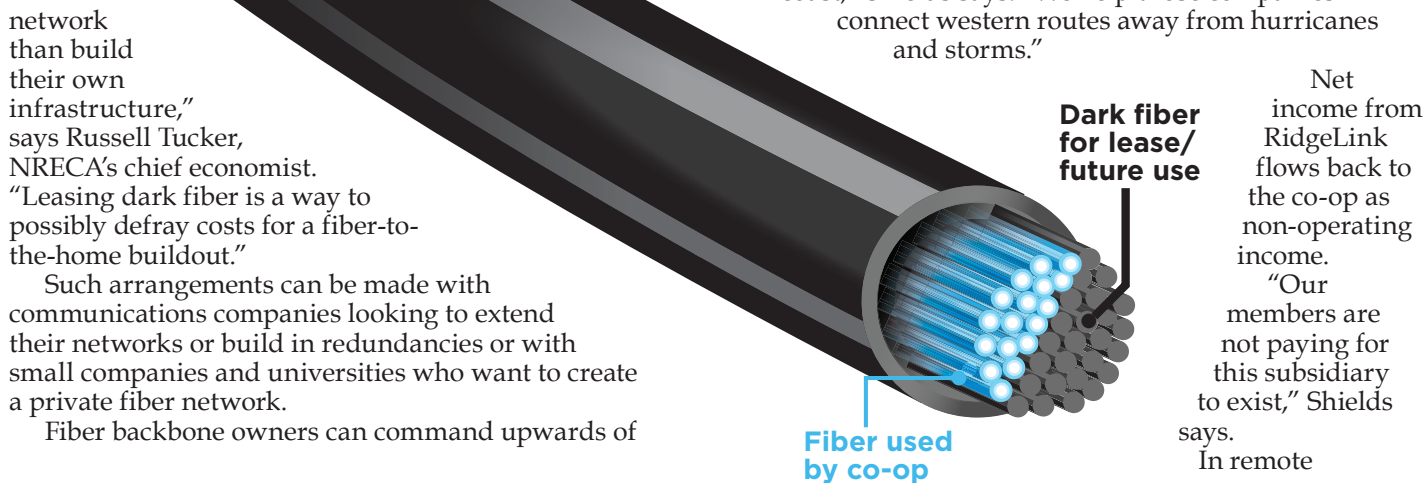
\$200 per mile per strand, according to industry experts. Leasing agreements generally have a flat rate and a 20-year term.

Blue Ridge Energy has been in the dark fiber business since 2001, when AT&T Wireless (then Cingular) paid to have the co-op build fiber to a cellular system in its mountainous North Carolina territory.

"Being in the mountains, it's a very difficult area to build in, very expensive," says Brad Shields, COO of the co-op's RidgeLink business. "We have the expertise to build because we have been here so long."

In 2009, the Lenoir-based co-op launched RidgeLink LLC, a for-profit entity to meet increasing dark fiber requests from large telecom carriers. Today it owns roughly 450 miles of fiber-optic line—totaling about 110,000 strand-miles—through northwest North Carolina and northeast Tennessee, inside and outside of the co-op's service territory.

"Big carriers have eastern routes that roll along the coast," Shields says. "We help those companies connect western routes away from hurricanes and storms."



VoIP: WHAT TO CONSIDER

By Cathy Cash

Electric cooperatives that pursue funding from the Federal Communications Commission (FCC) to build retail high-speed internet access are required to also provide telephone service for their territory through the broadband network—known as Voice over Internet Protocol, or VoIP.

Experts caution that entering the voice service business requires a great deal of planning and analysis. There are regulations to consider as well as equipment and systems interoperability and operating procedures to accommodate.

But if done right, it can be a profitable venture, says Terie Hannay, senior vice president of planning and integration at NRTC, the National Rural Telecommunications Cooperative.

"It can be a high-margin product that does not require

significant capital to launch," Hannay says. "But it does require regulatory and operational support."

Here are some key steps for electric co-ops to consider in planning for VoIP:

1. Conduct an analysis on federal and state regulations

- Although federal telecommunication regulations may be constant, state regulations may vary and change.
- Be clear on state oversight requirements, such as 911 call routing, universal service fund fees, and customer service standards.
- Learn what filings with federal and state agencies are required.

2. Determine a business model

- Partnership with a neighboring telephone cooperative or company.
- Pay to brand (or white-label) a third party's VoIP

ER Leveraging unused broadband capacity

By Cathy Cash

Northeast Iowa, Allamakee-Clayton Electric Cooperative has formed a successful dark fiber partnership with a local telephone company.

The co-op is leasing 9 miles of fiber from Hawkeye Telephone Co. to serve remote broadband subscribers and build redundancy into its network. In turn, the phone company leases nearly 22 miles of unused capacity on the co-op's system to provide an additional path for low-cost bandwidth and add redundancy to its own network.

"Both of us defer construction and duplication of services," says Dan Stelpflug, director of operations, engineering and technology at the Postville-based co-op. "We work together to utilize each other's assets to eliminate capital costs."

Anza Electric Cooperative in California says it will finish its fiber-to-the-home project next year and sees its unused backbone capacity as a business opportunity.

"We still have additional strands of fiber from strategic points that could be utilized," says Kevin Short, general manager of the small co-op based in Anza.

The co-op built about 40 miles of dark fiber into its original communications network. Short says potential lessees include cellular services, an internet service provider, and a large industrial park.

"If someone is looking for a shortcut from one population center to another, that's what we are offering," he says. "We are always going to have substations and field equipment connected along with the members and their internet subscriptions. The dark fiber multiplies the value stream."

FEDERAL BROADBAND MONEY

FEDERAL COMMUNICATIONS COMMISSION Rural Digital Opportunity Fund—part of the federal Universal Service Fund

Program Funding: Up to \$20.4 billion distributed over 10 years

Features:

- Make more rural areas eligible for support
- Areas that will be available can be viewed at <https://data.usac.org/publicreports/caf-map>
- Distributed via reverse auction, much like the 2018 CAF II reverse auction

How to apply:

FCC is seeking comments on rules governing the program. The reverse auction is expected in 2020.

U.S. DEPARTMENT OF AGRICULTURE: RECONNECT

Program Funding: Expected to be about \$1.15 billion

Features:

- 100% loans, 100% grants, and 50/50 combination
- For projects in rural areas lacking "sufficient broadband access"

How to apply:

Visit usda.gov/reconnect. USDA is evaluating applications for the first funding wave. The 2020 funding application period has not been set.

COMMUNITY CONNECT GRANT PROGRAM

Program Funding: Grants from \$100,000 to \$3 million

Features:

- For areas where the entire application area is without service at 10 Mbps/1Mbps
- Minimum 15% matching funds by applicants
- Projects must provide minimum speeds of 25 Mbps/3 Mbps

How to apply:

Visit rd.usda.gov/files/fact-sheet/RD-FactSheet-RUS-CommunityConnect.pdf. The deadline for 2020 has not been set.

service as your own.

- Go it alone.

3. Negotiate the terms and contract

- Fully understand your costs and the division of responsibility when partnering or white-labeling a service. Be clear on who is responsible and at what cost for connectivity to the rate center, which is the local calling area mapped by the telephone company or the incumbent local exchange carrier.
- Consider that 90% of customers want to keep their current phone number and ensure that is part of the agreement in launching VoIP.

4. Implementation

- Draft business processes and procedures to serve VoIP customers.
- Determine services, pricing, packages/bundles, installation and maintenance rules, and operations for

workflow and documentation.

- Work in state and local taxes and required regulatory fees for service such as 911, federal Universal Service Fund fees, etc.
- Develop marketing plans for services.
- Have a plan to advertise and provide Lifeline, reduced phone and internet for qualifying customers, as required by FCC.

5. Testing, training, launch

- Test business and operational support systems.
- Prepare launch support for integration of business and operation systems.
- Train all employees on telecom, VoIP, services, billing, and new workflow.

For more information on VoIP, contact Terie Hannay at NRTC, 386-218-5366 or thannay@nrtc.coop.

BROADBAND GLOSSARY

bandwidth

the maximum data transfer rate of a network or internet connection that determines how much data can flow through your broadband connection. Often referred to as “the width of the information pipe.”

broadband

high-speed internet access measured in megabits per second for downloading and uploading information. The federal benchmark for broadband is at least 25 Mbps download and 3 Mbps upload. State law may also benchmark broadband.

broadband backbone

a high-bandwidth, low-latency data connection composed of fiber-optics and/or wireless technology that connects to critical utility infrastructure forming a communications network.

Connect America Fund II Reverse Auction (CAF II)

the Federal Communications Commission’s reverse auction of money to help make the business case for deployment of broadband or high-speed internet to unserved rural census blocks. FCC opened CAF II in 2018 to electric cooperatives for the first time.

dark fiber

strands of glass fiber within a fiber-optic cable that are not “lit” or equipped to transmit data. Dark fiber unused by a co-op can be leased to internet providers, telecom carriers, or other companies seeking fiber for communications. State law and the language of the underlying easement should be reviewed prior to leasing unused fiber.

data center

a facility for housing computers, telecommunications, information, and storage systems with links to the internet.

fiber backhaul system

intermediate communications links between a broadband backbone and a remote site or network.

fiber-optics or fiber-optic cable

high-performance, high-speed communications network cable encasing strands of glass about the width of a human hair that transmit data long-distance through pulses of light.

FTTH or FTTP

fiber-to-the-home; fiber-to-the-premises.

internet

the global network of interconnected computers that provide users communications, data and information in a standardized format.

last-mile

final broadband connection that provides high-speed internet service from an internet provider to the end-user’s home or business.

latency

amount of time to deliver data between the internet and a device – laptop, smart phone, or computer.

middle-mile

midway broadband connection between a data hub or center and an internet service provider’s network.

Rural Digital Opportunities Fund (RDOF)

the latest version of the FCC’s CAF. Rules are pending for the auction, expected to occur in 2020.

take-rate

the percentage of broadband internet service subscribers for a certain broadband route or network.

VoIP

Voice over Internet Protocol – means by which internet service providers offer voice telephone service through fiber-optics.

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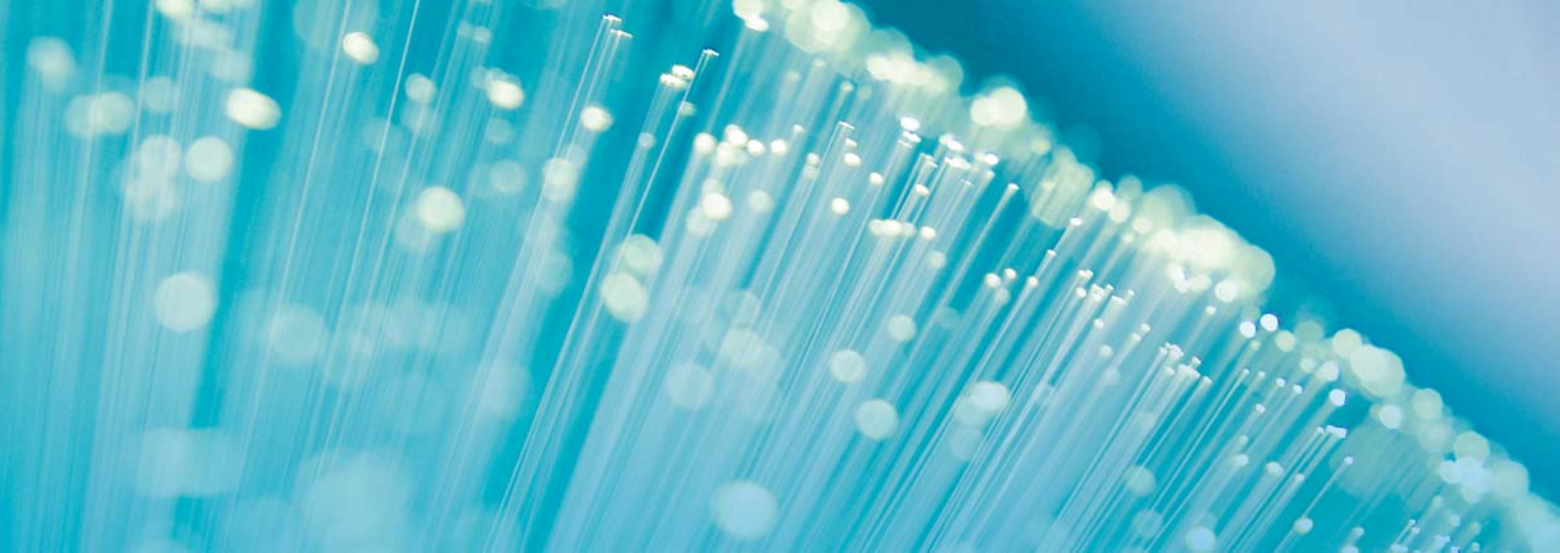
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CHIEF FINANCIAL OFFICER
OZARKS ELECTRIC COOPERATIVE



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Subject : Fwd: Commonwealth Connect Coalition - August Meeting
and

Fri, Aug 07, 2020 02:10 PM

📎 1 attachment

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Felicia

Felicia Hart

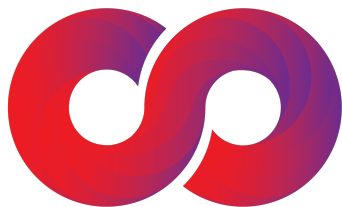
Director, Economic Development and Tourism
Clarke County, VA

101 Chalmers Court, Berryville, VA 22611
fhart@ClarkeCounty.gov
540-277-7567

*"There is no power for change greater than a community
discovering what it cares about."*

Margaret J. Wheatley

From: "kyle rosner" <kyle.rosner@governor.virginia.gov>
To: "Feinman, Evan" <efeinman@revitalizeva.org>
Sent: Friday, August 7, 2020 1:26:59 PM
Subject: Commonwealth Connect Coalition - August Meeting and



**commonwealth
connect**

Commonwealth Connect Coalition Members,

Our next coalition meeting will be on Tuesday, August 25 @ 11:00am. I will send the full agenda in the coming weeks but as always, please let me know if there is a topic you'd like
Broadband Implementation Committee Meeting - August 19, 2020

Page 31 of 40

covered.

August 25 - Commonwealth Connect Coalition Meeting

11:00am - 12:00pm

Agenda to come

Webinar link (video and audio)

- [https://link.edgepilot.com/s/44e92ba2/LRq2iwLG1UOK0hxBa78iZQ?](https://link.edgepilot.com/s/44e92ba2/LRq2iwLG1UOK0hxBa78iZQ?u=https://meet.google.com/viq-dxmr-zym)

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Conference Call (audio) - 413-340-2367 Pin: 993-933-335

Broadband Job Opening:

Join our team! The Virginia Department of Housing and Community Development (DHCD) is seeking an energetic and experienced individual to serve as a Policy Analyst in the Office of Broadband. The job closes on Thursday, August 13. Please share throughout your networks

- [https://link.edgepilot.com/s/d062de82/3pgJhuM_1UOI9JGhTKWxEA?](https://link.edgepilot.com/s/d062de82/3pgJhuM_1UOI9JGhTKWxEA?u=https://virginiajobs.peopleadmin.com/postings/193735)

[u=https://virginiajobs.peopleadmin.com/postings/193735](https://virginiajobs.peopleadmin.com/postings/193735)

VATI:

We strongly encourage all applicants to schedule application assistance with VATI staff before the August 17 deadline. Schedule technical assistance now - vati@dhcd.virginia.gov

For incumbent broadband providers - please review the [VATI notice of application list](#) and reach out to localities/applicants where overlap may occur. **Now is the time when projects can be re-scoped and time-intensive challenges can be avoided.** If you have questions, please reach out to our team.

Upcoming Events and Deadlines:

August 14 - Broadband Advisory Council Meeting

3:00pm - 5:00pm

Webinar link (video and audio)

- [https://link.edgepilot.com/s/18a5cf86/aJKt1u8we0efQCa6i_mMBg?](https://link.edgepilot.com/s/18a5cf86/aJKt1u8we0efQCa6i_mMBg?u=https://meet.google.com/pkg-uphr-eqr)

[u=https://meet.google.com/pkg-uphr-eqr](https://meet.google.com/pkg-uphr-eqr)

Conference Call (audio only) - 413-889-2315 PIN: 790-041-839

Agenda will be posted next week

- [https://link.edgepilot.com/s/2383187c/Iu0UdOLhtE2HPoAS0qSixA?](https://link.edgepilot.com/s/2383187c/Iu0UdOLhtE2HPoAS0qSixA?u=https://www.dhcd.virginia.gov/broadband-advisory-council)

[u=https://www.dhcd.virginia.gov/broadband-advisory-council](https://www.dhcd.virginia.gov/broadband-advisory-council)

August 17 - VATI Application Deadline

Schedule application assistance now - vati@dhcd.virginia.gov

August 25 - Commonwealth Connect Coalition Meeting

Broadband Implementation Committee Meeting - August 19, 2020

11:00am - 12:00pm

Agenda to come

Webinar link (video and audio)

- <https://link.edgepilot.com/s/44e92ba2/LRq2iwLG1UOK0hxBa78iZQ?>

[u=https://meet.google.com/viq-dxmr-zym](https://meet.google.com/viq-dxmr-zym)

Conference Call (audio) - 413-340-2367 Pin: 993-933-335

September 23 - VATI Challenge Application Deadline

Learn more [here](#)

October 29 - RDOF Phase I Auction

Learn more [here](#)

Thanks for reading! New to this list? We want this newsletter to be a one stop shop for all things broadband in Virginia. Learn more about the Commonwealth Connect Coalition - [here](#)

Kyle Rosner
Broadband Policy Specialist
Office of Governor Ralph S. Northam
804-371-7041 (office) | 540-514-8317 (cell)

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For Immediate Release: Grant Awards for Broadband Expansion Announced for Bath and Rockbridge

27-Jan-2020

Date: January 27, 2020

Contact: CSPDC Bonnie Riedesel, bonnie@cspdc.org or 540-885-5174 ext. 102

For Immediate Release: Grant Awards for Broadband Expansion Announced for Bath and Rockbridge Counties

The multi-jurisdictional project will connect unserved residences and businesses in Rural Virginia

Staunton, VA – Virginia Governor Ralph Northam announced Wednesday more than \$18.3 million in grants through the Virginia Telecommunication Initiative (VATI) to support 12 projects across Virginia, including the “BARC Connects Rockbridge and Bath Counties” project submitted by the Central Shenandoah Planning District Commission (CSPDC). The multi-jurisdictional project is a collaborative effort between Bath County, Rockbridge County, the CSPDC and BARC Electric Cooperative (BARC) to help bridge the digital divide in this part of rural Virginia. BARC is the private sector co-applicant and will provide fiber infrastructure to the unserved units identified in the project submission. The grant request was fully funded by VATI in the amount of \$2.2 million.

The overall project will have a total cost of \$17.8 million dollars including grant funds from VATI, funding from BARC and other funding from both Bath County and Rockbridge County. The fiber network will be expanded into a defined project area in both localities deploying a total of 314 miles of gigabit last mile fiber infrastructure serving about 1,100 businesses and residences. The project area includes identified unserved units in BARC’s electric service territory in Bath County and Rockbridge County. In constructing Fiber-To-The-Premise (FTTP) to reach these identified unserved areas in Bath and

Rockbridge, BARC will also make FTTP available to an additional 1,165 units outside the submitted project route funded by VATI.

“When we started our fiber project, we committed to one day serving every BARC member with world-class Internet,” said BARC CEO Mike Keyser. “As a result of the collaborative effort with the counties and CSPDC, we take one big step forward toward that goal. We appreciate the assistance of our partners and are very thankful that our project was chosen for funding.”

“This project is a game changer for Bath County,” says Bath County Administrator Ashton Harrison. “Broadband development is economic development and we thank Governor Northam and his administration for continuing to support economic development in rural Virginia. We believe this project will greatly benefit our businesses, schools, first responders, and government agencies and will positively impact the quality of life for Bath County residents.”

Rockbridge County Administrator Spencer Suter also expressed gratitude for all those who worked on the grant, saying “This award is the result of a tremendous amount of coordinated effort by the staffs of Rockbridge and Bath Counties, the CSPDC and BARC. Continuing to expand broadband into our rural areas remains a central focus, in support of business, education and quality of life.”

The CSPDC will serve as the grant administrator for the project and work with both localities and BARC from construction to completion. Additional information about the project and consumer eligibility will be made available closer to the beginning of construction.

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Supervisors back ambitious broadband incentive plan

Fauquier's board of supervisors Thursday agreed to pursue a two-pronged approach that would extend broadband internet service to rural areas of the county.

After a 70-minute closed session Thursday afternoon, Supervisor Rick Gerhardt (Cedar Run District) unveiled an incentive plan to use up to 15 existing telecommunication and water towers in portions of northern, central and southern Fauquier to provide high-speed internet access to unserved and underserved homes.

Under Mr. Gerhardt's incentive plan, Fauquier would pay Fort Lauderdale-based **Data Stream Mobile Technologies Inc.** \$150,000 per tower to install equipment that would provide wireless broadband via the structures by year's end. That equates to \$2.2 million.

In a separate move, the board voted, 5-0, to authorize County Administrator Paul S. McCulla to negotiate a possible agreement with Data Stream to provide broadband internet service across Fauquier. Fredericksburg-based Omnipoint Technology Partners LLC submitted the proposal. But, Data Stream owns a controlling interest in Omnipoint.

The incentive plan would fast-track the provision of broadband, while Fauquier negotiates a comprehensive, long-range plan to extend the service throughout the county, Mr. Gerhardt explained.

Fauquier also would subsidize Data Stream's cost to lease space on up to 10 structures for two years, according to Mr. Gerhardt's proposal. The \$18,000-per-tower lease contribution would total \$360,000.

Fauquier would use money in the county's capital improvement plan dedicated for broadband to fund the nearly \$2.3 million proposal. The 2020 CIP includes \$20.7 million for broadband expenses.

The Data Stream subsidies would be "offset by" a portion of subscriber fees the company would give Fauquier, Mr. Gerhardt said.

He outlined two possible scenarios, assuming a customer base of 2,000 subscribers. Under one, Fauquier would receive \$10 a month per customer, for a total of \$240,000 annually. At \$15 per customer, Fauquier would get \$360,000 a year.

"Ideally" such a payback arrangement "would continue as long as" Data Stream provides broadband to the county, Mr. Gerhardt said in text Friday.

But, he stressed: "Everything in that outline is negotiable at this point."

As of Thursday night, Mr. Gerhardt had not discussed the proposal with Data Stream representatives. He plans to personally negotiate a possible deal with company.

If Mr. Gerhardt can strike an acceptable agreement, the supervisors expect to approve it at their Sept. 12 meeting.

“What I like about this is we could almost begin immediately,” he said.

Mr. Gerhardt expressed no doubt that Data Stream can get the job done.

“Based on everything that I’ve seen from Data Stream and what they’re doing in the county and elsewhere, I have a lot of confidence in their abilities,” he said. “And, I certainly have confidence in their financials.”

Endorsing the incentive plan, Supervisor Chris Granger (Center District) said: “I don’t see any detraction from it It seems like a no-brainer.”

Mr. Gerhardt described the approach as “one more tool” to extend broadband to a county that craves it.

“We’re trying to be as creative as we can, within the confines of the law.”

The supervisors last year approved a **telecommunications tower incentive plan** that would pay a Baltimore-based company up to \$30,000 annually, per tower constructed for up to five years.

Omnipoint’s comprehensive proposal calls for 130 miles of underground fiber optic cable to connect 64 locations in Fauquier. With up to 21 new towers and existing structures, such a network would serve about 94 percent of the county, according to the company

“We believe our solution will position Fauquier County as a leading example of how counties should implement a world-class, state-of-the-art solution that will be a model that others will emulate,” the Omnipoint proposal states.

Springfield-based **Tenebris Fiber LLC** also submitted a proposal to design and build a network to provide broadband to Fauquier’s unserved and underserved areas.

Its proposal calls for 134.2 miles of underground fiber optic cable to serve 39 sites. That network would cost \$22.2 million, according to the Tenebris’s 33-page proposal.

Mr. Gerhardt declined to discuss why he and the board prefer the Omnipoint proposal.

Contact **Don Del Rosso** at Don@FauquierNow.com or 540-270-0300.

Operational and planned Data Stream Broadband broadcast points in Fauquier County



Map Key

- Planned as of June 1, 2020
- Operational as of June 1, 2020
- Fauquier County, Virginia

Locations are approximate

Map: Fauquier Towers - Fauquier County Datastream Broadband - created with DfMapper

Data Stream wireless broadband network in Fauquier County to double this summer

Staff Reports Jun 1, 2020 Updated Jun 2, 2020 The Fauquier Times

Six additional towers in Fauquier County will be added to the county's broadband network by the end of the summer, according to Cedar Run District Supervisor Rick Gerhardt.

Operated by Data Stream Broadband, the new Internet broadcast points will add to the six already in operation through the county's broadband initiative. Three additional towers are expected to go live this fall, Gerhardt said.

Currently there are two operational towers in Warrenton and one each in Casanova, Calverton, Morrisville and Goldvein.

Five towers will be added to the network by early July, Gerhardt said, significantly adding to the availability of Data Stream's signal in the northern part of the county.

These towers are located at Vint Hill, Pignut Mountain, Bear Wallow, Bealeton and Marshall. A sixth tower, located in Hume, should be operational by the end of the summer.

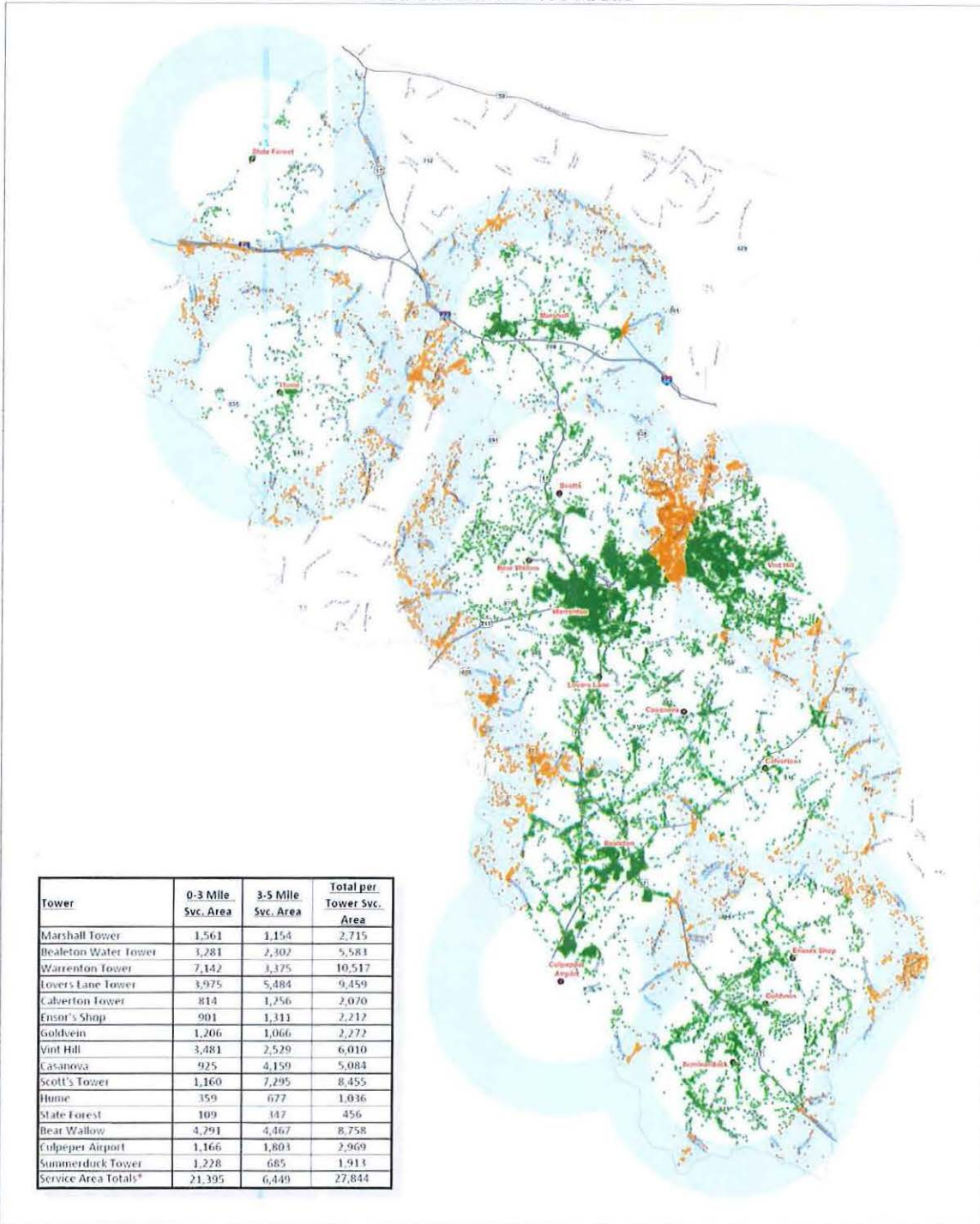
Towers located in Blue Mountain, Sumerduck and Brandy Station are planned for the fall.

Depending on the topography of the surrounding area, residences within approximately five miles of a tower should be able to receive a broadband signal, Gerhardt said, although several factors could make that distance greater or smaller.

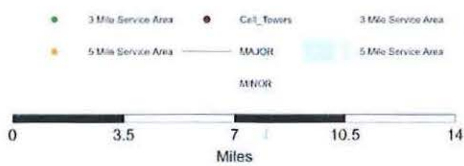
Residents of Fauquier County receive a discounted rate when purchasing an Internet plan from Data Stream. Plans start at \$29 per month and go to \$89 per month.



Fauquier County Virginia Data Stream Service Areas



Tower	0-3 Mile Svc. Area	3-5 Mile Svc. Area	Total per Tower Svc. Area
Marshall Tower	1,561	1,154	2,715
Bealeton Water Tower	1,281	2,302	5,581
Warrenton Tower	7,142	3,375	10,517
Towers Lane Tower	3,975	5,484	9,459
Calverton Tower	814	1,256	2,070
Ensor's Shop	901	1,311	2,212
Goldvein	1,206	1,066	2,272
Vint Hill	3,481	2,529	6,010
Casanova	925	4,159	5,084
Scott's Tower	1,160	7,295	8,455
Hume	359	677	1,036
State Forest	109	347	456
Bear Willow	4,291	4,467	8,758
Colpeper Airport	1,166	1,803	2,969
Summerduck Tower	1,228	685	1,913
Service Area Totals*	21,395	6,449	27,844



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