

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Application ID: 64508222019144341
Application Status: Pending
Program Name: Virginia Telecommunications Initiative 2020
Organization Name: Hanover County
Organization Address:
Profile Manager Name: Kevin Nelson
Profile Manager Phone: (804) 365-6168
Profile Manager Email: knelson@hanovercounty.gov

Project Name: Hanover County - Old Church Road VATI Grant
Project Contact Name: Kevin Nelson
Project Contact Phone: (804) 365-6168
Project Contact Email: knelson@hanovercounty.gov
Project Location: 7497 County Complex Road
Hanover, VA 23069-1529

Project Service Area: Hanover County

Total Requested Amount: \$1,081,533.00
Required Annual Audit Status: No Current Audits Found

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Budget Information:

Cost/Activity Category	DHCD Request	Other Funding	Total
Telecommunications	\$1,081,533.00	\$360,511.00	\$1,442,044.00
Construction	\$1,081,533.00	\$360,511.00	\$1,442,044.00
Total:	\$1,081,533.00	\$360,511.00	\$1,442,044.00

Budget Narrative:

The Old Church Road project consists of extending Comcast infrastructure from existing facilities in the area on Old Church Road (Rt. 606) from Immanuel Trail to approximately ½ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and its secondary streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane. Materials: \$346,091 Labor: \$1,009,431 Project Management: \$86,523 Total cost: \$1,442,044 Examples of items that are included in the Construction category are power supplies, fiber, conduit, splice enclosures, pedestals, and taps. Also included are in-house and contract labor to trench and backfill, lay conduct and fiber, perform administration of VDOT permits, and provide crew supervision.

Questions and Responses:

1. Project Area

Explain why and how the project area(s) was selected. Describe the proposed geographic area including specific boundaries of the project area (e.g. street names, local and regional boundaries, etc.). Attach a copy of the map of your project area(s). Label map: Attachment 1 –Project Area Map.

Answer:

The geographic area for this proposed project is in the Old Church Road area of Hanover County (“County”). The eligible project area includes Old Church Road (Rt. 606) from Immanuel Trail to approximately ½ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and its secondary streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane.

The project area was selected after consultation between the County and Comcast and meets the eligibility criteria established by the Virginia General Assembly and the Department of Housing and Community Development (“DHCD”) for a Virginia Telecommunication Initiative (“VATI”) award.

2.

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

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

providers (fixed and wireless) and speeds offered within the project area. Label Map: Attachment 2 – Existing Provider Map; label documentation: Attachment 3 – Documentation on CAF Funding Area.

Answer:

Hanover County contacted CenturyLink, Verizon, Segra, and SCS Broadband to gauge their interest in partnering with the County on a broadband grant application. The results to the county's outreach are noted below.

CenturyLink – Hanover's CenturyLink account manager reported the company made a business decision to not apply for VATI grants. CenturyLink does not offer service in the proposed grant area.

Verizon – Certain coverage maps show Verizon to offer Verizon DSL internet service in the vicinity of the proposed project area. Verizon responded as follows:

"Our engineers have reviewed the Old Church service area described in Hanover County's VATI proposal and it does not overlap with any Verizon wire line broadband services."

Segra – Segra is interested in working with Hanover County on potential broadband grant opportunities, however prefer to be a backhaul provider to a wireless internet service provider partner. Segra has no service in the proposed grant area.

SCS Broadband – On April 12, 2017, the Hanover Board of Supervisors approved a tower lease agreement with fixed wireless provider SCS Broadband to provide Internet service to some parts of the county. However, after several years SCS Broadband has still not completed a single wireless equipment setup and is not presently offering any service to County residents. The latest update from SCS Broadband to the County was that SCS Broadband lacked sufficient backhaul to provide broadband level speeds. If the VATI grant application is approved, the County will redirect SCS Broadband to areas in the County that do not have broadband internet.

In addition to outreach to the above providers, Hanover County's Emergency Communications Department sent letters to wireless internet service providers ("WISP") and telephone companies to take advantage of the County's extensive emergency communication tower network consisting of 18 towers. A number of cellular providers have entered into tower lease agreements to co-locate on County towers with the plan to provide 4G LTE service and potentially 5G service.

On July 13, 2015, the County entered into a tower lease agreement with Last Mile Wireless, a WISP, to provide service in the Poor Farm area. Last Mile Wireless successfully brought its site online however less than a year later due to lack of subscribers in the area and other financial difficulties Last Mile defaulted on the terms of the agreement and discontinued service.

In May of 2016, the County had discussions with All Points Broadband, a WISP. Ultimately, All Points made the decision not to enter into the Hanover County market.

Hanover County has posted several resources to its website. The County has designated a representative to participate on Congressman Wittman's Broadband Task Force. County Staff collaborate on a regular basis with

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

other localities across Virginia on broadband topics.

Finally, Hanover County issued the following public notice and received no responses from Internet service providers:

Hanover County seeking comment on potential Broadband project

Hanover County is soliciting public comment for a potential Broadband Project as part of an application(s) for Virginia Telecommunication Initiative Grant Funds. The eligible project area includes Old Church Road (Rt. 606) from Immanuel Trail to approximately $\frac{1}{2}$ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and associated streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane.

For additional information, contact Tom Harris at 804-365-6005. Written comments may be addressed to Tom Harris, via email to ctyadm@hanovercounty.gov, or in person during normal business hours, no later than August 21, 2019.

3. Project Need/Description

To be eligible for VATI, applicants must demonstrate that the proposed project area(s) is unserved. An unserved area is defined as an area with speeds of 10 Mbps / 1 Mbps or less and with less than 10 percent service overlap within the project area. Describe any anticipated service overlap with current providers within the project area. Provide specific information as to how you determined the percentage overlap. Label Attachment: Attachment 4 – Documentation Unserved Area VATI Criteria.

Answer:

The proposed project area is unserved based on data available through the Federal Communications Commission's publicly available Form 477 and direct information from broadband providers. Comcast and Hanover County anticipate no service overlap within the project area as there are no current providers.

While the attached map of FCC Form 477 data shows several providers offering Internet service in the census blocks encompassing the project area, Hanover County has verified that none of these providers offer service that would result in classifying the project area as served according to the VATI guidelines.

Specifically, Verizon DSL is shown to provide service to the following census blocks, however it is under the speed threshold noted in the VATI guidelines:

CENSUS BLOCK	REPORTED SPEED (MBPS DOWN)	REPORTED SPEED (MBPS UP)
510853214031040	7	0.768
510853214031039	7	0.768

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

510853214031041	7	0.768
510853214031042	7	0.768

The data also show VerizonDSL service with speeds of 15 Mbps down / 1 Mbps up in census blocks 510853214031019 and 510853214031016. As noted in Question 2, Hanover County verified with Verizon that it does not provide service in the Old Church Road area. Further, as noted in response to Question 2, Hanover County issued a public notice concerning the project area and no provider responded that it serves the area. In fact, in response to the public notice, Hanover County received several testimonials from residents in the project area voicing frustration with the lack of broadband access in the area. The testimonials are included as part of Attachment 8 to this application in further support of the eligibility of the project area.

Therefore, based on the best information currently available, Comcast and Hanover County understand that the

4. Provide the number of residential serviceable units in the project area(s). Describe the eligible premises that will be served by the proposed project and the basis for these projections.

Answer:

Hanover County does not have independent population estimates, however 2017 U.S. Census Bureau data show the population of census tract 3214.03 encompassing the Old Church Road area was approximately 2,982.

There are a total of 292 residential and commercial locations within the proposed service area in Hanover County. The number of locations was determined after a physical “walk out” of the area around Old Church Road. The “walk out” was performed by Comcast. Comcast proposes to expand its network so that each of these 292 locations is serviceable without a customer contribution.

In addition, upon completion of this project, Comcast customers who subscribe to an Xfinity Internet package will have access to Xfinity WiFi hotspots, including those that would be newly added to the Old Church Road area, for no additional cost. Moreover, these Old Church Road area customers would be able to access any of Comcast’s hotspots throughout Virginia and across the country. Comcast has the country’s largest WiFi network, including more than 19 million hotspots nationwide and over 600,000 in Virginia. Even non-subscribers of Xfinity Internet can gain WiFi hotspot access using a WiFi On Demand pass.

According to Hanover County School Board, there are 85 public school students within the Old Church area who may be without access to broadband. Through construction of Comcast’s network to the Old Church Road area, more Hanover County school students would have Internet access, plus all qualifying low-income families will also have access to Comcast’s Internet Essentials program. Internet Essentials is the nation’s largest and most comprehensive broadband adoption program and Comcast’s number one community impact initiative. It provides low-cost Internet service, the option to purchase an Internet-ready computer, and access to free digital literacy training online.

Since launching in 2011, Comcast has made dozens of improvements to the program, including 12 eligibility expansions—bringing Internet Essentials to new audiences such as public housing residents, low-income veterans, seniors, community college students, and new this year, to all qualified low-income households living in Comcast’s service area. Since 2011, Internet Essentials has connected more than eight million low-income Americans (in 2 million households) to the Internet at home.

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

5. Indicate the numbers of businesses and community anchor institutions the proposed project will pass in the project area. Also indicate the number of home-based businesses. Provide specific information.

Answer:

According to Hanover County' Commissioner of Revenue, there are at least 11 home-based businesses in the eligible project area. Based on these county data, these businesses could include Acme Dental Laboratory LTD, Laura McCray, John Ferrell, Bull Frog Power Wash LLC, Mylar Construction Inc, Ainsley Stables, St Clair Consulting, Capital Pharmacy Consultants LLC, GC Enterprises, Virginia Mulch Systems Inc, and Olde Church Turnings. Comcast offers small and medium-sized businesses Internet services that accommodate significant bandwidth and networking needs, as well as a variety of voice services and plans that include multiple lines and calling features. Additionally, Comcast Business can provide multi-gig speeds to business customers in Comcast's footprint – whether an enterprise with locations across the country that needs multi-gigabit speed or a small business with only a handful of locations.

There are also two community gathering locations in the area:

Bethlehem Presbyterian Church at 2446 Old Church Road

Old Church Community Center at 2080 Old Church Road

Hanover County's Old Church emergency communication tower is within the proposed service area on Drakes Landing Court. Microwave is utilized for the backhaul however a broadband connection could provide public safety additional network resiliency by providing an alternate path in the event of a microwave failure.

6. Understanding that projected take rates are an estimate, provide the anticipated take rate for the proposed service within one year of project completion and describe the basis for the estimate. Also detail all actions (e.g. marketing activities, outreach plan) to be implemented to reach the identified potential serviceable units within the project area.

Answer:

Comcast's business model is not dependent upon a particular take rate. Forecasting a take rate with a high degree of accuracy is most challenging as the actual number of customers who choose to subscribe is beyond the parties' control.

Comcast's take rate estimate for Old Church Road is based upon several unique factors. Hanover County's support for the project and involvement with the community is expected to add heightened awareness earlier than might otherwise occur. The public nature of the VATI program is also expected to add to the early awareness of residents of broadband availability and positively enhance the take rate. All of the factors combined inform our estimate that, on the high end, some 45-55% of residents may take service within the first year after project completion.

These projections for overall subscriber levels are dependent on several factors and even an initial prediction may change as the project progresses. Comparisons between applicants may not provide a useful measure of broadband access as each applicant will have different service offerings, marketing campaigns, and other intangibles that could drive take rates. For example, Comcast take rates may vary from those of other providers because Comcast offers more services than broadband alone – including video, telephone, mobile telephone, and home security – and the company offers bundled pricing promotions from time to time. These additional products and pricing

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

options can change the value proposition of Comcast service for each household that is unique among providers.

Comcast does undertake various actions to make residents aware that service is available. During the construction phase, before the service is active, the presence of Comcast vehicles visually alerts residents that service is coming. Comcast personnel involved with the construction in the public rights of way are often asked about availability. Soon after completing construction, Comcast provides notice to potential customers of service availability on a rolling basis. It typically employs various communication tactics to inform residents of availability. These tactics can include direct mail pieces, door hangers, and visits by Comcast sales representatives to residents' homes. These efforts augment existing advertising campaigns already in place within Hanover County for Comcast's existing customer base. Once service is established, Comcast may communicate with these residents through direct mail, direct e-mail, radio ads, video ads, and other marketing tactics.

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

Answer:

Not applicable.

8. Provide the proposed download and upload speeds for the project area. Detail whether that speed is based on dedicated or shared bandwidth, and detail the technology that will be used. This description can be illustrated by a map or schematic diagram, as appropriate. Describe the Internet service offerings to be provided after completion of this project and your price structure for these services. The service offerings should include all relevant tiers.

Answer:

In 2018, Comcast increased the download speeds of several of its residential "Performance," "Performance Pro," and "Blast!" broadband options. The broadband infrastructure Comcast would put in place in Old Church Road would offer all customers six residential and business broadband options that exceed the minimum requirements for VATI, as noted in the tables below:

Residential Tier	Speeds up to
Performance	60 Mbps down / 5 Mbps up
Performance Pro	150 / 5
Blast!	250 / 10
Extreme Pro	400 / 10
Gig	1000 (1 Gbps) / 35
Gigabit Pro	2000 (2 Gbps) / 2000 (2 Gbps)

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Business Tier	Speeds up to
Starter	25 Mbps down / 5 Mbps up
Business Internet 75	75 / 15
Business Internet 150	150 / 20
Business Internet 300	300 / 25
Business Internet 500	500 / 35
Business Internet 1G	1000 (1 Gbps) / 35

Comcast will utilize DOCSIS technology in building the network. DOCSIS technology is an international telecommunications standard that permits the addition of high-bandwidth data transfer to an existing cable TV system. It is employed by many cable television operators, including Comcast, to provide Internet access over an existing HFC infrastructure. The industry continues to deliver great speeds over DOCSIS 3.0, and is moving purposefully toward increased adoption of DOCSIS 3.1, which Comcast completed deploying in Hanover County in 2018. DOCSIS 3.1 enables Comcast to bring broadband speeds of up to almost 1 Gbps to a service area.

Comcast proposes to complete the construction of the area with a hybrid fiber coaxial (“HFC”) solution, emanating from the closest facility to the project. Fiber optic cables would be constructed to the service area, commonly referred to as a serving node, where optical signals would be converted to electrical or radio frequency for distribution on the coaxial network.

Upon completion of the Old Church Road build, Comcast will be able to offer its full suite of products and services to residents in the proposed service area, including broadband services, voice, video, and home security. With respect to broadband service, Comcast’s 1 Gigabit Internet service will use DOCSIS 3.1 technology to deliver the speeds through its HFC network. To enjoy the service, all customers need to do is install a DOCSIS 3.1 cable modem, which can be rented from Comcast or purchased on their own.

Residential Xfinity Internet and Video customers will also have access to Xfinity X1. X1 is a video platform that delivers the simplest, fastest, and most complete way for customers to access all of their entertainment on all of their screens. Features include Netflix and Amazon Prime Video access for those with a membership, YouTube access, advanced search and recommendations, and Xfinity apps for home and on the go. Xfinity X1 customers can also use the X1 Voice Remote for voice commands to change channels, search for shows, get recommendations, and more.

In addition, upon completion of this project, Comcast customers who subscribe to an Xfinity Internet package will have access to Xfinity WiFi hotspots, including those that would be newly added to the Old Church Road Project area, for no additional cost. Moreover, these customers would be able to access any of Comcast’s hotspots throughout Virginia and across the country. Comcast has the country’s largest WiFi network, including more than 19 million hotspots nationwide and over 600,000 in Virginia. Even non-subscribers of Xfinity Internet can gain WiFi hotspot access using a WiFi On Demand pass.

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Comcast Small and Medium Business customers will have access to gig speeds through the newly launched “Business Internet 1 Gig” product. Comcast’s “Business Internet 1 Gig” and “Business Internet 500” speed tiers are now available to business customers using the company’s existing network.

With respect to broadband service, Comcast’s 1 Gigabit Internet service will use DOCSIS 3.1 technology to deliver the speeds through its HFC network. Pricing for all relevant residential Xfinity Internet tiers is listed below.

Residential Tier	Xfinity Internet Service Only	With Xfinity TV or Voice Service
Performance	\$74.95	\$61.95
Performance Pro	\$89.95	\$76.95
Blast!	\$94.95	\$79.95
Extreme Pro	\$99.95	\$86.95
Gig	\$104.95	\$91.95
Gigabit Pro	\$299.95	\$299.95

Comcast Business customers will have access to gig speeds through the “Business Internet 1 Gig” product. Comcast’s “Business Internet 1 Gig” and “Business Internet 500” speed tiers are available to business customers using the company’s existing network. Pricing for all relevant Comcast Business SMB Internet tiers is listed below.

Business Tier	Standalone Pricing
Starter	\$69.95
Business Internet 75	\$149.95
Business Internet 150	\$249.95
Business Internet 300	\$349.95
Business Internet 500	\$399.95
Business Internet 1G	\$499.95

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Residents and businesses in the proposed service area will be offered broadband services of the same quality and

9. Provide a description of the network system design used to deliver broadband service from the network's primary Internet point(s) of presence to end users, including the network components that already exist and the ones that would be added by the proposed project. Also describe specific advantages of using this technology. Provide a detailed explanation on how this information was compiled and source(s). For wireless projects, provide a propagation map including the proposed project. Label Map: Attachment 5 – Propagation Map Wireless Project

Answer:

Comcast has built a fiber backbone at the core of its network that stretches across the country with more than 600,000 route miles of fiber-optic and coaxial plant nationwide – using the industry's most advanced optics/lasers and Internet Protocol ("IP") routing technologies. Dozens of converged regional area networks interconnect to create this fiber backbone that delivers video, voice, and high-speed Internet services to tens of millions of customers throughout the country. IP technology ties all of this together, creating a highly scalable connectivity platform or "IP core." Comcast has been building fiber into its networks incrementally over the past decade. In 2015, Comcast introduced Gigabit Pro, the industry's first residential fiber-to-the-home 2 Gigabit-per-second ("Gbps") service ever offered by an Internet service provider in the United States. In 2018, Comcast announced that it is the nation's largest provider of gigabit broadband, providing access to nearly 58 million homes and businesses.

Comcast's hybrid fiber coaxial ("HFC") network model offers the most flexibility and the best economics now and into the future. The company can surgically add speed, capacity, and fiber to its networks in a smart and economically feasible way.

Comcast's existing HFC network will deliver speeds up to 1 Gbps to residential customers. These speeds are among the fastest and most widely available and include access to the nation's largest WiFi network of more than 19 million hotspots. Combined with the company's recently launched Xfinity xFi platform, a new and personalized home WiFi experience, Comcast would provide its Old Church customers with the fastest speeds, the best WiFi coverage, and ultimate WiFi control in their homes.

Comcast proposes to complete the construction of the area with a hybrid fiber coaxial solution, emanating from the closest facility to the project. Fiber optic cables would be constructed to the service area, commonly referred to as a serving node, where optical signals would be converted to electrical or radio frequency for distribution on the coaxial network.

Upon completion of the Old Church Road Project build, Comcast will be able to offer its full suite of products and services to residents in the proposed service area, including broadband services, voice, video, and home security. With respect to broadband service, Comcast's 1 Gigabit Internet service will use DOCSIS 3.1 technology to deliver the speeds through its HFC network. To enjoy the service, all customers need to do is install a DOCSIS 3.1 cable modem, which can be rented from Comcast or purchased on their own.

According to the FCC's "Eighth Measuring Broadband America: A Report on Consumer Fixed Broadband Performance in the United States," Comcast's actual upload and download speeds were over 100% of what was advertised. Residents and businesses in the proposed service area will be offered broadband services of the same quality and current price as those offered in other Comcast service areas. Comcast will not offer a separate rate applicable to only those customers within the project area included in this proposal. The customer will ultimately

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

decide which service88 tier best suits their needs and preferences.

Residential Xfinity Internet and Video customers will also have access to Xfinity X1. X1 is a video platform that delivers the simplest, fastest, and most complete way for customers to access all of their entertainment on all of their screens. Features include Netflix and Amazon Prime Video access for those with a membership, YouTube access, advanced search and recommendations, and Xfinity apps for home and on the go. Xfinity X1 customers can also use the X1 Voice Remote for voice commands to change channels, search for shows, get recommendations, and more.

In addition, upon completion of this project, Comcast customers who subscribe to an Xfinity Internet package will have access to Xfinity WiFi hotspots, including those that would be newly added to the Old Church Road Project area, for no additional cost. Moreover, these customers would be able to access any of Comcast's hotspots throughout Virginia and across the country. Comcast has the country's largest WiFi network, including more than 19 million hotspots nationwide and over 600,000 in Virginia. Even non-subscribers of Xfinity Internet can gain WiFi hotspot access using a WiFi On Demand pass.

Comcast Small and Medium Business customers will have access to gig speeds through the "Business Internet 1 Gig" product. Comcast's "Business Internet 1 Gig" and "Business Internet 500" speed tiers are now available to business customers using the company's existing network.

10. Project Readiness

What is the current state of project development (e.g. planning, preliminary engineering, identifying easements/permits, final design, etc.)? Prepare a detailed project timeline or construction schedule which identifies specific tasks, staff, contractor(s) responsible, collection of data, etc., and estimated start and completion dates. Provide any Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) (drafts are allowable), letters of support, etc. The timeline should include all activities being completed within 12 months of contract execution with DHCD. Label Attachments: Attachment 6 – Timeline/Project Management Plan; Attachment 7 – Relationship between Applicant/Co-Applicant; Attachment 8 – Letters of Support;

- i. If the partnership is formalized in a written agreement, provide a copy of that agreement.
- ii. If the partnership has not been formalized, provide a short description of the project management role, financial commitment, or other contribution to the project for the applicant, co-applicant, and any additional partners.
- iii. If applicant is not a locality(s) in which the project will occur, please provide a letter of support from that locality.

Answer:

The Old Church Road project is in the preliminary engineering phase. Final design will commence upon the award of the grant by DHCD and will continue to completion on or before the construction deadline pursuant to a final grant agreement. Comcast is confident it can complete the proposed work on time and within budget. Workflow is included in the attached project management plan.

The specific initial tasks include project engineering and right of way preparation. Comcast may need to obtain the necessary permits from the Virginia Department of Transportation ("VDOT") to place facilities underground in the

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

VDOT right of way and will need support from the county in ensuring that necessary power supplies are coordinated and installed with the local electric company. Comcast will ask Hanover County officials to assist in obtaining these permits and power supplies expeditiously. This coordination will need to begin immediately upon notice of the grant award. Material procurement and some pre-construction work will occur during this period and will enable Comcast to proceed with actual construction as soon as VDOT issues the right of way permits.

Comcast anticipates completing the project within 12 months after contract execution between the County and DHCD. As contemplated by the 2020 VATI guidelines, Comcast may request an extension if it encounters permitting, pole attachment, or other circumstances beyond its control which may delay the project timeline.

Activation of all HFC plant will be completed by both in-house Comcast employees and select contract personnel. The final quality control inspection of all new infrastructure will be completed by Comcast employees to ensure all new construction meets or exceeds FCC standards. As noted above, an additional notice of service availability will be provided not later than 20 days prior to the Completion Date.

11. Matching funds: Provide a description of the matching funds the applicant and co-applicant will invest in the proposed project (VATI funding cannot exceed 80 percent of total project cost). The Funding Sources Table must be completed. Label Attachments: Attachment 9 - Documentation of Match Funding; Attachment 10 – Funding Sources Table;
 - i. For each element of matching funds in the description, indicate the type of match (e.g. cash, salary expense, or in-kind contribution).
 - ii. Identify whether the applicant or co-applicant is responsible for providing each element of the proposed matching funds.
 - iii. Include copies of vendor quotes or documented cost estimates supporting the proposed budget.

Answer:

The proposed project represents a partnership between Comcast and Hanover County. Comcast, the co-applicant, upon award of the VATI grant, will be responsible for any matching funds and will provide the labor and materials to complete the provision of services to the area delineated in the attached map. Comcast will provide approximately 25% of the projected construction costs of \$1,442,044, totaling approximately \$360,511. Hanover County will assist in providing in-kind contributions including application analysis and preparation, coordination with the Department of Housing and Community Development, assistance with right of way permitting, and participating in further concert with Comcast as the project is approved and construction begins. The value of these services will depend on the level of activity occurring as the project commences.

A breakdown of costs is attached below.

Name	Locations	Mileage	HP/Mile	Total Cost	Comcast Cost	Requested Gap Funding	VATI Gap Funding

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Old Church Road	292	17.4	16.8	\$1,442,044	\$360,511	\$1,081,533	75%
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12. Applicant and Co-Applicant: A description of the public-private partnership involved in the project. Detail the local government assistance: Local government co-applicants should demonstrate assistance to project that will lower overall cost and further assist in the timely completion of construction, including assistance with permits, rights of way, easements, and other issues that may hinder or delay timely construction and increase cost. Provide detail if this project includes additional partners such as municipal providers, middle-mile providers, or investor-owned utilities

Answer:

The project area for this application was selected in part because of a need for service and the absence of any contractual or legal requirements for Comcast, or any other provider, to extend service there.

Hanover County supervisors voted to proceed with a VATI application in partnership with Comcast at their meeting on August 28, 2019. The staff of Hanover County coordinated this partnership arrangement with Comcast. Comcast and Hanover County will complete a formal agreement to make review of work and processing of payments as efficient as possible. Comcast anticipates submitting invoices at the mid-point of the project and at project completion.

The partners have agreed in principle on the following responsibilities:

Hanover County intends to partner with Comcast as a co-applicant for a VATI grant to extend broadband service to unserved areas of Hanover County.

Hanover County would complete the grant application (with Comcast's assistance); submit the completed application(s) to the Virginia DHCD; and manage the processing of work payments. Because Hanover County will be the funded applicant in the event of award, the county would timely process all VATI related Comcast invoices that applied directly to the approved work plans, design, and statement of work. Any delays in completing the work as planned would be negotiated with DHCD as partners.

Hanover County also would provide services and support for any necessary citizen engagement activities, including but not limited to: processing applications for right of way in a manner consistent with all local, state, and federal law; advocating and describing the benefits of the project to those affected; and working with Comcast and other partner agencies (e.g. VDOT) and private industry (e.g. Dominion Energy) to help coordinate construction and/or pole attachments.

Comcast would provide accurate VATI construction plans; associated material and work invoices to match the construction plans; detailed descriptions of necessary right of way or pole attachments; and timely notice of other needs to Hanover County.

This general agreement proceeds from the notice of VATI award to the completion of the projects.

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

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

Answer:

Name	Title	Responsibility
Nathan Daugherty	Sr. Manager, Comcast Gov. Affairs	Coordination with Hanover County
Brian Engle	Manager, Comcast Construction	Supervision of construction
Cecil "Rhu" Harris	County Administrator, Hanover County	Coordination with Comcast; conduct project administration including invoice processing with DHCD

14. Project Budget and Cost Appropriateness

Applicants shall provide a detailed budget as to how the grant funds will be utilized, including an itemization of equipment and construction costs and a justification of proposed expenses. Expenses should be substantiated by clear cost estimates. Label Attachment: Attachment 11 – Derivation of Costs; Attachment 12 - Documentation of Supporting Costs; Attachment 13 – Supporting Documentation of Cost Estimates.

Answer:

See attachments.

15. The cost benefit index is comprised of three factors: (i) state share for the total project cost, (ii) state cost per unit passed, and (iii) the internet speed. From these statistics, individual cost benefit scores are calculated. Finally, the three component scores are averaged together and converted to a 30-point scale to form a composite score. Please

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

provide the following three pieces of information:

- a. Total State funding requested / Total Project cost
- b. Number of serviceable units
- c. Highest residential speed available

Answer:

- a. Total State funding requested/Total project cost:\$1,081,533 / \$1,442,044, or 75% of total project cost
- b. Number of serviceable units: 292
- c. Highest residential speed available: 1Gig

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

Answer:

In FY19 alone, Hanover County processed nearly \$20M in grant funds for everything from road construction to drug treatment programs to equipment installation and more.? Hanover County is an annual recipient of most of these grants which is indicative of the scope of grant management the County routinely handles.? Grant tracking and reporting processes are continually reviewed for improvements and efficiencies.? Grant reporting to both state and federal agencies is a standard business activity for the County, and Hanover has consistently received positive results on annual audits.? Grants management and acceptance are included in County's Board-approved financial policies.

Comcast has significant experience constructing broadband communications facilities. It is a leading communications provider in Virginia, offering video, high-speed Internet, home security, and phone services to residential customers under the Xfinity brand and also providing services to businesses through its Comcast Business suite of products. Comcast has invested in technology to build an advanced network that delivers among the fastest broadband speeds, and brings customers personalized video, communications, and home management offerings. Comcast has invested billions of dollars to create a network across the U.S. that makes broadband widely available, as part of its commitment to provide superior services to its customers.

Since 2011, Comcast made more than \$1.8 billion in technology and infrastructure investments in Virginia to offer reliably fast speeds even during peak use periods. The company has invested significant resources in both local and national Network Operations Centers ("XOC") to ensure continued proactive monitoring of network health, increased its Internet speeds for customers 17 times in 18 years, and doubled the capacity of its broadband network every 18-24 months.

In Virginia, Comcast employs over 1,900 people. It invests more than \$216 million annually in payroll, benefits, and training for its Virginia workforce. The company maintains a large, locally based engineering technical operations team that works around the clock to maintain network reliability and to directly support the company's business and residential customers. For many decades, Comcast, through its Beltway Region, has served over 140 communities in Virginia.? Many of these communities are very rural in nature.

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Comcast has experience partnering with public agencies to deploy broadband infrastructure in unserved areas. Comcast was awarded two Virginia Telecommunications Initiative grants in 2018. Both construction projects are now complete with Internet service offered to residences and businesses throughout the project footprints. Comcast was also awarded a VATI grant in 2019. Comcast is on schedule to fulfill its grant obligations for this grant, and planning and construction for the project is ongoing.

In 2018 Comcast also earned a Last Mile Broadband grant from the Virginia Tobacco Region Revitalization Commission to provide broadband access to nearly 7,000 homes and businesses. It is currently planning to complete construction in 2020, approximately 1.5 years ahead of schedule.

In Massachusetts, Comcast was awarded a grant of \$4,000,000 from the Massachusetts Technology Collaborative (“Mass Tech”) for construction of line extensions to areas in nine towns whose costs to construct exceeded Comcast’s economic standards. Comcast completed the project on time, on budget, and reached 20% more homes than the 1,000 originally anticipated. Comcast was also awarded a grant of \$805,800 by Mass Tech for construction of approximately 27 miles of line extensions in Montgomery, Massachusetts, a town which is currently unserved.

In 2013 and 2014, Comcast received two grants from the Vermont Telecommunication Authority (“VTA”) totaling \$336,558 to provide service to areas that were economically unfeasible for construction. In 2015 and 2017, the Vermont Department of Public Service (“DPS”) twice awarded Comcast funds from its Connectivity Initiative grant totaling \$359,850. Comcast has either fulfilled or is on schedule to fulfill its grant obligations to the VTA and DPS.

17. Commonwealth Priorities

Additional points will be awarded to proposed projects that reflect Commonwealth priorities. Please describe if the project fits into a larger locality or regional universal broadband plan.

Answer:

In 2012, the Hanover County Board of Supervisors established a citizen committee to research broadband opportunities and constraints within the County. The High Speed Internet Committee (HSIC) reported back with a number of recommendations for consideration by the Board, which have served as the basis for the County’s broadband planning effort. The full report and detailed summary of accomplishments is attached. A summary of their recommendations includes:

Designate point person for broadband – completed.

Communication – on-going (see Question #2).

Pursue grant opportunities – on-going.

Map internet availability – completed (using State/Federal mapping resources).

Ensure libraries have broadband internet service – completed. Hanover County makes high-speed internet service available in branches of the Pamunkey Regional Library and will continue to seek opportunities to expand public access to internet at public facilities.

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Consider establishing special tax districts – completed. Hanover County evaluated the potential for the creation of a utility to provide Internet service in the less populated areas of the County. The County evaluated operating models and capital investments, and projected the impacts of changing technology impacts. The Board of Supervisors determined not to proceed with this option or otherwise invest public tax dollars to provide a service more appropriately met by the private sector.

Additional activities the County has been pursuing related to broadband initiatives include:

Streamlining permitting processes to promote tower expansion and additional tower capacity.

Contacting all known Internet Service providers to encourage expansion within Hanover County.

Most providers have expressed concern over their lack of opportunity to see a Return on Investment for the needed capital to provide service within less densely populated areas of the county.

Engaging the Virginia Secretary of Technology's office for assistance on identifying solutions to meet the needs of Hanover County Residents.

Creating a list of providers and numbers to call that will be placed on the County website at www.hanovercounty.gov.

18. Additional Information

Any other equitable factor that the applicant desires to include. Applicants are limited to four additional attachments. Label Additional Attachments as:

- a. Attachment 14 – Two most recent Form 477 submitted to the FCC or equivalent
- b. Attachment 15 – Copy of Public Notice
- c. Attachment 16 – XXXXXXXX
- d. Attachment 17 – XXXXXXXX
- e. Attachment 18 – XXXXXXXX
- f. Attachment 19 – XXXXXXXX

Answer:

- c. Attachment 16 – Question 17 – Broadband Memo and Plan Hanover 2012-2019
- d. Attachment 17 – Question 17 – High Speed Internet Community Meeting 2015-02-10
- e. Attachment 18 – Question 18 – Comcast Rate Card - Hanover
- f. Attachment 19 – XXXXXXXX (Not used)

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Attachments:

Map(s) of project area, including proposed infrastructure

Attachment1ProjectAreaMapHanover830201915414.pdf

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

Attachment2ExistingProviderMapHanover830201915423.pdf

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

Attachment3DocumentationofCAFFundingAreaHanover830201915728.pdf

Documentation that proposed project area is unserved based on VATI criteria

Attachment4DocumentationUnservedAreaVATICriteriaHanover830201915443.pdf

Propagation Map if Wireless Project

Attachment5PropagationMapWirelessProjectNotApplicable830201915743.pdf

Project Management Plan

Attachment6TimelineProjectManagementPlanHanover2020830201915755.pdf

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

Attachment7RelationshipbetweenApplicantCoApplicantHanover830201915452.pdf

Letters of Support

Attachment8LettersofSupport830201915808.pdf

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

Attachment9DocumentationofMatchFundingHanover830201915505.pdf

Funding Sources Table

Attachment10FundingSourcesTableHanover830201915822.pdf

Application to DHCD Submitted through CAMS

Hanover County

Hanover County - Old Church Road VATI Grant

Derivation of Cost (Project Budget)

Attachment11DerivationofCostsWorksheetHanoverCounty2019932019124919.pdf

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

Attachment12DocumentationOfSupportingProjectCostsHanover2019932019124935.pdf

Supporting documentation for costs estimates

Attachment13SupportingDocumentationOfCostEstimatesHanover2019932019124945.pdf

Two most recent Form 477 submitted to FCC

Attachment14TwoMostRecentPublicForm477SubmittedtotheFCCCHANOVER830201915606.pdf

Copy of Public Notice

Attachment15CopyofPublicNoticeHanover830201915917.pdf

Optional

Attachment16Question17BroadbandMemoandPlanHanover20122019830201915930.pdf

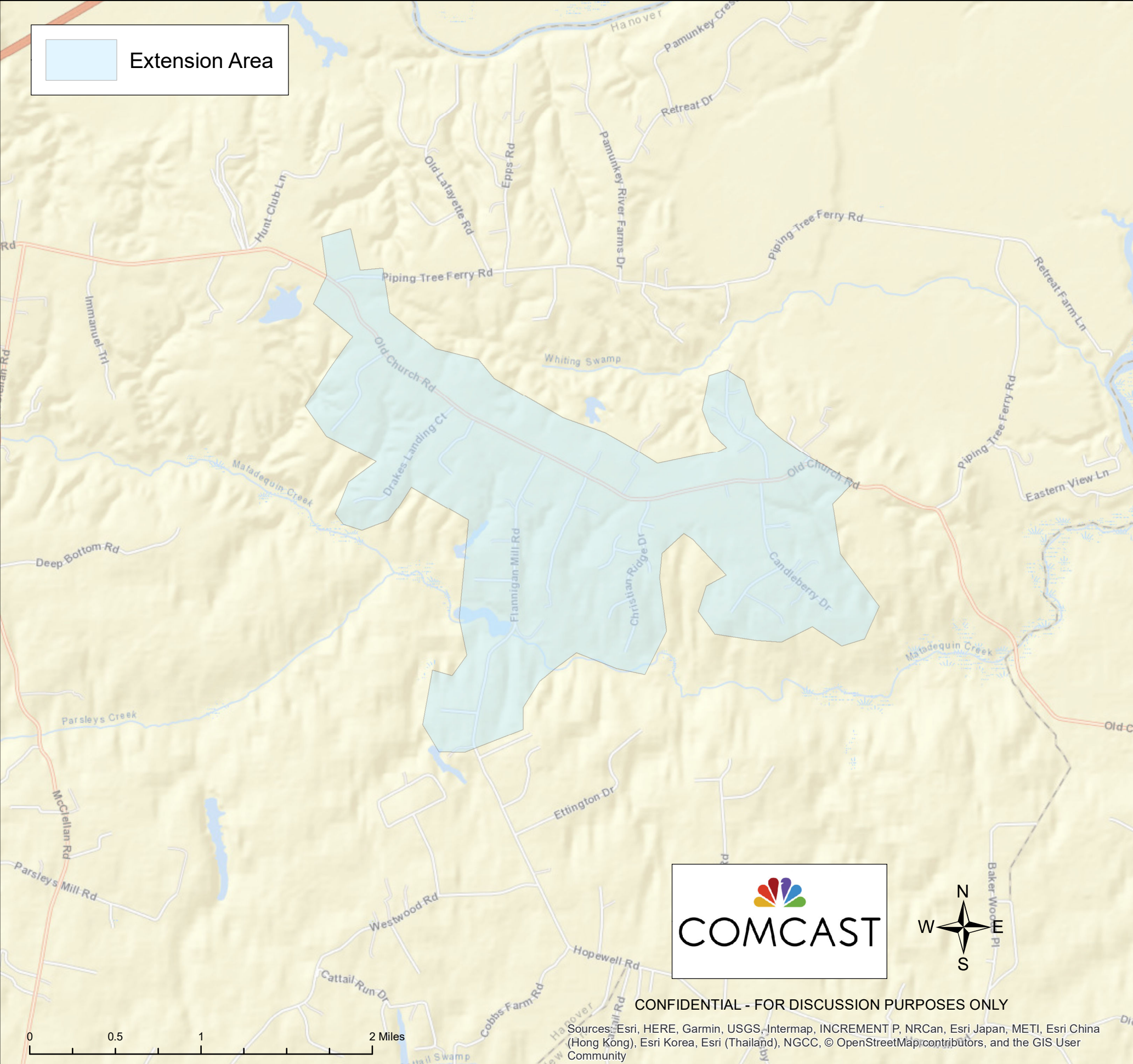
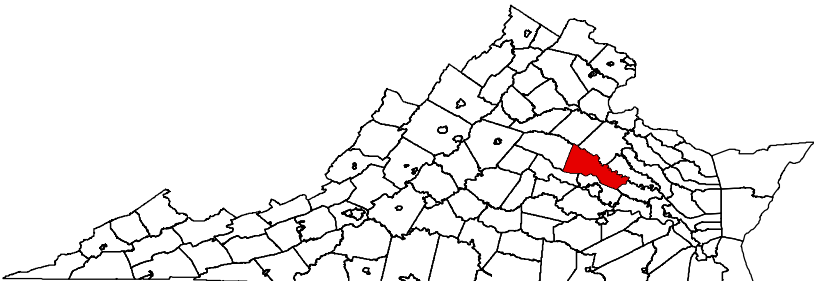
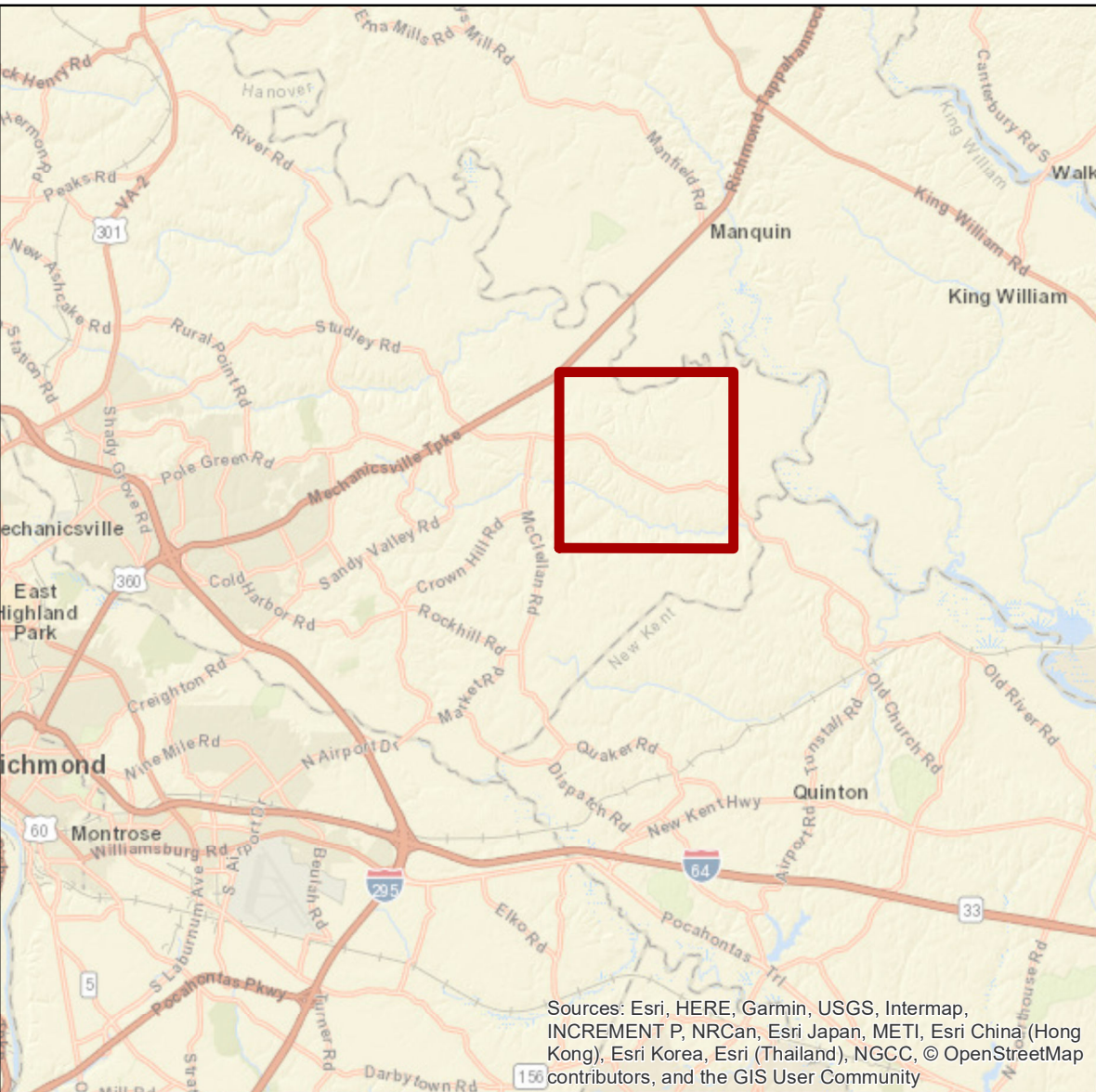
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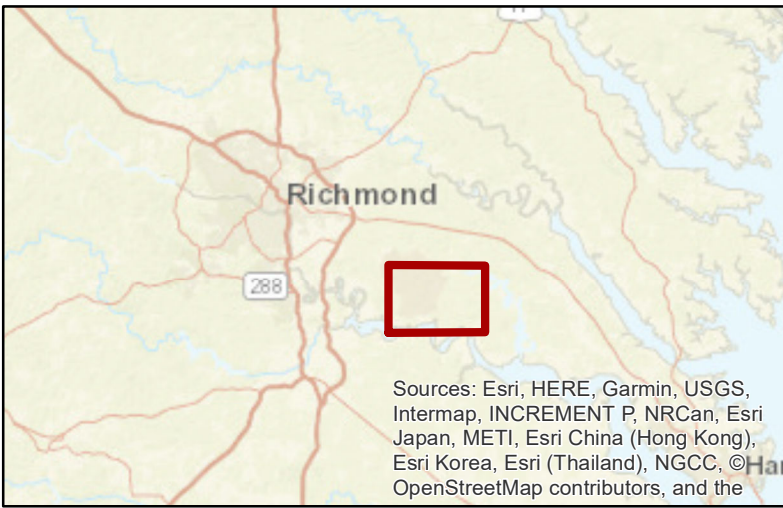
Attachment17Question17HighSpeedInternetCommunityMeeting20150210830201915943.pdf

Optional

Attachment18Question18ComcastRateCardHanover830201920027.pdf

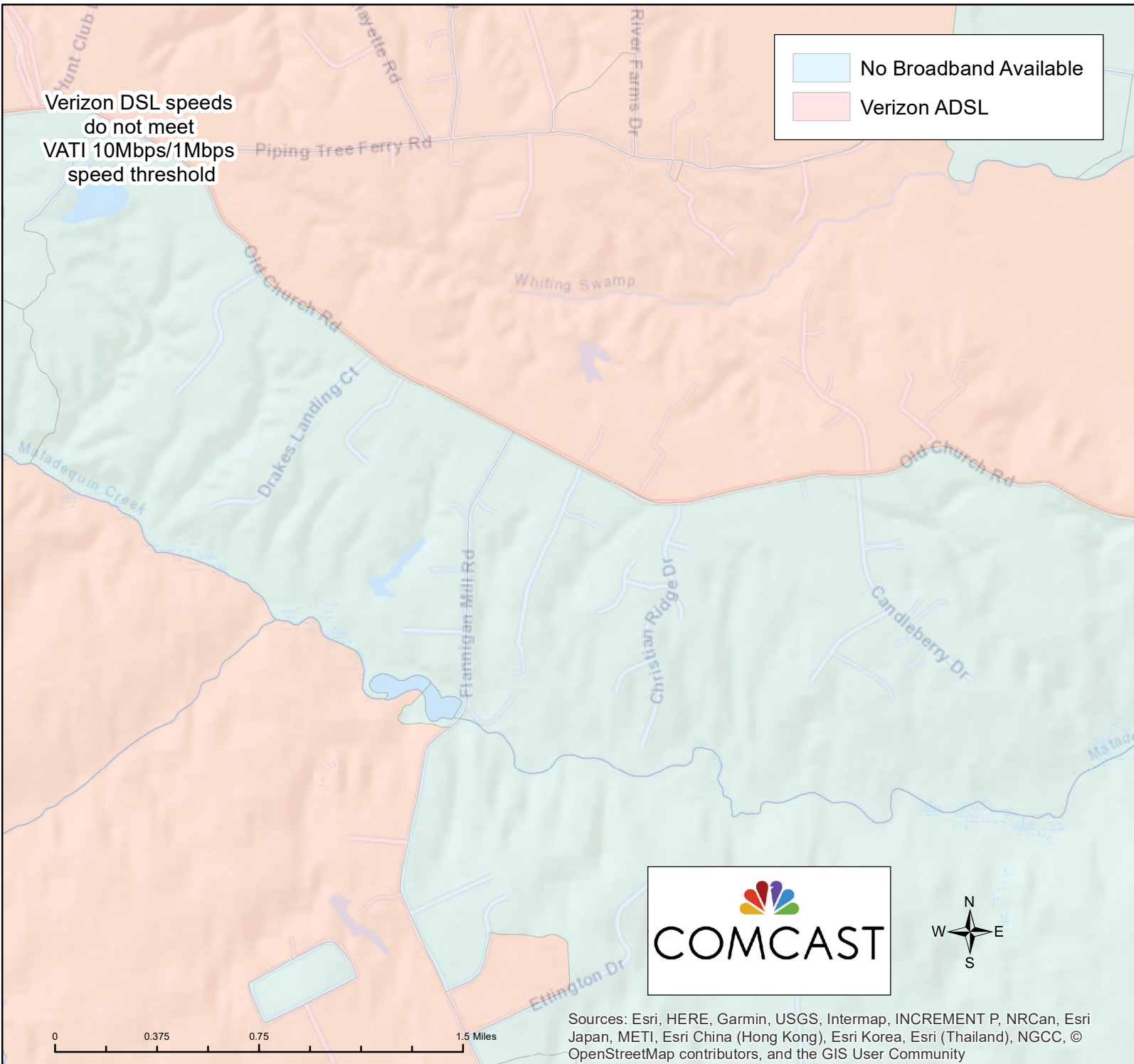
HANOVER COUNTY SERVICE EXTENSION OLD CHURCH AREA





EXISTING PROVIDERS AS REPORTED TO THE FCC

Form 477 Broadband Deployment Data
December 2017 (Version 2)



Documentation of CAF Funding Area

Universal Service Administrative Co. Connect America Fund Broadband Map Onboarding

Feedback

Old Church Road Project does not fall in CAF funding area

Ashland

King William

Glen Allen

Short Pump

Lakeside

Mechanicsville

Tuckahoe

Location of project area

Fund: All Funds

State: VA

Company Name: Search Company Name

Speed: All Speeds

Deployment Year: All Years

Clear All Filters

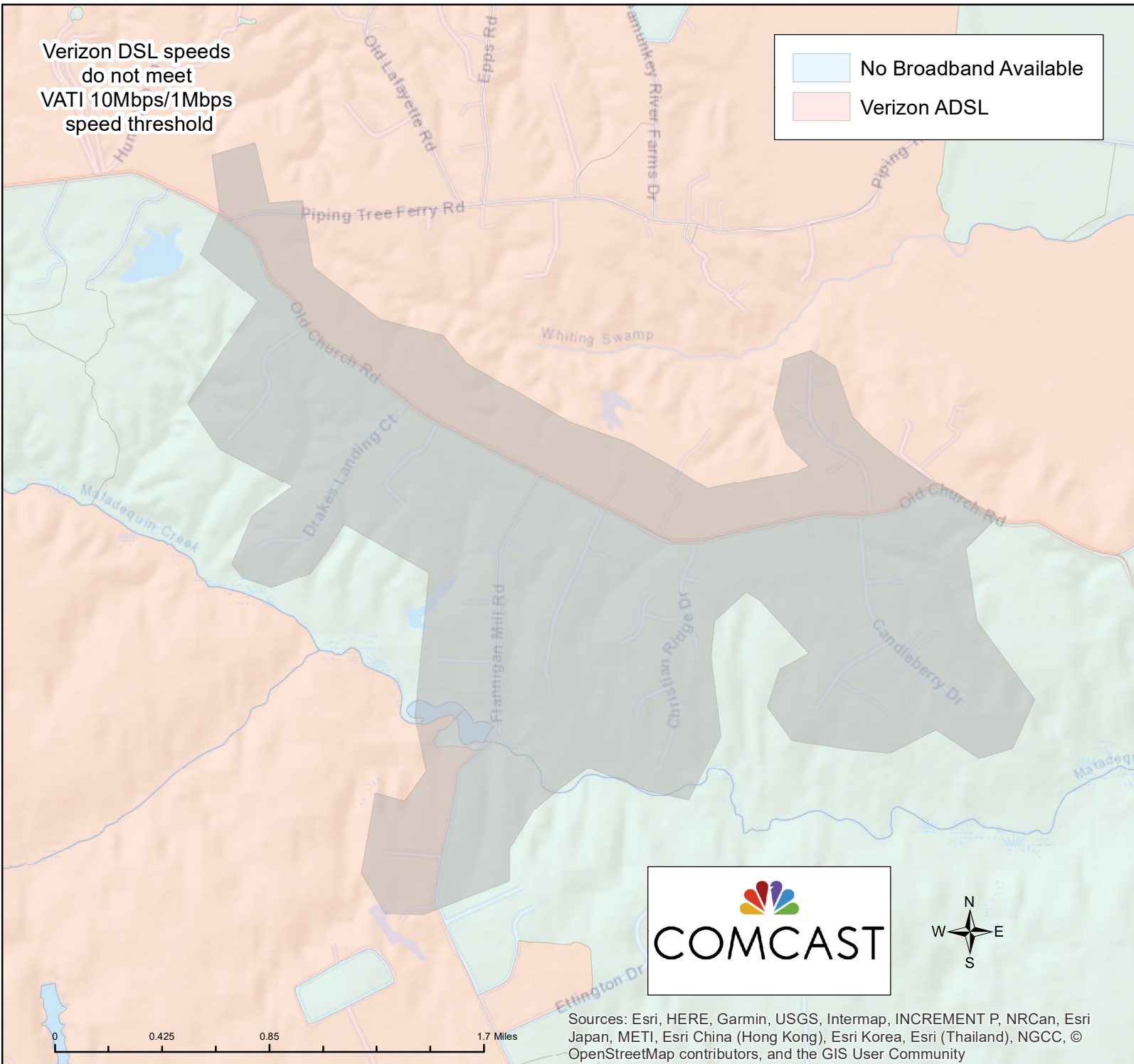
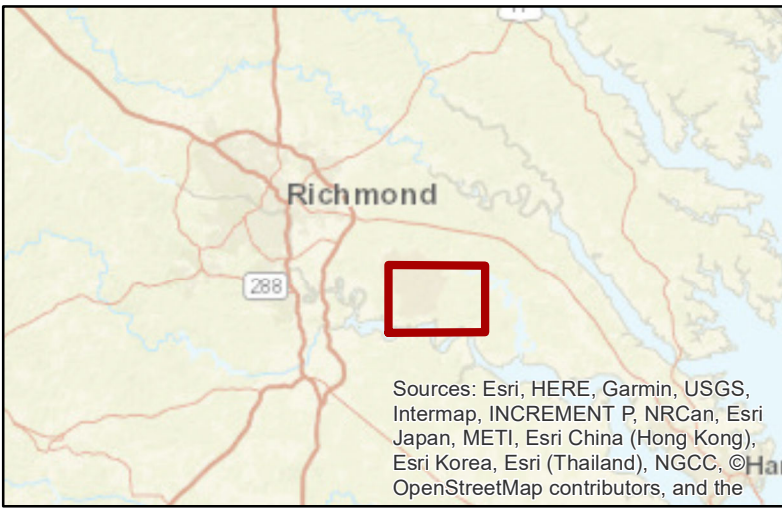
Source: <https://data.usac.org/publicreports/caf-map>; as of 9/1/19

Leaflet | © OpenStreetMap contributors, © CARTO

Old Church Area Hanover Co VA

BROADBAND AVAILABILITY AS REPORTED TO THE FCC

Form 477 Broadband Deployment Data
December 2017 (Version 2)





September 3, 2019

ATTACHMENT 5. Propagation Map if Wireless Project

Attachment 5 is not applicable to this grant application.

September 3, 2019

ATTACHMENT 7. Documentation of Relationship Between Applicant and Co-Applicant (formal or informal)

Hanover County supervisors voted to proceed with a VATI application in partnership with Comcast at their meeting on August 28, 2019. The staff of Hanover County coordinated this partnership arrangement with Comcast. Comcast and Hanover County will complete a formal agreement to make review of work and processing of payments as efficient as possible. Comcast anticipates submitting invoices at the mid-point of the project and at project completion.

The partners have agreed in principle on the following responsibilities:

- *Hanover County intends to partner with Comcast as a co-applicant for a VATI grant to extend broadband service to unserved areas of Hanover County.*
- *Hanover County would complete the grant application (with Comcast's assistance); submit the completed application(s) to the Virginia DHCD; and manage the processing of work payments. Because Hanover County will be the funded applicant in the event of award, the county would timely process all VATI related Comcast invoices that applied directly to the approved work plans, design, and statement of work. Any delays in completing the work as planned would be negotiated with DHCD as partners.*
- *Hanover County also would provide services and support for any necessary citizen engagement activities, including but not limited to: processing applications for right of way in a manner consistent with all local, state, and federal law; advocating and describing the benefits of the project to those affected; and working with Comcast and other partner agencies (e.g. VDOT) and private industry (e.g. Dominion Energy) to help coordinate construction and/or pole attachments.*
- *Comcast would provide accurate VATI construction plans; associated material and work invoices to match the construction plans; detailed descriptions of necessary right of way or pole attachments; and timely notice of other needs to Hanover County.*
- *This general agreement proceeds from the notice of VATI award to the completion of the projects.*

VIRGINIA: At a regular meeting of the Board of Supervisors for Hanover County held in the Board Room of the Hanover County Administration Building on the 28th day of August, 2019, at 3:00 p.m.

Present: Mr. W. Canova Peterson, Chairman
Mr. Scott A. Wyatt, Vice-Chairman
Mr. Sean M. Davis
Mr. Wayne T. Hazzard
Mrs. Angela Kelly-Wiecek
Ms. Faye O. Prichard
Mr. Aubrey M. Stanley

A RESOLUTION APPROVING THE FILING OF A GRANT APPLICATION WITH THE VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

WHEREAS, Virginia's Department of Housing and Community Development ("DHCD") administers the Virginia Telecommunications Initiative grant program to assist in constructing "last-mile" broadband telecommunications infrastructure in the unserved areas of the Commonwealth. Guidelines for the grant application were posted in June of 2019 and the deadline for applications has been set for 3 September 2019; and

WHEREAS, the program guidelines for grant application, requires a government entity as the applicant with a qualified and experienced private sector broadband provider as the co-applicant; and

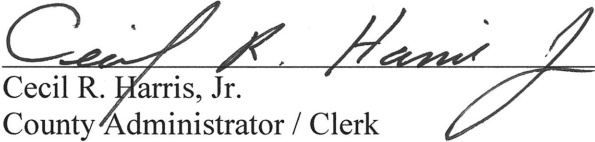
WHEREAS, Comcast Cable has offered, in conjunction with DHCD's Virginia Telecommunication Initiative, to extend parts of its system to include Old Church Road (Rt. 606) from Immanuel Trail to approximately ½ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and associated streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane.

NOW, THEREFORE, BE IT RESOLVED, the Hanover County Board of Supervisors does hereby approve the submittal of a grant application to the Virginia Department of Housing and Community Development to assist in constructing "last-mile" broadband telecommunications infrastructure in the unserved areas of the Commonwealth and authorizes the County Administrator to take such action necessary to file the grant application with DHCD with the co-applicant, Comcast Cable.

Upon motion by Mr. Wyatt, seconded by Mr. Stanley, the members of the Hanover County Board of Supervisors voted to adopt this resolution, as follows:

	Vote:
W. Canova Peterson	Aye
Sean M. Davis	Aye
Wayne T. Hazzard	Aye
Angela Kelly-Wiecek	Aye
Faye O. Prichard	Aye
Aubrey M. Stanley	Aye
Scott A. Wyatt	Aye

Date: August 29, 2019


Cecil R. Harris, Jr.
County Administrator / Clerk
Hanover County Board of Supervisors

SENATE OF VIRGINIA

RYAN T. McDOUGLE

4TH SENATORIAL DISTRICT
ALL OF CAROLINE, ESSEX, LANCASTER,
MIDDLESEX, NORTHUMBERLAND, AND
RICHMOND COUNTIES; AND PART OF
HANOVER, KING GEORGE, SPOTSYLVANIA,
AND WESTMORELAND COUNTIES
POST OFFICE BOX 187
MECHANICSVILLE, VIRGINIA 23111



COMMITTEE ASSIGNMENTS:
RULES, CHAIR
COMMERCE AND LABOR
COURTS OF JUSTICE
FINANCE
REHABILITATION AND SOCIAL SERVICES

August 27, 2019

Rhu Harris, County Administrator
County of Hanover
7516 County Complex Road
Hanover, Virginia 23069

Dear Mr. Harris:

I would like to express my strong support for Hanover County's Virginia Telecommunication Initiative grant application to increase access to broadband with Comcast by upgrading and expanding its network.

There is a demonstrated need in the Old Church Road area of Hanover for access to broadband. Residents and businesses alike have faced frustration with slow or no internet. Building broadband networks to unserved areas is often challenging due to larger distances to cover and fewer possible customers to purchase service. Comcast has indicated that in this part of Hanover County, population density is insufficient to make it economically feasible to build out at this time. Consequently, a Virginia Telecommunication Initiative grant is a key factor to providing broadband to the area.

Additional access to high speed broadband will allow businesses to compete more effectively, provide new educational opportunities for students, and offer residents more convenience and entertainment in their homes. Broadband will also attract new businesses and residents from outside the region by allowing telecommuting and other networking options suitable for today's global economy.

I support the proposed infrastructure upgrade in the Old Church area of Hanover County and request the Department of Housing and Community Development to approve the application because it will provide a great benefit to my neighbors and constituents in Hanover.

Thank you in advance for your consideration. If you have any questions or concerns, please do not hesitate to call my office.

Sincerely,

A handwritten signature in black ink that reads "Ryan T. McDougle".

Ryan T. McDougle



Christian Ridge Homeowner's Association

Box 146 Studley, VA 23162

www.christianridge.net

August 27, 2019

Frank W. Harksen, Jr.
Deputy County Administrator
Hanover County
P.O. Box 470
Hanover, VA 23069

Dear Mr. Harksen,

The Christian Ridge Homeowners Association supports the expansion of broadband service in Hanover County generally and specifically supports Hanover's Virginia Telecommunication Initiative grant application for the Old Church Road corridor, which will bring broadband service to the Christian Ridge community.

Broadband service is important in our daily routines and expanded service in areas of Hanover currently unserved will provide residents much needed access to a variety of goods and services, provide service to home-based businesses, and support telecommuting by our residents and education of our children.

In addition, we can attest that several families have left Christian Ridge and the Old Church area due to not having reliable broadband service in our community.

If there is anything we can provide to assist in this grant, please let me know.

Sincerely,

William J. Slaughter
President

August 18, 2019

Hanover County
Tom Harris
PO Box 370
Hanover, Virginia

Re: Proposed Broadband Project in Old Church, Virginia

Dear Mr. Harris,

I am writing to you regarding a publication of a press release regarding a proposal for extended broadband service in Old Church, Virginia that was posted on August 6, 2019.

I, along with undersigned/attached, would like to request that the application for the broadband extension include the communities that we live in. The only source of Internet that we are able to obtain is through use of a hotspot, satellite or mifi. While this does allow Internet access, the unreliability of these connections is a frustration amongst us all. In modern times, reliable Internet has become an expectation of today's living. Almost like having electricity. Every aspect from jobs and Hanover County school requirements for assignments is Internet based. Many of us have children within Hanover County schools and assignments that are to be completed are a lot of times online or need Internet availability. Our children are negatively affected when upload/download speeds are too slow to access required. Also, parents are unable to have a reliable connection to stay in contact with their student's teachers and check their progress due to slow upload/download speeds or lack of connection due to poor satellite reception.

Many jobs are now requiring employees to work from home or they allow employees to telecommute from their home. Without reliable secure Internet connection, such as broadband, we are unable to meet the needs of our employers, or be as competitive within our fields due to the lack of broadband.

Home values are also suffering in this community due to the lack of broadband. Most homebuyers seek homes in locations that have broadband connection due to the need for this in today's lifestyles. Not to mention that alternative Internet access through satellite or hotspots/mifi is more expensive than broadband service.

This means that our location is now considered "less desirable" and has a negative impact on home values in the area.

We would like to see that our community be added to your application for the grant for broadband service so that our children's education, our jobs, and overall opportunities can be competitive with others that have broadband service. Please don't just think of each signature as "one" connection as there are multiple people within a household that could be positively affected with the connection of broadband service.

The undersigned/attached are all members within this community that would connect to a broadband service if it were available. Again, please consider our plea for broadband service and kindly add our community to the application for the grant.

Sincerely,


Holly S Baker Bugin

Broadband Internet Signatures

PIN/TAX	ADDRESS	SIGNATURE
8774-63-7645	1015 Keck Circle	Holly & Zuber Busin
8774-64-9143	7247 Baker Woods Place	M. J. Bluff
8774-53-9461	1038 Holly Stone Drive	Archie P. Drake
8774-62-3970	1021 Holly Stone Drive	Diana Annette Hayes
8774-63-1036	1029 Holly Stone Drive	Steve & Julie Hayes
8774-63-2215	1030 Holly Stone Drive	Linda Perryman
8774-53-6337	Lot 4 Keckston	
8774-53-7508	Lot 5 Keckston	
8774-53-8264	Lot 3 Keckston	
8774-62-1847	Keckston	
8774-63-8041	Lot 8 Keckston	
8774-63-8274	Lot 9 Keckston	
8774-63-8487	Lot 10 Keckston	
8774-63-9751	Lot 12 Keckston	
8774-64-7974	7300 Black Walnut Lane	
8774-65-6760	7308 Black Walnut Lane	
8774-66-0914	7316 Black Walnut Lane	
8774-32-5386	4100 Hopewell rd.	
8774-32-7603	4110 Hopewell rd.	
8774-42-2955	4120 Hopewell rd.	
8774-22-9263	3960 Hopewell rd.	
8774-12-0820	3700 Hopewell rd.	
8764-76-9360	5410 Westwood Hill Rd	
8764-46-7186	7420 Flannigan mill rd	
8764-49-5333	7385 Flannigan mill rd.	
	Subdivisions along route	
	Westwood Farms	
	Ettington Hall	
	Baylar Springs	
	Keckston → all Keckston homeowners signed above	

Holly & Zuber Busin
 M. J. Bluff
 Archie P. Drake
 Diana Annette Hayes
 Steve & Julie Hayes
 Linda Perryman

Mills R. J.

David M. M.
 R. L. G.
 Jay G.
 Ted Paul
 Robt.
 William G.
 as per
 Floyd W. Shaw, Sr.

This project has been formally endorsed by Resolution of the Hanover County Board of Supervisors. The County has received 25 emails of support from citizens for the expansion of broadband. This includes an email of support from Senator Ryan McDougle and the Chamber of Commerce. It is difficult to discern how many are specifically in the project area, but many refer to the Old Church area. These emails are summarized in the related attachment. Contact information has been deleted, but can be provided as necessary.

In addition, the County has received a letter of support from the Christian Ridge Homeowners Association. Christian Ridge is the largest subdivision located in the project area. The County has also received a petition signed by 16 residents from the Keckston subdivision (just outside the project area). These letters have been included in the related attachment.

Summary Comments:

The Hanover Chamber of Commerce, VA, represents over 315 businesses and 650 individuals across our County; our membership includes every size business and industry. Our mission is to provide leadership within the Hanover County VA business community, to champion economic development while safeguarding business interests and property rights, to promote professional standards and ethics within the business community and to maintain positive relationships among businesses, educators, governments and residents. The Hanover Chamber of Commerce, VA, supports the expansion of broadband service in Hanover County, in alignment with our mission to champion strong business within our community. Access to broadband service is important in our daily lives and essential to economic growth. The expansion of broadband to currently unserved areas of Hanover will enable home-based businesses to thrive, enhance the possibilities for telecommuting, agricultural operations and tourism, provide all County residents and students a better quality of life, and allow continued access to our members' many goods and services.

Again, thank you for contacting us on this topic.

Melissa Miller
Executive Director
Hanover Chamber of Commerce

All the better for broadband in Hanover County. However please review the last mile areas. Little River Drive is the last mile for Century Link. New Market Mill Road, that runs by Little River Drive, has broadband to Verdon Road where for whatever reason they have an agreement with Verizon splitting this part of Hanover County.

Sincerely, Joe Dreyfuss

My name is Michael Jarvis. I am the HOA president for Baylor Springs neighborhood just down the street from you on Flannigan Mill Rd.

I know your neighborhood is in the same position we are in as far as lack of high speed Internet. I hope to start working together to help rectify this issue as well as share information you can disseminate to your HOA members. The more pressure we can place on local county officials, hopefully the better opportunity we will have for change.

I look forward to hearing back from you.

Thanks,
Michael Jarvis

Will you please consider extending the Broadband service area to all of Old Church (down Route 606 to the County line) to include the Keckston subdivision, Parcel 8774-66-0914, Parcel 8774-77-4019, Parcel 8774-78-4173, Parcel 8774-88-5496, Parcel 8774-65-6760, and Parcel 8774-64-7974?

I'm sure all of our neighbors would provide utility easements for broadband.

Sincerely,
Ashley Peace

I'm very interested in the potential broadband project in the Old Church Rd (Rt606) area. I believe additional choices for broadband access in this area would be a welcome improvement. Can you please provide more information of the process and the project?

--

Thanks,

James Gathright

We have horrible broad band !!!!
Can not work from home it is so bad.
Deanne Muller

I wanted to let you know why broadband is so important to my house. I have changed jobs since buying my home and the lack of broadband causes me late hours or weekend hours in the office because I don't have the speed or enough data plan to implement what I need. My husband and I are considering moving because it impacts work and we pay so much and get so little to have what we now have.

Donna Clisso

I saw the notice about the "potential Broadband project" and see that it is only for the eastern part of the county. What is being done for the western half of the county? There are actually areas that only have dial-up. Our internet is dsl at 3, three, Mbps and is so poor that many days basic pages will not load. It goes down on a regular basis. It is time to remember that there is another half of Hanover County that has been getting the short end of the stick.

Bonnie Muller Montpelier

My name is Michael Jarvis. I currently serve as the HOA president for the Baylor Springs neighborhood off Flannigan Mill Rd. in Old Church.

I recently read the press release discussing the broadband expansion project for Old Church Road and parts of Flannigan Mill Road. While I am excited for this project to get high speed Internet to additional homes in the Old Church community, I am disheartened to see that it will stop at the historic Mill along Flannigan Mill Road and not extend further down Flannigan Mill Road towards Westwood Road.

There are three neighborhoods totaling over 40 houses within a half mile of each other just past where this project is slated to end on Flannigan Mill Road. I would ask you to please consider looking into expanding the project further down Flannigan Mill Road as a significant number of homes, many of which are inhabited by families with young children in Hanover County Public schools, have a need for high-speed Internet for school related functions.

Any feedback you can provide about amending/adding to the proposed project would be appreciated.

Thank you,
Michael Jarvis

I am writing today concerning this initiative. The plans call for Broadband to potentially be placed in Old Church. The statement released states that the broadband will travel south on Flannigan Mill road but will stop at the Matedaquin creek bridge. There are many homes and several neighborhoods south of that on Flannigan Mill Road. Can the plan be reconsidered to make Broadband accessible to all residents in Old Church? We have waited long enough.

I do not think it is fair for HCPS students to be assigned homework that requires access to internet to complete when all residents do not have reliable access to the internet.

It makes it very possible to complete remote work from my residence as well.

Regards,

Amanda Dover, BSN, MBA

I live in Old Church off of Flannigan Mill Rd., in Hidden Lakes Estates on Hidden Lake Circle. Would this broadband be available for this community too.

Thank you, Susan Closs

I live on Corbin Braxton Lane and would like to participate in any project for increased broadband for my area. Please let me know what additional information you may need.

Regards,
Chris Fletcher

I am writing to ask for your support regarding broadband internet access in the Old Church area of Hanover County. As the Executive Director of a horse rescue organization in Hanover county and an Old Church property and small business owner, the lack of adequate internet access impairs our ability to do business and enjoy the luxury most other residence of the country are afforded. My family has actually consider moving; however, we dearly love the area and have made it home. We love the community and fully support your vote on broadband access.

Sincerely, Freda Cavallaro

I am writing to express my opinion that broadband is greatly needed in the Old Church area. I recently lost my job after 29 years at Bon Secours due to the merger with Mercy Health. My whole department was outsourced to an 800#. In my job search I've had to turn down 2 jobs that require broadband as I

would be providing telemedicine services. Satellite internet does not support telemedicine. Having broadband would definitely open many opportunities for finding professional employment. Thank you for taking the time to read my email.

Julie Burcham

My name is Cody Cavallaro. I have been following the broadband project for some time, ever since legislation passed over a year ago to allocate funds to the ability to begin the project. I wanted to briefly share my story, and why I greatly think the Old Church area needs this. I am a 24 year old graduate of James Madison University. My parents moved to the Old Church Area when I was 18, because it is simply beautiful. I lived there for 5 years, during the summers of school, and then 2 years after graduating. The reason I had to move out was the lack of internet access. As a young adult, I definitely rely on the internet more than others, however I believe in today's world it is very necessary for everyone. I bought my own house at the start of 2019, because I couldn't bare not being able to use the internet any longer. The internet is how I make money, connect with friends, entertain myself, this list goes on. My parents still to this day have no ability for reliable internet. They have lived in Old Church for 6 years now, and they have tried every option available. Nothing truly works as well as a simple broadband option, and they pay much more than I do every month for a sliver of what I have access to here. Their quality of life would definitely improve with the access to decent internet. I hope this happens soon, as it has been far too long.

Thank you for your time. Cody

I am writing to support the broadband initiative expanding service down Old Church Road. As has been widely documented poor broadband service hampers education, property values, and quality of life in this wonderful community What else can I do to move this forward

Bob McGuire

It's long over due that there would be internet in Old Church. It's beyond me that in today's technology we are just now having this conversation. There are a lot of high value homes in this neighborhood and it guts home values when people find they cannot get affordable quality internet here.

Christopher M Ray

High speed broadband is desperately needed in the Old Church Areas. The only access we can get is through either cellular or satellite. We currently have a cellular hot spot which is expensive and pretty ineffective.

We have fiber optic cabling at the end of our driveway, that the county installed to service the emergency cell tower on Old Church Rd, but as a private citizen we can't access it.

We only live approximately twenty one miles from the state capital, yet we don't have high speed broadband. Which in my eyes is pretty ridiculous Yet, the state poured millions and millions of dollars to bring high speed broadband to areas like South Hill and South Boston.

High speed broadband is not a luxury this day and age, it is a requirement to be connected to the world. Every student needs it, just to perform daily tasks that are part of their schooling. I firmly believe having high speed broadband would increase real estate values therefore increasing tax revenue to the county.

Anything that can be done would be greatly appreciated.

Gary Williams

Please help get reliable internet service to Old Church. This is effecting property values. Thanks Suzan Powell

I got a note that public comments ends tonight on High Speed Internet however I cannot find anything on your website regarding this topic other than much older stuff.

Regardless, we need reliable internet which is NOT available and we expect county support, rather than the usual, "we can't help". I work all over Virginia and reliable and high speed internet means economic development and many/most counties really understand this issue and are making efforts however sadly my very own county seems to sit on their hands for some odd reason. The time and thus money I waste on slow and unreliable internet when working for home is shocking and I can imagine the county has lost businesses due to this very issue.

Let's see a change...

Meade anderson

This service is should be a priority for this area.

whitelaw

My family and I just moved to our new home in Old Church in June and we absolutely love it out here! With one exception... the lack of Broadband internet!

We came from the other side of Hanover off of route 301 where we had high speed internet. It was always easy to stream our kids' favorite TV shows while getting work done from home. Now that we are in Old Church, we have tried several means to achieving the same functionality, but nothing even comes close! We tried to use hotspots from our cell phones, two Verizon MiFis, and now we have satellite internet. The satellite internet has worked the best, but we still have trouble using more than one device at a time, and the slightest change in weather is constantly affecting our connection.

My husband owns his own construction company and has to be available to answer emails, order machinery, schedules crews, etc. at all times. I am a teacher and all of my resources are saved on my school's Google drive and my online plan book. Both of our jobs rely on a steady internet connection that we just can't seem to get out here, and it makes life more difficult and stressful.

Thank you for taking the time to read this and I hope we can get Broadband out here in the near future!

Sincerely, Mandi Green

I would like to express our strong support for bringing Broadband to Old Church. Despite our proximity to the state capital, we have had to rely on inferior Internet services for too long. It would enhance our neighborhood in many ways to have Broadband, not only permitting more reliable and efficient Internet service, but also improving our real estate values. We appreciate any support you are able to direct toward this effort. Thank you. Nancy and Charles Wheeler



324 West Main Street
Charlottesville, VA 22903

September 3, 2019

Cecil Harris, Jr.
Hanover County Administrator
7516 County Complex Road
Hanover, VA 23069

Dear Mr. Harris:

The purpose of this letter is to provide documentation regarding the in-kind contributions for the projects proposed to the Virginia Telecommunication Initiative ("VATI") program.

The proposed project represents a partnership between Comcast and Hanover County. As indicated in the application, Comcast will provide approximately 25% of the projected construction costs of \$1,442,044, totaling approximately \$360,511. Hanover County will assist in providing in-kind contributions including application analysis and preparation, coordination with the Department of Housing and Community Development, assistance with right of way permitting, and participating in further concert with Comcast as the project is approved and construction begins. The value of these services will depend on the level of activity occurring as the project commences.

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

Sincerely,

A handwritten signature in black ink, appearing to read "N Daugherty".

Nathan Daugherty
Sr. Manager, Government Affairs & Regulatory Affairs

Comcast / Hanover County Broadband Project - Development Funding Sources

Source (e.g., HUD)	Amount	Status	Documentation Included
Comcast	\$360,511	<input checked="" type="checkbox"/> committed <input type="checkbox"/> pending	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
DHCD	\$1,081,533	<input type="checkbox"/> committed <input checked="" type="checkbox"/> pending	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No

Operating Funding Sources

Source (e.g., HUD)	Amount	Status	Documentation Included
n/a		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> committed <input type="checkbox"/> pending	<input type="checkbox"/> Yes <input type="checkbox"/> No

Comcast/Hanover
County VATI Derivation of Costs

Product	Total	VATI	Non-VATI	Source of Estimate	Date
Old Church Road Project					
<u>Construction</u>					
<i>Broadband Construction - 17.4 miles</i>	\$1,442,044	\$1,081,533	\$360,511	Comcast survey	9/3/2019



September 3, 2019

Cecil Harris, Jr.
Hanover County Administrator
7516 County Complex Road
Hanover, VA 23069

Dear Mr. Harris:

The purpose of this letter is to provide information supporting the construction costs for the Old Church Road project proposed to the Virginia Telecommunications Initiative (“VATI”) program.

The Old Church Road project consists of extending Comcast infrastructure from existing facilities in the area on Old Church Road (Rt. 606) from Immanuel Trail to approximately ½ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and its secondary streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane.

The total build is estimated to be 17.4 miles of infrastructure and laterals. Estimated budget costs for construction are:

Materials:	\$346,091
Labor:	\$1,009,431
Project Management:	\$86,523
 Total cost:	 \$1,442,044

Examples of items that are included in the Materials category are power supplies, fiber, conduit, splice enclosures, pedestals, and taps. Examples of items in the Labor category are in-house and contract labor to trench and backfill, lay conduct and fiber, perform administration of VDOT permits, and provide crew supervision. The itemized breakdown of construction costs is confidential and proprietary information, and cannot be disclosed.

Should you have any questions regarding the information listed above, please do not hesitate to contact Nathan Daugherty at nathan_daugherty@comcast.com or 434-238-0729.

Sincerely,

A handwritten signature in blue ink, appearing to read 'T. Yates' with a stylized flourish at the end.

Tom Yates
Senior Director, Construction



324 West Main Street
Charlottesville, VA 22903

September 3, 2019

Cecil Harris, Jr.
Hanover County Administrator
7516 County Complex Road
Hanover, VA 23069

Dear Mr. Harris:

The purpose of this letter is to provide information supporting documentation for cost estimates for the Old Church Road project proposed to the Virginia Telecommunications Initiative (“VATI”) program.

Comcast’s Construction and Design team managed projects that added thousands of miles to Comcast’s regional hybrid fiber coaxial network in 2017-18. Comcast’s construction estimates are determined through a detailed project analysis that includes a field survey, an analysis of permitting costs (internal or external), a network impact study to determine necessary hub site preparation and possible infrastructure requirements, and a financial evaluation for overall build costs and likely return-on-investment. When contract labor is utilized, costs are accrued according to the fee schedule in the contract. This design and construction process is standard within the telecommunications industry.

The precise amount to be spent on contract labor versus in house resources will be determined when the grant is approved and the work commences. The allocation of work will depend on the level of construction activity at that time. Any contracted engineering and design work outlined in this proposal will be performed by Comcast approved contractors.

Should you have any questions regarding the information listed above, please do not hesitate to contact Nathan Daugherty at nathan_daugherty@comcast.com or 434-238-0729.

Sincerely,

A handwritten signature in blue ink, appearing to read "T. Yates".

Tom Yates
Senior Director, Construction



September 3, 2019

Cecil Harris, Jr.
Hanover County Administrator
7516 County Complex Road
Hanover, VA 23069

Dear Mr. Harris:

The purpose of this letter is to provide information regarding the two most recent Form 477 submissions by Comcast to the Federal Communications Commission. Data from these submissions can be located at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>. Summaries of each are attached to this letter.

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

Sincerely,

Nathan Daugherty
Sr. Manager, Government Affairs & Regulatory Affairs

(RETAIN FOR YOUR RECORDS)
Form 477 Filing Summary

FRN: 0003768165 | Data as of: Dec 31, 2018 | Operations: Non-ILEC | Submission Status: Original - Submitted | Last Updated: Mar 6, 2019 11:43:12

Filer Identification

Section	Question	Response
Filer Information	Company Name	COMCAST CABLE COMMUNICATIONS, LLC
	Holding Company Name	Comcast Corporation
	SAC ID	
	499 ID	812736, 820956, 822102, 823798, 825948, 827142, 832043
Data Contact Information	Data Contact Name	Joanne Horstmann
	Data Contact Phone Number	(610) 665-2546
	Data Contact E-mail	joanne_horstmann@cable.comcast.com
Emergency Operations Contact Information	Emergency Operations Name	Edge Services Desk
	Emergency Operations Phone Number	(800) 777-9824
	Emergency Operations E-mail	CNOC_Voice_EventMgmt@cable.comcast.com
Certifying Official Contact Information	Certifying Official Name	Julie Laine
	Certifying Official Phone Number	(215) 286-2334
	Certifying Official E-mail	Julie_Laine@comcast.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	55.csv	Mar 6, 2019 10:24:06	1644
	54.csv	Mar 6, 2019 10:23:04	15801
	53.csv	Mar 6, 2019 10:21:53	74667
	51.csv	Mar 6, 2019 10:20:41	60837
	50.csv	Mar 6, 2019 10:19:16	10630
	49.csv	Mar 6, 2019 10:17:20	30370
	48.csv	Mar 6, 2019 10:15:57	65358
	47.csv	Mar 6, 2019 10:14:18	63236
	36.csv	Mar 6, 2019 10:13:14	1698
	35.csv	Mar 6, 2019 10:13:14	22660

Form Section	File Name	Date & Time	Number of Rows
	34.csv	Mar 6, 2019 10:13:14	77336
	33.csv	Mar 6, 2019 10:13:14	17064
	29.csv	Mar 6, 2019 10:13:14	5377
	28.csv	Mar 6, 2019 10:13:13	20394
	27.csv	Mar 6, 2019 10:13:13	34274
	26.csv	Mar 6, 2019 10:13:13	97886
	25.csv	Mar 6, 2019 10:13:13	86271
	24.csv	Mar 6, 2019 10:13:13	68768
	23.csv	Mar 6, 2019 10:13:13	2159
	22.csv	Mar 6, 2019 10:13:13	10354
	21.csv	Mar 6, 2019 10:13:13	5740
	45.csv	Mar 6, 2019 10:07:30	13212
	42.csv	Mar 6, 2019 10:05:43	180886
	20.csv	Mar 6, 2019 10:04:30	1423
	18.csv	Mar 6, 2019 10:04:29	89717
	17.csv	Mar 6, 2019 10:04:29	174924
	16.csv	Mar 6, 2019 10:04:29	47
	13.csv	Mar 6, 2019 10:04:29	67676
	12.csv	Mar 6, 2019 10:04:29	156513
	11.csv	Mar 6, 2019 10:04:29	5073
	10.csv	Mar 6, 2019 10:02:31	13840
	09.csv	Mar 6, 2019 10:02:31	25089
	08.csv	Mar 6, 2019 10:02:31	62692
	06.csv	Mar 6, 2019 10:02:31	138878
	05.csv	Mar 6, 2019 10:02:31	8454
	04.csv	Mar 6, 2019 10:02:31	3940
	01.csv	Mar 6, 2019 10:02:31	21183
	41.csv	Mar 6, 2019 10:01:33	38072
	39.csv	Mar 6, 2019 10:00:45	5871
	37.csv	Mar 6, 2019 09:59:48	144
Fixed Broadband Subscription	53.csv	Feb 27, 2019 15:17:24	21083
	48.csv	Feb 27, 2019 15:17:24	20216
	55.csv	Feb 27, 2019 15:09:11	400

Form Section	File Name	Date & Time	Number of Rows
	54.csv	Feb 27, 2019 15:09:11	2893
	51.csv	Feb 27, 2019 15:09:11	15993
	50.csv	Feb 27, 2019 15:09:11	2451
	49.csv	Feb 27, 2019 15:09:10	9308
	47.csv	Feb 27, 2019 15:09:10	16888
	45.csv	Feb 27, 2019 15:06:12	2691
	42.csv	Feb 27, 2019 15:06:12	41012
	41.csv	Feb 27, 2019 15:06:12	9478
	25.csv	Feb 27, 2019 15:05:24	22956
	39.csv	Feb 27, 2019 15:04:45	944
	37.csv	Feb 27, 2019 15:02:15	35
	18.csv	Feb 27, 2019 14:56:48	17567
	17.csv	Feb 27, 2019 14:56:48	42931
	16.csv	Feb 27, 2019 14:56:48	10
	13.csv	Feb 27, 2019 14:56:48	20865
	12.csv	Feb 27, 2019 14:56:48	40656
	11.csv	Feb 27, 2019 14:56:48	3020
	36.csv	Feb 27, 2019 14:52:24	421
	35.csv	Feb 27, 2019 14:52:24	5186
	34.csv	Feb 27, 2019 14:52:24	20079
	33.csv	Feb 27, 2019 14:52:24	3985
	29.csv	Feb 27, 2019 14:52:24	1464
	28.csv	Feb 27, 2019 14:52:24	4051
	27.csv	Feb 27, 2019 14:52:23	11901
	10.csv	Feb 27, 2019 14:50:04	3458
	09.csv	Feb 27, 2019 14:50:03	8020
	08.csv	Feb 27, 2019 14:50:03	18759
	06.csv	Feb 27, 2019 14:50:03	48079
	05.csv	Feb 27, 2019 14:50:03	1896
	04.csv	Feb 27, 2019 14:50:03	1657
	01.csv	Feb 27, 2019 14:50:03	4314
	26.csv	Feb 27, 2019 14:46:25	30211
	24.csv	Feb 27, 2019 14:46:24	21378

Form Section	File Name	Date & Time	Number of Rows
	23.csv	Feb 27, 2019 14:46:24	436
	22.csv	Feb 27, 2019 14:46:24	2195
	21.csv	Feb 27, 2019 14:46:24	947
	20.csv	Feb 27, 2019 14:46:24	537
Fixed Voice Subscription	48.csv	Feb 27, 2019 14:31:10	1190
	37.csv	Feb 27, 2019 14:31:10	36
	55.csv	Feb 27, 2019 14:21:01	44
	54.csv	Feb 27, 2019 14:21:01	227
	53.csv	Feb 27, 2019 14:21:01	1164
	51.csv	Feb 27, 2019 14:21:01	1069
	50.csv	Feb 27, 2019 14:21:01	162
	49.csv	Feb 27, 2019 14:21:01	508
	47.csv	Feb 27, 2019 14:21:01	993
	45.csv	Feb 27, 2019 14:21:01	180
	42.csv	Feb 27, 2019 14:21:01	2559
	41.csv	Feb 27, 2019 14:21:01	541
	39.csv	Feb 27, 2019 14:21:00	81
	36.csv	Feb 27, 2019 14:21:00	65
	35.csv	Feb 27, 2019 14:21:00	329
	34.csv	Feb 27, 2019 14:21:00	1303
	33.csv	Feb 27, 2019 14:21:00	249
	29.csv	Feb 27, 2019 14:21:00	109
	28.csv	Feb 27, 2019 14:21:00	277
	27.csv	Feb 27, 2019 14:21:00	667
	26.csv	Feb 27, 2019 14:21:00	1991
	25.csv	Feb 27, 2019 14:21:00	1315
	24.csv	Feb 27, 2019 14:13:03	1316
	23.csv	Feb 27, 2019 14:13:03	54
	22.csv	Feb 27, 2019 14:13:03	154
	21.csv	Feb 27, 2019 14:13:03	94
	20.csv	Feb 27, 2019 14:13:03	38
	18.csv	Feb 27, 2019 14:13:03	1090
	17.csv	Feb 27, 2019 14:13:03	2502

Form Section	File Name	Date & Time	Number of Rows
	16.csv	Feb 27, 2019 14:13:03	3
	13.csv	Feb 27, 2019 14:13:03	1240
	12.csv	Feb 27, 2019 14:13:03	2541
	11.csv	Feb 27, 2019 14:13:03	179
	10.csv	Feb 27, 2019 14:08:19	202
	09.csv	Feb 27, 2019 14:08:19	504
	08.csv	Feb 27, 2019 14:08:19	1044
	06.csv	Feb 27, 2019 14:08:19	2865
	05.csv	Feb 27, 2019 14:08:19	133
	04.csv	Feb 27, 2019 14:08:19	132
	01.csv	Feb 27, 2019 14:08:19	305

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Alabama	Comcast	Cable Modem – DOCSIS 3.0	5146
		Cable Modem – DOCSIS 3.1	16037
Arizona	Comcast	Cable Modem – DOCSIS 3.1	3940
Arkansas	Comcast	Cable Modem – DOCSIS 3.0	17
		Cable Modem – DOCSIS 3.1	8437
California	Comcast	Cable Modem – DOCSIS 3.0	804
		Cable Modem – DOCSIS 3.1	138051
		Optical Carrier/Fiber to the End User	23
Colorado	Comcast	Cable Modem – DOCSIS 3.0	282
		Cable Modem – DOCSIS 3.1	62406
		Optical Carrier/Fiber to the End User	4
Connecticut	Comcast	Cable Modem – DOCSIS 3.0	4426
		Cable Modem – DOCSIS 3.1	20662
		Optical Carrier/Fiber to the End User	1
Delaware	Comcast	Cable Modem – DOCSIS 3.0	599
		Cable Modem – DOCSIS 3.1	13240
		Optical Carrier/Fiber to the End User	1
District of Columbia	Comcast	Cable Modem – DOCSIS 3.0	170

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	4902
		Optical Carrier/Fiber to the End User	1
Florida	Comcast	Cable Modem – DOCSIS 3.0	10119
		Cable Modem – DOCSIS 3.1	146390
		Optical Carrier/Fiber to the End User	4
Georgia	Comcast	Cable Modem – DOCSIS 3.0	10945
		Cable Modem – DOCSIS 3.1	56728
		Optical Carrier/Fiber to the End User	3
Idaho	Comcast	Cable Modem – DOCSIS 3.1	47
Illinois	Comcast	Cable Modem – DOCSIS 3.0	743
		Cable Modem – DOCSIS 3.1	174173
		Optical Carrier/Fiber to the End User	8
Indiana	Comcast	Cable Modem – DOCSIS 3.0	3912
		Cable Modem – DOCSIS 3.1	85804
		Optical Carrier/Fiber to the End User	1
Kansas	Comcast	Cable Modem – DOCSIS 3.0	3
		Cable Modem – DOCSIS 3.1	1420
Kentucky	Comcast	Cable Modem – DOCSIS 3.0	5180
		Cable Modem – DOCSIS 3.1	560
Louisiana	Comcast	Cable Modem – DOCSIS 3.0	58
		Cable Modem – DOCSIS 3.1	10296
Maine	Comcast	Cable Modem – DOCSIS 3.0	186
		Cable Modem – DOCSIS 3.1	1973
Maryland	Comcast	Cable Modem – DOCSIS 3.0	5771
		Cable Modem – DOCSIS 3.1	62991
		Optical Carrier/Fiber to the End User	6
Massachusetts	Comcast	Cable Modem – DOCSIS 3.0	3971
		Cable Modem – DOCSIS 3.1	82284
		Optical Carrier/Fiber to the End User	16
Michigan	Comcast	Cable Modem – DOCSIS 3.0	9485
		Cable Modem – DOCSIS 3.1	88399
		Optical Carrier/Fiber to the End User	2
Minnesota	Comcast	Cable Modem – DOCSIS 3.0	28

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	34244
		Optical Carrier/Fiber to the End User	2
Mississippi	Comcast	Cable Modem – DOCSIS 3.0	7447
		Cable Modem – DOCSIS 3.1	12947
Missouri	Comcast	Cable Modem – DOCSIS 3.0	1
		Cable Modem – DOCSIS 3.1	5376
New Hampshire	Comcast	Cable Modem – DOCSIS 3.0	653
		Cable Modem – DOCSIS 3.1	16402
		Optical Carrier/Fiber to the End User	9
New Jersey	Comcast	Cable Modem – DOCSIS 3.0	4213
		Cable Modem – DOCSIS 3.1	73118
		Optical Carrier/Fiber to the End User	5
New Mexico	Comcast	Cable Modem – DOCSIS 3.0	2669
		Cable Modem – DOCSIS 3.1	19990
		Optical Carrier/Fiber to the End User	1
New York	Comcast	Cable Modem – DOCSIS 3.0	59
		Cable Modem – DOCSIS 3.1	1639
North Carolina	Comcast	Cable Modem – DOCSIS 3.0	9
		Cable Modem – DOCSIS 3.1	135
Ohio	Comcast	Cable Modem – DOCSIS 3.0	349
		Cable Modem – DOCSIS 3.1	5522
Oregon	Comcast	Cable Modem – DOCSIS 3.0	42
		Cable Modem – DOCSIS 3.1	38021
		Optical Carrier/Fiber to the End User	9
Pennsylvania	Comcast	Cable Modem – DOCSIS 3.0	9989
		Cable Modem – DOCSIS 3.1	170885
		Optical Carrier/Fiber to the End User	12
South Carolina	Comcast	Cable Modem – DOCSIS 3.0	3174
		Cable Modem – DOCSIS 3.1	10038
Tennessee	Comcast	Cable Modem – DOCSIS 3.0	10094
		Cable Modem – DOCSIS 3.1	53135
		Optical Carrier/Fiber to the End User	7
Texas	Comcast	Cable Modem – DOCSIS 3.0	311

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	65036
		Optical Carrier/Fiber to the End User	11
Utah	Comcast	Cable Modem – DOCSIS 3.0	78
		Cable Modem – DOCSIS 3.1	30291
		Optical Carrier/Fiber to the End User	1
Vermont	Comcast	Cable Modem – DOCSIS 3.0	504
		Cable Modem – DOCSIS 3.1	10126
Virginia	Comcast	Cable Modem – DOCSIS 3.0	12438
		Cable Modem – DOCSIS 3.1	48395
		Optical Carrier/Fiber to the End User	4
Washington	Comcast	Cable Modem – DOCSIS 3.0	63
		Cable Modem – DOCSIS 3.1	74596
		Optical Carrier/Fiber to the End User	8
West Virginia	Comcast	Cable Modem – DOCSIS 3.0	3797
		Cable Modem – DOCSIS 3.1	12003
		Optical Carrier/Fiber to the End User	1
Wisconsin	Comcast	Cable Modem – DOCSIS 3.1	1644
Total			1780158

Fixed Broadband Subscription

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

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Alabama	Cable Modem	4314	138114	16408	154522
Arizona	Cable Modem	1657	93468	3536	97004
Arkansas	Cable Modem	1896	58726	8285	67011
California	Cable Modem	48058	2746541	197417	2943958
	Optical Carrier/Fiber to the End User	21	25	0	25
Colorado	Cable Modem	18755	1144523	82087	1226610
	Optical Carrier/Fiber to the End User	4	4	0	4
Connecticut	Cable Modem	8019	458982	41003	499985
	Optical Carrier/Fiber to the End User	1	1	0	1
Delaware	Cable Modem	3457	190265	16048	206313
	Optical Carrier/Fiber to the End User	1	1	0	1

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
District of Columbia	Cable Modem	3019	132236	14999	147235
	Optical Carrier/Fiber to the End User	1	1	0	1
Florida	Cable Modem	40652	2390180	230652	2620832
	Optical Carrier/Fiber to the End User	4	4	0	4
Georgia	Cable Modem	20862	1153484	110101	1263585
	Optical Carrier/Fiber to the End User	3	3	0	3
Idaho	Cable Modem	10	106	6	112
Illinois	Cable Modem	42923	2066959	166984	2233943
	Optical Carrier/Fiber to the End User	8	8	0	8
Indiana	Cable Modem	17566	770802	63498	834300
	Optical Carrier/Fiber to the End User	1	1	0	1
Kansas	Cable Modem	537	15347	1406	16753
Kentucky	Cable Modem	947	44970	3947	48917
Louisiana	Cable Modem	2195	86901	9466	96367
Maine	Cable Modem	436	32938	2130	35068
Maryland	Cable Modem	21372	918093	82782	1000875
	Optical Carrier/Fiber to the End User	6	6	0	6
Massachusetts	Cable Modem	22942	1460260	121246	1581506
	Optical Carrier/Fiber to the End User	14	16	0	16
Michigan	Cable Modem	30209	1259656	103579	1363235
	Optical Carrier/Fiber to the End User	2	2	0	2
Minnesota	Cable Modem	11899	625487	48546	674033
	Optical Carrier/Fiber to the End User	2	2	0	2
Mississippi	Cable Modem	4051	162307	18765	181072
Missouri	Cable Modem	1464	67900	4217	72117
New Hampshire	Cable Modem	3977	309360	24754	334114
	Optical Carrier/Fiber to the End User	8	9	0	9
New Jersey	Cable Modem	20074	1093491	86031	1179522
	Optical Carrier/Fiber to the End User	5	5	0	5
New Mexico	Cable Modem	5185	233112	19277	252389
	Optical Carrier/Fiber to the End User	1	1	0	1
New York	Cable Modem	421	21243	1570	22813

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
North Carolina	Cable Modem	35	556	66	622
Ohio	Cable Modem	944	36327	3270	39597
Oregon	Cable Modem	9469	630789	54424	685213
	Optical Carrier/Fiber to the End User	9	9	0	9
Pennsylvania	Cable Modem	41000	1885330	165682	2051012
	Optical Carrier/Fiber to the End User	12	12	0	12
South Carolina	Cable Modem	2691	125678	12367	138045
Tennessee	Cable Modem	16881	708301	72129	780430
	Optical Carrier/Fiber to the End User	7	7	0	7
Texas	Cable Modem	20205	981666	104864	1086530
	Optical Carrier/Fiber to the End User	11	11	0	11
Utah	Cable Modem	9307	436762	34456	471218
	Optical Carrier/Fiber to the End User	1	1	0	1
Vermont	Cable Modem	2451	122143	11936	134079
Virginia	Cable Modem	15989	756338	69285	825623
	Optical Carrier/Fiber to the End User	4	4	0	4
Washington	Cable Modem	21075	1501401	99943	1601344
	Optical Carrier/Fiber to the End User	8	8	0	8
West Virginia	Cable Modem	2892	139666	10325	149991
	Optical Carrier/Fiber to the End User	1	1	0	1
Wisconsin	Cable Modem	400	19322	1691	21013
Total		480371	25019872	2119178	27139050

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
3.000	0.770	226867	7426	234293
5.000	1.000	3813	0	3813
6.000	1.000	0	2350	2350
7.000	1.000	0	4711	4711
8.000	2.000	1855	0	1855
10.000	2.000	611	0	611
15.000	2.000	1088418	0	1088418
16.000	2.000	2770	9788	12558

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
19.000	4.000	518	0	518
20.000	1.000	135043	0	135043
22.000	5.000	0	42895	42895
25.000	2.000	621920	0	621920
25.000	4.000	65	0	65
25.000	5.000	4960	541468	546428
25.000	10.000	0	187524	187524
27.000	7.000	0	33294	33294
50.000	5.000	3842	0	3842
50.000	10.000	1734	493055	494789
55.000	5.000	16	0	16
60.000	5.000	3712149	0	3712149
70.000	5.000	165642	0	165642
75.000	5.000	133153	0	133153
75.000	10.000	404	0	404
75.000	15.000	6	342257	342263
100.000	5.000	185305	0	185305
100.000	10.000	280320	3501	283821
100.000	20.000	0	104812	104812
105.000	10.000	113048	0	113048
105.000	20.000	188808	0	188808
150.000	5.000	5104672	0	5104672
150.000	10.000	5091950	0	5091950
150.000	15.000	27297	0	27297
150.000	20.000	100328	239069	339397
200.000	10.000	882	0	882
205.000	20.000	10	0	10
250.000	10.000	4561845	0	4561845
250.000	20.000	1131801	0	1131801
250.000	25.000	80771	1465	82236
300.000	25.000	66419	46890	113309
400.000	10.000	1507553	0	1507553
500.000	35.000	0	5360	5360

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
986.500	35.000	474935	10361	485296
1000.000	1000.000	0	42952	42952
2000.000	2000.000	142	0	142
Total		25019872	2119178	27139050

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

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Cable Modem	3.000	0.770	226867	7426	234293
	5.000	1.000	3813	0	3813
	6.000	1.000	0	2350	2350
	7.000	1.000	0	4711	4711
	8.000	2.000	1855	0	1855
	10.000	2.000	611	0	611
	15.000	2.000	1088418	0	1088418
	16.000	2.000	2770	9788	12558
	19.000	4.000	518	0	518
	20.000	1.000	135043	0	135043
	22.000	5.000	0	42895	42895
	25.000	2.000	621920	0	621920
	25.000	4.000	65	0	65
	25.000	5.000	4960	541468	546428
	25.000	10.000	0	187524	187524
	27.000	7.000	0	33294	33294
	50.000	5.000	3842	0	3842
	50.000	10.000	1734	493055	494789
	55.000	5.000	16	0	16
	60.000	5.000	3712149	0	3712149
70.000	5.000	165642	0	165642	
75.000	5.000	133153	0	133153	
75.000	10.000	404	0	404	
75.000	15.000	6	342257	342263	
100.000	5.000	185305	0	185305	
100.000	10.000	280320	3501	283821	

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
	100.000	20.000	0	104812	104812
	105.000	10.000	113048	0	113048
	105.000	20.000	188808	0	188808
	150.000	5.000	5104672	0	5104672
	150.000	10.000	5091950	0	5091950
	150.000	15.000	27297	0	27297
	150.000	20.000	100328	239069	339397
	200.000	10.000	882	0	882
	205.000	20.000	10	0	10
	250.000	10.000	4561845	0	4561845
	250.000	20.000	1131801	0	1131801
	250.000	25.000	80771	1465	82236
	300.000	25.000	66419	46890	113309
	400.000	10.000	1507553	0	1507553
	500.000	35.000	0	5360	5360
	986.500	35.000	474935	10361	485296
	1000.000	1000.000	0	42952	42952
Optical Carrier/Fiber to the End User	2000.000	2000.000	142	0	142
Total			25019872	2119178	27139050

Fixed Voice Subscription

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

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Alabama	0	0	77738	49623
Arizona	0	0	45193	38661
Arkansas	0	0	32366	16635
California	0	0	1391487	998375
Colorado	0	0	573134	405529
Connecticut	0	0	358604	270004
Delaware	0	0	143484	112218
District of Columbia	0	0	73345	46970
Florida	0	0	1311660	860109
Georgia	0	0	613527	405090

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Idaho	0	0	23	0
Illinois	0	0	1115178	764425
Indiana	0	0	397083	258069
Kansas	0	0	9771	7070
Kentucky	0	0	18866	12653
Louisiana	0	0	39989	27293
Maine	0	0	17031	14522
Maryland	0	0	623518	461779
Massachusetts	0	0	1141075	877862
Michigan	0	0	720546	493601
Minnesota	0	0	314434	224134
Mississippi	0	0	80744	52348
Missouri	0	0	36065	28956
New Hampshire	0	0	235711	185082
New Jersey	0	0	871338	699182
New Mexico	0	0	108245	69086
New York	0	0	19275	16210
North Carolina	0	0	901	0
Ohio	0	0	32142	24401
Oregon	0	0	326726	209211
Pennsylvania	0	0	1440673	1070417
South Carolina	0	0	57876	37988
Tennessee	0	0	358822	228430
Texas	0	0	519376	298825
Utah	0	0	199088	133825
Vermont	0	0	87758	66085
Virginia	0	0	475696	339654
Washington	0	0	771290	565072
West Virginia	0	0	81289	63207
Wisconsin	0	0	8946	5398
Total	0	0	14730013	10437999

**Fixed Voice
Subscription
(iVoIP)****Over-the-top VoIP Subscriptions by State and End-user Type**

State	Total	Consumer	Business / Govt
Alabama	0	0	0
Arizona	0	0	0
Arkansas	0	0	0
California	0	0	0
Colorado	0	0	0
Connecticut	0	0	0
Delaware	0	0	0
District of Columbia	0	0	0
Florida	0	0	0
Georgia	0	0	0
Idaho	0	0	0
Illinois	0	0	0
Indiana	0	0	0
Kansas	0	0	0
Kentucky	0	0	0
Louisiana	0	0	0
Maine	0	0	0
Maryland	0	0	0
Massachusetts	0	0	0
Michigan	0	0	0
Minnesota	0	0	0
Mississippi	0	0	0
Missouri	0	0	0
New Hampshire	0	0	0
New Jersey	0	0	0
New Mexico	0	0	0
New York	0	0	0
North Carolina	0	0	0
Ohio	0	0	0
Oregon	0	0	0
Pennsylvania	0	0	0
South Carolina	0	0	0

State	Total	Consumer	Business / Govt
Tennessee	0	0	0
Texas	0	0	0
Utah	0	0	0
Vermont	0	0	0
Virginia	0	0	0
Washington	0	0	0
West Virginia	0	0	0
Wisconsin	0	0	0
Total	0	0	0

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

State	Total	by End-user Type		by Bundle		by Last-mile Medium			
		Consumer	Business / Government	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Alabama	77738	49623	28115	74640	3098	0	77738	0	0
Arizona	45193	38661	6532	44335	858	0	45193	0	0
Arkansas	32366	16635	15731	31445	921	0	32366	0	0
California	1391487	998375	393112	1368046	23441	0	1391487	0	0
Colorado	573134	405529	167605	557369	15765	0	573134	0	0
Connecticut	358604	270004	88600	349456	9148	0	358604	0	0
Delaware	143484	112218	31266	139670	3814	0	143484	0	0
District of Columbia	73345	46970	26375	71709	1636	0	73345	0	0
Florida	1311660	860109	451551	1268443	43217	0	1311660	0	0
Georgia	613527	405090	208437	598330	15197	0	613527	0	0
Idaho	23	0	23	0	23	0	23	0	0
Illinois	1115178	764425	350753	1086282	28896	0	1115178	0	0
Indiana	397083	258069	139014	383993	13090	0	397083	0	0
Kansas	9771	7070	2701	9527	244	0	9771	0	0
Kentucky	18866	12653	6213	18130	736	0	18866	0	0
Louisiana	39989	27293	12696	38526	1463	0	39989	0	0
Maine	17031	14522	2509	16596	435	0	17031	0	0
Maryland	623518	461779	161739	610507	13011	0	623518	0	0
Massachusetts	1141075	877862	263213	1103637	37438	0	1141075	0	0
Michigan	720546	493601	226945	695291	25255	0	720546	0	0

State	Total	by End-user Type		by Bundle		by Last-mile Medium			
		Consumer	Business / Government	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Minnesota	314434	224134	90300	307055	7379	0	314434	0	0
Mississippi	80744	52348	28396	77671	3073	0	80744	0	0
Missouri	36065	28956	7109	35235	830	0	36065	0	0
New Hampshire	235711	185082	50629	227442	8269	0	235711	0	0
New Jersey	871338	699182	172156	851861	19477	0	871338	0	0
New Mexico	108245	69086	39159	105897	2348	0	108245	0	0
New York	19275	16210	3065	18944	331	0	19275	0	0
North Carolina	901	0	901	0	901	0	901	0	0
Ohio	32142	24401	7741	31021	1121	0	32142	0	0
Oregon	326726	209211	117515	317287	9439	0	326726	0	0
Pennsylvania	1440673	1070417	370256	1396659	44014	0	1440673	0	0
South Carolina	57876	37988	19888	55982	1894	0	57876	0	0
Tennessee	358822	228430	130392	347692	11130	0	358822	0	0
Texas	519376	298825	220551	510264	9112	0	519376	0	0
Utah	199088	133825	65263	195140	3948	0	199088	0	0
Vermont	87758	66085	21673	85259	2499	0	87758	0	0
Virginia	475696	339654	136042	464974	10722	0	475696	0	0
Washington	771290	565072	206218	751703	19587	0	771290	0	0
West Virginia	81289	63207	18082	79199	2090	0	81289	0	0
Wisconsin	8946	5398	3548	8470	476	0	8946	0	0
Total	14730013	10437999	4292014	14333687	396326	0	14730013	0	0

(RETAIN FOR YOUR RECORDS)
Form 477 Filing Summary

FRN: 0003768165 | Data as of: Jun 30, 2018 | Operations: Non-ILEC | Submission Status: Original - Submitted | Last Updated: Aug 30, 2018 17:22:35

Filer Identification

Section	Question	Response
Filer Information	Provider Name	COMCAST CABLE COMMUNICATIONS, LLC
	Holding Company Name	Comcast Corporation
	SAC ID	
	499 ID	812736, 820956, 822102, 823798, 825948, 827142, 832043
Data Contact Information	Data Contact Name	Joanne Horstmann
	Data Contact Phone Number	(610) 665-2546
	Data Contact E-mail	joanne_horstmann@cable.comcast.com
Emergency Operations Contact Information	Emergency Operations Name	Edge Service Desk
	Emergency Operations Phone Number	(800) 777-9824
	Emergency Operations E-mail	CNOC_Voice_EventMgmt@cable.comcast.com
Certifying Official Contact Information	Certifying Official Name	Julie Laine
	Certifying Official Phone Number	(215) 286-2334
	Certifying Official E-mail	Julie_Laine@comcast.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	36.csv	Aug 30, 2018 11:54:29	1689
	35.csv	Aug 30, 2018 11:54:29	22604
	34.csv	Aug 30, 2018 11:54:29	77078
	33.csv	Aug 29, 2018 16:26:46	16956
	29.csv	Aug 29, 2018 16:26:46	5357
	28.csv	Aug 29, 2018 16:26:46	20774
	27.csv	Aug 29, 2018 16:26:46	34275
	26.csv	Aug 29, 2018 16:26:46	97699
	55.csv	Aug 29, 2018 16:16:53	1639
	54.csv	Aug 29, 2018 16:16:14	15649

Form Section	File Name	Date & Time	Number of Rows
	53.csv	Aug 29, 2018 16:14:47	74580
	51.csv	Aug 29, 2018 16:13:42	60604
	50.csv	Aug 29, 2018 16:12:44	10589
	25.csv	Aug 29, 2018 16:12:11	86160
	23.csv	Aug 29, 2018 16:12:11	2134
	24.csv	Aug 29, 2018 16:12:11	68672
	22.csv	Aug 29, 2018 16:12:11	10354
	21.csv	Aug 29, 2018 16:12:11	5726
	49.csv	Aug 29, 2018 16:12:01	30199
	48.csv	Aug 29, 2018 16:11:25	65094
	47.csv	Aug 29, 2018 16:10:43	63275
	45.csv	Aug 29, 2018 16:10:09	13219
	42.csv	Aug 29, 2018 16:09:39	180414
	41.csv	Aug 29, 2018 16:08:27	38032
	39.csv	Aug 29, 2018 16:06:59	5854
	37.csv	Aug 29, 2018 16:05:52	145
	20.csv	Aug 29, 2018 16:00:36	1424
	18.csv	Aug 29, 2018 16:00:35	89638
	17.csv	Aug 29, 2018 16:00:35	174692
	16.csv	Aug 29, 2018 16:00:35	46
	13.csv	Aug 29, 2018 16:00:35	67489
	12.csv	Aug 29, 2018 15:58:55	156402
	11.csv	Aug 29, 2018 15:58:55	5082
	10.csv	Aug 29, 2018 15:58:55	13811
	09.csv	Aug 29, 2018 15:58:55	24502
	08.csv	Aug 29, 2018 15:58:55	62487
	06.csv	Aug 29, 2018 15:56:24	138664
	05.csv	Aug 29, 2018 15:56:24	8420
	04.csv	Aug 29, 2018 15:56:24	3933
	01.csv	Aug 29, 2018 15:56:24	21193
Fixed Broadband Subscription	53.csv	Aug 30, 2018 17:02:45	21669
	48.csv	Aug 30, 2018 16:55:01	20268
	55.csv	Aug 30, 2018 16:53:45	391

Form Section	File Name	Date & Time	Number of Rows
	54.csv	Aug 30, 2018 16:52:22	2736
	51.csv	Aug 30, 2018 16:50:40	15642
	50.csv	Aug 30, 2018 16:49:47	2449
	36.csv	Aug 30, 2018 16:49:20	395
	35.csv	Aug 30, 2018 16:49:20	5426
	34.csv	Aug 30, 2018 16:49:20	19611
	33.csv	Aug 30, 2018 16:49:20	3986
	29.csv	Aug 30, 2018 16:49:20	1448
	28.csv	Aug 30, 2018 16:49:20	3600
	27.csv	Aug 30, 2018 16:49:20	12341
	49.csv	Aug 30, 2018 16:47:55	9467
	47.csv	Aug 30, 2018 16:46:02	15850
	26.csv	Aug 30, 2018 16:45:15	27178
	24.csv	Aug 30, 2018 16:45:15	20580
	23.csv	Aug 30, 2018 16:45:15	436
	21.csv	Aug 30, 2018 16:45:15	954
	45.csv	Aug 30, 2018 16:44:50	2436
	42.csv	Aug 30, 2018 16:44:01	39940
	37.csv	Aug 30, 2018 16:42:58	34
	05.csv	Aug 30, 2018 16:39:15	1730
	20.csv	Aug 30, 2018 16:37:43	527
	18.csv	Aug 30, 2018 16:37:43	16166
	17.csv	Aug 30, 2018 16:37:43	40534
	13.csv	Aug 30, 2018 16:37:43	19985
	12.csv	Aug 30, 2018 16:37:43	37184
	10.csv	Aug 30, 2018 16:37:42	3333
	08.csv	Aug 30, 2018 16:37:42	19588
	06.csv	Aug 30, 2018 16:37:42	50729
	04.csv	Aug 30, 2018 16:37:42	1776
	01.csv	Aug 30, 2018 16:37:42	3980
	25.csv	Aug 30, 2018 16:19:29	23073
	22.csv	Aug 30, 2018 16:19:29	1963
	41.csv	Aug 30, 2018 16:18:53	9696

Form Section	File Name	Date & Time	Number of Rows
	39.csv	Aug 30, 2018 16:17:50	865
	16.csv	Aug 30, 2018 16:16:50	10
	11.csv	Aug 30, 2018 16:16:49	2958
	09.csv	Aug 30, 2018 16:16:49	7928
Fixed Voice Subscription	20.csv	Aug 30, 2018 10:48:08	35
	18.csv	Aug 30, 2018 10:48:07	1073
	17.csv	Aug 30, 2018 10:48:07	2488
	16.csv	Aug 30, 2018 10:48:07	2
	13.csv	Aug 30, 2018 10:48:07	1199
	12.csv	Aug 30, 2018 10:48:07	2481
	11.csv	Aug 30, 2018 10:48:07	179
	10.csv	Aug 30, 2018 10:48:07	199
	09.csv	Aug 30, 2018 10:48:07	489
	08.csv	Aug 30, 2018 10:48:07	1035
	06.csv	Aug 30, 2018 10:48:07	2806
	05.csv	Aug 30, 2018 10:48:07	122
	04.csv	Aug 30, 2018 10:48:07	118
	01.csv	Aug 30, 2018 10:48:07	302
	48.csv	Aug 30, 2018 10:15:32	1153
	55.csv	Aug 30, 2018 10:06:22	33
	54.csv	Aug 30, 2018 10:05:32	215
	53.csv	Aug 30, 2018 10:04:35	1140
	51.csv	Aug 30, 2018 09:59:56	1066
	50.csv	Aug 30, 2018 09:56:58	157
	49.csv	Aug 30, 2018 09:55:25	500
	47.csv	Aug 30, 2018 09:53:31	984
	42.csv	Aug 30, 2018 09:52:32	2507
	45.csv	Aug 30, 2018 09:50:48	179
	41.csv	Aug 30, 2018 09:47:44	533
	39.csv	Aug 30, 2018 09:46:26	73
	37.csv	Aug 30, 2018 09:43:55	20
	36.csv	Aug 30, 2018 09:19:44	52
	35.csv	Aug 30, 2018 09:19:44	326

Form Section	File Name	Date & Time	Number of Rows
	34.csv	Aug 30, 2018 09:19:44	1261
	33.csv	Aug 30, 2018 09:19:44	234
	29.csv	Aug 30, 2018 09:19:44	97
	28.csv	Aug 30, 2018 09:19:44	279
	27.csv	Aug 30, 2018 09:19:44	642
	26.csv	Aug 30, 2018 09:12:51	1943
	25.csv	Aug 30, 2018 09:12:51	1294
	24.csv	Aug 30, 2018 09:12:51	1312
	23.csv	Aug 30, 2018 09:12:51	39
	22.csv	Aug 30, 2018 09:12:51	148
	21.csv	Aug 30, 2018 09:12:51	91

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Alabama	Comcast	Cable Modem – DOCSIS 3.0	6932
		Cable Modem – DOCSIS 3.1	14261
Arizona	Comcast	Cable Modem – DOCSIS 3.1	3933
Arkansas	Comcast	Cable Modem – DOCSIS 3.0	519
		Cable Modem – DOCSIS 3.1	7901
California	Comcast	Cable Modem – DOCSIS 3.0	718
		Cable Modem – DOCSIS 3.1	137919
		Optical Carrier/Fiber to the End User	27
Colorado	Comcast	Cable Modem – DOCSIS 3.0	269
		Cable Modem – DOCSIS 3.1	62214
		Optical Carrier/Fiber to the End User	4
Connecticut	Comcast	Cable Modem – DOCSIS 3.0	4399
		Cable Modem – DOCSIS 3.1	20102
		Optical Carrier/Fiber to the End User	1
Delaware	Comcast	Cable Modem – DOCSIS 3.0	610
		Cable Modem – DOCSIS 3.1	13200
		Optical Carrier/Fiber to the End User	1
District of Columbia	Comcast	Cable Modem – DOCSIS 3.0	170

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	4911
		Optical Carrier/Fiber to the End User	1
Florida	Comcast	Cable Modem – DOCSIS 3.0	19145
		Cable Modem – DOCSIS 3.1	137254
		Optical Carrier/Fiber to the End User	3
Georgia	Comcast	Cable Modem – DOCSIS 3.0	13459
		Cable Modem – DOCSIS 3.1	54027
		Optical Carrier/Fiber to the End User	3
Idaho	Comcast	Cable Modem – DOCSIS 3.1	46
Illinois	Comcast	Cable Modem – DOCSIS 3.0	9536
		Cable Modem – DOCSIS 3.1	165149
		Optical Carrier/Fiber to the End User	7
Indiana	Comcast	Cable Modem – DOCSIS 3.0	7924
		Cable Modem – DOCSIS 3.1	81713
		Optical Carrier/Fiber to the End User	1
Kansas	Comcast	Cable Modem – DOCSIS 3.0	4
		Cable Modem – DOCSIS 3.1	1420
Kentucky	Comcast	Cable Modem – DOCSIS 3.0	5192
		Cable Modem – DOCSIS 3.1	534
Louisiana	Comcast	Cable Modem – DOCSIS 3.0	622
		Cable Modem – DOCSIS 3.1	9732
Maine	Comcast	Cable Modem – DOCSIS 3.0	182
		Cable Modem – DOCSIS 3.1	1952
Maryland	Comcast	Cable Modem – DOCSIS 3.0	5874
		Cable Modem – DOCSIS 3.1	62793
		Optical Carrier/Fiber to the End User	5
Massachusetts	Comcast	Cable Modem – DOCSIS 3.0	3986
		Cable Modem – DOCSIS 3.1	82163
		Optical Carrier/Fiber to the End User	11
Michigan	Comcast	Cable Modem – DOCSIS 3.0	13822
		Cable Modem – DOCSIS 3.1	83876
		Optical Carrier/Fiber to the End User	1
Minnesota	Comcast	Cable Modem – DOCSIS 3.0	28

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	34245
		Optical Carrier/Fiber to the End User	2
Mississippi	Comcast	Cable Modem – DOCSIS 3.0	8690
		Cable Modem – DOCSIS 3.1	12084
Missouri	Comcast	Cable Modem – DOCSIS 3.0	1
		Cable Modem – DOCSIS 3.1	5356
New Hampshire	Comcast	Cable Modem – DOCSIS 3.0	654
		Cable Modem – DOCSIS 3.1	16294
		Optical Carrier/Fiber to the End User	8
New Jersey	Comcast	Cable Modem – DOCSIS 3.0	4154
		Cable Modem – DOCSIS 3.1	72921
		Optical Carrier/Fiber to the End User	3
New Mexico	Comcast	Cable Modem – DOCSIS 3.0	2668
		Cable Modem – DOCSIS 3.1	19935
		Optical Carrier/Fiber to the End User	1
New York	Comcast	Cable Modem – DOCSIS 3.0	57
		Cable Modem – DOCSIS 3.1	1632
North Carolina	Comcast	Cable Modem – DOCSIS 3.0	8
		Cable Modem – DOCSIS 3.1	137
Ohio	Comcast	Cable Modem – DOCSIS 3.0	338
		Cable Modem – DOCSIS 3.1	5516
Oregon	Comcast	Cable Modem – DOCSIS 3.0	41
		Cable Modem – DOCSIS 3.1	37982
		Optical Carrier/Fiber to the End User	9
Pennsylvania	Comcast	Cable Modem – DOCSIS 3.0	23723
		Cable Modem – DOCSIS 3.1	156681
		Optical Carrier/Fiber to the End User	10
South Carolina	Comcast	Cable Modem – DOCSIS 3.0	4296
		Cable Modem – DOCSIS 3.1	8923
Tennessee	Comcast	Cable Modem – DOCSIS 3.0	13100
		Cable Modem – DOCSIS 3.1	50168
		Optical Carrier/Fiber to the End User	7
Texas	Comcast	Cable Modem – DOCSIS 3.0	401

State	DBA Name	Technology	Blocks
		Cable Modem – DOCSIS 3.1	64681
		Optical Carrier/Fiber to the End User	12
Utah	Comcast	Cable Modem – DOCSIS 3.0	70
		Cable Modem – DOCSIS 3.1	30128
		Optical Carrier/Fiber to the End User	1
Vermont	Comcast	Cable Modem – DOCSIS 3.0	496
		Cable Modem – DOCSIS 3.1	10093
Virginia	Comcast	Cable Modem – DOCSIS 3.0	13378
		Cable Modem – DOCSIS 3.1	47224
		Optical Carrier/Fiber to the End User	2
Washington	Comcast	Cable Modem – DOCSIS 3.0	112
		Cable Modem – DOCSIS 3.1	74460
		Optical Carrier/Fiber to the End User	8
West Virginia	Comcast	Cable Modem – DOCSIS 3.0	3690
		Cable Modem – DOCSIS 3.1	11958
		Optical Carrier/Fiber to the End User	1
Wisconsin	Comcast	Cable Modem – DOCSIS 3.1	1639
Total			1776554

Fixed Broadband Subscription

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

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Alabama	Cable Modem	3980	133774	16085	149859
Arizona	Cable Modem	1776	86496	3320	89816
Arkansas	Cable Modem	1730	55326	7918	63244
California	Cable Modem	50704	2671244	190503	2861747
	Optical Carrier/Fiber to the End User	25	30	0	30
Colorado	Cable Modem	19584	1095402	77910	1173312
	Optical Carrier/Fiber to the End User	4	4	0	4
Connecticut	Cable Modem	7927	437391	40079	477470
	Optical Carrier/Fiber to the End User	1	1	0	1
Delaware	Cable Modem	3332	181870	15554	197424
	Optical Carrier/Fiber to the End User	1	1	0	1

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
District of Columbia	Cable Modem	2957	130064	14602	144666
	Optical Carrier/Fiber to the End User	1	1	0	1
Florida	Cable Modem	37181	2209461	223300	2432761
	Optical Carrier/Fiber to the End User	3	3	0	3
Georgia	Cable Modem	19982	1117348	105753	1223101
	Optical Carrier/Fiber to the End User	3	3	0	3
Idaho	Cable Modem	10	101	6	107
Illinois	Cable Modem	40527	1990200	159352	2149552
	Optical Carrier/Fiber to the End User	7	7	0	7
Indiana	Cable Modem	16165	734632	61140	795772
	Optical Carrier/Fiber to the End User	1	1	0	1
Kansas	Cable Modem	527	14981	1304	16285
Kentucky	Cable Modem	954	43617	3796	47413
Louisiana	Cable Modem	1963	82900	9325	92225
Maine	Cable Modem	436	32361	2083	34444
Maryland	Cable Modem	20575	884980	80637	965617
	Optical Carrier/Fiber to the End User	5	5	0	5
Massachusetts	Cable Modem	23063	1425965	119309	1545274
	Optical Carrier/Fiber to the End User	10	11	0	11
Michigan	Cable Modem	27177	1202166	99719	1301885
	Optical Carrier/Fiber to the End User	1	1	0	1
Minnesota	Cable Modem	12339	606419	45954	652373
	Optical Carrier/Fiber to the End User	2	2	0	2
Mississippi	Cable Modem	3600	155128	18489	173617
Missouri	Cable Modem	1448	65430	3895	69325
New Hampshire	Cable Modem	3978	302519	24587	327106
	Optical Carrier/Fiber to the End User	8	8	0	8
New Jersey	Cable Modem	19608	1071293	84513	1155806
	Optical Carrier/Fiber to the End User	3	3	0	3
New Mexico	Cable Modem	5425	219858	18220	238078
	Optical Carrier/Fiber to the End User	1	1	0	1
New York	Cable Modem	395	20878	1543	22421

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
North Carolina	Cable Modem	34	533	64	597
Ohio	Cable Modem	865	34938	3167	38105
Oregon	Cable Modem	9687	613025	52703	665728
	Optical Carrier/Fiber to the End User	9	9	0	9
Pennsylvania	Cable Modem	39930	1813539	161382	1974921
	Optical Carrier/Fiber to the End User	10	10	0	10
South Carolina	Cable Modem	2436	121321	11782	133103
Tennessee	Cable Modem	15843	682723	69960	752683
	Optical Carrier/Fiber to the End User	7	7	0	7
Texas	Cable Modem	20256	929639	99945	1029584
	Optical Carrier/Fiber to the End User	12	12	0	12
Utah	Cable Modem	9466	417408	32644	450052
	Optical Carrier/Fiber to the End User	1	1	0	1
Vermont	Cable Modem	2449	114871	11649	126520
Virginia	Cable Modem	15640	722966	66604	789570
	Optical Carrier/Fiber to the End User	2	2	0	2
Washington	Cable Modem	21661	1456351	95681	1552032
	Optical Carrier/Fiber to the End User	8	8	0	8
West Virginia	Cable Modem	2735	130290	9907	140197
	Optical Carrier/Fiber to the End User	1	1	0	1
Wisconsin	Cable Modem	391	18454	1617	20071
Total		468862	24027994	2046001	26073995

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
3.000	0.770	242684	7842	250526
5.000	0.614	4	0	4
5.000	1.000	4225	0	4225
6.000	1.000	0	3229	3229
7.000	1.000	0	4916	4916
8.000	2.000	1896	0	1896
10.000	2.000	52801	0	52801
15.000	2.000	936509	0	936509

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
16.000	2.000	2617	11877	14494
16.000	3.000	1	0	1
19.000	4.000	651	0	651
20.000	1.000	62	0	62
22.000	5.000	157	42440	42597
25.000	2.000	467833	0	467833
25.000	4.000	8504	1	8505
25.000	5.000	16904	525923	542827
25.000	10.000	1	217002	217003
27.000	7.000	2	39490	39492
50.000	5.000	4093	0	4093
50.000	10.000	1671	561279	562950
55.000	5.000	2281	0	2281
60.000	5.000	3555998	0	3555998
70.000	5.000	192546	0	192546
75.000	5.000	151998	0	151998
75.000	10.000	1637	0	1637
75.000	15.000	27	238462	238489
100.000	5.000	61005	0	61005
100.000	10.000	5032672	3797	5036469
100.000	15.000	26934	0	26934
100.000	20.000	5	119421	119426
105.000	10.000	146037	0	146037
105.000	20.000	239745	0	239745
150.000	5.000	5128895	0	5128895
150.000	10.000	144699	0	144699
150.000	20.000	1193197	193925	1387122
150.000	35.000	23	0	23
200.000	10.000	99193	0	99193
205.000	20.000	28	0	28
250.000	10.000	4745001	0	4745001
250.000	25.000	109270	29554	138824
300.000	25.000	95349	26	95375

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
400.000	10.000	1167643	0	1167643
500.000	35.000	0	2781	2781
986.500	35.000	193064	6054	199118
1000.000	1000.000	0	37982	37982
2000.000	2000.000	132	0	132
Total		24027994	2046001	26073995

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

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Cable Modem	3.000	0.770	242684	7842	250526
	5.000	0.614	4	0	4
	5.000	1.000	4225	0	4225
	6.000	1.000	0	3229	3229
	7.000	1.000	0	4916	4916
	8.000	2.000	1896	0	1896
	10.000	2.000	52801	0	52801
	15.000	2.000	936509	0	936509
	16.000	2.000	2617	11877	14494
	16.000	3.000	1	0	1
	19.000	4.000	651	0	651
	20.000	1.000	62	0	62
	22.000	5.000	157	42440	42597
	25.000	2.000	467833	0	467833
	25.000	4.000	8504	1	8505
	25.000	5.000	16904	525923	542827
	25.000	10.000	1	217002	217003
	27.000	7.000	2	39490	39492
	50.000	5.000	4093	0	4093
	50.000	10.000	1671	561279	562950
55.000	5.000	2281	0	2281	
60.000	5.000	3555998	0	3555998	
70.000	5.000	192546	0	192546	
75.000	5.000	151998	0	151998	

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
	75.000	10.000	1637	0	1637
	75.000	15.000	27	238462	238489
	100.000	5.000	61005	0	61005
	100.000	10.000	5032672	3797	5036469
	100.000	15.000	26934	0	26934
	100.000	20.000	5	119421	119426
	105.000	10.000	146037	0	146037
	105.000	20.000	239745	0	239745
	150.000	5.000	5128895	0	5128895
	150.000	10.000	144699	0	144699
	150.000	20.000	1193197	193925	1387122
	150.000	35.000	23	0	23
	200.000	10.000	99193	0	99193
	205.000	20.000	28	0	28
	250.000	10.000	4745001	0	4745001
	250.000	25.000	109270	29554	138824
	300.000	25.000	95349	26	95375
	400.000	10.000	1167643	0	1167643
	500.000	35.000	0	2781	2781
	986.500	35.000	193064	6054	199118
	1000.000	1000.000	0	37982	37982
Optical Carrier/Fiber to the End User	2000.000	2000.000	132	0	132
Total			24027994	2046001	26073995

Fixed Voice Subscription

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

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Alabama	0	0	80980	52618
Arizona	0	0	44950	38412
Arkansas	0	0	33259	17958
California	0	0	1391915	1003247
Colorado	0	0	571074	406056
Connecticut	0	0	355316	267225

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Delaware	0	0	141500	110525
District of Columbia	0	0	74160	48119
Florida	0	0	1336332	888839
Georgia	0	0	623561	420236
Idaho	0	0	21	0
Illinois	0	0	1147871	803219
Indiana	0	0	409654	273374
Kansas	0	0	9634	7085
Kentucky	0	0	19588	13545
Louisiana	0	0	41409	28739
Maine	0	0	16819	14364
Maryland	0	0	619293	460018
Massachusetts	0	0	1140649	878823
Michigan	0	0	737026	514163
Minnesota	0	0	315690	228321
Mississippi	0	0	83498	54893
Missouri	0	0	35626	28695
New Hampshire	0	0	236064	186008
New Jersey	0	0	869615	697919
New Mexico	0	0	106557	68421
New York	0	0	19184	16143
North Carolina	0	0	835	0
Ohio	0	0	31652	24072
Oregon	0	0	330053	213330
Pennsylvania	0	0	1426141	1060115
South Carolina	0	0	58880	39162
Tennessee	0	0	368143	238942
Texas	0	0	510400	294402
Utah	0	0	197180	132190
Vermont	0	0	87075	65684
Virginia	0	0	466056	332898
Washington	0	0	773573	572347
West Virginia	0	0	79074	61472

State	Total VGE Lines	Consumer VGE Lines	Total VoIP Subscriptions	Consumer VoIP Subscriptions
Wisconsin	0	0	8733	5289
Total	0	0	14799040	10566868

**Fixed Voice
Subscription
(iVoIP)**

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

State	Total	Consumer	Business / Govt
Alabama	0	0	0
Arizona	0	0	0
Arkansas	0	0	0
California	0	0	0
Colorado	0	0	0
Connecticut	0	0	0
Delaware	0	0	0
District of Columbia	0	0	0
Florida	0	0	0
Georgia	0	0	0
Idaho	0	0	0
Illinois	0	0	0
Indiana	0	0	0
Kansas	0	0	0
Kentucky	0	0	0
Louisiana	0	0	0
Maine	0	0	0
Maryland	0	0	0
Massachusetts	0	0	0
Michigan	0	0	0
Minnesota	0	0	0
Mississippi	0	0	0
Missouri	0	0	0
New Hampshire	0	0	0
New Jersey	0	0	0
New Mexico	0	0	0
New York	0	0	0

State	Total	Consumer	Business / Govt
North Carolina	0	0	0
Ohio	0	0	0
Oregon	0	0	0
Pennsylvania	0	0	0
South Carolina	0	0	0
Tennessee	0	0	0
Texas	0	0	0
Utah	0	0	0
Vermont	0	0	0
Virginia	0	0	0
Washington	0	0	0
West Virginia	0	0	0
Wisconsin	0	0	0
Total	0	0	0

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

State	Total	by End-user Type		by Bundle		by Last-mile Medium			
		Consumer	Business / Government	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Alabama	80980	52618	28362	77665	3315	0	80980	0	0
Arizona	44950	38412	6538	44111	839	0	44950	0	0
Arkansas	33259	17958	15301	32294	965	0	33259	0	0
California	1391915	1003247	388668	1368613	23302	0	1391915	0	0
Colorado	571074	406056	165018	555028	16046	0	571074	0	0
Connecticut	355316	267225	88091	345555	9761	0	355316	0	0
Delaware	141500	110525	30975	137546	3954	0	141500	0	0
District of Columbia	74160	48119	26041	72523	1637	0	74160	0	0
Florida	1336332	888839	447493	1291344	44988	0	1336332	0	0
Georgia	623561	420236	203325	608164	15397	0	623561	0	0
Idaho	21	0	21	0	21	0	21	0	0
Illinois	1147871	803219	344652	1118806	29065	0	1147871	0	0
Indiana	409654	273374	136280	396404	13250	0	409654	0	0
Kansas	9634	7085	2549	9392	242	0	9634	0	0
Kentucky	19588	13545	6043	18823	765	0	19588	0	0

State	Total	by End-user Type		by Bundle		by Last-mile Medium			
		Consumer	Business / Government	Sold w/ Internet	Sold w/o Internet	FTTP	Coax	Fixed Wireless	Copper
Louisiana	41409	28739	12670	39875	1534	0	41409	0	0
Maine	16819	14364	2455	16396	423	0	16819	0	0
Maryland	619293	460018	159275	605958	13335	0	619293	0	0
Massachusetts	1140649	878823	261826	1100630	40019	0	1140649	0	0
Michigan	737026	514163	222863	710857	26169	0	737026	0	0
Minnesota	315690	228321	87369	308389	7301	0	315690	0	0
Mississippi	83498	54893	28605	80212	3286	0	83498	0	0
Missouri	35626	28695	6931	34781	845	0	35626	0	0
New Hampshire	236064	186008	50056	228340	7724	0	236064	0	0
New Jersey	869615	697919	171696	849727	19888	0	869615	0	0
New Mexico	106557	68421	38136	104236	2321	0	106557	0	0
New York	19184	16143	3041	18847	337	0	19184	0	0
North Carolina	835	0	835	0	835	0	835	0	0
Ohio	31652	24072	7580	30422	1230	0	31652	0	0
Oregon	330053	213330	116723	320388	9665	0	330053	0	0
Pennsylvania	1426141	1060115	366026	1380002	46139	0	1426141	0	0
South Carolina	58880	39162	19718	56910	1970	0	58880	0	0
Tennessee	368143	238942	129201	356529	11614	0	368143	0	0
Texas	510400	294402	215998	501398	9002	0	510400	0	0
Utah	197180	132190	64990	193188	3992	0	197180	0	0
Vermont	87075	65684	21391	84399	2676	0	87075	0	0
Virginia	466056	332898	133158	455100	10956	0	466056	0	0
Washington	773573	572347	201226	753713	19860	0	773573	0	0
West Virginia	79074	61472	17602	76843	2231	0	79074	0	0
Wisconsin	8733	5289	3444	8200	533	0	8733	0	0
Total	14799040	10566868	4232172	14391608	407432	0	14799040	0	0

Hanover County has published the following public notice on the County website at <https://www.hanovercounty.gov/CivicAlerts.aspx?AID=285>.

Hanover County seeking comment on potential Broadband project

Hanover County is soliciting public comment for a potential Broadband Project as part of an application(s) for Virginia Telecommunication Initiative Grant Funds. The eligible project area includes Old Church Road (Rt. 606) from Immanuel Trail to approximately ½ mile beyond Candleberry Drive, including Immanuel Trail, Ingleside Farm Lane, Wendellshire Way, Ironwood Lane, Drakes Landing Court, Corbin Braxton Lane, Twin Creek Trail, Christian Ridge Drive and associated streets, Dressage Way, and Candleberry Drive. It includes Flannigan Mill Road south to Matadequin Creek and Mill Lake Lane.

For additional information, contact Tom Harris at 804-365-6005. Written comments may be addressed to Tom Harris, via email to ctyadm@hanovercounty.gov, or in person during normal business hours, no later than August 21, 2019.

BOARD OF SUPERVISORS

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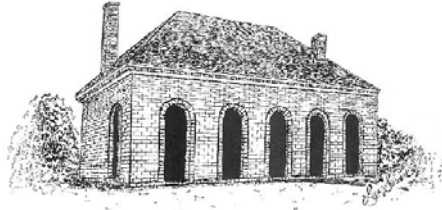
SEAN M. DAVIS,
Henry District

WAYNE T. HAZZARD
SOUTH ANNA DISTRICT

ANGELA KELLY-WIECEK
Chickahominy District

FAYE O. PRICHARD
ASHLAND DISTRICT

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HANOVER COURTHOUSE

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DEPUTY COUNTY ADMINISTRATOR

WWW.HANOVERCOUNTY.GOV

P.O. BOX 470, HANOVER, VA 23069
7516 COUNTY COMPLEX ROAD, HANOVER, VA 23069

PHONE: 804-365-6005
FAX: 804-365-6234

MEMORANDUM

To: Cecil "Rhu" Harris, County Administrator

FROM: Frank Harksen, Deputy County Administrator

Date: August 15, 2019

SUBJECT: Broadband Initiative Update

COPIES: Kathleen Seay, Deputy County Administrator
Tom Harris, Public Information Officer
Kevin Nelson, Director of Information Technology

This Memorandum is intended to provide an update on broadband expansion activities in Hanover County. As you are aware in 2012, the Board established a citizen committee to research broadband opportunities and constraints within the County. The High Speed Internet Committee (HSIC) reported back with a number of recommendations for consideration by the Board, which have served as the basis for the County's broadband planning effort (report attached). A summary of activities related to these recommendations is provided below.

HSIC Recommendation – designate point person for broadband – completed

Frank Harksen, Deputy County Administrator (policy matters)

Kevin Nelson, Director of Information Technology (technical matters)

HSIC Recommendation – Communication – on-going

In accordance with this recommendation, County staff have pursued multiple service options.

The Emergency Communications Department sent letters out to a number of wireless internet service providers (WISP) and telephone companies to take advantage of the County's extensive emergency communication tower network consisting of 18 towers. Since the Committees report, a number of cellular providers have entered into tower lease agreements to co-locate on County towers with the plan to provide 4G LTE service (and potentially 5G service).

Hanover staff have also pursued Wireless Internet Service Provider (WISP) partners. On July 13, 2015, County entered into a tower lease agreement with Last Mile Wireless to provide service in the Poor Farm area. Last Mile Wireless successfully brought its site online however less than a year later due to lack of subscribers in the area and other financial difficulties Last Mile defaulted on the terms of the agreement and discontinued service.

In May of 2016, the County had discussions with All Points Broadband, a WISP. Ultimately, All Points made the decision not to enter into the Hanover market.

The next effort involved SCS Broadband, a WISP, and a comprehensive plan to serve most of the unserved and underserved areas of the County was developed. This plan involved the use of wireless internet technology installed on five existing Hanover communications towers (Phase 1) in far eastern and far western Hanover. Additional towers as mutually agreed upon would be added as part of Phase 2. On April 12, 2017, the Hanover Board of Supervisors approved the initial two lease agreements with SCS Broadband for access the eastern Hanover Communications towers at a greatly discounted rate, with the plan to lease an additional three towers. In exchange for the discounted rate SCS Broadband committed to providing Wireless Internet Service to defined areas that could be served by the two towers. The first area was to be operation within 120 days and the second 120 days later. This was documented in a Memorandum of Understanding, which was also approved by the Hanover Board of Supervisors (attached). To date, 2.5 years later, the first installation has not occurred. SCS staff have offered a variety of explanations however the bottom line is a lack of ability to execute.

The County has posted a number of resources to our website. The County has designated a representative to participate on Congressman Wittman's Broadband Task Force. Staff collaborate on a regular basis with other localities across Virginia on broadband topics. Many localities are experiencing the same or similar issues to Hanover.

HSIC Recommendation – Grant Opportunities – on-going

There are now two grant programs that are specifically for providing broadband internet to “unserved” areas of the County. Because these grants require one party to be an internet service provider (ISP), the County is not eligible to apply for these grants on our own. We must have an ISP partner. These grants, which apply to fiber and/or wireless service, require a local match. Hanover staff have reached out to the existing traditional providers such as Comcast, Centurylink, Segra, and Verizon requesting service be extended into the more rural areas. The responses were almost identical that service could not be extended without a significant subsidy.

The federal Re-Connect grant program is a nationwide effort that provides three tiers of grants: 100% grant; 50% grant / 50% loan; and 100% loan. Corporations are eligible to apply for this grant on their own without the County. Based on discussions with other localities and ISP industry professionals, the application requirements can be onerous and the reporting requirements extensive.

The Virginia Telecommunication Initiative (VATI) is the State’s grant program. For 2019-2020 the State has allocated \$19 million for competitive grants. Hanover can apply for this grant in conjunction with an ISP. The County has received a proposal from Comcast to provide service along Old Church Road (designated as “unserved”).

HSIC Recommendation – Map Internet Availability – completed

The State and federal governments have provided mapping resources that identify “unserved” areas within the County. The federal government maps, which are based on 477 reporting requirements, has an initiative to improve the accuracy of their mapping.

HSIC Recommendation – Library Internet Service – completed

All Pamunkey Regional Library locations within Hanover County have, at a minimum, broadband level access speeds.

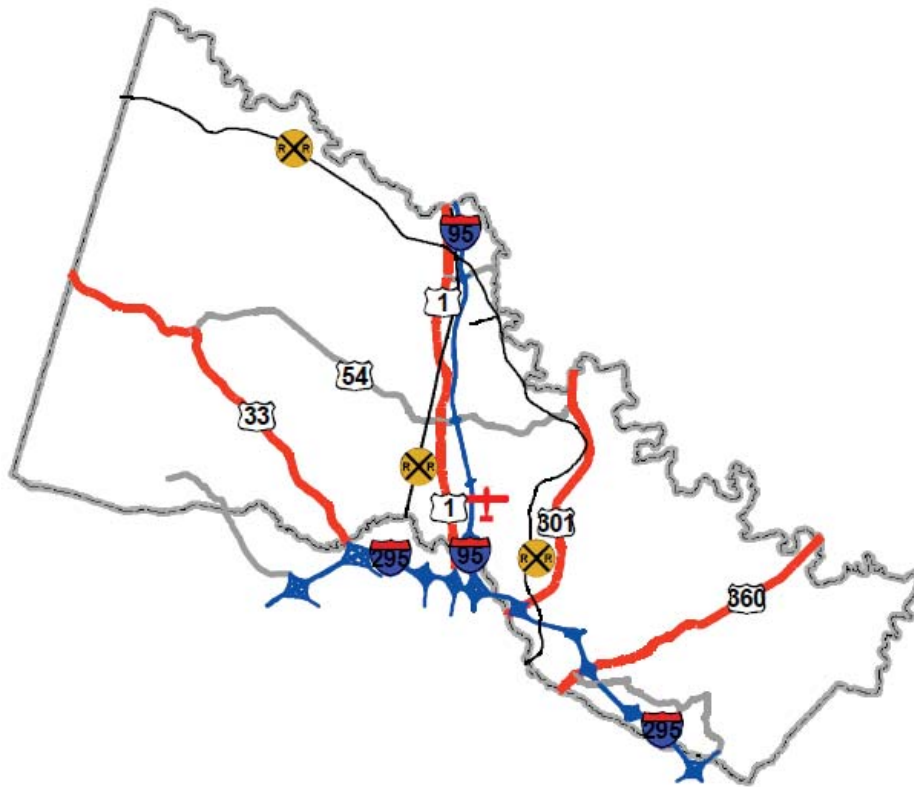
HSIC Recommendation – consider establishing special tax districts – completed

The Board expressed concerns over establishing these districts.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

February 2012, Revision 1





Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

Table of Contents

ABOUT THE HANOVER COUNTY HIGH SPEED INTERNET COMMITTEE	3
Formation	3
Vision/Mission	3
Members	3
ACKNOWLEDGEMENTS	4
EXECUTIVE SUMMARY	5
HSIG Findings.....	5
Current State	6
Recommendations.....	7
Next steps	7
PROCESS	8
The High Speed Internet Committee Process.....	8
SERVICE PROVIDERS SUB-COMMITTEE FINDINGS.....	10
MARKETING SUB-COMMITTEE FINDINGS	18
GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS	21
REVIEW OF SEPTEMBER 2010 HIGH SPEED INTERNET GROUP (HSIG) RECOMMENDATIONS.....	27
HIGH SPEED INTERNET COMMITTEE RECOMMENDATIONS	30
APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY.....	34
APPENDIX B – CITIZEN SURVEY RESULTS	45
APPENDIX C – DRAFT OF HIGH SPEED INTERNET SUPPORT POSITION JOB DESCRIPTION	47
APPENDIX D – HANOVER BUSINESS COUNCIL STATEMENT OF SUPPORT.....	48
APPENDIX E – HANOVER ASSOCIATION OF BUSINESSES & CHAMBER OF COMMERCE LETTER OF SUPPORT	49



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

ABOUT THE HANOVER COUNTY HIGH SPEED INTERNET COMMITTEE

Formation

The Board of Supervisors established the Hanover County High Speed Internet Committee (HSIC) to review the recommendations of the high speed Internet group (HSIG) for the purposes of identifying opportunities to facilitate County-wide availability of high speed Internet service.

Vision/Mission

To ensure all Hanover County residents and businesses have access to the high speed Internet service they desire. Through our work, the High Speed Internet Committee (HSIC) has prepared this report that reflects citizen and business high speed Internet desires and provides a basis for achieving our vision.

Members

- **John Gordon** - Hanover County Board of Supervisors
- **Aubrey Stanley** - Hanover County Board of Supervisors

- **Ken Russell** - Ashland District
- **Margie Smith** - Ashland District
- **Caroline Cooke** – Beaverdam District
- **Steve Ellis** - Beaverdam District
- **Jim Ellis** - Chickahominy District
- **Angela Kelly-Wiecek** - Chickahominy District
- **Jacob Eshler** - Cold Harbor District
- **Russell Minich** - Cold Harbor District
- **Gordon Silver** - Henry District
- **Randy Armbrrecht** - Mechanicsville District
- **Mark Creery** - Mechanicsville District
- **Owen Adams** - South Anna District
- **Amy Mendelson-Cheeley** - South Anna District

- **Joe Casey** - Hanover County Staff



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

ACKNOWLEDGEMENTS

Board of Supervisors

The High Speed Internet Committee (HSIC) wishes to acknowledge the support of the Hanover County Board of Supervisors in the formation of this committee and their commitment to ensuring the County's high speed Internet needs are understood and addressed.

County Staff

The High Speed Internet Committee (HSIC) wishes to thank Joe Casey and the Hanover County staff for support of our activities including support for meeting coordination, facilities, research, and communication.

Montpelier Center for Arts and Education

The High Speed Internet Committee (HSIC) wishes to thank the staff of the Montpelier Center for Arts and Education for support in hosting the western county citizen's forum as part of our activities.

Hanover Association of Businesses and Chamber of Commerce

The High Speed Internet Committee (HSIC) wishes to thank the Hanover Association of Businesses & Chamber of Commerce for their support for the April 2011 Internet forum and for their resolution supporting the activities of this committee. A copy of their resolution can be found later in this document.

Pamunkey Regional Library

The High Speed Internet Committee (HSIC) wishes to thank the staff of the Pamunkey Regional Library for support in hosting the eastern county citizen's forum.

Greater Richmond Chamber – Hanover Business Council

The High Speed Internet Committee (HSIC) wishes to thank the Greater Richmond Chamber – Hanover Business Council for their resolution supporting the activities of this committee. A copy of their resolution can be found later in this document.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

EXECUTIVE SUMMARY

HSIG Findings

In 2010, Supervisor John Gordon commissioned a study group (High Speed Internet Group – HSIG) to examine high speed Internet service in Hanover County.

Over a two-month period, the eight member citizen committee examined different aspects of the issue and presented a report, with recommendations, to the Board of Supervisors in the 4th quarter of 2010.

This committee's report and recommendations served as a basis for the formation of Hanover's High Speed Internet Committee (HSIC) in January, 2011.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

EXECUTIVE SUMMARY (CONTINUED)

Current State

Hanover County enjoys a wide range of high speed Internet providers working to increase coverage and market share to the benefit of our citizens.

Despite coverage maps indicating that virtually all of Hanover County has access to high speed Internet, a number of our citizens do not have a solution they feel is adequate. Because of limits of wired solution networks and limitations of wireless reach in varied topographies, there are those who appear to have high speed access that really do not. Further, the economic models used for network expansion mean that end of line and isolated dead spots are unlikely to see relief in the short term.

Some promise has been uncovered in aggressive testing of multiple wireless solutions. In many cases neighbors can have different results suggesting that a trial and error approach may have some merit.

Citizens have expressed significant frustration over their inability to secure a workable solution and have indicated it affects their quality of life, their child's success at school, and their sense that Hanover County may not be a good place for them to continue to live.

Likewise business owners indicate that the lack of reliable high speed Internet (and carrier redundancy) is negatively impacting their business and loyalty to Hanover as a good place to run a business.

Future needs for high speed Internet are expected to grow as the use of connected devices proliferates in our lives and businesses. The video produced by Corning Glass, *A Day Made of Glass* (http://www.youtube.com/watch?v=6Cf7IL_eZ38), illustrates Internet-based technologies that are not far off in our future. This trend is growing fast and Hanover County citizens will want to exploit these services to improve their quality of life, the education of their children, and the success of their businesses.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

EXECUTIVE SUMMARY (CONTINUED)

Recommendations

1. Designate a County staff person to oversee Hanover's high speed Internet issues.
2. Establish a quasi-government/special tax district group within selected neighborhoods that do not currently have any or inadequate Internet access.
3. The County should make resources available to keep people informed about the current state of high speed Internet options including current public wireless hotspots.
4. Use the annual paperwork required by the school system to help map Internet availability.
5. Continue to support the Internet growth and access needs of the Pamunkey Regional Library system.
6. Continue to use standing or ad hoc citizen committees to study specific issues that can help to expand Hanover's high speed Internet capabilities.
7. Continue to research grants and state/federal funding opportunities.

Further details of these recommendations can be found later in this document.

Next steps

The Hanover County High Speed Internet Committee urges the County to aggressively pursue the actions recommended in this report and to report their actions to the County citizens through printed and Internet communications.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

PROCESS

The High Speed Internet Committee Process

The committee was established by the Board of Supervisors in January, 2011. It was headed by supervisors John Gordon and Bucky Stanley. Each member of the Board appointed 1-2 citizens from his or her respective district to serve on the committee. County staff was also provided to assist the committee in its efforts.

The first step in the process that the committee followed was to reach agreement on its vision and mission. The committee determined that its vision was:

To ensure all Hanover County residents and businesses have access to the high speed Internet service they require at a reasonable cost.

The committee agreed that its mission was:

Through our work, the High Speed Internet Committee (HSIC) will prepare a report of findings that reflect citizen's and business's high speed Internet needs and provides a basis for achieving our vision.

Because of the depth and breadth of the issues which the committee felt it should address, three sub-committees were formed:

1. Service Providers
2. Marketing
3. Government Strategies

The work accomplished by each of these sub-committees is addressed elsewhere in the report.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

PROCESS (CONTINUED)

The High Speed Internet Committee Process

Throughout the year, the HSIC held two-hour monthly meetings. These meetings included:

1. Guest speakers:
 - a. Various telecommunication providers who currently provide service in the County as well as those who want to establish a foothold here.
 - b. Representatives of Hanover's school and library systems
 - c. A tower broker company that offers innovative approaches to making cell towers blend into the environment.
 - d. A representative from state government who provided an update on broadband initiatives and coverage in the Commonwealth.
2. Reports by each sub-committee of what they have learned in their research and activities.
3. Discussions of key issues that need to be addressed (e.g., the importance of high speed Internet access to the small business owner).



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS

The Service Providers Sub-Committee's members were:

- **Jacob Eshler** - Chair
- **Randy Armbrrecht**
- **Russell Minich**
- **Ken Russell**

The role of the sub-committee was to:

1. Survey the current providers (wire, wireless, and satellite), their current coverage areas and speed; identify planned enhancements to coverage and speed, including when such enhancements will occur.
2. Frame system enhancement time and speeds into goal-type statements and thresholds of County desires.
3. Investigate alternatives for citizens to get high speed access via schools, libraries and other potential resources.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

A questionnaire was developed and sent out to six providers/potential providers of high speed Internet to Hanover County residents and businesses – Comcast, AT&T, HughesNet, CenturyLink, Verizon and Virginia BroadBand (VABB). Comcast and AT&T returned the questionnaire with their responses. HughesNet did not respond. CenturyLink, Verizon and VABB presented to the HSIC and addressed most of the questions in the questionnaire. Several additional providers presented to the HSIC – iWISP, ClearWire, and Milestone (towers).

Comcast and AT&T- These two providers e-mailed written responses to the questionnaire. A summary of their response is shown below - detail is in the attachments.

Comcast is a cable TV provider that also offers wired broadband and telephone service over its cable network to residential and business customers in Hanover County.

The standard residential product communication rate (6Mbps+) offered is about 1-1/2 times what is considered high speed by the current FCC definition (4Mbps+). Higher speed service (15, 25, 50, & 105 Mbps) can be purchased. The square mile area of coverage is not easily calculated as all service offered by Comcast is wired. They did provide a coverage map. The monthly data usage threshold for standard residential usage is 250 GB. Comcast does not own or lease fiber optic for internet backhaul in Hanover.

At 40,000 total households, internet service is available to about 83%. The standard installation fee is \$99 for serviceable homes. Actual billing varies with promotional offers, level of service chosen by a customer and applicable taxes. Comcast expands service based on residential development. Whenever an area meets the density standard as specified in the Cable TV Franchise Agreement, they wire that community and provide the full suite of services, including Internet. Financial limitations make areas that fall below the density standard (currently 25 homes per linear mile of cable plant) unfeasible for wire-line providers to build into sparse, rural areas. In some cases developers, homeowner's associations, and individual homeowners contribute to the funding of otherwise financially unfeasible projects.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

AT&T offers wireless coverage to customers in Hanover County. 4G wireless coverage (HSPA+ network) is available in particular on the eastern side of the County, and to a lesser degree on the western side of the County. 4G speeds currently being made available in some areas of the County can well exceed the current FCC HSI definition (4Mbps+) depending on location, equipment, geography, terrain and a variety of other factors. AT&T's wireless broadband service covers nearly 80 percent of the population, nationwide, as depicted on the wireless coverage map AT&T provided.

The percentage of the 471 square miles in Hanover covered by level of service by AT&T is not easily calculated. Data packages offered are dependent upon the type of service and rate plan a customer selects. As a user approaches the data usage limitations of their package, the customer can make the decision that is best for their needs at that point in time. While the number of wireless transmission sites in Hanover was not given, coverage maps are available. As mentioned earlier, coverage available from a transmission site is a function of many factors, including spectrum frequency, modulation protocol, antenna elevation, device and terrain, among others. AT&T may own, or instead may control communication facilities procured from a variety of underlying providers. Specific information is proprietary and competitively sensitive. AT&T recognizes that you cannot build a broadband wireless network on a foundation of narrowband backhaul.

AT&T does not charge wireless voice customers any additional installation fees for wireless broadband. However, there is an activation fee--currently \$36.00 per line--for the underlying voice service. For laptop connect cards (air cards), there is also a one-time activation fee of \$36 per device. The commitment term and the device selected affect up-front cost and monthly rates. Actual billing varies with promotional offers, level of service chosen by a customer and applicable taxes.

Due to the dynamic nature of the technology and the business, competitive sensitivities and legal considerations, AT&T cannot share its specific network or service build-out plans for Hanover County. AT&T believes that connecting all Americans to high-speed internet access is a national challenge and one that the FCC together with the communications industry must continue to address.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

CenturyLink, Verizon, and VABB - presented to the committee and addressed their concerns with providing Internet coverage to sparsely populated areas of Hanover County and in special situations in the County.

Verizon presented coverage maps for their wire and wireless service. They can provide DSL Internet service over their wire phone lines. DSL requires that a switching point be close to the customer to provide internet service, so they cannot provide Internet service at every phone service location. Distance to the switching point and the condition of the lines affect service level available. FIOS service is not being expanded in Hanover at this time. Wireless service available from Verizon ranged in service level much like wireless service from AT&T. They also mentioned that wireless service level to a particular point will vary depending on spectrum, geography, terrain, and device.

CenturyLink provides wire phone service in the Montpelier area. They can provide DSL internet service over their wire phone lines. DSL requires that a switching point be close to customer to provide Internet service, so they cannot provide Internet service at every phone service location. Distance to the switching point and the condition of the lines affect service level available.

VABB presented to the committee and provided a written document to the committee. That document is included in the appendix. They quoted Karen Jackson (Deputy Secretary of Technology - Commonwealth of Virginia): "There is no single technology that will solve the commonwealth's last mile issues", (from HSIC April report on the HSIC website), VABB also commented: "Rural Broadband is expensive, difficult, technically challenging, and risky" and added the following recommendations:

1. Financing of HSI has to be solved for any area
2. Accurate County level data, detailing where services are available and where they are not. *(The HSIC adds that citizen input will be a vital part of determining where acceptable service is not available)*
3. Provide tower access as an incentive for HSI deployment assuring quiet enjoyment without restricting use by other suppliers
4. Share and encourage the sharing of existing transmission facilities that can support backhaul to remote areas. School->Library->School->etc.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

Milestone and ClearWire participated in a HSIC meeting and explained their services.

ClearWire – Cell phone/broadband company operating in Hanover County. Coverage maps are available on their website.

Milestone – Tower “broker” company that offers innovative approaches to making cell towers blend into the environment. Since 2000, Milestone has developed and now manages over 50 wireless communication infrastructure sites with towers on them in the Washington Metropolitan region. They market another 750 raw land sites that have the potential for future towers. The company uses its equity capital to build, own and maintain stealth wireless facilities on public property that generate stable, recurring income for local governments.

Milestone puts in the resources to market the sites, zone the sites, build the towers, lease space on the towers and maintain the sites. The government puts in their land to place the tower, via a ground lease. Any revenue that is generated is split 50/50 with the landowner.

They are not active in Hanover County at this time - they are interested in opportunities in Hanover.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

HughesNet – This company provides Internet service via satellite. Their connection speeds range from 1Mbps to 2Mbps which are well below the 4Mbps+ speed that is used to define high speed Internet. However, for citizens in areas that are not being served by the other telecommunication companies, it is the only option other than dial-up service.

There are drawbacks with satellite coverage including latency of the signal and it is subject to disruption due to weather such as heavy rain or snow. The service is also expensive when compared to the wired and wireless providers. Depending upon the speed of the connection, the monthly cost ranges from \$49.95 to \$109.95. Another drawback is the significant upfront cost involved. They have an install/lease program which costs about \$100 upfront and about \$10/mo and an install/purchase plan which runs about \$300 upfront but they return \$200 of that after 3 months.

Satellite users also are subject to a Fair Access Policy (FAP). The FAP is designed to ensure that heavy users do not monopolize the limited space available on the satellite's transponders. In effect, as a user gets close to his/her daily usage allotment (250mb – 450mb), the connection speed decreases. This is becoming more of an issue for users as more Internet companies update their software over the Internet (e.g., Microsoft).



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

Innovative approaches to supplying Internet service.

There are examples of innovative solutions to supplying high speed Internet in special situations.

- **iWISP**
 - This is a wireless service that requires that the customer have an external antenna and have line of sight from the antenna to the provider transmission tower/antenna. There are indications that the Internet service could be 6Mbps+. The HSIC has not had the resources to verify the speed or customer satisfaction with the service.
- **T1 communication line sharing**
 - There have been some instances in Hanover where a communication line into a neighborhood has been shared by multiple homes
- **Hickory Hills development/Comcast**
 - The developers have tentatively come to an arrangement with Comcast to extend service to the development. The developers believe that HSI is an integral part of package they must provide to homebuyers in the value range of homes in the development
- **Specialized antennas, relays, etc.**
 - It is not clear why some of the major wireless “telephone” communication providers have not developed services that are more focused on Internet communication
- **Cooperation between providers**
 - Services like iWISP require relatively high capacity connection from the transmission tower into the Internet. This would probably be communication line/capacity provided by another entity that services a tower



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS (CONTINUED)

Conclusions:

Providers are very cautious about providing “wire/FIOS” connections to individual houses or businesses, except where demand density and short access to a high capacity web connect point provide a viable payback.

Providers of wireless service can map their coverage, but that may not explain what is happening at the customer level. Trees, topography, tower height and device are some of the factors that affect individual homeowner service. Availability of wireless phone service does not mean that high speed Internet is available. It may mean that you can attach to the Internet via the wireless phone, but the speed may not be acceptable.

There are examples of innovative solutions to supplying high speed Internet in special situations. The challenge is promoting and implementing innovative solutions in the County, especially to those who do not work with newer technologies on a daily basis.

When Internet is needed in a fringe coverage area or there are unusual issues with coverage, there is a need for a service that identifies the best solution at the consumer level, especially to those who do not work with newer technologies on a daily basis. There is a need to provide continuity to the effort to bring Internet to underserved areas of the County with the interests of County residents and businesses in mind. There is a need to facilitate bringing together groups of people/entities that could benefit from a group effort.

Home buyers/businesses are learning to make Internet connectivity a requirement for a location. This has implications for real-estate values and business development in the County.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

MARKETING SUB-COMMITTEE FINDINGS

The Marketing Sub-Committee's members were:

- **Steven Ellis** – Chair
- **Caroline Cooke**
- **Jim Ellis, Jr.**
- **Angela Kelly-Wiecek**
- **Amy Mendelson-Cheeley**

The role of the sub-committee was to:

- Communicate with and educate others on the importance of high speed Internet.
- Organize and facilitate town hall meetings to simulate discussion and ideas about the importance of Internet connectivity, with a particular emphasis on high speed Internet, and to solicit ideas for improvement.
- Survey Hanover citizens to elicit feedback from a cross-section of the population about concerns such as accessibility, reliability, cost, and service from telecommunication providers.
- Determine the capabilities of existing towers, located throughout the County for accommodating the addition of various antenna arrays.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

MARKETING SUB-COMMITTEE FINDINGS (CONTINUED)

Communicate with and educate others on the importance of high speed Internet.

In April 2011, the sub-committee chair participated as a panelist during an Internet forum sponsored by the Hanover Association of Businesses and Chamber of Commerce. Other panelists included Aubrey “Bucky” Stanley, Supervisor, Beaverdam District, Dr. Jamelle Wilson, Superintendent, Hanover County Public Schools, Randy Dillard representing Verizon Wireless and Rich Schollmann representing CenturyLink. The purpose of the forum, which was held at the Montpelier Center for Arts and Education, was to give citizens in the western part of the County an opportunity to learn about:

- the difficulties in extending high speed Internet service into rural areas.
- how the school system is trying to meet the high speed Internet accessibility needs of students.
- the importance of high speed Internet to the economic growth of the County and why it is critical to Hanover’s future.

In September 2011, the Sub-Committee wrote an article that was included in the County’s *Hanover Review* newsletter. The publication, which reached 40,000 addresses throughout the County, promoted the work that the HSIC was undertaking, shared some of the issues the committee was attempting to address and identified the individuals who were appointed to the committee by County Supervisors. The article additionally served as a means of publicizing the scheduled town hall meetings discussed below and elsewhere in this report.

Organize and facilitate town hall meetings to simulate discussion and ideas about the importance of Internet connectivity, with a particular emphasis on high speed Internet, and to solicit ideas for improvement.

To help the HSIC fulfill its mission of preparing “a report of findings that reflect the high speed Internet needs of citizens and businesses,” the Sub-Committee organized and facilitated two town hall meetings. To maximize feedback from citizens who live in both the rural and developed areas of the County, one meeting was held in Montpelier and the other in Mechanicsville. Over 100 citizens participated in these two-hour events sharing their ideas and concerns about high speed Internet access. A complete discussion of the findings of these town hall meetings can be found in **Appendix A**.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

MARKETING SUB-COMMITTEE FINDINGS (CONTINUED)

Survey Hanover citizens to elicit feedback from a cross-section of the population about concerns such as accessibility, reliability, cost, and service from telecommunication providers in the County.

The Sub-Committee collaborated with County staff to structure a comprehensive question that was included in the triennial County survey that went to 1,200 Hanover citizens in July 2011. An analysis of the survey results can be found in **Appendix B**.

Determine the capabilities of existing towers, located throughout the County for accommodating the addition of various antenna arrays.

There are approximately 75 communication towers located throughout the County; the County owns 12 of these. The towers serve a variety of needs; some are solely cellular service, others serve radio stations, and still others support emergency services, paging services and similar businesses/organizations that require an over-the-air communication capability. There was insufficient time in HSIC's study process to contact the tower owners to determine capabilities.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS

The Government Strategies Sub-Committee's members were:

- **Mark Creery** – Chair
- **Owen Adams**
- **Gordon Silver**
- **John Gordon**

Mission

The HSIC Government Strategies Sub-committee was formed to understand what Hanover currently does and what other local governments are doing (including lessons learned) in regards to best market high speed Internet, providers and the related partnership agreements and grants; with understanding of what can be done and achieved for \$0 local tax investment vs. higher \$ investments. This would also include roles and responsibilities of State and Federal government, and past roles as it pertained to other utility infrastructure improvements in rural areas (e.g., telephone, electricity). Our goal was to draft findings and recommendations for inclusion in the full HSIC report to the Board of Supervisors.

The role of the sub-committee was to:

- Survey & report best practices - other localities successes and lessons learned
- Survey & report federal and state history, roles and funding
- Determine need and define funding for Hanover HSI staff position
- Determine feasibility of Hanover providing portal into state service map



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS (CONTINUED)

Survey & report best practices - other localities successes and lessons learned

Investigated Goochland County, Franklin County, Surry County, Caroline and/or Louisa and nationally Lafayette Parish. LA, Ontario, NY, NC, SC, others.

Goochland County, VA: At the request of Goochland County (County), CBG Communications, Inc. (CBG) has conducted a Broadband Network Deployment Study that has reviewed and analyzed broadband availability and developed alternative approaches and models to deployment of a network (including benefits, drawbacks and possible costs of those alternatives) to expand broadband availability within the County. This will help meet the needs of a variety of Communities of Interests within the County and the County's broadband network deployment goals.

CBG employed a number of information gathering methodologies and engaged in related activities in order to meet the Project objectives:

- For organizational Communities of Interest (business and non-profits, government, educational and community organizations), focused discussions were held to finitely explore subject areas related to broadband availability, adoption and use, as well as deployment options for the future.
- A written, mail-out survey of the residential community was conducted utilizing a survey instrument designed to obtain a wide variety of information about residential broadband availability, adoption and use. A public forum was also held and an on-line and written survey was made available.
- The broadband system development efforts of neighboring counties were reviewed.
- Broadband services, infrastructure and technologies available in the County were reviewed and mapped.

Reference: <http://www.co.goochland.va.us/LinkClick.aspx?fileticket=fYXlwAWH7k4%3D&tabid=158&mid=1402>



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS (CONTINUED)

Survey & report best practices - other localities successes and lessons learned

Franklin County, VA faced a similar situation to Hanover County, VA. According to Sandie Terry, IT Director, Franklin County, VA, “Broadband is quickly becoming a utility, same as electricity and phone service, and is critical for communities to attract new development and support both existing business and the growth of new business. Franklin County continues to be the fastest growing locality in this region of Virginia.” Located in the foothills of the Blue Ridge Mountain Franklin covers a large area, approximately 721 square miles of small towns and sparsely populated rural areas. While the rural area attracts a growing population the lack of broadband access limits the opportunity to attract new businesses, as well as support the County’s residents, schools, public safety agencies, and existing business. Similarly to Hanover, the economic development team was being challenged in that the County’s broadband offerings were limited and expensive.

DSL, Satellite, fiber, and cable were considered. Cable was eliminated because the current build-out only covered one third of the region. DSL and T1 connections also had limited coverage to the more populated areas and were also considered too expensive for most residents. Satellite service would not support business demands and fiber was cost-prohibitive and unable to meet terrain challenges and expanse of rural areas between communities. Wireless broadband seemed to be the perfect solution and a broadband assessment was conducted in 2004 and 2005 that mapped the most underserved areas. Franklin County worked with local landowners, partnered with B2X (a small local ISP), and leveraged grant funding (The American Recovery and Reinvestment Act) to expand broadband services throughout the 721 square mile area for a total County investment of \$83,000 from the general fund and a \$50,000 federal grant (less than 24% of the projected cost).



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS (CONTINUED)

Survey & report best practices - other localities successes and lessons learned

The solution was Motorola Wireless Broadband Point-to-Multipoint. Using existing tower sites and working with landowners to gain access to place additional towers on private property in exchange for reduced service fees, Franklin County enabled a network design that provided wireless connectivity from 18 towers and water tanks, including redundant network paths. B2X then implanted a Motorola Wireless Broadband Point-to-Multipoint system to deliver scalable, interference-resistant, high-speed connectivity to residential, business, institutional and municipal locations throughout the County. (Case Study: Franklin County, VA Attracts Economic Development with High Speed Wireless Broadband)

Reference: http://www.yesfranklinCountyva.org/bb_assets/pdf/franklin_County_wireless_Internet.pdf.

Tazewell, VA: Southwest Virginia is receiving \$22.7 million in federal stimulus funds to develop a 388-mile fiber optic backbone project through an eight County region.

Reference: <http://bdtonline.com/local/x1671038013/Stimulus-funding-to-stretch-broadband-through-8-Va-counties>.

Winchester, VA: Wave2Net High Speed Wireless Internet provides high speed Internet service to underserved areas in Winchester Virginia and surrounding counties using the latest wireless technologies, even in the most dense difficult to reach areas.

Reference: <http://www.wave2net.com/>.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS (CONTINUED)

Survey & report federal and state history, roles and funding

The Government Strategies Sub-committee searched funding opportunities that might help increase high speed Internet opportunities to its citizens. Our research included:

- eRate (<http://www.universalservice.org/sl/>)
- Broadband Technology and Opportunities Program – BTOP (<http://www2.ntia.doc.gov/>)
- Virginia wireless authorities (Code of Virginia, §15.2-5431.1 et seq.)

We did find some activity, mostly confined to early organizational, of wireless authorities in Virginia including:

- King River Wireless Authority (<http://bit.ly/x4ojV9>)
- New River Valley Network (<http://www.nrvpdc.org>)

An exception is the Eastern Shore of Virginia Broadband (<http://www.esvabroadband.net>) which is in the process of building a middle-mile connection to supply high speed Internet to the entire Eastern Shore of Virginia. They have received over \$4m in construction grants.

We would suggest monitoring the progress of these efforts to determine applicability to Hanover.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

GOVERNMENT STRATEGIES SUB-COMMITTEE FINDINGS (CONTINUED)

Determine, need, define funding for Hanover HSI staff position

One of the challenges in determining high speed Internet availability, or prospects thereof is that the information can sometime be unreliable and may be difficult to coalesce. In addition, efforts to coordinate the activities of the various providers (wired, wireless, infrastructure) can be fractured. Lastly, communication on the progress of service availability varies greatly between vendors.

We think there is some merit in providing Hanover County staff support for these and similar activities to support the County's citizens and businesses. There are similar staff positions in Fairfax County and with the Eastern Shore of Virginia Broadband.

A draft job description for this position can be found later in this document as well as our recommendation for staffing this position.

Determine feasibility of Hanover providing portal into state service map

National broadband (<http://broadbandmap.gov/>) and Virginia broadband (<http://www.wired.virginia.gov/>) maps are available online. Unfortunately, the maps available do not represent a reliable method of determining service levels for many Hanover locations. In addition, the websites can be difficult to use. We discussed the potential of merging the data from these maps with the Hanover County GIS online portal (www.hanovercountygis.org) with Hanover County IT staff. It appears that while feasible, the information is not timely or accurate and would not significantly enhance the ability of citizens to determine their high speed Internet service levels beyond the current websites.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

REVIEW OF SEPTEMBER 2010 HIGH SPEED INTERNET GROUP (HSIG) RECOMMENDATIONS

In 2010, Supervisor John Gordon commissioned a study group to examine high speed Internet service in Hanover County. Over a two-month period, the eight member citizen committee examined different aspects of the issue and issued a report, with recommendations, in the 4th quarter of 2010. This committee's efforts served as a basis for the formation of Hanover's High Speed Internet Committee (HSIC) in January, 2011.

It is worthy to note the recommendations of that committee because they help clarify the issues and concerns that were addressed by the HSIC as well as the direction the committee is recommending the County take in this report.

1. Establish a standing Technology Committee.
2. Map actual user-level access to high-speed Internet service in the County.
3. Investigate grant and foundation funding for the expansion of HSI in Hanover County.
4. Explore public/private collaborations.
5. Obtain citizen input in a more systematic fashion.
6. Establish a relationship with the Virginia Office of Telework Promotion and Broadband Assistance.
7. Establish relationships to help with HSI expansion in Hanover County or the wider Richmond region.
8. Stay up to date on technological advances.
9. Explore further use of the County's 911 tower system to achieve ubiquitous HSI coverage.
10. Explore the feasibility of a contract for Countywide broadband coverage similar to the franchising agreement for cable television.
11. Explore adding HSI access to developer's proffers for new construction in Hanover County.
12. Explore using the County's website, members of a standing Technology Committee, or other means to provide citizen information and consumer education about HSI in Hanover County.

The formation of the HSIC was an outgrowth of Recommendation #1. While initially proposed as a standing committee, the Board of Supervisors felt that a 12-month study committee would be more appropriate and in January gave approval to its formation. The committee began its work in February.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

REVIEW OF SEPTEMBER 2010 HIGH SPEED INTERNET GROUP (HSIG) RECOMMENDATIONS (CONTINUED)

In line with recommendation #2, the HSIC attempted to develop a better map of what services were available in the different parts of the County, but overall accuracy was limited by several factors. While DSL or wireless coverage might be available in one area, an adjacent area may not be able to avail itself of similar services due to topography, distance from a central office or field unit or the presence of trees or structures that might interfere with an over-the-air signal. An accurate map of services therefore must be on an address-by-address basis.

Recommendations #3 and #4 should continue to be considered. High speed Internet service is becoming an ever-increasing part of people's everyday lives – whether for business or pleasure – and there will be increased pressures on governments to ensure that citizens are able to keep pace with changing technology.

The town hall meetings and the survey question on the Hanover County survey were the efforts the HSIC used to solicit citizen input (recommendation #5) on the issue of broadband access. This has become a mainstream issue and a means of establishing a regular dialogue with citizens should be developed and maintained.

The Telework and Broadband Assistance Agency referenced in recommendation #6 has a relatively accurate broadband availability map to which users can link from their website (<http://www.otpba.vi.virginia.gov/index.shtml>). The County needs to continue to work with this agency to explore possible avenues for bringing more widespread access to broadband into the County.

Recommendations #7-#9 are also ongoing activities that the County should continue to explore to stay abreast of current technology and the means available to deliver it.

Recommendation #10 is not likely to happen. Unlike cable systems, the Internet is neither controlled nor overseen by any government agency. There is no single service provider who is able and willing to extend cost effective Internet service throughout the County, especially in low density areas such as western Hanover.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

REVIEW OF SEPTEMBER 2010 HIGH SPEED INTERNET GROUP (HSIG) RECOMMENDATIONS (CONTINUED)

Recommendation #11 deserves some additional consideration and study. The positive side is that it can bring revenue to the County to support its efforts to make broadband access available to more citizens. The downside is that any increased proffer raises the cost of construction which ultimately is passed along to the buyer. With the housing and economic markets currently in a depressed state, this may not be a viable option in the foreseeable future.

Recommendation #12 is essential to continue to pursue. Broadband access is a necessity that supports a vibrant workplace and a high standard of living. Current and potential citizens should be cognizant of what service resources are available so they can seek out the areas in which to live and work in the County. This would include references to service availability provided by Internet vendors.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

HIGH SPEED INTERNET COMMITTEE RECOMMENDATIONS

The High Speed Internet Committee makes the following recommendations in this report to the Board of Supervisors:

1. Designate a County staff person to oversee Hanover's high speed Internet issues.

The town halls and the HABCC Internet forum indicated the high level of emotion that citizens have about access to high speed Internet. It is affecting their businesses, their children's education, the resale value of their homes and their quality of life. In short, it has become too important an issue to be treated passively. Initially, this recommendation is that it be an added-value item for a current staffer. As the individual's workload regarding high speed Internet expands, the County might consider devoting a fulltime resource to help move this issue forward and to stay abreast of the vendors/services available in the marketplace.

2. Facilitate the creation of quasi-government/special tax district groups within selected neighborhoods that do not currently have any or inadequate Internet access.

Precedent has been set for special tax districts in the County as respects recycling. A similar approach can be taken for high speed Internet, but it can include a geographic area larger than a specific neighborhood/subdivision. Our recommendation is that pilot programs be initiated in the eastern and western parts of the County. A "champion" would solicit the agreement to participate with 80 percent or more of the citizens in a defined geographic area. The County would then work with the various providers to determine what combination of services could be provided to them and what it would cost to provide this service. The results would be studied and, if successful, rolled out to other parts of the County.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

HIGH SPEED INTERNET COMMITTEE RECOMMENDATIONS (CONTINUED)

The High Speed Internet Committee makes the following recommendations in this report to the Board of Supervisors:

3. The County should make resources available to keep people informed about the current state of high speed Internet options including current public wireless *hotspots*.

The Committee's recommendation is for the County to develop material that can be published both on the County's website and in brochures that would identify the vendors who provide high speed Internet service. The website would also develop and maintain an accurate map that would identify the levels of Internet service available in each part of the County. Lastly, this information should include the locations of active public wireless hotspot locations so that citizens can use these locations in lieu of adequate coverage at their home or businesses.

4. Use the annual paperwork required by the school system to help map Internet availability.

Each year, a parent who has a child in the Hanover school system must complete an extensive amount of paperwork. Our recommendation is that the County partner with the school system to solicit Internet-related information which would:

- a. Help teachers prepare their curriculum to accommodate a student's access to high speed Internet; and
- b. Give the County valuable mapping information that would provide details as to what areas are being served by what Internet speeds.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

HIGH SPEED INTERNET COMMITTEE RECOMMENDATIONS (CONTINUED)

5. Continue to support the Internet growth and access needs of the Pamunkey Regional Library.

When the Board of Supervisors examines the County's annual budget, they should be aware that funds allocated to the Pamunkey Regional Library support not only staff, books and other library resources, but also computers and high speed Internet access. Since the Hanover library branches are in some cases the only place students and small businesspeople are able to access high speed Internet service, the Board of Supervisors should dedicate (i.e., earmark) money to the Library system for that specific purpose.

6. Continue to use standing or ad hoc citizen committees to study specific issues that can help grow and expand Hanover's high speed Internet capabilities.

Between the Hanover High Speed Internet Group and the High Speed Internet Committee, considerable progress has been made in communication increasing awareness with citizens and business, communication with providers, and understanding of potential solutions. We recommend that the Board of Supervisors consider continuing these efforts by encouraging ongoing citizen's involvement.

7. Continue to research grants and state/federal funding opportunities.

There are frequent articles in newspapers and online about new funding programs that are designed to extend high speed Internet access to more citizens. Government officials understand that high speed Internet access promotes competitiveness and that, in turn, promotes business expansion and job growth.



Hanover County High Speed Internet Committee (HSIC)
Report to Board of Supervisors

APPENDICES



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY

Overview

One of the twelve recommendations in the 2010 ad hoc committee's report was that the County should "obtain citizen feedback in a more systematic fashion." The HSIC accomplished this by holding two town hall meetings and adding a multi-part question to the triennial County citizen satisfaction survey.

The feedback from citizens was clear. It supported the ad hoc committee's contention that high-speed Internet service had moved from "innovation to expectation". It personalized and documented the negative impacts of poor or absent high-speed Internet service and it demonstrated widespread citizen support for an active County role in solving the problem.

Town Hall Meetings

In coordination with County staff and the Pamunkey Regional Library, two town hall meetings were held by the HSIC. Both meetings were facilitated by HSIC member Steve Ellis. Other HSIC members helped to facilitate breakout sessions at the meetings.

The town hall meetings were held on Monday, October 3, 2011 at the Montpelier Center for Arts and Education in Montpelier and on Wednesday, October 5 at the Mechanicsville Branch Library. Approximately 40 people attended the Montpelier meeting and about 65 people attended the meeting in Mechanicsville. Attendees at both meetings included representatives from some service providers.

At each meeting, Steve Ellis made opening remarks covering the issues that the HSIC had studied to date. These included the importance of access to high-speed Internet for residents and businesses in the County and the economic challenges in providing Internet service faced by for-profit providers in areas of the County with low population densities.

Following the opening remarks, attendees broke into discussion groups according to the type of Internet service they had. Members of the HSIC facilitated the breakout groups. After the breakout groups concluded, the facilitators told the full audience what they had discussed which helped engage the full audience in an exchange of ideas about what needs to be done as the County moves forward.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

The major themes, challenges, and opportunities that came out of the meetings were:

- a. Strong confirmation by citizens in attendance of the importance of ubiquitous access to high-speed Internet service, for the reasons cited in the ad hoc committee's report.
- b. Support for the County to have a role in addressing the problem of better access to high-speed Internet.
- c. A functional definition of "high-speed Internet" as the speed at which videos can be viewed without delays or buffering.
- d. Concerns about spotty service, inadequacy of some wireless services for telework because they do not support VPN connections, concerns about coverage maps that do not match actual service gaps "on the ground", dissatisfaction with the cost and inconvenience of having to subscribe to multiple telecommunications services for marginal levels of service, and frustration at being so close to other households with good service yet being unable to obtain service.
- e. Some support for the County to continue to seek funding for high-speed Internet improvements, and general support for any solution that would make reliable high-speed Internet available to their homes.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Possible solutions included:

- a. Discussion of partnerships with libraries, schools, businesses, emergency services and providers to pool available resources or coordinate investments to help address high-speed Internet access in the County.
- b. Discussion of neighborhood cooperatives that would work with providers to pool resources and pay for the infrastructure that would carry high-speed Internet service.
- c. Raising revenue from specific portions of the County to pay for Internet infrastructure by allowing the citizens in defined areas to petition to County to be in a special tax district. The model would be the special tax districts now in existence to support curbside recycling services, or the special tax district in the Atlee Manor neighborhood to pay for County water and sewer infrastructure.
- d. Offering space on existing County-owned communications towers to providers willing to use them to expand coverage. The County has been pursuing this avenue for more than a year, and intends to continue doing so.
- e. A discussion by a local businessman with prior experience as an Internet service provider of a model to assess specific conditions and needs in specific neighborhoods, and tailor solutions to those neighborhoods. The provider offered support for this approach.
- f. A discussion by another local businessman who runs a wireless Internet service provider who stated that for a relatively low cost, he can provide high speed Internet service to low population density areas throughout the County. His business model makes use of existing towers as well as silos and other vertical structures as a means to deliver wireless Internet services.
- g. A County-generated pool of seed money to jump-start infrastructure for specific neighborhoods, which would be paid back by revenue from cooperatives, special tax districts or other arrangements.
- h. Facilitation by the County to help with any and all of these ideas, as well as others that might develop.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Montpelier Town Hall Meeting Details

As noted earlier, the first town hall meeting was held on Monday, October 3, 2011 at the Montpelier Center for Arts and Education in Montpelier. Approximately 40 people attended, including representatives from some service providers. Steve Ellis made opening remarks covering the issues that the HSIC had studied to date. These included the importance of access to high-speed Internet for businesses and residents in the County, and the economic disincentives to provide Internet service faced by for-profit providers in areas of the County with low population densities.

In response to questions from Ellis by show of hands, nearly all in attendance had cell phones but only about half had a signal at their homes. Two or three people had dial-up Internet service, three had satellite, about 40% had cable or DSL, and about 40% had wireless Internet service. One person said that at his business office they had no Internet service. About one-quarter to one-third indicated they would be willing to pay more for better service.

There was some discussion about coverage maps provided by service providers or state agencies that show services being available in certain areas, but the experiences of some residents in those areas show that they cannot get reliable high-speed Internet service. A service provider representative at the meeting said that the coverage maps are generated from algorithms that essentially estimate or predict service levels, so some differences from those estimates can occur.

Ellis noted that the situation is complicated by the expense of installing fiber optic cable, the “not in my back yard” opposition to new cell phone or other wireless towers, and the difficulty in mapping detailed coverage information.

There was a comment from the attendees that DSL should not count as high-speed service, and a question about what level of service the HSIC was using to define high-speed Internet service. The committee is using the federal government definition of 4 Mbps or better. Attendees said they would define high-speed Internet as the speed at which they could watch videos without buffering delays.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Montpelier Town Hall Meeting Details

There was some resistance to the idea of considering DSL as high-speed service, and some discussion about whether the threshold applied to download or upload speeds.

There was a question about a newspaper article that had appeared just before the Montpelier town hall meeting. The article contained a figure of \$30 million as the cost of addressing the problem in Hanover County. This figure was a rough estimate of the cost to install fiber optic cable to bring high-speed Internet access to all households without it. Various solutions might be available at lower costs, and no use of public funds was intended or implied in posing that dollar figure. It was released by the County as a way of measuring the scope of the problem.

At this stage of the meeting, the participants were divided into three breakout groups according to the type of Internet service they currently had: wireless, cable/DSL, and satellite/dial-up. Each group was asked to list the pros and cons of their current service, and to discuss possible solutions to the problem of underserved areas of the County.

Comments from the wireless group included concerns about spotty and non-existent coverage, too much buffering when trying to view videos online, being unable to telecommute effectively and paying a lot each month as a small business for multiple telecommunications and Internet services. One participant commented that he could see the lights of the capital of Virginia at night yet cannot communicate with a friend in a town of 400 people in New England, who has better connectivity. The main question from this group was, "What can be done to get high-speed Internet to the rural areas of Hanover County?"



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Montpelier Town Hall Meeting Details

Comments from the cable/DSL group included criticism of Comcast's lack of follow-through, service not being available across the street from a house with service, the need to purchase a CenturyLink wireless adapter from the store, poor quality third-party components required to use CenturyLink, DSL has a monopoly and should be opened up to competition, and too many protocols for the operating entity to follow. Suggestions and questions included the observation that if schools can connect school-to-school, perhaps they could be used in neighborhood or village hubs for broader access.

Comments from the dial-up and satellite group included positive mentions that dial-up is functional and provides a variety of free services, and that satellite service did not require wires or poles, is functional and is adequate for light browsing. The criticisms included slow speeds, being unable to work while other people visit the home and use bandwidth, limitations of service that leave people barely on the "wrong side of the line", the impact of topography and wooded areas, and the inability of these services to support VPN (virtual private network) connections that are more commonly being required by businesses for employees to telecommute. Suggestions included making more information available to citizens about the options available to them, and having a County department or employee who could function as an advocate for citizens.

Ellis continued the discussion after the notes from the breakout groups were discussed with the full group of participants. By show of hands, four or five participants said they would consider moving if nothing changed regarding high-speed Internet service. The group did not go so far as to say that access to high-speed Internet service was a "right," but the group agreed that it was a necessity in today's world, and some participants suggested it was already a right in the area of education for children.

Ellis stated that Hanover County does not seem to be sufficiently rural or economically disadvantaged to qualify for grants to expand high-speed Internet service.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Montpelier Town Hall Meeting Details

Sam Smith, a wireless Internet service provider in attendance, stated that wireless service was the solution and his company could help. This opened a discussion about wireless Internet service and the regulations governing towers. The County allows towers up to 100 feet by right. Smith said that his service can also use existing structures such as silos and steeples to propagate service. There was also discussion about neighborhoods banding together to establish a hub or a co-op for high-speed Internet service, and a quasi-government authority to help with access to high-speed Internet service. It was noted that a major fiber optic data line already runs north-south through Hanover County and in theory it could be tapped into to extend service. There was some discussion of the risks incurred by governments that get into the provision of high-speed Internet services and the lack of profits that prevent private vendors from already offering these services in some areas. Others in attendance pointed out that lack of high-speed Internet service will hurt growth in the County and make it harder for residents to sell their houses.

A representative from AT&T discussed some of the technical aspects of deciding where to locate new towers and noted that the incentives in the industry lead them to always consider using existing tower space first.

Ellis ended the Montpelier meeting by suggesting several next steps: testing your Internet speed at home using an online testing service such as speedtest.net, and after obtaining that information contacting your provider to discuss options for better service.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Mechanicsville Town Hall Meeting Details

The second town hall meeting was held on Wednesday October 5 at the Mechanicsville Branch Library. Approximately 65 people were in attendance. Steve Ellis once again made opening remarks similar to those at the Montpelier meeting.

Seven to ten attendees indicated by show of hands that they are thinking about moving due to lack of service, and those in attendance were unanimous in their belief that lack of high-speed Internet service has a negative impact when selling one's home. About half of the attendees with children said their children do not have high-speed Internet service at home, so they make accommodations to do homework and projects at local coffee shops, the library, early or late hours at school and working at a neighbor's house with access.

All attendees said they had cell phones, but many fewer had reception at home, and about one-third to one-half had smart phones. Most indicated they would not buy a home without high-speed Internet service.

Ellis described the County's inability so far to qualify for grants for expanding high-speed Internet service. There was some discussion of the capacity of the tower at Old Church. A representative from a service provider said it usually costs about \$100,000 to \$125,000 to place a transceiver on a tower, with additional costs of about \$10,000 per month for tower rental and telecommunications services to run the apparatus.

Attendees were then broken into three groups according to the type of service they currently had: wireless, cable/DSL and satellite/dial-up.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Mechanicsville Town Hall Meeting Details

The wireless group reported several pros of wireless service, including its portability, the fact that it is better than dial-up, and it has good upload speed. The cons were far more numerous, however. They included the fact that if one takes advantage of the portability of wireless, those at home are out of service. In addition wireless does not support VPN access, data use is limited monthly, the quality of the connection can depend on the weather and time of day, it is slow, there is a lack of choice, the unpredictability of service makes it easy to buy but hard to return, it often requires the expense of mixing services for different telecommunications needs, upload speed is bad, high latency with satellite services, and it uses a finite spectrum that will not support future data needs. Suggestions for improvements from this group included building more towers and higher towers or putting more arrays on existing structures.

The group moved to a discussion of the U.S. Postal Service being mandated to provide service to all homes so that more “profitable” homes were essentially subsidizing service to more isolated homes. The group noted that telephone service was done the same way to ensure extension of service to low-density rural areas. When asked if anyone in the group supported using public money to address this problem, almost all raised their hands, with some noting that they support public schools even though they do not have children in the schools.

The cable/DSL group discussed lack of competition, and expensive and bad service. There was a sense that Comcast did not try hard due to lack of competition. The group wondered if Verizon FIOS was welcomed in the County, and if providers were given the support they needed to provide services. They discussed the negative impact of lack of high-speed Internet service on buying and selling homes. One person in the breakout group said they were considering moving and one person said they would already have moved if the housing market were not so bad. There was some discussion about broadband over power lines (BPL) and the technical issues that impede that approach.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Mechanicsville Town Hall Meeting Details

The satellite/dial-up group had similar concerns to those voiced at the Montpelier meeting.

After the full group reassembled, there was discussion about a neighborhood in the Black Creek area that was trying to form their own Internet group by running a T1 line to a Verizon telephone box to serve the subdivision. One resident, Robby Gray, said if he had known about the lack of high-speed Internet service there he would not have moved there. But having discovered it afterwards, there was no choice but to run a T1 line for his business. He recommended assessing each neighborhood and tailoring the solution to the local conditions.

There was some discussion of applying the model for curbside recycling service to the high-speed Internet service problem. There are about 20 neighborhoods in Hanover County that voted themselves into special tax districts for the purpose of paying for curbside recycling service. The tax is about \$2.25 monthly and is added to the property tax bills twice a year. Eighty percent of the property owners in a specific neighborhood must sign a petition to agree to the extra tax, the petition is submitted to the County and the Board of Supervisors votes on the establishment of the special tax district.

There was discussion of the coming LTE/4G service standard that will provide much more bandwidth. Comments from the attendees indicated support for more towers and faster implementation of better service. It was noted that the County will soon be renegotiating the cable television franchise agreement, but that agreement does not cover high-speed Internet access. The County negotiated a requirement for Comcast to run cable service past any area with at least 25 houses per linear mile, but all laws passed in the last 15 years have benefitted the industry, not the citizens, so that the County may not even be able to get a threshold of less than 25 homes per linear mile in the next franchise agreement.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX A - SUMMARY OF TOWN HALL MEETINGS AND THE FINDINGS OF THE HSI QUESTION ON THE COUNTY SURVEY (CONTINUED)

Mechanicsville Town Hall Meeting Details

Comments from the attendees pointed out that no one subsidizes a lot of businesses so it seems wrong to suggest using public dollars to subsidize expansion of high-speed Internet access. Some suggested spending more time and being more aggressive pursuing federal funds to expand access. There was discussion about government as a facilitator for people, and there was some support for a bond issue or other debt mechanism. It was noted that one cent on the County property tax rate (currently at 81 cents per \$100 assessed value) was worth \$1.3 million. If the rough estimate of \$30 million to address lack of high-speed Internet access is accurate, then servicing that much debt would cost two to three cents more on the property tax rate.

Attendees noted that New Kent has high-speed Internet access – they asked if the committee or County had talked at length with New Kent, Goochland, Caroline or King William counties. The committee was familiar with some of these situations but has not talked at length with people in these counties.

Ellis made final comments and the meeting was adjourned.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX B – CITIZEN SURVEY RESULTS

In summer 2011, Hanover County executed their triennial citizen satisfaction survey. The survey was conducted by mail by the National Research Center in Boulder, Colorado as part of the National Citizen Survey (NCS) package offered through the International City/County Management Association (ICMA). The County may add three customized questions to the NCS. To help meet the objective of obtaining more systematic feedback from citizens regarding high-speed Internet access, one of the customized questions for 2011 was a multi-part question regarding citizen attitudes about high-speed Internet access.

The question was worded as follows, with answers given on a scale of strongly agree, somewhat agree, somewhat disagree or strongly disagree:

High-speed Internet access, speed, and costs vary across Hanover County. To what extent do you agree or disagree with each of the following?

- *I am satisfied with the availability of high-speed Internet in Hanover County*
- *I am satisfied with the cost of high-speed Internet in Hanover County*
- *I am satisfied with the speed of high-speed Internet in Hanover County*
- *For Internet services, affordability, accessibility and speed are all important to me*
- *In addition to the continued investments being made by various Internet providers, Hanover County government should continue to devote staff resources in helping the Internet providers improve high speed Internet availability*

Approximately 400 to 425 respondents responded each of these five statements. Overall satisfaction with the speed of Internet connections was highest (59% strongly or somewhat agreed that they are satisfied with the speed of Internet connections), followed by availability (55%) and cost (39%).

Almost everyone (94%) agreed that affordability, accessibility, and speed are all important to them (72% strongly agreed).

Almost everyone (87%) agreed that Hanover County government should continue to devote staff resources to helping Internet providers improve high-speed Internet availability (51% strongly agreed).



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX B – CITIZEN SURVEY RESULTS (CONTINUED)

Not unexpectedly, overall satisfaction with availability of high-speed Internet was highest in the more densely populated magisterial districts of the County (Mechanicsville, Chickahominy and Ashland). Overall satisfaction with availability of high-speed Internet increased in line with time living in the County. Overall satisfaction with availability of high-speed Internet was highest in the lowest-income group (under \$50,000 annual household income). Overall satisfaction with availability of high-speed Internet was lowest in the 35-54 age group.

Respondents in the more densely populated magisterial districts were also more satisfied with the cost of high-speed Internet than were those in rural districts. Interestingly, households with annual incomes under \$50,000 were most satisfied with cost compared to higher-income households. The youngest age group (18-34) was most satisfied with cost.

Respondents in the more densely populated magisterial districts were also more satisfied with the speed of high-speed Internet than were those in rural districts. Highest-income households (\$100,000 or more annually) were most satisfied with the speed of high-speed Internet, as were the youngest respondents (18-34 years of age).

Respondents in the Ashland, Mechanicsville and South Anna districts were the most supportive of Hanover County staff involvement in helping providers to improve high-speed Internet access, but all districts had at least 81% of respondents in favor of staff involvement.

The full results of the survey are available on the Hanover County website.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX C – DRAFT OF HIGH SPEED INTERNET SUPPORT POSITION JOB DESCRIPTION

Position: **High Speed Internet Support Specialist**
Reports to: **Director of Information Technology**

Job Summary:

Responsible for supporting the County's efforts in providing affordable, high speed Internet access to its citizens by working with service providers and County services to expand services. Also responsible for citizen communication and education on high speed Internet issues.

Essential Job Functions (other duties may be assigned):

- Serve as liaison between user community, County services, service providers, and developers
- Act as front-line support resolving workflow and non-code related issues prior to escalation
- Coordinate and support activities for current and future functionality and workflows, system and integration testing, and user acceptance testing of completed issues and enhancements
- Manage and maintain bug / issue tracking system for resolution and prioritization
- Schedule and manage meetings to prioritize development efforts with key user support and management
- Provide support to committees chartered by the Board of Supervisors to study Internet related issues.

Knowledge, Skills and Abilities

- Strong analytical and project management skills with an attention to detail
- Excellent communication skills, both oral and written, as well as ability to listen and solicit feedback/input from a variety of users within the County
- Ability to work with cross-functional teams and to work without direct supervision
- Ability to organize and prioritize tasks efficiently with multiple, simultaneous deadlines
- Capable with Microsoft Office, Microsoft Visio, and Microsoft Project

Minimum Qualifications:

- Bachelor's degree in information systems, computer science
- Minimum 2 years experience in a similar technical support role in telecommunications

Supervisory Responsibilities:

- No direct reports; management of 3rd party vendors

Work Environment (includes physical requirements):

Office environment; continuous sitting at desk while using PC. Infrequent travel up to 5%.



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX D – HANOVER BUSINESS COUNCIL STATEMENT OF SUPPORT



November 15, 2011

The Hanover Business Council of the Greater Richmond Chamber, at a meeting of the Council's cabinet held on November 15, 2011, voted to express its support of the Hanover County High Speed Internet Committee's efforts in bringing affordable high speed internet to all Hanover residents and businesses.

In today's competitive business environment, a lack of adequate internet accessibility can severely impact the success of our existing businesses and negatively impact our ability to attract new businesses.

Likewise, today's students are increasingly finding that high speed internet access is critical to their success in the classroom.

Affordable high speed internet availability is fast becoming an essential service to our community. The Hanover Business Council recognizes this need to keep Hanover competitive as a great place to live, work, play, and operate a business.

We urge the Hanover County Board of Supervisors to actively review and consider the Committee's recommendations in an effort to find solutions that will expand high speed internet availability throughout the county.

Sincerely,

A handwritten signature in black ink, appearing to read "Owen Matthew".

Owen Matthew, Chair
Hanover Business Council
Greater Richmond Chamber



Hanover County High Speed Internet Committee (HSIC) Report to Board of Supervisors

APPENDIX E – HANOVER ASSOCIATION OF BUSINESSES & CHAMBER OF COMMERCE LETTER OF SUPPORT



**Hanover Association
of Businesses and
Chamber of Commerce**

Providing Business Leadership within Hanover and Ashland

804-798-8130 office
9097 Atlee Station Road, Suite 117
Mechanicsville, VA 23116
www.habcc.com

**Resolution of the Board of Directors of the
Hanover Association of Businesses and Chamber of Commerce
in Support of the Conclusions of the Hanover High Speed Internet Committee**

The Board of Directors, on behalf of the membership of the Hanover Association of Businesses and Chamber of Commerce, hereby resolves, and urges the Hanover Board of Supervisors to carefully review and consider for appropriate practical action the recommendations of the Hanover High Speed Internet Committee (HSIC) to facilitate county-wide introduction of practical high speed Internet service.

We acknowledge that citizens and business owners are concerned that the absence of high speed Internet service is diminishing the value of their homes and businesses, and that Hanover County may lose current residents and businesses, and future investment, in favor of competing localities that have high speed Internet service we now lack.

The pace of technology is rapidly changing. What was nice to have five years ago is a necessity today. Hanover is considered a great place to live and work, but if it is to remain so, it must have the leadership and foresight to anticipate and practically prepare for the future.

While it is impossible to perfectly predict the future, it is certain that technology and its applications will progress in certain reliably predictable ways:

- To help control expenses, businesses will rely more heavily on telecommuting.
- To help minimize downtime and maximize productivity, workforce training will increasingly be conducted using videoconferencing tools.
- Social media will continue to proliferate as people rely upon these systems to stay in contact with business associates, friends and family.
- More people and businesses will rely upon high speed Internet to manage their finances, including the billing of clients, payment of bills and managing funds.



Hanover County High Speed Internet Committee (HSIC)
Report to Board of Supervisors

APPENDIX E – HANOVER ASSOCIATION OF BUSINESSES & CHAMBER OF COMMERCE LETTER OF SUPPORT (CONTINUED)

HABCC Resolution to support High Speed Internet Committee, cont. page 2

- High speed Internet will enable VoIP (voice over Internet protocol) to expand and provide an alternative to traditional telecommunications companies.
- High speed Internet will enable more sharing of information in data-intensive fields such as medicine and engineering enabling world-wide collaboration to solve local problems.
- Public and private school systems – at all levels – integrate the Internet into their curricula at levels ranging from basic to advanced research.
- Leisure activities rely more heavily on the Internet than ever before. Televisions and gaming systems access the Internet to provide users an interactive experience.

We believe that the facilitation of practical high speed Internet service across Hanover County will advance the County's position as a regional competitor in keeping and attracting quality business investment, and in maintaining an educated, motivated, and capable workforce.

As a representative voice of businesses in Hanover County, it is our unanimous resolution passed this 12th day of January, 2012, for the reasons stated, to urge the Hanover Board of Supervisors to carefully and practically consider, and act upon, the recommendations of the HSIC to facilitate, as soon as possible, practical County-wide high speed Internet service.

Sincerely,

Handwritten signature of Jennifer Y. Scott in black ink.

Jennifer Y. Scott, APR
Executive Director

Handwritten signature of Michael H. Gladstone in black ink.

Michael H. Gladstone
President



Hanover County High Speed Internet Committee (HSIC)
Report to Board of Supervisors

END OF REPORT

Memorandum of Understanding

Between
Hanover County
and
AcelaNet, LLC

This Memorandum of Understanding (“MOU”) is between Hanover County, a political subdivision of the Commonwealth of Virginia (the “County”) and AcelaNet, LLC, a Virginia limited liability company, whose principal office is located at 604 Thomas Nelson Highway, Arrington, Virginia 22922, and is doing business as SCS Broadband (“SCS”). The purpose of this MOU is to set out the understanding of the Parties with regard to the utilization by SCS of communications towers owned or leased by the County (the “Towers”) in order for SCS to provide high speed internet service within Hanover County.

Background

The County wishes to increase the availability of high speed internet service to Hanover County residences and businesses. SCS has been a provider of high speed internet service to rural Virginia for more than 10 years. SCS has determined that the use of low cost towers to deliver internet service to residents and businesses is important to a successful wireless internet program in rural areas.

Agreement

1. The County agrees to lease to SCS, at a significantly reduced rental rate, the right to use a portion of the following Towers and to install SCS’s high speed internet equipment and accessories on these Towers:
 - A. Old Church (2343 Old Church Road, Mechanicsville, Virginia 23111)
 - B. Ellyson (5834 Cold Harbor Road, Mechanicsville, Virginia 23111)
 - C. Montpelier (15182 Clazemont Road, Montpelier, Virginia 23192)
 - D. Rockville (16405 MLC Lane, Rockville, Virginia 23146)
 - E. Beaverdam (19180 Halls Hideaway Lane, Beaverdam, Virginia 23015).
2. Provided that SCS is not in default on the terms of this MOU or any lease agreement with the County, the County agrees not to lease to any third party the right to use other Towers for the provision of high speed internet service and the installation of related equipment and accessories without giving SCS the right of first refusal to lease such Towers and to install related equipment and accessories. If a prospective tenant submits a letter of intent to lease Tower space, the County agrees to notify SCS in writing and to allow SCS 60 days in which to notify the County in writing of SCS’s desire to exercise or waive its right to lease such Tower space.

Phase 1

3. The County agrees to allow SCS to provide high speed internet service within Hanover County in a coverage area as represented in **Attachment A**.
4. SCS agrees to build a high speed internet network in the coverage area represented in **Attachment A**, through the leasing of space on the Towers identified in paragraph 1 above, pursuant to the execution of standard County lease agreements. SCS agrees to execute a lease agreement for the first of the five Towers and begin the installation of its equipment and accessories on such Tower immediately following the execution of this MOU, with the installation of equipment and accessories on the first Tower to be completed within 120 days of the execution of the MOU. SCS agrees to execute lease agreements for and to complete the installation

of equipment and accessories on the remaining Towers using a schedule by which a lease agreement is executed and installation is completed on one of the remaining Towers every 120 days thereafter until the lease agreements have been executed and installation has been completed on all five Towers.

5. SCS agrees to provide an internet connection for and install a video camera (to be provided by the County) on each Tower identified in paragraph 1, at no cost to the County, for the purpose of providing security for the Tower premises. The location and installation of each video camera will be coordinated with the County.

Phase 2

6. The County agrees to lease to SCS, at a significantly reduced rental rate, the right to use a portion of additional Towers, which Towers will be identified by both parties no later than the completion by SCS of all installations on the Towers identified in paragraph 1.

Reporting

SCS agrees to provide to the County during Phase 1 a monthly written summary report on SCS's progress until the last Tower has been activated with SCS equipment, and shall provide such other reports as may be requested by the County.

Modification

This MOU may be modified as agreed to in writing by the parties.

Duration

This MOU shall become effective upon the date of the last signature of the parties' authorized officials and will remain in effect until terminated by either party, following delivery of written notice to the other party. Notice to the County shall be sent to the **County Administrator, Hanover County, P. O. Box 470, Hanover, Virginia 23069.**

Hanover County and AcelaNet, LLC, by their signatures hereto, accept and agree to the terms of this MOU.

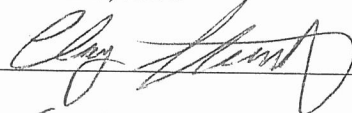
HANOVER COUNTY

By: _____

Date: _____

Its: _____

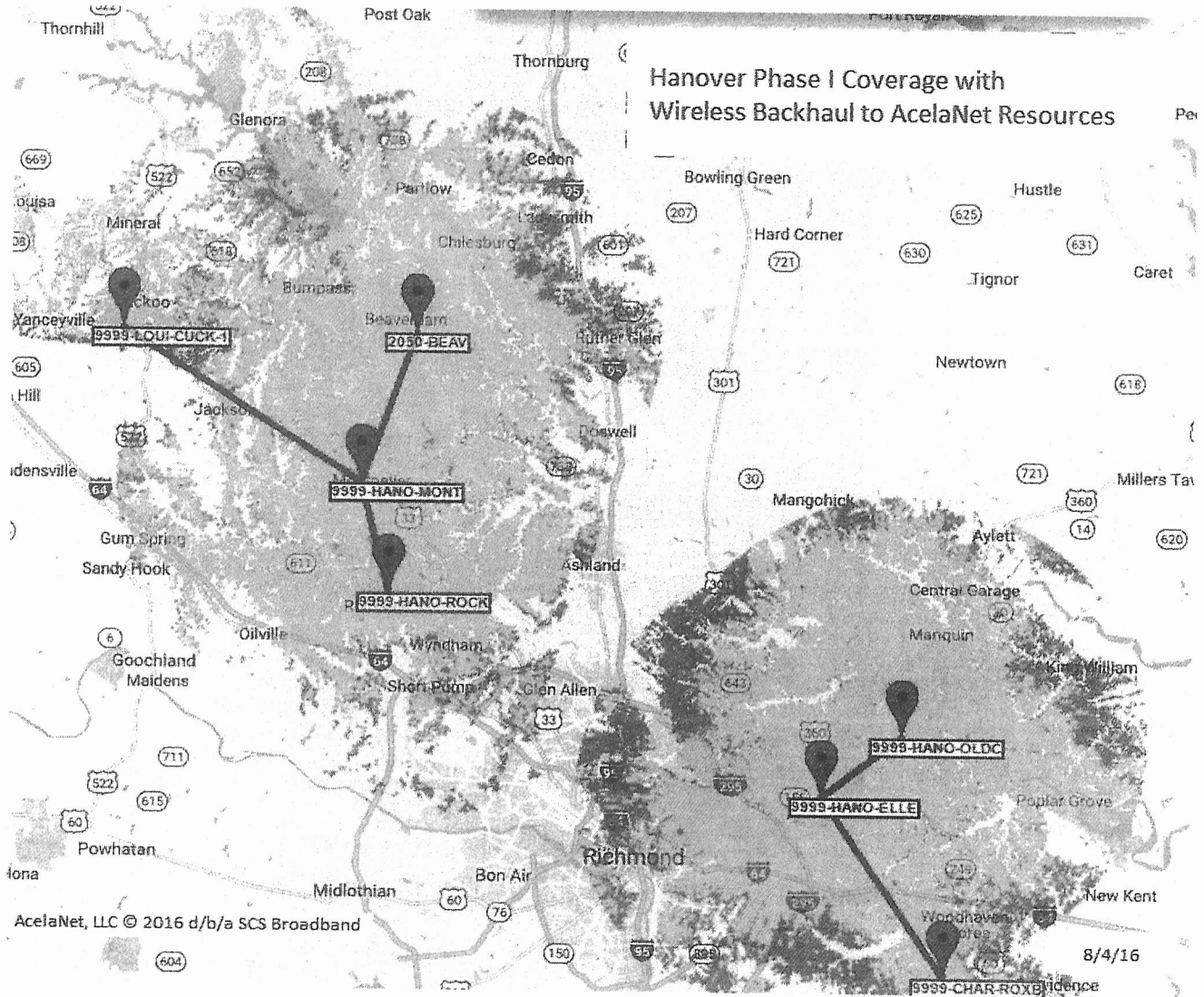
ACELANET, LLC

By:  _____

Date: 3/28/2017

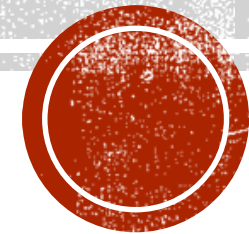
Its: CEO

Attachment A



HANOVER COUNTY INTERNET SERVICE MEETING

Patrick Henry High School
February 10, 2015



Hosted by:

Wayne Hazzard, Chairman and South Anna District Representative

Aubrey "Bucky" Stanley, Vice Chairman and Beaverdam District Representative

COMMUNITY MEETING OBJECTIVES



- I.** Clarify the County role and provide information
- II.** Gain an improved understanding of the additional internet needs of our residents
- III.** Provide access to our service providers, share information on available services, and identify opportunities for providers to address “gaps” in service



HANOVER COUNTY POSITION ON INTERNET SERVICE PROVISION



- Hanover County recognizes the importance of high speed internet access to all residents and businesses. Internet service provision is critical to the county's growth in economic development, quality of life, and educational program offerings. The County encourages all providers of high-speed internet services to provide services to all residents in Hanover County regardless of their proximity to current service areas.



HANOVER COUNTY ROLE IN INTERNET SERVICE REGULATION

- The County does not have the authority to approve or deny high-speed internet services offered by any company; companies offer a service, or choose not to, based on their own business plans.



“PUBLIC PRIVATE PARTNERSHIPS”

■ Current Efforts

- We make available existing facilities and communication tower infrastructure to internet service providers. In fact the county currently has 20 agreements in place with providers on our existing infrastructure.
- We also are evaluating potential contractors to more actively promote available tower sites and infrastructure to private internet service providers.
- We meet with emerging providers of wireless technology to provide expanded service to residents and welcomes new opportunities to discuss expansion with providers.



“FRANCHISE AGREEMENT”

- "Franchise" means an initial authorization, or renewal thereof, issued by a franchising authority, including a locality”
 - “that authorizes the construction or operation of a cable system, a telecommunications system, or other facility in the public rights-of-way, including either a negotiated cable franchise or an ordinance cable franchise.”
 - § [15.2-2108.1:1](#). Franchise fees and public rights-of-way fees on cable operators.
- 15-Year agreement approved October 1997 (company then was MediaOne of Virginia)
- The County reserved the right, at its discretion, to grant other franchises in accordance with the Cable Ordinance.





DOES THE COUNTY HAVE AN EXCLUSIVE CONTRACT WITH COMCAST?

- No
 - The County has a Franchise Agreement with Comcast governing only the provision of cable TV services.
 - This franchise agreement does not address County-wide internet service.
 - The franchise agreement with Comcast is non-exclusive; all cable providers are welcome to and encouraged to expand their service into Hanover County.
 - While access to cable television does increase the probability of Internet access because both can be provided through the same cable, the franchise agreement does not govern internet services.



WHY CAN'T THE COUNTY FORCE COMCAST TO SERVE ALL RESIDENTS?



- Under the terms of the franchise agreement for cable TV, Comcast is required to:
 - Extend cable service when the extension will provide service to 25 potential subscriber units per mile, provided the potential subscribers are within 150 feet of the nearest connection point.
 - Comcast is not obligated to provide cable TV or other service in areas where it would not be financially feasible or otherwise meet Comcast's business objectives.
 - Aside from the franchise agreement, Hanover County has no authority to require Comcast or any other private sector company to expand service. Such decisions by the private section are market based.



WHY IS HANOVER COUNTY STOPPING VERIZON FIOS FROM EXPANDING?



- It has been shared with the County that a perception exists that “the County” is in some way prohibiting Verizon from expanding FIOS in the county. This information is inaccurate. The county encourages and fully supports FIOS or any other internet expansion.



VERIZON POSITION ON FIOS EXPANSION

“Verizon has no current plans to deploy FiOS TV or FiOS Internet services in Hanover County. This decision is based strictly on the business factors that determine the allocation of investment capital...”

John P. Welch

Senior Consultant - Government Affairs

Verizon

Verizon **FiOS**



INITIATIVES TO DATE

- Permitting process have been streamlined to promote tower expansion and additional tower capacity.
- We make high-speed internet service available in its branches of the Pamunkey Regional Library to the greatest extent possible and will continue to seek opportunities to expand public access to internet at public facilities.
- All known Internet Service providers have been contacted by the County to encourage expansion within Hanover County.
 - Most providers have expressed concern over their lack of opportunity to see a ROI (Return on Investment) for the needed capital to provide service within less densely populated areas of the county.





INITIATIVES TO DATE CONTINUED

- Evaluated the potential for the creation of a utility to provide Internet Service in the less populated areas of the County
 - Evaluated operating models, capital investments, and changing technology impacts were projected
 - At this time, the Board of Supervisors has determined not to proceed with this option or otherwise invest public tax dollars to provide a service more appropriately met by the private sector.
- Engaged Secretary of Technology's office for assistance on identifying solutions to meet the needs of Hanover County Residents
- Created list of providers and numbers to call that will be placed on the County website at www.hanovercounty.gov



OPPORTUNITIES FOR SUPPORT

■ Grants

- The County will support applications for grants and other incentives provided by the State and Federal government and private foundations to expand internet service to underserved areas of our community.

■ Tax Districts

- The County is open to exploring opportunities to support resident groups who would be willing to make the financial commitments necessary to potentially create a special tax district within specific neighborhoods or geographical regions that have inadequate access to internet services. Services would be provided through private providers.





RESOURCES

- Information from this meeting will be available this week on www.hanovercounty.gov
- <http://www.gis.vt.edu/mapbook/>
- <https://technology.virginia.gov/initiatives/broadband-strategies-workshops/>
- Provider Websites



PROVIDERS

- All Points Broadband
 - Tom Ennis
- AT&T
 - Alex Madlinger
- CenturyLink
 - Rich Schollmann, Glenn Butler
- Comcast
 - Ken Dye
- Exede High Speed Satellite Internet
 - Ed Durham, Alana Pilkington
- Global Web Solutions, Inc.
 - Randy Armbrecht



PROVIDERS

- **HughesNet**
 - Christii Watkins
- **Last Mile**
 - Keith McMichael, Miguel Labor, Whitt Whittaker
- **Sprint**
 - Joseph O'Donnell, Richard Letter
- **SCS Broadband**
 - Clay Stewart
- **T-Mobile**
 - Tim Dwyer
- **Verizon Wireless**
 - Marshall Pearsall



OPEN QUESTIONS - COUNTY REPRESENTATIVES AND PROVIDERS



- 8:00 p.m. - One on One with County Representatives and Providers



RICHMOND, CHESTERFIELD & CAROLINE COUNTY

BUNDLED PACKAGES^{1,2}

QUAD PLAY PACKAGES

QUAD PLAY PACKAGE PRICING BELOW IS ADDITIONAL TO TRIPLE PLAY PACKAGE PRICING

with Xfinity Home Security add ⁴⁰	\$39.95
with Xfinity Home Security Plus add ⁴¹	\$49.95

TRIPLE PLAY PACKAGES³⁹

Standard Triple Play

Includes Limited Basic, Kids & Family, Entertainment, Sports & News and HD programming for primary outlet, 10 Hour DVR Service, Performance Pro Internet and Voice Unlimited

	\$129.99
- with Blast! Internet upgrade add	\$20.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Select Triple Play

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Preferred Tier, DVR Service and HD programming for primary outlet, Blast! Internet, and Voice Unlimited

	\$149.99
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Signature Triple Play³⁶

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Preferred Tier, Showtime, Starz, Streampix, DVR Service and HD programming for primary outlet, Extreme Pro Internet, Voice Unlimited and Netflix Standard HD Plan

	\$169.99
- with Netflix Premium UHD Plan upgrade add	\$3.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Super Triple Play³⁶

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Premier Tier, Sports Entertainment Package, Streampix, DVR Service and HD programming for primary outlet, Gigabit Internet, Voice Unlimited, Netflix Standard HD Plan

	\$199.99
- with Netflix Premium UHD Plan upgrade add	\$3.00
- with Gig Pro Internet upgrade add ²¹	\$238.00
- with Xfinity Mobile deduct	-\$12.00

DOUBLE PLAY PACKAGES³⁹

Choice Double Play³⁷

Includes Choice TV, 10 Hour DVR Service and Performance Plus Internet

	\$89.99
- with Performance Pro Internet upgrade add	\$15.00
- with Blast! Internet upgrade add	\$20.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Standard Double Play

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, 10 Hour DVR Service, and HD programming for primary outlet and Performance Pro Internet

	\$109.99
- with Blast! Internet upgrade add	\$20.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Select Double Play

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Preferred Tier, HD programming for primary outlet, 10 Hour DVR Service and Performance Pro Internet

	\$119.99
- with Blast! Internet upgrade add	\$20.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Signature Double Play³⁶

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Preferred Tier, HD programming, Showtime, Starz and Streampix for primary outlet, 10 Hour DVR Service, Performance Pro Internet and Netflix Standard HD Plan

	\$139.99
- with Netflix Premium UHD Plan upgrade add	\$3.00
- with Blast! Internet upgrade add	\$20.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

Super Double Play³⁶

Includes Limited Basic, Kids & Family, Entertainment, Sports & News, Digital Premier Tier, HD programming and Streampix for primary outlet, 10 Hour DVR Service, Blast! Internet and Netflix Standard HD Plan

	\$169.99
- with Netflix Premium UHD Plan upgrade add	\$3.00
- with Extreme Pro Internet upgrade add	\$25.00
- with Gig Internet upgrade add	\$30.00
- with Gig Pro Internet upgrade add ²¹	\$238.00

XFINITY TV¹

BASIC SERVICES

Limited Basic ⁹	\$22.95
Broadcast TV Fee ²⁷	\$10.00
Expanded Basic ¹¹	\$44.32

XFINITY TV SERVICES

Choice TV ³³ Includes Limited Basic, Streampix and HD programming	\$30.00
--	---------

Genre Packs³⁴ Choose up to 2 packs

Kids & Family Includes kid and family-friendly channels including Cartoon Network, Disney Channel, Nickelodeon and Universal Kids	\$10.00
Entertainment Includes entertainment channels including A&E, AMC, Bravo, Food Network, FX, TNT and VH1	\$15.00
Sports & News Includes sports and news channels including CNBC, CNN, ESPN, Golf, MSNBC and NBC Sports	\$28.25

Digital Starter Includes Limited Basic, Expanded Basic for primary outlet, additional digital channels, MoviePlex, access to Pay-Per-View and On Demand programming and Music Choice	\$67.27
---	---------

Digital Preferred Tier¹⁶ Includes over 65 channels including CBS College Sports, Destination America, Disney XD, Encore and Science Channel	\$17.95
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Digital Preferred Tier plus One Premium Includes Digital Preferred Tier and choice of Showtime [®] , Starz [®] , Cinemax [®] , or The Movie Channel [®]	\$29.95
--	---------

Digital Preferred Tier with HBO[®] Includes Digital Preferred Tier and HBO [®]	\$32.95
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Digital Premier Tier Includes Digital Preferred Tier, HBO [®] , Showtime [®] , Starz [®] , Hitz, and The Movie Channel [®]	\$64.95
---	---------

Sports Entertainment Package¹⁶ Includes over 15 channels including NFL Red Zone and CBS Sports Network	\$9.95
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Deportes¹¹ Includes over 6 deportes channels including ESPN Deportes, FOX Deportes and NBC Universo	\$7.00
With Choice Double Play or Standard, Select, Signature, Super Double or Triple Play Packages	\$5.00
Xfinity TV Latino ¹¹ Includes over 50 channels of Spanish language programming	\$17.95
With Choice Double Play or Standard, Select, Signature, Super Double or Triple Play Packages	\$10.00
HBO^{®11}	\$15.00
Showtime^{®11}	\$12.00
Starz^{®11}	\$12.00
Cinemax^{®11}	\$12.00
The Movie Channel^{®11}	\$12.00
Epix³²	\$5.99
Playboy^{®11}	\$15.00
HD Technology Fee¹⁰	\$9.95
DVR Service^{12,15}	\$10.00
AnyRoom DVR Service^{3,16}	\$10.00
Service to Additional TV¹⁴	\$9.95
with HD ¹⁷	\$9.95
with DVR Service	\$19.95
with AnyRoom DVR Service ¹⁹	\$19.95
with AnyRoom DVR Service (client)	\$9.95
with CableCARD ³⁵	\$7.27
Service to Additional TV with TV Adapter¹³	\$6.99

INTERNATIONAL SELECTIONS

WKTU (Korean)	\$14.99
ART: Arabic³⁸	\$9.99
TV Globo: Brazilian³⁸	\$19.99
Brazilian 2 Pack³⁸ Includes TV Globo and PFC	\$24.99
Brazilian 4 Pack³⁸ Includes TV Globo, PFC, Band Internacional and Record TV	\$34.99
TVB Jade: Cantonese³⁸ Includes TVB Jade	\$10.99
Mandarin 2 Pack³⁸ Includes Phoenix Info News and Phoenix North America	\$6.99
Mandarin 4 Pack³⁸ Includes CTI Zhong Tian, CCTV4, Phoenix Info News and Phoenix North America	\$19.99
Filipino 2 Pack³⁸ Includes GMA Pinoy w/ GMA Video On Demand and GMA Life	\$14.99
Filipino 3 Pack³⁸ Includes GMA Pinoy w/ GMA Video On Demand, GMA Life and TFC	\$22.99
TV5MONDE: French³⁸ With Cinema On Demand	\$9.99
DW Deutsche +: German³⁸	\$9.99
Antenna: Greek³⁸	\$14.99
The Israeli Network³⁸	\$19.99
Rai Italia: Italian³⁸	\$9.99
Italian 2 Pack³⁸ Includes Rai Italia and Mediaset	\$14.99
TV JAPAN³⁸ Includes TV JAPAN On Demand	\$24.99
TV Polonia: Polish³⁸	\$19.99
SIC: Portuguese³⁸	\$9.99
Portuguese 2 Pack³⁸ Includes RTPi and SIC	\$14.99
Impact TV: Russian Add-on³⁸ With any International package	\$6.99
Russian 2 Pack³⁸ Includes Channel One Russia and NTV America	\$14.99
Russian 4 Pack³⁸ Includes Channel One Russia, RTN, TV1000 Kino and NTV America	\$26.99
Russian 5 Pack³⁸ Includes Channel One Russia, RTVi, NTV America, RTR-Planeta and Rossiya 24	\$26.99
Russian 8 Pack³⁸ Includes Channel One Russia, RTN, RTVi, TV1000 Russian Kino, NTV America, RTR-Planeta, Rossiya 24 and CTC	\$34.99
Willow: Cricket Add-on³⁸ With any International package	\$6.99
Willow: Cricket³⁸	\$14.99

Zee TV: Hindi³⁸	\$14.99
SET: Hindi³⁸	\$14.99
Hindi 2 Pack³⁸ Includes Zee TV & SET	\$24.99
Hindi Pack³⁸ Includes Zee TV, SET, TV Asia, NDTV 24x7 and NDTV Good Times	\$29.99
Hindi Plus Pack³⁸ Includes Zee TV, SET, TV Asia, NDTV 24x7, NDTV Good Times, Eros Now and Willow	\$39.99
SBTN: Vietnamese³⁸	\$14.99
TVB Jade: Cantonese³⁸	\$10.99
Record TV: Brazilian³⁸	\$14.99
ABP News: Hindi³⁸	\$7.99
TFC: Filipino³⁸	\$11.99

PAY-PER-VIEW AND ON DEMAND SUBSCRIPTION SERVICES⁴

Eros Now On Demand	\$12.99
Eros Now On Demand w/a South Asian international selection	\$9.99
here! TV On Demand	\$7.99
Filipino On Demand	\$7.99
Filipino On Demand w/a Filipino international selection	\$5.99
The Jewish Channel On Demand	\$6.99
Disney Family Movies On Demand	\$5.99
Kidstream On Demand	\$4.99
History Vault On Demand	\$4.99
Gaiam TV Fit & Yoga On Demand	\$6.99
Grokker Yoga Fitness On Demand	\$6.99
UP Faith and Family On Demand	\$4.99
Lifetime Movie Club On Demand	\$3.99
Anime Network On Demand	\$6.99
Stingray Karaoke On Demand	\$6.99
DOGTV On Demand	\$4.99
Gaia On Demand	\$9.99
AMC Premiere On Demand	\$4.99
Stingray Classica On Demand	\$6.99
TumbleBooksTV On Demand	\$4.99
FitFusion On Demand	\$6.99
CuriosityStream On Demand	\$5.99
PlayKids On Demand³¹	\$6.99
MagellanTV History On Demand³¹	\$5.99
Disney Story Central On Demand	\$4.99
Acorn TV On Demand	\$5.99
Daily Burn On Demand³¹	\$14.99
Xive TV On Demand³¹	\$4.99
Quark On Demand³¹	\$4.99
Stephens Drum Shed On Demand³¹	\$4.99
Pro Guitar Lessons On Demand³¹	\$4.99
Touchfit TV On Demand³¹	\$4.99
Lion Mountain TV On Demand³¹	\$3.99
Blueprint TV On Demand	\$7.99
Urban Movie Channel On Demand	\$4.99
The Great Courses Signature On Demand³¹	\$7.99
DJAZZ On Demand³¹	\$6.99
Pantaya On Demand	\$5.99
Outside TV Features On Demand³¹	\$4.99
The Reading Corner On Demand³¹	\$3.99
Hopster On Demand³¹	\$6.99
Ride TV On Demand³¹	\$4.99
Brown Sugar On Demand³¹	\$3.99
Echoboom Sports On Demand³¹	\$5.99
Stingray Qello On Demand³¹	\$7.99
Revolution Golf+ On Demand³¹	\$6.99

Hallmark Movies Now On Demand ³¹	\$5.99
Dove Channel On Demand ³¹	\$4.99
Kocowa On Demand ³¹	\$6.99
WHAM On Demand ³¹	\$2.99
Gravitas Movies On Demand ³¹	\$4.99
MHz Choice On Demand ³¹	\$7.99
Hi-YAH! On Demand ³¹	\$2.99
True Royalty On Demand ³¹	\$5.99
Real Vision On Demand ³¹	\$14.99
Docurama On Demand ³¹	\$2.99
Con TV On Demand ³¹	\$4.99
Walter Presents On Demand ³¹	\$6.99
Dekkoo On Demand ³¹	\$9.99
ZooMoo On Demand ³¹	\$2.99
Miniteve On Demand ³¹	\$1.99
Kids Room On Demand ³¹	\$5.99
Cinemoi On Demand ³¹	\$2.99
Hitz ⁴²	\$12.00
Streampix ²⁵	\$4.99
Pay-Per-View and On Demand Movies and Events ⁵ (per title or event)	Prices Vary
Revry On Demand ³¹	\$6.99
Too Much for TV On Demand	\$14.99
Brazzers On Demand ¹⁸	\$19.99
Vivid On Demand Subscription ¹⁸	\$19.99
Hustler On Demand Subscription ¹⁸	\$19.99
TEN On Demand Subscription ¹⁸	\$19.99
Urban Fantasy On Demand ¹⁸	\$19.99
Falcon On Demand ¹⁸	\$19.99
Homegrown Amateur On Demand ¹⁸	\$19.99
Evil Angel On Demand ¹⁸	\$19.99
Mature Lust On Demand ¹⁸	\$19.99
Penthouse On Demand ¹⁸	\$19.99
Girlfriends Films On Demand ¹⁸	\$19.99
Wicked On Demand ¹⁸	\$19.99
XTSY On Demand ¹⁸	\$19.99
Reality Kings On Demand ¹⁸	\$19.99
Arouse On Demand ¹⁸	\$19.99

SPORTS PACKAGES⁴

MLB Extra Innings [®]	Call 1-800-XFINITY for pricing
MLS Direct Kick	Call 1-800-XFINITY for pricing
NHL [®] Center Ice [®]	Call 1-800-XFINITY for pricing
NBA League Pass	Call 1-800-XFINITY for pricing

XFINITY TV EQUIPMENT

TV Box Limited Basic	\$2.50
TV Box	\$2.50
Remote	\$0.18
HD TV Box Limited Basic	\$2.50
TV Adapter (Limited Basic — Primary TV)	\$0.00
TV Adapter (Limited Basic — 1st and 2nd Additional TVs)	\$0.00
TV Adapter (Limited Basic — 3rd Additional TV)	\$0.50
CableCARD (first card in device)	\$0.00
CableCARD (second card in same device)	\$0.00

INSTALLATION

(PER OCCURRENCE UNLESS NOTED)

	Initial Installation of Service	After Initial Installation of Service
Professional Installation ^{23,24}	\$79.99	N/A
In-Home Service Visit ²²	N/A	\$40.00
Hourly Service Charge ²⁴ (Custom Installation)	\$50.00	\$50.00
Xfinity Internet Gigabit Pro Professional Installation (per occurrence)		\$500.00
Wireless Networking On-Site Professional Set-Up (Separate trip, per occurrence)		\$99.95
Wireless Networking On-Site Professional Set-Up (each additional device over 4 devices per occurrence)		\$29.95

REACTIVATION

(NO IN-HOME VISIT REQUIRED—PER OCCURRENCE UNLESS NOTED)

Reactivation - TV	\$6.00
Reactivation - Internet	\$6.00
Reactivation - Voice	\$6.00

MISCELLANEOUS (PER OCCURRENCE UNLESS NOTED)

Customer-Owned Video Equipment Credit See www.xfinity.com/equipmentpolicy for additional information	\$2.50
Regional Sports Fee ²⁹ (per month)	\$3.60
Field Collection Charge Visit to customer's residence required to collect past due balance or unreturned equipment	\$30.00
Returned Payment Item (each)	\$25.00
Late Fee	5%
Agent Assisted Payment For payment made by phone with a Customer Care Representative	\$5.99
Unreturned or Damaged Equipment Fees ⁶ (per piece)	Replacement Cost
Self Install Kit Shipping and Handling	\$15.00
Self Install Kit Shipping and Handling (Priority Shipping)	\$29.95

XFINITY INSTANT TV^{1,28}

BASIC SERVICE

Xfinity Instant TV

Includes Limited Basic for simultaneous streaming on two devices, and 20 hours of Cloud DVR service \$10.00

XFINITY INSTANT TV ADDITIONAL SERVICES³⁰

Kids & Family Includes 13 kid and family-friendly channels including Cartoon Network, Disney Channel, Nickelodeon and Universal Kids	\$10.00
Entertainment Includes 22 entertainment channels including A&E, AMC, Bravo, Food Network, FX, TNT and VH1	\$15.00
Sports & News Includes 14 sports and news channels including CNBC, CNN, ESPN, Golf, MSNBC and NBC Sports	\$28.25
Deportes Includes over 6 deportes channels including ESPN Deportes, FOX Deportes and NBC Universo	\$7.00
Latino Includes 13 latino channels including Cine Latino, Discovery en Espanol, Galavisión, Viendo Movies and VME Kids	\$5.00
HBO [®]	\$15.00
Starz [®]	\$12.00
Streampix	\$4.99

XFINITY VOICE^{1,7}

Xfinity Voice—Unlimited	\$44.95
With TV and Internet Service	\$39.95

Xfinity Voice—Local with More With TV or Internet Service	\$34.95
	\$24.95

XFINITY INTERNET^{1,8}

	Xfinity Internet Service Only	with Xfinity TV or Voice Service²⁶
Performance Starter	\$49.95	\$49.95
Performance	\$74.95	\$61.95
Performance Plus	\$84.95	N/A
Performance Pro	\$89.95	\$76.95
Blast!	\$94.95	\$81.95
Extreme Pro²⁰	\$99.95	\$86.95
Gigabit²⁰	\$104.95	\$91.95
Gigabit Pro^{20,21}	\$299.95	\$299.95
Modem Rental		\$13.00
Wireless Adapter (each, one-time charge)		\$30.00
Gigabit Pro Activation Fee (per occurrence)		\$500.00
Unreturned or Damaged Equipment Fees⁶ (per piece, per occurrence)		Replacement Cost

¹ Certain services available separately or as a part of other levels of service. Xfinity services are subject to Comcast's standard terms and conditions of service. Unless otherwise specified, prices shown are the monthly charge for the corresponding service, equipment or package. Prices shown do not include applicable taxes, franchise fees, FCC fees, Regulatory Recovery Fee, Public Access fees, other state or local fees or other applicable charges (e.g., per-call toll or international charges). Prices, services and features are subject to change. If you are an Xfinity TV customer and you own a compatible TV Box or CableCARD device, please call 1-800-XFINITY for pricing information or visit www.xfinity.com/equipmentpolicy. © 2019 Comcast. All rights reserved.

² Requires a Modem and TV Box with remote, CableCARD or compatible customer owned device.
³ Sold only with Service to Additional TV with TV Box for up to 3 TVs, maximum 3 clients per household. Requires HD Technology Fee and professional installation. Not available to customers with Limited Basic only.

⁴ Requires Limited Basic, TV Box with remote or compatible customer owned device. Sports Package subscriptions can be billed at once or in 4 total payments. Restrictions may apply.

⁵ Price of Pay-Per-View and On Demand Movie or Event is displayed prior to the completion of the Pay-Per-View or On Demand ordering process.

⁶ Contact 1-800-XFINITY for questions regarding equipment replacement charges.

⁷ Requires a Modem. Unlimited Local and Long Distance package pricing applies only to direct dialed calls from home to locations included in the plan. Plans do not include other international calls. For more information regarding Xfinity Voice pricing go to <https://www.xfinity.com/Corporate/About/PhoneTermsOfService/ComcastDigitalVoice/cvresidential>.

⁸ A Modem is required. For more information regarding Xfinity Internet go to <http://www.xfinity.com/internet-service.html>.

⁹ Requires TV Box, TV Adapter, CableCARD or compatible customer owned device.

¹⁰ Not available to customers with Limited Basic only. Must subscribe to HD Technology Fee to receive HD programming.

¹¹ Requires Limited Basic, TV Box, CableCARD or compatible customer owned device.

¹² Subject to availability.

¹³ Includes TV Adapter and remote. Digital service tier on additional TV corresponds to digital service tier on primary outlet. Does not include access to On Demand content, premium channels or channel numbers above 1000 unless otherwise noted on the channel lineup. Not available to customers with Limited Basic only.

¹⁴ Not available to Limited Basic only customers. Digital service tier on additional TV corresponds to digital service tier on primary outlet.

¹⁵ Requires HD Technology Fee. Service to Additional TV with TV Box required for DVR service on additional TVs.

¹⁶ Requires Digital Starter.

¹⁷ Requires HD Technology Fee.

¹⁸ One month minimum purchase required. Not available in all areas.

¹⁹ Non-client includes Service to Additional TV charge.

²⁰ Not available in all areas. May require installation and non-refundable installation charge.

²¹ Requires 2 year contract. Monthly rental of Gigabit Pro compatible cable modem/router additional. Activation and professional installation fees additional. Gigabit Pro does not qualify for Comcast 30-day money back guarantee.

²² Applies to installation, relocation and activation of additional outlets as well as upgrade/downgrades of service after initial installation of service and in-home visits. Does not cover installation or in-home visits for Xfinity Home.

²³ Includes standard installation of Xfinity TV, Xfinity Internet and/or Xfinity Voice and installation of additional outlets and wireless networking set-up if requested at time order is placed. Does not include installations of Xfinity TV only, Xfinity Home or Xfinity Gigabit Pro Internet.

²⁴ Standard installations include installations up to 125 feet from existing Comcast plant, primary outlet only. Custom installations include installations which require in-wall wiring or installations in extensive drop ceilings, basements, or crawl spaces.

²⁵ Requires Limited Basic and TV Box and remote or compatible customer owned device. Requires HD Technology Fee to receive HD programming. Streaming to device requires Xfinity TV app. Internet service with bandwidth of at least 600 Kbps and to Limited Basic. Streaming to laptop/computer requires equipment meeting minimum requirements posted at <https://www.xfinity.com/support/internet/requirements-to-run-xfinity-internet-service/>. Internet service with bandwidth of at least 600Kbps and to Limited Basic.

²⁶ Xfinity Internet discount does not apply to Xfinity Instant TV.

²⁷ Applies to Limited Basic and Xfinity Instant TV.

²⁸ Requires Xfinity Internet.

²⁹ Applies to Digital Starter and above, and Xfinity Instant TV Sports & News.

³⁰ Requires Xfinity Instant TV.

³¹ Requires Limited Basic with X1 TV Box and Xfinity Internet service.

³² Requires Limited Basic, HD Technology Fee and TV Box, CableCARD or compatible customer owned device.

³³ Requires TV Box, CableCARD or compatible customer owned device with Xfinity Internet service. Up to 10 hours of cloud DVR service available with either X1 TV Box (eligible with minimum subscription to one Genre Pack) with Xfinity Internet service or compatible customer owned device with Xfinity Internet service.

³⁴ Requires Choice TV. Cannot be combined with Limited Basic or Digital Starter.

³⁵ Not available to customers with Limited Basic only. Includes a customer-owned video equipment credit. An additional charge will apply for additional CableCARDS in the same device.

³⁶ Netflix activation of subscription requires X1 equipment.

³⁷ Cannot be combined with the Sports & News genre pack.

³⁸ Requires Limited Basic with X1 TV Box or compatible customer owned device and Xfinity Internet service.

³⁹ 10 Hour DVR Service requires Xfinity Internet Service and either an X1 TV Box or a compatible customer owned device.

⁴⁰ Equipment required at an additional cost. For additional information go to <http://www.xfinity.com/homesecurity>.

⁴¹ Includes Xfinity Home Security and 24/7 Video Recording for up to 4 cameras. Equipment required at an additional cost. For more information on 24/7 Video Recording go to <http://www.xfinity.com/videoRecording>.

⁴² Requires Limited Basic TV service and a compatible Xfinity TV Box or customer owned device.

Xfinity Home License Numbers:

AL: 001484, 001504; **AR:** 12-030; **AZ:** ROC 280515, BTR 18287-0; **CA:** CSLB 974291, ACO 7118, CT: ELC 0189754-C5; **DE:** FAL-0299, FAC-0293, SSPS 11-123; **FL:** EF0000921, EF20001002, EF0001095; **GA:** LVU406303, LVU406264, LVU406190, LVU406354; **IL:** PACA 127-001503; **LA:** F1691; **MA:** SS-001968; **MD:** 107-1776; **ME:** LM50017039; **MI:** 3601206217; **MN:** TS674412; **NC:** 2335-CSA, 29443-SP-FA/LV; **NJ:** Burglar and Fire Alarm Business Lic. # 34BF00047700; **NM:** 373379; **NY:** licensed by the N.Y.S. Department of State 12000305421; **OH:** LIC# 53-89-1732; **OR:** CCB 192945; **SC:** BAC-13497, FAC-13440; **TN:** ACL 1597, ACL 1604; **TX:** ACR-1672104,-1818, B16922, B02571; **UT:** 8226921-6501; **VA:** 2705145289, DCJS 11-7361; **VT:** ES-02366; **WA:** COMCABS892DS; **WASHINGTON, DC:** ECS 902687, BBL 602512000005; **WV:** WV049211.

MS: 15018010

Valid 1/1/19. See www.xfinity.com/home-security for current list.

82996000: 0050;0060;0070;0080;0090;0100;0110;0130;0140