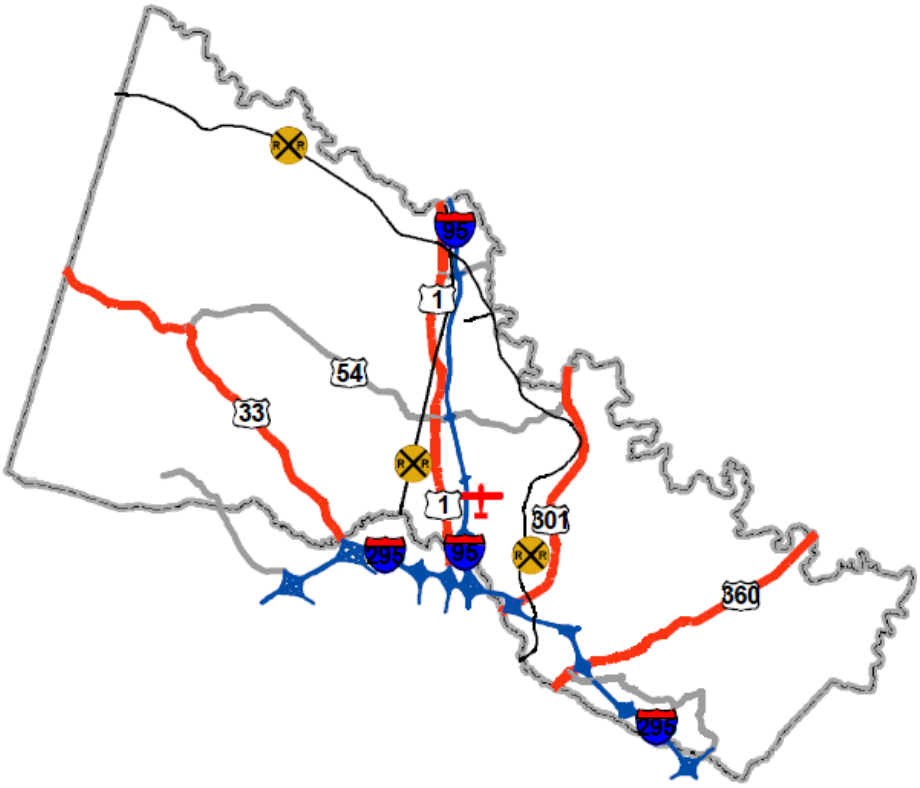
Hanover County High Speed Internet Committee (HSIC)
Report to Board of Supervisors

February 2012, Revision 1



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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 Armbrecht** - Mechanicsville District
- **Mark Creery** - Mechanicsville District
- **Owen Adams** - South Anna District
- **Amy Mendelson-Cheeley -** South Anna District

- **Joe Casey** - Hanover County Staff

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.

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.

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.

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.

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.

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).

SERVICE PROVIDERS SUB-COMMITTEE FINDINGS

The Service Providers Sub-Committee's members were:

- **Jacob Eshler** - Chair
- **Randy Armbrecht**
- **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.

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.

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.

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.

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.

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).

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

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.

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.

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**.

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.

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

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

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).

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/.

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.

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.

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.

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.

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.

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.

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.

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.

APPENDICES

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.

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.

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.

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.

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?”

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.

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.

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.

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.

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.

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.

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).

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.

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%.

APPENDIX D – HANOVER BUSINESS COUNCIL STATEMENT OF SUPPORT

GREATER RICHMOND CHAMBER
HANOVER BUSINESS COUNCIL

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,

Owen Matthew, Chair
Hanover Business Council
Greater Richmond Chamber

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.

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

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- 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,

Jennifer Y. Scott, APR
Executive Director

Michael H. Gladstone
President

END OF REPORT