

## Telecommunications and Broadband – Appendix “F”

Electronic communication has become an essential element for modern life whether for business, research, education, shopping, or social life and entertainment. Businesses need the ability to send and receive large volumes of data quickly and economically. Residents need good electronic communication to manage their daily lives. As more information becomes digital and the volume of communication continues to increase, key considerations related to internet access for residents and businesses are geographic coverage, data transfer speed, network reliability, and cost.

Telecommunication is also vital for county and municipal government for police, fire, and emergency management as well as for education and basic communication between government and citizens. This report was prepared at the request of the County Commissioners to elevate treatment of the topic as a part of the Comprehensive Plan.

“Broadband” allows users to access the internet and internet-related services at significantly higher speeds than those available through “dial-up” internet access services. The term “broadband” refers to a signaling method that includes or handles a relatively wide range, or band, of frequencies. Broadband speeds vary significantly depending on the particular type and level of service ordered, whether data is downloaded or uploaded, and may range from as low as 200 kilobits per second (kbps), or 200,000 bits per second, to six megabits per second (Mbps), or 6,000,000 bits per second. Some recent service offerings even include 50 to 100 Mbps<sup>1</sup>.

The term “broadband” is always relative; a band may be broad enough for household needs but not for business, for example. We use the term broadband to refer broadly to telecommunications capabilities that meet residents, business, and government’s respective needs.

### *1. Telecommunications Coverage in Charles County*

Telecommunications coverage in Charles County is a mix of telephone, Digital Subscriber Line (DSL), cable, fiber, wireless (broadcast from towers and tall buildings), and satellite. The geographic extent and types of coverage are changing rapidly as technologies change.

**Telephone.** Traditional copper wire telephone service is available almost everywhere in Charles County. Users can connect to the internet over these wires using a “dial up” connection through an internet service provider. However download and upload speeds are generally slow and increasingly unsuitable for today’s needs. Verizon is the major service provider although there are alternative providers that can lease lines from Verizon to provide service<sup>2</sup>.

**Digital Subscriber Line (DSL).** DSL is a wire line transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses. Verizon is the major service provider in Charles County.

**Cable.** Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to a television set. Charles County has two cable service providers, Comcast and Verizon.

**Fiber-Optic Cable (Fiber).** Fiber optic technology converts to light electrical signals carrying data and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at

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<sup>1</sup> <http://www.fcc.gov/guides/getting-broadband> accessed 1-8-12

<sup>2</sup> Maryland Public Service Commission, Telecommunications Division, 1-10-12.

speeds far exceeding current DSL or cable modem speeds. The same fiber providing broadband can also simultaneously deliver voice and video services, including video-on-demand. Verizon and Comcast offer fiber to homes and businesses. . Future locations for the extension of fiber infrastructure are limited per terms of County agreements with service providers.

The One Maryland Broadband Network is fiber optic broadband network that will link government facilities and community institutions in every county in the state (see description below).

Charles County government owns and manages an Institutional Network known as the I-Net. The I-Net is a fiber optic network providing high speed broadband service to County government departments, the College of Southern Maryland, as well as the Board of Education, schools, libraries, fire and rescue stations, Civista Medical Center, and other public uses. The I-Net is limited to public uses.

Dark fiber is fiber optic cable that has been deployed without the optical equipment necessary to "light" the fiber so that it may carry telecommunications traffic (voice, data, video, etc.). A good deal of "dark fiber" has been laid in Charles County by commercial entities for future use<sup>3</sup>.

**Wireless.** Wireless broadband can be fixed or mobile. Wireless fidelity (WiFi) is a fixed, short range technology that is often used in conjunction with DSL or cable modem service to connect devices within a home or business to the Internet. WiFi connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. This fixed wireless broadband service is becoming more and more widely available at restaurants, bookstores, and other public locations called "hotspots."

The Town of La Plata has partnered with the Charles County Public Library and several community partners to provide WiFi across downtown La Plata (mainly accessible outdoors) through an Innovation Grant from the International City/County Management Association and the Bill and Melinda Gates Foundation.

Fixed wireless technologies using longer range directional equipment can provide broadband service in remote or sparsely populated areas where other types of broadband would be too costly to provide.

Mobile wireless broadband services, such as, 3<sup>rd</sup> Generation (3G) are also becoming available from mobile telephone service providers, such as cell phone companies and others. These services generally require a special card with a built in antenna that plugs into a user's laptop computer. Generally, they provide lower speeds, in the range of several hundred kilobytes per second (kbps). 4<sup>th</sup> Generation (4G) services are beginning to become available in Charles County and expected to increase in the near future.

All the major carriers provide wireless coverage in Charles County including Sprint, T-Mobile, AT&T, Cricket and Verizon.

**Satellite.** Satellite broadband is another form of wireless broadband and is useful for serving remote or sparsely populated areas. Obtaining satellite broadband can be more costly and involved than obtaining DSL or a cable modem. DirectTV is the major provider in Charles County providing television as well as internet service through its partners. Hughesnet provides service in Charles County.

## **2. *Extent of broadband coverage***

The extent of broadband coverage in Charles County is not easy to define with precision. On one level, it can be argued that using satellite or mobile wireless technology, broadband is available throughout all or most of Charles County. However, many people would disagree that it is really available since this coverage may not be complete and can be expensive depending on location.

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<sup>3</sup> Source: Charles County's Information Technology Division staff.

Defining the extent of coverage is also difficult because some services may be available in one street or neighborhood but not in the adjacent one. The Maryland Broadband Cooperative (MdBC of which Charles County is a member, see description below) provides the best available coverage information.

As part of a federal grant, MdBC tracks coverage by US Census block and almost 75 percent of the blocks in the County has coverage (Figure 1). However, the map may overstate the actual coverage, because, as required by federal rules, if one residence or business in that block can be served the entire block is reported as having coverage.

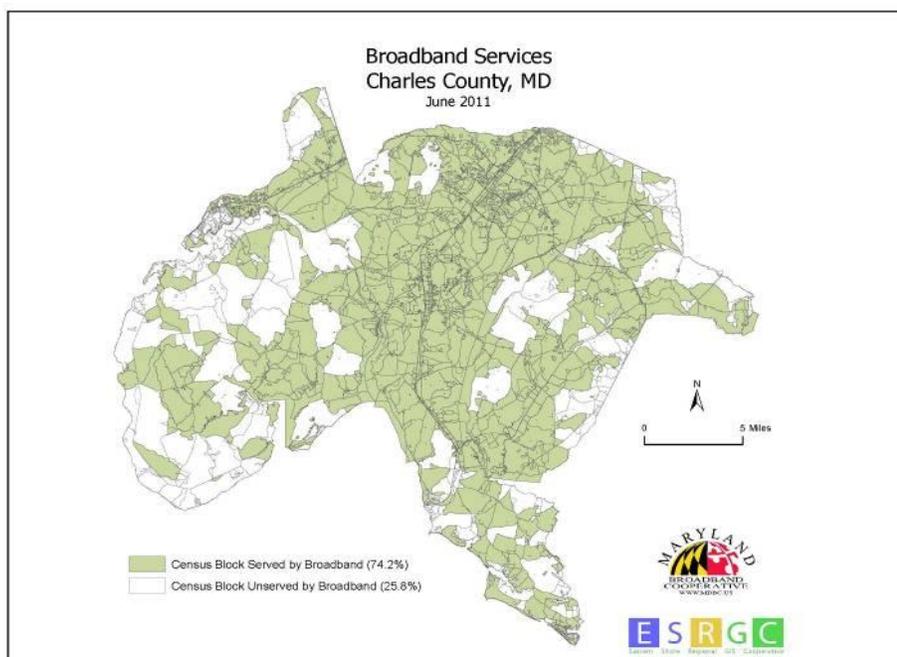
Figure 2 is a breakdown of Figure 1 by broadband type. The figure shows that cable is mostly available in the central and northern parts of the county while DSL is more widespread. Areas without any coverage are scattered throughout the County, but the largest uncovered area is in the western part of the county.

Figure 3 shows blocks with fiber coverage. This coverage is mostly in a north-south swath through the County on both sides of US 301.

The Maryland Broadband Cooperative is currently laying fiber beside the One Maryland Broadband fiber and will eventually make that fiber available for lease to its members, some of which are service providers. However, this effort will be limited – described as a “backbone” -- and additional fiber will still be needed to cover the “last mile” or final location in order to reach all rural residents.

**Broadband over Powerline (BPL).** BPL delivers broadband over the existing low and medium voltage electric power distribution network. BPL speeds are comparable to DSL and cable modem speeds. BPL can be provided to homes using existing electrical connections and outlets. BPL is an emerging technology, currently available in very limited areas and not at all in Charles County<sup>4</sup>. It has significant potential because power lines are installed virtually everywhere, alleviating the need to build new broadband facilities to every customer.

Figure 1: Broadband Service Coverage, 2011



<sup>4</sup> [www.bpldatabase.org](http://www.bpldatabase.org) accessed 1-9-12

Figure 2: Cable and DSL Services, 2011

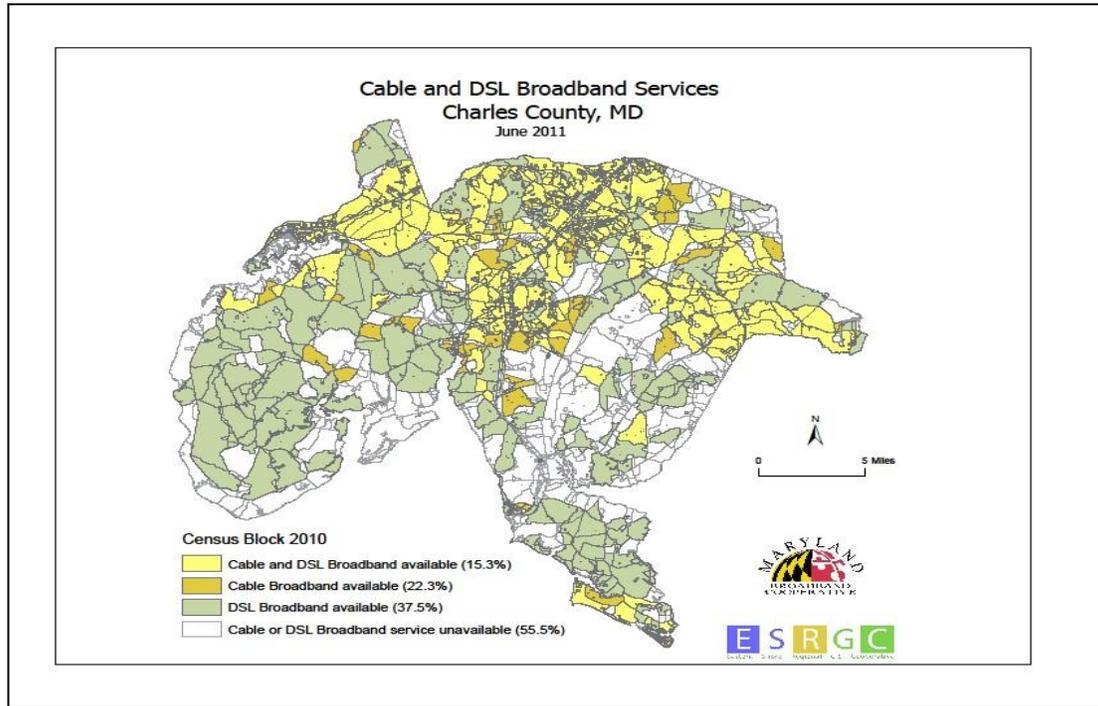
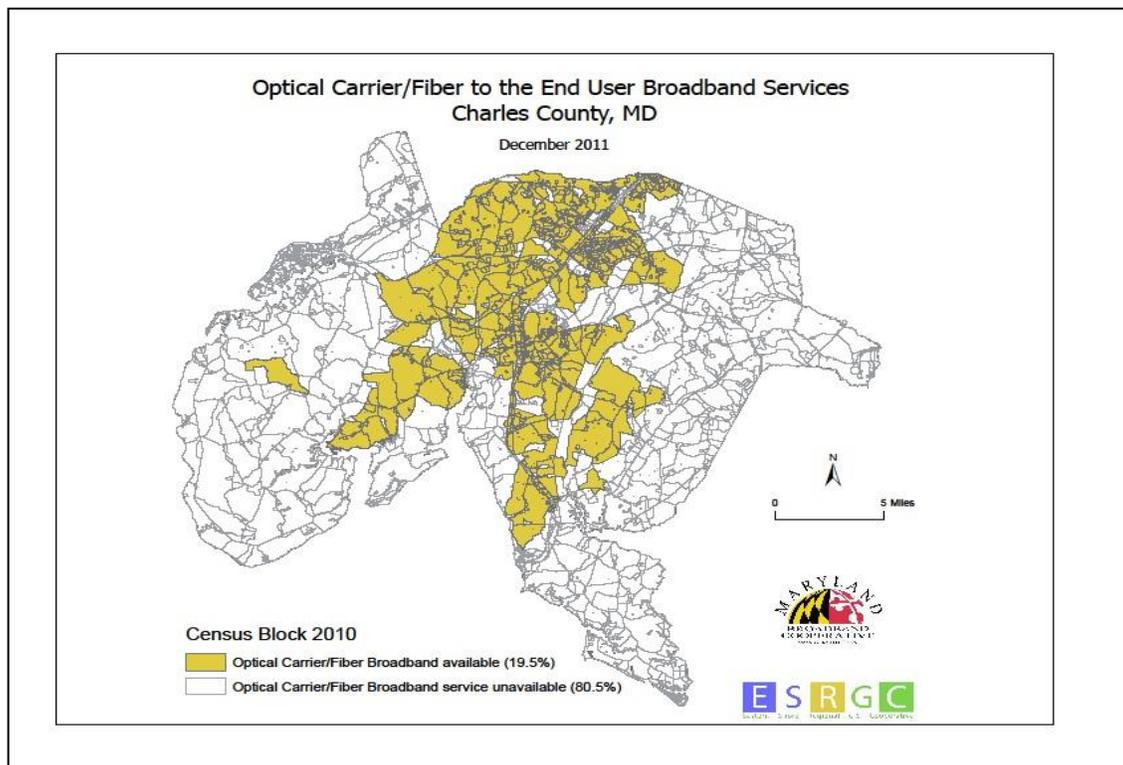


Figure 3: Optical Carrier/Fiber to End User



### 3. Organizational Considerations

#### **Charles County Government**

Charles County government plays an important role in planning for, facilitating, and helping provide broadband in the County. In 2011 Charles County was selected by the Center for Digital Government as one of ten “most digitally advanced counties” for counties nationwide with populations of less than 150,000. The award (Charles County’s 9<sup>th</sup> in a row) recognizes leading examples of counties using information and communications technology. Key County agencies involved in or with interest in broadband are:

- The Department of Fiscal and Administrative Services’ Information Technology Division is responsible for software applications used to deliver services, network infrastructure including the I-Net, and operations, the County’s centralized computing platform.
- The Department of Emergency Services is responsible for emergency preparedness, emergency medical services and 911 fire and rescue communications.
- The Office of Economic Development’s job creation and local business growth objectives are supported by the availability of affordable broadband for new companies and existing businesses locating to and expanding in Charles County.



Inside Charles County’s 911 call center on Radio Station Road

#### **Advisory groups**

The Cable Advisory Commission, established under the county’s 2002 Cable Ordinance, advises the County Commissioners on cable TV matters.

The Economic Development Executive Board is an advisory board created by the Board of County Commissioners for the purpose of sharing ideas, solutions and creative approaches to business and economic development and related issues facing Charles County.

The Charles County Technology Council is a non-profit organization acting as a cooperative alliance dedicated to the advancement of people, technology, and ideas in Charles County.

*The Charles County Communications Committee was formed in 2011. It is an interdepartmental group of key county employees working on various communication issues. One of its objectives is to improve county wide access to various telecommunication services for the future in order to enhance potential business development in rural areas of the county as well to improve access to services for all county residents.*

#### 4. Statewide and Regional Initiatives relevant to Charles County

##### **One Maryland Broadband Network**

The One Maryland Broadband Network (OMBN) is a planned, 1,294-mile, state-owned fiber optic broadband network that will link over 1,000 government facilities and community institutions in every county in the state, while interconnecting and extending three independent networks<sup>5</sup>:

- networkMaryland™, the statewide network operated by the MD Department of Information Technology (DoIT);
- The Maryland Broadband Cooperative (Mdbc), a member-owned and operated non-profit cooperative established to provide universal access, fiber optic network designed to deliver a broadband network across the rural communities of Eastern, Southern, and Western Maryland -- Charles County is a member of the Mdbc; and
- The Inter-County Broadband Network (ICBN), a consortium of 10 central Maryland counties and cities (not including Charles County).

Fiber currently runs roughly north-south through the County from Prince George's County to the Nice Bridge (Figure 4). Through the OMBN, fiber will be extended from the existing line west to Indian Head and Bryans Road and east through Hughesville to St. Mary's County. The major hub for these lines is in the Charles County Government Center in La Plata.

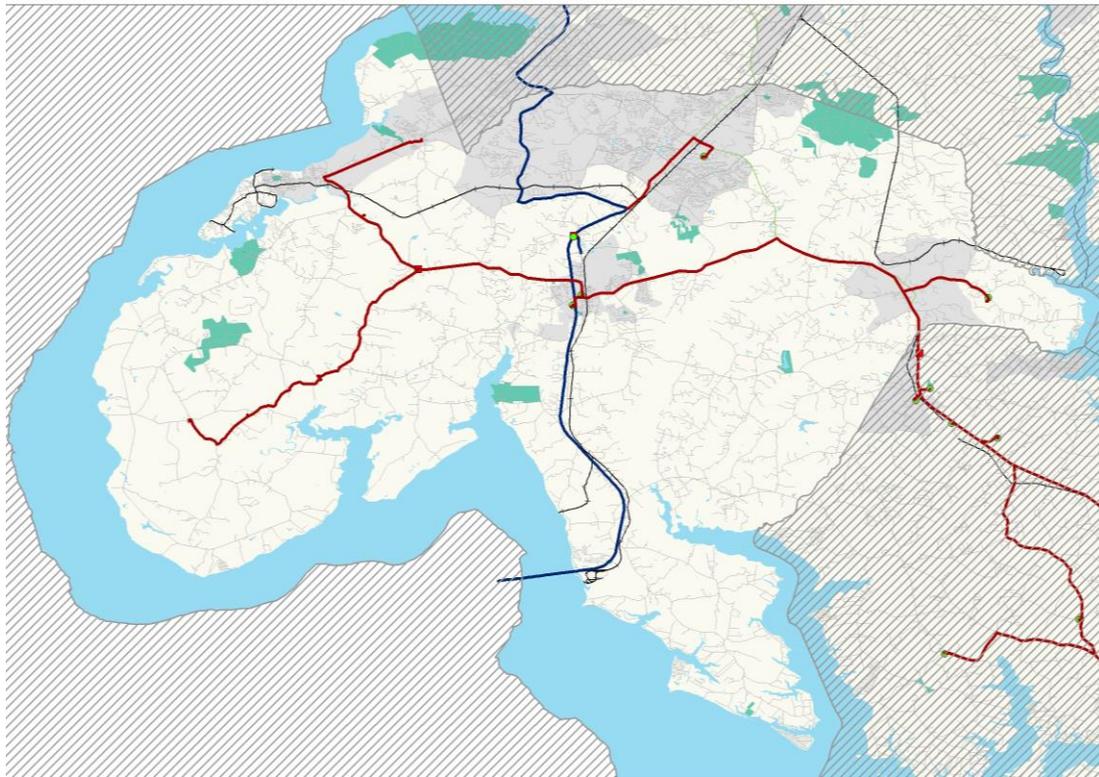
The number of strands of fiber in the OMBN varies by geography. Throughout the State some strands are reserved for networkMaryland™. Within Charles County, through a use agreement with the State, Mdbc will have exclusive access to between 48 and 96 fibers. As part of Mdbc's mission to provide open access in rural Maryland, Mdbc members can obtain access to these fibers to develop new markets, support economic expansion, and complete enterprise applications for service.

Within Charles County, Mdbc will have three "points-of-presence" (electronic equipment hubs) in La Plata, Indian Head, and Nanjemoy. These points of presence will be the least-expensive and best option for Mdbc members to connect to the fiber network, though it is theoretically possible to "ring-cut" into the network at other places. From these points-of-presence, fiber can be extended outward from the main broadband network to businesses, neighborhoods, and residences. The extensions could be through different methods including private fiber optic cable for direct connectivity, connecting to the existing dark fiber network, or, where it would be too expensive to extend fiber, by extending fiber to a tower or other high point, from which a provider could then offer high-speed wireless service.

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<sup>5</sup> <http://doit.maryland.gov/ombn/Pages/ombnHome.aspx>. OMBN is being built with approximately \$115 million in grant funding awarded in September 2010 through the federal Broadband Technology Opportunities Program (BTOP).

Figure 4: Existing and Proposed Fiber Routes, 2011



Source: <http://doit.maryland.gov>

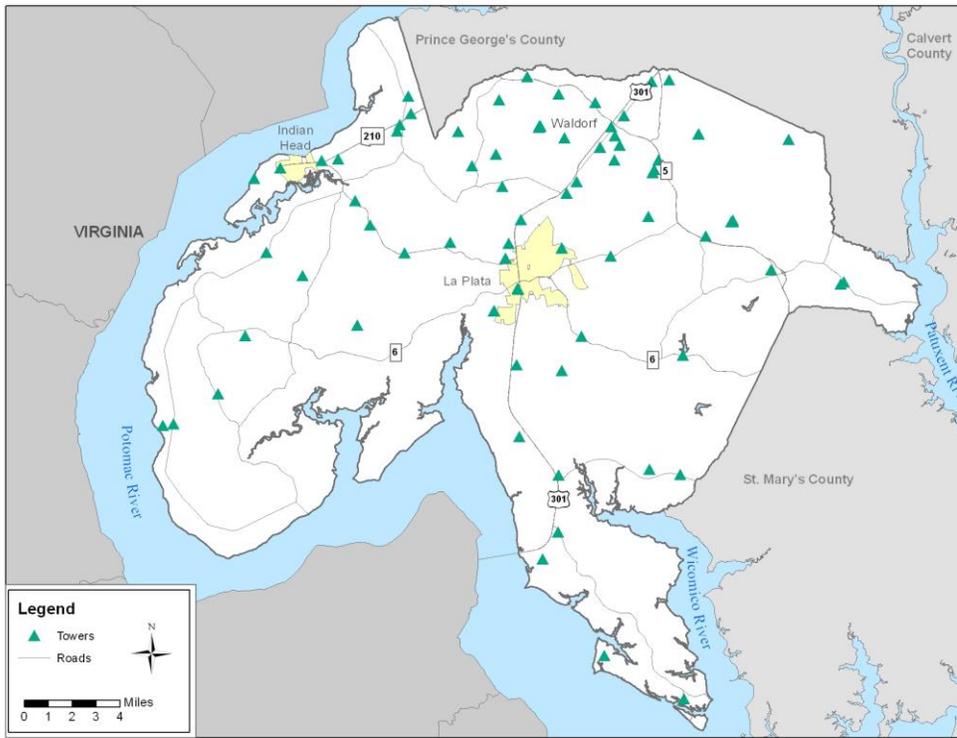
— OMBN Proposed Fiber Routes  
— Existing Fiber Routes

### **Southern Maryland Broadband Study**

The Tri-County Council for Southern Maryland (TCC) is a planning and development agency to foster the social and economic development of Calvert, Charles and St. Mary's Counties. In 2005 the Council completed a broadband study of the region, the Southern Maryland Broadband Study. It identified needs for business, government, educational institutions, and residents; assessed deficiencies; analyzed delivery by current providers; assessed alternatives; and made recommendations for improving access, service, and delivery.

As of 2012, the TCC is updating the 2005 Study working with Business Economic and Community Outreach Network, of the Franklin P. Perdue School of Business at Salisbury University (BEACON), MdBC, and Towson University (for mapping). Charles County is participating in the update. TCC expects to complete the study in fall 2012.

Figure 5: Towers in Charles County, 2011



Source: Charles County Dept of Emergency Services