

**Rappahannock County
Broadband Initiative Committee
Final Report**

November 5, 2007

Committee Members (Appointed by the Board of Supervisors)

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I. Executive Summary

There are a number of Broadband providers who market their product in Rappahannock County, no provider has a dominant position, and all have service area limitations imposed either by technology, capital needs or regulation. A survey of existing and anticipated technology has brought the Broadband Initiative committee to the conclusion that no one service or technology provides the “magic bullet” to providing broadband access throughout the community. However, some actions by County government would both facilitate the expansion of service from existing providers, and conceivably lower barriers to new providers, and they are outlined in the conclusions to this document. We also encourage the County to participate in the proposed study funded by the Department of Housing and Community Development, to evaluate further opportunities.

II. The Existing Landscape

Existing broadband providers may generally be broken down into two categories; “wired” and “over air”. While there are a significant number of persons in the community who depend upon “dial-up” internet service, no technology exists to allow boost in speeds sufficient to consider these as “broadband”. One of the committee members, Mr. Chris Payne, prepared a survey posted on RappVoice, the locally-based internet newspaper, that sought to have readers identify the type of service they have at their home or business, and allowed them to type in an address that was subsequently “populated” on a map. The map is currently available on-line at <http://www.skinfoan.us/internetsurvey/map.aspx>.

“Wired” Providers;

There are currently two telephone companies and one cable television company offering broadband internet service in our community. For our purposes, we will refer to these as “wired” providers. Verizon and Embarq provide DSL service from their hubs in Sperryville and Washington, respectively. Comcast Digital Cable provides service

mile on a roadway. This, coupled with Comcast's lack of interest in "pushing" this limit in order to secure a larger customer base, combines to mean that cable broadband, while valuable where it is available, is unlikely to expand significantly in area. Service costs vary from a low of \$24.95 to \$69.95 per month, with installation fees often waived for bundled services or in cases of promotions.

"Over Air" Providers

There are two firms that are providing "over air" broadband internet access. Virginia Broad Band is commencing service in the extreme southern and far eastern portions of the County, while eOffice is commencing service in the central part of the County, building out of a hub centered in Castleton.

Both firms provide broadband service to individual homes or businesses through a broadcast radio signal (at the 700 or 900 mhz range) which is relayed to a receiver at those homes or businesses from a microwave transmitter. That transmitter, in its turn, receives its signal either from a relay from a remote station (in the case of Virginia Broad Band) or from a T1 line (in the case of eOffice, at present).

Virginia Broadband is a firm with its roots in the Northern Neck, that has steadily moved westwards. It provides service to this county through a hub in Culpeper (at the former landfill site) which relays signal to a microwave receptor that is then re-transmitted to local radio receivers at individual subscribers' homes or businesses.

Both services rely on "line of sight" from the transmitter to receivers, and so often require an antenna location mounted on a structure. There are some practical differences in the effect of the frequency bands that the different systems operate over, in the sense of their sensitivity to tree cover, etc., but generally, if you can see it, you can transmit to it.

Both firms require not insignificant expenses for installation (\$295.00 and \$795.00 for VBB and eOffice, respectively), with monthly fees averaging \$59-69.00 per month for typical service, but higher volumes of data transmission costing more.

Satellite providers are available for broadband users in the County. Both commonly available national providers, however, are suffering significant problems with reliability, as witnessed by the reports from local subscribers. In addition, there are significant capital costs involved in the equipment that a subscriber must obtain; for all but the most remote locations, satellite service is not the best solution for broadband users.

There exist some mobile broadband services, primarily those offered by Verizon and Sprint (Wimax). The latter provider seemed very promising in theory, as it would allow broadband access provided through Sprint's network of personal wireless services (cell) towers, but they have had three delays in the scheduled "roll-out" of the

from Chester Gap to Massie's Corner roughly along U.S. Rt. 522, and thence both east to Amissville and west to Washington.

"T1" Telephone is a service available from both companies on a limited basis, but is basically a large end-user form of service; it is used locally both by the school system and by an "Over Air" provider discussed below.

The telephone companies' service areas are outlined in the attached graphic (Ex. 1) and divide the County into two parts. Both companies employ DSL technology, which is built out of their respective "wire centers" in Sperryville (Verizon) and Washington (Embarq). A limited amount of DSL service is available to parts of Chester Gap, and is served out of a Warren County based wire center. The technological limitation on DSL service is such that, at best, it can extend service three miles from the wire center. Feeding both wire centers are direct copper wire connections to individual telephone subscribers and wired connections to remote terminals, which are groupings of individual subscribers.

Remote terminals generally may be upgraded to wire centers, in order to deploy more DSL technology (and hence create another three mile area of service), but the costs are great and each phone company intends to do so only if they feel that the subscribers they will net are sufficient to justify the investment. At present, neither intends to create new wire centers at any of their remote terminals, although Embarq did indicate a willingness to study the possibility of upgrading their remote terminals at Flint Hill and Huntly should the County request that they do so. As part of the Committee's conclusions, we suggest that the Board of Supervisors make this request.

DSL Service typically costs from \$15 to \$60.00 per month for users, although higher volume users can pay more; installation fees and monthly fees can vary in cases of bundled services or promotions. It is important to note that, even if you could create an overlapping network of wire centers providing DSL service, you still could not serve everyone over phone lines due to the fact that existing wire centers have direct wired connections to subscribers that go as much as ten-eleven miles.

Comcast provides its broadband service through direct coaxial cable connection from nodes located along its fiber optic line that originates in Front Royal. This fiber optic line is built along a backbone of existing utility poles, and service to customers comes from the nodes spaced at various places along the backbone. There is a limit of how far apart the nodes may be to efficiently transport signal, and how far "drops" from the nodes to individual subscribers may be before the signal degrades.

The principal limitation with the cable broadband service in the community is that Comcast's franchise agreement only mandates expansion if population density reaches 11 homes or more per linear

technology. Careful monitoring of the potential in this area is appropriate, with perhaps this being a focus of the DHCD study discussed elsewhere in this report.

III. The Future

EOffice is planning, in the 6-8 month time frame, to include a backbone signal from Loudoun County that will significantly expand their capacity; they hope ultimately to provide service to a significant portion of the County (see Exhibits 2 & 3, for the current area they feel they cover, to that projected).

Similarly, VBB is looking to expand and to relay its signal to more locations in the County.

Both firms, in order to significantly expand their service, will require regulatory relief from the County. Currently, the county requires a Special Exception for all "Telecommunication facility or radio, television and microwave antenna and/or transmitting facility" in every zoning district. This is a fairly absolute injunction. While no doubt imposed for the best of reasons (such as the preservation of landscape, the desire to not have Rappahannock be a hub for signal transmission elsewhere that provide no local benefit, etc.) there would seem to be some accommodation that might be provided to allow reasonable impact in service of furthering this service; recommendations are included later in this document.

How much either over air provider is able or willing to expand will largely be a function of the customer base which exists to support it. As has been observed, two of the blessings of living in Rappahannock County is its low population density and open space; both conditions are the enemy of broadband providers. When coupled with our high degree of topographic variation, this amounts to a near knockout. County government may be able to significantly influence the expansion of both companies through one form of subsidy or another. Again, we provide a recommendation below.

IV Recommendations

The Broadband Initiative Committee suggests that the Board of Supervisors:

- 1.) Immediately request that Embarq conduct an evaluation of the feasibility of upgrading its Flint Hill and Huntly relay stations to Wire Centers, capable of providing DSL service.
- 2.) Participate fully in the DHCD Broadband study.

- 3.) Amend the County code to exempt certain facilities from the requirement for special exception permitting, in cases where such service facilities are for local service distribution. Mr. McCarthy has attached his proposed resolution to this problem (see Exhibit 4)
- 4.) A public subsidy of private industry given an active competitive environment is probably inappropriate. However, the County as an actor in the marketplace has a significant demand for broadband service, when County government and schools are considered. This leverage should be used to seek expanded service areas for underserved areas of the County. We think that the county, in consultation with one or more of the over air providers, should seek to place its broadband service with them in exchange for expanded service area(s) on a scheduled basis.

Exhibit I

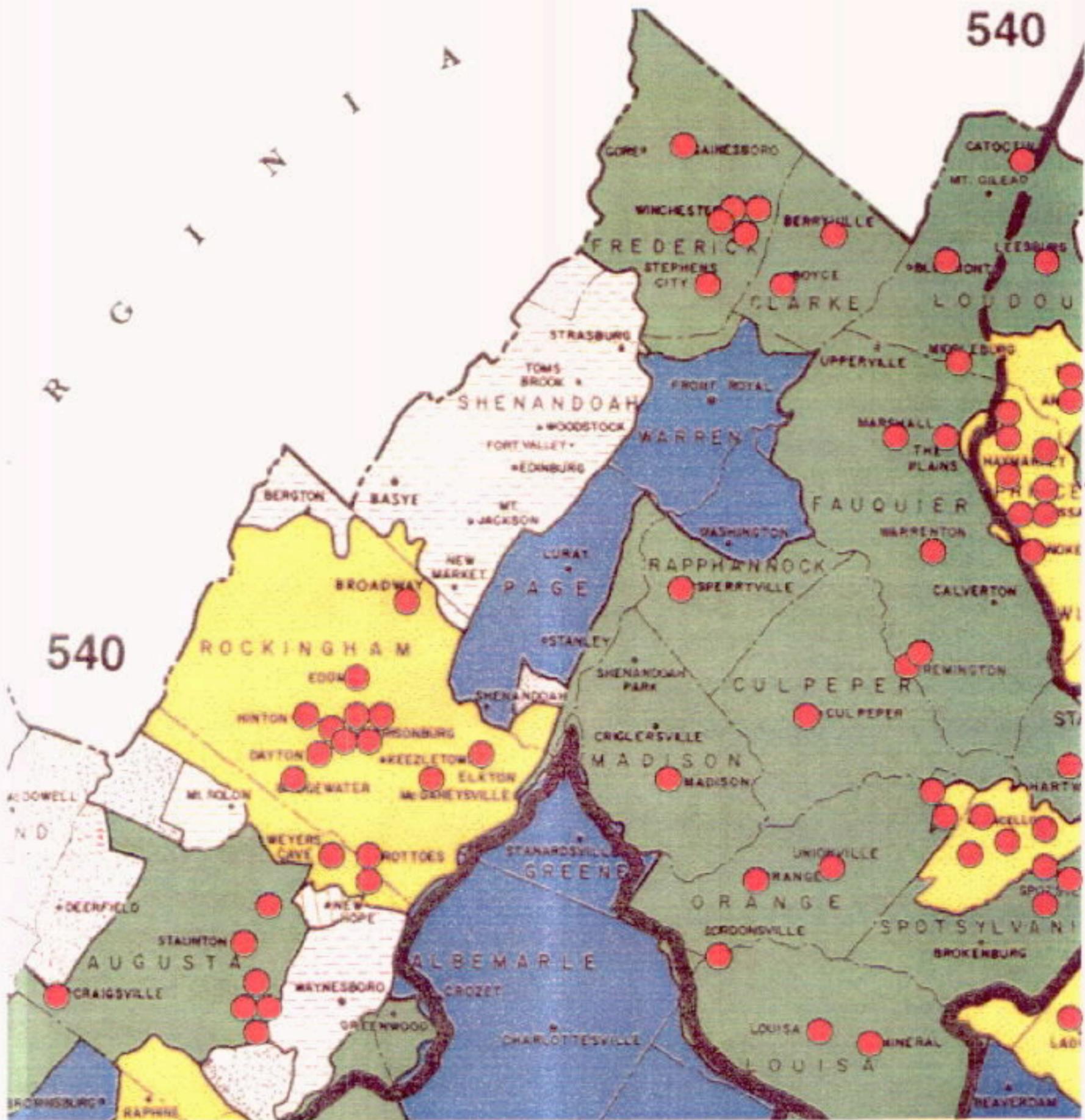




Exhibit 3

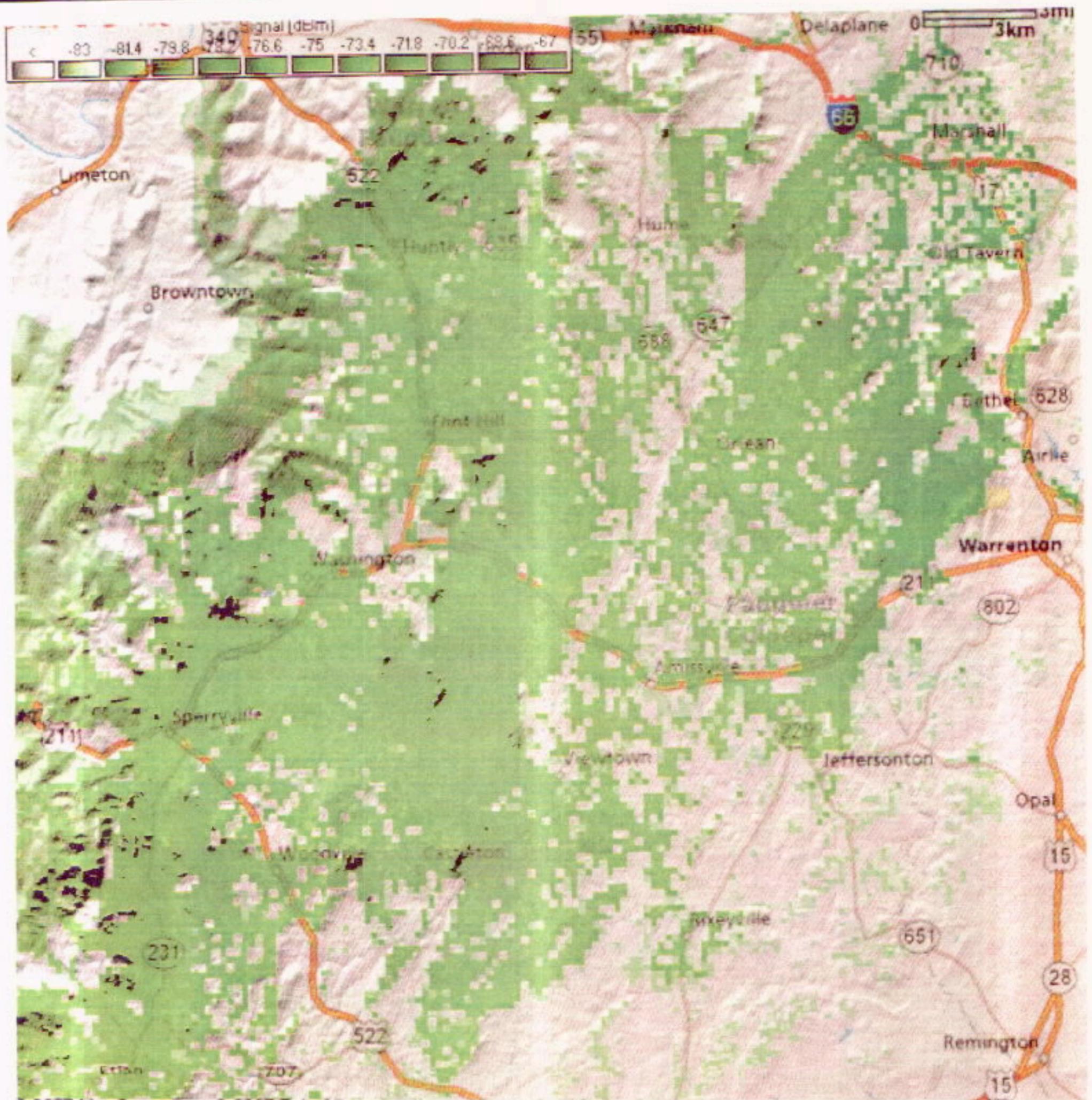


Exhibit 3

Exhibit 4

Amend Chapter 170 "Zoning" of the Rappahannock County Code, as follows:

Amend §170-12 Exemptions, by adding a new section B., to read:

- B. Exempted from the provisions of this chapter is any and all equipment for the transmission and reception of wireless broadband internet-based communication services, when such equipment is installed on property owned by a subscriber to such services, and when such equipment is mounted on existing structures or on single wooden utility poles which project no more than sixty (60) feet above existing grade. The antenna, reception and transmitter equipment exempted may only be used for the subscriber's reception, distribution or relay or for reception, distribution or relay to other subscribers in Rappahannock County or immediately adjacent counties. In no case shall this exemption apply to microwave or other transmission of signal for end users in jurisdictions not immediately adjacent to Rappahannock County.

Amend §170-12 by Re-labeling the existing "B" as "C", by adding a new sentence after the first sentence, to read as follows:

This exemption shall apply to the equipment described in B., above.