



Western Maryland Broadband Deployment Strategy

Key Investment Abstract

February 2, 2004

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Introduction

The Tri-County Council for Western Maryland just completed a year-long evaluation of broadband demand and created a broadband deployment strategy culminating with a Feasibility Study and Plan for Deployment (the Study). The study includes the result of surveys, interviews, best practices, and a strategy based on proposals from prospective providers of broadband infrastructure, services, and applications.

This document is an action plan that briefly reviews the results of the Study so that we can accomplish policy recommendation number two, namely, take measurable next steps to improve broadband infrastructure and services in the near term.

As a *Key Investment Abstract*, this document pays special attention to the problems Western Maryland faces, and then focuses on two of the Study's goals that make up the key investment-related components of the strategy to improve broadband infrastructure. As the study consists of well over 150 pages and at least 50 specific recommendations, information in this document is presented on a high-level and only covers a few of the key recommendations. Please refer to the complete study for detailed information and related recommendations.

In addition, note that these investment-related backbone infrastructure recommendations focus mainly on Garrett and Allegany counties. This is because parts of Washington County already have minimally diverse infrastructure and some competitive services similar to those in Maryland's urban areas, and significant funding is not required to bring basic diversity to Washington County's broadband services. In addition, the funding of Garrett and Allegany-focused initiatives will also bring substantial benefits to Washington County. The 50 recommendations in the study include many action items to bring additional broadband to Washington County – most which do not require any significant funding – and which include recommendations for last mile broadband access which is desperately needed in the county.

If you have any questions regarding this study or the efforts currently underway to drive broadband availability in Western Maryland, please contact Guy Winterberg at (301) 777-2158. The authors of the study can also be contacted at the following:

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What Did Businesses Say They Wanted?

Our team issued a total of 1,231 surveys to all companies in the western Maryland counties of Garrett, Allegany, and Washington that employed over 10 persons. 174 completed surveys were returned for a statistically valid completion rate of 15%. Key findings included:

1. If high-speed Internet access were available at rates similar to urban areas, 67% of businesses would buy these services.
2. Based on an extrapolation of the statistically significant survey data, Western Maryland has 5,980 employees that telecommute; an additional 1,569 would if high-speed Internet was available at their homes.
3. Of those firms that allow regular telecommuting, 39% are satisfied with the performance; 55% of the respondents who use the service regularly would use more services if it were available at a faster rate.
4. 52% of firms use standard phone modems to conduct business. While 18% of businesses use cable modem service, only 6% use DSL due to its lack of availability across the region (as of the survey date).
5. 32% of businesses have identified a specific communications-related service that they have not implemented at their site, with over 75% indicating lack of availability or cost as the reason for not implementing this service.
6. 51% of businesses indicate that Internet access speed is one of their three largest IT challenges; cost of Internet access is one of the top three IT issues for 54% of businesses
7. While the number of key health care institutions is limited in the region, telemedicine demands are strong – 80% of current users would use more services if bandwidth was available at a reasonable cost, and only 20% of these users were satisfied with telemedicine over their current connections.
8. Businesses are projecting a 2% increase in overall employment by next year.

In Person Interviews Validated Survey Results

TLA interviewed over 90 businesses, key industry players, and prospective partners as part of this project. These individuals and businesses provided insight into many possible solutions to address Western Maryland's broadband communications requirements.

Some of the key findings from the business interviews included:

- Businesses that represent the region's largest economic growth potential are unable to obtain services that meet their needs, i.e., small businesses and growing medium businesses with mission critical applications such as data services, medical services, etc.
- The number of medium-sized, mission critical telecommunications business users is growing. They are the ones who require several T-1s who are less able to withstand downtime and need diverse routes and carriers – they are willing to buy additional capacity to ensure uptime.
- Most businesses are interested in encouraging or sponsoring employee or customer remote broadband usage if support issues are capably handled by the ISP or last mile provider.
- Local government and other non-business broadband use is increasing and can attract service offerings from providers that could be shared with businesses.
- Applications that create sudden or abrupt need for broadband are often not foreseen, even by knowledgeable IT staff.

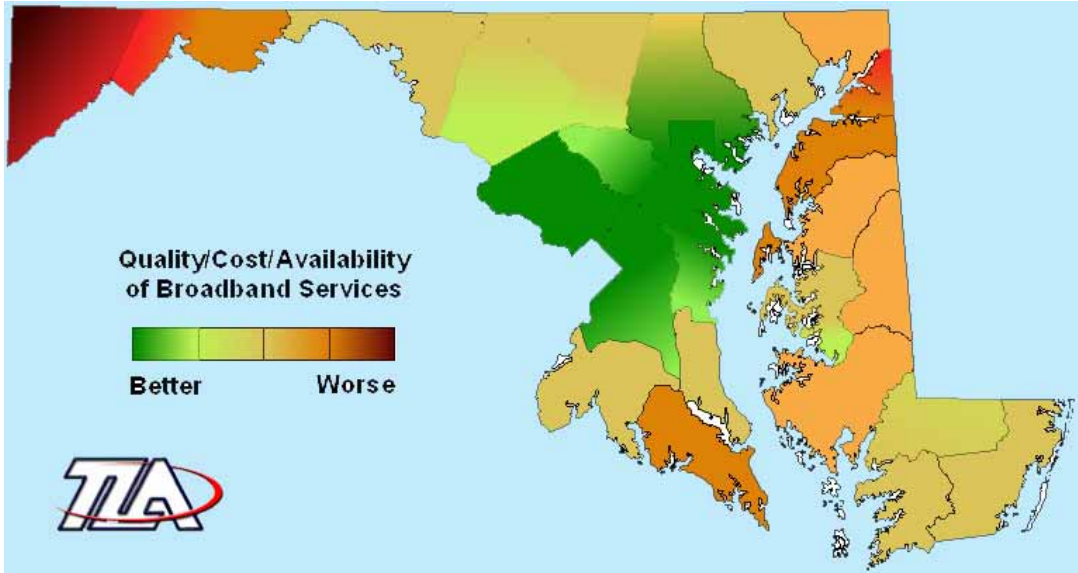
The Problem

In common terms, the problem is simple. Very few **long distance** carriers have points of presence in Western Maryland, the **local** carrier has older facilities and fewer switching centers per square mile, and communication out of Western Maryland requires a mix of services from both **local** and **long distance** carriers.

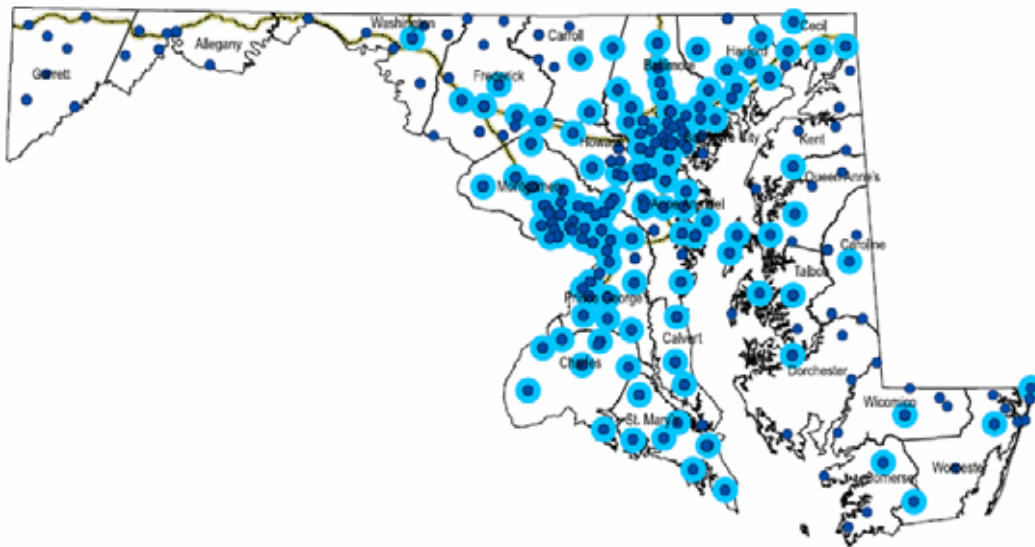
The lack of diverse routes and carriers translates to more service outages, higher monthly recurring costs for services, and an overall economic disincentive. The following picture¹ illustrates the results of the lack of this diversity and depicts relative quality, cost, and

¹ Note – for those viewing a printed black-and-white or grayscale version of this document, the colors change from green in the urban areas to dark red in far parts of Garrett and Cecil/Kent counties. Most of the Eastern Shore, Western Maryland, and Southern Maryland are in a shade of either orange or red, versus green to light yellow for other parts of the state.

options for services across the state of Maryland. Note the correlation between orange and red colors and the rural counties in Maryland.



The next illustration translates some of this into technical terms by depicting the location of local phone company switching centers in the state. This is important as the proximity to a switching center can determine the quality of service, the amount of service outages, and whether or not certain service offerings can be provided at all (e.g., DSL).²



² This map is provided courtesy of TEDCO and represents DSL availability and locations of incumbent local exchange carrier (ILEC) central offices as of February 2003. As a note, the ILEC has recently made enhancements to its DSL offering, including the addition of this service to many central offices. However, due to the geographic dispersion of central offices in rural Maryland, DSL will never be able to reach all users in these counties.

The issues are similar with cable Internet access – the next figure outlines the availability of cable Internet access in the state.³ Of special note is the contrast between Central Maryland and Western Maryland.

Maryland - District of Columbia Cable Modem Service Area*



The following tables compare exactly identical dedicated T-1 Internet access service offerings from five major Internet access carriers. This is “best case scenario” pricing, which was prepared by NetGain Communications, a premier carrier agent, who represents over 50 different carriers, and which is intimately familiar with the best pricing options and promotions for Internet access. The carriers are ACC (a subsidiary of AT&T and not Allegheny Communications Connect), AT&T, MCI, Qwest, and Sprint.⁴

Location:	Montgomery County		Garrett County		Allegany County		Washington County	
Address:	101 Monroe Street Rockville, Maryland 20850		203 South Fourth Street Oakland, Maryland 21550		701 Kelly Road Cumberland, Maryland 21502		100 W. Washington Street Hagerstown, Maryland 21740	
Phone Number:	(301) 334-8970		(301) 334-8970		(301) 777-2438		(240) 313-2210	
	<u>Monthly</u>	<u>Installation</u>	<u>Monthly</u>	<u>Installation</u>	<u>Monthly</u>	<u>Installation</u>	<u>Monthly</u>	<u>Installation</u>
Carrier A	\$700	\$405	\$1,991	\$405	\$1,526	\$405	\$700	\$405
Carrier B	\$750	\$400	\$2,368	\$400	\$1,803	\$400	\$750	\$400
Carrier C	\$1,120	\$0	\$1,551	\$0	\$1,227	\$0	\$1,121	\$0
Carrier D	\$733	\$0	\$3,071	\$0	\$733	\$0	\$733	\$0
Carrier E	\$639	\$0	\$639	\$0	\$639	\$0	\$639	\$0

The offerings shown under Carrier D and E are one-time promotional pricing arrangements, available for the most part only through the agent channel and normally not available for customers working with account teams or carrier’s toll-free order desks.

³ This map is provided courtesy of the Cable Telecommunications Association of MD, DE and DC. It correctly represents service in their member companies serving areas. Areas in non-member companies’ areas of service may be overstated or understated, and the Advisory Team believes that the availability in western Allegany County and Garrett County is currently overstated. This map is provided for illustrative purposes only.

⁴ Pricing is not referenced to carrier name due to carrier agreements, and carriers have been presented in the table in a random order.

Promotional offers could disappear at any time. These rates reflect the best possible deals available from these five carriers for a standard service offering in December 2003. The difference in pricing between western Maryland and its more urban counterparts is striking. A client in Garrett County desiring Internet access from its Tier 1 long distance carrier would be required to pay an average of \$1,420 more for the same service as its counterpart in Montgomery County, assuming that this client was unaware of the agent channel and did not know an agent that represented the one-time promotional offer by Carrier E.

Private sector businesses in rural LATAs, therefore, have several specific challenges, especially in the purchase of T-1 or higher Internet access:

- Small competitors may not have a presence in the LATA or only one POP
- Access to diverse routes and carriers for backbone and last mile is limited at best
- Promotional pricing is rarely available for small/mid-sized users for T-1 access circuits
- Mileage charges and lack of promotional pricing increase costs for:
 - T-1 or higher Internet access
 - Dedicated long distance voice access circuits
 - Frame Relay networking
 - Inter-LATA point-to-point services

The Solution: Infrastructure and Funding

Our strategic plan, as outlined in the study, reflected multiple components to address each of our project's seven goals, including the 18 policy recommendations in the next section. However, the most critical and costly part of our proposed strategy requires the most coordination and communication, and is outlined here.

This part of the solution provides 1) a point-of presence-connection to MCI or Level 3's fiber optic route that comes to Cumberland from the east, and, 2) a connection to the Allegheny Communications Connect fiber coming from the west. An example of an additional funding tool that could facilitate this part of the solution is presented in the form of a broadband bonding authority. Both the infrastructure and bonding authority goals are included in the Study as goals number 4 and 7 and are summarized below.

GOAL 4: Increase availability of diverse carriers and routes for Intensive Internet access to businesses and ISPs within 2 years, as businesses increasingly require fully available, mission critical services and carriers need diverse access to ensure network availability.

Status: As of the close of the initial publication of this report, two providers have made proposals to connect an alternative fiber route that would provide Intensive Internet access to businesses and ISPs in the Cumberland area, one from the east by MCI and UCN (Solution A) that could link to Hagerstown, and one from the west

from Allegheny Communications Connect (Solution B) that would connect to Oakland, and if connected to MCI, provide an additional link to Hagerstown. The MCI proposal could also lay the ground-work to provide a rate center from which data and voice circuits could be priced.

Goal 4 could be accomplished with either of these proposals or a combination of the two. The MCI proposals include a connection to AllCoNet2 in Cumberland through which businesses and public sector entities can make use of their POP. This could also support a proposed extension of AllCoNet2 into Garrett County.

Goal 4 can be accomplished in large measure because of the public sector demand that is being aggregated through AllCoNet2 and its possible extension into neighboring counties. This was described in greater detail in the study and in the discussion surrounding policy recommendation #6, where we discuss the need to aggregate demand, and #4, where we discuss applications such as emergency services communications that will drive growing demand for broadband infrastructure at the backbone and last mile. AllCoNet2's ability to support mobile emergency communications through the Internet and through government private networks can go a long ways to working around the national and local problem of on-demand interoperability. This demonstrates how AllCoNet2 can be a significant vehicle for demand to be aggregated while the applications such as emergency services, education, and telecommunications can be what pulls the demand through the vehicle.

This aggregated demand is helping to motivate infrastructure and service providers to negotiate the creation the points of presence that can make diverse routes available from the west in Garrett County to Hagerstown. These diverse routes in turn can support additional last mile services and providers who can provision services to rural areas throughout Washington, Allegany, and Garrett Counties.

Option A: MCI connection to Cumberland

Cost: Service contracts and revenue commitments

MCI has worked directly through their government division and indirectly through UCN⁵ to make an arrangement with Allegany County's AllCoNet2 project to create a local point of presence in Cumberland. In a press release dated January 22, 2004, UCN, a provider of business telecommunication services, announced that the company, along with MCI, will provide high speed, advanced telecommunications services to the rural communities of Allegany County under the AllCoNet2 project.⁶

⁵ Company information can be found at <http://www.ucn.net/AboutUs.aspx>.

⁶ Text of this press release can be found in many online sources, including at the following URLs: http://biz.yahoo.com/prnews/040122/lath113_1.html and at http://www.globeinvestor.com/servlet/ArticleNews/story/PRNEWS/20040122/2004_01_22_19_0733_10_76940.

As of the date of this proposal, it is uncertain what financial support may be needed, if any, in addition to business contracts with AllCoNet2 to establish this connection and finalize this relationship with a definitive agreement. Additional funds might be needed if a connection with ACC is also created.

The objective of promoting and facilitating this connection is that it will bring a long distance carrier point of presence directly into Cumberland, 40 miles closer to Allegany and Garrett counties than most current services, and it will use a diverse route from the backbone Verizon services used for communications out of western Maryland. Businesses and carriers in this area will now be able to obtain multiple services from diverse carriers and routes – the key behind Goal 4 of our study.

The illustration below shows where AllCoNet2 plans to offer a competitive, diverse last mile wireless backbone – a backbone that other ISPs can lease and resell as a last-mile offering. The addition of a MCI POP in Cumberland would increase the reliability and availability of this county-wide service offering and asset.



Solution B: Connect the Allegheny Communications Connect fiber from Oakland to Cumberland; Cost \$5,000,000 - \$7,000,000

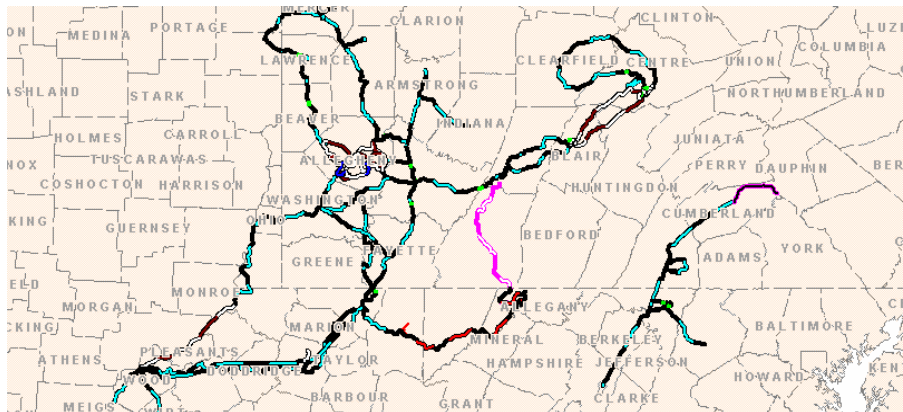
Allegheny Communications Connect (ACC) has proposed linking their networks from Youngstown and Pittsburgh to Cumberland and out to other networks in Pennsylvania. To date, they have received funding to bring a point-to-point connection into Oakland in Garrett County. This backbone connection will provide high-speed Internet access to the area. As Garrett County is the poorest-served county in the state for backbone telecommunications services, this high-speed network and diverse route goes a long ways towards improving this infrastructure.

As indicated in our study, almost every service in western Maryland takes one of two routes out of the region towards the east. To truly implement diverse routes, a route is

needed to the west and/or north that could be used for high-speed Internet access and which is carrier-neutral. ACC's proposal in this Solution B would accomplish this.

ACC has proposed to install a diverse route between its already-funded infrastructure in Oakland and Cumberland, and then to connect this infrastructure in self-healing, diverse rings going to the west and north. The proposed cost of \$5-7 million includes the installation of this fiber route, mostly along its power line rights-of-way – a route diverse from other routes, such as the I-68/I-70 fibers and the CSX fibers of MCI and Level3 discussed in our study.

If MCI provisions a full-service POP in Cumberland (as described above), we see a potential for ACC to swap some capacity with MCI as part of a mutually-beneficial teaming agreement. This could provide MCI with added avenues to reach more areas, including Oakland, without requiring long local carrier circuits, and ACC could connect its Hagerstown fiber routes into its backbone network. It may not need mentioning that there would be a number of different benefits to all parties to linking up with Verizon facilities, also. While neither carrier prepared this specific combined offering, we believe that these are viable additional options that should be facilitated throughout the year as next steps are taken. The following map outlines a portion of the ACC fiber backbone, and illustrates the proposed ring through Garrett and Allegany counties.



These solutions will provide western Maryland with a more survivable infrastructure along with competitive options for broadband pricing from multiple backbone providers. The benefits to the community could be substantial if the business case risks to both companies could be mitigated with equipment and facility financing.

GOAL 7: Provide financial tools to foster public and private sector infrastructure and service initiatives such as a broadband infrastructure bonding authority as described in Policy Recommendation #9 within 18 months.

Accomplishing this Goal will help simplify the process to fund capital expenditures for telecommunications services and will strengthen this and any possible future funding rounds. Bonding authority funds could be part of the amount needed for state and local match, or could be used for future additions to the route. Developing these tools could

enable total funding of Goal #4, which would provide an example of a project supportable by the statewide Broadband authority.

Policy Recommendations

The 18 policy recommendations in this report include a range of action items that can be taken by local businesses, local government, and state government to facilitate expanded broadband data infrastructure and services. Strategies include the leveraging of current resources, aggregation of local demand, the adoption and development of broadband applications, and attraction of outside resources. Two of the recommendations carry forward into these strategy goals, namely the implementation of diverse broadband routes and the creation of an alternate funding vehicle – a broadband bonding authority.

1. Create rural broadband policy that fosters survivable, sustainable, scalable and interoperable high speed networks by supporting diverse routes and carriers for backbone and last mile infrastructure serving government, business, and citizens.
2. Follow through policy recommendations and strategies with specific next steps, responsible parties, and resulting goals that can be measured.
3. Support the availability to businesses of current and proposed diverse routes, such as the Level3 fiber optic network that runs along Interstate 68, the MCI fiber route that runs along the CSX tracks, and the Allegheny Communications Connect fiber route that is being extended into Oakland in Garrett county.
4. Encourage adoption of cost saving or value creating applications which require broadband usage, such as converged voice, data, and video emergency services communications.
5. Facilitate access to rights of ways, including conduits and towers, for private business and carriers to provide diverse routes for backbone and last mile services. Review cost recovery structure to minimize overcharges compared to the market while maintaining revenue needed to maintain systems.
6. Explore feasibility of aggregating demand for private sector and public sector rural broadband networks as they create peering relationships in their respective points of presence. This would include use of networkMaryland, SAILOR, AllCoNet2, UMATS and Internet2. As an example, the Baltimore Education Research Network (BERnet) is a model that can be used in rural regions.
7. Create a Maryland broadband and related critical infrastructure bonding authority to support public/private partnerships in infrastructure development, especially to underserved areas.
8. Develop and support county or tri-county critical infrastructure coordinators who understand public and private sector critical infrastructure and can coordinate, plan, and procure funds for their protection and growth.
9. Develop local process to gain and protect information required to plan for emergency communications as outlined in the federal executive orders.

10. Support local and state capacity to find federal funds, including federal rebates to rural health care providers for broadband internet usage.
11. Encourage the development and implementation of cost-saving telemedicine applications and coordinate state reimbursements for services to further promote the use of these applications.
12. Encourage the state to modify current economic development incentives to attract external infrastructure funding.
13. Consider the economic development promotion of western Maryland as a strategic location for remote sites for information technology assets and employees for the purposes of business continuity and other smart growth initiatives.
14. Leapfrog from rural “catch-up mode” to a world class leadership role. Support entrepreneurship and business development that provides broadband services and infrastructure technology commercialization that will lead the world in the deployment of new technology, services, and businesses. Use next generation internet resources to create virtual incubators for broadband intensive start-ups and high growth firms.
15. Encourage and prioritize the use of the dozen fiber optic strands that network Maryland has for swapping with other carriers to be used in the state-wide development of rural networks.
16. Eliminate Maryland-only disincentives to the deployment of broadband infrastructure.
17. Create demand-side opportunities, such as a broadband day sign-up by chambers of commerce.
18. Develop a model of a systems and network development (SAND) corporation serving local government that can reinvest a meaningful portion of money saved or increased revenue into staff, services, and infrastructure.