



Western Maryland Broadband Deployment Strategy

FINAL REPORT, 2nd Edition

Executive Summary

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Acknowledgements

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The survey, interviews, and strategy development were developed with extensive efforts of the following individuals on the project's Advisory Team:

- Guy Winterberg, Tri-County Council for Western Maryland
- David Houle, Maryland Technology Development Corporation (TEDCO)
- Anna Custer, The Greater Cumberland Committee
- Frank Shap, Garrett County Economic Development
- Corey Stottlemeyer, Office of Delegate LeRoy Myers
- Michael Beach, Principal, TLA Associates
- Charles Manto, Senior IT Strategist, TLA Associates
- Laura Ahern, Project Manager, TLA Associates

Numerous others participated in an expanded Advisory Team that included officials from various economic development organizations, libraries, hospitals, schools, universities, government offices and private businesses.

The majority of this report was written by Michael Beach and Charles Manto, with assistance on the Best Practices from David Schnepf and on the Business Survey from Matthew Kachura.

The Tri-County Council for Western Maryland is committed to the development and implementation of a regional strategy for economic development. One of the focal points of the strategy is the development of telecommunications infrastructure for the three westernmost counties of Maryland. The Council would like to thank TEDCO, EDA, ARC, and the Office of the Lieutenant Governor of Maryland and the regional participants that have assisted in helping move this project forward.

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 this study can also be contacted at the following:

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EXECUTIVE SUMMARY

INTRODUCTION

The Tri-County Council for Western Maryland (TCC) and the Maryland Technology Development Corporation (TEDCO) have led a project aimed at expanding Western Maryland's communications infrastructure capacity and competitiveness. This project seeks to resolve the lack of access in Western Maryland by determining best practices for using the region's existing assets, analyzing and defining critical gaps in current infrastructure, as well as providing specific workable solutions for the counties of Garrett, Allegany and Washington.

The goal of this project was to improve economic opportunities for Western Maryland's businesses and citizens. TEDCO's *eReadiness Maryland* study determined that Western Maryland's private sector lags behind other areas of the state in broadband usage, and the project efforts were focused towards finding practical, economical solutions to move the region forward.

As a result of this project, TCC and TEDCO will have a feasible strategy that articulates current communications demand and potential future demand as well as current infrastructure. This final report, along with its business case addendum, outlines capital investments necessary to make the region more attractive to new business development, and explicitly addresses how end-users in all areas of the region will be served, including large and small businesses, education, government and non-profit users.

The results are laid out in 18 policy recommendations and 7 broadband deployment goals. Most of them create value for all of rural Maryland. Many provide substantial benefits to urban areas of the state, as well.

THE PROJECT

There are several components to this project, including a survey, interviews of businesses and vendors, development of business cases for investment, and the comparison against best practices. The specific tasks for this project include:

1. Orientation, Final Review and Approval of Scope of Work
2. Survey of Western Maryland Business Telecommunications Demand
3. Interviews to Assess Local Institutional Broadband Demand and Capacity to Participate as Partners
4. Identifying and Profiling "Best Practice" Rural Broadband Initiatives
5. Broadband Provider Business Cases for Investment
6. Final Report
7. (Optional) Implementation Plan



This report is the Final Report, which contains the results of the project tasks as outlined in the RFP and the Agreement with the project consultant.

BACKGROUND AND THE PROJECT TEAM

TEDCO and TCC prepared and released a Request for Proposals (RFP) in November 2002 for consultants experienced in the development of solutions to address these unique requirements. In January 2003, TLA Associates, a Virginia-based telecommunications and network design firm, was awarded this project after a competitive bidding process. TLA and its technical leader, Mr. Charles Manto, have expertise in design of communications solutions, in the development of business cases for technology investment, in local government economic development, and in deployment and operations of communications platforms.

THE PURPOSE

The TLA team's purpose was to design, as comprehensively as possible, a strategy for broadband telecommunication infrastructure and services implementation for western Maryland's three counties (Washington, Allegany, and Garrett). The TLA method was aimed at discovering ways to elicit specific proposals for enhancing broadband capabilities in the region from current and prospective broadband providers, whether backbone, last mile, or services and applications.

The assumptions behind this purpose included:

1. The answer to improved services may come in multiple pieces for:
 - . Different parts of the region,
 - . Different types of customers, and from
 - . Different broadband infrastructure and service providers.
2. It is better to leverage the substantial investments and business models of these various companies or organizations than to design a theoretical solution without resources or one that depends on one company or public source of funds.
3. It is more effective to discover current market needs and trends of broadband users and use that information to foster additional broadband infrastructure and services from providers.

Where current market needs are insufficient to encourage providers to enhance infrastructure and services, TLA worked with providers to develop proposals or business cases to close those gaps as additional resources were provided.



THE METHODOLOGY

UNIQUE SURVEYS

TLA designed a survey with its teaming partner, the Jacob France Institute of the University of Baltimore, which was sent to all entities (businesses, non-profits, and government organizations) of ten or more employees in Western Maryland – defined as Garrett, Allegany, and Washington Counties for this report – to determine current and prospective market demand. The questions focused on what kinds of telecommunications bandwidth they were currently using and would like to purchase if available. In addition, TLA introduced unique questions and survey approaches to uncover new applications that could create sufficient demand or justification to fill gaps. This included questions that deliberately probed how businesses or institutions in the area would want to drive telecommunications broadband to remote sites and homes of employees, customers, and business partners.



In order to foster broad awareness and participation in the survey, TLA's senior telecom advisor personally presented an overview of the strategy to associations of businesses and governmental officials throughout the region from January to the closing date of the survey. TLA, TEDCO, and the TCC also made numerous media presentations that resulted in television, radio, and newspaper coverage in the project. A letter from the Lt. Governor Michael Steele accompanied the survey form. As a result, TCC and TLA succeeded in obtaining statistically significant results in its findings.

INTERVIEWS OF KEY INSTITUTIONS AND BUSINESSES

Once the surveys were initiated, TEDCO, TCC, and TLA began the process of identifying and interviewing area businesses and institutions that represented either substantial use of broadband resources or drivers that would result in substantial additional use of broadband. Maryland Delegate LeRoy Myers, Jr. provided a letter of introduction to the area institutions. Most of the interviews were done in person and at the businesses' sites in Washington, Allegany, and Garrett Counties. A number were conducted by phone.

In addition to discussing current usage and determining what they liked and didn't like about their current telecommunications service, TLA used the interviews as an opportunity to discuss potential near term growth of services and applications that could be used to entice broadband service providers to improve services.



PUBLIC SECTOR INTERVIEWS

TLA led discussions with various local and state elected officials and their staffs, participants of state and federal agencies, and national associations of local governments including:

- Public Technology Inc.
- League of Cities
- National Association of Counties
- National Governors Association
- National Council of State Legislatures
- National Interoperability Task Force

These discussions also included local public safety and related non-governmental organizations such as the Red Cross and the Medical Reserve Corp. The purpose of these meetings was to verify broadband needs, prospective funding sources, and form consensus about next steps on specific projects.

PROSPECTIVE SERVICE PROVIDERS

TLA began interviewing prospective providers from the beginning of the study in order to recruit their participation in specific proposals for broadband services in the region. TLA assumed that organizations would need time to organize resources within their own companies in order to make meaningful proposals, especially if the companies were larger. These interviews included providers of backbone and last mile infrastructure in addition to services and applications whenever possible. Both private and public sector service providers were interviewed. Both backbone and last mile providers agreed to work on proposals.

PROSPECTIVE APPLICATIONS PROVIDERS

TLA also interviewed companies, institutions, and government leaders from outside the Western Maryland area that could have a direct impact on broadband telecommunications deployment and economic development in the region. These included medical, educational, and emergency services providers. As many of these meetings were beyond the scope of the budget made available to TLA, TLA raised additional funds to cover those expenses.

Meetings were held with Maryland government leaders in Baltimore, Annapolis, and Washington DC. Other local government, state and federal agency leaders were also interviewed across the country in person in Florida, Pennsylvania, Virginia, and Washington DC.



CONTINUED COORDINATION WITH TCC ADVISORY PANEL MEMBERS

TLA continually worked closely with TCC advisors through each step of the strategy development process. This made it possible to facilitate interaction with numerous organizations regarding recommendations and action steps. It even made it possible to attract firms to the area to demonstrate new technology and services at no additional cost to TCC.

SURVEY RESULTS

This survey was designed to collect business demand, and not specific residential demand for broadband (high-speed Internet) services. A total of 1,231 surveys were mailed to all companies in Western Maryland (Allegany, Garrett, and Washington Counties) that employed over 10 persons. The list of companies was derived from the Dun & Bradstreet iMarket database, and included all establishments that met the geographic and employment criteria in the region. To ensure the best possible response, the survey was sent to all businesses that met the criteria, not just a sample set of businesses. The survey was sent out in spring 2003, with responses due approximately one month later.

A total of 64 surveys were undeliverable, leaving a valid sample of 1,167 businesses. Of the businesses with valid addresses, a total of 174 completed surveys were returned for a completion rate of 15%. This represents a statistically valid response rate. In addition, the responses received from each county allow the analysis of data county-by-county and the comparisons between counties, as the responses from each county also represent statistically valid response rates.

The following list contains several key observations and findings from the survey of all Western Maryland businesses with more than 10 employees.

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.



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.

KEY INTERVIEW FINDINGS

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.



BEST PRACTICES

As part of this project, our team reviewed nationwide best practices performed by rural areas to deploy or motivate the deployment of broadband services for the purposes of economic development. Four of the five best practices profiles contained in our report are all successful examples of publicly-funded or publicly-driven initiatives that spurred deployment and accessibility of cost-effective broadband to rural areas. One is still in development.

Our team researched each of these projects and contacted the suppliers, vendors, and customers in each instance to obtain proprietary, up-to-date information regarding the success of these initiatives.

While there are other examples of rural broadband deployments, the five projects were selected for their likeness to Western Maryland in terms of geography, population densities, and overall similarity of challenges. The projects also represent the wide spectrum of services, technologies, financial instruments and management structures currently being implemented to deliver broadband to rural areas across America:

- **UTOPIA** (Utah Telecommunications Open Infrastructure Agency)¹ is a prime example of how multiple municipal authorities, backed by State legislative support, can join together to issue revenue bonds to deploy a fiber to the home (FTTH) network. This network is in deployment phase as of this report.
- **The Grant County, WA Public Utility District “Zipp Network”**² highlights the ability of an existing utility to cost-effectively extend their internal fiber network to residents and businesses in areas currently unable to access broadband services.
- **The City of LaGrange, GA**³ represents how a city can enter into a public-private venture that is a win-win situation for all participants – government, business and the public.
- **The Borough of Kutztown, PA**⁴ showcases that even a small town of 5,000 can successfully finance, deploy, manage and market a state of the art Fiber to the Home (FTTH) network in the face of resistance and competition from the local cable operator.

¹ See <http://www.utopianet.org/> and our Best Practices section for more information.

² See <http://www.gcpud.org/zipp/> and our Best Practices section for more information.

³ See <http://www.lagrange-ga.org/computer.html> and our Best Practices section for more information.

⁴ See <http://www.kutztownboro.org/> and our Best Practices section for more information.



- **The City of Buffalo, MN⁵** displays an innovative approach to extending the reach and effectiveness of their existing fiber network to residents and small businesses through the use of low-cost wireless system.

While each municipality cited above is unique in its particular challenges and crafted solutions, the following success factors emerged throughout the secondary research and participant interviews:

- **Plan and Execute:** The key success factor stressed by everyone was the importance in developing and following a detailed work plan that all participants could reference from initial design throughout financing and implementation.
- **Customized Solutions:** Every municipality clearly understood their local marketplace and implemented a system that met their particular needs.
- **Organize:** All key stakeholders (government, business, citizens, and service providers) must be engaged from the earliest points of the project.
- **Maintain Focus:** Above all, the ability to generate and *maintain* momentum for all aspects of the project was cited as key in overcoming the numerous challenges that every project will face.

POLICY RECOMMENDATIONS

TLA worked with local companies, units of government, and state agency officials in its strategy interviews and in participation with the Maryland Rural Broadband Task Force to develop and discuss a number of policy recommendations. However, TLA's following policy recommendations are based on its experience and expertise and do not imply endorsement by any other entity, including TCC and TEDCO.

The 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.

They include:

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.

⁵ See <http://www.bwig.net/> and our Best Practices section for more information.



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 networkMaryland 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.

RECOMMENDATIONS AND STRATEGY

Fortunately, Western Maryland has a head start in providing multiple backbone routes and carriers given that fiber optic conduit and fibers already pass through the area. All that needs to be done to make use of these diverse routes is to either light the fibers that are there or provide local points of presence where local users can participate in the network.

Given the initial responses from the surveys and private interviews, most of the carriers interviewed throughout the course of this study agreed to provide proposals for next steps based on business cases that fit with their financial models. They have confidence that remaining gaps between current service offerings and customer requirements can be filled between a combination of what they can offer and what they could offer if some help is provided.

TLA's broadband deployment strategy is identified at a high-level below. Specific strategic action items are segregated by the 7 project goals (which are defined in full in the section 'Rural Challenges and Project Goals'). In essence, these seven 'strategic plans' make it possible to develop specific action steps that can be followed and measured as the region moves to bring broadband services in to support the private sector. Some of these action items and recommendations require little public investment. The backbone infrastructure goal (Goal #4) requires the largest investment, but, can be significantly less expensive than many have assumed because of the infrastructure already in place and sources of outside funding.

GOAL 1: Make Moderate application Internet access available to all businesses and homes in rural Maryland immediately (200 Kb/sec in one direction)

- Satellite Internet access is currently available to all residents and businesses
- DSL and cable modem service, along with wireless and other providers, cover parts of the area



- All small and home-based businesses today can get Internet access at a reasonable price (although the service and reliability of some services does not match urban areas)

GOAL 2: Provide competitive options for Moderate Internet access (200 Kb/sec in one direction), including last mile options within one year, for almost all businesses. (a) Increase speed of moderate access to exceed 200 Kb/sec in **both** directions (200 Kb/sec to 1Mb/sec services in both directions) for at least one competitive option. (b) Make multiple competitive options from different technologies at higher speeds available within 1 year for 50% of businesses.

- High-speed satellite services coming in 12 months
- DSL and cable modem service expanding rapidly
- AllCoNet2 wireless available soon for Allegany County
- Multiple choices will be available within 1 year, with at least one option > 200 Kbps both ways

GOAL 3: Provide cost-effective Intensive (high-speed) Internet access services to 70% of businesses within 1 year (1 Mb/sec to 100 Mb/sec in both directions).

- Agents have identified deals for < \$700 per month for full T-1s from major carriers to all three counties
- With negotiation and knowledgeable resources, all businesses today can get Internet T-1s at a reasonable price (although the service and reliability does not match urban areas)

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.

In order to fully achieve this goal, any two or more of the first three need to occur and can be accelerated by number four.

1. One or two companies, such as XO Communications, using fiber along the Level 3 routes and Network Maryland, provide connection points to Hagerstown, Cumberland and west into Garrett County.
2. MCI, with a fiber route along CSX rails, provides a connection point in Hagerstown, Cumberland, and west into Garrett County.
3. Allegheny Communications Connect (ACC) provides a connection to Oakland in Garrett County and facilitates a multi-carrier connection north/northeast towards Cumberland.



4. Government users such as Allegany County use contracts to attract alternative backbone carrier with rate center services that would provide diverse carrier and diverse route services to the private sector.

Our specific strategy includes proposals from ACC, MCI, and AllCoNet2 that gets close to this goal.

- **Allegheny Communications Connect (ACC)** – The recent award from USDA to ACC to bring public sector network access into Oakland in Garrett County can be leveraged for the entire region. A private sector POP could be placed in Oakland, and/or a fiber route could be built from Oakland through Cumberland into Pennsylvania, with a POP in Cumberland.
- **MCI and UCN** – There are two proposals to bring an MCI point of presence to Cumberland. MCI, through their government division, has recently submitted an unsolicited proposal to Allegany County, describing a project to “light” a new full service MCI point of presence (POP) and to establish a new Local Service rate center in Allegany County. In addition, an alternative exists and is currently underway to bring a facilities-based POP to Cumberland on the MCI network through UCN in response to aggregated demand for services from AllCoNet.
- **AllCoNet2** – AllCoNet2 would offer wholesale services to regional ISPs, such as TWR and ProCom, who in turn would provide private sector services. These ISPs would offer their services to end-users over AllCoNet’s wireless last mile transport.

GOAL 5: Incorporate survivable broadband use as a cornerstone of interoperable emergency services communication.

- During the development of AllCoNet2, networkMaryland, SAILOR and other government networks, local governments can begin the process of using broadband communications to enhance their emergency communications very much like the demonstration TLA conducted in Cumberland on August 5, 2003.
- Next steps in this goal would include continuing the discussions between regional EOC directors, elected officials and related public service agencies, such as public health, to coordinate development, funding, and use of broadband resources for their respective needs.

GOAL 6: Create economic development incentives at the local and state level for firms creating infrastructure and services with beneficial economic impact within 18 months.

- Modifications to economic development policies will require specific discussions and actions at both the local level and with state representatives over a couple of legislative sessions to modify job creation economic development incentives such as the proposed modification of OneMaryland type programs.



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

- The broadband and critical infrastructure finance authority is an example of a tool that local leaders can develop while holding discussions with prospective providers of broadband connectivity in the region. Review of the best practices section will provide additional ideas for financial tools that the community could also develop.