



Western Maryland Broadband Deployment Strategy

FINAL REPORT, 2nd Edition

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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.

Dedication

The writers and producers of this report wish to pay special honor to a Western Maryland broadband entrepreneur, Mr. Buford Saville, whose contributions were noted this October 6, 2003 in the Cumberland Times-News. In reaction to receiving poor television coverage in his rural community, he and his father-in-law rigged up one of the nation's first cable television stations in 1951 providing better coverage for his Cumberland customers than contemporary urban viewers were able to get in Baltimore and Pittsburgh. During most of that first decade, their company, Potomac Valley Television, Inc., was the largest in their industry. When the company was sold to TCI of Maryland in 1983, it had 53 employees and 24,000 subscribers. To all in rural Maryland who may ever despair of staying perpetually behind in telecommunications services, Buford Saville's example is one that encourages us to either do something about it or help someone who can bring us to the point where we can lead the industry instead of waiting to be served by it.

Foreword/Introduction

As this report covers more than 150 pages, and its referenced and included attachments cover many more pages, please note the following regarding this document:

There are basically three major sections to the main body of this report:

1. Executive summary and project goals, which describe the project, the challenges faced by the private sector in Western Maryland, and the expected outcome;
2. Survey, interviews, best practices, and research section; and
3. Strategy, business cases, and policy recommendations sections.

To avoid repetition, very little information is repeated from section to section, yet many of the sections still remain independent and can be read separately.

For a brief review of the study, we recommend reviewing the Rural Challenges and Project Goals section and the three last sections entitled Business Cases, Policy Recommendations, and Strategy/Next Steps.

In addition to the main body of this report, there is an additional exhibit section containing business cases, proposals, and policy recommendations of broadband applications, services and infrastructure providers. Electronic or CD copies of this report along with its exhibits are available from the Tri-County Council for Western Maryland's web site (<http://www.tccwmd.org>).

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:
 - a. Different parts of the region,
 - b. Different types of customers, and from
 - c. 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.



RURAL CHALLENGES AND PROJECT GOALS

The purpose of the first section of this report is to lay a baseline or foundation for the study. In the next few pages, we outline the challenges that face private sector businesses in rural Maryland and the goals that we developed to deploy broadband to these underserved areas.

TECHNOLOGICAL BASELINE

Before outlining the challenges, it is critical to understand what broadband means and how it is used by businesses (as this is a report focusing primarily on private sector issues). Broadband, for the purposes of this study, refers to high-speed access to the Internet.

Both the term ‘broadband’ and ‘high-speed’ have multiple definitions; the FCC even has published several definitions of these terms over the past few years, with a recent enhancement in November 2003 as they discussed rural health care. We are primarily concerned about the functional ability of a business to perform applications over the Internet, and only as a consequence of that are we concerned with a specific rate of data transmission.

However, there are vast differences between broadband services. Some services are geared towards very small businesses and individuals, while others are able to support the needs of hundreds of users or bandwidth-intensive applications. This is the primary discriminating factor we use when defining broadband service – the difference between ‘**Moderate**’ Internet access and ‘**Intensive**’ access.

Moderate Internet access, in today’s technology, includes services such as DSL, cable modems, wireless Internet, and satellite ‘DSL’ service. As the only exclusion from this category is dial-up access, ISDN, multi-BRI ISDN, and fractional T-1 access are also part of this set of services. In essence, these services provide smaller groups of individuals or low intensity applications with adequate access to accomplish their objectives. Typical applications include many home offices, sole proprietorships, user side of ecommerce, non-technical businesses, store-and-forward email applications, and many telecommuters.

Intensive Internet access includes services that provide robust, bi-directional service capable of supporting thousands of web users (either internal or external) and graphical applications. These services are typically defined as services with bandwidth greater than T-1 (1.544 megabits per second). Large businesses, businesses that host web sites, remote offices, and most medical organizations and others that make regular use of imaging or video applications would require access of this magnitude. Most offices with over 25 employees, by virtue of aggregating their requirements, need or will need this type of access.

The reason behind this differentiation is simple – we have focused our efforts to drive the deployment of broadband in rural Maryland – including BOTH **Moderate** and **Intensive**



services. The purpose of this study is not simply to secure DSL or cable modem availability across the region, as an example, since this would not suffice for businesses that need Intensive Internet access. Economic disincentives would still exist, in this scenario, discouraging the growth or relocation of businesses to the region.

Our team also needs to comment on a frequently made assertion beyond this clarification of the two levels of Internet services:

Today, in Western Maryland, private sector businesses can implement Intensive Internet access and can purchase these services for their use from a variety of carriers.

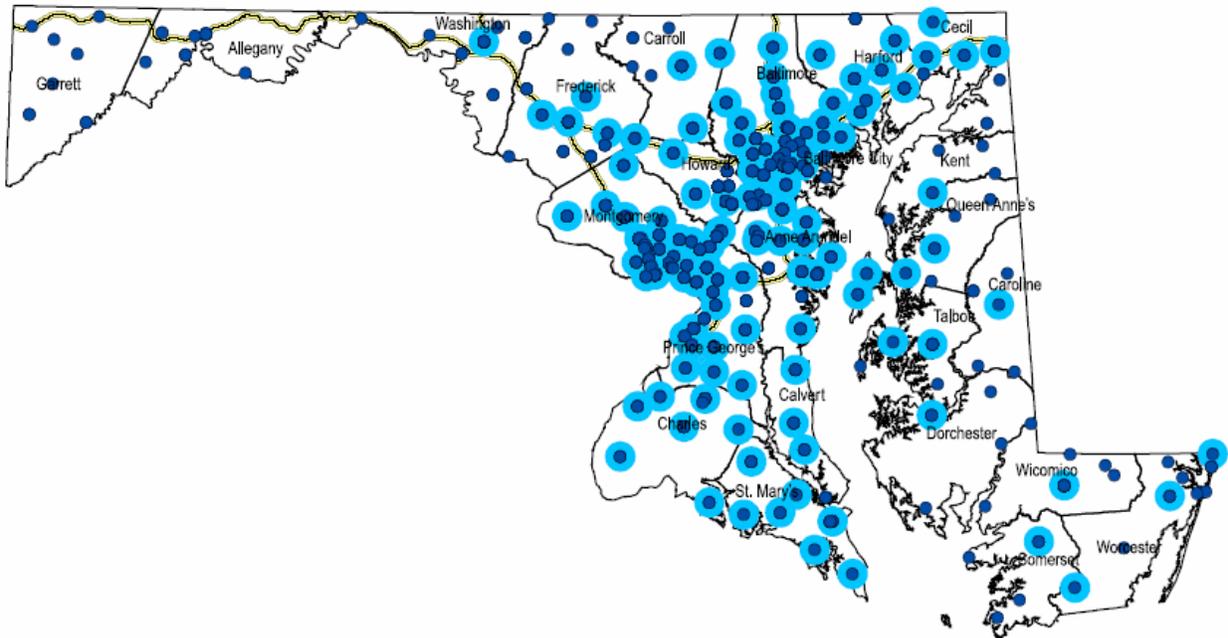
While this assertion is true, it leaves many things unsaid. Today, a company in Garrett County can buy a T-1 from AT&T or from MCI to the Internet, and can obtain apparently similar access to its counterparts in urban areas, such as Montgomery County. There is no fundamental inability to purchase these services, as they are available. The local exchange carrier (LEC), Verizon in most areas of Maryland, can provide T-1 access to almost any carrier's point-of-presence (POP) and therefore allow high-speed Internet/broadband access to all private sector companies.

So, what's the problem? What are the challenges that rural businesses face? Why has this issue attracted attention from the press to the legislature and the Governor of Maryland? The answer is that, while access is available, it is not the same as the access in urban areas, for three major reasons:

1. The availability of **Moderate** Internet access services is limited, and geographic or other physical issues further limit their ubiquity. As an example, DSL covers almost 95% of the population and businesses in Montgomery County, Maryland, but will never be so in Garrett County, as current DSL technology requires users to be within 3 miles of their LEC central office (CO). Users in Garrett and Allegany counties can be up to 10 miles from their CO, as there are only 7 COs in Garrett and 6 in Allegany. Capital expenditures to deploy other technologies are often seen without a tangible return-on-investment, further limiting the deployment of technologies that could serve these areas. The diagram on the following page outlines the central offices in Maryland, and graphically depicts the difference in CO density between rural and urban areas.⁶
2. While **Intensive** Internet access is almost ubiquitous in rural areas, it is not the same access as in urban areas as the distance between the user's site and the carrier's POP for rural customers is substantially different, which can cause additional outages and imposes substantially higher access costs. The next paragraphs fully outline this issue. In

⁶ 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.

addition, facilities in rural areas can be of lower quality than those in urban areas (e.g., services on poles versus underground wiring, older wiring, etc.), causing additional outage potentials and service deficiencies.



3. Many users in rural areas can not obtain services from diverse routes and carriers. This is particularly important for those whose mission-critical applications require constant access to outside resources.

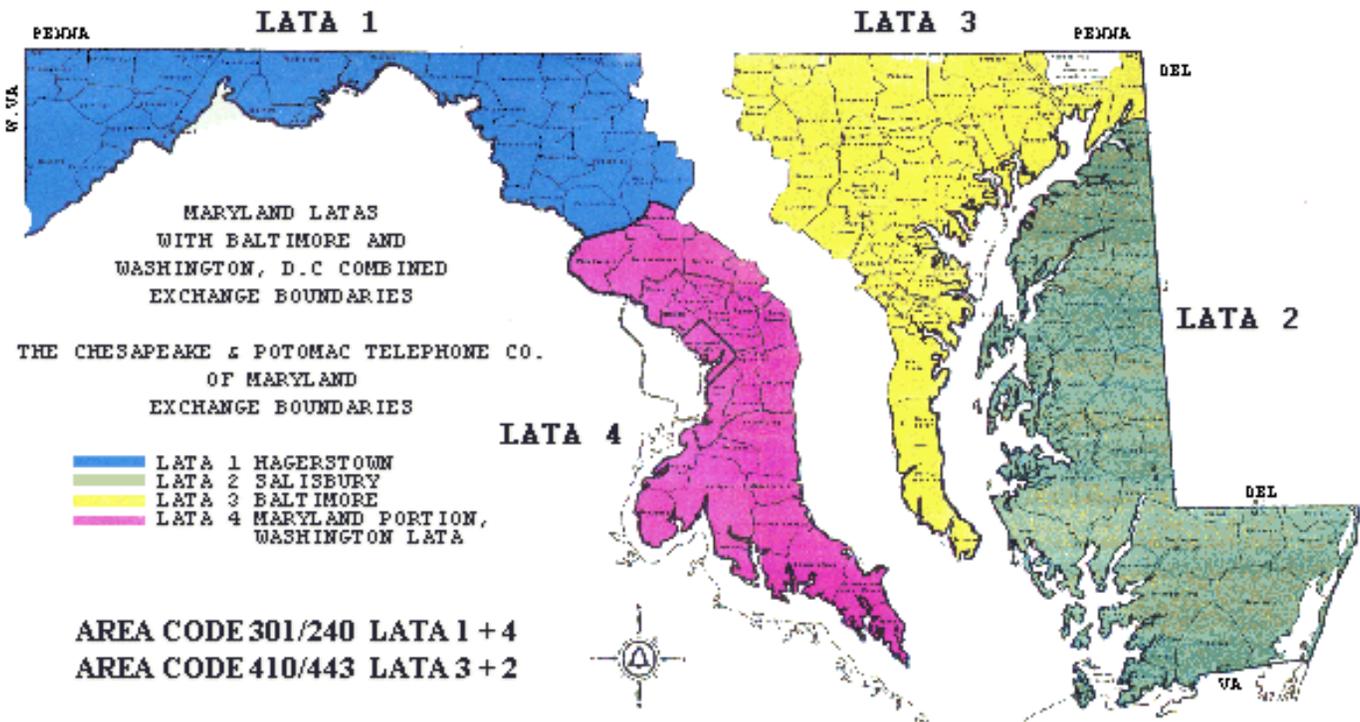
The issues that face **Moderate** Internet access will be mitigated somewhat by the proposals from vendors associated with this study, and continue to be further mitigated by advances in technologies that provide low-cost, higher-bandwidth solutions for **Moderate** access applications. However, the issues facing **Intensive** application users are more profound and require substantial investments and improvements to western Maryland’s communications infrastructure.

Prior to understanding these issues, background on local access and transport areas (LATAs) is required. In the Modified Final Judgment of 1982 that led to the breakup of the AT&T monopoly, LATAs were created. In essence, they’re areas drawn on a map to differentiate which traffic would be carried by a local carrier (e.g., Verizon) and which traffic would be carried by a long distance carrier (e.g., MCI, AT&T, Sprint). Traffic within a LATA was in the province of the local company; a long distance company was required for all traffic that crossed LATAs.⁷ Traffic passing outside a local LATA would be transported by the incumbent LEC to the long distance carrier’s point-of-presence (POP), and, upon arriving at the destination LATA, would travel from the long distance carrier’s POP to the destination using the local carrier in that region.

⁷ Note that many changes have been happening in the telecommunications industry – especially the Federal Telecom Act of 1996 – which are slowly blurring this distinction.

Most long distance carriers have 200-300 full service POPs nationwide – POPs that can provision data and Internet services, as well as traditional voice services. AT&T, the carrier with the most domestic POPs, has over 500. As there are 164 LATAs across the nation, most LATAs, especially rural LATAs, have only one long distance POP for each carrier. These POPs are often co-located in one facility known as the ‘carrier hotel’.

Maryland has 4 LATAs, two of which encompass additional territory in neighboring states. The following map, courtesy of the Maryland Public Service Commission, outlines Maryland’s four LATAs.



The LATA indicated as LATA 1 in the map (officially LATA 240) covers the three Western Maryland counties and Frederick County, plus additional territory in Pennsylvania and West Virginia which is not shown on this map.

RURAL CHALLENGES – INTENSIVE APPLICATIONS

For any mid-sized or large business with substantial application demands to communicate outside its LATA, whether through a private network or the Internet, it needs access to a long distance carrier point-of-presence (POP). A business with 100 employees might require three T-1 lines to its long distance carrier – one for Internet access, one for a private network (such as frame relay) and one for dedicated long distance voice access. While this report focuses on broadband access, note that the issues described here are often multiplied many times for a business located in or desiring to move in to this region.



In the Washington DC LATA (LATA 236), AT&T, WorldCom, Sprint, and other major carriers have approximately 15 unique POPs (1220 L Street, Arlington, Rockville, Silver Spring, Herndon, Reston, etc.). In this LATA, circuits to a long distance carrier rarely exceed 20 miles. Extensive competition for services in this urban area often results in promotional, flat-rate T-1 access circuits (\$100-\$300 per T-1 local loop).

However, in Western Maryland, most carriers have only one or two POPs, and the majority of these carriers are based in Frederick or in Myersville, both of which are in the far eastern side of the LATA. This geographic location puts users in Allegany County and especially Garrett County at a disadvantage, as they have extensive local loops to reach their carrier's POP. In the Western Maryland LATA, Sprint has one POP in Hagerstown, and MCI has a POP in Myersville and in Hedgesville, WV.⁸ Most other carriers have only one POP in the LATA, and it resides in the carrier hotel in Frederick County.

T-1 circuits used to connect to long distance dedicated voice circuits, private data networks, or Intensive Internet access, cost approximately \$350 + \$10/mile from the local carrier. This increases the costs of these services for businesses in rural areas which can often be 50 – 100 miles from their nearest POP. The following tables compare exactly identical service offerings from five major Internet access carriers, prepared by NetGain Communications, a premier carrier agent⁹, who represents over 50 different carriers. The carriers are ACC¹⁰, AT&T, MCI, Qwest, and Sprint.¹¹

Dedicated T-1 Internet Access			
Location:	Garrett County		
Address:	203 South Fourth Street Oakland, Maryland 21550		
Phone Number:	(301) 334-8970		
<i>Carrier</i>	<i>Monthly</i>	<i>One-Time</i>	
Carrier A	\$ 1,991	\$	405
Carrier B	\$ 2,368	\$	400
Carrier C	\$ 1,551	\$	-
Carrier D	\$ 3,071	\$	-
Carrier E	\$ 639	\$	-

Dedicated T-1 Internet Access			
Location:	Montgomery County		
Address:	101 Monroe Street Rockville, MD 20850		
Phone Number:	(240) 777-2500		
<i>Carrier</i>	<i>Monthly</i>	<i>One-Time</i>	
Carrier A	\$ 700	\$	405
Carrier B	\$ 750	\$	400
Carrier C	\$ 1,120	\$	-
Carrier D	\$ 733	\$	-
Carrier E	\$ 639	\$	-

⁸ Based on current information from carrier sources. Note that carriers often provide 'virtual' POP services from other cities to remain competitive or to satisfy other requirements. While virtual POPs can reduce service costs, the circuits often are still routed to the physical POP location on long local loop circuits.

⁹ See <http://www.netgaincom.com> and the Strategy section of this report for more information.

¹⁰ A subsidiary of AT&T as opposed to Allegheny Communications Connect discussed throughout the study.

¹¹ Pricing is not referenced to carrier name due to carrier agreements, and carriers have been presented in the table in a random order.



The offering shown under ‘Carrier E’ is a one-time promotional pricing arrangement, available for the most part only through the agent channel and is normally not made available for customers working with account teams or carrier’s toll-free order desks. These rates reflect the best possible deals available from these five carriers for a standard service offering in December 2003.

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.

In addition, mileage on local loop point-to-point access services often do not have the same level of diversity, redundancy, and fault tolerance as long distance backbone networks, which can increase outages and downtime. As an illustration, compare two scenarios – a client three miles from its long distance carrier’s POP and a client 75 miles from its carrier’s POP. In the first scenario, the client is provisioned with a T-1 to its central office, which is connected via the local carrier’s network to the adjacent CO where the circuit is transferred to the long distance carrier. This circuit has now entered the ‘cloud’ backbone of the long distance network, and traffic on this circuit can be rerouted to any facilities as it travels to its final destination.

In the second scenario, the local loop to the client’s site is the same, but the circuit from its CO must be nailed up between as many as 15 or 20 COs, and sometimes even different local carriers, until it reaches the long distance carrier. These 75 miles of local loop are not as reliable as ‘cloud’ services, and this scenario increases the chance for a failure in the circuit.

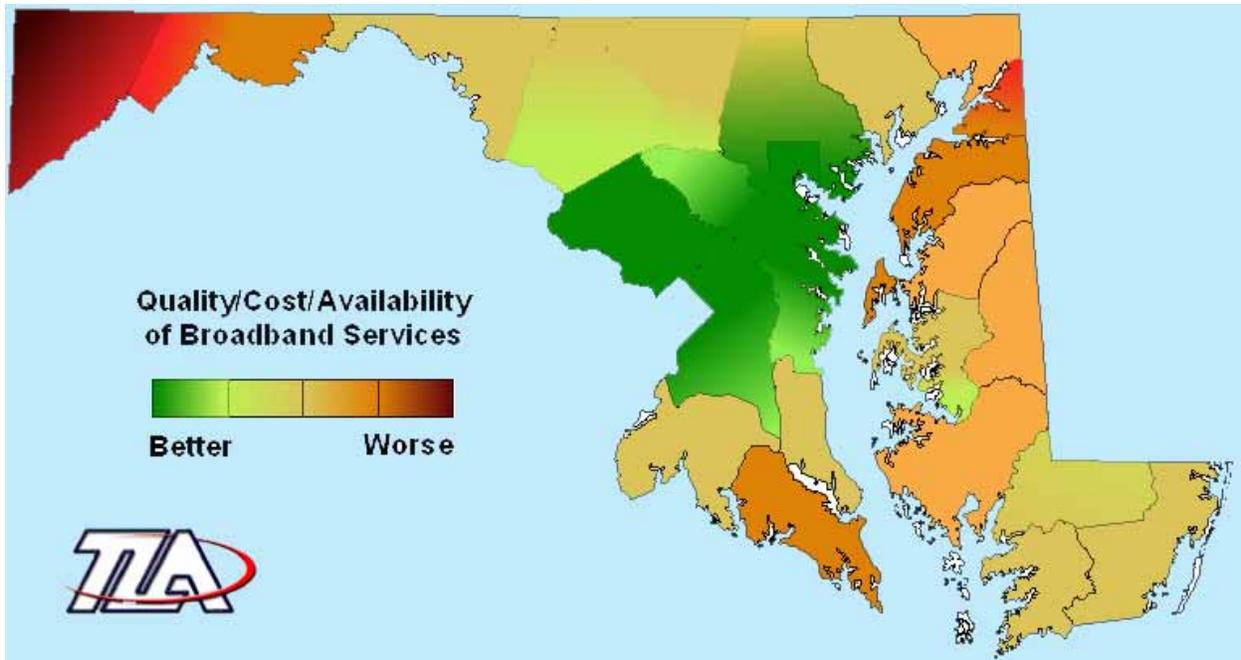
However, in the rural areas, clients often are also much further from their CO than in urban areas. As an example, Allegany County has 6 COs and Montgomery County has approximately 30 COs, while Allegany’s 430 square miles is not much less than Montgomery’s 497 square miles.¹² The circuit from a CO to a client’s site most often is the source of outages – sometimes as much as 75% of all circuit failures. Increasing the mileage on this circuit increases the possibilities of more failures. Additionally, the often older or poorer facilities in rural areas only aggravate this problem.

This last issue also impacts **Moderate** access, as some users within 3 miles of a CO may still be unable to obtain DSL services, as an example. However, as traffic over most Moderate access services enters the ‘cloud’ network immediately at the CO or transmission facility, long distance local loop circuit issues have only a limited impact on this class of service.

As a final example, the *additional* costs to set up a remote call center of 30 employees in Garrett County versus Montgomery, Baltimore, or Fairfax counties could easily exceed \$5,000 per month.

¹² All CO and geographic figures in this paragraph from the TEDCO CO/DSL maps and the U.S. Census Bureau’s web site at <http://quickfacts.census.gov/qfd/states/24000.html>.

The following illustration summarizes all of these challenges county-by-county across the state in a graphical format. In this illustration, none of the three counties in western Maryland has any green – symbolizing the lack of urban-type services in the region.¹³



Private sector businesses in rural LATAs, therefore, have several specific challenges, especially in the purchase of **Intensive** 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:
 - Intensive Internet access
 - Dedicated long distance voice access circuits
 - Frame Relay networking
 - Inter-LATA point-to-point services

¹³ 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.



PROJECT GOALS

TLA has outlined the following goals for this project, based on the requirements identified in the RFP, and further modified in Advisory Team meetings and as a result of the surveys, interviews with businesses, and vendor meetings:

1. Make Moderate application Internet access available to all businesses in rural Maryland immediately (200 Kb/sec in one direction)
2. Provide competitive options for Moderate Internet access, including last-mile options, within 1 year, for almost all businesses. Increase speed of moderate access to exceed 200 Kbps in both directions (200 Kb/sec to 1Mb/sec services in both directions) for at least one competitive option. Make multiple competitive options at higher speeds available within 1 year for 50% of businesses.
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)
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.
5. Incorporate survivable broadband use as a cornerstone of interoperable emergency services communication within one year
6. Create economic development incentives at the local and state level for firms creating infrastructure and services with beneficial economic impact within 18 months
7. Provide financial tools to foster public and private sector infrastructure and service initiatives such as a broadband infrastructure bonding authority within 18 months.

Each of these goals is addressed, with the strategy to achieve the goal, in the Strategy section at the end of this document.

ADDITIONAL BACKGROUND FOR MODERATE AND DIVERSE INTERNET ACCESS

Many home-based broadband offerings are insufficient to support standard business applications required by telecommuters, as these offerings tend to involve higher download speeds coupled with slow upload speeds. Upload speeds are often similar to or only double that of a standard dial-up modem connection. Residential broadband offerings with these asymmetrical bandwidth services made sense for those who were merely making requests for others to send larger files, but, make little sense when the user sends as many large files as he or she receives. Traditional web-surfing is well-g geared towards asymmetrical services; e-mail, Internet telephony, and other



advanced business applications require symmetrical high-speed access for productivity and functionality. As memory intensive computer applications that contain voice, images, or video grow more popular, even non-business residential users will require symmetrical broadband services.

Many businesses and their employees in remote locations, including home offices, need to send files as large as they receive them. These rural Maryland users are competing in regional, national, and global markets and need to be on a level playing field or better with any user in any environment anywhere in the world. Therefore, it is important not to lock rural users into a process or technology that keeps them perpetually behind.

It is also important for rural Maryland to enjoy the benefits of diverse routes and diverse carriers. Commensurate with our recommendations for supporting public safety and homeland security applications, diverse routes will also infer diverse technologies of terrestrial, wireless, and satellite technologies which will offer different bandwidth and cost models depending on core technologies. Bandwidth alone is not the only issue requiring consideration.

Technology and service deployment strategies will be diverse as different companies will have different business models and technology refreshment cycles which will make it possible to deploy broadband infrastructure and services quickly in different ways. The same company will find that it can provide more than 1 Mb/sec to the home in some areas through DSL, while providing fiber to the home in another area, and providing it wirelessly in another. Topography, distance to backbone providers, current investments, customer demand, and applications all have a role to play in coming up with the best strategy for a neighborhood, let alone a town, county or region.

TLA believes that it is this very same diversity of suppliers, technologies, and techniques that will make it possible to meet the aggressive goals that form the basis of a successful implementation strategy.

DEMAND AGGREGATION OPPORTUNITIES

There are two kinds of demand aggregation opportunities in western Maryland that can help close the gap in business cases for those offering broadband backbone and last mile solutions. The first kind is where a large business or government entity negotiates for a fiber connection or point of presence for their own need that will make it possible for other businesses to make use of that same point of presence. The second is where a larger number of smaller users organize to purchase capability either as a group or at roughly the same time so that the provider can see the opportunity to make a business case for their investment required to offer the service at that location.

There are current examples of both in western Maryland that indicate that it should be possible to provide these services in the near future. For example, the activities of AllCoNet2 in Allegany County and the County's current negotiations with backbone providers that would connect the



wireless broadband local network of AllCoNet2 to the outside world could make it possible for other businesses to collocate with AllCoNet2 to the same backbone providers. In fact, TLA discussions with several of these backbone providers have shown that more than one will consider creating a point of presence that other backbone providers could use so that prospective customers would have a choice of multiple providers.

The second type of example is also possible as new applications are making it worthwhile for businesses to encourage broadband usage among their employees and customers from home. Many businesses have expressed willingness to make it possible for service providers to sell services to groups of individual employees and customers. One of the hesitations of some of the businesses reflects the concern that users could still vent their anger with faulty services at them instead of the provider. To overcome this, TLA discussed several strategies that seemed to reduce their fears and increased their willingness to participate in programs that would aggregate individual demand. One suggestion that received widespread support was the creation of a chamber of commerce “broadband fair” where businesses would work with providers to sign up users in groups.



BUSINESS SURVEY RESULTS

The TLA Associates team, including the Jacob France Institute at the University of Baltimore, was retained to create and implement a survey of businesses in Western Maryland to assess the existing gap between broadband services available in the region and the use for and need for these services by businesses.

SURVEY OVERVIEW

This survey was designed to collect business demand, and not specific residential demand for broadband (high-speed Internet) services. However, a number of questions on the survey were designed to detect business interest in communicating with employees and customers at home, and, possibly sponsoring that service. See Attachment A for the complete survey and accompanying introduction letters encouraging response.

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.

COMPANY DEMOGRAPHICS

Firms in Western Maryland were asked to provide information on their location, what type of firm they are, and their current and expected employment. Table 1 shows the County of the responding firm and the number of surveys mailed to firms in each of the three counties. The greatest number of surveys was returned from companies in Washington County, but the greatest percentage of firms responded from Garrett County with 22% of firms that were mailed a survey returning a completed survey.



Table 1
County of Responding Firm

	Number	Percent	Total Mailed	Valid Responses as a Percentage of Mailed
Total Responses	174		1,231	
No Response to County	8	5%	64*	
<hr/>				
Total Valid Responses	166		1,167	
Allegany	47	28%	327	14%
Garrett	40	24%	179	22%
Washington	79	48%	661	12%

* - Returned undeliverable

Table 2 shows that of the valid responses, the greatest percentage of firms was locally owned and headquartered, single site operations (62%). Twenty-five percent (25%) of firms were locally headquartered, with more than one facility, and 8% were headquartered out-of-region, with the site answering the survey a remote office location. Of the firms headquartered elsewhere, two firms have their headquarters located in Maryland, two firms have their headquarters in Pennsylvania, and one firm each has their headquarters in Virginia, Ohio, Colorado, and Oklahoma. Of the responses that indicated ‘Other’, all were state or local government organizations.

Firms were also asked to provide their current employment in 2003 and their projected employment at the end of 2004 for both full-time and part-time workers. Table 3 shows the number of firms by employment size for 2003 and 2004 and the percentage change. Currently in 2003, the responding firms, from which their county could be determined, employ a total of 10,808 full-time workers and 3,095 part-time workers. The greatest percentage of firms employs less than 25 workers. Projected for 2004, responding firms expect to employ a total of 10,973 full-time workers and 3,164 part-time workers. From 2003 to 2004, responding firms are predicting to increase both full-time and part-time employment by 2%.



Table 2
Firm Description

	Number	Percent
Total Responses	174	
No Response	15	9%
<hr/>		
Total Valid Responses	159	
Single Local Site	98	62%
Locally Headquartered, Multiple locations	40	25%
Headquartered out-of-region, Multiple locations	12	8%
Government*	9	6%
<hr/>		
If Not Locally Headquartered, Location of HQ	12	
Maryland	2	17%
Pennsylvania	2	17%
Virginia	1	8%
Ohio	1	8%
Colorado	1	8%
Oklahoma	1	8%
No Response	4	33%

* - All responses to 'Other' were state or local government organizations



Table 3
Firm Employment - Three County Region

	Number	Percent	Current (2003)		Projected (2004)		Percentage Change	
			Number of Employees		Number of Employees		Percentage Change	
			Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Total Responses	174							
No Response to County	8	5%	210	49	251	56	20%	14%
Total Valid Responses	166							
Under 25 Employees	78	47%	834	189	882	176	6%	-7%
25 to 49 Employees	29	17%	827	161	787	173	-5%	7%
50 to 99 Employees	27	16%	1,486	476	1,559	469	5%	-1%
100 or More Employees	32	19%	7,661	2,269	7,745	2,346	1%	3%
Total Employment			10,808	3,095	10,973	3,164	2%	2%
Allegany County								
Total Valid Responses	47							
Under 25 Employees	20	43%	200	50	214	38	7%	-24%
25 to 49 Employees	11	23%	289	79	254	82	-12%	4%
50 to 99 Employees	11	23%	624	160	657	165	5%	3%
100 or More Employees	5	11%	742	210	752	220	1%	5%
Total Employment			1,855	499	1,877	505	1%	1%
Garrett County								
Total Valid Responses	40							
Under 25 Employees	17	43%	129	45	146	45	13%	0%
25 to 49 Employees	5	13%	160	20	129	24	-19%	20%
50 to 99 Employees	8	20%	394	233	412	222	5%	-5%
100 or More Employees	10	25%	2,127	394	2,154	458	1%	16%
Total Employment			2,810	692	2,841	749	1%	8%
Washington County								
Total Valid Responses	79							
Under 25 Employees	41	52%	505	94	522	93	3%	-1%
25 to 49 Employees	13	16%	378	62	404	67	7%	8%
50 to 99 Employees	8	10%	468	83	490	82	5%	-1%
100 or More Employees	17	22%	4,792	1,665	4,839	1,668	1%	0%
Total Employment			6,143	1,904	6,255	1,910	2%	0%



TELECOMMUTING

Forty-one firms responded that they have employees that telecommute on a regular basis (see Table 4). Of these firms, there are a total of 879 employees that telecommute, which is 7% of the total 2003 employment of responding firms. When asked if additional employees would telecommute if high speed Internet access were available in more employees' homes, all of the firms that already had telecommuting employees responded that more of their workers would telecommute. A total of 234 more employees would telecommute for an increase of 27%.

However, when reviewing the specific survey data, we discovered that one respondent had 662 of the 879 telecommuters. The project team followed-up with this respondent, and in an interview, discovered that these are actual telecommuters or contractors that normally use telecommuting methods to access data and resources at the main company facilities. As this is a legitimate telecommuting application, and as there are undoubtedly other larger organizations with telecommuters who did not respond to the survey, the data has been kept as part of the survey results. Readers are notified, however, that the Telecommuting numbers can be re-analyzed with a reduction of 662 current and no reduction of future telecommuters if this organization was excluded. Also, a business considered someone a telecommuter if they worked from a remote site on a regular basis. In many cases this meant that the same telecommuter also worked from the regular business site.

The telecommuting question was one of a number that indicated that businesses need to communicate with employees and customers from remote broadband sites including home. Many of these needs were sufficiently compelling to motivate some employers to pay for some of that remote broadband coverage.

Table 4 - Telecommuting

<i>Firms with Employees that Currently Telecommute</i>	Total	Allegany	Garrett	Washington	No Response to County
Number of Firms	41	14	8	15	4
Number of Employees	879	89	34	725	31
<i>If High-speed Internet Access Were Available Would Additional Employees Telecommute</i>					
Number of Firms	41	14	8	15	4
Number of Additional Employees	234	68	35	122	9
Percentage Increase in Telecommuters	27%	76%	103%	17%	29%



COMPANY COMMUNICATION SERVICES

Firms were surveyed as to the types of technologies that they use in their business, the frequency and satisfaction of Internet and communication services, and various other questions gauging their demand for greater Internet access and communication services.

Table 5 shows that over half of the responding firms (52%) use dial up Internet access in their business. Thirty-two percent (32%) use dedicated Internet access, 18% use cable modem service, and 12% use private corporate Wide Area Network. Other technologies used by firms included home Internet connections and wireless Internet connections. Firms were allowed to respond to using multiple types of technology in their business. Twenty-two firms used three or more of these technologies in their business and the employment size of these firms ranged from 15 to over 1,000 employees with 64% of these firms having at least 100 or more employees.

Table 5
Which of These Technologies Does Your Business Currently Use?

	Total		Allegany		Garrett		Washington		No Response	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Responses	174		47		40		79		8	
Dial Up Access	90	52%	19	40%	29	73%	38	48%	4	50%
Dedicated Internet Access	55	32%	9	19%	15	38%	28	35%	3	38%
Cable Modem Service	31	18%	9	19%	0	0%	19	24%	3	38%
Private Corporate WAN	21	12%	4	9%	5	13%	10	13%	2	25%
Video Conferencing Lines	13	7%	3	6%	4	10%	5	6%	1	13%
DSL	11	6%	1	2%	1	3%	7	9%	2	25%
AllCoNet	10	6%	10	21%	0	0%	0	0%	0	0%
Direct Satellite Internet Access	7	4%	1	2%	4	10%	2	3%	0	0%
Other	7	4%	4	9%	3	8%	0	0%	0	0%
Private Satellite Network	5	3%	0	0%	2	5%	3	4%	0	0%

Table 6a indicates the reported satisfaction with various Internet access or wide area communication services and whether firms would like the service at a faster rate for those firms that use the service either frequently or often. The service for which firms is the most satisfied are corporate Internet email (75%), Internet video conferencing (75%), and VOIP (71%). The services that these firms would like at a faster rate included Internet video conferencing (100%), telemedicine applications (75%), and VOIP (71%).

Table 6b indicates satisfaction with various Internet access or wide area communication services and whether firms would like the service at a faster rate for those firms that use the service either seldom or not at all. The service for which firms is the most satisfied are individual Internet email (48%) and transmitting/receiving large files (37%). The services that these firms would like at a faster rate included transmitting/receiving large files (38%), VOIP (37%), and Internet-based video broadcasts (100%).



Table 6a
Often or Frequent Use of Internet Access or Wide Area Communication Services

	Number	Satisfied		Use More If Faster Rate	
		Yes	Percent	Yes	Percent
Internal Company Email	104	N/A	N/A	N/A	N/A
Internet Email (Corporate)	105	79	75%	47	45%
Internet Email (Individual)	90	54	60%	40	44%
Internet Audio Broadcasts	23	12	52%	14	61%
Internet-Based Video Broadcasts	15	7	47%	10	67%
Non-Internet Video Conferencing	13	9	69%	N/A	N/A
Internet Video Conferencing	4	3	75%	4	100%
Telemedicine Applications	4	1	25%	3	75%
Distance Learning	19	8	42%	10	53%
eCommerce	59	39	66%	27	46%
Web Chat Customer Support	12	7	58%	4	33%
Transmit/Receive Large Files	72	25	35%	44	61%
VOIP	7	5	71%	5	71%
VPN	29	19	66%	15	52%
Telecommuting/Teleworking	31	12	39%	17	55%

Table 6b
Seldom or No Use of Internet Access or Wide Area Communication Services

	Number	Satisfied		Use More If Faster Rate	
		Yes	Percent	Yes	Percent
Internal Company Email	30	N/A	N/A	N/A	N/A
Internet Email (Corporate)	15	4	27%	2	13%
Internet Email (Individual)	21	10	48%	5	24%
Internet Audio Broadcasts	72	16	22%	18	25%
Internet-Based Video Broadcasts	86	19	22%	32	37%
Non-Internet Video Conferencing	78	8	10%	N/A	N/A
Internet Video Conferencing	87	10	11%	27	31%
Telemedicine Applications	66	6	9%	9	14%
Distance Learning	90	22	24%	24	27%
eCommerce	60	14	23%	20	33%
Web Chat Customer Support	88	8	9%	22	25%
Transmit/Receive Large Files	60	22	37%	23	38%
VOIP	92	6	7%	34	37%
VPN	71	2	3%	17	24%
Telecommuting/Teleworking	67	5	7%	19	28%



When asked if their firm would pay for and use these services if faster Internet services were available at rates comparable to the nearest urban area, 66% of responding firms replied that they would (see Table 7). Garrett County firms were the most likely to use faster Internet services (78%) and Washington County firms were the least likely to pay for and use faster Internet services at (63%).

Firms were asked to provide their average monthly expenditures on voice calls and lines and data services (see Table 8a and Table 8b). Nearly half (49%) of responding firms spend at least \$1,000 per month on voice calls and lines with the average monthly cost being \$2,718. Seventy percent (70%) of firms spend \$499 or less on data services monthly. The average monthly firm expenditure on data services was \$1,168.

Table 7
Number of Firms that Would Use and Pay for Faster Internet Services if they Were Available at Rates Comparable to the Nearest Urban Area

	<i>Total</i>		<i>Allegany</i>		<i>Garrett</i>		<i>Washington</i>		<i>No County</i>	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total Number of Firms	174		47		40		79		8	
Total Responding Yes	114	66%	30	64%	31	78%	50	63%	3	38%
Under 25 Employees	48	62%	10	53%	10	59%	27	73%	1	25%
25 to 49 Employees	24	86%	9	82%	5	100%	9	82%	1	100%
50 to 99 Employees	17	61%	9	82%	6	75%	2	25%	0	0%
100 or More Employees	25	78%	2	67%	10	100%	12	75%	1	100%

Table 8a
Company Estimates of Monthly Voice Calls and Line Costs

	Number	Percent
Total Responses	174	
No Response	26	15%
Total Valid Responses	148	
Under \$250	21	14%
\$250 to \$499	26	18%
\$500 to \$999	29	20%
\$1,000 to \$2,999	38	26%
\$3,000 and Above	34	23%
Average Monthly Cost	\$2,718	



Table 8b
Company Estimates of Monthly Data Services Costs

	Number	Percent
Total Responses	174	
No Response	51	29%
Total Valid Responses	123	
Under \$100	50	41%
\$100 to \$199	20	16%
\$200 to \$499	16	13%
\$500 to \$999	13	11%
\$1,000 to \$4,999	15	12%
\$5,000 and Above	9	7%
Average Monthly Cost	\$1,168	

Firms were also asked a number of questions about their likelihood to use faster Internet service in given circumstances. When asked if their organization would pay for high-speed Internet services for a customer if it generated more revenues than costs, 38% of the firms responded that they would (Table 9).

Table 9
Would Your Organization Pay for High Speed Internet Services for a Customer if it Generated More Revenues than Cost

	Number	Percent
Total Responses	174	
No Response	7	4%
Total Valid Responses	167	
Yes	63	38%
No	104	62%

When asked if they would use faster Internet access service if it were provided free of charge by another business supplying a service to you, 80% responded that they would (Table 10).



Table 10
Would You Use a Faster Internet Access Service if it were Provided Free of Charge by Another Business

	Number	Percent
Total Responses	174	
No Response	7	4%
Total Valid Responses	167	
Yes	134	80%
No	33	20%

When asked if they or an employee would be more likely to sign up for a course at a college or university if the course included high-speed Internet service to the home or business, 68% of firms responded that they would sign up for the course (Table 11).

Table 11
Would You or an Employee Be More Likely to Sign Up for a Course at a College or University if the Course included High Speed Internet Access to Your Home or Business

	Number	Percent
Total Responses	174	
No Response	6	3%
Total Valid Responses	168	
Yes	115	68%
No	53	32%

Businesses were also asked as to how they would like to have service improved by phone companies, the cable company, and Internet providers. Table 12 lists the responses provided by the responding firms. Firms were allowed to provide more than one suggestion as to how they would like to have their service improved by any or all of the types of companies. The appendix lists all the responses by the businesses to this question.

When asked for suggestions to improve service by phone companies, the most common responses were to improve technical service/infrastructure (26%), costs to businesses (20%), work on billing/pricing plans (16%), and provide high-speed service (13%). Businesses suggested that the cable company reduce costs (33%), improve technical service/infrastructure (29%), and provide high-speed service (21%). In regards to Internet providers, businesses suggested providing high-speed service (45%), improving technical service (29%), and reducing costs (24%).



Table 12
Ways Businesses Want to See Improvements by Providers

	Phone Companies		Cable Company		Internet Providers	
	Number	Percent	Number	Percent	Number	Percent
Total Responses	174		174		174	
No Response	72	41%	126	72%	92	53%
Total Valid Responses	102		48		82	
Improve Technical Service/Infrastru	27	26%	14	29%	24	29%
Reduction of Costs	20	20%	16	33%	20	24%
Billing/Pricing Plan	16	16%	2	4%	2	2%
Other	14	14%	3	6%	4	5%
High-speed Service Desired	13	13%	10	21%	37	45%
Customer Service/Maintenance	12	12%	3	6%	3	4%
No Issues	11	11%	7	15%	10	12%
Wireless Issues	7	7%	N/A	N/A	N/A	N/A
More Channels/Content	N/A	N/A	6	13%	N/A	N/A

(Responses comprising 15% or more of the valid responses for this question are bolded in the above table.)

Thirty-two percent (32%) of businesses responded that there is a communications-related service that they have not implemented that would make it possible to grow their operations (see Table 13). The most frequently mentioned communications-related services included: company website; video conferencing/teleconferencing; high-speed Internet access; and remote/wireless access.

Table 13
Is There a Communications-Related Service Not Implemented at Your Site?

	Total		Allegany		Garrett		Washington		No Response	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Responses	174		47		40		79		8	
No Response	16	9%	7	15%	3	8%	6	8%	0	0%
Total Valid Responses	158		40		37		73		8	
Yes	50	32%	15	38%	13	35%	18	25%	4	50%
No	108	68%	25	63%	24	65%	55	75%	4	50%

Table 14 lists the reasons why the communications-related service was not implemented by their business. The most frequently cited response was that the service was too expensive (48%) followed by that it is not available to their business (33%). Other responses provided by responding firms included that there was a lack of resources and corporate restrictions.



Table 14
Why Have You Not Implemented this Service?

	<i>Total</i>		<i>Allegany</i>		<i>Garrett</i>		<i>Washington</i>		<i>No Response</i>	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Valid Responses	54		14		13		23		4	
Too Expensive	26	48%	7	50%	5	38%	12	52%	2	50%
Not Available	18	33%	3	21%	8	62%	5	22%	2	50%
Other	10	19%	4	29%	0	0%	6	26%	0	0%

Western Maryland businesses were asked to prioritize their greatest challenges with regards to their organization’s current communications services and information technology operations (Table 15). The most frequently cited challenges by firms were Internet access speed (24%); cost of Internet access or data services (18%); variety of options, carriers, speeds (12%); and maintenance of the current infrastructure (12%). Other challenges included cell service, regulations by the State of Maryland, reliability, security and viruses, and the need for wireless service areas.

Table 15 - Biggest Challenges with Regards to Your Organizations
Current Communications Services and Information Technology Operations

	Total Citing as 1st	Percent of Total Responses	Total Citing as 1, 2, or 3	Percent of Total Responses
Internet Access Speed	41	26%	87	51%
Cost of Internet Access or Data Services	30	19%	92	54%
Variety of Options, Carriers, Speeds	21	14%	65	38%
Maintenance of Current Infrastructure	21	14%	62	36%
Retention of Qualified Help	15	10%	33	19%
Redundancy, Availability, Fault Tolerance	14	9%	47	28%
Awareness of New Technologies	7	5%	47	28%
Other	6	4%	6	4%



KEY INTERVIEW FINDINGS

The TLA team conducted many interviews throughout this process. These interviews considered:

- Broadband **users** in private and public sectors
- Broadband **providers** in private and public sectors
- Broadband **applications** which would drive usage and supply of broadband infrastructure and services

The last category contains important drivers that impact the region, but those key applications and organizations are not necessarily from the region. They are important since they may, at times, have a very significant role in determining whether resources are deployed by private or public sector entities into the region.

These discussions were conducted on the strategic level with senior business and technical leaders. Whenever possible, the discussions included ways to substantially increase market share, defend against market losses, reduce costs, and improve profits using broadband telecommunications. The discussions also included a review of specific telecommunications infrastructure and services that were used by the companies and institutions in Western Maryland and at any other of their locations. These interviews also included institutions that impacted the use of broadband in the region even though their local presence may currently be minimal.

All of this information, including infrastructure and services, are deemed to be proprietary information of the companies. If specifics were included in this public report, they could result in unintentional sharing of information to their competitors that could damage their competitive positions. However, overview information is provided as Appendix B to this report.

BROADBAND USERS – GENERAL FINDINGS

Broadband users in the region can be classified into three size groups and two strategic use types.

Small Users (sub T-1)	Medium Users (T-1>DS3)	Large Users (20+ T-1s, 1DS3s+)
Mission Critical	Mission Critical	Mission Critical
Small Users	Medium Users	Large Users
Non-mission Critical	Non-mission Critical	Non-mission Critical

The largest companies, such as a Citigroup call center with over 2,000 employees, are large users who are generally satisfied with their telecommunications services where they are currently



located. They usually command attention from a national level account management team and contract from telecommunications services providers who provide market competitive services and prices.

The medium sized users of bandwidth were either satisfied or dissatisfied with services depending primarily on whether their usage was mission critical. In this case, mission critical is loosely defined by whether the organization can withstand an outage of data services for more than an hour without serious results.

There are examples of both within the region. Those that are supporting clients, plants, or suppliers outside the region, especially those across multiple time zones, are usually the ones that are most impacted by outages. They need diverse carriers and diverse routes to ensure that their business operations continue despite network outages.

For medium bandwidth size users that can withstand some network outages, pricing is usually not as large an issue for them either since it is usually a small percentage of their overall costs.

On the other hand, smaller bandwidth users are usually very cost sensitive. Those that need broadband communications and can not afford network downtime of an hour or so, face the most severe challenges in rural Maryland.

These different profiles of users will account for contradictory opinions as to what is wrong with rural telecommunications, who is to blame, and what must be done about it. Emerging smaller businesses with the highest growth potential in terms of employment and income are the most dissatisfied and the most cynical about the telecommunications infrastructure in their rural or small town environments.

There is some pent-up demand for additional T-1 services to medium sized users who view their telecommunications as mission critical. If they have one or two T-1 lines today, or its equivalent, they are likely to buy an additional amount of capacity from another carrier to ensure that they have diverse routes and carriers.

DEMAND AND GROWTH

Institutions could be categorized into one of four areas, based on their expected growth in usage of telecommunications services. This growth can be internal, external, or both. Internal growth is growth in a company’s network services, and external growth is growth in the networks and connectivity of a company’s suppliers, partners, vendors, customers, and employees/telecommuters that is directly tied to the growth in the company.

Internal Growth, No External Growth	Internal Growth, External Growth
No Internal Growth, No External Growth	No Internal Growth, External Growth



Organizations are normally expected to discuss only their own internal needs to grow. Many of them, however, volunteered or conceded that many of their employees, contractors, or customers might provide substantial growth opportunities for telecommunications bandwidth usage. The opportunities for growth usually required interaction with the institution from remote sites including homes. The external broadband needs of these organizations were not restricted to small businesses hoping for higher growth, but also for larger businesses hoping only for small to moderate growth.

In a number of cases, there were businesses and public institutions that would either help aggregate the purchase of broadband services on behalf of employees and contractors either as a benefit that the employees would purchase at a discount, or, as a fully paid service for key customers or employees either required or encouraged to work from home.

The potential for this kind of growth was also supported by the results of the surveys taken in addition to the interviews. There was strong support for telecommuting from those surveyed. One especially large supporter of telecommuting supported 200 of their own employees and 462 of their contractors. They were also open to helping those telecommuters bundle their broadband needs for a local broadband provider.

Interviews showed that new uses for broadband came from a combination of sources. At times, employers could not foresee a need for their work force to make use of broadband applications until their suppliers or customers created the need. Supply chain, logistics, and customer support applications provided examples where employers changed from having no perceived need for anything more than dial-up applications in one year to perceiving strong need broadband the next.

Given that these users were very pragmatic and near term oriented in estimating their broadband needs, they were also highly likely to be very conservative in forecasting their own needs beyond 1-2 years.

PUBLIC SECTOR USAGE OF BROADBAND

Interviews and tests verified that many government agencies that use a significant amount of broadband still have insufficient bandwidth to support their mission critical applications. However, cost concerns were still high among those interviewed in addition to concerns for more fault tolerant diverse routes and carriers. This was true even for AllCoNet2 users who were in the midst of upgrading their local broadband capacity. AllCoNet is currently negotiating with carriers for points of presence (POP) to be created on the fiber routes passing through Cumberland. If successful, new points of presence can make it possible for carriers to reduce prices for both public and private network users.



ALTERNATE CARRIER AND BACKBONE OPPORTUNITIES

The combination of concerns for many larger institutions, public agencies, and businesses that demand diverse carriers and routes presents sufficient opportunities for some backbone providers. Backbone providers who have expressed interest during the initial interviews include those who either run fiber routes through the area already but have not lit up services or provided a point of presence, or providers near the area who are considering alternative routes of their own and could come through the area for their own purposes of serving businesses outside the region while picking up additional business within the region.

ADDITIONAL OPPORTUNITIES FOR LAST MILE PROVIDERS

The need for diverse carriers and routes provide last mile providers with additional opportunities for additional business as long as they can become one of those providers with diverse routes and backbone carriers of their own, or, can provide services that allow internet users to instantly switch to another carrier in the event of a network outage. It is possible for a business to have their internet addresses run over two networks without waiting to have the internet take days to redirect users to their sites by using well-known capabilities such as border gateway protocol.

Last mile providers and ISPs can join forces with their customers to purchase services that would entice alternate carriers to provide alternate routes for broadband users in western Maryland.

INSTITUTIONAL OPPORTUNITIES FOR DISASTER RECOVERY SERVICES

There is a strongly felt need by area institutions to provide alternate data storage for disaster recovery. Several interviewees expressed willingness to join together to establish such facilities in the region and recruit their peers in other institutions to join them. This represents economic development opportunities for the region while enabling the cost centers of some area institutions to become profit centers or revenue producers.

PUBLIC APPLICATION DRIVERS FOR PRIVATE BROADBAND

The library system of the State of Maryland is deploying wireless broadband infrastructure throughout the state and is in the process of studying deployment in western Maryland.¹⁴ AllCoNet is also in the process of deploying their wideband infrastructure and services for traditional governmental applications.

These systems could be part of a diverse route and carrier solution for the region. Though they may choose to only serve public agencies, carriers who bring connectivity and services to them may also be able to provide them to private sector firms at these same locations, creating cost saving peering points.

¹⁴ See <http://www.sailor.lib.md.us>



BEST PRACTICES

In order to identify what rural communities outside the region are doing in regards to innovative broadband deployment, TLA conducted a review of best practices. Best practices were reviewed in light of the team's prospective solutions and recommendations. Since prospective opportunities for development come from outside Western Maryland, TLA also arranged meetings and explored potential for expansion with those leading telecommunications applications in public and private sectors across the nation.

These best practice examples are of special interest to western Maryland because of the continued development of AllCoNet2 and its interest in serving private business. The following cases show where local government, often in conjunction with their local municipal utility, created their own network to meet local business needs that others would not meet. The best practices demonstrate differences in ownership models and the degree to which services are outsourced to other private sector firms. For example, see the LaGrange model that was worked out with Charter Cable.

These models include the option where local governments own networking assets and then outsource services from the private sector or lease the facilities out to private sector firms who either maintain them, manage them, or market their use to business users.

The five best practices chosen for this project include:

- Grant County, Washington
- Kutztown, Pennsylvania
- Buffalo, Minnesota
- Utah UTOPIA
- LaGrange, Georgia

The project team reviewed each of these case studies, collected information regarding each entity, and conducted interviews to assess the current state of each of these best practices. The following sections contain the overview of the problem, the solution developed, and current information regarding the viability, scope, and outcome of these efforts.

However, there are several caveats and cautions that should be read along with these best practices. First of all, these are U.S.-based best practices. We need to remember that in the most recent comparison of 178 national economies, the U.S. came in 11th in overall broadband usage.¹⁵ The point is that there may be other international best practices worth watching, as well, especially considering the traditional position of the United States as the leader in Information Technology deployment.

¹⁵ See ITU Strategy and Policy Unit Newslog, 19 November 2003, "[ITU Digital Access Index: World's First Global ICT Ranking](http://www.itu.int/osg/spu/newslog/2003/11/a336)" at <http://www.itu.int/osg/spu/newslog/2003/11/a336>. See chart at end.



The following table further clarifies the International adoption of broadband services.¹⁶

International Broadband Penetration as of Dec. 2001

COUNTRY	BROADBAND HOUSEHOLDS (in thousands)	BROADBAND AS % OF TOTAL HOUSEHOLDS	INTERNET HOUSEHOLDS (in thousands)	INTERNET AS % OF TOTAL HOUSEHOLDS
United States	11,200	10.4%	56,379	52.3%
South Korea	7,500	51.7%	8,265	57.0%
Japan	2,570	5.8%	21,497	48.2%
Canada	2,300	19.7%	6,505	55.6%
Germany	2,090	5.4%	14,858	39.1%
Taiwan	1,125	18.2%	2,604	42.0%
France	605	2.5%	7,448	30.4%
Netherlands	550	8.1%	4,196	61.7%
Hong Kong	545	26.0%	1,241	59.1%
Sweden	542	13.4%	2,546	62.1%

Source: eMarketer, "[Broadband & Dial-Up Access](#)," Aug. 2002.

In addition, new practices, not yet proven to be a best practice by reason of results, are included. In this western Maryland report, the Utopia project is new and just now being financed and built. Other new practices will be included in the Eastern Shore report, including projects that use the Internet to make phone calls.

These practices are included to broaden the options that are considered while raising significant policy and market issues with their offerings from companies such as Vonage. Will those Internet calls be taxed as other calls? Will carriers providing Internet phone calls be required to provide service even when the power goes out? Residential phone subscribers receive that capability from the public switched telephone network now. If the financial and services playing field is not level, what are the possibilities that traditional phone companies will go out of business and those traditional phone services are no longer offered? What are the possibilities that incumbent local exchange carriers (ILEC) facing difficult financial futures decide to go out of the traditional phone business and only offer data services that are not regulated or are much less regulated? On the other hand, how might the ILECs use their combined PSTN and data networks to create blended voice and data products that make it difficult for data-only networks to compete? All these are questions that should be considered as new policy issues and technologies arise.

Readers should also be aware of new local government initiatives launched in coordination with groups such as Public Technology Inc. (PTI). PTI is working on a couple of initiatives where it may be possible for local governments to offer free or nearly WI/FI services across their areas. One such experiment is being conducted in Texas where the cost of the WI/FI service is

¹⁶ See entire report at http://www.technology.gov/reports/TechPolicy/Broadband_020921.pdf.



underwritten by a wireless meter reading application that pays for itself and still provides bandwidth to spare.¹⁷

And, most importantly, these best practices do not include worst practices. Readers should also be aware of publicly supported programs and projects that have failed. One emerging study that should be released by the end of January 2003 will highlight a number of such programs. Sharon Strover, Ph.D., Director of the University of Texas Telecommunications and Information Policy Institute (TIPI) will publish her study that will compare program success after initial funding has ended.

Most of the failed practices that will be described in this report, according to Dr. Strover's remarks at a rural telecommunications conference held in Washington, D.C. in 2002, have a common theme, namely insufficient funding because of a lack of understanding the total cost of operations. This is a nearly inherent flaw of many government telecommunications and information technology practices and is addressed in one of the policy recommendations.

Finally, each practice example has its own special circumstances that make these projects and patterns worth observing. But, any locality will need to modify even the most successful model for its own needs.

ZIPP NETWORK (GRANT COUNTY, WASHINGTON – PUBLIC UTILITY DISTRICT)

Grant County Public Utility District (GCPUD) first started investigating building out a countywide fiber optic system (now named “Zipp Network”)¹⁸ in March of 2000 when Washington State Governor Gary Locke signed Senate Bill 6675, allowing Washington's public utility districts to provide wholesale telecommunications services.

Prior to 2000, GCPUD had maintained fiber optic lines between substations, hydroelectric facilities, and administrative buildings as a mode of communication. Upon analysis prompted by the new legislation, GCPUD discovered there was enough excess capacity in its existing system to extend the network to businesses and residents throughout the county.

During the summer of 2000, Grant PUD launched a nine-month pilot test of its Gigabit Ethernet fiber optic project to 150 customers, offering broadband access to services including high-speed Internet and digital video. The pilot project marked the beginning process of a build out plan that, when complete in 2007, will form a countywide infrastructure used to read the county's 35,000 electrical meters remotely while providing customers access to competitive value added services, such as cable TV, telephone and high speed Internet.

¹⁷ See Policy Recommendations section, #5 – Access to Rights-of-Ways, for a PTI press release describing this type of initiative, and <http://www.pti.org> for more information.

¹⁸ For more information, reference <http://www.gcpud.org/zipp/>.

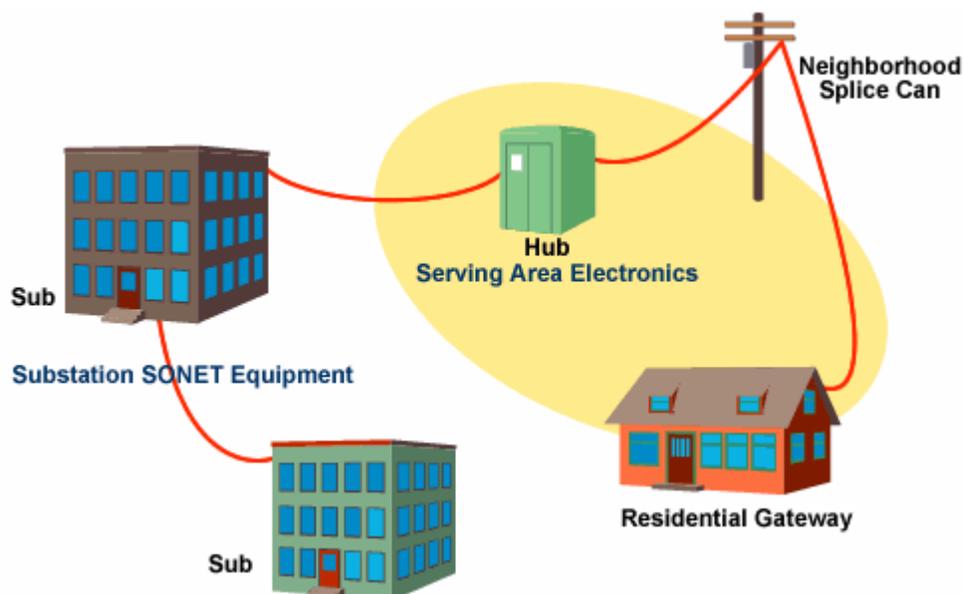
Prior to the launch of the Zipp Network, communication services for the people of the county were primitive. According to the local ILEC (Qwest), the county's sparse rural population (13 people per square mile in an area over 2,777 square miles) prevented them from investing in the area. Additionally, there was no competition for the local cable companies. In fact, more than 95 percent of the cable systems had less than 32 analog channels available. Three areas of the county even lacked basic telephone service and those that could access the Internet without dialing long-distance still only connected at 28.8 Kbps dial-up service.

TELECOMMUNICATIONS SOLUTION

Zipp is a wholesale-managed facilities network and is leased to retail service providers as an unbundled network element. Elements include dark fiber, 10/100/1000 Ethernet, SONET and a voice over IP (VoIP) gateway. The retailers bundle the Zipp Network element with their "service" or "services" and brand the product as their own to market to the public. The PUD installs, owns and maintains the leased facilities while the retailer markets, bills, collects and manages the end-user.

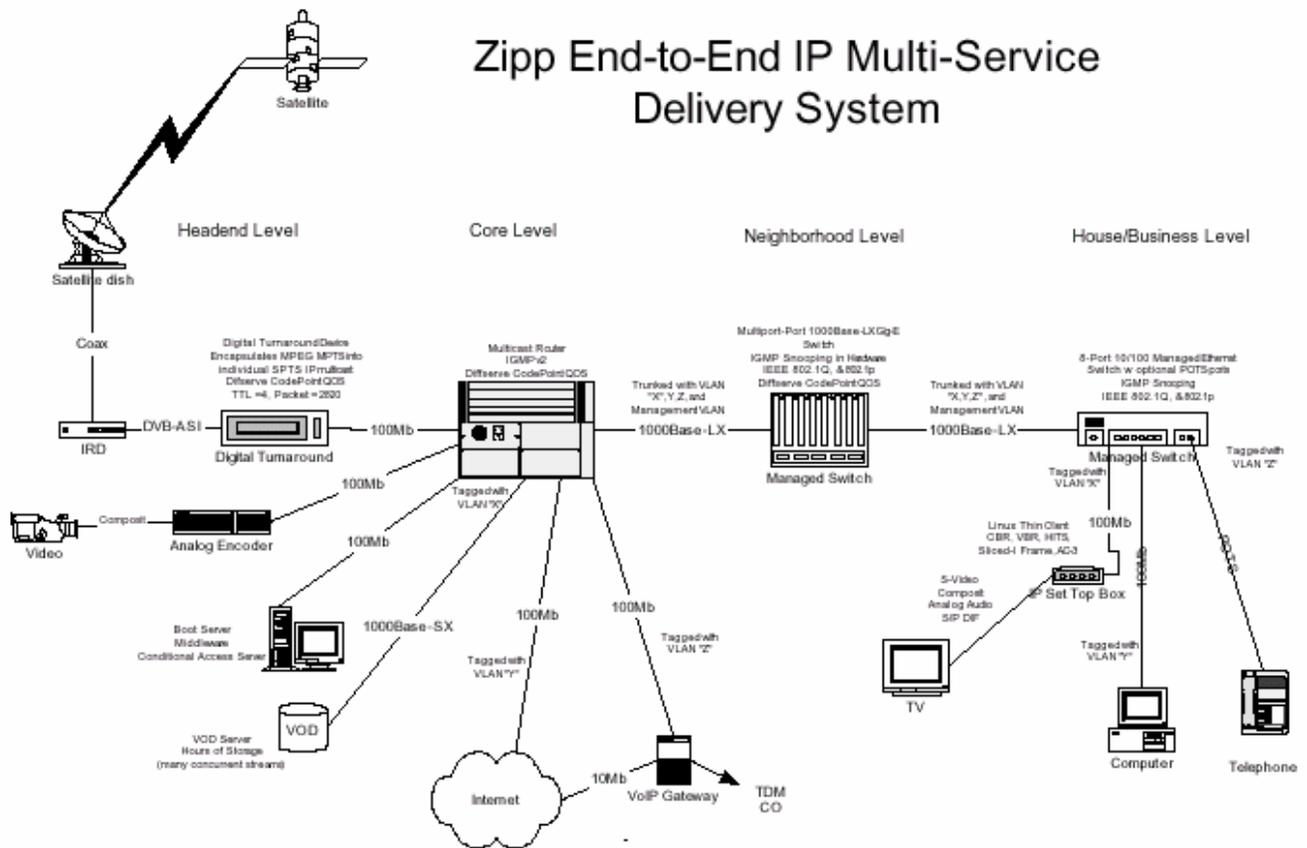
The Zipp Network was engineered based upon the following principles:

- Utilities work best with large, long-term infrastructure construction and management
- Independent retail service providers are more responsive to short-term competitive change
- Open Access and non-discriminatory pricing is essential to enable service competition
- Everything can be accomplished over IP
- Network topology should have maximum flexibility to mitigate obsolescence
- Single-mode fiber optics is the only medium to support future services of unknown bandwidth



The Zipp Network uses dedicated point-to-point single-mode fiber pairs from each home, business and farm to an active curbside network aggregation device in a star topology that forms a neighborhood serving area. These serving areas encompass approximately 288 homes using Gigabit Ethernet (1000base-LX) with a reach no further than 6-8 kilometers. (During the fourth quarter of 2003, the density may change to 576 homes per curbside aggregation device with the use of dual-frequency (1310nm & 1550nm), single-fiber small form pluggable (SFP) optics.)

The active curbside device is housed in a NEMA-4 rated above ground enclosure, located within existing utility ROW, and containing HVAC, batteries, patch panels and electronics. Through the use of patch panels and fiber jumpers, any customer can have their choice of dark fiber, lit Ethernet or SONET.



The customer fiber termination equipment, sometimes called an optical network termination (ONT), is a managed layer-2 Ethernet switch with an optical Gigabit Ethernet uplink, 6-8 RJ-45 10/100Mb copper Ethernet ports, 2 RJ-11 telephone ports, battery backup, and a utility accessible local management interface. Software features include IGMP snooping for efficient handling of IP multicast video, a VoIP gateway, and IEEE 802.1Q VLAN support. For the utility fiber-to-the-home market, the ONT is housed in an environmental enclosure and mounted outside the home, next to the telephone and electric demarcation devices. VLANs allow for



network separation amongst competing retail service providers while using a shared utility fiber network.

Zipp's use of dedicated fiber pairs to each customer and Gigabit Ethernet allows for a fully symmetric network and a non-blocking architecture. This enables anyone, anywhere to be either a network source or sink without bandwidth restriction in the first mile. Packets are marked (IEEE 802.1p) at the point of ingress and quality of service managed at the curbside aggregation device. This makes for a scalable architecture where bandwidth is managed amongst a limited number of core devices, and edge activities limited to VLAN membership assignments and link up/down status.

SCOPE OF SERVICES

The Zipp Network is currently available to roughly 10,000 homes and businesses in Coulee City, Electric City, Ephrata, Grand Coulee, Moses Lake, Quincy, Royal Camp, and Soap Lake. Additionally, all school districts in the county have access to a fiber optic connection. With more than 4,500 customers connected, the Zipp Network is larger than many electrical utilities in the United States. Grant PUD plans to continue the fiber optic rollout throughout the county until construction is complete to each home, business and farm.

ADMINISTERING ORGANIZATION

The Zipp broadband network is administered by the Grant County PUD. The PUD is owned by the citizens of Grant County Washington and is governed by a 5-member elected Board of Commissioners. Further, the PUD owns and operates the two-dam Priest Rapids Project on the Columbia River in central Washington.

OUTCOME DATA

As of September 2003, the Zipp Network has achieved a 48% take rate, with more than 19 competing retail service providers (including 17 ISPs, a CLEC, and two video service providers) offering advanced voice, video & data services over a converged, open-access Gigabit Ethernet, IP, fiber-to-the-home network. With the launch of the Zipp Network, Grant County has seen the development of 5 new businesses and 96 new jobs resulting in over \$8 million annual economic development. Average bundled cost for basic Internet, telephone and cable or satellite services is \$82 per month (before tax or options).

The Zipp Network offers the citizens of Grant County more choices for cable TV, Internet, telephone and broadband service providers. Zipp creates new options for existing Grant County businesses and offers attractive incentives to new companies seeking to grow their business and families in a community with a high quality of life. Powerful possibilities for this fiber optic network are just beginning to emerge.

Currently, more than 4,500 customers subscribe to service on the Zipp Network. Of those:



- 96% subscribe to Internet service
- 26% subscribe to digital television
- 10% subscribe to telephone

The people of Grant County have been strong advocates for the deployment of Zipp. More than 360 individuals have volunteered their time to canvas their neighborhoods and distribute information on Zipp. Their efforts helped log more than 12,000 petition signatures to bring Zipp into neighborhoods more quickly.

HOMETOWN UTILICOM (KUTZTOWN, PA)

The Kutztown borough, nestled in the heart of Pennsylvania Dutch country 50 miles northwest of Philadelphia, with a population of 5,000, established its own electric utility in 1902 and is one of 35 Pennsylvania communities still providing municipal power. Revenue from the utility pays for many borough services, and is a major reason Kutztown's property tax rate hasn't increased since the 1930s.



Kutztown recently created the State's first municipal Fiber-to-the-Home (FTTH) network in Pennsylvania. The community of Kutztown is also a university town, with Kutztown University – one of the leading business schools in the Northeast – in close proximity. The \$4.6 million project was created to provide competition for high-speed Internet access, cable television and telephone services. Out of that \$4.6 million, \$2.4 million was provided by the electric utility from reserve funds and the remaining \$2.2 million was bonded. The borough created its own brand name, [Hometown Utilicom](http://www.hometownutilicom.org/), to market the network along with other municipal services such as electric, water, sewer and garbage collection.¹⁹

The goals of the project were as follows:

1. Provide a one-stop shop, as well as consolidated billing and maintenance for all municipal and telecom services.
2. Offer a value-added services approach to the customer, including a full menu of services and diverse billing and payment options.
3. Enable the offering of future advanced services, such as wireless Internet services, smart appliance monitoring, home and business security services and data modeling/storage.

Kutztown decided that FTTH was the best infrastructure solution to meet the needs of their citizens and the goals of the project. Faced with alternative technologies that could leverage

¹⁹ For more information, reference <http://www.hometownutilicom.org/>.



traditional copper infrastructure, the borough felt that copper-based solutions were not in the best position to meet the demands of today's services, and that a copper-based approach would ultimately restrict future network upgradeability for the citizens of Kutztown. Copper-based solutions would also limit the borough's ability to deliver enhanced community services, which would ultimately increase property value and differentiate Kutztown from surrounding communities. Furthermore, Kutztown discovered that a FTTH solution would compliment its existing municipal-owned electric system, enabling the borough to make use of its utility pole ownership, right-of-way assignments and construction equipment, as well as its technically competent field staff for construction, service and maintenance, and its office staff for customer, marketing and billing services.

Under the branded name [Hometown Utilicom](#), Kutztown offers state-of-the-art voice, video and data services to its residents and businesses over an [Optical Solutions'](#) FiberPath 400 fiber-to-the-community network.²⁰ The borough offers these services at highly competitive prices — these services cost up to 20 percent (20%) less than those offered by incumbent service providers Service Electric Cablevision and Verizon Communications – connecting residents and off-campus university students to the broadband fiber-optic network. As a University community, Kutztown's need to provide future-proof technology is essential to remain attractive and viable to students, residents and the businesses that call Kutztown home.

Although many municipalities have built broadband networks to offer cable television and high-speed Internet service, Kutztown is one of only a handful to run state-of-the-art fiber-optic cable into every home and business in town. Verizon and Service Electric use fiber-optic cables throughout much of their networks, but they typically use coaxial cable or copper wire to deliver services from the nearest utility pole into homes. Those older technologies have a lower data-carrying capacity than fiber. That creates a choke point that limits the speed and volume of information coming in and out of the home. By contrast, modern technology has given fiber-optic networks virtually unlimited data-carrying capacity. For example, Kutztown's network can offer commercial Internet access at speeds up to 100 megabits per second – many times faster than the best cable modem. That capacity also gives Kutztown's network plenty of room for expansion.

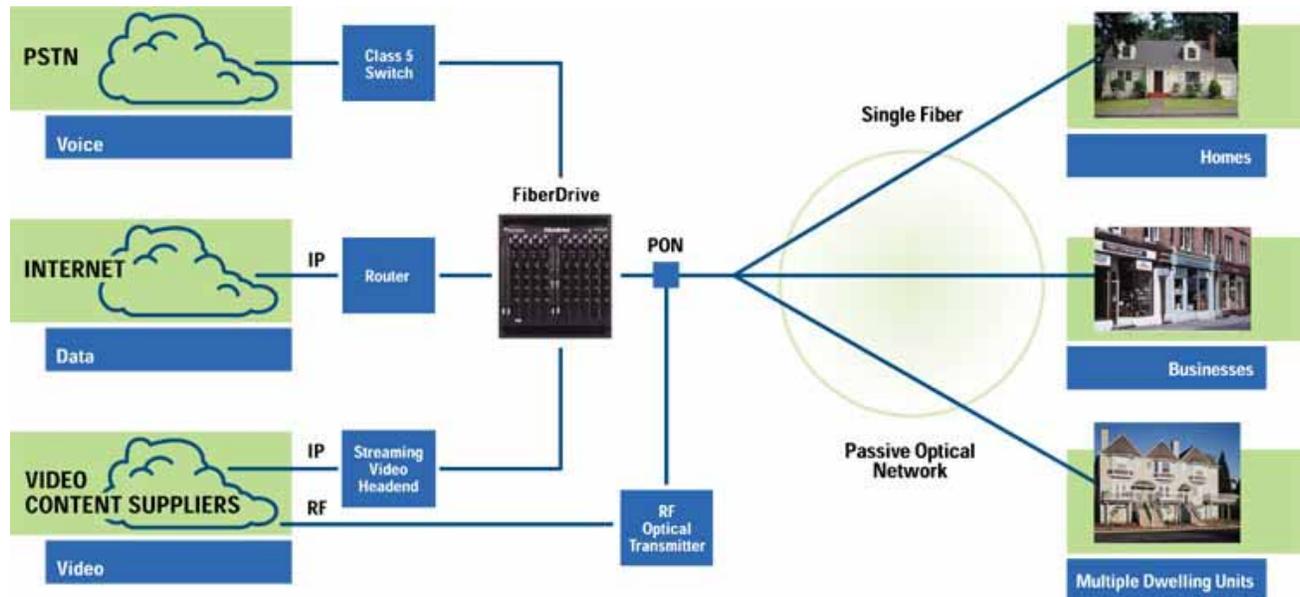
The FiberPath 400 system will also be used to provide voice services via an agreement with a local independent telephone company. Other services include voice over Internet Protocol (VoIP), home and business security monitoring, audio advertising, video on demand (VOD), virtual private network (VPN) services, online customer services, smart home applications and more. Kutztown is using the fiber optic cable for delivery of data collected from a planned automated meter reading (AMR) system.

²⁰ See http://www.opticalsolutions.com/products_fp400.html for more information.

TELECOMMUNICATIONS SOLUTION

After conducting a thorough technology survey and business case analysis, the borough and the Kutztown Municipal Authority (KMA) sought out a firm to provide a turnkey, yet cost-effective FTTH solution. Leveraging its experience and expertise in the telecom industry, the Atlantic Engineering Group was able to offer the borough the end-to-end solution it was looking for – combining FTTH electronics from Optical Solutions with the entire outside plant infrastructure from Corning Cable Systems.

Working together with Atlantic Engineering²¹, Corning Cable Systems²² provided the Kutztown with a complete passive infrastructure solution for their FTTH deployment, including optical cable, splice closures and couplers and splitters. Optical Solutions’ FiberPath 400 network uses passive optical network (PON) architecture to deliver converged voice, video and data services from a central office to a customer premise. A PON is a shared network architecture that transports optical signals from a service provider's central office (CO) and distributes them in tree-branch fashion to 32 subscribers. Because it is passive, no active electronics are needed within a five-mile radius of the CO or active node. PON technology is proving to be one of the most cost and labor-efficient method for delivering converged voice, video and data services to homes and businesses.



²¹ See <http://www.atlantic-engineering.com/>.

²² See <http://www.corningcablesystems.com/web/city.nsf/ehtml/home>.



SCOPE OF SERVICES

Kutztown had to overbuild against an incumbent Hybrid Fiber Coax (HFC) provider, Service Electric, which already offered cable modem access to the Internet. In response to the FTTH, the incumbent lowered its price for standard cable TV services by about 30 percent. The result was an incumbent price for cable TV \$3 cheaper than the price which Kutztown’s Hometown Utilicom had set and maintains. Despite this, Kutztown's subscriber uptake exceeded by 60 percent its end-of-2002 target of 250.

Kutztown began construction in November 2001 and completed the project in nine months. Service began in August 2002. In the first five months Hometown Utilicom signed up about 400 customers, on a 2,200 (electric) meter base, or 18 percent. Kutztown expects 700 customers by the end of the first operational year, mid-2003, for a total of 32 percent. That will be a third of the town within roughly a year-and-three-quarters of the construction start, accomplished while competing with an aggressive HFC incumbent.

Kutztown offers a several different competitively priced high-speed Internet service packages. CEI Networks (part of D&E Communications, Inc.)²³ is the local and long distance telephone service provider of Hometown Utilicom; they offer competitive residential and business rates for both local and long distance calling.

ADMINISTERING ORGANIZATION

The service is administered by the borough of Kutztown under the branded name Hometown Utilicom.

OUTCOME DATA

The borough launched its broadband services in August 2002. According to personal interviews with the organization, today they have more than 629 customers²⁴. In less than a year of service, they were within 95% of their target, 25% market share. The following table is currently displayed on their web site:

Hometown Utilicom Customer Statistics				
Effective: September 16, 2003				
Television	Internet	Telephone	Total Customers	Installed Services
425	430	287	612	1142

²³ See <http://www.decommunications.com/> for information on the company.

²⁴ Interviews took place in September 2003.



And, more recently updated for the second edition of this final report:

Hometown Utilicom Customer Statistics
Effective: January 12, 2004

Television	Internet	Telephone	Total Customers	Installed Services
425	441	298	635	1164

The following objectives of the project have all been accomplished according to the borough:

- Encourage economic development and growth in the community
- Reduce the overall end-user monthly expense for voice, video and data services
- Create additional revenue stream to keep taxes low
- Keep residents and business money in the community, working for the community
- Allow choice, open the door for advanced services where broadband is a requirement

Kutztown’s original plan focused on building a “distribution system” whereby private enterprise could provide their services at a scale unachievable on the existing 50-year old infrastructure. The goal was for a hub for converged services. The fiber optic technology was to allow multiple services across the same infrastructure without large investments in the field.

The only “failure” related to the service that occurred was a lack of cooperation by the large telephone and TV service providers. The borough advertised for business alliances to help with the build and to become the service provider of choice. Instead the borough was forced to build its own TV system.

As a final outcome data note, Kutztown was recently featured in an article from the Standard-Speaker on January 18, 2004, posted on the web on msnbc.com²⁵. The article follows.

High on fiber

In Kutztown, competition quest fueled borough-backed network

ERIC CONOVER/Standard-Speaker

Frank P. Caruso, director of information technology for the Borough of Kutztown, shows a utility box placed on the sides of customers' homes to deliver Internet, television and telephone services through fiber-optic cables.

By MARK KATCHUR

The Standard-Speaker

Updated: 12:05 a.m. ET Jan. 18, 2004



²⁵ See <http://www.msnbc.msn.com/id/3989909/> for the article.



Jan. 17 - The greatest benefit of Kutztown's fiber-optic system, its information technology director says, is the competition it brought among utilities - and the lower prices that followed. When the Berks County borough introduced its own cable television package - 101 channels for \$26.95 - in late 2002, Service Electric, which for long had a firm grasp on the market, dropped its price by \$10 to compete.

"The rates for TV kept going up, and without competition, there was no stopping the rise," said Frank Caruso.

Kutztown's entry into a barren cable TV, telephone and Internet market saved borough residents up to \$70 per month, including more than \$200,000 total last year in just television bills, he claims.

"That says it all," Caruso said.

The same could happen for Hazleton and West Hazleton consumers if NuNet follows through on a plan to wire the city and borough for fiber-optics and roll out Internet, telephone and cable television services during the next year.

Yet, there are differences between what Hazleton and Kutztown, the only municipalities in Pennsylvania that will be fully geared with fiber-optics, have planned.

Hazleton will ink an agreement with NuNet, an Allentown-based Internet service provider-turned-fiber technologies firm, and earn 5 percent of the company's gross earnings.

Meanwhile, Kutztown shelled out \$5.5 million to run fiber cables and build the system necessary to become its own cable TV, phone and Internet provider under the guise of Hometown Utilicom, a borough-owned entity.

Kutztown covered half of the initial cost with a non-taxable bond issue, and sustains the system with ongoing payments from customers.

"With the picture that we were looking at, 880 customers (for each of the three services) after three years would make us money," Caruso said.

After just more than a year in operation, Hometown Utilicom is about halfway to its goal in two services, with 425 Internet customers and 441 Internet customers. The borough provides telephone service to 298 residents.

Caruso expects to gain more customers when Kutztown's cable TV package can offer Comcast SportsNet, a popular sports channel from Philadelphia that airs Phillies baseball, Flyers hockey and Sixers basketball games.

Although many were excited about competition in the cable TV market, the borough's package was a tough sell to some, Caruso said.



"We didn't want to force the issue, so we just ran lines and (connected) the customers when they signed on," he said. "Some people have a bad taste of paying government. They're already paying utility bills and other taxes. But if they're going to be paying for a service anyway, they might as well put the money back into their own community, where it can help police, fire, recreation."

Residents who did sign on had utility boxes attached to the side of their houses. The box converts the fiber-optic cables - installed down every borough street - to traditional "co-ax" wiring inside most homes. NuNet will use the same utility boxes in Hazleton.

"All three services are beamed into the home by one unit," Caruso said.

To offer telephone service, the borough partnered with Conestoga Telephone, which ran fiber 26 miles from its assigned location in Birdsboro to offer a dial tone in Kutztown, following Federal Communications Commission territory guidelines.

Meanwhile, fiber links the customers' utility boxes to a network that allows Hometown Utilicom engineers to monitor the entire system from its headquarters in the borough hall.

Through a computer, they can turn services on when a new customer signs up, or off when someone goes on vacation.

A customer can even request a certain channel be blocked, or a premium channel be added for a period of time, and be billed accordingly.

It's one step closer to Caruso's vision for the cable television industry: Customers pick only those channels they want to view.

The Hometown Utilicom staff also knows when something is wrong. A computer tells them if a battery in a customer's utility box is low, or if someone unplugged their TV, or even accidentally blocked channels with their remote control.

"We know what the problem is immediately, sometimes before the customer even knows there's a problem," Caruso said. "This leads to a reduction in maintenance costs through fieldwork." Caruso and his staff can also detect when a customer is sending spam e-mails or downloading music that other computers can access. Such traffic stresses the network, and the technicians ask the offenders to stop before pulling the plug.

The computer room in the borough hall is vital, but the system wouldn't work without the "head-end" center on top of a ridge overlooking the town.

There, a large satellite dish and antennae gather signals that are sent to a building that houses stacks of signal boxes, one for each channel offered by Hometown Utilicom.



In that building, Caruso and his technicians can assign television dial numbers and adjust each channel's picture. The signals are then sent out over the fiber cables to the homes.

"The switch to fiber is just a matter of time," he said. "In the long run, you're going to see fiber at every home."

On the Net:

<http://www.kutztownboro.org>

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BUFFALO WIRELESS INTERNET GROUP (CITY OF BUFFALO, MN)

Buffalo has a growing population of 10,000 and is 26 miles north of Minneapolis. Sixty percent of the population commutes into the twin cities of St. Paul-Minneapolis. The City built a small fiber backbone network in 1996 for internal data networking. Demand mushroomed for access from other businesses and residents in the area, about 90 percent of whom were not on this initial fiber route. Taking fiber out to these new customers was determined to be too costly, so Buffalo officials determined to find an alternative.



Buffalo initially started looking at broadband fixed wireless as a way to connect remote pumping and electric stations for telemetry, and to reach others demanding service that could not be cost-effectively provided by its fiber optic network. The City decided, after discussions with the business community, to provide local businesses, schools and its residents with fixed wireless high-speed Internet access, in addition to its fiber optic services. Before Buffalo launched its Wireless Internet Service Provider (WISP) service, businesses in the city could buy dedicated T-1s or frame relay service from Qwest. However, both of those services were expensive and the frame relay service was considered by many to be unstable and not very flexible.

The City's Municipal Utilities now offers and manages fiber optic and wireless Internet services – the Buffalo Wireless Internet Group ([BWIG](http://www.bwig.net))²⁶. In order to provide wireless broadband Internet access, the City partnered with wireless equipment provider [WaveRider Communications Inc.](http://www.waverider.com/)²⁷ to install its WaveRider Last Mile Solution(R) wireless non-line-of-sight (NLOS) system that it hopes will take broadband access to about 1,700 homes and business, or about 60 percent of the available market.

²⁶ Information available at <http://www.bwig.net>.

²⁷ See <http://www.waverider.com/> for more information.



NLOS uses technology to filter out the interferences caused by semitransparent objects such as trees, and in some instances buildings, that might get in the way.²⁸ NLOS produces lower data rates than line-of-sight (LOS) systems but compensates by being much easier to install. NLOS systems also are less expensive to deploy. With LOS systems, an engineer must install and align the receiving antenna for each customer. LOS technology provides up to 8 megabits per second access, while NLOS delivers between 126 and 512 kilobits per second. Some customers, such as big companies, need the higher rates and do not mind paying the extra cost, but smaller companies and home office users often do not require that much bandwidth and would prefer to avoid antennae on their roofs. For those users, the company provides a combined modem and antenna for the NLOS service that users can install themselves using a "best-strength" signal indicator.

Buffalo rolled out its wireless system in two phases. The first cost \$180,000 and required the construction of three wireless towers. Residential users within 1 kilometer (five-eighths of a mile) of each tower initially were asked to pay \$29.99 a month for 128-kilobits/sec access. Speeds of up to 256 kilobits/sec were offered at higher prices for business users. The second phase, in which another five towers were to be installed, was to cost around \$300,000. The City planned on a four-year payback period for its total investment.

TELECOMMUNICATIONS SOLUTION

The [Buffalo Municipal Utilities' \(BMU\)](#) fiber optic system serves 44 customer sites that include commercial, industrial, financial, medical and governmental sites. The system has 336 fibers, 38,604 feet of conduit, 113,512 feet of fiber cable and 109 hand holes. The total length of all the fibers is 3,737,052 feet (that's 707 miles). BMU built its Metropolitan Network with reliability in mind. It uses state of the art routers and switches from vendors such as Cisco Systems and FORE Systems to route and manage information on the system. The physical fiber has been certified as 99.9% accurate in transmission of data. BMU has available high-speed fiber optic connections to the Internet with speeds up to 1.5 mbps with guaranteed rates of at least 256 kbps. The City of Buffalo's high-speed service connects users to the Internet via a wireless modem and indoor antenna that connects directly to the user's computer, providing an "always-on" connection, and eliminating the need to install extra phone lines. The modem connects to a computer through a standard NIC (network interface card).

In order to provide wireless broadband Internet access, the City partnered with wireless equipment provider [WaveRider Communications Inc.](#) to install its LMS3000 series WaveRider Last Mile Solution(R) wireless non-line-of-sight (NLOS) system. WaveRider's LMS3000 series of wireless non-line-of-sight products includes the fully network-managed LMS3000, which delivers high-speed Internet access to thousands of subscribers, and the entry-level LMS3100, which can serve up to 300 users on a single communications access point. WaveRider's LMS3000 series throughput speeds of up to 1.4 Mbps via the license-exempt 900 MHz ISM

²⁸ Learn more about NLOS technology at <http://www.waverider.com/en/products/index.html>.



frequency band over a one-mile range. The range can be extended to up to four miles with a line-of-sight installation.

The LMS3000 end-user modem and indoor antenna can be easily installed by subscribers via an Ethernet connection. The LMS3000 features WaveRider's proprietary Network Management System (NMS) that enables WISPs to conduct advanced networking functions including bandwidth shaping, setting up new subscribers, monitoring the operation of equipment and initiating network changes to avoid service disruptions. The NMS also enables service providers to offer customized service levels to their subscribers.

WaveRider's LMS3000 series offers a cost-effective solution to deliver high-speed Internet access to residential and SOHO customers. The non-line-of-sight end-user modem and indoor antenna for the LMS3000 can be easily installed by subscribers, which eliminates the cost for professional installation services associated with traditional wired Internet access. In addition, the LMS3003 is easily expanded and upgraded, enabling service providers to introduce wireless Internet access to a small number of subscribers and grow their network as they increase their subscriber base.

SCOPE OF SERVICES

The BMU (BWIG) offers three levels of wireless Internet service:

- Business Gold - 384 kbps (\$39.99 per month);
- Residential Silver – 256 kbps (\$29.99 per month); and
- Residential Bronze – 128 kbps (\$15.99 per month).

ADMINISTERING ORGANIZATION

The broadband services provided by the City of Buffalo, MN is a public/private partnership. The City partnered with wireless equipment provider [WaveRider Communications Inc.](#) to install the hardware required to provide wireless Internet access. The BMU operates and manages both the fiber optic and wireless networks.

OUTCOME DATA

Residential wireless service started in the latter part of 2001. By mid-January of 2002, over 125 customers had signed up. As of September of 2003, the wireless service has a total of 625 customers (residential and small businesses). The city's goal is to reach up to 25% of the potential customer base (1,500 users out of a potential pool of 6,000) within the next few years.

The fiber service, focused exclusively on large businesses and non-profits (hospital), current has about 60 customers.

UTOPIA (UTAH TELECOMMUNICATIONS OPEN INFRASTRUCTURE AGENCY)

The Utah Telecommunications Open Infrastructure Agency (UTOPIA)²⁹ is dedicated to accelerating economic development and quality of life for its citizens and businesses by deploying a publicly owned advanced telecommunications network over the last mile to all homes and businesses within member communities.



UTOPIA's first phase will focus on approximately 35,000 homes in northern Utah County and central Salt Lake County. After construction is started on these initial pieces of the network, additional bonds will be issued, which will control when subsequent phases of the project start.

UTOPIA is structured as a Utah interlocal agreement agency. It consists of 17 franchising authorities along the "Wasatch front," a region south of Salt Lake City with 542,000 residents and 19,400 businesses.

The State of Utah recognizes the right of municipalities to form and enter into interlocal operating Agreements under the Utah Interlocal Cooperation Act. This Act grants cities (and other public agencies) the authority to form political subdivisions to jointly execute governmental activities/services that they are authorized to perform individually.

Under Utah law, interlocal governmental entities may issue bonds and share revenues. Referred to as limited obligation bonds, they are legally secured by a specified revenue source rather than by the city's power to tax. Interlocal agencies can issue bonds on behalf of their members. Revenue bonds do not increase taxes. Bonds generated in this manner allow for a 15 - 20 year cost recovery and debt management service.

UTOPIA's current efforts are focused on completing all the necessary background work and studies required for issuing the initial bond. Once the bond is issued, construction on the first portion of the network will begin. Bonds were planned to be issued by the end of 2003, but, as of the date of this report, they expect to be issued in the first quarter of 2004. Construction is expected by summer according to press releases of December 23, 2003. AT&T has jointly announced agreement to be a non-exclusive anchor tenant for voice, data, and video services. Qwest and Comcast, current providers in the area, have still declined to participate at this time though UTOPIA has an open invitation to them to participate.

²⁹ See <http://www.utopianet.org/> for current information on this project.



TELECOMMUNICATIONS SOLUTION

UTOPIA has completed its feasibility study for a \$450 million, fiber-optic network running directly to businesses and homes. UTOPIA plans on providing 100 megabits per second to 1000 mbps of edge connectivity through 5.6 terabits per second of distributed core-switch fabric. UTOPIA is based on a wholesale or "open access" model, whereby the municipalities own the infrastructure and ISPs sell services on top of it. UTOPIA solely provides carrier-class wholesale transport services – it will not provide retail service in any capacity. Each service provider owns its customer relationships – directly selling, marketing, and billing their customers. Under Utah law, UTOPIA's municipal entities cannot sell retail services to residential or business customers. UTOPIA can only sell its facilities wholesale, so it must lease its capacity to content or service providers.

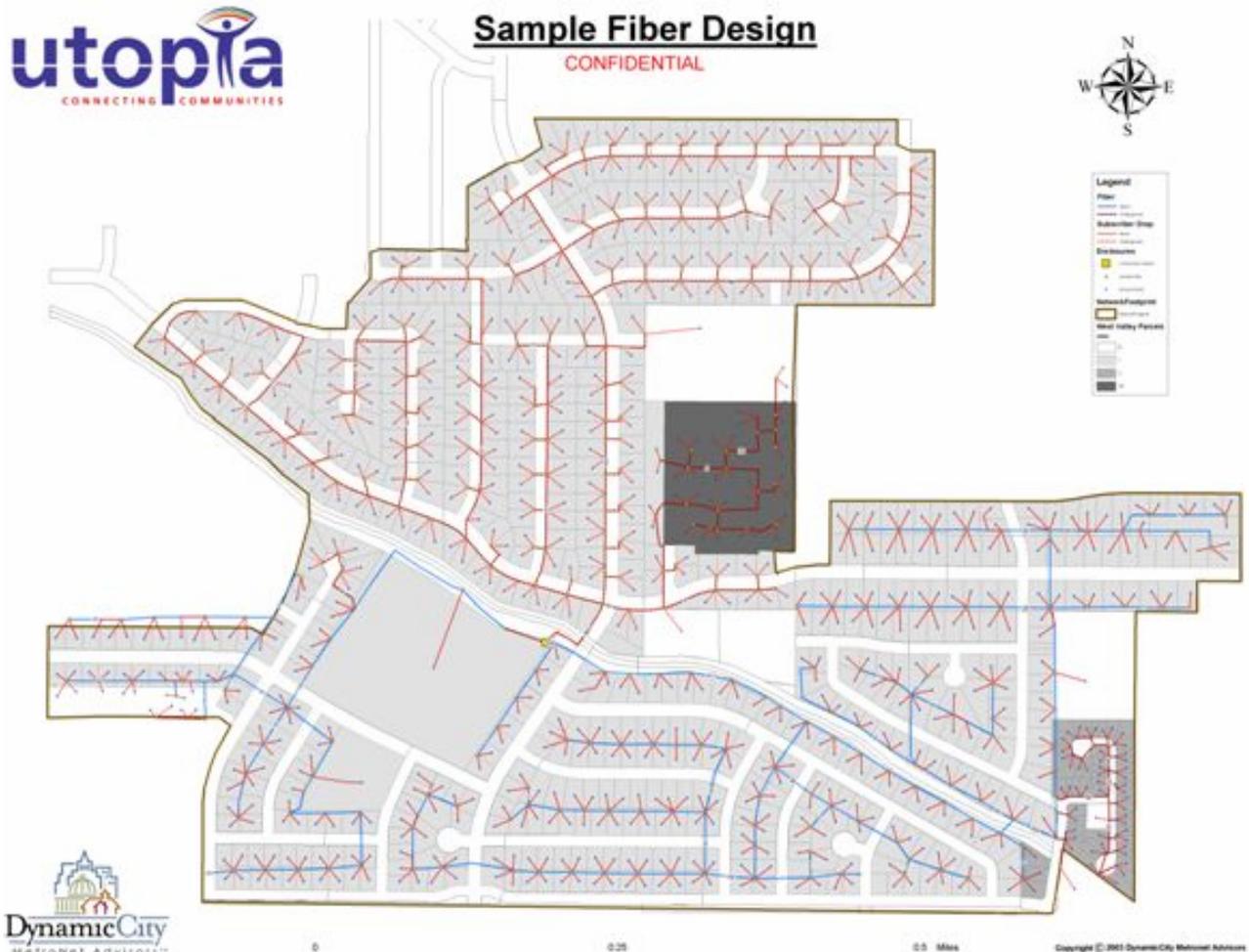
When complete, UTOPIA will serve a population of over 700,000 persons, over 250,000 households and some 35,000 businesses. Approximately 75% of Utah's population lives in cities encompassed by the current boundaries of the UTOPIA project, allowing for significant potential expansion. Additional Utah cities that have already expressed interest in becoming members of UTOPIA would potentially double the current size of the project.

UTOPIA's fiber optic telecommunications infrastructure will operate as an Open Service Provider Network™ (OSPN). One service agreement/contract with UTOPIA provides, in effect, a franchise agreement with all member cities (currently 18) of the interlocal agreement agency. Service provider benefits include a major decrease in capital expenditures, no in-field construction, repair, or maintenance; access to a ubiquitous Fiber-to-the-Home/Fiber-to-the-Building (FTTH/FTTB) network at competitive wholesale prices; aggregated 18-city client presence with single network plug-in. Currently, UTOPIA is thought to be the largest FTTH and FTTB project in the world.

UTOPIA's professionally managed carrier class service level agreements (SLA), including maintenance and repair, flexible provisioning, granular scalable services, security, and symmetrical transmissions guarantee the highest levels of Quality of Service (QoS).

SCOPE OF SERVICES

The feasibility study showed that UTOPIA can finance its network through three phases of bonding over the next three to five years. The study also verified that UTOPIA's projected \$450 million for construction and its anticipated customer base are realistic, given current market conditions. The \$700,000 study was funded by contributions from UTOPIA's member cities.



ADMINISTERING ORGANIZATION

The service will be administered by the Utah Telecommunications Open Infrastructure Agency (UTOPIA), a Utah interlocal Agreement agency (18 founding cities – Brigham City, Cedar City, Cedar Hills, Centerville, Layton, Lindon, Midvale, Murray, Orem, Payson, Perry, Riverton, Roy, Salt Lake City, South Jordan, Taylorsville, Tremonton, West Valley City).

OUTCOME DATA

UTOPIA expects about 60 percent of businesses and residences to buy into its network of 18 million feet of cable. On average, the agency plans to spend \$1,408 per household installing the cable.

Phase One construction of its first-of-its-kind, 18-city, fiber-optic network was scheduled to begin early in the fall of 2003. UTOPIA announced two major advancements in the procurement process:



1. Awarding of contracts for the electronics portion of the initial buildout
2. Issuance of a multimillion-dollar RFP for fiber and construction services.

More than 80 firms participated in UTOPIA's RFP for electronics equipment and hardware. Of these, UTOPIA selected two to provide technical solutions--Riverstone Networks³⁰ (switches and routers) and Allied Telesyn³¹ (access portals).³²

UTOPIA planned to award contracts for its fiber and construction services RFP in early September 2003. The award was announced a couple of months later on November 25, 2003 by Tetra Tech, Inc.³³ and UTOPIA.

This largest-of-its-kind project will deliver high-speed fiber directly to homes and businesses over an open, wholesale network owned and managed by a consortium of local communities. The UTOPIA infrastructure will operate much like a public road system, providing open access to information transport to promote commerce. This approach is being viewed as a potential model by a number of communities across the United States.

The first phase of the contract, for one year, is valued by the Company at approximately \$22 million. If all phases of the contract proceed, the contract is valued by the Company at approximately \$240 million over approximately 3 years.

CITY OF LAGRANGE, GA

A rural city of 27,000 people 60 miles southwest of Atlanta, LaGrange, the county seat of Troup County, has pioneered in developing public-private ventures for broadband-based economic development. Set in the rural Georgia countryside, LaGrange is an enterprise-based community that levies no local taxes but instead earns revenue by delivering services: electricity from the municipal-owned plant, water and sewer, and most recently telecommunications.



LaGrange's foray into telecommunications infrastructure came about out of necessity. As was the case with many small southern towns, LaGrange's mainstay for years was the textile industry. In 1970, 70 percent of LaGrange's employment base came from textiles. City officials, concerned about the decline of textiles in the South, sought to diversify the city's economy. They

³⁰ See <http://www.riverstonenet.com/> for more company information.

³¹ See <http://www.alliedtelesyn.com/allied/home.asp?country=2&lang=en> for more information.

³² See the article at <http://www.convergedigest.com/DSL/lastmilearticle.asp?ID=8947> from Converge! Network Digest.

³³ See <http://www.tetrattech.com/> for more info, including press releases.



established an economic development authority, invested more than \$100 million in the city's infrastructure and built an industrial park.

By 1990, textiles accounted for only 10 percent of the city's employment base and more than 2,700 jobs had been created in either the expansions or locations of 27 companies. However, LaGrange was still facing a net loss of 161 jobs and a 9.2 percent unemployment rate. In 1992, City leaders decided to redirect their economic development efforts and appointed a telecommunications committee to examine the local telecommunications infrastructure and identify elements that lacked state-of-the-art technology necessary for attracting compatible businesses.

LaGrange was already a provider of utility services such as electricity and natural gas and saw an opportunity for growth in providing telecommunications. After becoming a local and long distance service provider, with offerings including T1 lines, the city sought to acquire the local cable system. In 1998, through a \$9.6 million bond, LaGrange entered into a unique public/private partnership with local cable operator Charter Communications. LaGrange bought the local transmission lines and the equipment and agreed to lease channel capacity back to Charter to provide video entertainment.

LaGrange then began an upgrade of the cable system to provide more advanced services. The upgrade of the cable system entailed the deployment of a hybrid fiber-coax (HFC) network that enabled LaGrange to offer residents broadband Internet service via cable modem. Broadband connections of up to 2 mbps are available to commercial consumers. The broadband network today encompasses more than 150 miles. All 21 area public schools, LaGrange College, and the West Georgia Technical Institute are connected via broadband.

Using this infrastructure, the city initiated the LaGrange Internet TV (LITV) pilot program to provide free high-speed Internet access service for all residents, with free installation and training, delivered via a WorldGate³⁴ set-top system and the cable TV network. The LITV initiative (about \$300K/yr) was funded entirely by the city, without state or federal support using profits from the sale of telecommunications services to businesses. Customers were given a wireless keyboard, set-top box, five email addresses, and a parental control feature. The Internet access service was provided to cable operators by WorldGate much like any other "channel" such as a sports or news channel. In turn, the cable operator, in this case Charter, paid a fee back to WorldGate for providing the service.



³⁴ Recent update - **Trevoze, Pa., Oct. 1, 2003** - WorldGate Communications, Inc. (Nasdaq: WGAT - News) announced today that on September 30, 2003, its shareholders approved a proposal to sell to TVGateway, LLC certain of WorldGate's assets relating to its interactive television business. Subsequent to obtaining shareholder approval, WorldGate and TVGateway closed on the sale with WorldGate receiving \$2.4 million in cash, the balance of the \$3.0 million amount for the transactions with TVGateway, as set forth in the definitive agreements between the parties. WorldGate will use the net proceeds (after payment of associated transaction costs and expenses) to fund continuing operations, including the development and distribution of its Ojo video phone product.



In locations outside of LaGrange, the WorldGate service was typically offered to a cable company's customers as a premium service for a fee ranging from \$4.95 to \$16.95 per month. The broadband connection offered service at about 150 kbps.

Free Internet access was offered to LaGrange citizens as a community-building tool to provide residents of all ages and economic levels with email and Web-browsing services, creating a "community of use" for Internet and broadband applications. Deployment of the pilot free Internet service program began in June 2000, and almost one-half of the city's 9,000+ cable television households signed up for the service. The LITV was extended a second year through September 30, 2002.

Upon completion of the pilot program, the City's focused its efforts on adding new content and developing [community link](#) platforms that make the Internet relevant to the daily lives of its citizens. Among the platforms the City of LaGrange has initiated is iVicinity, a citywide "Community Link" program that enables residents with common interests to share information through highly interactive web sites. This "virtual town square" serves neighborhoods, sports teams, schools, religious congregations, and civic associations. Other platforms available on LITV include free on-line Internet education through a partnership between the City and eMercer, the distance learning division of Mercer University, and an on-line directory of LaGrange businesses. The City of LaGrange has also created links that enable its citizens to request city services and pay utility bills on-line.

The City of LaGrange has received international acclaim for its LITV initiative, including being the first U.S. city to be named the "Intelligent City of the Year" by the [World Teleport Association](#) and receiving a "Government Technology Leadership Award" from Government Technology magazine.

Further using its network, the city has attracted a new call-center company and opened an Internet hosting center and small-scale TV production facility. At the same time, its network operations generate over \$1 million in revenue for the city treasury each year. Despite its small size and location in a rural area of the US, LaGrange is a proven leader in broadband deployment and the creation of applications that attract a critical mass of local users.

TELECOMMUNICATIONS SOLUTION

In the early 1990s, the city officials recognized the growing need of local industries to have access to a wider variety of telecommunications services. They knew their ability to keep existing industries in LaGrange and to attract future industry depended heavily on the capability to deliver voice and data communications in increasing quantities and increasing speeds. As a result, in 1992 the city council appointed a "Blue-Ribbon" committee comprised of local citizens and business leaders to critically examine LaGrange's existing infrastructure and determine what steps needed to be taken to develop a telecommunications infrastructure that would encourage economic development.



The committee's report was delivered in 1993 and revealed that LaGrange's telecommunications infrastructure was not well prepared to deliver the kinds of services increasingly demanded by industries that were relying more heavily on information technology. The report had three findings:

1. There was no local point of presence (POP)
2. The telephony switch was analog rather than digital
3. There was too little fiber in the current network

The consequence of not having a local point of presence was that long distance communication became inordinately expensive since a hauling charge had to be paid to the local carrier in order to get to the nearest POP, which was 45 miles away. The committee concluded that this was a disincentive for companies looking to locate in LaGrange. The second finding determined that the analog switch, which was one of the last analog switches installed in Georgia, was outdated and would be an obstruction to advanced infrastructure development. The third finding, too little fiber in the network, represented an additional impediment to infrastructure development.

City officials began looking at ways to address the findings of the committee and eventually partnered with ITC Holding Company. The terms of the agreement provided LaGrange with a local POP along with access to ITC's digital switching services. The partnership called for ITC to provide telecommunication services and in return LaGrange would provide the facilities over which to operate them and make the services available to businesses located within the city.

LaGrange's first contract for telecommunications services with a commercial customer was signed in 1994 and in that year gross revenues were roughly \$45,000. Over the next six years LaGrange developed an OC-12 self-healing SONET ring serving 60 major commercial customers and grew revenues to over \$1,000,000 per year.

As a result of the city's partnership with ITC, LaGrange had the ability to offer a wide range of advanced telecommunications services including point-to-point T-1s, frame relay, high-speed business Internet access as well as residential broadband service.

In the mid-1990s amidst talk of electricity deregulation, city officials began to contemplate ways to secure alternative funding in the event the city's core revenue generator (electrical utilities) came under the increased competition that would result from deregulation. One sector that was of particular interest was the cable market.

While LaGrange was exploring possible ways to enter this market, Charter Communications purchased the cable system that was then serving LaGrange citizens. The system had a reputation for providing poor quality service and this had been a source of consternation for many customers. Charter and LaGrange saw an opportunity to take advantage of each other's strengths in improving the system.

A deal was structured whereby LaGrange purchased the cable system from Charter and subsequently rebuilt and improved it. The result was a two-way 750- MHz hybrid system



consisting of 18 fiber optic nodes distributed around the city. Coaxial cable radiated from the nodes to individual households to provide last mile connectivity.

A public bond offering in 1998 financed the \$9.6 million cost of the upgrade. The system was then leased back to Charter on terms concurrent with terms of the bonds, which was 17 years. To help mitigate LaGrange's risk in meeting the debt obligation the lease payment was made equal to 101% of the bond payment.

There were several advantages to both parties under this agreement: Charter didn't have to face a competitor and their lease payment to LaGrange effectively represented a loan for capital improvement with a 6.2% interest rate. Benefits to LaGrange included free bandwidth and a cable system with a market value that had increased to \$45,000,000 as of January 2001. To further insulate LaGrange against a possible default by Charter, a bankruptcy remote LLC was created. For Charter to declare bankruptcy, unanimous consent of the Board of the Directors was required and the board was required to include a representative from the city.

Under the agreement, Charter was entitled to 619-MHz of the bandwidth, LaGrange received 24-MHz that it planned to set aside for future use, and the remaining frequencies in the spectrum were split alternately between Charter and the city. Dividing the spectrum in this manner resulted in each party having small unusable pieces of bandwidth that could only be made useful by entering into an excess bandwidth agreement. Influenced by LaGrange's desire to diversify its revenue source and to enhance its attractiveness for economic development, the first agreement entered into to use the excess bandwidth was to provide high-speed cable modem access.

A partnership was developed with High Speed Access Corporation to provide ISP services via the hybrid fiber coaxial network. As of January 2001 approximately 1,200 subscribers, 85% of which were residential with the remainder being commercial, used the cable modem service. In return for providing HSAC access to the network, Charter and LaGrange receive a percentage of HSAC's gross revenues.

In addition to offering broadband services using traditional coaxial cable modems, LaGrange had planned offer its commercial customers television-based Internet access. WorldGate Communications Inc offered this product using the same digital set-top boxes that provided Charter's residential customers digital cable services. Thus, the only cost involved is the basic cable television fee that the subscriber pays. The Internet access service was provided to cable operators by WorldGate much like any other "channel" such as a sports or news channel. In turn, the cable operator, in this case Charter, paid a fee back to WorldGate for providing the service.

The WorldGate system operated using a thin-client architecture with a television, wireless keyboard, and digital set-top box working together to provide input and display functions. WorldGate computers did the actual processing to deliver the web content and transmitted the output back to the digital set-top box to be displayed by the user's television. The user was presented with an interface similar to that of a traditional web browser. The WorldGate system



did not have the ability to print, save files, or view sites that required software plug-ins (e.g., RealPlayer™).

The system offered users the ability to hyperlink from a cable channel directly to a website. Cable channels offering this feature displayed a small hyperlink logo in the corner of the television that would notify users the feature was active. Users would then click on the "hyperlink" button on the keyboard to be taken directly to the corresponding web site. It was hoped that viewers watching a commercial or television program with hyperlinked capability would use the feature to engage in e-commerce or conduct further research on the web site. In return for providing this service, WorldGate received \$.40 per click-through from the sponsor of the hyperlink. WorldGate's business model was predicated on generating a significant amount of revenue through this feature.

Under an agreement with the parties, LaGrange was responsible for the ISP fees (which had been reduced to \$.30 a month per digital box), the installation costs associated with Charter's incremental cost to provide the additional service, and the opportunity cost of the revenue Charter would have gotten from selling the service on a commercial basis. (The city also agreed to reimburse Charter for part of the \$6.95 monthly fee Charter would have normally collected from customers as payment for using the digital box.) The city budgeted \$296,000 for the first 15 months to cover these costs.

The agreement also called for LaGrange to be responsible for the installation of the digital boxes in residents' homes and to provide the necessary training to operate the WorldGate system. In return Charter would reimburse the city \$45 per installation.

Additionally, LaGrange contracted to purchase the digital set-top boxes from Charter at a cost of \$258 per box. After the first year, Charter agreed to repurchase them from LaGrange at the same price plus a 6% cost of capital charge. The deal was structured this way so that for the first year residents would not be responsible for any fees beyond the \$8.70 per month cost of basic cable. Charter was then obligated to charge customers a monthly rental fee no greater than \$5.95 per month, in addition to fees for providing cable service, for the first year after they repurchased the digital set-top boxes. Since it was felt that lower income residents would benefit the most from having the system, the city felt it was important to structure the deal this way and make the WorldGate system as affordable as possible.

In April 2000, LaGrange began its Free Internet Initiative, using the city's hybrid fiber optic-coaxial cable system for the technology infrastructure. Internet access was provided through a digital cable set-top box that was distributed free of charge along with free training to any citizen who requested the service. The technology, which has already been implemented in approximately 4,200 homes, allows citizens full Internet access through their television. Citizens who receive the service not only gain unlimited high-speed access to the Internet, but are also provided with a free e-mail address, 5 MB of personal web space, in-the-home training, and a technical support help desk that is open 7 days a week.



SCOPE OF SERVICES

The City of LaGrange offers digital switching service, multi-carrier POP, and two growing networks consisting of a 100-mile commercial network and 150-mile residential broadband network. The City is also a Competitive Access Provider for ITC Deltacom, Globe, and other interstate carriers. LaGrange has both CLEC and OCC Certifications and is licensed by the Georgia Public Service Commission to offer many traditional telecom services across the entire state of Georgia. Lastly, but certainly not least, the City offers both T-1 point-to-point availability and Internet for businesses.

LaGrange is an example of “Connecting Each to All.” The value of the network grows as more people are connected to it. Sharing information builds strong community bonds. Community building in the 21st century is no longer solely about traditional infrastructure like roads and houses. Now, the new infrastructure that unites the community via broadband and communications technology is equally critical. LaGrange and its citizens are expecting to experience rapid growth because they can communicate with each and with the world.

KEY USERS

Among LaGrange citizens that benefited most from LITV were the city's senior citizens, a group that for the most part would not have Internet access if it were not for the free Internet service initiative. Seniors now have some of the power that information and access provide, whether they are researching medical information, shopping, or using e-mail to communicate with friends and family members. Many people were skeptical about the interest level and ability of seniors to use Internet TV, but they have shown tremendous interest in LITV and excellent proficiency in operating its user-friendly system.

Another of the primary goals of the Free Internet Initiative was to encourage workforce education for citizens whose socioeconomic status inhibited the adoption of information technology. This group was targeted in particular because the value it could provide to them was greater than the value that would be provided to people already familiar with technology. City officials expressed both surprise and disappointment that interest in the Free Internet Initiative wasn't higher among this target group.

ADMINISTERING ORGANIZATION

The service is a public-private partnership/collaborative effort of [WorldGate Communications Inc.](#), [Charter Communications Inc.](#) and the [City of LaGrange, Ga.](#) Three members of the city's seven person IT department managed the telecommunications operations: a manager, a technician, and a cable puller collectively performed all the functions necessary to serve LaGrange's 60 commercial customers.



OUTCOME DATA

Upon completion of the pilot free Internet access program, about one-half of households with cable TV had ordered and installed the WorldGate system. However, City officials had hoped the demand for the system would be greater, somewhere closer to 6,000- 7,000 units.

37 percent of LaGrange households – nearly 750 families – that did not previously have Internet access now have it and have improved their computer skills considerably. The households that did not previously have computer experience also reflected characteristics of those typically found in the digital divide – lower education, lower incomes, and older ages. Of the households that utilized the LITV service, 53 percent use the Internet for communication (either through e-mail or online chat rooms), 50 percent use it for entertainment purposes, 45 percent for educational reasons and 42 percent for researching specialized information. In this sense, the LITV project has crossed the digital divide by improving adults' computer skills and increasing accessibility.

WorldGate conducted a user survey in April 2001 and found that the service was being utilized 7.2 hours per week on average. They also found that 51% of users were "very satisfied" with the service while 20% said they were "dissatisfied". The satisfaction ratings were higher for users who did not have already have a computer with Internet access.

LaGrange garnered international attention for its LITV program, but the economic impact of LaGrange's telecom networks go far beyond that. The City contacted the local Fortune 500 companies and asked them what they need – digital switching, a point of presence (POP) as an entry ramp onto interstate carriers, and the deployment of broadband cabling, all of which have been implemented by the City.

The result is a two-way system of communications that connects every business, resident, school, medical facility, industrial park, government office, college and public utility provider in LaGrange. Local Fortune 500 employers who benefit from this network include Gillette (Duracell), Kimberly-Clark, Exxon-Mobil (Mobil Chemical), Dow Jones/ Wall Street Journal, Caterpillar, International Paper, Georgia Pacific, and a new 1.2 million square foot Wal-Mart distribution center.



MUNICIPALLY-OWNED NETWORKS

The following article from the National Association Of Telecommunications Officers And Advisors, Journal Of Municipal Telecommunications Policy provides an overview of the potential for municipal broadband networks.³⁵

NATIONAL ASSOCIATION OF TELECOMMUNICATIONS OFFICERS AND ADVISORS

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The Case For Municipal Broadband Networks: Stronger Than Ever

By Jim Baller and Sean Stokes *

The recent economic downturn and the shakeout in the telecommunications industry have halted or slowed the pace of private-sector deployment of advanced telecommunications services in many areas. As a result, adversely affected local governments have increasingly begun to explore the possibility of building their own broadband networks. A recent court decision striking down Virginia's ban on municipal entry into telecommunications may heighten such interest. This article examines the relevant considerations, gives examples of successful local telecommunications efforts, and discusses the new challenges that local governments will face if they elect to provide or facilitate the provision of advanced telecommunications services in their communities.

"The Future Is Not What it Used to Be" ²

As recently as a year ago, the Federal Communications Commission believed that the prospect of rapid private-sector deployment of advanced telecommunications services was very good, except in rural areas. According to the Commission,

204. [W]e conclude that the deployment of advanced telecommunications capability to all Americans is reasonable and timely at this time. Providers are rapidly building the infrastructure for two major types of advanced services - DSL services and cable-based services. Large-scale entry by other providers deploying fixed wireless and satellite technologies is also likely. Great amounts of capital, even by the standards of the communications industry, have poured into the infrastructure for advanced services. Demand, measured by the rates of subscription to high-speed services, is increasing rapidly and shows no sign of losing momentum.

³⁵ Used with permission



205. Despite our conclusion that deployment is reasonable and timely overall, we realize that not all Americans have access to advanced services today. Indeed, the data support the troubling conclusion that market forces alone may not guarantee that some categories of Americans will receive timely access to advanced services.³

In the last year, however, the telecommunications world has plunged into disarray. According to the *New York Times*, telecommunications companies spent some \$35 billion over the last two years to build Internet-inspired communications networks, but after a string of corporate bankruptcies, "fears are spreading that it will be many years before these grandiose systems are ever fully used."⁴ *U.S. News & World Report* estimates that telecommunications companies have defaulted on bonds totaling \$15.8 billion during the first six months of 2001, and it reports that "analysts predict that more than \$100 billion of [the total of \$650 billion in telecommunications bonds] will end up in default" over the next two years.⁵

Profound changes are also manifesting themselves in the marketplace. Numerous competitive local exchange carriers have either cut back on their plans to compete with incumbent telecommunications providers or have gone out of business altogether.⁶ The same misfortune has befallen many of the "broadband overbuilders" that had intended to build sophisticated new communications networks that would enable them to compete simultaneously with providers of voice, video, data and other advanced communications services.⁷ Even the major incumbent providers of cable and telecommunications services have retreated from their bold claims to extend their services aggressively outside their traditional markets.⁸

In this environment, it may well be years before private-sector cable and telecommunications providers are willing and able to offer communities outside the nation's major population centers the same level of services at comparable prices as they are offering in major markets. There is nothing venal or surprising about this - profit-maximizing firms owe their investors a fiduciary duty to attack the most lucrative markets first. But given the critical importance of prompt and affordable access to advanced communications services, many affected communities are coming to believe that they cannot afford to wait for the private sector to get around to them. "What's Past Is Prologue."⁹

For rural communities, being left behind by the private sector is nothing new. During the first few decades of the electric power industry, privately-owned electric power companies literally left Rural America in the dark while electrifying more densely-populated and lucrative urban markets. Today, the same patterns are repeating themselves in the telecommunications industry. This time, however, many larger cities have joined rural communities in being at risk of falling behind urban population centers in obtaining the full benefits of the Information Age. These benefits include the ability to attract and hold on to businesses, the ability to create attractive educational and employment opportunities, and the ability to offer the many other technology-based advantages that collectively make for a high quality of life.

At the turn of the last century, residents in thousands of rural communities that were shunned by the private electric power companies formed their own electric utilities, in recognition that electrification was critical to their economic development and survival. The great majority of



these communities thrived while others failed, and the public power systems they created still exist today, providing their customer-owners superior service at substantially lower prices than their counterparts in the private sector. Public power utilities also emerged in several large cities - including Austin, Cleveland, Jacksonville, Knoxville, Los Angeles, Memphis, Nashville, Portland, San Antonio, and Seattle - where residents believed that competition was necessary to lower prices, raise the quality of service, or both. These public power systems, too, have stood the test of time.

As they did in the electric power industry, local governments can play a critical role in ensuring that our Nation's telecommunications goals are met, particularly in rural areas. The Federal Communications Commission underscored this point in its second report on the deployment of advanced communications services, in which it featured the experience of Muscatine, Iowa, as an example of how rural communities can help themselves to obtain competitive broadband services.¹⁰ The Commission unanimously reaffirmed and strengthened these findings in the Missouri preemption case, even while finding that the agency lacked the legal authority to preempt state barriers to municipal entry.¹¹ Although the composition of the Commission has changed, there is no reason to believe that the new Commission will view these facts in a fundamentally different way.

The Relevant Considerations

A local government that is dissatisfied with the pace, nature or quality of private-sector deployment of broadband services in its community will theoretically have a number of options ranging from doing nothing to becoming a full-service provider of broadband services. To determine which option(s) may be viable, the local government will have to analyze carefully the legal, technical, marketing, financial, political and other considerations affecting its community. While generalizations cannot substitute for case-specific analyses, there are some useful lessons to be learned from the experiences of others.

First, communities that already operate their own electric utilities have several advantages that may contribute to the success of a broadband project. To remain competitive in the increasingly competitive electric power industry in the years ahead, public power utilities will need highly sophisticated communications infrastructure and facilities. Such infrastructure and facilities can readily support the provision of video, voice, data and other advanced telecommunications services, either by the utilities themselves or by other providers of such services. Furthermore, public power utilities also have decades of experience in operating complex technologies, serving customers of all kinds, managing billing and collection systems, and providing technical support. They have access to essential poles, conduits and rights of way. Public power utilities also have a century-long tradition of universal service.

With assets such as these, public power utilities have successfully provided broadband communications since the late 1980s, when the public power utility of Glasgow, Kentucky, upgraded its communications infrastructure for internal purposes and discovered that it could use its new facilities to offer better and cheaper cable television service than the incumbent provider. Currently, more than eighty public power utilities are offering broadband services in over thirty-



three states, and many more are considering doing so. These utilities range from small systems serving less than 1000 customers to the \$100 million, state-of-the-art fiber network planned for Memphis, Tennessee, which will furnish wholesale high-speed communications services on an "open access" basis to telecommunications and data providers and resellers, which will in turn offer cable TV, video on-demand, high-speed data connections, telephone services and other advanced communications services throughout the city. ¹²

Public power utilities may also lead the way to the next generation of advanced telecommunications services - those offered through fiber to the home. For example, while major broadband providers claim that they have yet to find a business model that would justify offering fiber-to-the-home ¹³, the Public Utility District of Grant County, Washington, has already installed over 7,000 fiber miles and is building out an open-access fiber-to-the-home system that will make advanced telecommunications services available at *gigabit* speeds to approximately 40,000 homes and businesses by 2006. ¹⁴ The Grant County PUD will charge residents and businesses \$40 a month for access to its system, and they will then bring their own bandwidth to applications offered by cable, telecommunications, and other service providers over the PUD's network. This plan was well received in a recent pilot program to test consumer acceptance.

While helpful, operating an electric utility is not a prerequisite to a local government's ability to foster the rapid deployment of broadband communications in its community. For example, Chicago's CivicNet project promises to bring prompt and affordable fiber connectivity, not just to the City government's 1600 sites, but also to thousands of other organizations, including businesses, schools, libraries, hospitals, community centers, churches and even individuals. ¹⁵ By aggregating the \$25 million in annual telecommunications expenditures of the City's agencies and holding out the promise of substantial user fees paid by the others using the system, the City has given itself sufficient clout to attract private-sector partners who will build and operate the CivicNet system in accordance with the City's goals and specifications.

The City of Lynchburg, Virginia, furnishes a smaller-scaled but equally creative example. In 1997, the City began to construct a 42-mile fiber optic network to interconnect its municipal buildings and school facilities. The City essentially paid for the network within 18 months, as measured by the costs that the City would have had to pay to obtain equivalent services from the incumbent telephone company. When local businesses and residents urged the City to make its system available to the public, the incumbent telephone and cable companies of Virginia pushed a law through the state legislature that not only barred Virginia's localities from offering telecommunications services themselves, but that also precluded localities from leasing their telecommunications infrastructure and facilities to potential competitors of the incumbents. In response, the City embarked on a nationwide search for a strategic partner that would purchase the City's network and operate it in a manner that advanced the City's goals. The City eventually sold the system for \$1 to CFW Communications, a century-old telephone company in central Virginia which had reinvented itself as an aggressive telecommunications provider. In return, the City obtained a 30-year irrevocable right to use the fibers that it was currently using, 8 dedicated fibers on all newly-constructed routes, the lowest rates for telecommunications services in Virginia for a period of 10 years, a commitment by CFW to extend high-speed services to 95



percent of the City's addresses in defined stages within four years, and numerous other significant benefits. ¹⁶

Even in sparsely-populated areas in which fiber-based networks may be infeasible, local governments have stepped forward to bring themselves into the 21st Century. Examples include Washington County, Ohio, ¹⁷ Greenup, Illinois, ¹⁸ and the Missouri Basin localities of Keokuk, Iowa, and Sioux Falls, South Dakota, ¹⁹ which are all working to implement fixed wireless solutions. Numerous other satellite and terrestrial possibilities are also under development. ²⁰

New Challenges

Local governments that enter the communications field are likely to face challenges that are somewhat different from those faced by their predecessors.

First, shortly after the Telecommunications Act became law, a number of states enacted explicit state barriers to municipal entry. While some of these laws were working their way through the courts, several other states enacted laws that were ostensibly intended to balance the interests of public and private providers of cable and telecommunications services. While Section 253(a) of the Telecommunications Act prohibits both explicit and effective barriers to entry, proving that a non-explicit state law is an "effective" barrier to entry ²¹ may in some cases be difficult to prove. Doing so will require a showing that the measure "inhibits or limits the ability of any competitor or potential competitor to compete in a fair and balanced legal and regulatory environment." ²² Where such a showing is not possible, public entities will have to comply with the state laws or persuade the state legislatures to change them.

Second, incumbent cable and telecommunications providers have undergone a metamorphosis over the last few years that has left several of them larger and better able to cross-subsidize anti-competitive behavior. In several recent cases, incumbents have engaged in clearly predatory behavior, as if taunting affected competitors and federal agencies to try to stop them. When considering entry into broadband services market, public entities must therefore be prepared for the possibility that the incumbents will not only respond aggressively, but perhaps even unlawfully.

Third, for the last several years, the most rapidly growing source of competition for cable companies, particularly in rural areas, has been Direct Broadcast Satellite (DBS) service. While legal and technological problems have limited the growth of this platform, the legal issues have largely been removed, and the technological issues are not as severe as they used to be. Broadband DBS service is still constrained by the need for most users to use dial-up modems over ordinary telephone lines for the upstream link, but over time, new technologies may solve or mitigate this problem. If that occurs, DBS may prove to be a very formidable competitor in rural areas.

Finally, in the current "hands-off" deregulatory environment, new public entrants into the broadband communications market must be prepared to rely on themselves. It is unclear at this point whether, or to what extent, the Federal Communications Commission, or other branches of



the federal government, will forcefully intercede to prevent anticompetitive practices. While these agencies may ultimately decide that strong pro-competitive intervention is necessary if deployment of broadband services continues to lag, that is not something on which public entities can rely in formulating their business and economic decisions.

Conclusion

Given the critical importance of prompt and affordable access to advanced telecommunications services and the relatively slow pace of deployment of such services outside the major population centers, local governments will increasingly perceive the need to take matters into their own hands. Some will find that establishing and operating their own broadband networks is feasible. Some will find that working with strategic partners is the best course. Others will find that attractive alternatives do not exist, or no longer exist. In each case, however, the longer a local government waits, the more its community will miss out on the benefits of the Information Age. Unfortunately, as history shows, there are great dangers in waiting too long.

Footnotes:

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¹In *City of Bristol, Virginia v. Earley*, 2001 WL 520469 (W.D.Va. May 16, 2001), *appeal pending*, Nos. 01-1741, 01-1800, CA-173 (4th Cir.), the federal district court found that in Section 253(a) of the Telecommunications Act of 1996, Congress clearly and unequivocally expressed its intent to protect all entities, including public entities, from state barriers to entry into telecommunications. Section 253(a) provides that "No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of *any entity* to provide any interstate or intrastate telecommunications service." The court applied canons of statutory construction to which the United States Supreme Court has consistently adhered for over fifty years, including cases involving federal preemption of traditional state powers. *Bristol*, 2001 WL 520469 at *5, citing *Salinas v. United States*, 522 U.S. 52, 57 (1997) and *United States v. Gonzales*, 520 U.S. 1, 5 (1997). An appeal of the Federal Communications Commission's failure to preempt a similar Missouri law is currently pending before the Eighth Circuit, *Missouri Municipal League v. FCC*, No. 01-1379 (8th Cir.).

²Variouly ascribed, most often to the poet Paul Valery (1871-1945) or Yogi Berra.

³*Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146, *Second Report*, FCC 00-290 204-05 (rel. Aug. 21, 2000) (footnotes omitted) ("*Second Advanced Services Report*").

⁴Romero, *Once-Bright Future of Optical Fiber Dims*, NYTimes Online (June 18, 2001), <http://www.nytimes.com/2001/06/18/technology/18MELT.html?pagewanted=print>.

⁵Yang, *Overwired World: Telecom's Crash*, U.S. News & World Report at 40 (June 25, 2001).

⁶Goodman, "A Hot Sector Burns Out As Investors Stop Calling, Companies Search for Answers," The Washington Post at G01 (February 28, 2001), <http://www.washingtonpost.com/ac2/wp->



dyn/A59646-2001Feb26?language=printer; Kane, *Rhythms Looks For a Way Out*, CNET News.com (April 2, 2001), <http://news.cnet.com/news/0-1004-200-5419260.html?tag=lh>.

⁷Estrella, *Digital Access Pulls The Plug*, MultichannelNews (March 1, 2001), http://www.tvinsite.com/multichannelnews/index.asp?layout=print_page&publication=Multichannel+News&webzine=tv&doc_id=17868&articleID=&pub_id=MCN; Gerstein, *No Hand-Wringing Allowed - Focus on the Future*, The TelecomAnalyst (January 9, 2001), <http://www.thetelecomanalyst.com/individual/010109sections/pan4gold.asp>.

⁸See, e.g., Borland, *Local Phone Giants In a Squeeze*, CNET News.com (March 20, 2001), <http://news.cnet.com/news/0-1004-200-5193605.html>.

⁹Shakespeare, *The Tempest*, Act II, Scene 1.

¹⁰*Second Advanced Services Report*, at 139-151.

¹¹*In re Missouri Municipal League, et al.*, FCC 00-443, 2001 WL 28068 at 10-11 (rel. January 12, 2001); see also accompanying statement of Commissioner Susan Ness.

¹²Flessner, *Memphis Utility Forms Joint Venture For Fiber Network*, The Times & Free Press (November 22, 2000), <http://www.timesfreepress.com/2000/nov/22nov00/memphisutility.html>.

¹³Brown, *New Technology, Old Rules?*, Broadband Week (May 21, 2001), http://www.broadbandweek.com/news/010521/010521_news_regs.htm; Estrella, *RCN Quietly Testing FTTH Deployment*, MultichannelNews (June 13, 2001), http://www.tvinsite.com/multichannelnews/index.asp?layout=story_stocks&articleid=CA89798&display=archives.

¹⁴*Grant County PUD Selects Artesian Direct's CAPRISOL™ E-commerce Solution for Initial Pilot*, http://www.technetnw.org/news_stories/artesian_direct/grant_county_PUD.htm.

¹⁵Hayes, *They Won't Get Left Behind*, FWC.com (April 2, 2001), <http://www.fcw.com/civic/articles/2001/apr/civ-feat2-04-01.asp>.

¹⁶CFW's Press Release, http://www.business.com/directory/telecommunications/local_and_long-distance_carriers/us_local_exchange_carriers/competitive_local_exchange_carriers_clec/ntelos/key_developments.

¹⁷McKay, *Rural Ohio Creates Its Own Connectivity*, Government Technology (September 1, 2000), www.govtech.net/news/news.phtml?docid=2000.09.01-2030000000000236.

¹⁸Van & Tatum, *Wireless Broadband Service Migrates From Silos To City*, Chicagotribune.com (May 14, 2001), <http://chicagotribune.com/business/printedition/article/0,2669,SAV-0105140045,FF.html>.

¹⁹Recinto, *Broadband Comes to the Corn Belt*, Red Herring (May 18, 2001), http://www.redherring.com/index.asp?layout=story_imu&doc_id=350019435&channel=10000001

²⁰A technology that is not promising at all is broadband through plumbing facilities, *Waternet: Harnessing Water's Power For Broadband Communications*, <http://www.dutchwater.com/>.

²¹*In the Matter of the Public Utility Commission of Texas*, FCC 97-346, 13 FCC Rcd 3460, 1997 WL 603179 at 22 (rel. Oct. 1, 1997).

²²*In the Matter of California Payphone Association Petition for Preemption of Ordinance No. 576 NS of the City of Huntington Park, California Pursuant to Section 253(d) of the Communications Act of 1934*, CCB Pol 96-26, *Memorandum Opinion and Order*, 12 FCC Rcd. 14191, 1997 WL 400726 (F.C.C.) 31 (rel. July 17, 1997).

BUSINESS CASES

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 those 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.

What has kept private business and local governments from participating in those networks have been a lack of paid usage sufficient to justify the investments to provisioning those fibers and local connections on one hand, and the disruption to the telecommunications industry on the other.

Given the initial responses from the surveys and private interviews, most of the carriers listed below have agreed, through personal interviews in which they participated, 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 through the capabilities they are about to offer and, in many cases, what they could offer if some help is provided. For that reason, they have been preparing an outline of what they are currently offering, what they are about to offer, and what they may additionally offer if the assistance can be provided either in the way of additional customers or financial assistance to help pay for incremental capital equipment required to launch and support services. The proposals that have already been submitted are included in exhibits in this second edition of the final report and are discussed in the strategy section.

COMPANIES CAPABLE OF PROVIDING PROPOSALS FOR NEXT STEPS

The following overview of current and prospective broadband providers, included in the first edition, is expanded in this second edition and further discussed in the strategy section.

ACC, ALLEGHENY COMMUNICATIONS CONNECT (BACKBONE)

ACC is a regional provider of telecommunications services. Between their established fiber networks and those of prospective collaborators with whom they already have relationships, ACC has indicated interest in creating or participating in a regional network that would serve the Western Maryland area businesses or ISPs.

ACC and Garrett County, Maryland were recently awarded a grant from the US Department of Agriculture. The picture in this section is of Administrator Hilda Gay Legg and State Director





Marlene Elliot presenting a check to Allegheny Communications Connect and the town of Oakland, Maryland for \$1,140,722. The USDA Rural Development grant is part of the RUS Community Connect Broadband Grant program, and is one of the Bush Administration's initiatives to strengthen our nation's economy.

Oakland is one of 34 communities in 20 states to receive a portion of the \$11.3 million, which will help provide broadband transmission service. This investment is intended to help enhance educational opportunities, improve access to health care, increase public safety and accelerate economic development.

ADELPHIA (LAST MILE)

Adelphia has still not completed bankruptcy proceedings, which have hampered local companies such as Procom from consummating offers for the purchase of their local franchises.

Adelphia offers their Power Link cable modem service in areas where their backbone networks have been upgraded to two-way fiber optic transmission facilities. Adelphia Power Link is high-speed broadband Internet service delivered through standard television cable service. Adelphia's fiber optic network delivers the Internet at speeds simply not possible with traditional dial-up services. Adelphia Power Link is not available in all areas.

In addition, Power Link Premier is a new high-speed Internet service from Adelphia that offers even faster upload and download speeds than the standard Power Link service plus provides enhanced email features. Power Link Premier is designed for customers actively using bandwidth-intensive services, particularly if the internet connection is also being shared among multiple PCs.

Power Link Premier addresses intensive Internet usage requirements with download speeds of up to 4 Mbps, and upload speeds of up to 512 Kbps. It also provides for up to 10 individual email accounts that can share a total of 100 Mb of network storage. Power Link Premier is priced at \$79.95 per month for customers with a qualifying Adelphia cable video service and \$91.95 for customers without Adelphia cable service.

Recent construction in Loudoun County, Virginia indicates that Adelphia is still performing facility upgrades during these bankruptcy proceedings. We are awaiting their business case to indicate their deployment schedule for their territories in Western Maryland.

ALLCoNET2 (LAST MILE)

AllCoNet2's deployment of local wireless broadband services will make it possible for Allegany county to negotiate with broadband backhaul providers to provide an alternative route for western Maryland that other private and public sector entities could use. It would be very beneficial for the county to consider the economic development ramifications of the various



kinds of services that backhaul providers can offer so that the area businesses and ISPs can make the best of use of the company that provides services. This is a case where the lowest price may not be the best value.

AT&T (BACKBONE)

Though many of the services of AT&T are delivered to Western Maryland businesses via the Verizon network, they provide distinctively different services that could play a critical role in providing a diverse carrier to the area.

AT&T's ability to leverage its CLEC assets and its industry-leading points of presence can easily position AT&T as a major player and competitor in the Western Maryland region.

BLUE MOON (BACKBONE AND LAST MILE SERVICES)

Blue Moon claims to have one of the best-priced reseller's contract from MCI because of their volume usage. They have indicated interest in serving the Western Maryland area across the MCI fiber optic system that already exists across the CSX right of way and in making their deep discounts available to prospective users there. They also provide a franchise model for broadband support services that current or prospective ISPs might use to strengthen their support capabilities and plan to offer development of a broadband laboratory for rural Maryland.

BUSINESS INFORMATION GROUP (BIG)

BIG has been contracted by SAILOR to provide wireless infrastructure across Maryland and has also maintained a working relationship with AllCoNet2 including providing engineering support services for the interoperability demonstration performed on August 5, 2003. BIG, Blue Moon, and TWR are examples of companies that can assist rural firms or agencies to design and deploy wireless broadband infrastructure and services.

CHARTER (BACKBONE AND LAST MILE)

Charter has signed a definitive agreement with Atlantic Broadband LLC selling some of its cable assets, including some of those in Western Maryland. The sale followed the company's strategy to rid itself of assets that were not geographically strategic.

Charter has recently completed a portion of a fiber optic network in Western Maryland to reduce their dependence on Verizon. This may make it possible for Charter to offer diverse route services to businesses or ISPs in circuit and collocation offerings that are over and above their residential cable model offerings. Depending on location, many businesses will not be on their routes, which have been designed to pass near homes for cable television usage and not for businesses.



Charter is already making cable modem service available in some western Maryland service areas, such as Cumberland. TLA has offered to interview the new management to see what commitments they may be willing to make to the Western Maryland markets.

This is in keeping with the recommendation that encourages cable providers to offer cable modem services throughout their current service areas.

INTELSAT/VERESTAR; HUGHES/SKYCASTERS (BACKBONE AND LAST MILE)

Intelsat will have at least two diverse satellite systems that could serve businesses and residents in rural Maryland. Current services that they offer directly (and through Verestar³⁶ as a value added reseller) could provide substantial broadband services to ISPs needing Mb/sec service alternatives. Though more costly than fiber based services, they could be used to provide a diverse carrier and diverse route strategy for more survivable networks that are important for businesses and public agencies who cannot tolerate network down time.³⁷

Intelsat is also releasing a less expensive system as part of a joint venture named “Wild Blue” that would rival DSL pricing for broadband services including larger bandwidth from the user to the satellite by late 2004. A more complete outline of these services is has been provided by Intelsat and is included in the exhibits. Together, those two services could provide diverse routes to very rural and isolated users, depending on their bandwidth requirements.

Hughes Network Systems, the parent of DirecTV, offers a Direcway DSL alternative delivered through satellite.³⁸ Using the same satellite system, Skycasters currently provides VPN services through added value infrastructure they have installed at their Hughes collocation.³⁹ Skycasters owns and operates its own Hughes-manufactured Satellite Gateways, which are collocated inside of the Hughes Network Operations Center (NOC). Skycasters owns and operates over \$1 Million dollars worth of dedicated facilities including Satellite Gateways, routers, servers, etc. that are used to provide its advanced services.

LEVEL 3 (BACKBONE)

Level 3 installed 96 strands of fiber along I-70 and I-68 for a number of carriers, such as XO Communications (which owns 24 of these strands), and networkMaryland. While normally not involved with the kind of on and off ramps needed by Western Maryland customers, they have

³⁶ See <http://www.verestar.com/> for company information.

³⁷ See <http://www.intelsat.com/pdf/en/products/broadband/broadband.pdf>.

³⁸ See <http://directv.direcway.com/> for info; also <http://www.hughes.com/home/default.asp>.

³⁹ See www.skycasters.com.



indicated willingness to assist their carrier customers in doing so and have participated in negotiations with Allegany County. Level 3 also has empty conduits that can be used to blow more cable through them in relatively short time (nearly 60 mi/hr) if new fiber is ever needed in the future for purposes such as technology refreshment.

NETWORKMARYLAND (BACKBONE)

networkMaryland supports government agencies with services across western Maryland. They have the ability to provide connectivity to local government agencies in western Maryland, but, have yet to define availability, pricing and other issues. They could also use their strands across the Level 3 conduits, especially the ones that they are ready to exchange for routes by other fiber holders, to serve as an alternate route for businesses and agencies in rural Maryland.

PROCOM (LAST MILE)

Procom is beginning to offer a combination of DSL or fiber to the home infrastructure and services in their service areas in Garrett County. They are in the process of providing information about their near term expansion plans and willingness to participate in a more aggressive roll out plan if assistance could be provided. Material describing their current offering is in the exhibits.

QCOL (LAST MILE)

QCol, working closely with Procom, is also offering fiber to the home infrastructure and services to Friendsville and other areas.

SAILOR (LAST MILE)

SAILOR is the library network, which plans to support broadband wireless infrastructure across the state. As this network grows across western Maryland, it will provide impetus for public sector applications along with AllCoNet2 and networkMaryland that could support or attract backbone connectivity outside the region.

Additional current service offerings include DNS (domain name services) for the State of Maryland's state.md.us, support of the Sailor Internet Connection Service, and outreach in the form of "beyond the Sailor router" technical consulting for Maryland Public Libraries and ICS participants.



TWR (LAST MILE)

TWR has been active in serving areas across western Maryland and Pennsylvania for clients such as Allegany College with wireless services supported from their towers in the area. In the last several months of 2003, they have been deploying Motorola Canopy services to the Cumberland area. These fixed wireless services provide 1-2 Mb downstream bandwidth and 500Kb to 1Mb upstream bandwidth. Three of eight systems have already been installed with the remainder expected to be on line by the beginning of 2004.

UNIVERSITY OF MARYLAND SYSTEM (BACKBONE AND LAST MILE)

University of Maryland System services can provide the foundation for services supplied to business parks at campuses they support, such as Frostburg State University and their remote campus in Hagerstown, MD.

VERIZON (BACKBONE AND LAST MILE)

As the incumbent local exchange carrier (ILEC) for the region, Verizon will continue to play a vital role in infrastructure and services. Verizon is in the process of rolling out more DSL service to towns across western Maryland. Ideally, they could make a ubiquitous offering of DSL service through each of their central offices. In situations where the business case may be uncertain, Verizon or other last mile providers could offer DSL services if certain incentives were offered. Verizon will provide their rollout schedule sometime in February 2004. Now that Verizon is no longer prohibited from providing long distance services, they should be able to offer reduced-cost bundled services. This could provide a significant economic incentive for local businesses for their primary voice and data communications services.

XO COMMUNICATIONS (BACKBONE AND LAST MILE)

XO Communications is a large carrier that provides competitive local exchange services across the country, and owns 24 of the 96 strands that lie within the Level 3 conduits. They also provide local broadband wireless services in a number of their service areas. They recently received a substantial additional investment and are in the process of acquiring other telecommunication firms.

They have also provided broadband wireless service across the country and could provide similar services in western Maryland.



POLICY RECOMMENDATIONS

These policy recommendations are part of the broadband deployment strategies created for the Tri-County Council for Western Maryland. They are based on the background of the project team and the various activities that were part of the development of the deployment strategies. Activities included interviews, surveys, and interactions with community and business leaders who have participated in the Western Maryland Broadband project.

The TLA team has suggested these policy recommendations to enable and accelerate the deployment of broadband to rural and underserved areas in the state of Maryland. These recommendations are ours, based upon our findings, and do not necessarily reflect the views of the project sponsors or any other entity.

Our team strongly believes that these steps are key in transitioning Maryland into a state where rural development is strongly supported to the benefit of all of its citizens. Our vision is for Maryland to take a lead role nationwide as a supporter of efforts to drive sustainable and appropriate development in rural areas.

A recent study, prepared by Analysis Consulting and TechNet, entitled “The State Broadband Index”, presented an assessment of state policies impacting broadband deployment and demand.⁴⁰ In this report, Maryland was not listed in the Top 25 or Top 10 states in any of the indices, including The State Broadband Index, the Deployment Regulations Index, the Supply-Side Promotions Index, and the Demand-Side Promotion Index.

To our understanding, many local and state government representatives are endeavoring to change this perception and reality. The Broadband Task Force, enacted by legislation last year and chaired by Senator Pipkin, is studying potential options to improve the state of broadband deployment in rural Maryland. Our team has worked closely with this task force to share our vision based on our in-depth knowledge of Maryland’s rural broadband challenges. Some excerpts from Senate Bill 487 (House Bill 697) that comment on the use of state and regional assessments, such as this report, are included on the next page.

The purpose of this chapter in our final report is to outline our proposed recommendations and to present the case for their inclusion into local and state policies. The first section in this chapter presents a list of the recommendations; each recommendation is then described in detail in its own following subsection.

⁴⁰ See http://www.technet.org/resources/State_Broadband_Index.pdf for a copy of this report, and Appendix B for a copy of the press release.



SENATE BILL 487

Unofficial Copy
C8

2003 Regular Session
(31r1237)

ENROLLED BILL

-- Finance/Economic Matters --

Introduced by **Senator Pipkin**

23 (h) The Task Force shall:

24 (1) shall consider developments and best practices in regions of the
25 country where broadband communications is being deployed for are being deployed in
26 rural communities, the broadband networking infrastructure in those areas, and the
27 direct and indirect benefits and costs associated with the networks;

28 (2) after considering existing State and regional broadband
29 communications assessments and information that may become available during the
30 deliberations of the Task Force, shall evaluate:

(i) the resources, infrastructure, and cost structures now in place
2 or available in the various rural regions of the State for developing or accessing
3 obtaining access to broadband communications;

4 (ii) the feasibility of using existing or alternative legal mechanisms
5 and infrastructure to support the economical development of broadband
6 communications in rural areas of the State;

7 (iii) the utility of several applications where broadband
8 communications would be beneficial to benefit rural areas, such as applications
9 relating to agriculture, medicine, and education; and

10 (iv) other matters that the Task Force considers pertinent to
11 establishing effective broadband communications in the rural areas of the State;

(See HOUSE BILL 697)

OVERVIEW OF RECOMMENDATIONS

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 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.

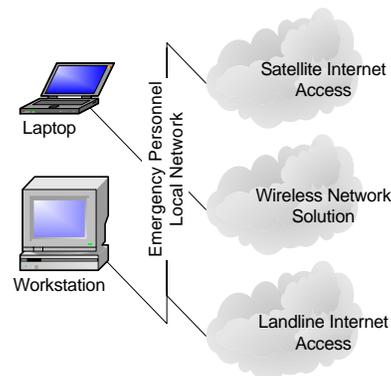
17. Create demand-side opportunities, such as a broadband day sign-up by chambers of commerce.
18. Develop a model of a systems and network development (SAND) corporation serving local government that can reinvest a meaningful portion of money saved or increased revenue into staff, services, and infrastructure.

#1 – DIVERSE ROUTES AND CARRIERS

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.

Economic sustainability and growth of a modern community require broadband infrastructure and related services. This requirement will continue to grow as data, voice, and video application continue to converge in new applications. Without a solid communications infrastructure, existing businesses have a competitive disadvantage and new businesses have a disincentive to start or move to an area. Additionally, the requirement for a survivable and robust communications system is also growing in other applications – and this need is becoming critical at the agencies and businesses that deliver emergency services. Unfortunately, when emergencies arise, either by accident, through natural events, or as an act of terrorism, the very networks we need to protect ourselves and recover from these emergencies are also affected and often are unavailable.

While local exchange carriers, including Maryland’s carriers, have invested billions of dollars in diversifying and protecting their inter-office facilities (backbone services), last mile services have little or no protection and are still the single largest cause of day-to-day network outages. Additionally, regional issues, such as the lack of inter-exchange carrier points of presence in Maryland’s rural LATAs, require excessively long point-to-point local T-1 access circuits, which increase the potential exposure to outages, especially in emergencies. The only solution to address these problems is the deployment of diverse backbone and last mile routes and carriers.



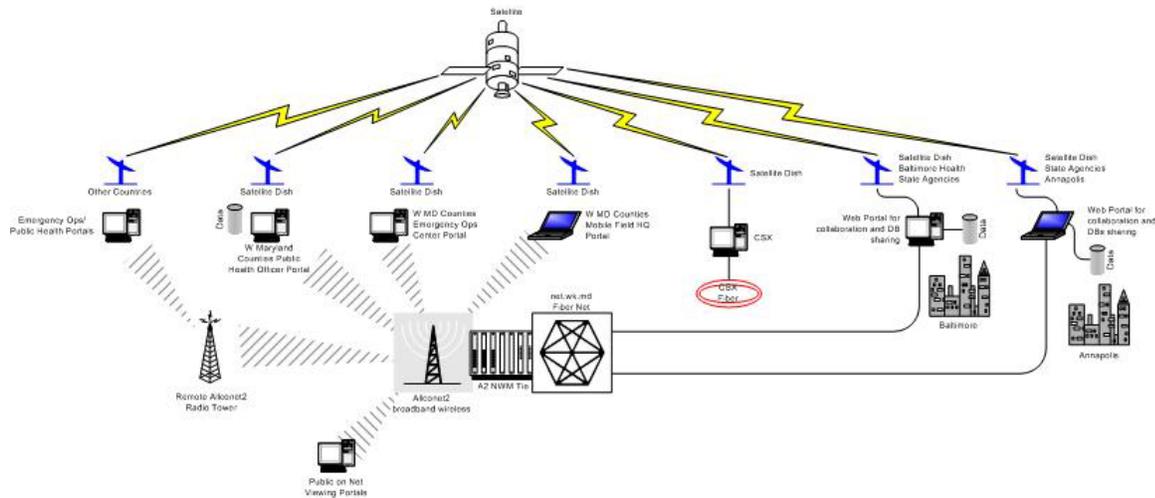
AN ILLUSTRATION OF SURVIVABLE NETWORKS – ENABLING COMMUNICATIONS IN EMERGENCIES

Rural leaders should create and support policy and applications at the local, state, and national level that promote the use of multiple broadband networks encompassing diverse routes, carriers, and technologies for the backbone as well as the last mile. Local agencies and companies should participate in regional municipal and county organizations to promote broadband policies that support rural stakeholders in their need for diverse routes and carriers.

There will always be trade-offs between different technologies and service providers. Even though any one of those may dominate at any one time, changes in technologies, business models, applications, and the environments in which they serve will make it advisable for any given community to make use of diverse routes, carriers, and technologies.

The following picture of a survivable network includes the use of the Internet, private wireless and fiber optic networks, and satellites. These same networks that could be used by businesses, schools, health care providers, and government agencies, can be the same used by emergency services personnel on a daily basis, or in the event of a crisis requiring massive interagency and inter-locality communications. For these reasons, rural communities should also look for opportunities to demonstrate the value of their communications infrastructure in supporting their urban counterparts in various emergency scenarios so that rural communities can improve their revenue generation and funding opportunities.

This approach makes it possible to work around interoperable communications problems while creating interoperable infrastructure. See the recommendations for emergency services communications for more detail.



SURVIVABLE, INTEROPERABLE NETWORKS – DIVERSE BACKBONES, DIVERSE ROUTES, MULTIPLE CARRIERS

#2 – DEVELOP NEXT STEPS AND GOALS

Follow through policy recommendations and strategies with specific next steps, responsible parties, and resulting goals that can be measured.

Each of these policy recommendations and the recommended goals for the implementation strategy later in this report will be valuable to the extent that the community takes steps to implement them. Each of these recommendations can be broken down into next steps that can be



accomplished by specific companies, agencies, and individuals with the responsibility to carry them out. This will make it possible to measure progress and make any necessary changes along the way to accommodate changing circumstances. This will also make it possible to identify resources that will be needed to accomplish these recommendations and goals.

The Tri-County Council for Western Maryland can prioritize these recommendations and goals and create a matrix of next steps, responsible parties, and due dates for each measurable outcome with the help of appropriate stakeholders.

#3 – SUPPORT INDUSTRY PROPOSALS

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.

One general principle in creating infrastructure and services for rural communities is to aggregate local purchasing power so that a local community can gain the attention it deserves from businesses and service providers it normally would not be able to attract. Another principle is to find opportunities to serve those outside the community in such a way that their money is attracted into the rural community. The opportunity to create local points of presence in western Maryland that tie businesses into these networks could do both.

Aggregating business and government usage of these networks can make the difference as to whether a long haul provider can justify providing a local point of presence for their established network, such as MCI or Level3. In some instances, it may justify the development of a new regional route similar to the one proposed by ACC. The current negotiations of Allegany County with owners of these fiber routes asking that they create local points of presence should be encouraged. Difficulties in meeting business case objections by the carriers should be seriously considered and creative alternatives offered by the County.

The availability of a more sustainable broadband network with diverse routes and carriers will enhance the ability of private businesses and public institutions to place remote networks and staff in western Maryland in order to create more rigorous business continuity alternatives. Specific proposals from broadband providers are included in the exhibit of this second edition of the final report. Strategy recommendations will provide suggested next steps for implementation in Strategy Goal 4.

#4 – USE OF BROADBAND IN EMERGENCY SERVICES

Encourage adoption of cost saving or value creating applications which require broadband usage, such as converged voice, data, and video emergency services communications.



Applications that reduce costs or create revenue make it a lot easier to justify and deploy broadband networks and services. Compelling applications also makes it possible to provide the revenue that could support more than one backbone carrier or last mile provider. One example of a broadband application that can reduce costs, create value, and attract outside resources is interoperable emergency communications. Emergency operations center (EOC) staff may need to communicate with their peers and staff from other agencies, non-governmental agencies, and businesses in the normal course of their work. They may also be required to communicate with others in nearby jurisdictions without any notice. Those other jurisdictions will include those on other mobile radio communication frequencies and with agencies that have no radio communication capabilities at all including public health officials and those in non-governmental organizations such as the Red Cross.

Critical EOC staff may need to be brought into communication while they are at remote locations. An emergency operations center may need to relocate “on the fly” to remote sites in order to maintain command and communications. These requirements show the importance of the portion of the interoperability problem that requires communication that is available “on-demand”.

Broadband networks that are developed in communities for government, schools, health care providers, and businesses are the same networks that can provide these crucial communications services in a way that is interoperable and supports voice, data, and video applications. Rural communities need these capabilities not only for their own survival, but, for the ability to meet the needs of their urban neighbors in times of substantial calamity. A core aspect of Internet access is its built-in interoperability – anyone can access any application anywhere with a standard suite of services available on any Internet-connected computer.

Nowhere else in communications, save traditional voice services, is this degree of interoperability available. The use of Internet access, especially high-speed broadband services, can provide a back-up to analog voice services in the event of an emergency – especially an emergency that limits the availability of voice communications. Imagine the possibilities of communications on September 11, 2001, if survivable (i.e. landline, wireless, and satellite) Internet access was ubiquitous across the affected areas. Individuals could communicate seamlessly, using applications that they are familiar with (e.g., web portals, email). The loss of mobile and voice services, especially in lower Manhattan, seriously impacted the ability to communicate and respond in that emergency. Prospective users of the Internet for mission critical communications should monitor and consider deployment of advanced Internet services that provide for higher levels of service level agreements and related security issues similar to those provided by Internap⁴¹.

The Tri-County Council for Western Maryland demonstrated this capability on August 5, 2003 with participating agencies around Appalachian Maryland and others as far away as California and New Mexico. Western Maryland is an ideal place to showcase diverse routes, carriers, and technologies that employ broadband wireless, fiber optic, and satellite systems for survivable

⁴¹ See www.internap.com for information regarding their solutions and the applicability to this

interoperable networks. This demonstration was a local effort to contribute to the solution of the interoperability problem as outlined in the report, “Why Can’t We Talk?” by the National Task Force on Interoperability in February 2003⁴². One of the two Task Force members of the published report representing state representatives, Thomas Armstrong, and Charles Manto organized the demonstration.

Local units of government should continue the work of attracting federal and state resources to bolster this capability, particularly AllCoNet2 and its counterpart in Garrett County, which can be a model for many communities across the nation.

The following news account from the Cumberland Times-News shows the ability to create a broadband-enabled virtual emergency command center on-demand.

Wednesday, August 06, 2003

Emergency resources at fingertips



Cumberland Police Capt. Byron Schulten, left, demonstrates an in-car computer with a high-speed system capable of communicating with other agencies throughout the county via the Internet to Prince William County (Va.) Police Technical Service Analyst Steph Vavarick Tuesday at the Allegany County Department of Emergency Services and Communications.

(Photo Credit: John A. Bone/Times-News)

Heath E. Combs

Times-News Staffwriter

CUMBERLAND — Imagine heavy rains hit Allegany County. A nursing home and elementary school sit in the flood’s path.

Dick DeVore asked state and federal public safety representatives to imagine this situation Tuesday afternoon, then showed them how to control the emergency in a matter of minutes.

DeVore, Allegany County’s director of Emergency Services and Communications, accessed blueprints, safety routes to hospitals and emergency shelters. He even found an emergency shelter with room for 500 and an industrial-sized kitchen.

And he did it all from a remote computer at Frostburg State University.



Law enforcement and emergency agencies met Tuesday to view a presentation by the Tri-County Council for Western Maryland and the Instant Area Networks team of companies. The presentation “Survivable, Interoperable, Emergency Communications,” involved live emergency demonstrations of possible catastrophic events and possible disaster plans. The demonstration took place at the Allegany County 911 Center.

DeVore was using a strategy combining high speed wireless Internet to access information public agencies need for emergency situations.

“What we have is a virtual EOC (Emergency Operations Center) online,” said DeVore. These emergency strategies are not available yet, but are part of strategy developed by emergency response officials in the tri-state area.

Charles Manto of TLA Associates worked closely with area emergency agencies on the strategy. Manto said the plan was executed with practically no monetary resources.

“So we can now talk to each other, or even see each other during an emergency,” said Manto.

“We’re kind of at a disadvantage, because other areas in Maryland have a bigger infrastructure,” said DeVore.

But, he said, this helps Allegany County to develop a more cost effective strategy. In addition, working daily as a multi-county, tri-state agency reflects positively on interoperability strategies in Allegany County.

Also on display were police cruisers containing computers with wireless high-speed technology. Information could be transferred to the vehicles that were traveling at speeds up to 70 mph.

Police using the equipment could access crime records for specific locations and times when crimes frequently occur.

Greg Wilburn, director of Internet Services at Luminary of Chantilly, Va., said current police systems are outdated. Wilburn said such services are needed that give officers more access to information they don’t have today.

Wilburn said that equipment that would allow police to see real-time videos of crimes happening would be an excellent resource.

“An officer watching might be able to see a situation and say, ‘I’ve seen this situation, before, wait,’” said Wilburn.

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#5 – ACCESS TO RIGHTS-OF-WAYS

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.

All units of local and state government with oversight or management of rights of ways and towers should review and modify their policies when necessary to support diverse routes and carriers for both backbone and last mile providers. This would include the pricing of rights of ways to make it possible for small businesses to participate as last mile providers and businesses to provide their own infrastructure when feasible.

At the same time, agencies overseeing the use of rights of ways and towers need to make sure that they are maintained and secure. This requires proper funding from either the users or the communities. The total cost of development and ownership should be considered in cost models so that pricing can recover all related costs so that rights of ways can be properly secured and maintained. But, pricing should not be so high that it prices smaller providers out of the market. Future use can be projected to determine if it is wiser to build additional conduits at the time of trenching, or provide for another nearby tower so that undue costs and disruption can be avoided when additional capacity or diverse routes are needed in the future.

Private interviews with smaller businesses and service providers have uncovered dissatisfaction with perceived highly overpriced access charges to rights of ways and towers that have slowed their investment in new services. In addition, some organizations have communicated their discontent with the effectiveness and equality of the processes to distribute access to key facilities, and the time required to do so.

Local and state governments should participate in regional municipal and county organizations to organize and learn from stakeholders while discovering and supporting best practices regarding rights of way issues. By exploring on-going discussions with national telecommunications associations and local government associations such as Public Technology Inc.⁴³ and the National Association of Counties⁴⁴, local government can develop a framework for technical and policy recommendations.

Some applications have been tied into the very utility rights of way producing broadband infrastructure and services for citizens. For example, wireless utility meter reading applications are being explored as ways to provide wireless services (in this case, Wi-Fi) to underserved communities. Public Technology Inc is currently in the process of developing a program in

⁴³ See <http://www.pti.org> for more information.

⁴⁴ See <http://www.naco.org/> for more information.



coordination with Corpus Christi. This program is described in detail in their joint press release below.

November 21, 2003
For Immediate Release

Contact:
Brian Anderson, Public Technology, Inc., 202/626-2432, banderson@pti.org
Doug Stroh, Public Technology, Inc., 202/626-2445, dstroh@pti.org

Corpus Christi, PTI join forces to implement AMR initiative

Washington, DC-- Corpus Christi, TX has contracted with Public Technology, Inc. (PTI) to act as general contractor to implement a city-wide Automated Meter Reading (AMR) solution for both water and gas utilities. The AMR solution is intended to reduce meter reading and maintenance costs by allowing meter levels to be read by wireless technology rather than human interaction. The project is scheduled to be implemented over a five year period.

"PTI is in the unique position to draw on the experience of its members who implemented AMR and use their 'best practices' and 'lessons learned' for the design and implementation of Corpus Christi's AMR and wireless network. That's what makes our partnership with PTI so exciting," said George P. Noe, City Manager of Corpus Christi.

"This project is the first of its kind in that the city is looking to implement a metro-scale wireless (Wi-Fi) network solution that will enable city utilities to remotely read meters as opposed to traditional drive-by radio transmitted reads used in traditional AMR solutions," said Brian Anderson, PTI's Chief Information Officer. This AMR solution has been approved by Corpus Christi based on the assessment and return on investment study completed by PTI earlier this year.

Metro-scale cellular Wi-Fi networks utilize the benefits of standard broadband data networking while overcoming its limitations. Through the use of these Wi-Fi systems, economical, citywide coverage can be achieved at hundreds of times the speeds of conventional cellular data networks. Wi-Fi systems can be used across all departments to speed up productivity as well as enhance communities. Wi-Fi can be used as a public safety tool to increase surveillance as well as for the general public in providing Internet connectivity in municipal buildings such as city halls and courts. In addition, some cities and counties are investigating, in conjunction with local service providers, providing Wi-Fi broadband service to constituents in outlying regions where laying fiber networks is not cost effective.

"Corpus Christi should be commended for the leadership role they are taking in exploring the benefits of the AMR initiative and implementing a Wi-Fi network," said Costis Toregas, PTI President. "It is PTI's expectation that their experience will encourage other cities and communities to explore implementing some of the same systems to improve communication and wireless capabilities in their own communities."

About PTI

Public Technology, Inc. (PTI) is a non-profit technology research and development membership organization based in Washington, DC. Cities and counties across the country are members of PTI. Founded more than 30 years ago, to advance the use and development of technology, PTI's mission is to bring the benefits of technology to local and state government. Through task forces, focus groups and pilot demonstration sites, PTI's members and industry partners work together to keep pace with advances in today's technology and forge innovative solutions to tomorrow's challenges.



#6 – AGGREGATION OF PUBLIC AND PRIVATE SECTOR BROADBAND NETWORK PEERING POINTS

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.

While public sector network managers have created points of presence which are serviced by various backbone providers, other networks within the private sector could make use of the local points of presence of those backbone providers by collocating equipment that ties their networks into that point of presence. In some cases, the presence of private sector networks can make it possible for public sector agencies and universities to collocate their network equipment so that they may be able to extend their capabilities to rural areas. Together, private and public sector entities can attract diverse backbone providers to create a point of presence in those rural areas.

In some instances, there will be value in having public and private sector users join in discussions with prospective providers in order to create a sufficiently large customer demand. This is an understandably more complicated way to conduct business for all parties, but, it can be done. Public and private buyers of services do not usually work together. The sales teams of the backbone providers are divided into government and commercial account representatives who do not often work together. In the case of Allegany County, officials could bring some private sector users together to help strengthen the case for establishing local points of presence. (This assumes additional private meetings between government and private sector users.) But, if they do, both the government and commercial sales representatives of the respective carriers will need to be included.

The Tri-County Council for Western Maryland, or its technical representatives, could facilitate next step meetings with each of the parties as needed.

The press release describing the Baltimore Education Research Network (BERnet) is presented as an example on the following two pages. After this press release, we have included a web article that outlines the current state of BERnet.

**NEWS RELEASE**

11 -12 03

Consortium Brings High-Speed Data Service to Baltimore and the State

A consortium of Maryland universities, libraries, and government has created a link that will provide high-capacity data transmission service exclusively for educational and research institutions in the Baltimore metropolitan area that connects to all major statewide networks. The Baltimore Education and Research Network (BERnet) will enable connected institutions to share and transfer large amounts of research data, images, and files across the country.

By providing a connection to the high-capacity Internet 2, BERnet will extend resources in education, research, and human services to all areas of the state. It will provide access to graduate-level research and education to teachers and workers; provide access to citizens via public libraries; expand medical, social, legal, and specialized technologies to rural areas; and reduce the need to travel.

The consortium includes the University System of Maryland (USM), the University of Maryland, Baltimore; the University of Maryland, Baltimore County; Johns Hopkins University (JHU); Morgan State University (MSU); the Enoch Pratt Free Library and Maryland Public Libraries' Sailor Network; the Mid Atlantic Crossroads (MAX); City of Baltimore; and the State of Maryland Department of Budget and Management.

Along with the 13 USM institutions, access to BERnet includes several community colleges, the Maryland State Department of Education, the City of Baltimore, MAX, the Enoch Pratt Free Library and the schools and public library systems connected to the Sailor Network. JHU, Morgan State University, and others will be connected by January 2004.

BERnet connects several Maryland networks that have been built over the years and allows Maryland to be one of the first states in the nation to establish a "network of networks" to increase speed, efficiency, and dependability of data transmission service. BERnet builds on the early efforts of the University of Maryland, College Park, which established one of the first regional networks in the country, making it possible for mid-Atlantic universities to connect to the first generation Internet that has grown into the Maryland-District of Columbia-Virginia consortium that created the MAX, which is the regional connector to Internet 2.



BERnet uses the State of Maryland's fiber-optic cables along I-95 between Washington and Baltimore to connect the consortium through the MAX in College Park to the national high-capacity data transmission services known as Internet 2. Created by educational and research institutions, Internet 2 provides 3,500 times the capacity of a typical home broadband connection. Research and educational institutions have found that the commercial Internet is slowed by too many users and does not adequately support their high bandwidth applications. Consortium members access BERnet through the state office building at 6 St. Paul Street, Baltimore. BERnet's fiber-optic cables are part of **net.work.Maryland**, a data transmission system built, operated, and managed by the Maryland State Department of Budget and Management to meet the state's future data transmission needs. Sailor, Enoch Pratt Free Library, has been instrumental in spearheading the early efforts to interconnect Baltimore City's academic institutions and libraries to this valuable resource.

"The state of Maryland has taken a leadership role in supporting economic development of the scientific industry," says Governor Robert L. Ehrlich Jr. "This project shows the value of **net.work.Maryland** in anticipating industry needs."

"Another value of this system," says William E. Kirwan, chancellor of USM, "is the increased capability it gives educators and researchers in the Baltimore area. It is another step in the improvement of Maryland's higher education system."

"BERnet has made it possible to connect every level of public and private education in Maryland to affordable next-generation network access and has created an environment that will make it easier to attract businesses to the Baltimore metropolitan area," said William R. Brody, president of JHU.

"The network is important to the continued economic development of City of Baltimore," says Mayor Martin O'Malley. "We are pleased that it will provide immediate service to the Pratt Library and Sailor, and we are looking forward to the opportunity to extend this service to our elementary and secondary public schools."

"Through this partnership of organizations, Marylanders will have equitable high speed access to the unique resources available on Internet 2," says Carla Hayden, PhD, executive director of the Enoch Pratt Free Library.

At \$200,000, the startup cost of the network is low and will be split by the consortium members. The annual cost per institution will be approximately \$5,000. If the consortium were to purchase this level of service from a provider, annual charges could exceed 1.5 million dollars a year. Other colleges, schools, and research institutions in the Baltimore area will be eligible to join and help defray the costs.



Internet2 Awareness and Education & High Speed Connectivity in Baltimore

Update November 2003

Objectives:

To promote the capability of this high-speed network for collaborating with colleagues at other institutions and research agencies. To educate faculty, researchers, and staff on the use and benefits of video-conferencing as well as transmitting large files of data and/or images across the Internet2 Abilene network. To build and connect to a Baltimore network infrastructure in the City of Baltimore which is faster than the current Internet network used by UMB. The connection would be supported by the Baltimore Consortium, which would include UMB, USM, JHU, MSU, SAILOR, UMBC, the City and the State DBM.

Current State:

UMB is now a primary member of Internet2. The Center for Information Technology Services worked with the Internet2 organization as well as with UMB Schools in presenting our first Internet2 day here at UMB on March 10, 2003. Notable researchers and faculty demonstrated applications and video for research, teaching, learning and collaboration. A series of "show and tell" sessions have been delivered to all the UMB schools where faculty and researchers attended. These sessions showed faculty how to send large files of data as well as videoconference using Internet2 and the Abilene network.

Also, the Baltimore Education and Research network (BERnet) is fully operational. UMB now send Internet2 education and research "traffic" through a much faster connection in the City of Baltimore. The City of Baltimore, Baltimore region, and State of Maryland, now has a major Internet infrastructure in place, further expanding the capacity of UMB to connect with local, regional, and national education and research entities.

Outcome:

UMB faculty, researchers and staff will gain an understanding of how to use video-conferencing technologies and how to transmit files from servers and computers to colleagues at other Internet2 member institutions and agencies. An acquired knowledge of how to use this high-speed research and teaching network will hopefully lead to additional collaborative teaching and educational programs as well as collaborative research projects between UMB faculty and their colleagues at other Internet2 member institutions.

Goal:

To increase research and educational activity through the use of the Internet2 network, and as a result of this increased activity, additional revenues would be generated for UMB. To enhance economic development in the area through the use of the high-speed network connection in Baltimore City, in conjunction with the developing UMB Technology Park. To further expand educational opportunities and information resources to K-12 and other educational organizations in Baltimore.

#7 – BROADBAND AND CRITICAL INFRASTRUCTURE BONDING AUTHORITY

Create a Maryland broadband and related critical infrastructure bonding authority to support public/private partnerships in infrastructure development, especially to underserved areas.

Given current state budget and revenue issues which make it difficult to obtain appropriations from the state, and given that future economic circumstances could be even more severe, we recommend the creation of alternative financial tools to capitalize projects. One recommendation would be to attract public and private funds through a telecommunications broadband and critical infrastructure bonding authority.

The state of Michigan has created a broadband bonding authority (MI Senate Bill 0881 [2001] Public Act 49 of 2002 [Effective: 03/14/02]) that could be used as a model for a Maryland version that would cover broadband and related critical infrastructure. Examples of the procedures used in Michigan can be found on their website at www.BroadbandAuthority.org. Visitors to the site will notice that the bonding authority staff provides a broad range of funding advice to prospects that makes use of financial tools other than bonds.

One reason we use Michigan as an example is that it has received critical acclaim for its efforts to deploy broadband in its rural areas. In the TechNet study described in the first page of this chapter⁴⁵, Michigan ranked as the #1 state on The State Broadband Index, with a score of 144.4. The second place state, Florida, received a score of 80.6. On the Deployment Regulations Index, Michigan also ranked #1, with a score of 93.6, a full 31.2 points above the next state, Missouri. It also ranked #1 on both of the remaining indices in the study. The cornerstone of Michigan's policy to deploy rural broadband was the creation of its broadband bonding authority.

An excerpt from the Authority's website reads: "The Broadband Authority's mission is to expand broadband access for Michigan's citizens and businesses. We offer organizations in the public and private sector low-cost financing for the acquisition of hardware, software and services that will improve or increase their use of broadband technologies."



From our studies and interviews, we have determined that backbone and last mile providers in Maryland have shown strong interest in creating such a financing tool. The Tri-County Council for Western Maryland, or its technical representatives, along with their counterparts in the state's Rural Broadband Task Force, should take next steps to explore next steps to initiate the program. TEDCO should be considered a likely overview agency for the authority, especially as it is in the development stage.

The following exhibit is an example of the text for a proposed Maryland legislation's introductory section of broadband and critical infrastructure bonding authority.

⁴⁵ See http://www.technet.org/resources/State_Broadband_Index.pdf.



Maryland Broadband and Critical Infrastructure Bonding Authority

The People of the State of Maryland enact:

Sec. 1. This act shall be known and may be cited as the "Maryland telecommunications broadband and critical infrastructure development authority act".

Sec. 2. The legislature finds that certain areas of this state are not being adequately served with telecommunications broadband services and other related critical infrastructure, and that, for the benefit of the people of this state and the improvement of their health, welfare, and living conditions, the improvement of the economic and educational welfare of this state, and the improvement of its public safety and security, it is essential that broadband and other critical infrastructure be expanded to provide broadband services throughout this state and that the private sector should be encouraged to invest in the deployment of broadband services, networks, and related critical infrastructure and that financing by this authority will encourage broadband and critical infrastructure investment. This act shall provide a method to assure that economic, technological, and logistical integrated broadband and related critical infrastructure and services are provided throughout this state on a nondiscriminatory basis. The provision of affordable broadband services, networks, and related critical infrastructure will assure the long-term growth of and the enhancement and delivery of services by the educational, medical, commercial, and governmental entities within this state, including, but not limited to, municipalities and counties, public safety and homeland security facilities, judicial and criminal facilities, tele-medical facilities, schools, colleges, universities, hospitals, libraries, community centers, businesses, nonprofit organizations, and residential properties. To increase the speed and availability at which affordable broadband and related critical infrastructure services become available in this state and supported by a more survivable network of diverse routes and service providers capable of supporting on-demand interoperable communications and interoperable network infrastructure, it is declared to be a valid public purpose to assist in the financing and refinancing of the private and public sectors' development of a statewide broadband and related critical infrastructure, including, but, not limited to power and alternative energy sources. It is further declared to be a valid public purpose for the authority created under this act to issue bonds and notes to provide for financing or refinancing to developers and operators of broadband and related critical infrastructure services, to make loans and provide joint venture and partnership arrangements (subject to pertinent sections that follow) to developers and operators of broadband and related critical infrastructure and services, to enter into contracts for the lease or management of all or portions of the broadband and related critical infrastructure, and to enter into joint venture and partnership arrangements and partnerships with persons that will acquire, construct, develop, create, maintain, own, and operate all or portions of the broadband and related critical infrastructure. The legislature finds that the authority created and powers conferred by this act constitute a necessary program and serve a necessary public purpose.



#8 – CRITICAL INFRASTRUCTURE COORDINATORS

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.

The role of a Critical Infrastructure Coordinator for a county or a tri-county region will be to understand, document, and disseminate all information regarding critical infrastructure within his area, coordinate the protection and use of infrastructure in emergencies, and procure funding for their protection and growth. This position will enable local government to fulfill its mandate to plan and use this infrastructure in emergencies. This will also allow local governments to identify potential single points of failure and underserved areas to intelligently distribute resources such as rights-of-way to mitigate potential system failures.

During the course of this study and after the initial recommendation for the use of local critical infrastructure coordinators, the Federal Department of Homeland Security provided funds through the states to local emergency operations centers for planners through local emergency operations centers. This is a funded first step in the creation of our recommended critical infrastructure coordinator position. The current funding for planners are available.

We recommend that each jurisdiction attempt to obtain those funds and fill the position if they have not already done so. In addition, local units of government should supplement the planner's capability with appropriate tools such as geographical information systems (GIS), awareness of what the private sector communications capabilities are, the infrastructure those firms use, and the funding sources the community can acquire to maintain and improve the infrastructure.

The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets (p. 24 – document page 36) provides the groundwork for federal assistance to local governments in this area⁴⁶:

Develop an integrated critical infrastructure and key asset geospatial database

To enable effective critical infrastructure and key asset protection planning, analysis, and decision support, we must develop an integrated critical infrastructure and key asset geospatial database for access and specific use by federal, state, and local government officials, and the private sector. A geospatial assurance partnership of appropriate government departments and agencies is needed to serve as the imagery/geospatial data broker, integrator, and coordinator for this database. DHS and other federal departments and agencies will continue current efforts to acquire data for priority population centers, domestic critical infrastructure sectors, and transborder infrastructures in cooperation with the private sector. This database will provide a common frame of reference for

⁴⁶ Entire document can be found at http://www.whitehouse.gov/pcipb/physical_strategy.pdf.



senior public- and private-sector decision makers and operational planners in support of vulnerability analysis, domestic preparedness, and incident management.

There is also value in coordinating economic development incentives in growing infrastructure that supports the economic viability of a community. These recommendations will likely push the scope of the funded planner position beyond its currently defined mission.

Local authorities should consider finding resources to support an expanded role for this activity. The Tri-County Council for Western Maryland can assist in finding these funds, especially those that are aimed at supporting regional initiatives.

#9 – CRITICAL INFRASTRUCTURE INFORMATION

Develop local process to gain and protect information required to plan for emergency communications as outlined in the federal executive orders.

Local units of government are expected to participate in the planning of emergency communications and the protection of critical infrastructure as provided in The National Strategy for The Physical Protection of Critical Infrastructures and Key Assets and various presidential executive orders.

The National Strategy for The Physical Protection of Critical Infrastructures and Key Assets

The White House FEBRUARY 2003; pp. ix, 12

GUIDING PRINCIPLES:

3. Encourage and facilitate partnering among all levels of government and between government and industry

Critical infrastructure and key asset protection concerns span all levels of government as well as the private sector.... The *National Strategy for Homeland Security* recognizes the need to mobilize our entire society in a collective effort to defend our homeland. Accordingly, it places great emphasis on “the crucial role of state and local governments, private institutions, and the American people.” This principle is central to our critical infrastructure and key asset protection effort.

Every disruption or attack is initially a local problem. Because of the immediate effects experienced by local communities, state and local governments, and private-sector infrastructure owners and operators invariably form the vanguard of response when terrorists strike. Consequently, public confidence depends heavily on how well the community implements protective measures and plans in advance of a crisis. Accordingly, the federal government will provide overall support, coordination, and focused leadership to foster an environment in which all stakeholders can better carry out their individual protection responsibilities.



As local units of government procure the information needed to protect and use public and private communications systems in the event of emergencies, the information that they gain needs to be protected.

In order to do that, the information needs to be protected from theft as well as legitimate requests such as a Freedom of Information Act (FOIA) request for information. Local governments can ask for the state's Attorney General opinion as to the process required to protect information to this extent. Similarly, the state Attorney General may need federal opinions on the same issues.

We expect that local units of government will need a specific process of obtaining, classifying, and protecting that information in order to establish the ground rules under which FOIA requests can be effectively denied. Similar security needs may also be valuable to local courts that require information security and health care providers attempting to meet Health Insurance Portability and Accountability Act of 1996 (HIPAA) requirements. Local governments and the state should consider the value of a certification process that guarantees that this level of security is in place for this information.

Once local government agencies responsible for the planning and protection of critical infrastructure can show their ability to protect the security of that information, then private sector firms who normally limit access to this information may more likely comply with local requests for information and minimize the need to compel their participation.

The federal government has shared similar concerns in its National Strategy on p.26 (page 38 of the PDF):

Information Sharing and Indications and Warnings Initiatives

The enactment of the *Homeland Security Act of 2002*, the *Act*, represents substantial progress in removing the legal obstacles that stand in the way of information sharing between the public and private sectors. The *Act* provides that critical infrastructure information voluntarily submitted to DHS, when accompanied by an express statement of the expectation that it will be protected, will be exempt from disclosure under the *Freedom of Information Act* and state "Sunshine" laws. Further, if such information is submitted in good faith, it may not be directly used in civil litigation without the consent of the person submitting it.

The *Act* also provides for the establishment of governmental procedures for receiving, handling, and storing voluntarily submitted critical infrastructure information and for protecting the confidentiality of such information. It also provides for the development of mechanisms that, while preserving confidentiality, also permit the sharing of such information within the federal government and with state and local governments.

Recent federal actions have been taken to reclassify information - reference an executive order issued in March 2003⁴⁷ and a corresponding news story in the following box.

⁴⁷ Executive order can be found at <http://www.whitehouse.gov/news/releases/2003/03/20030325-11.html>.



BUSH ORDER COVERS INTERNET SECRETS

Last modified: March 26, 2003, 12:11 PM PST

By [Declan McCullagh](#)
Staff Writer, CNET News.com

President Bush has signed an executive order that explicitly gives the government the power to classify information about critical infrastructures such as the Internet.

Bush late Tuesday changed the definition of what the government may classify as confidential, secret and top-secret to include details about "infrastructures" and weapons of mass destruction. The new [executive order](#) also makes clear that information related to "defense against transnational terrorism" is classifiable.

In his executive order, which replaces a 1995 directive signed by President Bill Clinton, Bush said that information that already had been declassified and released to the public could be reclassified by a federal agency. Clinton's [order](#) said that "information may not be reclassified after it has been declassified and released to the public."

The definition of what may be properly classified typically becomes an issue when a lawsuit is filed under the Freedom of Information Act seeking to force the government to divulge documents that it claims are secret and properly classified. Bush's decision gives the U.S. Justice Department, which defends agency classification decisions in court, more leeway in fighting such lawsuits.

The Tri-County Council for Western Maryland can work regionally with its emergency services professionals and elected officials to create methods and policies that are coordinated with state and federal agencies to acquire and protect information.

The Tri-County Council for Western Maryland can work with its members to acquire funding and coordination assistance to develop its geospatial database needs in coordination with state and federal authorities. This can also leverage the Critical Infrastructure Coordinator position described earlier.

#10 – FEDERAL SOURCES

Support local and state capacity to find federal funds, including federal rebates to rural health care providers for broadband Internet usage.



We recommend that county or tri-county level organizations establish local capacity to find external sources of funds, especially federal grants and programs. An example of this local capacity is in the Tri-County Council for Western Maryland which currently supports a full time staff person responsible to explore funding opportunities and assists local entities in their grant application processes.

Consideration should be made for funds as diverse as the US Department of Homeland Security, US Department of Agriculture RUS funds, and the universal service rural health line rebates (\$400M/year) which remains mostly untapped. Regarding the rural health rebates, local government should provide assistance to local health care providers to secure those funds. Last year, the two states that recovered the majority of the federal monies provided assistance to health care providers to fill out forms.

In addition, we recommend that Maryland state groups (such as the Rural Forum and TEDCO) should be tasked to provide similar support. Changes at the FCC in recent weeks have also enabled another avenue for assistance in the development and deployment of broadband services. The following exhibit contains portions of the text from a recent FCC ruling that allows for 25% rebates on internet services for the first time as of 2004. It is noteworthy that the FCC defines “broadband” in this document far more broadly than in the past. The definition is more application oriented and ranges as high as multi-Mb/s and T-3 rates.

NEW FCC Rural Health Care Support Mechanism Report (Nov 17, 2003)
Portions from http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-288A1.doc

Adopted: November 13, 2003 **Released:** November 17, 2003

Comment Date: 60 days after publication in the Federal Register
Reply Comment Date: 105 days after publication in the Federal Register

CORE BROADBAND RULING

§ 54.621 Access to advanced telecommunications and information services.

(a) Twenty-five percent of the monthly cost of eligible Internet access shall be eligible for universal support. Health care providers shall certify that the Internet access selected is the most cost-effective method for their health care needs as defined in § 54.615(c)(7), and that purchase of the Internet access is reasonably related to the health care needs of the rural health care provider.

(b) Each eligible health care provider that cannot obtain toll-free access to an Internet service provider shall be entitled to receive the lesser of the toll charges incurred for 30 hours of access per month to an Internet service provider or \$180 per month in toll charge credits for toll charges imposed for connecting to an Internet service provider.



Internet Access

Background. “Information services” are defined in the Act as “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.”⁴⁸ Internet access is an information service that allows consumers, including rural health care providers, to access the Internet.⁴⁹ More specifically, Internet access allows users to “alter the format of information through computer processing applications such as protocol conversion and interaction with stored data.”⁵⁰

Discussion. Given the rapid development of the Internet’s capacities, the proliferation of applications available on the Internet, and the increase in the number of Internet users since the 1997 *Universal Service Order* was issued, we believe that it is now appropriate to provide funding for Internet access to rural health care providers.⁵¹ In particular, we conclude that support equal to twenty-five percent of the monthly cost for any form of Internet access reasonably related to the health care needs of the facility should be provided to rural health care providers.⁵² The definition for Internet access that we adopt here is intended to provide rural health care providers considerable flexibility to utilize the resources available over the Internet that will assist them in fulfilling their health care needs.

We agree with commenters that the Internet can serve as an invaluable resource, by providing on-line courses in health education,⁵³ medical research,⁵⁴ follow-up care,⁵⁵ regulatory information

⁴⁸ 47 U.S.C. § 153(20).

⁴⁹ Fundamentally, the Internet is a global, packet switched network that enables interconnection between networks using Internet Protocol (IP). The Supreme Court has described the Internet as “an international network of interconnected computers.” *Reno v. ACLU*, 521 U.S. 844, 849-50 (1997). See also Kevin Werbach, *Digital Tornado: The Internet and Telecommunications Policy*, Office of Plans and Policy Working Paper Series 29, 15 (1997).

⁵⁰ *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report to Congress, 13 FCC Rcd 11501, 11516-17, para. 33 (1998) (*Report to Congress*) (citations and internal quotations omitted). See also *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Universal Service Obligations of Broadband Providers, Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements*, CC Docket Nos. 02-33, 95-20, 98-10, Notice of Proposed Rulemaking, 17 FCC Rcd 3019 nn.16-17, 27, 38 (2002) (*Wireline Broadband Internet Access NPRM*).

⁵¹ See generally 1997 *Universal Service Order*.

⁵² 47 C.F.R. §§ 54.601(c)(2)(ii), 54.621(a) as adopted herein.

⁵³ See Alaska Comments at 2; Alliance Comments at 1; Avera Comments at 2.

⁵⁴ See GCI Comments at 6-7.

⁵⁵ See Healthcare Anywhere Reply Comments at 4-9 (“Health care providers can use the Internet to receive immediate results of screenings for patients that is crucial to follow-up care. Patient compliance with follow-up care is more likely if a patient gets the results during his or her visit, gets advice on what to do next, and gets the



such as compliance with the Health Insurance Portability and Accountability Act of 1996,⁵⁶ video conferencing,⁵⁷ web-based electronic benefit claim systems including on-line billing,⁵⁸ and other crucial business functions.⁵⁹ The incredible potential of the Internet to provide access to such a breadth of medical information may also help reduce isolation in rural communities.⁶⁰ In light of the development of medical applications for the Internet since 1997, we conclude that encouraging access to this information service will improve the level of care available in rural areas.

Furthermore, health care information shared over the Internet may enable rural health care providers to diagnose, treat, and contain possible outbreaks of disease or respond to health emergencies. We agree with commenters that Internet access provides a vital link to information and instantaneous communications in times of natural disasters and public health emergencies.⁶¹ National connectivity of telehealth and telemedicine networks could also promote the national defense by serving as vehicles for rapid, secure communications in times of emergency,⁶² due to outbreaks of disease or biological and chemical attacks.⁶³

opportunity to ask questions about his or her condition. A rural patient may need immediate results more than an urban patient because a rural patient is less likely to have a telephone for receiving results and setting up follow-up appointments.”).

⁵⁶ See Alliance Comments 5-6; David Bolt, Lewis Co. Primary Care Center, email 8/22/03; Kansas DHE Comments at 1; Kansas Hosp. Assoc. Comments at 1; see also Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191, 110 Stat. 2021-31.

⁵⁷ See Washington Rural Comments at 1-2.

⁵⁸ See Shannon Clark, Ashley County Medical Center, email 8/18/03; Kansas DHE Comments at 1; Kansas Hosp. Assoc. at 1.

⁵⁹ See Kansas DHE Comments at 1; Kansas Hosp. Assoc. Comments at 1. “[A]nyone with access to the Internet may take advantage of a wide variety of communication and information retrieval methods...[such as] electronic mail (e-mail), automatic mailing list services (‘mail exploders,’ sometimes referred to as ‘listservs’), ‘newsgroups,’ ‘chat rooms,’ and the ‘World Wide Web.’ All of these methods can be used to transmit text; most can transmit sound, pictures, and moving video images. Taken together, these tools constitute a unique medium -- known to its users as ‘cyberspace’ -- located in no particular geographical location but available to anyone, anywhere in the world, with access to the Internet.” *Reno v. ACLU*, 521 U.S. at 851.

⁶⁰ See *NPRM*, 17 FCC Rcd at 7816, para. 22.

⁶¹ See Adams Co. Health Dept. Comments at 2; Alliance Comments at 1-2; Cortland Co. Health Dept. Comments at 1; Lane Co. Health Dept. Comments at 2; NACCHO Comments at 1; NRHA Comments at 2; WGA Comments at 3.

⁶² See Univ. of Arizona Health Sciences Comments at 2; Illinois Center for Rural Health Comments at 3; Kingston eHealth Comments 2, 4; Madden Comments at 2; NM Health Resources Comments at 3; NOSORH Comments at 3; Tri-County Memorial Hosp. Comments at 2-3. See also *The Telemedicine Response to Homeland Safety and Security: Developing a National Network for Rapid and Effective Response for Emergency Medical Care* (2001), available at <http://www.americantelemed.org/news/homelandsecurity3.3.htm> (retrieved November 13, 2003) (ATA’s proposal regarding the use of telemedicine in support of homeland security).

⁶³ See Alliance Comments 5-6; FRC Reply Comments at 13; Kingston eHealth Comments 2, 4; Madden Comments at 2; Minn. Ambulance Assoc. Comments at 2; NRHA Comments at 2; Nevada State Office Comments



Accordingly, for purposes of the rural health care support mechanism only, we define “eligible Internet access” as “an information service that enables rural health care providers to post their own data, interact with stored data, generate new data, or communicate over the World Wide Web.”⁶⁴ Eligible Internet access provides access to the world-wide information resource of the Internet, and includes all features typically provided by Internet service providers to provide adequate functionality and performance. To qualify as Internet access under the definition we adopt today for the rural health care support mechanism, transmissions must traverse the Internet in some fashion. Internet access may provide transport of digital communications using any Internet-based protocols, including encapsulation of data, video, or voice.

We specifically decline to adopt the definition of Internet access currently used in the schools and libraries support mechanism. Under those rules, Internet access includes:

(2) The transmission of information as part of a gateway to an information service, when that transmission does not involve the generation or alteration of the content of information, but may include data transmission, address translation, protocol conversion, billing management, introductory informational content, and navigational systems that enable users to access information services, and that do not affect the presentation of information to users[.]

47 C.F.R. § 54.5.

. Furthermore, we find that a twenty-five percent discount is reasonable because provision of support to health care providers under the rural health care support mechanism is not contingent on economic need, similar to the twenty-five percent discount provided to the least disadvantaged rural schools and libraries.⁶⁵ As we gain more experience with this aspect of the support mechanism, we will determine whether an increase in the discount is necessary or advisable. Finally, **we disagree with WorldCom that support for Internet access must be based on the difference between urban and rural rates**, because section 254(h)(2)(A) of the Act, the statutory provision dealing with information services, makes no reference to an urban-rural comparison, unlike section 254(h)(1)(A).⁶⁶ The urban-rural comparison for telecommunications services that Worldcom cites to in section 254(h)(1)(A) does not apply to information services such as Internet access.⁶⁷ Provision of Internet access and other information services is governed by section 254(h)(2)(A).⁶⁸



at 6; NM Health Resources Comments at 3; NOSORH Comments at 3; Tri-County Memorial Hosp. Comments at 3.

⁶⁴ 47 C.F.R. § 54.601(c)(2)(i) as adopted herein.

⁶⁵ 47 C.F.R. § 54.505(c).

⁶⁶ See WorldCom Comments at 5-6 (agreeing that the Commission has the authority to subsidize Internet access but only the difference between rates for urban and rural Internet access); 47 U.S.C. §§ 254(h)(1)(A), 254(h)(2)(A). *But see* Intelenet Comments at 5; Kingston eHealth Comments at 7-8; Nevada State Office Comments at 6 (agreeing that no urban-rural comparison is necessary).

⁶⁷ 47 U.S.C. §§ 254(h)(1)(A), 254(h)(2)(A).

⁶⁸ 47 U.S.C. § 254(h)(2)(A).



#11 – TELEMEDICINE

Encourage the development and implementation of cost-saving telemedicine applications and coordinate state reimbursements for services to further promote the use of these applications.

The development and deployment of telemedicine applications across the Western Maryland region will have several benefits for all of the residents and businesses in the area. First of all, advanced medical services will be available to patients without the need for excessive travel to specialists. Secondly, any application that drives the requirement for broadband services will encourage the deployment of additional infrastructure to the benefit of all, including the addition of diverse and robust routes and the introduction of additional carriers and services. Telemedicine has also been proven in studies to reduce costs, increase productivity, and improve knowledge transfer among professionals.⁶⁹

Appropriate county and state staff could assist health care providers to make business cases to state and federal agencies that define how medical reimbursements are made so that cost-saving and value-enhancing telemedicine applications can be financially supported.

According to medical practitioners, currently available telemedicine applications that would save the state money now are not currently being implemented because of counter productive reimbursement rules. Mr. Steve Black, Vice President at Western Maryland Health System's Sacred Heart Hospital has prepared the following letter outlining his and some others concerns in the region regarding the deployment of telemedicine applications. From our interviews and discussions, we have seen his concern raised by others across the state.

Widespread availability of broadband infrastructure for converged services will enable more applications such as telemedicine that can connect medical service providers to their clients at remote clinics, at work, or, at home.

⁶⁹ See the example in the exhibit by Radvision, a leading video teleconferencing equipment manufacturer.



Western Maryland Health System

December 18, 2003

Chuck Manto
TLA Associates
582 Bellerive Drive
Unit 4D
Annapolis, MD 21401

C. Manto
Dear Mr. Manto:

The Western Maryland Health System is in the process of developing telemedicine services. However, there are issues with reimbursement for both the physician and the hospital that builds the infrastructure to facilitate the delivery of these clinical services.

The psychiatrists that work for the Health System also provide services to Garrett County Lighthouse, Inc., a residential psychiatric facility in Garrett County. The facility is fifty-five (55) miles one-way from Cumberland. Depending upon the time of year and the road conditions it would be safer for the psychiatrists to be able to provide services to patients at this facility without having to drive to the facility. However, in the state of Maryland a psychiatrist must be in the same physical room as the patient in order to be paid for his professional services. Telepsychiatry is not an option for patients in the state or in this particular situation.

Several modalities such as radiology, pathology and ophthalmology are able to provide consultations via a process called "Store and Forward" which allows facilities to capture images and "store" them in a digital format which can then be sent, the "forward" part of the process, to a specialist for interpretation and clinical recommendation. However, this type of telemedicine is not reimbursed in the state of Maryland.

The state's Medicaid program is in crisis and is looking for ways to reduce costs. Telemedicine may be perceived as a "new" service that will add costs to the program instead of a "replacement" service that would allow services to be provided where the patient lives instead of making them travel to the service. Since Medicaid pays for the patient to travel to the specialist, telemedicine could actually reduce the cost to provide the services if Medicaid paid for telemedicine, instead of travel.

Memorial Hospital and Medical Center
600 Memorial Avenue
Cumberland, Maryland 21502
301-723-4000

Sacred Heart Hospital
900 Seton Drive
Cumberland, Maryland 21502
301-723-4200

System Offices
P.O. Box 539
Cumberland, Maryland 21501-0539
301-723-6407

St. Vincent de Paul Nursing Center
48 Tarn Terrace
Frostburg, Maryland 21532
301-689-1391



There are many states that have enacted legislation in order to facilitate the development of telemedicine programs to address the healthcare needs of its citizens, especially when there are remote and rural regions within the state. It would be most helpful if there were legislation or regulations that would require all insurers in Maryland to allow coverage of telemedicine services, especially for cardiology, oncology, ophthalmology, pathology, pediatrics and psychiatry that are shown to maintain or improve quality of services at the same or less cost.

If you have questions about the services that we are in the process of developing, please feel free to contact me at 301.723.5204 or email me at sblack@wmhs.com.

Sincerely,

Steven L. Black, MBA
System Director, Cancer Services
Telemedicine Coordinator

C: Claudia Baquet, M.D., M.P.H.

#12 – MODIFY ECONOMIC DEVELOPMENT INCENTIVES

Encourage the state to modify current economic development incentives to attract external infrastructure funding.

Western Maryland communities have viable opportunities to present their locations as sites for regional businesses and governments who want to create alternative locations for portions of their staff and networks as part of their business continuity strategies. The current infrastructure could be complemented with additional infrastructure and local points of presence to provide a very robust communications environment.

At the same time, it would be helpful to modify some of the current economic development incentives. Whenever there are economic development incentives based on job creation only, local and state leaders should seek to modify them to include business expansions that make meaningful broadband infrastructure and services investments which create economic benefits similar to direct new jobs.

As an example, the current One Maryland law would not provide an incentive for a carrier that planned to locate a major switching center, with millions of dollars in equipment and related infrastructure, but which only required 15 personnel to operate. Similarly, the deployment of a backup data center for a mission critical financial services firm, which would drive substantial demand for Internet access and telecommunications infrastructure, but which would only staff 4



dedicated full-time personnel, would not qualify for the incentive. Other remote sites for business continuity may place a dozen or so full time equivalents, perhaps on a rotating basis, along with network and data assets, but would still not qualify.

Local economic development groups could consider the creation of other incentives using communications infrastructure peering arrangements and local rights of way as additional local incentives for the development of new businesses or the creation of remote sites for established businesses.

Example of One Maryland suggested change:

From:

Job Creation Minimums: The business must create at least 25 new, full-time positions at the project within 24 months of the date the project is placed in service.

Other General Requirements: The project must be engaged in an eligible activity as defined by the statute. Only new jobs that pay more than 150 percent of the federal minimum wage are counted toward the credit. A job must be filled for 12 months before it is a “qualified position” for the tax credit.

To:

Job Creation Minimums: The business must create at least 25 new, full-time positions at the project within 24 months of the date the project is placed in service, **or, the equivalent economic impact due to the deployment of critical infrastructure such as broadband communications infrastructure.**

Other General Requirements: The project must be engaged in an eligible activity as defined by the statute. Only new jobs that pay more than 150 percent of the federal minimum wage are counted toward the credit. A job must be filled for 12 months before it is a “qualified position” for the tax credit. **Critical infrastructure must be deployed and placed in service before it is qualified for the tax credit.**

#13 – STRATEGIC LOCATION

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.

Business continuity experts have long understood the value of dispersing information technology assets to remote locations both for information safety and cost factors. Since September 11, 2001, many more have come to value dispersing employees for business continuity as well. Western Maryland can serve as a remote location of employees and information technology



assets for companies and government agencies in the region from Pittsburgh to Baltimore, D.C, and Northern Virginia. Given rail, highway, and now telecommunications infrastructure, western Maryland offers substantial value as a remote site for organizations serious about business continuity.

The perceived need for business continuity plans has heightened even further as reports showing the relative ease of gaining weapons of mass destruction have been widely distributed.⁷⁰ Articles continue to be published that show the disappearance of hand held rockets with an 8 mile range and other weapons useful in the dissemination of “dirty bombs” from the former Soviet Union⁷¹, and unabated funding for terrorist organizations.^{72 73} New Year’s coverage in January 2004 reiterated federal concerns showing teams in cities like Baltimore in search of dirty bombs.

Broadband telecommunications infrastructure and services make it possible for smart growth of towns across rural America, such as Cumberland, MD, who lost half of their population during the decline of their initial industrial base. These towns and cities can often accommodate growth without the effects of suburban sprawl, unlike their urban counterparts. The redevelopment of rural towns as opposed to urban sprawl, supported by competitively priced broadband telecommunications, can also provide substantial quality of life and environmental advantages.

Prospects for these sites would be information intensive organizations such as financial firms (insurance, securities, banking), hospitals, and various government agencies. Local rural leaders should encourage their federal and state counterparts to use their areas for their own business continuity plans. This would then make it easier for political leaders in urban areas to support infrastructure and services in less vulnerable rural areas since they could see the benefits they might gain when their urban areas depend on those rural resources.

Some of these economic development initiatives can be supported by local and state government actions in related areas. For example, Allegany County has been the home to what they claim is the only bio-chemical public health lab in Maryland outside of the Baltimore area. This could provide important services for the state as a whole, especially if facilities in the Baltimore area are overwhelmed or somehow diminished in effectiveness during a crisis. The county has expressed interest in expanding that capability in addition to its own HAZMAT center in a combined facility. Activities such as this and incubators for IT, bio-tech, and health care firms

⁷⁰ See the February 2003 article from USA Today that described how widespread lower level nuclear waste formerly considered difficult or impossible to use for fissionable nuclear weapons can be made small enough to fit into a pick-up truck but powerful enough to take out a square mile of a city.

⁷¹ See the Eastern Europe news section of the Washington Post at <http://www.washingtonpost.com/wp-dyn/world/europe/easterneurope/>

⁷² See <http://www.washingtonpost.com/wp-dyn/articles/A62515-2003Dec13.html>

⁷³ See also US and UN assessment WMD threat in US high for next 2 years at <http://www.cbsnews.com/stories/2003/06/10/attack/main557805.shtml> and also other articles available by any Internet search engine, such as Google.



could create some momentum for the expansion of health and bio-tech firms in the western Maryland area.

#14 – LEADERSHIP ROLE

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.

Rural areas are usually trying to catch up to urban areas in infrastructure and services by virtue of the economics of aggregation. However, most new companies, products, services, and innovations start small and could, in some cases, just as easily have their start in smaller towns or rural areas that offer a high quality of life. One of the reasons why innovation may not occur in rural areas even in proportion to their urban counterparts is that an entrepreneur may not be able to interact with his potential suppliers, investors, or customers fast enough in the start-up phase to work out the inevitable problems innovators face. If entrepreneurial networking could be facilitated by prospective participants, and, if continued broadband telecommunications could support those relationships, then, smaller towns and rural areas could see more than their fair share of innovation and economic development.

“Necessity is the mother of invention” is just one way to describe problems that rural communities face that could be the basis of technology commercialization that the world at large needs to enjoy. For that reason, local and state economic developers should encourage and support technical innovation and commercialization that puts rural Maryland communities at the forefront of new telecommunications services and infrastructure deployment.

In case anyone doubts the ability of rural Marylanders to leapfrog their urban counterparts, the following two examples will show how they have done it in the past.

WESTERN MARYLAND CABLE

The surveys taken as part of this report have shown how rural Maryland, like much of the country, has seen the cable television industry beat telephone companies in the deployment of Moderate broadband by roughly 2:1⁷⁴. But, what many do not know is that the cable television industry got its start in rural America. In fact, one of the first started in Western Maryland in 1951, 14 years before the Maryland Cable Association began. At the time, it was the only way that many could receive a television signal. In many small towns, the only way a television salesman could sell TV sets was to make sure prospects would have a station to watch.

⁷⁴ In the third quarter of 2003, cable maintained its 64% share of the US broadband market versus DSL's 36%. In the top four broadband states, 73% of high-speed Internet connections are from cable, according to <http://www.websiteoptimization.com/bw/0311/>.



This October 6, 2003 obituary from the Cumberland Times-News⁷⁵ of industry founder Buford Saville should give encouragement to anyone daring to lead the way in meeting rural needs instead of just waiting for someone else to do it.

**Cumberland Times-News
October 6, 2003**

In 1951, Buford Saville and his father-in-law, J. Holland Rannells, started Potomac Valley Television Company, Inc., one of the first cable television stations in the country. They made their first test run from a hilltop antenna to the Rannells family home in Romney. Encouraged by their success and undaunted by the challenges of homemade equipment and improvised techniques, the pair decided to try their experiment in a commercial venue by bringing cable television to Cumberland. They started with only a handful of subscribers and a total of \$10,000 in bank loans - all the local banks would lend them for their "hair-brained" scheme. It meant working long days and seven-day weeks. Saville had to perform every job in the business, since they were starting from scratch and learning as they went along. That perseverance paid off when after a year they were able to bring the people of Cumberland television pictures that were much clearer and free from atmospheric and electronic interference and with a range of programming that was superior to that available in larger metropolitan areas such as Baltimore and Pittsburgh.

It was the largest such company in the world for most of the decade. Mr. Saville served as vice-president and general manager until the death of Mr. Rannells on Sept. 23, 1973, at which time he became president, a position he held until the company was sold to TCI of Maryland in 1983. At that time, it had 55 employees and 24,000 subscribers.

ALLCoNET – LEADING TECHNOLOGIES

AllCoNet and its current broadband development, AllCoNet2, is still deploying its broadband network. Private sector firms, including Alvarion⁷⁶ (a U.S. and Israeli-based company) and Marconi⁷⁷, have tested and installed their most advanced wireless telecommunications equipment in Allegany County in the form of alpha and beta test units. This is another example of how leading global telecommunications innovators have first tested and deployed their equipment and services in rural Maryland.

⁷⁵ Used with permission.

⁷⁶ See <http://www.alvarion-usa.com/RunTime/UsaHomePage.asp> for company information.

⁷⁷ See <http://www.marconi.com/html/homepage/home.htm> for company information.



Local leaders should encourage the development of relationships with industry leaders so that local officials and entrepreneurs can participate in the commercialization, application and ownership of new technologies.

#15 – NETWORK MARYLAND ‘PRIVATE SECTOR FIBERS’

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.

The state of Maryland’s Department of Budget and Management has an on-going request for proposals (Solicitation No. DBM-2017)⁷⁸ for use of twelve optical fibers that are not part of the state’s active telecommunications network and other assets. This RFP’s release date is January 25, 2000, and proposals are due by November 24, 2005.⁷⁹

The RFP offers to barter these fibers for other assets, in part, to enhance the state’s network. The development of a complementary regional route in the Eastern Shore by a private sector partner could create an opportunity for just such a proposal. The state could swap western Maryland fibers for some on the Eastern Shore (installed by a private sector partner), giving both the state and the partner double the network size immediately.

Similarly, the use of those 12 strands and other available telecommunications assets for other rural economic development purposes could encourage the deployment of diverse routes, and broadband services in rural Maryland. The state should consider using DBED, TEDCO, and the Rural Forum as the equivalent of marketing channels for the use of those fibers and related assets on behalf of DBM for economic development purposes.

Private sector firms may need to be serviced from private sector providers that collocate with these public sector networks if policy issues prevent the public networks from directly servicing those firms. Policies may need to be developed that delineate the circumstances in which the public sector networks can be used as opposed to the private sector networks that peer with the public sector networks. The fact that private sector and public sector firms can collocate with each other at points of presence can provide substantial cost savings to these firms. Firms who may wish to connect to universities and federal labs on joint research or training could gain technical, quality of service, and cost benefits by peering with Internet 2 providers. Wireless last mile connections to these points of presence can make it possible for the new firms to be supported from any location that the wireless connection can reach.

⁷⁸ http://www.dbm.maryland.gov/dbm_search/procurement/toc_resource_statewide_comm/2017rfp.doc

⁷⁹ Two addendums have also been published – one on Nov. 15, 2000 and the other on Nov. 18, 2002.



#16 – ELIMINATE DISINCENTIVES

Eliminate Maryland only disincentives to the deployment of broadband infrastructure.

Encourage the state to eliminate Maryland-only disincentives to investment. In particular, assess the feasibility of eliminating the sales and use tax on telecom and critical infrastructure in Maryland that currently pushes investment into neighboring states and out of rural Maryland communities.

Maryland is one of the few states that maintains a sales and use tax on telecommunications equipment alongside neighboring states that do not impose such a tax. When companies have the opportunity to deploy new services and infrastructure, they will often locate the infrastructure in a neighboring state that does not apply that tax. This creates an economic disincentive that loses more revenue for the state than it gains. The following email from Verizon outlines their side of the state telecommunications equipment sales and use tax.

-----Original Message-----

From: sean.m.looney@verizon.com [<mailto:sean.m.looney@verizon.com>]
Sent: Monday, September 09, 2002 2:02 PM
To: cal@smartceo.com
Cc: David Houle; barry.j.sasscer@verizon.com
Subject: Maryland Law

Regarding one law that I would like to see passed:

Elimination of Sales and Use Tax on Certain Telecommunications Equipment

Maryland is the only state in the region and one of the few in the country that still imposes a "double taxation" on telecommunications services. Companies like Verizon pay the 5% state sales and use tax on the purchase of telecommunications switches (the computers that process all calls and services), then collect the 5% state sales and use tax and/or the 2% gross receipts tax from customers when they certain services provided from those switches. Most states have treated the tax on the purchase of equipment as a "manufacturing" tax and have repealed it. Because MD still imposes this tax, it is 5% more expensive to buy these switches in this state compared to neighboring states. This tax does not encourage companies to place switches in the state, which results in companies paying unnecessary mileage charges to transport services to switches located across the border in lower-cost states. Repeal of this antiquated tax will send a message that MD wants to encourage, not penalize, companies' deployment of advanced telecommunications infrastructure.

If you have any questions, please contact me on 410-269-6653.

Sean M. Looney
Director - Government Affairs
Verizon Maryland, Inc.



For example, Sprint has only four points of presence in the state (Baltimore, Elkridge, Salisbury, and Hagerstown) – and none in the state in LATA 236 – the Washington, DC LATA. Its POPs in this LATA are in Virginia, which does not leverage this tax. Similarly, MCI, which has two POPs in the Western Maryland LATA 240, located one in Hedgesville, WV, instead of Cumberland or Hagerstown, which would have provided significant infrastructure benefits to the region. Businesses in Washington, Allegany and Garrett counties must pay additional mileage fees to reach the Hedgesville, WV POP, which is a competitive disadvantage to their urban counterparts (and rural counterparts in other states without similar disincentive taxes). Additionally, their unnecessarily long T-1 tail circuits increase their potential for outages.

The rural counties should consider taking next steps to eliminate the tax. These next steps include interviews of companies that have located elsewhere because of the tax, discussing the revenue implications with the department of revenue, and discussions concerning the economic development implications with DBED.

A similar attempt was previously made in the passage of HB 794, but, it only applied to broadcast service providers. Rural counties will likely need to work with law makers to assess negative ramifications of eliminating the tax and come up with ways to minimize the negative impacts as much as possible.

#17 – CUSTOMER AGGREGATION

Create demand-side opportunities, such as a Broadband Day Sign-up by chambers of commerce.

Since many businesses have shown willingness to pay for some of their employees' use of broadband and many others encourage employees to obtain broadband on their own, it would be helpful for local chambers of commerce to support broadband fairs where broadband suppliers can sign up customers en masse. This could take place as soon as any area has two or more broadband last mile providers.

Customers can be grouped so that sales can be completed sooner by the broadband provider. In some cases, employers may even be willing to pay the bill, making administration easier and less costly for the service provider.

Businesses and chamber staff have indicated willingness to explore creating broadband fairs.

#18 – SYSTEMS AND NETWORK DEVELOPMENT (SAND) CORPORATION

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.



Significant telecommunications traffic will be aggregated and grown within the public sector through organizations such as AllCoNet2, SAILOR, and networkMaryland. It is in the best interest of the carriers who service those networks through their current or prospective POPs and the other businesses wishing to make use of those carrier POPs to see that the public sector participants are reliable and sustainable partners.

Public sector networks will have better negotiating power with carriers and greater attractiveness to public funding sources when they can show that they will be able to maintain their services once their initial public sources of capitalization are used.

For these reasons, it would be beneficial for public sector networks to be able to show the full cost of ownership of their respective networks and project the sources of funds that will be available to sustain them over time.

There are a number of ways to accomplish this, but, many units of governments have budget rules that make it difficult at best. Merely outsourcing network and IT services is one way to accomplish this, but, is normally unacceptable because of other cost and control issues.

Most local governments are not able to sustain staff, departments, or telecommunications infrastructure as well as the private sector. There are a couple of main reasons for this. First, local governments do not usually consider the total cost of ownership of technical staff and assets. Secondly, local governments do not set aside funds or revenue to maintain staff and assets as well as the private sector.

For example, if an enterprising CIO for a local government saved their local unit of government \$1M on one hand and found a way to increase revenues by \$1M because of improved performance on the other hand, the CIO would be congratulated and the \$2M would go into the general fund. In the private sector, a significant portion of that money might go into the department staff and assets that created that \$2M value so that they could do more of the same. In the public sector, when that same CIO comes back makes a suggestion to capture another \$4M but needed two more staff people to do it, they would often be told, "I'm sorry, that additional staff is not in the budget" even though the CIO just improved the budget by \$2M.

Most local government budget processes are legally set in such a way that it would be very difficult to do anything else. In that context, fully calculating a total cost of ownership may appear to a department head as a quick way to further budget cuts. Explaining how a new service or new technology "does not cost anything extra" is usually the safest way to get approval.

This phenomenon is why it is often easy for local government-sponsored technology projects, including telecommunications, to be criticized for not being sustainable. One way around this problem is to consider spinning off some of the communications and information technology capability into a separate entity similar to economic development corporations where the board is appointed or approved by elected officials, but includes capable private sector board members.



That board can operate the SAND both within the public and private sector as a service agency to their local government customer. In this way, the total cost of ownership can more readily be assessed and reduced costs and enhanced revenues can be used in part to maintain services and assets.

This same group could also work with private sector firms in partnership to develop joint projects, attract both private and public funding and investment while delivering services with staff and assets that are commensurate with private sector firms.

An example of how this may play out in western Maryland can be seen in a recently released assessment of AllCoNet to the County by the Tanner Group. AllCoNet is in the on-going process of growing its network while trying to decide on the best ownership and governance model for the long term. It is also trying to evaluate its funding options. For example, the Tanner Group disclosed that AllCoNet has been delivering roughly \$65,000 per month of benefits to its county users for which it is not charging. Although, it is to be remembered that members make in-kind contributions of staff and other assets.

If the county decides to recapture those benefits by providing a bond that requires 10% of those savings, it could provide in excess of \$500,000 of capitalization, according to Tanner estimates. The question becomes, how might the other savings be captured to ensure the on-going operations of AllCoNet? How might additional savings or revenues that the new services generate be used to maintain and grow AllCoNet operations? This avenue should be explored regardless of the governance and ownership model AllCoNet2 eventually adopts. The fact that AllCoNet has discussed this option is positive in that it is beginning to address the total cost of operations it is leading.

Regardless of the model that is adopted, public/private partnerships can be developed which ensure that in the case of the demise of the partnership or any of the partners, the community provided assets can remain in the community.

The Tri-County Council for Western Maryland can engage its county participants to review ownership, governance, and funding models for regional networking initiatives in the public sector that can help attract private sector resources, such as new points of presence. See Strategy Goal #4 for more details.



STRATEGY AND NEXT STEPS

Western Maryland is served both by Amtrak and Greyhound. Imagine a crowd of several hundred waiting to board at the train station in downtown Cumberland and thirty or so waiting at the Greyhound Bus stop two blocks away. There are cabs at both locations waiting to pick up passengers getting off. As the train and the bus slow down next to their stops, instead of stopping they just keep on going.

In the case of western Maryland, this metaphor is particularly relevant. Just as there are Amtrak trains running down the CSX track and Greyhound buses running down Interstate 68 through downtown Cumberland, MCI and others have fiber optic lines running down the CSX tracks while Level 3 and others have fiber optic lines and conduits buried along Interstate 68. There are local ISPs serving last mile customers, not unlike the cab drivers, but, they can only do so much if the train and bus refuses to let passengers on and off.

Western Maryland is exceptionally well endowed with transportation and telecommunications infrastructure that most rural areas would do almost anything to get. The capital for deploying that infrastructure would be hard to find today. But, the little that needs to be done now, given the substantial benefits to public safety, quality of life, business continuity, and economic development, should not scare off current users and providers from participating in innovative solutions to fill the gaps.

Initial discussions among businesses, government, and service providers show that despite the current economic difficulties in telecommunications and government, western Maryland could enjoy the prospects of diverse carriers and diverse routes for their backbone and last mile needs in the near future.

From the results of the survey and in-depth interviews of key users and drivers of broadband usage in the Tri-County area, the broadband deployment that is critical for public safety, quality of life, business continuity and economic development is not merely access to backbone and last mile connectivity that was missing as of the outset of this study, but access to diverse routes and carriers both in the backbone and last mile services. All counties have need for two or more suppliers of both backbone and last mile broadband even though they do not have even one today.

INITIAL SURVEY AND INTERVIEW FINDINGS AND RECOMMENDATIONS

Key findings and preliminary recommendations from the *survey and interview process* have been identified and forwarded to the Council during the engagement. These items included:

1. Obtain public sector DS3 connectivity for Allegany County's network (AllCoNet) from networkMaryland.



2. Continue support for telecom and technology based economic development in the regions.
3. Create regional telecom and critical infrastructure coordinators (county and tri-county levels).
4. Support GIS development and applications requiring broadband communications.
5. Submit an unsolicited proposal to the US Department of Homeland Security for \$1M pilot in western MD (completed, demonstration performed on August 5, 2003, funding is still pending, interest for a regional project like this has been shown from the state in meetings organized with local officials and the Governor's Office of Homeland Security).
6. Attract funding for on-demand interoperable training and emergency communications
7. Explore financial methods such as a telecommunications and critical infrastructure bonding authority.
8. Explore feasibility of creating regional offices of critical infrastructure coordination.
9. Explore ubiquitous last mile offerings as much as possible.
10. Explore feasibility of additional inter-exchange carriers' points of presence.

ACHIEVABLE BROADBAND GOALS FOR RURAL MARYLAND

Based on the survey results and interviews conducted through this study, TLA is confident that the following aggressive and measurable broadband goals can be reached in rural Maryland and stands ready to help implement them in follow-on activities outlined in the optional steps that are part of the original proposal that it submitted.

These goals comprise the basis for a multifaceted broadband implementation across western Maryland. The fourth goal is the key infrastructure deployment objective of the strategy. Each of these goals can be implemented by a combination of next step activities of the broadband providers, and are supported by the policy recommendations that include the creation of a telecommunications and critical infrastructure bonding authority.

1. Make **Moderate** application Internet access available to all businesses in rural Maryland immediately (200 Kb/sec in one direction).
2. Provide competitive options for **Moderate** Internet access, including last-mile options, within 1 year, for almost all businesses. Increase speed of **moderate** access to exceed 200 Kbps in both directions (200 Kb/sec to 1Mb/sec services in both directions) for at



least one competitive option. Make multiple competitive options at higher speeds available within 1 year for 50% of businesses.

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)
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.
5. Incorporate survivable broadband use as a cornerstone of interoperable emergency services communication within one year
6. Create economic development incentives at the local and state level for firms creating infrastructure and services with beneficial economic impact within 18 months
7. Provide financial tools to foster public and private sector infrastructure and service initiatives such as a broadband infrastructure bonding authority within 18 months.

This section outlines the strategic plan to achieve these goals, as outlined in the Rural Challenges and Project Goals section of this report. Each of the following sections addresses one of these goals and the strategy to achieve these goals in greater detail.

MODERATE ACCESS

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

Status: This goal has been achieved for “downloading” data, though at a slightly higher cost than in urban areas. Significant work is being done to close the pricing gap and provide similar bandwidth for “uploading” data (which is discussed in goal 2). These are only “make-do” solutions while higher bandwidth services become available over the next year or two.

SATELLITE ‘DSL’ SERVICES

This goal can be identified as partially achieved, as almost every private sector business in rural Maryland can access the Internet and *receive* data at greater than dial-up speeds through the use of satellite services and send data at dial-up or slightly higher speeds (depending on the provider and program). These services, such as the Direcway offering⁸⁰, cost \$10 - \$35 per month more

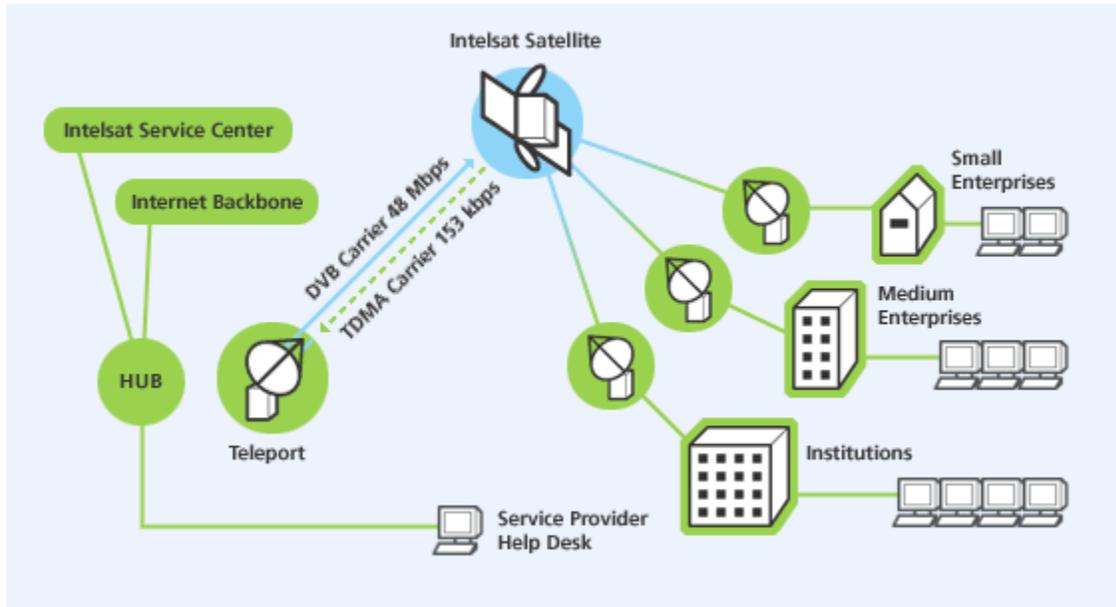
⁸⁰ See <http://directv.direcway.com/> for more information.



than landline DSL or cable services, have slightly longer delays, and have one-time costs of over \$200. However, their service is very similar to residential/small business DSL services, and any customer with access to the southern sky can use these service offerings.

DIRECWAY	
Standard Plan	
Current Promotions	none
Monthly Fee	\$59.99 Purchase your hardware and installation up front and pay just \$59.99 per month for service! See "Feature and Restriction Details" below for details.
Hardware Fee Details	\$399.99 for DIRECWAY hardware
Installation Fee	\$199.99 for standard installation. Depending on site requirements, installation costs can vary. Any additional installation costs will be paid directly to your installer. Please clearly discuss site requirements with your installer before system is installed.
Activation Fee	Waived
Other Fees	None
Early Termination Fee	\$300 Early Termination Fee if cancelled after 30 days from installation.
Term Commitment	15 months
Guarantee	Equipment can be returned for refund within 30 days of installation. Installation fee is non-refundable.
Billing Options	Credit card billing
Downstream Connection Speed	Up to 500Kbps
Upstream Connection Speed	Up to 50K
Hours Included Per Month	Unlimited
Number Of Free Email Accounts	5

Cost-effective, bi-directional broadband services, defined as comparable to current DSL and cable modem prices, have been announced for the end of 2004 by Intelsat/Wild Blue and by Hughes/SpaceWay and will be discussed in goal 2. The following illustration identifies the typical network topology in a satellite-based DSL offering.



As the reader may know, each of the technical options (DSL, cable modems, and satellites) has its own set of advantages and disadvantages. These satellite programs have limitations that include over-subscription strategies shown in their Fair Access Policy restrictions.

At least one agent reseller, Skycasters, offers enhanced business offerings including VPN, though at a higher price a business would expect to pay. While Hughes does not provide technical support for any of their channels' VPN offerings, Skycasters is listed as one of their "platinum" channels. Skycasters also offers mobile and portable versions of their systems. Their technology is based on IP-spoofing, which allows many real-time applications to perform under the limitations of the satellite technology.⁸¹

ACTION ITEM: NEGOTIATE WITH SATELLITE PROVIDERS FOR VOLUME DISCOUNTS, REDUCED EQUIPMENT COSTS

ACTION ITEM: FOSTER AWARENESS OF CURRENT BUSINESS OFFERINGS BY SATELLITE PROVIDERS

⁸¹ For VPN and 'real-time' information, go to <http://www.skycasters.com>.



COMPETITIVE MODERATE ACCESS OFFERINGS

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.

Status: This goal, and its sub-goals, appears to be on track, based on proposals from vendors. They can be achieved in the timeframe presented.

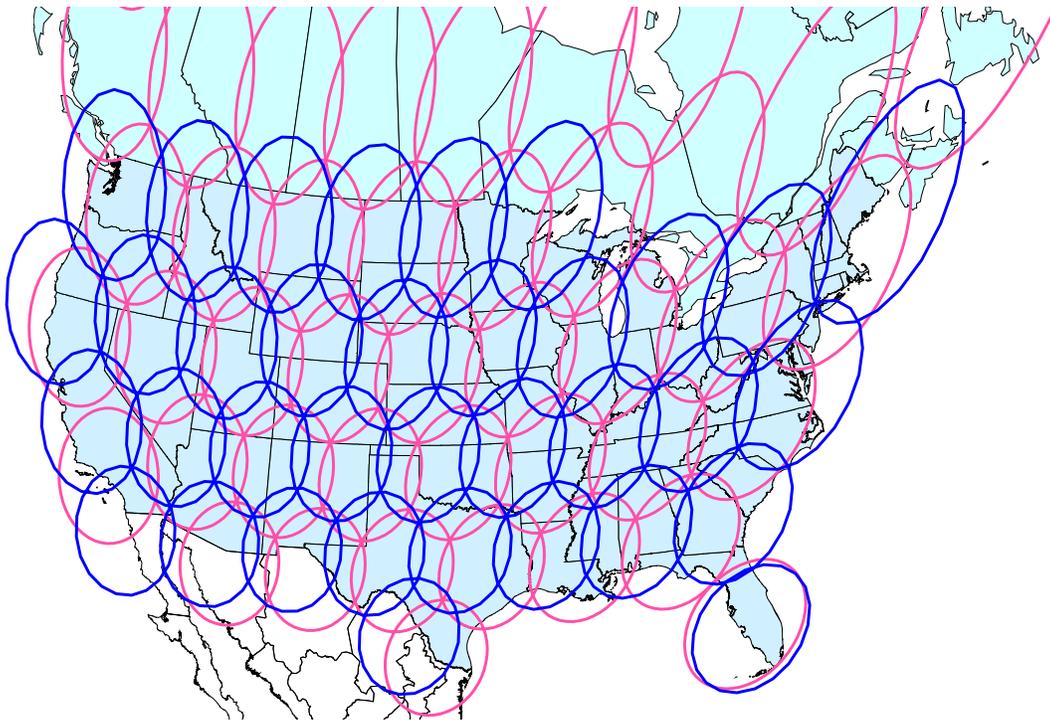
WILDBLUE

WildBlue, a company funded by strategic investors including Intelsat, NRTC, Kleiner Perkins Caufield & Byers, Liberty Satellite, and Telesat, will deliver affordable two-way broadband Internet access via satellite to virtually any home and small business in small cities and rural America in the second half of 2004. WildBlue's motto is "Broadband. Within Your Reach."

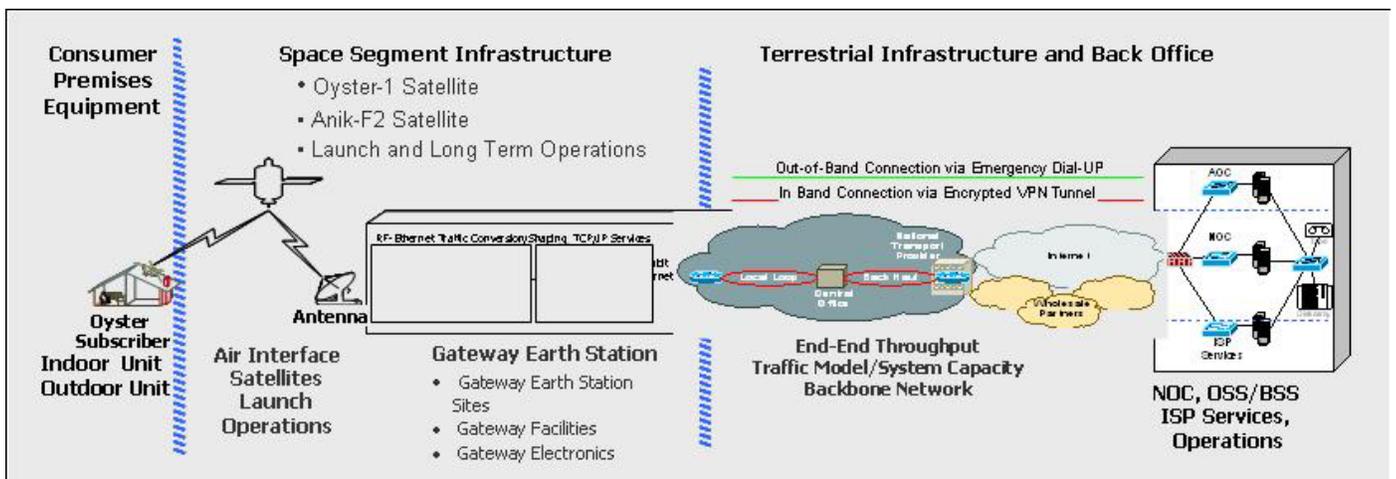
WildBlue will use a 26-inch satellite mini-dish equipped with both a transmitter and receiver for two-way satellite connectivity to the Internet. WildBlue service will not require cable or phone lines. It will be accessible to virtually every home and small business in the continental U.S., including the estimated 30 million homes and small offices that will not be wired for terrestrial (DSL or cable modem) service when WildBlue is introduced.

WildBlue's approach is based on next generation, two-way wireless Ka-band spot beam satellite technology, which dramatically lowers the cost of providing high bandwidth access to the Internet. WildBlue will launch its service aboard the U.S. capacity of Telesat's Anik F2 satellite, being built by Hughes, and scheduled to launch in the first half of 2004. WildBlue-1 is being built by Space Systems / Loral and will launch after Anik F2. WildBlue plans to exploit the Ka frequencies, 20 and 30 GHz, using geostationary (GEO) earth orbit satellites (satellites that are stationed in a fixed position over the earth). This will allow high-speed Internet access nationwide with just one satellite in place. These satellites allow "bandwidth on demand" for WildBlue customers.

The following illustration depicts the spot beam satellite coverage provided by WildBlue. The blue ovals indicate initial implementation, and the red ovals indicate the next phase implementation of services.



WildBlue uses industry-standards in its consumer premise equipment. The resulting low cost structure enables an affordably priced high-speed Internet service that is available virtually anywhere within sight of one of our satellites. This could equate to a price and bandwidth advantage over satellite competitors using Ku-band technology and a larger "footprint" service area vs. DSL and cable modem service providers. One WildBlue dish can physically receive both WildBlue's high-speed Internet access and either of the two U.S. satellite TV services (DirecTV and DISH Network).



WildBlue's first core service offering, to be rolled out in the second half of 2004, will offer homes and small offices/home offices (SOHO) an Internet connection that is easy to use, reliable, always on, and more than 25 times faster than standard dial-up service. WildBlue



Internet service for consumers includes typical Internet Service Provider features (e-mail, web space, etc.). The flat rate monthly fee for unlimited broadband Internet access for consumers is expected to be comparable to DSL and cable modems. They plan to offer several packages with downstream speeds up to 1.5 Mbps and upload speeds up to 512 Kbps.⁸²

This service meets and/or exceeds Goal 2 and its sub-goal A, as rural customers will now have an option for Moderate broadband access that exceeds 200 Kbps each way. The service is diverse, as it will use a new satellite being launched this year, separate from the satellite used for the Direcway service.

HUGHES SPACEWAY

SPACEWAY⁸³ is the next major step in HUGHES' ongoing commitment to provide their Direcway customers with innovative satellite communications solutions, to maintain their competitive advantage in the marketplace. SPACEWAY will launch commercial service in North America in 2004.

SPACEWAY is a next-generation satellite system, operating in globally assigned Ka-band spectrum, that employs high-performance, on-board digital processing, packet switching and spot-beam technology to offer single-hop connectivity, regardless of location. Its novel mesh architecture will allow customers to communicate directly via satellite, without connecting through a central retransmission service or hub. Bandwidth-on-demand means customers will only pay for the bandwidth their applications require, whether it's for low data rate transactions, or multi-megabit, video-intensive, media-rich content delivery.

With SPACEWAY, large businesses, telecommuters, small office/home office (SOHO) users and eventually consumers will have access to two-way, broadband applications, including telemedicine, desktop video conferencing and interactive distance learning operating at faster speeds and delivered more cost-effectively than by conventional terrestrial systems, such as frame relay. It will seamlessly integrate with existing land-based local and wide-area networks and be fully compatible with a wide range of communications industry standards.

The high-powered SPACEWAY satellite will enable very high speeds in both directions while using compact, cost-efficient terminals. SPACEWAY will provide a variety of service options to meet every need — with upload speeds as high as 16Mbps and downloads as fast as 50Mbps. With SPACEWAY, businesses will be able to download files at up to 60 times the speed of DSL.

⁸² Most web materials and press documents have the maximum upstream rate at 256 Kbps; their proposal supporting this report indicates that 512 Kbps uplinks will be available.

⁸³ See <http://www.hns.com/default.asp?CurrentPath=spaceway/overview.htm> for more information. As this is a future product, we relied extensively on Hughes' marketing materials and support to define this proposed solution. This section paraphrases and includes many of Hughes' supporting documents.



Today, terrestrial bandwidth is purchased in "chunks" — forcing customers to pay for enough capacity to accommodate their highest bandwidth applications, all the time, even though it may only be used intermittently. SPACEWAY provides the enormous advantage of only paying for bandwidth only when it's needed — enabling the occasional use of high-bandwidth applications, such as videoconferencing or large file transfers, without the need to commit to excessive over-capacity and long-term contracts. This not only reduces costs; it allows companies to allocate resources more efficiently.

Customer Type	SOHO SME	Branch Office Enterprise
Application	Internet Access LAN/WAN Extranet Telecommuting	LAN/WAN Extranet Broadcast Center Network Gateway
Uplink Data Rate (Mbps)	0.512	2.048
Downlink Data Rate (Mbps)	30	30

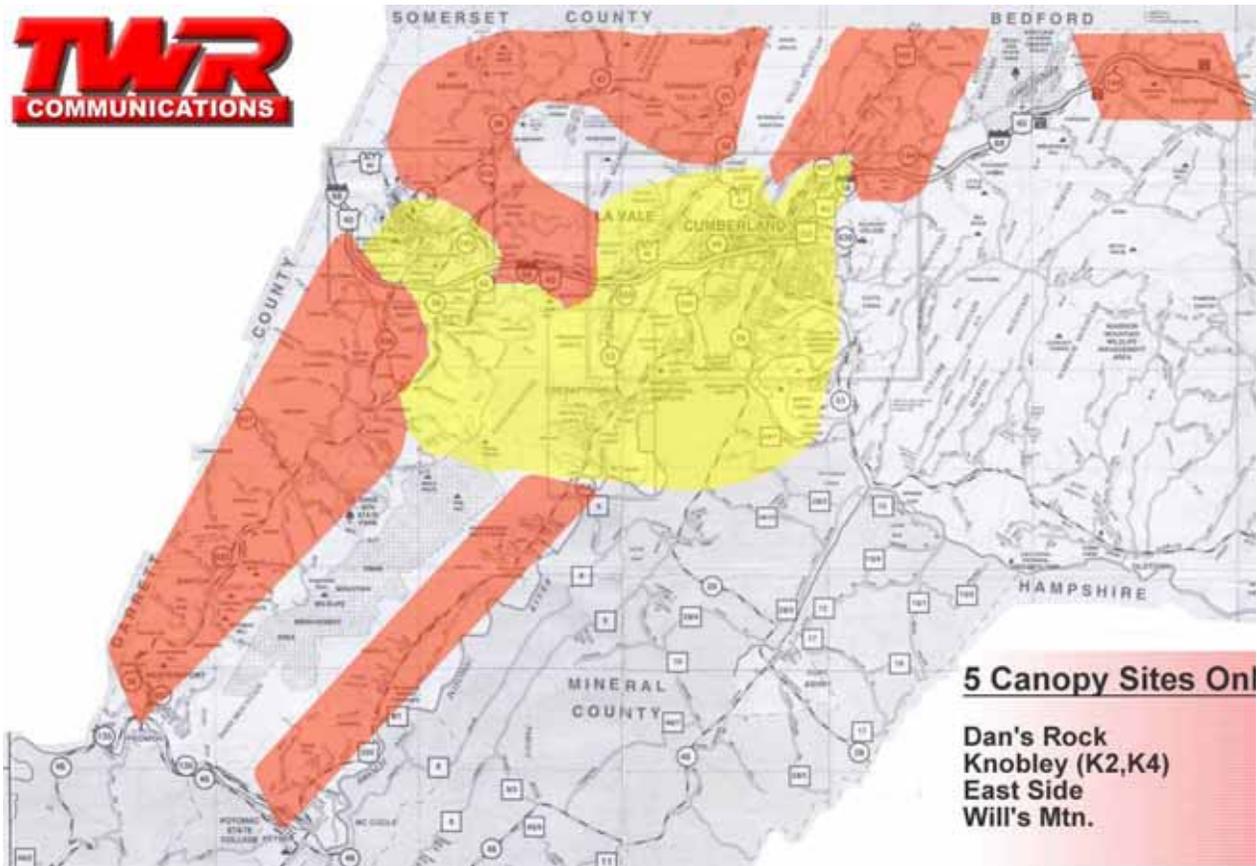
Given that goal 1 has been met by satellite service with Moderate Internet access (200 Kb/sec in one direction), and, if, by the end of 2004, Wild Blue or Hughes' SPACEWAY offerings succeed in providing satellite based Moderate Internet at roughly DSL or cable modem prices, then users will have a choice of two or three options. Since the WildBlue and SPACEWAY offerings will make it possible to provide Moderate Internet access greater than 200 Kbps in both directions, then, most rural users will be able to have Moderate Internet access in **both** directions from one or two carriers.

The next part of goal 2 is more important and requires more effort from local providers and communities, namely, to gain Moderate Internet access (200 Kb/sec) in **both** directions from more than one carrier and technology, based on our core recommendation of redundant **routes, carriers, and technologies.**

REGIONAL PROVIDERS

We believe that it is possible to provide competitive options from different routes and technologies for 50% of businesses in western Maryland within one year from now if DSL, cable modem, and wireless services (both licensed and unlicensed frequencies) continue to add to the promised enhanced satellite services.

TWR began to offer multi-megabit per second services to users in Cumberland from late 2003 and could expand its services over the next year. These include services up to 2Mb/sec downstream and up to 1Mb/sec upstream. The following illustration identifies (in yellow) areas with current service and proposed additions for 2004 in red.



ProCom is offering CLEC DSL within a four mile radius of Thayerville of Garrett County, and T-1 service within 6 miles of Thayerville.



Got Broadband?

DSL and Full T-1 Now Available on Deep Creek Lake

Pro Business

Local Telephone Service
Guaranteed 20% Savings over Verizon

Long Distance Service
4.2¢ FLAT anywhere / anytime (Inbound 800 also)

Package Includes

DSL Broadband starting at \$65.⁰⁰ per month

includes 6 E-mail addresses and 10mb of personal web space

Also Available

Full T-1 access starting at \$325.⁰⁰ per month

Don't want the package?

Just DSL starting at \$125.⁰⁰ per month

Just T-1 Starting at \$525.⁰⁰ per month



866-776-2662

ProCom

Route 3, Box 69G
Bruceston Mills, WV 26525

Additional state, local, federal taxes and surcharges apply





In time, we also expect Verizon Wireless to offer enhanced wireless data services, also. The following news release came from Verizon, where its Chairman and CEO Ivan Seidenberg presented the company's vision at the Consumer Electronics Show. The company says it will invest \$3 billion over next two years to bring broadband to mass market, based on its January 8, 2004 press release.⁸⁴

Verizon Wireless To Expand 'BroadbandAccess' Nationwide

Verizon Wireless will begin immediately to expand its BroadbandAccess service nationally. Powered by its Evolution-Data Optimized (EV-DO) third-generation (3G) wide area network, BroadbandAccess will be phased in nationally over the next two years.

With average user speeds of 300-500 kilobits per second, BroadbandAccess is the fastest commercial wide-area wireless data technology available today and is based on CDMA technology. Proven to be the most versatile and cost-effective wireless technology in the marketplace, BroadbandAccess will be available to business and individual customers beginning in the summer of 2004 throughout significant portions of the Verizon Wireless national footprint, and in additional markets through 2005. Verizon Wireless was the first U.S. wireless carrier to launch commercial wide-area wireless data service in major markets last fall.

Unlike with Wi-Fi, BroadbandAccess users don't have to be within a few hundred feet of a hotspot to have a true wireless high-speed connection. They can connect on the road, at the job site, in a taxi, on the train, or anywhere within the BroadbandAccess coverage area.

For those businesses who need redundant services before these goals can be met, it is possible to blend more expensive traditional satellite services with their land-based systems in order to create some network fault-tolerance. There are several that can provide integration services for businesses needing upstream services in excess of 200 Kb/sec. Others, such as Verestar⁸⁵, can help large users such as ISPs that may need Mb/sec satellite services.

VERIZON DSL

Verizon, providing 94% of the phone service in Maryland, has been announcing new DSL service in rural Maryland from time to time in the past year. On October 31, 2003, Verizon announced that it extended DSL to 29 communities on the Eastern Shore. During that same time, they announced new service in several western Maryland communities such as Oakland in Garrett County and are expected to announce service in a similar number of additional western Maryland towns in late January/February 2004. Similar to cable modem service, the technology could offer megabit per second speeds in both directions to all users including residents.

⁸⁴ See <http://newscenter.verizon.com/proactive/newsroom/release.vtml?id=83234> for full details.

⁸⁵ Verestar also offers a "fly-away" service for that can be deployed globally within 25 minutes of arrival with their VSAT and GPS based laptop system that can provide 96 Kb/sec to 2 Mb/sec.



However, service providers usually try to reserve higher bandwidth services to businesses that will pay more for similar service.

March 19, 2003

VERIZON PUSHING TO EXPAND DSL CUSTOMERS BY 30 PERCENT

Robert J. Terry
Staff

Maryland's dominant telephone company, Verizon Communications, announced Wednesday it will expand its broadband network to 10 million additional homes and businesses this year.

The move will result in a 30 percent boost to the number of Verizon customers equipped with digital subscriber line, or DSL, service. Verizon currently services about 36 million DSL lines nationally.

The company controls roughly 94 percent of the local phone market, according to estimates, and is planning to offer long-distance service to Maryland residents and businesses.

The initiative comes on the heels of a federal government decision allowing the so-called "Baby Bells" to expand their high-speed Internet businesses without having to share their infrastructure with competitors.

Verizon is not releasing specific state-by-state plans, but company vice chairman Lawrence T. Babbio promised an aggressive deployment now that regulators appear to be taking "a more realistic approach to broadband regulation."

Babbio also said the company would begin network upgrades with fiber-optic equipment next year — potentially good news to the host of next-generation equipment makers and suppliers in the Baltimore region waiting for carriers to begin spending again on capital upgrades.

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With a Verizon DSL connection, businesses can transfer data at speeds up to 1.5 Mbps downstream and up to 768 Kbps upstream. The following pricing table reflects the costs for Maryland DSL services to businesses, based on different uplink and downlink speeds.⁸⁶ Note that the faster speeds may require higher-end facilities or closer locations to a central office.

Maximum Connection Speed (download/upload)	1.5M/ 128K	384K/ 384K	1.5M/ 384K	768K/ 768K	7.1M/ 768K
Dynamic IP DSL Monthly Cost	\$59.95	\$79.95	\$89.95	\$129.95	\$204.95
Static IP DSL Monthly Cost	\$89.95	\$109.95	\$119.95	\$159.95	\$234.95

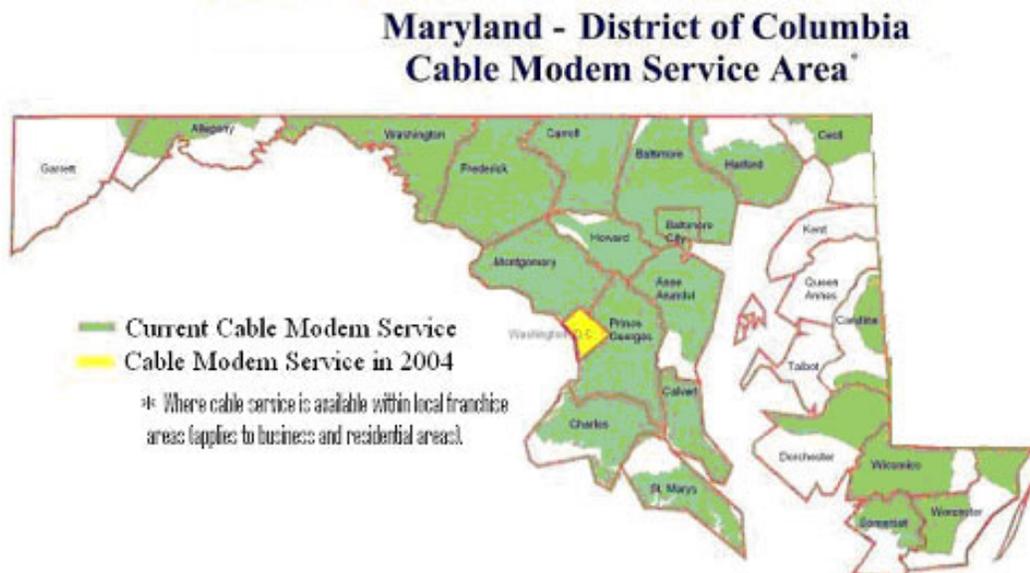
⁸⁶ As of January 2004, from <http://biz.verizon.net/pands/dsl/packages/Default.asp>.

As our surveys and interviews of western Maryland businesses have shown, it is very important to extend broadband services to the home. DSL, cable modem service, and current satellite services provide some of that capability now. For those who do increasingly more bandwidth intensive work from home even after their normal work-day and don't have a lot of time available to do it, higher speed services are growing more important. Many home users may not be as concerned about redundant routes as their businesses, but, having multiple sources of broadband will help to keep pricing competitive so that rural users will become less disadvantaged compared to their suburban counterparts.

CABLE MODEM SERVICE

Cable modem service has primarily been a residential offering, in large measure, since cable systems were routed along residential areas and not business areas. Charter Cable and its successor in western Maryland (Atlantic Broadband, LLC) offers cable modem service in its Cumberland market. Tele-media services the Frostburg area. Washington County is served by Antietam Cable Television who offers cable modem service to its customers. These companies are expected to continue to expand cable modem services within their current service areas.

The following map identifies current cable modem service across the state of Maryland. Areas that are not currently served by cable modem service, yet which have a cable network, should be pressed into service.



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.



COST-EFFECTIVE INTENSIVE ACCESS

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).

Status: This goal is partially achieved, through the use of carrier agents as described below.

In our Rural Challenges and Project Goals section of this report, we addressed the following assertion:

Today, in Western Maryland, private sector businesses can implement Intensive Internet access and can purchase these services for their use from a variety of carriers.

While this assertion is true, it leaves many things unsaid. Today, a company in Garrett County can buy a T-1 from AT&T or from MCI to the Internet, and can obtain apparently similar access to its counterparts in urban areas, such as Montgomery County. There is no fundamental inability to purchase these services, as they are available. The local exchange carrier (LEC), Verizon in most areas of Maryland, can provide T-1 access to almost any carrier's point-of-presence (POP) and therefore allow high-speed Internet/broadband access to all private sector companies.

However, as this section clarified, while access is available, it is not the same as the access in urban areas, for one key reason. While Intensive Internet access is almost ubiquitous in rural areas, it is not the same access as in urban areas as the distance between the user's site and the carrier's POP for rural customers is substantially different, which can cause additional outages and imposes substantially higher access costs. In addition, facilities in rural areas can be of lower quality than those in urban areas (e.g., services on poles versus underground wiring, older wiring, etc.), causing additional outage potentials and service deficiencies.

The next section, Diverse Carriers and Routes, will address this major deficiency in service between urban and rural areas. In the interim, the objective of this goal is to provide cost-effective Internet access for western Maryland businesses that require **Intensive** Internet access – access defined with data transmission rates of 1.5 Mbps or greater in a symmetrical manner (same speed uplink and downlink).

The method to provide cost-effective access is very simple – it boils down to education. In the quest to gain business, carriers, including the largest Internet and data carriers in the country, have developed contract vehicles where small businesses can purchase Internet access without the need for huge volume and term commitment contracts. The problem is that most businesses are unaware of these offerings, and do not have the time, resources, or tools to obtain these prices. The service itself does not change – these contracts, promotions, and offers merely change the price for the service. If a user in Garrett County would have a 75 mile local loop to a



given carrier, these options discussed in this section will do nothing to change this local loop, but will make it more cost-effective.

An agent, in telecommunications terms, is a company that represents the products of a set of vendors. Advanced telecommunications agents (like NetGain Communications, Inc.⁸⁷) are also referred to as professional services agencies. Agents typically represent and extend the sales and marketing arms of carriers, and are enabled to do so with special pricing. Many agents also provide complete support through the design and installation of services, acting as the client's advocate. Clients are still billed directly by the vendor and can work with the vendor to resolve any problems or issues.

Some major agents, like NetGain, represent over 50 carriers, and therefore become an objective consultative resource. Agents, through their knowledge of options and promotions, are able to obtain best-possible service and pricing alternatives for their clients. Agents are compensated directly from the carriers, so are no additional cost to the consumer. Many small businesses do not know about the existence of agents, and often rely exclusively on their carrier's direct customer service lines.

The following is an excerpt from NetGain's web site that describes the role of a carrier agent.

NETGAIN CORPORATE OVERVIEW

NetGain Communications is a Telecom Consultancy that specializes in providing medium and large businesses with superior telecommunications solutions.

NetGain is a free resource focusing on Network Services (Local, Long Distance, Internet and Data) and Conferencing Services (Audio and Web). NetGain's clients benefit by having ongoing access to industry veterans who design and broker comprehensive telecommunications solutions. NetGain has access to a vast selection of carriers nationwide. Our strong portfolio allows NetGain to maintain objectivity as a consultancy and still not charge customers anything for our services.

NetGain's value proposition can be summarized as follows:

- Decades of telecommunications expertise and experience that provides strong industry and product knowledge
- A strategic partnership which will deliver both upfront sales support and a depth of back office support for order entry, provisioning, project management, vendor coordination and post-cutover support
- A robust portfolio of industry carriers that offer real choices for network and conferencing requirements

⁸⁷ See <http://www.netgaincom.com> for more information on this agent.



- A Single Point of Contact for initial and ongoing requirements that will simplify getting the job done effectively and expeditiously
- A commitment to quality customer care that will ensure we grow our companies together

As we've identified, an agent can assist western Maryland businesses with the skills and knowledge of telecommunications rates and services which these businesses may not otherwise have access. However, this advantage comes to light when reviewing actual price quotes for Internet access in western Maryland.

The following five quotes (Carriers A - E) were provided by AT&T, MCI, Sprint, Qwest, and ACC, a business unit of AT&T (and not Allegany Communications Connect). All carriers were asked to bid on the same service - full T-1 Internet access, 256 IP Addresses, full SMTP email support, including all telco and port charges and fees. Each set of quotes was for service at the County Executive Offices for each of the three counties in western Maryland, and also for the benchmark of Montgomery County.

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 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.

In most cases, knowledge of and/or access to these prices is only available due to the volume of an agent's business and their extensive daily interactions with carriers. Certain of these rates can only be achieved through the use of an agent. Individual businesses, with under \$10,000 a month in volume and term contracts, may not receive these rates when requesting quotes from their primary telecommunications carrier. Standard port rates to small and mid-sized businesses will typically be 20-50% higher. These rates reflect a "best case scenario" pricing for businesses without hundred-thousand dollar carrier contracts. Some of these rates reflect one-time promotion(s), which could be terminated at any time. *Therefore, this is not a long term solution.*

Through simple education and identification of carrier agents that can serve western Maryland businesses, local economic development teams can bridge the first huge chasm in the digital divide between rural and urban Maryland areas. Intensive Internet access, while not as reliable



as in urban areas, can be purchased at cost-effective prices from time to time through special promotions, even in remote areas of Garrett County (pending last mile facilities issues).

ACTION ITEM: PROVIDE BUSINESSES IN WESTERN MARYLAND WITH THE KNOWLEDGE OF AGENT SKILLS AND SERVICES TO ALLOW THEM TO PROCURE THE MOST COST-EFFECTIVE INTENSIVE INTERNET ACCESS PRIOR TO THE IMPLEMENTATION OF INTENSIVE ACCESS DIVERSE ROUTES AND CARRIERS.

DIVERSE CARRIERS AND ROUTES

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: Proposals submitted, achievement possible, requires substantial follow-up to become a success.

This goal makes it possible for diverse routes and carriers from the last mile through the backbone provider. In order to do this, 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.

This edition of the strategy includes proposals from ACC, MCI, and AllCoNet2 that gets close to this goal. The local community and these private sector providers need to determine if two or more carrier proposals can be sustained by current demand. If not, some additional resources may be needed to ensure that more than one of these succeeds. Another alternative would be to negotiate with two or more of the companies making proposals to see if a combined approach could work. Portions of two or more proposals could be funded so that a diverse route and carrier combination can be achieved.



The additional financing in this scenario could be very manageable for local governments that work with a finance authority to jointly fund a combined project to provide for equipment and facilities that two or more carriers would need in a carrier neutral facility. That equipment can be owned by the local entity to ensure that the demise of any of the telecommunications firms would not result in the loss of the equipment. But, the equipment can be leased out to the private sector firms to manage, maintain, and upgrade while they sell services to users.

The following three elements provide one example of how redundant routes, carriers, and points of presence can be provided to western Maryland. The benefits would be substantial for local ISPs and businesses in lower rates and diversification of routes and carriers for a highly sustainable network.

ALLEGHENY COMMUNICATIONS CONNECT

As stated in the Rural Challenges and Project Goals section at the beginning of this document, one of the greatest challenges to western Maryland is the fact that almost all data and Internet inter-exchange services originate in the eastern portion of the LATA (Frederick and Hagerstown) and follow the same routes westward to reach Allegany and Garrett counties. Users in Garrett County have 100+ mile local loops to reach some of their broadband and data carriers, which results in substantial access prices and potential for outages in these services.

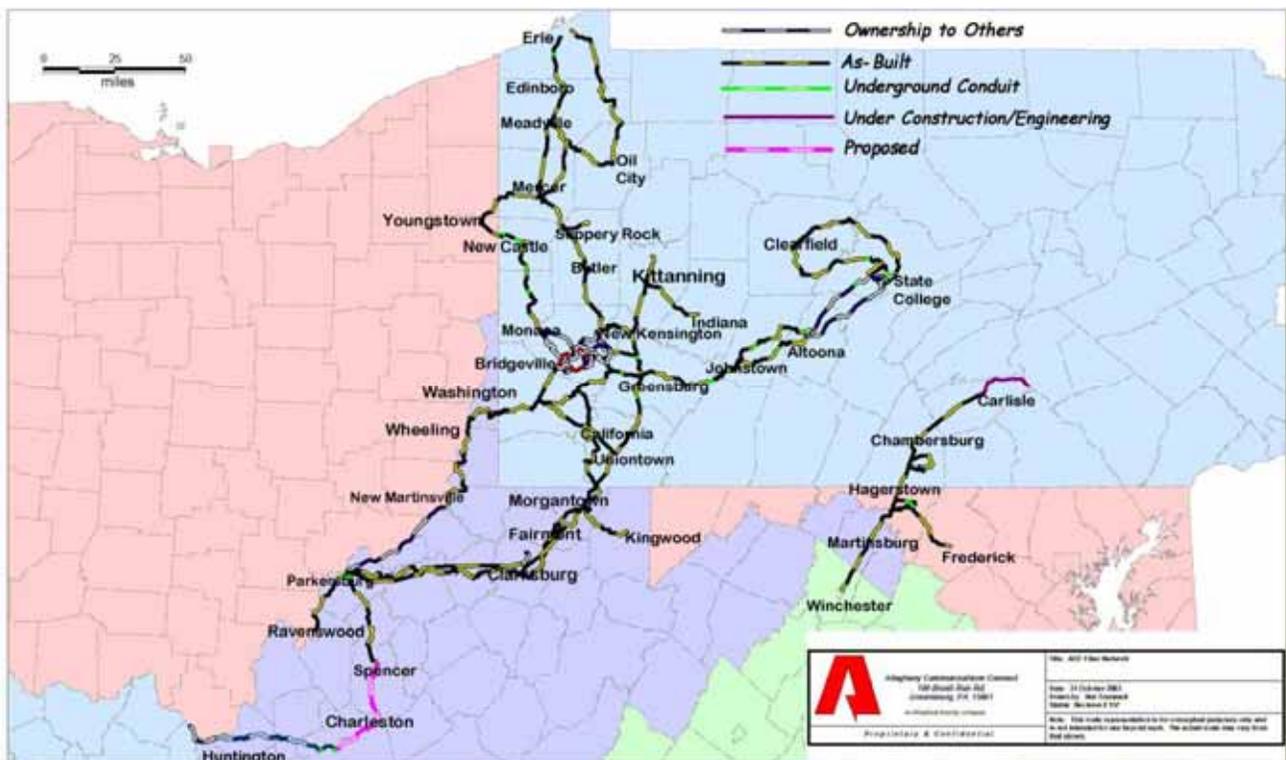
Very few carriers have a presence in or near the western end of the three-county region. Part of our strategy relies on engaging the carriers that exist in this region to bring diversity to both businesses in the area and also to regional ISPs. The addition of a route westward out of the area will eliminate some of the single points of failure that can cripple western Maryland's voice, data, and video communications – and especially broadband access.

An example of this single point-of failure can be hypothetically illustrated by ISP 'X', a company providing wireless Internet access service in a 10-mile radius of Oakland, the seat of Garrett County. If this company, in its business plans, purposefully opted to buy upstream access from two different carriers to obtain diversity and fault tolerance (as most mid-sized and larger ISPs do), it would expect to be able to serve its customers with near Six Sigma (99.999%) availability. However, any major loss of Verizon T-1 facilities in the 50-150 miles east of Oakland could potentially drop BOTH carriers' services, as all major carriers' services in the LATA are many miles east of Garrett County. Access to a route west and north would limit the single point-of-failure to the company's own equipment, the last mile to Verizon, and the Verizon serving central office. (And, by obtaining access at two separate locations served via separate central offices, there are no single points-of-failure at all on the upstream facilities – an option that a wireless-based ISP has.)

The recent award from USDA to Allegheny Communications Connect (ACC) to bring network access into Oakland in Garrett County can be leveraged for the entire region. There are three major benefits to this network:

1. It is already funded into Garrett County, while other networks are in Pennsylvania or West Virginia
2. Their network infrastructure follows power line rights-of-way, and not freeways, railroads, or other typical telecommunications rights-of-way. This second benefit provides additional route diversity for services into western Maryland.
3. The route goes north and west of the tri-county region, crossing LATA boundaries and connecting to non-Baltimore/Washington services. All other existing inter-LATA services go east to Hedgesville, WV, Hagerstown, and/or Myersville/Frederick, and often connect to the nationwide backbones through Baltimore and/or Washington, DC hubs.

The following map outlines the current ACC network. This network is an Internet access network, and provides peering and transit with other major Internet carriers. We propose that western Maryland leverage this network to provide additional regional services to while providing an alternate and redundant route to the west/northwest to Wheeling, Youngstown, and Pittsburgh.

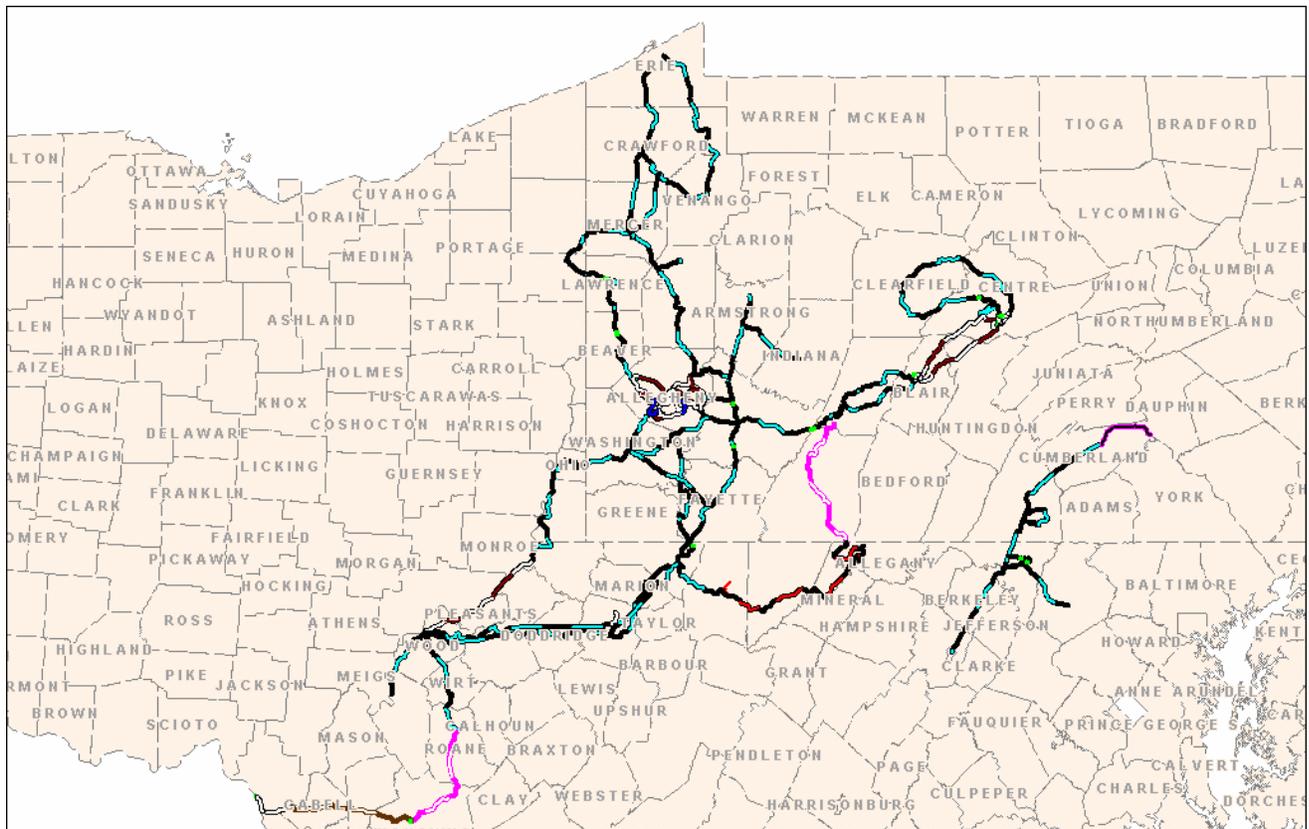


By identifying sufficient aggregated demand, ACC could have a business case to provide Internet access to ISPs and major private sector companies over this route. This could be accomplished through the implementation of additional wireless capacity in the region (possibly an expansion to AllCoNet2) or through a co-location agreement with Verizon, where Verizon would provide the last mile access to ACC’s network facilities in Oakland. In the latter case, only limited investment by ACC would be required; although, businesses would have to

purchase mileage-based T-1 access circuits from Verizon to reach ACC – circuits that could cost several hundred dollars more than urban circuits, due to the mileage to Oakland. In order to accomplish this, regional participants would need to calculate costs for customers, aggregate their demand, and work with ACC to develop a business case to implement a private sector service in addition to the grant-based public sector offering.

ACTION ITEM: INVESTIGATE THE FEASIBILITY AND ACTUAL DEMAND FOR A PRIVATE-SECTOR POP ON THE DIVERSE ACC ROUTE IN OAKLAND.

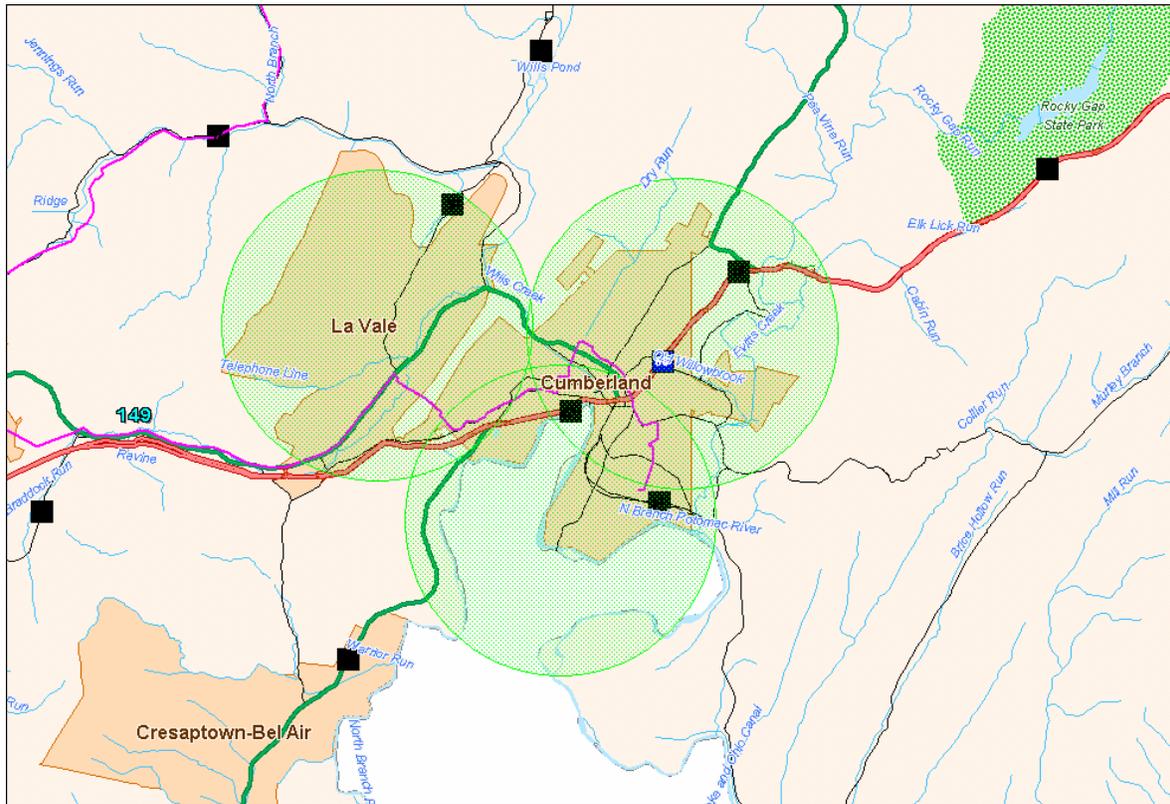
The following map outlines a proposal from ACC (prior to the grant to build out the Garrett County link) to bring a SONET ring with Internet access through the Cumberland area and to connect this region into the westerly route of the network.



This route would enable ACC to provide the following benefits (see the ACC presentation in the exhibits):

- Physically diverse fiber-optic routes to Pittsburgh
- Initial Network Bandwidth - OC12 scalable to multiply OC48
- POP in Cumberland (along with the already funded POP in Oakland)
- Carrier neutral transport to Pittsburgh

The following map outlines the specific proposed route to Cumberland.



ACC initially proposed this entire build-out as follows:

Fiber Optic Network	\$4,350,000
Network Electronics	\$ 200,000
POP	\$ 150,000
4 Base Stations	\$ 294,000
Installation Cost	\$ 200,000
Total	\$5,194,000

Along with this proposal, they offered recurring rights-of-ways fees for operations at \$70,000 a year. The rights-of-way fees could be used to pay back local funding of the capital portion of the project.

Given that ACC has already brought a fiber route into Garrett County, this could be a low risk method to gain a long distance point of presence in Allegany County (which currently does not have a major carrier POP) and access to a fully-diverse route to the west and north. ACC would offer a carrier neutral facility that would make it possible for other carriers to participate in collocating connections using this facility. Business customers could then be provided with choices in providers as well as routes.



It is expected that this proposal could be revamped to include a public-sector POP in Oakland as well, and discounted as the link into Oakland is already funded.

ACTION ITEM: SOLICIT A REVISED PROPOSAL FROM ACC TO TRANSITION THE GARRETT COUNTY LINK INTO A RING WITH A DIVERSE ROUTE THROUGH CUMBERLAND AND A POP IN CUMBERLAND AND OAKLAND.

MCI

There are two MCI related proposals. The first is through MCI's government division. The second is through the wholesale division which is working through UCN, described later. MCI 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. A full service POP provides access to MCI's entire suite of carrier class services, including: Internet through UUnet, Long Distance, Toll Free, Local Service, and next generation network based applications such as award winning MCI Advantage (VoIP), and award winning Web Center (IP contact center).⁸⁸

The result of this build-out, anchored with a commitment of government services, would provide area residents and businesses with increased competition and lower cost broadband services. The MCI proposal required no up front payments, but, asked for an agreement to purchase any combination of MCI services in order to allow MCI a return on investment over time. Although this offer has expired, the proposal demonstrates MCI's flexible approach to the challenge of broadband delivery in under-served markets.

The MCI Government Market group is a \$2 Billion dollar a year business unit of MCI. The Mid-Atlantic State team has been working in Maryland for many years and currently holds four statewide pricing agreements. MCI has made a commitment to the State of Maryland and promises to continue to explore public / private partnership opportunities.

This can be significant. Though the TLA team has not been part of any negotiations between the County and MCI, and though one consulting firm has suggested that the county "suspend the current" negotiations with MCI, it might be worthwhile to understand what onerous requirements MCI was demanding and how they might be remedied.

In conversations with MCI, MCI has expressed willingness to work with ACC in participating in a carrier neutral facility where MCI can place their rate center.

⁸⁸ MCI Government Markets has supported this effort and submitted a letter reiterating this information, which is contained in the exhibits section.



MCI has offered their proposal based on customer usage alone. Any onerous provisions to the county, such as a minimum amount of traffic to which the County cannot subscribe, could be off-set by other facility or financial provisions that could be offered to MCI.

ACTION ITEM: REQUEST A CURRENT PROPOSAL FROM MCI TO PLACE A FULL-SERVICE POP IN CUMBERLAND AND REVIEW THE TERMS AND CONDITIONS OF THIS OFFER TO DETERMINE POTENTIAL ABILITIES TO OFF-SET OR MODIFY DIFFICULT REQUIREMENTS.

In addition, an alternative MCI proposal through UCN exists and is currently underway to bring a facilities-based POP to Cumberland on the MCI network. This option is fully supported through the aggregated demand of AllCoNet2.

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.⁸⁹ However, a definitive agreement has not yet been reached.

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 (through either option) 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. (Most Verizon inter-office facilities do not share the same route as long distance carrier facilities – and the MCI connection will possibly come up from Hedgesville, WV.) In an ideal situation, these facilities would originate in the north or west, but we believe that this is extremely unlikely due to the substantial cost of installing such a route.

With the implementation of a MCI backbone POP in Cumberland, both 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. These services should also cost less, as long-haul Verizon T-1s (with per-mile charges) are no longer needed to access a long distance POP. This also reduces single points-of-failure on these services.

⁸⁹ 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_1076940.

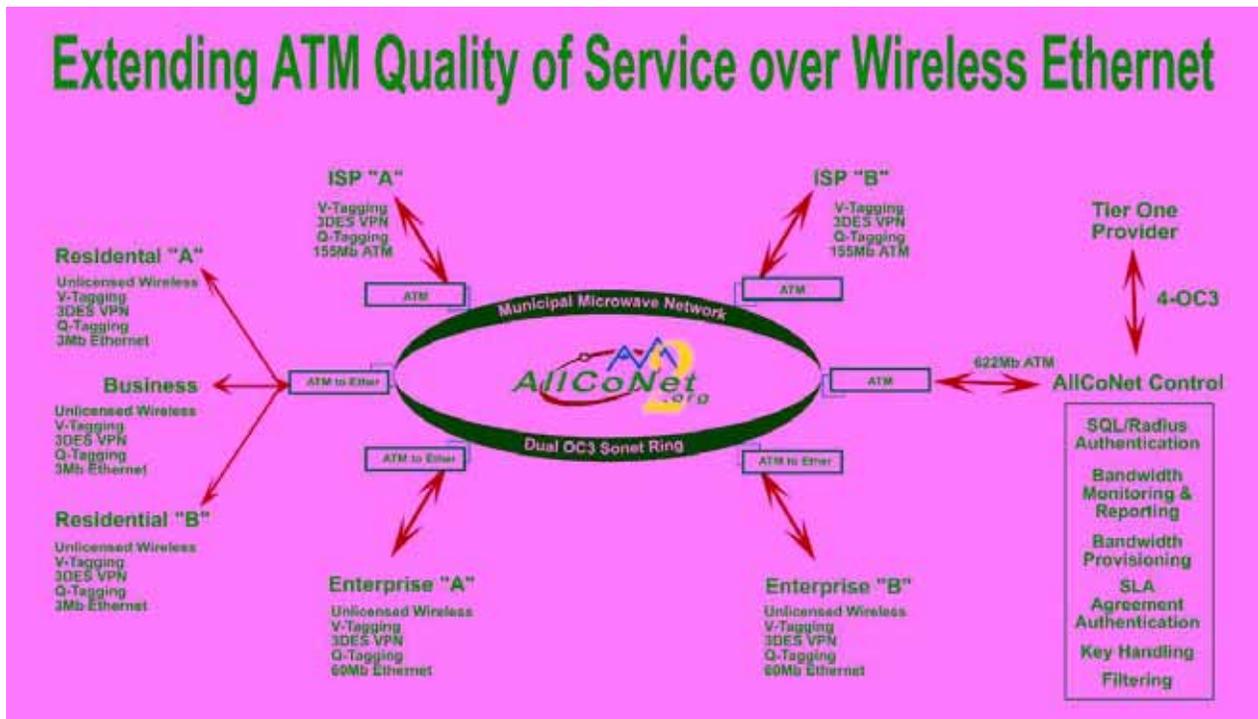
ALLCoNET2

AllCoNet2 offers a carrier class wireless infrastructure, connected together via a self-healing and redundant SONET ring that would serve public-sector organizations on its backbone and others through ISPs who would offer last mile services. Following is a draft map of their proposed Allegany County wireless service area offering. AllCoNet is also proposing to extend wireless service into Garrett County. The benefits of AllCoNet2 would be that they would aggregate local demand that would be serviced by the backbone providers of the ACC and MCI model. In particular, users of Moderate Internet access would be well served by this solution in areas where other Moderate Internet access methodologies are unavailable – i.e. areas too far from a CO to obtain DSL and areas where cable modem service is unavailable – and for users where satellite services are too slow or costly.



In essence, while AllCoNet itself will not provide Internet access services to private sector and residential subscribers, it would offer wholesale services to regional ISPs, such as TWR and ProCom, who in turn would provide those private sector services. These ISPs would offer their services to end-users over AllCoNet’s wireless last mile transport. Users served by AllCoNet would then have the option to also purchase traditional last mile service offerings, delivered over the incumbent local exchange carrier’s network, allowing for true mission-critical service delivery. The close-to-ubiquitous nature of the AllCoNet2 network across Allegany County would also drive broadband and competition due to the competitive nature of multiple providers able to offer competing services.

AllCoNet’s aggregation strategy includes providing private sector resellers the ability to reach business customers as seen in the following AllCoNet graph.



The following overview (next page) provided by AllCoNet shows the remaining financial requirements for them to capitalize wireless services to Allegany and Garrett counties. The cost to reach Garrett and portions of Washington counties with the AllCoNet2 network will be between \$6-7M. See the one page AllCoNet summary below. TLA has identified homeland security funding sources for some of this additional network build-out.

The benefit of having all three of these capabilities would include system redundancy, aggregation of government and ISPs, and mobile communications. Each of these would be beneficial to a broadband-based emergency communications system that was discussed earlier in this strategy study and emphasized in the next goal.

And, as we indicated at the beginning of this section, the ability to capitalize on two of these options will provide true route diversity and redundancy to the region. For example, the addition of a western route into the area (ACC) and a POP in Cumberland would provide the AllCoNet network with another source for its Internet access, further increasing its availability and reliability to public and private sector entities, and firmly establishing the region as an area with a communications infrastructure capable of matching any urban area and able to support urban areas in an emergency event.



**AllCoNet2, High Speed Telecommunications Service
December 22, 2003**

Phase I – Sonet Ring and Spur Sites, Backbone Equipment (Marconi) - \$2,558,900

Funding Status

City/County Funding Agreement (PH. I-\$63,900): Signed, September 24, 2002

DBED Grant Agreement (\$2,000,000): Signed, January 2, 2003

ARC Supplemental Grant (\$500,000): Approved, August 6, 2003

USDA-RD Obligation of RBEG and ARC Funds (\$525,000): Obligated, September 16, 2003

Schedule Status

Notice to Proceed: September 9, 2003

Completion of construction/installation of Sonet Ring (8 sites): no later than December 31, 2003

Testing of Sonet Ring Complete – January 7, 2004

Completion of construction/installation of Spurs (6 sites): May 1, 2004

Frederick Street – Underway

Bowling Green – Requires MDE concurrence (loan agreement) before installation

Willowbrook Road – Requires final agreement with ACMD

Westernport – Requires relocation decision to replace former Moran Airfield site

Lonaconing – Requires resurvey and environmental review of proposed tower site

Frostburg – Requires agreement with private tower owner

Phase II-Broadband Signal Outreach Equipment (Alvarion) - \$1,521,000

Funding Status

City/County Funding Agreement (PH. II-\$431,122): Signed, September 24, 2002

ARC Supplemental Grant (\$495,000 proposed): Pending Identification of Basic Agency for Application

Federal/State Gap Source (\$594,878 proposed): Pending Identification of Agency for Application

Current Issues

Testing of Ring and Completion of Basic Business Plan Documents for Beta User Company

Federal Reimbursement Request #1: January 7, 2004

Completion of Phase I Spur Sites, Final Federal Funding Request, and Closeout

Completion of Fully-Integrated Business Plan Model for Marketing and Implementation via ISP's with New Partners Identified

Ability to Overlap Phase I Spur Buildout with Phase II Equipment using Local Funds

Identification of \$1.1M to complete Phase II and Timing of Application Process

Decision on Availability and Use of Debt, Equity, or Grants to Complete Phase II

Re-setting of AllCoNet Operating Model and Tracking of Cash Flow

Consideration of Replacement for AT&T Connection to Wholesale Provider

Funding and Implementation of Fiber Link from County to Board of Ed

Garrett County Phase 1

Est 3.2 Million for the backbone Ring

Issues will have to resolved with respect to tower rights

See PPT

Garrett County Phase 2

Est 2.8 Multipoint Equipment



SUMMARY

Each of these backbone providers could offer and enhance services to last mile providers such as ProCom, who are planning to offer fiber to the home services, and TWR, who can provide wireless Intensive Internet access, so that they may offer survivable network services to their clients. Cable companies and ILECs can also share in the redundant route offerings and provide additional collocation facilities of their own.

TLA believes that all three of the above options are fundable in the near term. TLA also believes that sustaining revenue could be achieved if converged services applications are supported and encouraged in both the public and private sectors.

ACTION ITEM: THE TRI-COUNTY COUNCIL FOR WESTERN MARYLAND, OR ITS TECHNICAL REPRESENTATIVES, CAN FACILITATE DISCUSSIONS BETWEEN PROSPECTIVE BROADBAND PROVIDERS AND KEY CUSTOMERS TO ARRANGE A COORDINATED INFRASTRUCTURE DEPLOYMENT AGREEMENT BETWEEN THE PARTIES.

ACTION ITEM: TLA BELIEVES THAT THE TRI-COUNTY COUNCIL FOR WESTERN MARYLAND, OR ITS TECHNICAL REPRESENTATIVES, CAN RAISE THE FUNDS TO SUPPORT A THREE-FOLD INFRASTRUCTURE DEPLOYMENT CAPITALIZATION PROJECT IN THE NEAR TERM.

ACTION ITEM: TLA BELIEVES THAT THE TRI-COUNTY COUNCIL FOR WESTERN MARYLAND, OR ITS TECHNICAL REPRESENTATIVES, CAN TAKE NEXT STEPS TO AUGMENT A CAPITALIZATION PROGRAM WITH AN APPLICATIONS IMPLEMENTATION PROGRAM THAT WOULD CREATE ON-GOING REVENUE TO SUPPORT THE THREE-FOLD INFRASTRUCTURE.

The partial list of applications would include:

1. Mobile emergency communications throughout the county.
2. ASP based converged emergency services for first responders, government agencies including public health, and non-governmental organizations
3. Broadband 911.
4. LAN and MAN network efficiency and security assessments meeting federal and private sector standards.
5. Telemedicine applications, leveraging regional hospital use of NetworkMaryland into clinics and homes.
6. Remote class and home-based training of volunteers and volunteer organizations providing services to the community



EMERGENCY SERVICES

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

Status: In progress.

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 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 and use of broadband resources for their respective needs.

Emergency services operations applications can be the door to even additional financial support for emergency services communications that would normally cost each of the counties \$10's of millions. The related policy recommendation #4, requires detailed planning to assure that related applications that make such communications useful to each of the stakeholders are also developed so that the infrastructure is not under-utilized and additional funding can be procured. TLA has identified sources of homeland security funding for TCC to pursue.

ACTION ITEM: THE TRI-COUNTY COUNCIL FOR WESTERN MARYLAND, OR ITS TECHNICAL REPRESENTATIVES, SHOULD WORK WITH REGIONAL ENTITIES TO FUND AND DEVELOP EMERGENCY SERVICES CONVERGED COMMUNICATIONS APPLICATIONS THAT WILL ENABLE COMPLETE COMMUNITY PARTICIPATION IN BROADBAND NETWORKS.

As in Goal #4, the partial list of applications would include:

- Mobile emergency communications throughout the county.
- ASP based converged emergency services for first responders, government agencies including public health, and non-governmental organizations
- Broadband 911.
- LAN and MAN network efficiency and security assessments meeting federal and private sector standards.
- Telemedicine applications, leveraging regional hospital use of networkMaryland into clinics and homes.
- Remote class and home-based training of volunteers and volunteer organizations providing services to the community.



ECONOMIC DEVELOPMENT INCENTIVES

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.

Status: In progress.

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 one proposed modification of OneMaryland type programs. Economic development leaders who are most involved in these activities would likely be those who could take responsibility for organizing next steps.

Economic development leaders could also provide special attention and encouragement to new business ventures that require intensive broadband applications to attract service providers to establish points of presence across the tri-county area.

ACTION ITEM: THE TRI-COUNTY COUNCIL FOR WESTERN MARYLAND, OR ITS TECHNICAL REPRESENTATIVES, SHOULD WORK WITH ECONOMIC DEVELOPMENT LEADERS IN THE COUNTIES AND ACROSS THE STATE WITH GROUPS SUCH AS MIDAS, TO DEVELOP ECONOMIC DEVELOPMENT INCENTIVES THAT PROVIDE CRITICAL TELECOMMUNICATIONS SERVICES.

FINANCIAL TOOLS

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.

Status: In progress.

A combined bonding issue, repayable by ROW and other use fees, can enable funding of Goal #4 and provide an example of a project supportable by the state-wide Broadband Bonding Authority. 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. Since financing is critical and since it takes a while for a finance authority to be created, local officials should offer knowledgeable officials who understand bonding authority, infrastructure funding, and economic development issues to participate in the Rural Broadband Task Force ad hoc committee on finance. The Tri-County Council can also recruit elected local officials to oversee the development of next steps.



ACTION ITEM: THE TRI-COUNTY COUNCIL, OR ITS TECHNICAL REPRESENTATIVES, CAN TAKE NEXT STEPS TO IMPLEMENT INFRASTRUCTURE FUNDING OF GOAL #4 WHILE ALSO DEVELOPING ADDITIONAL FUNDING TOOLS SUCH AS THE BROADBAND AND RELATED CRITICAL INFRASTRUCTURE BONDING AUTHORITY. STEPS WOULD INCLUDE FACILITATING PARTICIPATION OF LEADERS FROM MICHIGAN FAMILIAR WITH THE DEVELOPMENT OF SUCH AN AUTHORITY, MEETING WITH STATE LEGISLATORS TO CREATE MODEL LEGISLATION, ASSEMBLE PRIVATE SECTOR PARTICIPANTS SUCH AS CARRIERS AND FUNDING PARTNERS WHO WOULD LIKE TO PARTICIPATE IN INITIAL BOND OFFERINGS.



APPENDIX A – ADDITIONAL SURVEY DATA

Responding Firm Size Compared to Census Establishments by Employment Size Class¹

	Allegheny County			Garrett County			Washington County		
	Survey	Census	Percent	Survey	Census	Percent	Survey	Census	Percent
Total	47	474	10%	40	204	20%	79	1,009	8%
10 to 49 Employees	31	399	8%	22	172	13%	54	813	7%
50 to 99 Employees	11	38	29%	8	18	44%	8	104	8%
100 or More Employees	5	37	14%	10	14	71%	17	92	18%

¹ Census figures are from 2001 and exclude all businesses that employed less than 10 persons which were not included in the survey.

The following tables show the frequency of use and the satisfaction with various Internet access or wide area communication services. The most frequent services used by firms were Internet email (corporate) (78%), internal company email (72%), and Internet email (individual) (66%). Eighty-six percent (86%) of firms do not use telemedicine applications, 80% do not use Internet video conferencing, and 80% do not use VOIP. Firms expressed the greatest satisfaction with Internet email (corporate) (81%), eCommerce (78%), and Internet email (individual) (72%). Sixty-one percent (61%) of firms were not satisfied with telecommuting/teleworking, 59% were not satisfied with VOIP, and 58% were not satisfied with telemedicine applications. Overwhelmingly firms responded that they would like all of the mentioned services at a faster rate of access. In particular, the ability to transmit/receive large files (90%), Internet-based video broadcasts (83%), Internet email (individual) (81%), VOIP (80%), and VPN (80%).

Frequency of Firm Use of Internet Access or Wide Area Communication Services

	Frequency of Use				Satisfied		Use More If Faster Rate	
	Often	Frequently	Seldom	Not at All	Yes	No	Yes	No
Internal Company Email	72%	4%	6%	17%	N/A	N/A	N/A	N/A
Internet Email (Corporate)	78%	9%	2%	11%	81%	19%	79%	21%
Internet Email (Individual)	66%	15%	8%	11%	72%	28%	81%	19%
Internet Audio Broadcasts	11%	14%	29%	46%	59%	41%	74%	26%
Internet-Based Video Broadcasts	4%	11%	34%	51%	53%	47%	83%	17%
Non-Internet Video Conferencing	1%	13%	12%	74%	56%	44%	N/A	N/A
Internet Video Conferencing	1%	3%	15%	80%	50%	50%	73%	27%
Telemedicine Applications	3%	3%	9%	86%	42%	58%	48%	52%
Distance Learning	5%	13%	29%	53%	58%	42%	72%	28%
eCommerce	23%	27%	24%	27%	78%	22%	79%	21%
Web Chat Customer Support	5%	7%	19%	69%	52%	48%	62%	38%
Transmit/Receive Large Files	20%	35%	29%	17%	55%	45%	90%	10%
VOIP	5%	2%	13%	80%	41%	59%	80%	20%
VPN	20%	9%	6%	65%	49%	51%	80%	20%
Telecommuting/Teleworking	13%	18%	16%	52%	39%	61%	75%	25%



Frequency of Firm Use of Internet Access or Wide Area Communication Services

	Frequency of Use						Satisfied		Use at a Faster Rate		
	Often	Frequently	Seldom	Not at All	NA	No Response	Yes	No	Yes	No	NA
Internal Company Email	92	5	8	22	40	7	N/A	N/A	N/A	N/A	N/A
Internet Email (Corporate)	94	11	2	13	43	11	87	21	45	12	21
Internet Email (Individual)	73	17	9	12	50	13	68	26	46	11	19
Internet Audio Broadcasts	10	13	28	44	66	13	29	20	35	12	18
Internet-Based Video Broadcasts	4	11	34	52	63	10	26	23	44	9	20
Non-Internet Video Conferencing	1	12	11	67	71	12	18	14	N/A	N/A	N/A
Internet Video Conferencing	1	3	14	73	69	14	14	14	35	13	21
Telemedicine Applications	2	2	6	60	89	15	8	11	12	13	35
Distance Learning	5	14	32	58	54	11	30	22	36	14	20
eCommerce	27	32	28	32	41	14	53	15	49	13	18
Web Chat Customer Support	5	7	19	69	61	13	16	15	26	16	22
Transmit/Receive Large Files	26	46	38	22	28	14	50	41	69	8	13
VOIP	5	2	13	79	63	12	12	17	40	10	17
VPN	20	9	6	65	62	12	22	23	33	8	21
Telecommuting/Teleworking	13	18	16	51	62	14	18	28	38	13	18

Services for which firms would pay for high-speed Internet services for a customer:

- all that provide MR>MC
- customer menu's -take out
- data
- direct dsl wholesaler
- dsl
- dsl
- educational
- educational
- email, web access
- file transfers
- high speed access in general
- internet (dsl, cable, modem), email, EDI(FTP)
- internet access in rooms
- internet access video conferencing
- internet based services for UPN
- internet connection
- just about anything that produces a net profit
- medical
- p-commerce, voip
- payroll/bookeeping
- sales
- t1
- tax collection, date base access, permit processes
- teetime reservations
- TI
- video conferencing, training for health professionals
- voice and data
- vpn
- we offer the services but will take more bandwidth
- whichever services may exist
- wireless
- wireless network in restaurant



Ways in which firms would like services improved by their phone companies:

additional service	lower rates and better transmitters for our nextel phones towers are still limited in the area
Adequate for our business now	make true broadband, high speed access available
after dsl	more accurate billing services, increased responsiveness to requests for new added services
avail. To DSL	more accurate billing services, increased responsiveness to requests for new/added services
better backbone services	more competition verizon is the only game in town and they knew it.
better billing and technical support reduced cost	more competitive local pricing
better cell phone : county and Mt. Sava, Flinstone/Oldtown	more customer focused, improved communication facilities
better customer service to deal with problems	more reasonable costs to small businesses to businesses are often charged per call for connection
better customer service, especially w/ long distance provider	more reliable
better maintenance service, lower rates	More reliable service, less confusion. Too many folks "cramming" miscellaneous charges on bills
better mobile service	more reliable, better service
better phonline quality	more stability, offer dsl
better reliability had many down times do to verizon issues	more understandable invoices
better response to problems+issues more face to face to discuss new technologies and services	need dsl
better service, less expensive	no charge per call
better service, lower rates, more internet broad band service	no comment
better understanding bill	no issues
better use of wireless phone services	no issues
better wireless connections	no more slamming
better, clearer, faster lines	no suggestions
cheaper	no work related problems
customized board band choices frac Fi, etc.more affordable high speed broad band	none
discount programs for volume use	none
doing just fine	offer dsl, reduce prices
DSL	offer us only the features on each line that we want instead of packages of unwanted junk
Easter setup service	ok as is
especially cell service	ok for now
expanded offerings for digital service/speeds	one bill, very high speed, discounted rate
faster affordable service and connection	one provider
Faster data transmission lines	one provider
faster repair service	one stop shopping would be nice. Local/long distance/inside service
faster response to service problems	physical plant improvements
faster, better customer service	plan comparison that make sense
fiber	price
fine	prices for what service is provided
flat rate charges for local + long distance	quicker response times for service calls, ownership of problems
foolproof protection against slamming	rates for non-profits
good rates from a single company instead of having 2 or 3 companies	reduction in cost
splitting long distance local & international	
high speed internet connections, higher capacity	reliability
I liked the way it waas in the old days with sell in charge -efficient , simple	relieability
improved rates for businesses, proper advertisng in directories (never place appropriate information supplied on proofs	satisfied
ISDN/video conferencing costly	seamless integration with long distance carrier
it would be helpful if our long distance service was more customer service oriented and not second tier	seems ok
Less expensive	service
local competition, fiber and dsl installed throughout area	service fine
lower bill-usually about 800per month	service for internet
lower cost better customer service, no charge for calls that did not go through	simplify billing -invoices are too complex , improve tech support
lower costs, improved wireless quality and increase service areas	stop bumping me to other companies w/out my knowledge
Lower Ld rates	the business needs no computers
lower long distance costs	The Mental Health Center just invested in 3Tl lines for phone syste, and internet services
lower rates	verizon -has had ongoing billing problems . The company continues to send bills in error
	verizon needs competition, their service is lausy
	wireless network



Ways in which firms would like services improved by their cable company:

Adequate for our business now	more channels&less money
better and more consistent quality	more competition, anti-torn cable does not have a big enough infrastructure to handle growth in Washington County
better knowledgeable support, particularly in the area of VPN/routers	more competitive local pricing
better rates	more nfl games
better reliability, increased capacity	need broadband access
better selection of channels for prices in which charged	no comment
better service, less expensive	no issues
better viewing channels get out of the prehistoric times of cable boxes&system	no issues
cheaper	no suggestions
cheaper	none
cheaper rates	none
cheaper rates, bring into business, area/location, allow static IP's	none
cleaner signal	not applicable
current service is adequate	ok for now
dna	one bill, very high speed, discounted rate
doing just fine	one provider
faster affordable service and connection	provide fixed IP addressing
fine	provide home/cable access
fine now-lower costs	provide service to our industrial park
High speed orbital internet	provides internet access, service is ok, sometimes slows down
improve speed, reduce downtime	rates for non-profits
improve tech support	reliability
include cable money service in Frostburg	same as above
internet cable access	two way digital access
lower cost	we shouldn't have to install it ourselves
lower pricing for high speed service	
lower rates	
more channels for the same price	
more channels web tv faster	



Ways in which firms would like services improved by their Internet provider:

additional annual accounts-limited to 8	high speed wireless access available throughout county
Adequate for our business now	higher bandwidth for less cost
all dial up provider to have dsl also	higher spreads same costs
allow static IP's , better technical support	if our band rate was consistent over the business pay, it would be useful (more 50)
better connection access, pop up cease	less fees
Better connections, faster speed	lower cost
better filters for spam/junk email	lower costs for services and higher bandwidths
better rates	lower costs for services and higher bandwidths
better server	lower costs, on demand capacity increase, no cost redundancy
better service, less expensive	minimize down time
cheaper	more flexibility to our needs
cost effective	move reliable message transmission
cost reduction	need affordable TI type service
easier to use	need broadband access
faster	needs to be more reliable
faster	no comment
faster	no complaints
faster affordable service and connection	no high speed access available at this, it is needed badly
faster connection speeds	no issues
faster data connections	no problems
faster dial up in a larger geographical area	no suggestions
faster modem speed /transition speed	no work related problems
faster more consistent service (no downtimes)	none
faster service	ok for now
faster service	one bill, very high speed, discounted rate
faster service	one provider
faster service	price
faster service that will work all the time and not get interrupter also cheaper	provide high speed services
faster speed	provide high speed unkind access
faster speeds, cheaper costs	quicker access
faster speeds-no increase in prices	redundant service connection from 2 different backbones
faster, better equipment	reliability
fewer interruption	relieability
fine	response issues occasionally
gcnet-improve speed for downloads	same as cable
greater bandwidth	satisfied
greater bandwidth	service fine
high speed	service is excellent
high speed digital service	speed only
high speed internet at reasonable rates, speed must be consistent	TI That's affordable
high speed internet services	variety of options, carriers, speeds
	we are the internet provider
	wireless



Service that firms would like to implement that would allow them to grow operations:

- affordable high speed broad band
- broadband
- broadband service for banquet rooms
- cable, or other, internet
- cable/dsl/VOIP
- DSL
- dsl
- expand to other locations
- extranet for clients
- faster internet hoop up
- fixed wireless
- frame relay
- gps satellite traking in trailers
- gps system for tracking fleet equipment
- high speed access
- high speed credit card processing
- higher capacity data transmission
- internet access
- internet sales
- internet video conferencing
- IP vocie and video services
- IP voice and video services
- limited customer access to internal computer resources
- live satellite broadcast-for trainings
- networking multiple locations T1 line
- online, real time, atm debit&credit card network
- submit perscription claims over internet
- telemedicine
- upgrading or adding to our internet site
- video conferencing
- video conferencing
- video conferencing /VOIP
- video conferencing for meetings with branch stores
- voice over IP across WAN
- VPN
- VPN
- VPN/DSL to telecommuter
- we don't grow operations
- web based ordering
- web hosting permit applications
- web page
- web page
- web site
- web site and networking computers for remote access
- website
- wireless



LETTER FROM LIEUTENANT GOVERNOR STEELE



STATE OF MARYLAND
OFFICE OF
THE LIEUTENANT GOVERNOR

MICHAEL S. STEELE
LT. GOVERNOR

April 3, 2003

Dear Western Maryland Constituent:

I am writing to ask for your assistance on an issue of critical importance to the economic well-being of Western Maryland. The enclosed survey is part of an in-depth project being conducted by TLA Associates on behalf of the Tri-County Council for Western Maryland and the Maryland Technology Development Corporation (TEDCO).

The goal of this endeavor is to improve access to broadband infrastructure in Western Maryland by analyzing current and future market demand and determining specific investment requirements that will provide the region with the same range of communications opportunities that your neighbors have "down state."

All information you provide will be held in the strictest confidence. Neither you nor your organization will be identified in any reports or publications. Surveys **MUST** be returned by May 16, 2003 in order for them to be included in the data analysis. Please return the completed survey in the enclosed postage paid envelope, or you may fax it to 410-837-5814.

If you have any questions, please visit the Western Maryland Broadband Infrastructure project website at www.marylandtedco.org/WesternMD.htm for a complete overview of project goals and objectives, or you may want to email the survey team at survey@marylandtedco.org. If necessary, you may contact Michael Beach, TLA Associates' Project Manager, at 703-450-8438.

This survey will only be helpful and accurate if all organizations respond and complete the enclosed survey in its entirety. I hope you will take a few minutes to participate in this important effort as we work to improve Western Maryland's access to the economic development tools of the 21st Century.

Thank you in advance for your time.

Sincerely,

Michael S. Steele
Lt. Governor of the State of Maryland

STATE HOUSE, ANNAPOLIS, MARYLAND 21401
(410) 974-2804 1-800-811-8336
TTY USERS CALL VIA MD RELAY



LETTER FROM DELEGATE MYERS

LEROY E. MYERS, JR.
Legislative District 1C
Allegany and Washington Counties

Ways & Means Committee



The Maryland House of Delegates
ANNAPOLIS, MARYLAND 21401-1991

April 23, 2003

Annapolis Office
320 Lowe House Office Building
Annapolis, Maryland 21401-1991
1-800-492-7112 Ext. 3435

Allegany County Office
111 South George Street
Cumberland, Maryland 21502
301-722-0926

Washington County Office
14627 National Pike
Clear Spring, Maryland 21722
240-527-2500

Dear Western Maryland Business Leader:

As you may be aware from recent media releases and from the survey that was sent to your business, the Tri-County Council for Western Maryland and the Maryland Technology Development Corporation (TEDCO) are sponsoring a project to identify the requirements for high-speed Internet access in Western Maryland and to develop specific strategies to deploy additional services to meet your needs.

My colleagues and I have been supporting this initiative as well as others to foster economic development throughout the region.

Your firm has been identified as a key business in our region. As such, the project team would like to interview you so that we may learn your thoughts about the opportunity to enhance high speed Internet availability in Western Maryland. The interviews are a follow-up to the survey businesses have already received. That survey can be found on the website, www.marylandtedco.org/WesternMD.htm.

Someone from the Tri-County Council, from other local government organizations, or from the project contractor, TLA Associates, will call to arrange a meeting with either Charles Manto, who has been a CEO and led operations of a broadband provider; or Michael Beach, a TLA principal who has advised federal agencies, local governments and businesses on their telecommunications needs and opportunities. This interview will last less than one hour and information obtained will remain within the project team and will only be used to assist in the development of broadband strategies.

On behalf of the Tri-County Council and the members of the Maryland General Assembly, I thank you for your participation.

Sincerely yours,

LeRoy Myers, Jr.
Delegate, District 1C



SURVEY INSTRUMENT



IMPROVING ACCESS TO BROADBAND INFRASTRUCTURE IN WESTERN MARYLAND – DEMAND SURVEY

This survey is part of an overall effort to discover how businesses and users in Western Maryland can obtain more robust, higher capacity Internet access. Based on results published in Maryland’s eReadiness report, apparently most users are limited to slower dial-up services.

This survey will help us better understand the existing gap between the broadband services available in the region and the use of and need for these services by businesses like yours. All responses will be kept confidential; contact information will be used for data verification purposes only. For businesses with multiple locations, please respond to this survey with answers relevant to the office location where the survey was sent, and not answers that cover all your company’s locations and facilities.

If you have any questions, please review the Frequently Asked Questions (FAQs) at the project’s website – <http://www.marylandtedco.org/WesternMD.htm>, email us at survey@marylandtedco.org, or contact Michael Beach, the TLA Associates Project Manager, at (703) 450-8438. Thank you in advance for your valued support in completing this survey.

Company name: _____
Contact name: _____
Address: _____
Phone number: _____
Email (optional): _____

- 1. Which of these best describes your firm at this location?
[] Locally owned (single site) [] Local operation – headquartered elsewhere
[] Locally headquartered (multi-site) (HQ Location _____)
[] Other (please describe _____)
2. How many employees currently work at this location?
____ Full-time ____ Part-time
How many employees do you expect to have in this location by the end of 2004?
____ Full-time ____ Part-time
3. Approximately how many employees currently telecommute on a regular basis? _____ [] N/A
If high-speed Internet access were available in more employees’ homes, would additional employees be authorized to telecommute on a regular basis? [] Yes [] No [] N/A
If yes, then how many additional employees would telecommute? _____



4. Please describe the frequency in which your firm uses the following Internet access or wide area communications services, and indicate whether you are satisfied with the current performance and availability of these services.

Of the services that your firm **does not use regularly**, which would you use more frequently if they were affordable and available "at a faster rate"?

Please note: The terms below are further defined on our project website:

<http://www.marylandtedco.org/WesternMD.htm>

	Frequency of Use					Satisfied?		Use at Faster Rate		
	Not Applicable	Not At All	Seldom (Monthly)	Frequently (Weekly)	Often (Daily)	Yes	No	Yes	No	Not Applicable
Internal Company Email	<input type="checkbox"/>									
Internet Email (Corporate System)	<input type="checkbox"/>									
Internet Email (Individual ISP Accounts)	<input type="checkbox"/>									
Internet Audio Broadcasts	<input type="checkbox"/>									
Internet-based Video Broadcasts	<input type="checkbox"/>									
Non-Internet Video Conferencing	<input type="checkbox"/>									
Internet Video Conferencing	<input type="checkbox"/>									
Telemedicine Applications	<input type="checkbox"/>									
Distance Learning (Web-based classes)	<input type="checkbox"/>									
eCommerce (transactions and payments)	<input type="checkbox"/>									
Web Chat Customer Support	<input type="checkbox"/>									
Transmit/Receive Large Files (>2MB)	<input type="checkbox"/>									
Voice Calls Over the Internet (VOIP)	<input type="checkbox"/>									
Internet-based Private Networking (VPN)	<input type="checkbox"/>									
Telecommuting/Teleworking	<input type="checkbox"/>									

5. Which of these technologies does your business currently use for data and video, including Internet, to communicate outside your local facility?

- | | |
|---|---|
| <input type="checkbox"/> Dial-up Access | <input type="checkbox"/> Digital Subscriber Line (DSL) |
| <input type="checkbox"/> Dedicated Internet Access (e.g., T1, ISDN) | <input type="checkbox"/> Direct Satellite Internet Access |
| <input type="checkbox"/> Private Corporate WAN (e.g., frame relay) | <input type="checkbox"/> Cable Modem Service |
| <input type="checkbox"/> Private Satellite Network (VSAT) | <input type="checkbox"/> Video Conferencing Lines (ISDN BRI and/or PRI) |
| <input type="checkbox"/> AllCoNet | <input type="checkbox"/> Other (please describe _____) |

6. If faster Internet services were available at rates comparable to the nearest urban area (e.g., for DSL, \$50/month residential, \$100+/month business), would your organization pay for and use these services? Yes No



7. Please estimate how much your firm spends on communications on a monthly basis at this location:

Voice Calls and Lines (incl. mobile): _____ Data Services (incl. dial-up): _____

8. Would your organization pay for high-speed Internet services for a customer if it generated more revenues than the costs associated with the service? Yes No N/A

If yes, for which services: _____

9. Would you use a faster Internet access service if it were provided free of charge by another business supplying a service to you? Yes No

10. Would you or an employee be more likely to sign up for a course at a college or university if the course included high-speed Internet service to your home or business? Yes No

11. If you were trying to reach an employee by phone, and heard a message before the connection was made that an additional charge would be applied to your phone bill in order to complete the call:

Would you pay the additional charge to complete the call? Yes No

What if it was a customer you were trying to reach by phone? Yes No

What if it was a relative you were trying to reach by phone? Yes No

12. Please describe how you would like to see your service improved by the following providers:

Phone companies: _____

Cable company: _____

Internet provider: _____

13. Is there a communications-related service that you have not implemented at your site that would make it possible to grow your operations? Yes No

If yes, please describe the service(s): _____

And why haven't you implemented this service?

Not Available Too Expensive Other (please describe _____)

14. Please prioritize your three biggest challenges with regards to your organization's current communications services and information technology operations. Please mark the most important item as (1), and the second as (2) and the third as (3).

- | | |
|---|--|
| ___ Internet Access Speed | ___ Cost of Internet Access or Data Services |
| ___ Redundancy, Availability, Fault Tolerance | ___ Variety of Options, Carriers, Speeds |
| ___ Retention of Qualified Help | ___ Awareness of New Technologies |
| ___ Maintenance of Current Infrastructure | ___ Other _____ |

THANK YOU FOR COMPLETING THIS SURVEY!



APPENDIX B – INTERVIEW RESULTS

The following information is selected from the database of notes from interviews. It is deemed to be free of any proprietary or confidential data as shared by interviewees with TLA. Some interviews that were conducted are not placed in this list due to the desired privacy of the interviewee.

Allegheny County, Emergency Operations Center

- Interviewed several staff, including Dick DeVore, Director of Emergency Services
- Medium user of communications services – greater needs than T-1, less than DS-3
- Organization deems its communications services to be mission critical, very limited tolerance for downtime
- Needs alternate carriers and routes
- Would like to deploy on-demand training and communications services
- Criticality of data services growing to meet urgency of E-911 services

Allegheny County, Information Technology Department

- Multiple interviews with Beth Thomas
- Medium user of communications services – greater needs than T-1, less than DS-3
- Organization deems its communications services to be mission critical, very limited tolerance for downtime
- Needs alternate carriers and routes
- County is negotiating for access to fiber optic communications services that are nearby for diversity and additional bandwidth

Allegheny County, Public Health Department

- Interviewed staff, multiple sessions with Mr. Fred Tola
- Bandwidth not able to meet expected future needs; AllCoNet2 may address this
- Needs alternate carriers and routes
- Would like to deploy on-demand training and communications services

Allegheny College of Maryland

- Interviewed John Moore
- Had business requirement to communicate between campuses in Maryland and Pennsylvania; couldn't wait for traditional service providers to develop solutions; partnered with TWR Communications to deploy a private broadband wireless network to interconnect campuses
 - Needed to tie local campus in Allegheny County to Pennsylvania locations, with a minimum of T-1 to each campus (896Kb for data, 384 Kb for video, 256Kb for voice circuits)
 - Campus Backbone: Server 10/100 with Gigabit Uplink, backbone switch Gigabit Fiber, 10 Mb connection to wireless



Allegheny Communications Connect (ACC)

- Several discussions and an on-site interview with John Flinko
- Interested in offering backbone services to local Internet providers
- ACC is a subsidiary of Allegheny Energy
- Allegheny Energy has multiple rights of ways and towers throughout the region

Allegheny Energy

- Interviewed Tom Haynes
- For telecommunications services, ACC is preferred provider (e.g., first right-of-refusal)
- As a company, they are a large user of communications services in Pennsylvania (multiple DS-3s in service), medium user to large user in Maryland
 - Eastern Region: Williamsport, Cumberland, Martinsburg, Frederick
 - Greensburg 12 DS3s, Fremont 10-12 DS3s (Call center), Hagerstown, 2 DS3s
 - Many employees work from home with cable modems in western Pennsylvania
 - Hagerstown 200 employees, Greensburg, PA 1000 employees, Monroeville, PA 250 employees, Fremont WV 250 employees

AllCoNet

- Interviewed Jeff Blank, Project Supervisor, several times
- Current public sector network covering some major public buildings in Allegany County
- Beginning to deploy equipment for widespread implementation of dedicated Internet access services
- AllCoNet2 is a broadband wireless network being deployed in two phases across Allegany County
- AllCoNet2 Phase 1 being implemented now; additional funding required to complete project through Phase 2
- Design is to include all public sector buildings and reduce requirement for dial-up services; use by private sector ISPs is in discussions

Citibank

- Interviewed Keith Arnold
- 2500 seat call center at Hagerstown
- 24x7 operations
- Citibank locally, as well as nationwide, is classified as a large user, requiring several DS-3s of voice and data communications services (Uses multiple DS-3s for data, 120 T-1s for voice)
- Organization deems its communications services to be mission critical, very limited tolerance for downtime
- National contracts are used to acquire services
- Redundant services have been procured from multiple carriers to minimize downtime



Farmers & Merchants Bank

- Interviewed several staff members
- Bank networks support 33 sites
- 140 employees in Washington County, 45 in West Virginia, and 80 in Allegany and Garrett counties
- 15 ATMs communicate to host computers through private frame relay network
- May follow the lead of the nation's largest banks in the use of interactive video with customers
- Other video applications being considered
- Would consider purchasing broadband to support certain customers

Financial Computer Support, Inc. (FCSI)

- Interviewed Dusty Huxford
- Custom and packaged software for financial planners
- Provides services from data center in Garrett County
- Has capability of offering ISPs collocation services
- Medium user of communications services – greater needs than T-1, less than DS-3
- Would prefer options for multiple carriers and routes into and out of Garrett County

First United Bank and Trust

- Interviewed CEO, Chairman Bill Grant
- 400 employees in Oakland, MD
- \$990,000,000 revenue
- Locations in 4 counties
- Satisfied with current private network services and carrier's telecommunications offerings
- Medium user of communications services – greater needs than T-1, less than DS-3

Frostburg State University

- Interviewed Mr. Roger Bruszewski and staff
- Main data communications services provided by the University of Maryland System
- Special concerns for alternate carriers and routes to support growth of business park on campus; cannot use on-campus network; must procure individual services from telecommunications companies
- Interested in coordinating interactive video with on-demand training

Garrett Community Network (GCNet)

Garrett Rural Information Cooperative (GRIC, Inc.)

- Interviewed Penny McLaughlin
- Publicly-created local dial-up ISP created in Garrett County by community college to address lack of local Internet access numbers
- Spun into separate private entity
- Provides dial-up, ISDN, and web hosting services across Garrett County



- Their requirements are mission critical, as users do not have Internet access if GCNet's services are down
- Interested in bulk purchasing with other ISPs
- Wants improved costs, broader bandwidth options
- Needs redundancy
- Planning higher speed access services

Total Biz Fulfillment (Hobby House)

- Interviewed Greg Wilburn and staff
- Full service fulfillment facility servicing the needs of manufacturers
- Medium user of communications services – greater needs than T-1, less than DS-3
- Organization deems its communications services to be mission critical, very limited tolerance for downtime

Internap

- Interviewed Michael McCrane and several others in multiple discussions
- Prospective provider of application services over dedicated internet access
- Supports mission critical applications with strong SLAs.

Mack Truck

- Medium user with several T-1s.
- Limited customer contact from this location but would support broadband usage of 15-20 employees from home

networkMaryland

- Multiple interviews with project team
- Attended board meetings
- Discussed connectivity to AllCoNet for diversity
- Discussed prospects of swapping extra fibers with private sector firms for additional regional services for public and private sector uses
- Reviewed plans and future direction with DBM and DBED staff

Pharmacare

- Interviewed Chad Corwell and staff
- Provides services to nursing homes and home health care patients
- Implementation of video services and telemedicine could quickly increase their requirement for telecommunications services
- Served by local ISP, Pennswoods
- Pennswoods uses some Pharmacare computer room space as collocation facilities for networking and application equipment
- Medium user of communications services – greater needs than T-1, less than DS-3
- Organization deems its communications services to be mission critical, very limited tolerance for downtime



S. Schwab Company

- Interviewed Sam White, Brian Glisan, and Doug Schwab on multiple occasions
- Main frustration, supporting mission critical applications 24x7x365, and they believe local vendors do not have the redundancy and capability to provide this level of service
- Needs alternate data providers with border gateway protocol
- Supports broadband services to Peru, Columbia, Mexico, Hong Kong, Toronto, New York, Dallas, and Martinsburg, WV
- Medium user of communications services – greater needs than T-1, less than DS-3

TWR Communications

- Interviewed Jeff Hutter and staff on multiple occasions
- Provides wireless ISP services to medium sized users with mission critical applications
- Maintains and owns approximately 8 towers on key high ground locations across Allegany County, with some overlap into Pennsylvania, West Virginia, and Garrett County
- Would like to have the option to implement multiple diverse upstream routes to the Internet
- Currently deploying broadband wireless services using Motorola Canopy equipment

Washington County Health System

- Interviewed Carey Leverett and Pat Lannon
- Intensive internal data communications requirements
- Medium user of external data services – greater needs than T-1, less than DS-3
- Supports mission critical systems.
- Wants diverse routes and stronger disaster recovery system
- Supports 200 telecommuting employees and 462 telecommuting contractors
- Planning a move within County in next 3-5 years

Western Maryland Health System

- Interviewed Steve Conrad, Director of Information Systems and staff
- Large internal user with fiber connections between three sites
- Medium user of external data services – greater needs than T-1, less than DS-3
- Supports mission critical systems
- Wants diverse routes and stronger disaster recovery system
- Exploring expanded telemedicine applications



APPENDIX C – INTERVIEW LIST

Casper R. Taylor, Jr.
Government Relations Consultant
Alexander & Cleaver

Barbara Buehl
President
Allegany County Chamber of Commerce

Vance C. Ishler
County Administrator
Allegany County Government

Richard M. Harris
Manager, Office of Project Services
Department of Economic Development
Allegany County Government

Thomas E. Cooley, CED
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APPENDIX D – EMERGENCY SERVICES & HOMELAND SECURITY COMMUNICATIONS

TLA, while presenting an overview of this initiative to the Chamber of Commerce assembled in Garrett County in January 2003, met with Business Information Group (BIG) of York PA. BIG explained that there might be an opportunity for the Council to win a million dollar pilot project for broadband emergency services communications from the US Department of Homeland Security. Mr. Manto met with former PA legislator Tom Armstrong, a BIG consultant, who presented the opportunity. After evaluating businesses and technologies that could provide a composite solution, TLA agreed to lead an effort on behalf of the Council to submit an unsolicited proposal for \$1,000,000.

In order to further the prospects of that unsolicited proposal and to further explore opportunities for additional broadband deployment in the region, Mr. Manto organized a half dozen companies to assist in corresponding with or interviewing several hundred additional individuals in organizations within the region, across the state, and across the nation who play a part in providing emergency services including communications.

By assembling key institutions and businesses in the region with their partners across the country, TLA has confirmed a community threatening telecommunications need, and has proposed a solution that could be the basis for successful broadband telecommunications investment in the region. The need is for on-demand interoperable emergency services communications; the opportunity is to solve it in western Maryland, first.

While the lack of interoperable communications is considered one of the gravest telecommunications needs in the country, requiring what many have thought as trillion dollar plus solutions, the western Maryland region presents a worst-case scenario. Not only are agencies within Allegany County, for example, unable to communicate with each other since they use different radio frequencies, the problem is compounded when they have to communicate with their peers in different counties, many of whom are in different states (WV, PA, VA).

The communications difficulties are compounded by mountainous terrain where wireless communications are not simple and Appalachian economies traditionally have not been able to spend as much as other areas to deploy even partial solutions.

The answer came by making a very difficult problem even larger, and, only afterwards, simplifying it. Instead of only looking at the interoperability problem as one of voice communications by emergency service providers and by broadening it to include interoperability sharing data, video, and computer applications interactively among all emergency service providers and their communities, businesses and citizens, a simpler broadband solution emerges.

In order to assess the validity of the solution, TLA interviewed area organizations concerning the application, its need, and their interest in participating in a solution. Companies were also



recruited to provide parts of the solution, as well as additional funds to conduct additional interviews on behalf of the County, including those who were dispersed across the country. These companies were then asked to contribute additional staff, resources, and equipment to test the concept.

On April 10 and 11, TLA organized a group of companies, affiliated under the name of Instant Area Networks, to test the concept at the national meeting of local governments through Public Technology Inc. The Allegany Emergency Operations Center was connected with others in Maryland, Virginia, and Pennsylvania to computers with cameras in Miami through the Internet. All were able to share voice, data, and video in real time. The concept was presented to a nationwide audience of public safety and transportation officials where both the need and approach to a solution was affirmed.

Through subsequent interviews, some staff of elected officials focused on different aspects of interoperable communications. Some focused on systems in general, others on mobile communications in particular, or the data that any combination of participants would need.

On July 16, 2003, TLA worked with the same group of IAN companies and a few more to extend the interoperable capabilities to mobile users through the Alvarion equipment being used by AllCoNet in Cumberland. Council area emergency services agencies, public health, and NGOs shared voice, data, and video communications including those in the mobile command center of the Cumberland police department and a commander's squad car.

On August 5, a successful test was conducted with observers from ten state agencies in CA, three in New Mexico and a number of Federal Department of Homeland Security staff. The goal of this test was to further the consideration of the Council as the recipient of a \$1 million pilot project. A second goal was to continue the interest of participating agencies and companies to a follow-on demonstration of enhanced capabilities within two months. All of the equipment, ASP licenses, and engineering services were recruited by TLA for the Council at no charge. The participating agencies have also donated their time free of charge.

Allegany County has offered to explore the use of its upcoming funding for AllCoNet from ARC as match for additional funds for the pilot and is exploring a cross agency agreement for those ARC funds to be routed through a supporting agency of the US DHS.

The County is also exploring the Governor's designation of the region as a primary FEMA jurisdiction, which would also provide additional funding for interoperable communications and infrastructure. Given that the other likely contenders of that designation, Baltimore, Annapolis, and Montgomery County, are more likely targets than western Maryland, and that institutions in western Maryland are ahead of other jurisdictions across the state and the nation in interoperable communications, we believe that western Maryland would make a good choice.

The benefits for rural areas such as western Maryland who deploy broadband emergency services should not be underestimated. While establishing interoperable broadband communications for emergency services, including the establishment of interoperable data such



as GIS supported applications and public health records for dislocated citizens, communities have an opportunity to leverage the broadband infrastructure of local government, hospitals, schools, and businesses for their emergency communications needs.

For the first time, emergency services personnel can foster the creation of interoperable infrastructure that can link any number of users of PCs with access through the internet to emergency services communications on-demand. All that is necessary to completely implement this vision is to make sure that broadband also includes wireless broadband for mobile users.

Broadband emergency communications also maximize investment opportunities for rural areas since emergency services networks also require diverse routes and diverse carriers to create a sustainable broadband network in the face of natural and manmade disasters.



APPENDIX E – OTHER SUPPORTING DOCUMENTS

NETWORKMARYLAND PRESS RELEASE

networkMaryland Unveils Statewide High-Speed Infrastructure to Connect Public Sector Networks

Phase I Kicks Off the Network by Connecting Across Maryland

ANNAPOLIS, MD (October 30, 2002) - The Maryland Department of Budget and Management (DBM) today announced that the networkMaryland project, a statewide high-speed infrastructure connecting public sector networks, has launched Phase I that includes Internet access across four InterLATA's (Local Access and Transport Area). In two separate events, one in Western Maryland and another in Southern Maryland, state officials officiated the launch. Speaker of the House Casper R. Taylor and Cumberland Mayor Lee Fiedler spoke in Allegany County at Frostburg State University and Senator Thomas "Mac" Middleton spoke at the Charles County Government Building.

"Today marks an important milestone in the development of this infrastructure as we move forward with the networkMaryland project," said Speaker Taylor. "networkMaryland is good for Rural Maryland, helping the underserved areas of the State to become connected." As part of this design, networkMaryland will provide the public sector with Intranet connectivity, consolidated networks, maximized resources and shared information.

"The State has provided the funds necessary to build out this first phase of the network, an important investment that can now be leveraged by government, education, among many other institutions across the state, by bringing enhanced connectivity to every region," Senator Middleton.

Local networks have already committed to taking part in this new technology when launched: AllCoNet (Allegany County's network), Charles County Government and University of Maryland, Eastern Shore. "The fact that networkMaryland exists today, that we can 'flip the switch' for high-speed InterLATA connections, is the direct result of intergovernmental cooperation, interagency teamwork, and a mutual motivation to provide the highest level of service to the taxpayers of Maryland," said DBM Secretary Eloise Foster.

The engineering plan utilizes leased facilities, State-owned fiber and equipment to construct a statewide backbone to all regions. The State plans to establish a network operations center for network monitoring, maintenance and customer care.

All stakeholders will have the opportunity to be consistently and actively involved in the direction of the project through the Advisory Group, and will have access to the same service at the same price. **networkMaryland** is a statewide high-speed Internet available throughout the State of Maryland to connect Public Sector customers' networks. For more information on networkMaryland, please visit <http://www.techmd.state.md.us/Technology/networkmdpage.htm>

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MICHIGAN BROADBAND DEVELOPMENT AUTHORITY – LEGISLATION

Act No. 49
Public Acts of 2002
Approved by the Governor
March 14, 2002
Filed with the Secretary of State
March 14, 2002
EFFECTIVE DATE: March 14, 2002
STATE OF MICHIGAN
91ST LEGISLATURE
REGULAR SESSION OF 2002
Introduced by Senator Stille
ENROLLED SENATE BILL No. 881

AN ACT to create the Michigan broadband development authority; to create funds and accounts; to authorize the issuing of bonds and notes; to prescribe the powers and duties of the authority; and to provide incentives for the development of broadband services.

The People of the State of Michigan enact:

Sec. 1. This act shall be known and may be cited as the "Michigan broadband development authority act".

Sec. 2. The legislature finds that certain areas of this state are not being adequately served with broadband services and that, for the benefit of the people of this state and the improvement of their health, welfare, and living conditions, the improvement of the economic and educational welfare of this state, and the improvement of its public safety and security, it is essential that broadband infrastructure be expanded to provide broadband services throughout this state and that the private sector should be encouraged to invest in the deployment of broadband services and networks and that financing by this authority will encourage broadband investment. This act shall provide a method to assure that economic, technological, and logistical integrated broadband services are provided throughout this state on a nondiscriminatory basis. The provision of affordable broadband services and networks will assure the long-term growth of and the enhancement and delivery of services by the educational, medical, commercial, and governmental entities within this state, including, but not limited to, municipalities and counties, public safety facilities, judicial and criminal facilities, telemedical facilities, schools, colleges, universities, hospitals, libraries, community centers, businesses, nonprofit organizations, and residential properties. To increase the speed and availability at which affordable broadband services become available in this state, it is declared to be a valid public purpose to assist in the financing and refinancing of the private and public sectors' development of a statewide broadband infrastructure. It is further declared to be a valid public purpose for the authority created under this act to issue bonds and notes to provide for financing or refinancing to broadband developers and broadband operators, to make loans and provide joint venture and partnership arrangements subject to section 7(2) and (3) to broadband developers and broadband operators, to enter into contracts for the lease or management of all or portions of the broadband infrastructure, and to enter into joint venture and partnership arrangements and partnerships with persons that will acquire, construct, develop, create, maintain, own, and operate all or portions of the broadband infrastructure. The legislature finds that the authority created and powers conferred by this act constitute a necessary program and serve a necessary public purpose.

Sec. 3. As used in this act:

(a) "Authority" means the Michigan broadband development authority created under section 4.

(b) "Board" means the board of directors of the authority.



(c) "Capital reserve fund requirement" means the fund amount requirement that may be established in the resolution authorizing notes or bonds for which a capital reserve fund has been established under section 8. The required amount shall not exceed the maximum amount of principal and interest maturing and becoming due in a succeeding calendar year on the notes or bonds secured in whole or in part by the fund.

(d) "Broadband developer" means a person selected by the authority to acquire, construct, develop, and create any part of the broadband infrastructure.

(e) "Broadband infrastructure" means all facilities, hardware, and software and other intellectual property necessary to provide broadband services in this state, including, but not limited to, voice, video, and data.

(f) "Broadband operator" means a person selected by the authority to operate any part of the broadband infrastructure.

(g) "Broadband services" means those services, including, but not limited to, voice, video, and data, that provide capacity for transmission in excess of 200 kilobits per second in at least 1 direction regardless of the technology or medium used, including, but not limited to, wireless, copper wire, fiber optic cable, or coaxial cable. If voice transmission capacity is offered in conjunction with other services utilizing transmission in excess of 200 kilobits per second, the voice transmission capacity may be less than 200 kilobits per second.

(h) "Development costs" means the costs associated with the broadband infrastructure that have been approved by the authority and include, but are not limited to, all of the following:

(i) The costs for the planning, acquiring, leasing, constructing, maintaining, and operating of the broadband infrastructure.

(ii) Payments for options to purchase, deposits on contracts of purchase, and payments for the purchases of properties for the broadband infrastructure.

(iii) Financing, refinancing, acquisition, demolition, construction, rehabilitation, and site development of new and existing buildings.

(iv) Carrying charges during construction.

(v) Purchases of hardware, software, facilities, or other expenses related to the broadband infrastructure.

(vi) Legal, organizational, and marketing expenses, project manager and clerical staff salaries, office rent, and other incidental expenses.

(vii) Payment of fees for preliminary feasibility studies and advances for planning, engineering, and architectural work.

(viii) Any other costs and expenses necessary for the acquisition, construction, maintenance, and operation of all or portions of the broadband infrastructure.

(i) "Person" means an individual, corporation, limited or general partnership, joint venture, or limited liability company or a governmental entity, including state authorities, municipalities, counties, and townships, police, fire and other public safety organizations, judicial entities, medical entities, schools, colleges, universities, hospitals, libraries, community centers, and local economic development entities. Except to the extent that state authorities, police, fire, and other public safety organizations, judicial entities, medical entities, schools, colleges, universities, hospitals, and libraries may constitute state entities, person does not include this state.

Sec. 4. (1) The Michigan broadband development authority is created as a public body corporate and politic within the department of treasury.

(2) The authority may do all of the following:



- (a) Assist through financing and refinancing the expansion of broadband infrastructure services to residential, commercial, public, and nonprofit customers in this state.
- (b) Authorize the issuance of bonds and notes to finance or refinance the private and public sectors' development of the broadband infrastructure.
- (c) Authorize the making of loans and joint venture and partnership arrangements subject to section 7(2) and (3) to broadband developers and broadband operators.
- (d) Authorize the imposition and collection of rents, charges, and fees for the services furnished by the broadband infrastructure in conjunction with financing entered into by the authority.
- (e) Enter into joint venture and partnership arrangements and partnerships subject to section 7(2) and (3) to acquire, construct, maintain, and operate the broadband infrastructure.
- (f) Assist broadband developers and operators with all other matters necessary for the acquisition, construction, maintenance, and operation of the broadband infrastructure.
- (g) Continuously evaluate all types of technologies in order to encourage the widest deployment of broadband services and broadband infrastructure in this state.
- (h) Make broadband services to schools and libraries a priority under authority financing programs.
- (i) Insure that the financing and refinancing of the development of broadband services under this act includes provisions that small businesses and that each region of this state have an equal opportunity to receive financing and refinancing.

Sec. 5. The authority shall exercise its duties independently of the state treasurer. The budgeting, procurement, and related administrative functions of the authority shall be performed under the direction and supervision of the state treasurer.

Sec. 6. (1) The authority shall exercise its duties through its board of directors.

(2) The board shall be made up of the following members:

- (a) The president and CEO of the Michigan economic development corporation.
- (b) The state treasurer.
- (c) The executive director of the Michigan state housing development authority.
- (d) Eight members with knowledge, skill, or experience in the academic, business, technology, or financial fields appointed by the governor with the advice and consent of the senate. Not more than 2 of the 8 appointed members shall be, during their term on the board, employees of this state. The 2 members of the board who are employees of the state under this subdivision shall not hold any other positions with the state during their term on the board. Six of the 8 appointed members shall serve for fixed terms. Not more than 3 of the 6 appointed members serving for fixed terms shall be members of the same political party. Of the 6 fixed-term members first appointed, 2 shall be appointed for a term that expires December 31, 2003, 2 shall be appointed for a term that expires December 31, 2004, and 2 shall be appointed for a term that expires December 31, 2005. Upon completion of each fixed term, a member shall be appointed for a term of 4 years. The 2 appointed members serving without a fixed term shall serve at the pleasure of the governor. The 8 appointed members shall serve until a successor is appointed. A vacancy in a fixed-term membership shall be filled for the balance of the unexpired term in the same manner as the original appointment. As used in this subdivision, "members of the same political party" includes a person who, in the determination of the governor, is currently a member of the same political party and a person who was a member of the same political party at any time within the immediately preceding 2 years, as attested by the person to be appointed.



(3) Each member of the board serving under subsection (2)(a), (b), and (c) may appoint a representative to serve in his or her absence.

(4) Except for the board president, who shall serve as the board's chief executive officer pursuant to subsection (5), and vice president, members of the board shall serve without compensation but may receive reasonable reimbursement for necessary travel and expenses incurred in the discharge of their duties. The board shall establish reasonable compensation for the board president and vice president.

(5) The governor shall designate 1 member of the board to serve as its chairperson who shall serve at the pleasure of the governor. Of the 2 board members serving without a fixed term at the pleasure of the governor, the governor shall designate 1 member to serve as the board's president and chief executive officer and the other member to serve as its vice president.

(6) A majority of the serving members of the board shall constitute a quorum of the board for the transaction of business. Actions of the board shall be approved by a majority vote of the members present at a meeting. The business of the board shall be conducted in compliance with the open meetings act, 1976 PA 267, MCL 15.261 to 15.275.

(7) A record or portion of a record, material, information, or other data received, prepared, used, or retained by the authority in connection with an application to or project related to the broadband infrastructure assisted by the authority that relates to trade secrets, commercial, financial, or proprietary information submitted by the applicant, and which is requested in writing by the applicant and acknowledged in writing by the president of the authority to be confidential, is not subject to the freedom of information act, 1976 PA 442, MCL 15.231 to 15.246. As used in this subsection, "trade secrets, commercial, financial, or proprietary information" means information that has not been publicly disseminated or that is unavailable from other sources, the release of which might cause the applicant significant competitive harm.

(8) The authority may employ or contract for legal, financial, and technical experts, and officers, agents, and employees, permanent and temporary, as the authority requires, and shall determine their qualifications, duties, and compensation. The board may delegate to 1 or more agents or employees those powers or duties with any limitations that the board considers proper.

(9) The members of the board and officers and employees of the authority are subject to 1968 PA 317, MCL 15.321 to 15.330, or 1968 PA 318, MCL 15.301 to 15.310.

(10) A member of the board or officer, employee, or agent of the authority shall discharge the duties of his or her position in a nonpartisan manner, with good faith, and with that degree of diligence, care, and skill that an ordinarily prudent person would exercise under similar circumstances in a like position. In discharging the duties of his or her position, a member of the board or an officer, employee, or agent of the authority, when acting in good faith, may rely upon the opinion of counsel for the authority, upon the report of an independent appraiser selected with reasonable care by the board, or upon financial statements of the authority represented to the member of the board or officer, employee, or agent of the authority to be correct by the president or the officer of the authority having charge of its books or account, or stated in a written report by a certified public accountant or firm of certified public accountants to fairly reflect the financial condition of the authority.

Sec. 7. (1) The powers of the authority shall include all those necessary to carry out and effectuate the purposes of this act, including, but not limited to, all of the following:

(a) To borrow money and issue bonds and notes to fund operations of the authority, to finance or refinance part or all of the development costs of the broadband infrastructure, to refinance existing debt for technology that constitutes a part of or is related to the broadband infrastructure, and to secure bonds and notes by mortgage, assignment, or pledge of any of its revenues and assets.

(b) To invest any money of the authority at the authority's discretion, in any obligations determined proper by the authority, and name and use depositories for its money.



- (c) To enter into joint venture and partnership arrangements subject to subsections (2) and (3) with persons that will acquire, construct, develop, maintain, and operate all or portions of the broadband infrastructure.
 - (d) To be designated the state program manager for federal telecommunications assistance, to represent this state in negotiations with the federal government regarding telecommunications assistance, and to receive and distribute federal funding, including loans, grants, and other forms of funding and assistance on this state's behalf.
 - (e) To receive and distribute state or local funding including grants, loans, general appropriations, or an appropriation made for the purposes under subsection (4).
 - (f) To make loans and to enter into any joint venture and partnership arrangements subject to subsections (2) and (3) with broadband developers and broadband operators that will acquire, construct, maintain, and operate all or portions of the broadband infrastructure.
 - (g) To provide operating assistance to make broadband services more affordable to broadband developers, broadband operators, and broadband customers, in conjunction with broadband infrastructure financed by the authority.
 - (h) To impose and collect charges, fees, or rentals for the services furnished by those portions of the broadband infrastructure financed by the authority under this act.
 - (i) To set construction, operation, and financing standards for the broadband infrastructure in connection with authority financing and to provide for inspections to determine compliance with those standards.
 - (j) To acquire from any person interests in real or personal property necessary for the operation of the authority.
 - (k) To procure insurance against any loss in connection with the broadband infrastructure and any other property, assets, or activities of the authority.
 - (l) To sue and be sued, to have a seal, and to make, execute, and deliver contracts, conveyances, and other instruments necessary to the exercise of the authority's powers.
 - (m) To enforce financial, operational, warranty, security, lease, and guaranty terms and conditions established under financings by the authority. The authority may under this subsection acquire, construct, develop, lease, create, and maintain all or portions of the broadband infrastructure and acquire from any person interests in real and personal property.
 - (n) To make and amend bylaws.
 - (o) To indemnify and procure insurance indemnifying any members of the board of the authority from personal liability by reason of their service as a board member.
 - (p) To investigate, evaluate, and assess the current broadband infrastructure and the future broadband infrastructure needs of this state and to encourage and participate in aggregation strategies for the broadband services of all public entities and nonprofit corporations in this state to maximize the interconnectivity and efficiencies of the broadband infrastructure.
- (2) Notwithstanding any other provision of this act, the authority shall not make loans to, or enter into any joint venture and partnership arrangements or participation with, any governmental entity or nonprofit organization except in connection with the financing or refinancing of development costs for that allocable portion of the broadband infrastructure used or to be used exclusively by governmental entities or nonprofit organizations, including, but not limited to, universities, colleges, hospitals, school districts, public safety agencies, judicial organizations, libraries, cities, townships, and counties. No allocable portion of the broadband infrastructure financed by a loan to a governmental entity or a nonprofit organization shall be used to serve residential, business, or other commercial customers.



(3) Notwithstanding any other provision of this act, except in connection with financing or refinancing under subsection (2) or enforcement procedures authorized under subsection (1)(m), the authority shall acquire real or personal property constituting portions of the broadband infrastructure only in connection with the participation of persons other than governmental entities or nonprofit organizations through joint ventures and partnership arrangements, or other co-ownership arrangements and only if the participation is necessary to assure availability of financing or refinancing derived from the issuance by the authority of bonds or notes, the interest on which is exempt from taxation under the United States internal revenue code, and the financing derived from the tax-exempt bonds or notes is allocated only to those development costs relating to that portion of the broadband infrastructure that is to be used by governmental bodies or nonprofit organizations.

(4) The authority shall establish a seed capital loan program to make capital loans to persons planning to apply to the authority for financing of broadband infrastructure. Priority for the seed capital loan program shall be given for developments targeted to underserved areas. During the initial 2 years of operations, the authority shall designate a minimum of \$500,000.00 to be targeted to rural underserved areas and a minimum of \$500,000.00 targeted to urban underserved areas. Community economic development programs and small providers shall be given a preference to receive loans under this subsection. The terms and conditions for the seed capital loans shall be established by the authority. As used in this act, "underserved areas" means geographical areas of this state identified by the authority as having the greatest need for broadband development. In identifying underserved areas, the authority shall consider the area's economic conditions, including, but not limited to, family income, affordability of access, lack of options available, low percentage of residents subscribing, and any other criteria considered important by the authority in determining whether an area is underserved.

(5) As part of an application for financing under this act, the broadband developer and broadband operator shall file with the authority a participation plan for small and minority owned businesses and a communitywide outreach plan to educate the public of the availability of broadband services. The authority shall not approve an application unless a plan is submitted under this subsection.

Sec. 8. (1) A reserve capital account is created under the jurisdiction and control of the authority and shall be administered by the authority to secure notes and bonds of the authority. The authority shall credit to the reserve capital account the proceeds of the sale of notes or bonds to the extent provided for in the authorizing resolution of the authority, and any other money that is made available to the authority for the purpose of the reserve capital account.

(2) In the resolution authorizing the issuance of notes or bonds, the authority may establish a capital reserve fund for the payment of the principal and interest of notes or bonds, for the purchase or redemption of the notes or bonds, or for the payment of a redemption premium required to be paid when the notes or bonds are redeemed before maturity. The authority shall not use a capital reserve fund for an optional purchase or optional redemption of notes or bonds if the use would reduce the total of the money in the capital reserve fund to less than the capital reserve fund requirement established for the fund.

(3) In addition to, or in lieu of, depositing money in the reserve capital account or in a capital reserve fund, the authority may obtain or pledge letters of credit, insurance policies, surety bonds, guarantees, or other security arrangements if the security arrangements are approved by the state treasurer. The amount available under letters of credit, insurance policies, surety bonds, guarantees, or other security arrangements pledged to the capital reserve fund shall be credited toward the capital reserve fund requirement for the fund.

(4) Income or interest earned by the reserve capital account may be transferred by the authority to other funds or accounts of the authority.

(5) Income or interest earned by a capital reserve fund may be transferred by the authority to other funds or accounts of the authority to the extent that the transfer does not reduce the total of the amount of money and security arrangements authorized under subsection (3) in the fund below the capital reserve fund requirement for that fund.

Sec. 9. (1) The authority shall accumulate in a capital reserve fund an amount equal to the capital reserve fund requirement for that fund. If at any time the amount of a capital reserve fund falls below the capital reserve fund requirement for that fund, the authority shall transfer from the reserve capital account to the capital reserve fund an



amount equal to the capital reserve fund requirement. If a deficiency exists in more than 1 capital reserve fund and the amount in the reserve capital account is not sufficient to fully restore the capital reserve funds, the money in the reserve capital account shall be allocated between the deficient capital reserve funds pro rata according to the amounts of the deficiencies. If at any time the reserve capital account has been exhausted and the amount of the capital reserve fund is insufficient to meet the capital reserve fund requirement, the authority on or before September 1 shall certify to the governor the amount necessary to restore the capital reserve fund to an amount equal to the capital reserve fund requirement for that fund. The governor shall include in his or her annual budget the amount certified under this subsection by the authority.

(2) This state is not liable on notes or bonds of the authority and the notes and bonds are not a debt of this state. The notes and bonds shall contain on their face a statement of the limitation contained under this section.

Sec. 10. (1) The authority may issue notes and bonds as provided under this act to do all of the following:

(a) Pay the development costs associated with acquiring, leasing, constructing, maintaining, and operating the broadband infrastructure.

(b) Make loans to persons for development costs.

(c) Make loans to persons to make purchases related to the broadband infrastructure.

(d) Make loans to persons to refinance existing debt of the authority or other persons incurred in connection with the acquisition or development of technology that constitutes a part of or is related to the broadband infrastructure.

(e) Pay the interest on bonds and notes of the authority.

(f) Establish reserves to secure the bonds and notes of the authority.

(g) Make other expenditures necessary to carry out the authority's duties under this act, including the payment of the authority's operating expenses.

(2) The authority may issue renewal notes, issue bonds to pay notes, and refund bonds by the issuance of new bonds, whether or not the bonds to be refunded have matured. The refunding bonds shall be sold and the proceeds applied to the purchase, redemption, or payment of the bonds to be refunded. The authority may issue instruments separate from the obligations described in this subsection that establish a contractual right in the holder of the instrument to require mandatory tender for purchase of the obligations to which the instrument applies for a period of time and subject to provisions as the authority may determine.

(3) Except as otherwise provided by the authority or this act, every note or bond issue of the authority shall be a general obligation of the authority payable out of revenues or money of the authority, subject only to agreements with the holders of particular notes or bonds pledging any particular receipts or revenues.

(4) Whether or not the notes or bonds are of a form or character as to be negotiable instruments, the notes or bonds are negotiable instruments within the meaning of the uniform commercial code, 1962 PA 174, MCL 440.1101 to 440.11102.

Sec. 11. (1) The notes and bonds shall be authorized by resolution of the authority and mature at the time provided in the resolution. The notes and bonds shall be in a form, bear interest at a rate or rates, be in the denominations, carry registration privileges, be payable, and be subject to the terms of redemption as provided in the resolution.

(2) The notes and bonds of the authority may be sold by the authority at public or private sales at prices as the authority determines.

Sec. 12. A resolution relating to authorizing notes or bonds may contain any of the following provisions, which shall be a part of the contract with the holders of the notes or bonds:



- (a) Pledging all or any part of the revenues of the authority, and all or any part of the money received in payment of loans and interest on loans, and other money received or to be received to secure the payment of the notes or bonds.
- (b) Pledging all or any part of the assets of the authority, including mortgages and obligations obtained by the authority in connection with its programs, to secure the payment of the notes or bonds.
- (c) Pledging any loan, grant, or contribution from a government entity.
- (d) The use and disposition of the gross income from contracts and leases of the authority.
- (e) The setting aside of reserves or sinking funds and the regulation and disposition of reserves or sinking funds.
- (f) Limitations on the purpose to which the proceeds of sale of notes or bonds may be applied and pledging proceeds to secure the payment of the notes or bonds.
- (g) Limitations on the issuance of additional notes or bonds, the terms upon which additional notes or bonds may be issued and secured, and the refunding of outstanding or other notes or bonds.
- (h) The procedure, if any, by which the terms of any contract with noteholders or bondholders may be amended or abrogated, the amount of notes or bonds the holders of which shall consent to the amendment or abrogation, and the manner in which the consent is to be given.
- (i) Vesting in a trustee or trustees property, rights, powers, and duties in trust as the authority may determine, which may include any of the rights, powers, and duties of the trustee appointed by the bondholders under this act and limiting or abrogating the right of the bondholders to appoint a trustee under this section or limiting the rights, powers, and duties of the trustee.
- (j) Establishing a contractual right to require mandatory tender for purchase of the notes or bonds in an instrument separate from the notes or bonds. The instrument may be issued or sold by the authority to investors.
- (k) Except as otherwise prohibited by this act, any other provision that may affect the security or protection of the notes or bonds.
- (l) Delegating to an officer or other employee of the authority, or an agent designated by the authority, for a period of time as the authority determines, the power to cause the issue, sale, and delivery of the notes or bonds within limits on those notes or bonds established by the authority as to any of the following:
 - (i) The form.
 - (ii) The maximum interest rate or rates.
 - (iii) The maturity date or dates.
 - (iv) The purchase price.
 - (v) The denominations.
 - (vi) The redemption premiums.
 - (vii) The nature of the security.
 - (viii) The selection of the applicable interest rate index.
 - (ix) Other terms and conditions with respect to issuance of the notes or bonds as the authority shall prescribe.

Sec. 13. (1) Any pledge made by the authority is valid and binding from the date that the pledge is made.



(2) The money or property pledged and received by the authority shall immediately be subject to the lien of the pledge without any physical delivery or further act and the lien of the pledge is valid and binding against all parties having claims in tort, contract, or otherwise against the authority, irrespective of whether the parties have notice of the lien.

(3) The resolution or any other instrument by which a pledge is created need not be recorded.

Sec. 14. The members of the board or any person executing the notes or bonds under this act are not liable personally on the notes or bonds or subject to any personal liability or accountability by reason of the issuance of the notes or bonds.

Sec. 15. Subject to any agreements with noteholders or bondholders, the authority has the power to use any funds available to purchase notes or bonds of the authority at a price determined by the authority.

Sec. 16. This state pledges and agrees with the holders of any notes or bonds issued under this act, that this state will not limit or alter the rights vested in the authority to fulfill the terms of any agreements made with the holders, or in any way impair the rights and remedies of the holders until the notes or bonds, together with earned interest, with interest on any unpaid installments of interest, and all costs and expenses in connection with any action or proceeding by or on behalf of the holders, are fully met and discharged. The authority is authorized to include this pledge and agreement of this state in any agreement with the holders of notes or bonds under this act.

Sec. 17. (1) The authority may issue notes or bonds that are expressly stated not to be general obligations of the authority but that constitute limited obligations of the authority payable solely from and secured solely by the revenues, money, and property as the authority may specify.

(2) The notes or bonds designated as limited obligations under this section shall not be payable from or secured by the reserve capital account, and any reserve fund established for the limited obligation notes or bonds shall not constitute a capital reserve fund under this act.

Sec. 18. (1) If the authority defaults in the payment of principal or interest of any notes or bonds when due, whether at maturity or upon call for redemption, and the default continues for a period of 30 days, or if the authority fails or refuses to comply with this act, or defaults in any agreement made with the holders of any notes or bonds, the holders of 25% in aggregate principal amount of the notes or bonds then outstanding may apply to the circuit court of Ingham County for the appointment of a trustee to represent the holders of the notes or bonds.

(2) A trustee appointed under this act may, and upon the written request of the holders of 25% in aggregate principal amount of the notes or bonds shall, do any of the following:

(a) Enforce all rights of the noteholders or bondholders, including the right to require the authority to perform its duties under this act.

(b) Bring suit upon the notes or bonds.

(c) Require the authority to account as if it were the trustee of an express trust for the holders of the notes or bonds.

(d) Enjoin any acts or things that may be unlawful or in violation of the rights of the holders of the notes or bonds.

(e) Declare all the notes or bonds due and payable.

(3) Before declaring the principal of notes or bonds due and payable, the trustee shall first give 30 days' notice in writing to the governor, to the authority, and to the attorney general.

(4) The trustee has all of the powers necessary or appropriate for the general representation of bondholders or noteholders in the enforcement and protection of their rights.

(5) An action under this section shall be brought in the circuit court for the county of Ingham.



Sec. 19. (1) Money of the authority shall be held by the authority and deposited in a financial institution approved by the state treasurer, which financial institution may give security for the deposits.

(2) The authority may, subject to the approval of the state treasurer, contract with the holders of any of its notes or bonds as to the custody, collection, securing, investment, and payment of money of the authority, of any money held in trust or otherwise for the payment of notes or bonds, and to carry out the contract. Money held in trust or otherwise for the payment of notes or bonds or in any way to secure notes or bonds and deposits of money may be secured in the same manner as money of the authority.

(3) The authority may enter into an interest rate exchange or swap, hedge, or similar agreement or agreements in connection with the issuance of its notes or bonds or in connection with its then outstanding notes or bonds.

Sec. 20. The notes and bonds of the authority are securities in which public officers and bodies of this state and municipalities and municipal subdivisions, insurance companies and associations and other persons carrying on an insurance business, banks, trust companies, savings banks and savings associations, savings and loan associations, investment companies, administrators, guardians, executors, trustees and other fiduciaries, and any other person who is now or may be authorized to invest in bonds or other obligations of this state, may properly and legally invest funds, including capital, in their control or belonging to them.

Sec. 21. The authority, at its discretion, may recommend an issuance of full faith and credit bonds to the legislature for a vote of the people.

Sec. 22. This state covenants with the purchasers and all subsequent holders and transferees of notes and bonds issued by the authority, in consideration of the acceptance of and payment for the notes and bonds, that the notes and bonds of the authority, issued under this act and the income from the notes and bonds and all its fees, charges, grants, revenues, receipts, and other money received or to be received, pledged to pay or secure the payment of the notes or bonds shall at all times be free and exempt from all state, city, county, or other taxation provided by the laws of this state, except for estate and gift taxes and taxes on transfers.

Sec. 23. The property of the authority and its income and operation are exempt from all taxation by this state or any of its political subdivisions.

Sec. 24. The authority shall submit an annual report no later than March 1 of each year relating to its activities for the preceding calendar year to the governor, the speaker of the house of representatives, the majority leader of the senate, and to each member of the house and senate committees with oversight over utility and energy issues.

Sec. 25. Except to the extent necessary to maintain, improve, complete, or expand within the defined service area, an element of the broadband infrastructure already acquired or financed under this act, the authority shall not enter into new partnerships or other joint ventures arrangements or provide new loans or joint venture and partnership arrangements after December 31, 2008.

This act is ordered to take immediate effect.

Secretary of the Senate.

Clerk of the House of Representatives.

Approved

Governor.



MICHIGAN BROADBAND DEVELOPMENT AUTHORITY – OVERVIEW

The MBDA was created to help Michigan attract more private sector investment in high-speed Internet infrastructure, and to increase demand for and utilization of broadband services. It does so by offering low-cost loans to telecommunications companies willing to make such investments and by offering organizations low-cost financing for the acquisition of hardware/software applications that will improve or increase their use of broadband service.



As a result of the findings of the [Link Michigan Project](#), Michigan's legislature created the first Broadband Development Authority in the United States. The agency facilitates broadband expansion for the benefit of all people of the state. The Authority is an independent state government agency. Created by the State Legislature on March 14, 2002 ([Act No. 49 of the Public Acts of 2002](#)), the Authority is authorized to issue investment grade, taxable and tax-exempt bonds, the proceeds of which can be used to provide financing assistance.

Contact us at:
Michigan Broadband Development Authority
735 E. Michigan Ave.
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TECHNET STATE RANKINGS – PRESS RELEASE

FOR IMMEDIATE RELEASE: Thursday, July 17, 2003

TechNet Releases State-by-State Ranking of Broadband Deployment Policies

Broadband Index Assesses Policies in 25 Top States with Michigan and Florida Leading the Way

Palo Alto, CA -- The Technology Network (TechNet), a national network of more than 200 CEOs and senior executives in the high technology and biotechnology industries, today unveiled [The State Broadband Index](#) assessing state policies that impact broadband deployment and demand. Michigan and Florida lead the nation in policies that encourage next-generation broadband networks.

"Broadband is the foundation for our nation's continued technological and economic leadership," said Rick White, President and CEO of TechNet. "The states at the top of the Broadband Index have shown leadership in clearing roadblocks to broadband deployment and adopting innovative policies that foster demand for the benefit of their citizens and industry."

Broadband - the capacity to deliver Internet access with a continuous "always on" connection and the ability to both receive and transmit digital content or services at high speeds - has the potential to significantly improve our economy. Universal access to high-speed Internet connections could inject an estimated \$300 billion into the U.S. economy each year. According to the Organization for Economic Cooperation and Development (OECD), the U.S. currently ranks sixth in the world in broadband access behind Korea, Canada, Sweden, Denmark and Belgium with a penetration rate of only 6 out of 100 residents having high speed Internet, largely due to the lack of coordinated broadband deployment policies.

With the State Broadband Index, TechNet examines the key role that states can play in making broadband available to all Americans. The report ranks the top 25 states based on the extent to which their public policies spur or impede broadband deployment and demand, and includes a Best Practices Guide to the most innovative state broadband initiatives.

"Michigan's commitment to jump-starting broadband is already benefiting our citizens and industry," stated Michigan Governor Jennifer Granholm, "The State Broadband Index highlights one of the most critical technology policy challenges facing states today and is a valuable resource to state governments."

"A national broadband strategy will not succeed without a concerted national and state commitment to a business climate that facilitates broadband deployment," stated John Chambers, President and CEO of Cisco Systems and co-founder of TechNet. "We urge the Governors and policymakers in all 50 states to make broadband a priority and to use this report as a roadmap to a comprehensive broadband strategy."

"The State Broadband Index highlights the important role of the states in determining our nation's broadband future," stated Eric Benhamou, Chairman of 3Com Corporation and Palm, "With the right policies and leadership, states can lay the groundwork for the next-generation infrastructure that will drive technological and economic growth, and improve quality of life."

The [Broadband Index Top 10 states](#) are:

1. Michigan
2. Florida
3. Missouri
4. [Texas](#)



5. Ohio
6. [Washington](#)
7. Kansas
8. Virginia
9. Colorado
10. Iowa

The State Broadband Index calls on states to consider a range of policies critical to broadband deployment, including:

- legislation that standardizes and expedites rights-of-way permitting;
- adoption of a state-wide broadband strategy and creation of a lead broadband agency;
- comprehensive infrastructure mapping;
- policies to enable wholesale municipal networks;
- innovative initiatives that increase private sector deployment;
- financial incentives to reach underserved communities; and
- demand-promotion efforts including enhanced e-government.

The [TechNet CEO Broadband Task Force](#), created in spring 2001, includes: John Chambers, CEO of Cisco Systems; John Doerr, Partner with Kleiner Perkins Caufield & Byers; Eric Benhamou, Chairman of 3Com Corporation and Palm Inc.; Paul Gudonis, Executive Vice President of Level 3 Communications; Tony Ley, Chairman and CEO of Harmonic, Inc; Rick Burnes, Partner with Charles River Ventures; John Young, retired President and CEO of Hewlett Packard; Patrick Gelsinger, Chief Technology Officer of Intel Corporation; Brad Smith, Senior Vice President of Microsoft; Rick Roscitt, Chairman and CEO, ADC Telecommunications; Matt Rhodes, President of Conexant Systems; Milo Medin, former Chief Technology Officer of Excite@Home.

The Technology Network (TechNet) is the national network of chief executive officers and senior executives of the nation's leading companies in the fields of information technology, biotechnology, venture capital, investment banking and law. TechNet has called for an affordable [100-megabit per second broadband connection to 100 million homes and small businesses by the year 2010](#) and a national strategy to achieve this goal.

The Broadband Index was completed in conjunction with Analysys, the global advisers in telecommunications, IT and new media, works at the forefront of the communications revolution, delivering advice and insight to clients in the public and private sectors. Analysys staff provide strategy and systems consultancy and information services to the companies that are creating the networked economy, and regulatory and policy advice to governments on all six continents. www.Analysys.com

For a copy of the full report, please go to www.technet.org or call Jim Hock at 202-973-6616 for more information.

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SAILOR NETWORK OVERVIEW

The Sailor Network is one of Maryland's major data communications networks. The Sailor Network has enjoyed the highest profile of all Sailor Project services because it is unique in Maryland for its ubiquity and service to public libraries, government agencies and schools.



The Sailor Operations Center (SOC) and Sailor Network central site are located at Enoch Pratt Free Library, State Library Resource Center in Baltimore City. SOC is the hub between Sailor's connections to the Internet and the Sailor Network Points of Presence (POPs) located in 20 Maryland counties. Maryland Public Library networks, and public agency networks connect to the backbone through the Sailor POPs for Internet access. The Sailor POPs also anchor Sailor modem pools serving each of Maryland's 24 subdivisions, providing a toll-free, statewide bridge across the digital divide in Maryland.

The network came about as a result of The Seymour Plan (1992), which proposed a Maryland Public Library network that would be:

1. A telecommunications backbone to which the libraries could connect for access to the Internet and information resources on the Sailor network. (Project Backbone)
2. A network to which Maryland residents could dial via modem to access the Internet and the information resources on the Sailor network (Project Linkup)

Construction of that network began in July 1994. It was comprised of data communications circuits connecting Sailor POPs to Sailor Hub Sites in each of the four Maryland Local Access Transport Areas (LATA), with inter-LATA T1 service connecting the LATAs to the central Sailor site at Pratt. The first Sailor POPs to come online that July were located in Baltimore City (SOC), Annapolis (Anne Arundel County Public Library) and Bel Air (Harford County Public Library).

In late 1995, Maryland's public libraries had built the first statewide public network in the United States. At that time, the Sailor POPs in the 23 counties and the City of Baltimore had been established, offering access to the Internet for all Maryland citizens whether using a computer in a public library, or toll-free Sailor dial-up access over a modem connection. First generation Sailor provided the only access to the Internet for many parts of Maryland, including parts of Western Maryland, Eastern Shore and Southern Maryland. By providing these services at that time, Maryland Public Libraries were among the very first builders of bridges across the digital divide. All of this was accomplished over 18 months and was celebrated in November 1995 with a symbolic "Golden Spike" ceremony at Montgomery County Department of Public Libraries attended by Governor Parris Glendening and State Superintendent of Education Nancy Grasmick.



In 1997-98 second generation Sailor was created by supplementing the ISDN lines with Frame Relay transport to increase bandwidth to all Maryland Public Libraries on the network. By January 2002, Sailor was migrating to its 3rd generation of network services development with the goal of breaking the T1 barrier at each Sailor POP. The first generation network had an aggregate intra-state capacity of 44.5 Mbps, with a 4 Mbps connection to the Internet. Third generation Sailor consisted of an aggregate 342 Mbps intra-state, with 90 Mbps connectivity to the Internet in June 2002. Under FY2002/2003 Sailor Network contracts the network can be scaled to intra-state capacity of 2,117 Mbps, and 310 Mbps Internet access. To punctuate the additional capability of the fastest network segments, Sailor held a press conference on April 30, 2002 featuring a videoconference between Enoch Pratt Free Library in Baltimore and Wicomico County Free Library in Salisbury.

Plans for the future include construction of wireless facilities to supplement leased services. The staff of the Sailor network operations center provides day-to-day operations of the Sailor Network. Their activities include selection of networking services and equipment with the goal of providing the most reliable network with the maximum amount of bandwidth to every subdivision of the state within the constraints of Sailor's funding. Additional services provided by the NOC include DNS (domain name services) for the State of Maryland's state.md.us, and support of the Sailor Internet Connection Service, and outreach in the form of "beyond the Sailor router" technical consulting for Maryland Public Libraries and ICS participants.

VERIZON EXTENDS HIGH-SPEED INTERNET SERVICE TO EASTERN SHORE

October 31, 2003
Robert J. Terry
Staff

Verizon said Friday it had extended its high-speed Internet service to 29 communities on the Eastern Shore.

Company executives and government officials said the move brings much-needed broadband access to businesses and residents in the mostly rural peninsula. Verizon now has 160,000 digital subscriber lines available for Eastern Shore customers.

"Verizon's commitment to expand its super-fast Internet capabilities to the Eastern Shore has exciting potential for rural Maryland businesses and residents," Gov. Robert L. Ehrlich said. "This will help our economic development efforts in the region."

Verizon Maryland President William R. Roberts said the company will "continue to roll out DSL service aggressively here and across the state."

Residential DSL service will start at \$29.95. Business contracts will start at \$59.95.

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VERIZON EXPANDS DSL LINES

With broadband sign-ups on the rise, the telco upgrades DSL-ready lines and plans a broadband technology strategy as Microsoft's MSN tweaks its Internet strategy away from dialup users.

by [Erin Joyce](#)

Managing Editor of www.atnewyork.com

[March 21, 2003]

Regional Bell operating company [Verizon](#), which is preparing to launch a co-branded broadband offering with Microsoft's MSN, is expanding the number of lines equipped for delivering broadband access by nearly 30 percent. The goal is to make its DSL service available to 10 million homes by the end of the year.

The upgrade comes as [MSN](#) signals a switch in its Internet strategy to focus more on delivering software products over broadband and through its MSN portal, while eventually leaving the dial-up access part to other providers.

Verizon said it is adding more than 10 million new lines to the 36 million that are now equipped with DSL service. The upgrade would extend the Verizon Online broadband service to about 80 percent of its regional markets, primarily in suburban and rural communities.

"I certainly think it's mutually beneficial for us," said Bob Visse, MSN's marketing director. "The more lines Verizon can reach, the better the relationship is for the MSN/Verizon co-branded product. We're excited that the largest DSL provider is partnering with us for distribution of MSN."

Verizon and MSN are still working out some technical issues involved with integrating their products for a co-branded DSL offering, the companies said, which pushed the launch schedule to the second quarter instead of the initial plans for a first quarter launch.

When it does roll out by mid-year, the product would showcase MSN's recent strategy switch to focus more on providing Internet-based software services, and on content and services provided through the MSN portal.

"We'll be redoubling our efforts in this area of Internet software subscriptions over a broadband connection," Visse said. "We see this market tipping more toward the mainstream broadband market, and we're starting to go after that market with more of our resources and marketing dollars."

Visse was recently interviewed by an analyst for tech research firm IDC, whose report about MSN heralded a "strategic shift" away from driving dial-up subscriptions.



MSN counts about 8 million dial-up subscribers that it is working to coax over to broadband subscriptions through partnerships with ISP providers such as Qwest Communications, cable company Charter Communications and Verizon.

The Verizon offering would be a key part of that strategy, with offers to coax dial-up users to instead use their DSL-ready phone lines for a high-speed connection, helped by MSN's portal which counts some 65 million customers visiting the site each month.

But Visse downplayed the change as more subtle.

"I think the assumption that we'd be moving quickly to get out of dial-up is not spot on," he said in an interview. "However, as the business matures and broadband starts to move more and more mainstream, there will be a point when we need to evaluate if we need to be in the narrowband business." But that's years down the road, he added, and in the meantime, "we think the dial-up market could integrate well with a broadband home."

Verizon's spokesperson Bobbi Henson said the co-branded offering with MSN is more than just about the development of a co-branded portal. "It's about the entire customer experience, from installing the kit, getting it up and running, and then experiencing the wonderful new content, services and applications that will be up there," she said. "For people currently on dial-up and for others looking to change to another provider, we think it will be an attractive service."

The Baby Bell now counts about 1.8 million subscribers to its DSL-broadband service, which currently ranks it as the largest provider of DSL service among the telcos. According to Jupiter Research (which is owned by the same company that owns this publication) the residential broadband base is about 15.7 million subscribers. Although most of the providers are on the cable side, the uptake in broadband sign-ups is growing for both cable and DSL modems. In a press statement, Verizon said that it is looking to fixed wireless and fiber for the next generation of broadband. The company said that initial trials of fixed wireless broadband in Maryland and Virginia "are yielding encouraging results."

Verizon also said, "DSL is a first-generation broadband technology used with copper lines. However, Verizon already is serving most larger businesses on fiber links, and the company expects that fiber-optic technology ultimately will become the preferred communications medium to reach homes as well as businesses. Verizon is exploring ways to advance its broadband deployment in 2004, including deploying fiber into neighborhoods and even bringing fiber to the premises of an initial set of customers."

Lawrence Babbio, Verizon vice chairman, added, "If the FCC's final order as it relates to broadband is written the way it's been advertised that will encourage us to speed our deployment of all broadband technologies."