

Technology Council of Maryland

Broadband Access in the State of Maryland

Policy Development Recommendations

Executive Overview

An infrastructure that accommodates broadband telecommunications services is as vital to the New Economy of the Twenty-first century as railroads, rivers and roads were to businesses of our past. Just as the business leaders of our past built their facilities near that transportation infrastructure, advanced technology businesses today will migrate towards areas where a robust, affordable broadband infrastructure is available. We need to look no further than Northern Virginia, which has made advanced telecommunications infrastructure a major priority, and has seen the economic benefits of that strategy.

Maryland's public policy has done little to encourage the private sector to fully deploy and utilize an advanced telecommunications infrastructure, yet over the past several years, the State has spent considerable tax dollars and effort to both build a public broadband infrastructure and to try to understand the capabilities that exist within the state from private investment. The most significant of these efforts were known as Network.Maryland and e-Readiness Maryland, respectively.

The Technology Council of Maryland has been examining the broadband infrastructure within the State for the past two years. We have found the following:

- With the Network.Maryland initiative, the state has found itself, with a network that is still not operational. Most of the fiber is still "dark", very few public buildings have been connected to the network, and the State is trying to figure out how to make it useful, either to governmental, quasi-governmental or private organizations.
- The e-Readiness Maryland recommendations are yet to be released. Early indications are that private investment in the broadband infrastructure is insufficient to meet the needs of Maryland today and in the future.
- We have found that the State and several of its local governments have not only failed to encourage private companies to provide broadband service, but actually have, through a combination of regulations, taxes, fees and surcharges, discouraged providers from investment. This has had the effect of stifling growth within and throughout the state, leaving businesses with inconsistent and often

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costly options for needed services, and, limiting the basis on which the state and localities would actually collect revenues.

The net of this is that deployment of a robust, affordable broadband infrastructure in the State of Maryland is lacking vis-à-vis the needs of a growing populace and advanced technology business community. Significant work has already occurred to understand where actions can be taken to stimulate the deployment of a pervasive broadband infrastructure that can drive the growth of the state for the coming decades. This paper provides details and recommends actions by the state and local governments to allow this to happen.

Understanding the Need

In today's environment, use of broadband and the Internet capability is vital to growth of business, especially advanced technology businesses. Broadband capability is key to connecting a company's communications infrastructures – voice, data and video – with

- a) a company's multiple locations,
- b) their partners and suppliers, and,
- c) their clients.

The latter two interactions are commonly referred to as “B2B”, or “Business-to-business” commerce. Whether it is a life science company communicating with hospitals in clinical trials, or, a software company working with its various locations around the world, a robust, affordable broadband infrastructure is important today, and will be vital in the future, for the continued growth and prosperity of advanced technology businesses. Unfortunately, the State of Maryland has not been on the forefront of policies and actions conducive to the deployment of that infrastructure within the state.

It is important to note, that this is not peculiar to the information technology or communications industries. All advanced businesses, including aerospace, defense, life sciences and information technology require this capability, and will not be able to thrive if this capability is not readily available.

Exactly what is a robust, affordable broadband infrastructure? First, let's look at a definition of broadband: of, relating to, or being a communications network in which a frequency range is divided into multiple independent channels for simultaneous transmission of signals (as voice, data, or video). For our purposes, we will define broadband as a means to deliver high-speed digital information between two or more locations. To understand what we mean by robust, affordable broadband infrastructure, let us look at three things:

- Types of broadband
- Uses of broadband
- Broadband suppliers and carriers

There are several types of broadband available in the marketplace. The attached chart shows a number of the more prevalent media, and their typical speeds.

Media	Typical Speeds
DSL	256KB to 1.5MB@sec
Cable	(T1) 1.5MB@ sec
Fiber	(OC3) 45MB@sec
Satellite/Wireless	56KB to 2MB+

(See Note 1 for definitions of speeds)

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The uses of broadband continue to grow throughout the business community, but three key areas stand out:

- Access to the internet
- Intra company communications (Intranet)
- Communications with partners, vendors and customers (Extranet)

Internet access: This is one of the most basic uses of broadband. It allows companies to connect, through an ISP, or Internet Service Provider, to the Public Internet. Once connected, they can perform business functions such as e-mail, manage a website and conduct some B2B and B2C (Business-to-customer) transactions. In this environment, even medium sized companies must be in a position to do hundreds, or thousands, of simultaneous transactions.

Internal company communications: Businesses need to create virtual workplaces between and across their multiple physical locations. Starting with something as common as a single electronic mail system within the organization, growing to virtual meeting rooms using video conferencing, today's advanced businesses require high-speed bandwidth to meet these needs. Where five years ago, 1.5MB of capacity was more than enough to handle a medium sized company's needs, today many times that is the starting point. Where 45MB fiber links was used within telecom providers (connecting their facilities to each other), it is now commonplace to see them as the direct links within, and to, user businesses. These connections regularly now carry video (which uses 384KB+ per session) at the same time that they are moving graphics (megabyte+ files) and transactional data such as e-mail and instant messaging. In the Life Sciences areas, gigabytes (i.e. 1000 megabytes) of genomic data regularly need to be moved between sites, and the demands of DNA analysis, which is both complex and time consuming, continues to grow.

Extranet: The extension of a company's intranet out onto the Internet, e.g. to allow selected customers, suppliers and mobile workers to access the company's private data and applications via the World-Wide Web. This is in contrast to, and usually in addition to, the company's public web site that is accessible to everyone. The difference can be somewhat blurred, but generally an extranet implies real-time access through a security gateway, or firewall, of some kind. This is a key area for the development a growth of small businesses to medium size, and medium sized businesses to large ones. Extranets are typically developed using a concept of Virtual Private Networks (VPNs) where differing locations "connect" to each other through a public, or private, network using encryption techniques to simulate a direct connection. These same technologies can be used for several governmental applications such as public safety interchanges with other jurisdictions, and, connectivity to key suppliers.

Broadband suppliers and carriers:

- Regional or local suppliers are able to provide access to companies for access to the Internet and for intranet applications for local and/or regional

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companies. Examples in this space would be Verizon, Starpower and Atlantech Online. Once a company grows beyond the local geography, they would need to cobble a network of local providers, or, connect to the larger providers. This causes challenges for the user company in that a) management of multiple vendors does not facilitate volume discounting and b) performance of systems across the public Internet which may be required to connect the local carriers, is not optimal.

- National suppliers expand the reach of network capability to handle the needs of a more extensive organization. Examples here would be Covad and Winstar. These capabilities allow a multi-site company to use the same provider for all three of the uses, above, where most of the traffic will remain within the single suppliers network. Extranet relationships would be handled, for the most part, through peering relationships between telecom vendors.
- Global suppliers extend the reach through many parts of the world. They allow medium to large companies to obtain both volume discounts and better performance across all uses of the network. Examples in this space would be AT&T, Worldcom and Sprint.

The Challenges in the State

The challenge in the State of Maryland, and some of its localities, is that they have not created an environment conducive to the ready deployment of broadband throughout the state. This has limited the rollout of the capability, and left the advanced businesses of Maryland with few options, and at high costs.

We know from discussions with users of the service and confirmed by vendors, that Maryland is not “business friendly” when it comes to the deployment of fiber within many parts of the state. Although ultimately, it should be a business case decision by a company as to whether or not they will deploy fiber in a particular area, actions by the state and some localities have altered the economic equation so as to make it less cost effective for them to do business here vs. other jurisdictions. Examples of these disincentives, *as currently implemented*, include:

- Franchising requirements
- Usage taxes
- Permitting process
- Sales and Use Tax on the purchase of broadband switching equipment
- Right-of-way restrictions and fees
- Undergrounding requirements

Collectively, the above have created an environment where a company’s investment dollars are better spent elsewhere.

What about Network.Maryland? Network.Maryland needs to have a plan developed for its use. Having been built by the state, there are regulatory and indemnity issues that make it difficult for it to be utilized by the private sector. The regulatory issues involve using state owned facilities to compete with private sector companies. The Public Service Commission has prevented such activity in other states. The indemnity concerns arise around the needs of private providers to often indemnify their customers in the event of outages. If the State is the ultimate provider of the service, such provisions will be difficult, at best. The more readily available approach would be to have the infrastructure used by governmental and quasi-governmental organizations.

Recommendations

The State and localities of Maryland must work together on a rational strategy for the facilitation of broadband deployment within the state. This strategy should be to encourage the private sector to invest in adding value to Maryland's advanced telecommunications infrastructure – placing fiber, buying switches to light the fiber, providing advanced services on the fiber, etc.

The state and localities need to examine and restructure regulations, permitting, taxes, use fees, etc. to be consistent with the strategy, and should consider incentives for carriers to deploy broadband in the state within the context of the strategy.

For Network.Maryland, the State needs to develop a plan for use in Public sector and/or determine feasibility and/or alternatives, for privatization.

A relationship should be forged between the State's Chief Technology Office, Chief Information Officer, local jurisdictions and the private sector to monitor progress of broadband infrastructure deployment and changing needs.

Note 1:

- KBS- Kilobytes per second, or, 1000 bytes of data transmitted per second
- MBS – Millibytes per second, or, 1,000,000 bytes of data transmitted per second
- Today, dial-in phone lines operate at a maximum of 56KBS, for use by typically a single user. Business users must contend with multiple concurrent users, as well as a demand for larger amounts of data being transmitted.