

DE.02FA0A
Board of Public Works - PAYGO
State Communications

High Speed Data Network

PAYGO GF \$10,000,000 Recommendation: Approve

Project Description: Construct a statewide high speed digital backbone network capable of providing high speed voice, video, and data transmission. The proposed standards-based network will connect existing data networks throughout the State into one common, statewide network. Once complete, the network will link universities, hospitals, county and local government agencies, businesses, and the general population. The network will utilize high speed digital communications technology providing voice, video, and data transmissions. It will promote economic development, improve healthcare delivery to rural areas, increase collaboration in university research, enlarge distance learning networks, and bring all areas and sectors of the State closer together. The State's high speed data network is called net.work.Maryland.

Comments: In fiscal 2000, \$6 million was appropriated in support of net.work.Maryland; however, only \$5 million was available for use during fiscal 2000. The remaining \$1 million was withheld until more detailed information on two pilot projects was provided to the budget committees. In July 2000 those funds were released. During the summer and fall of 2000, the Department of Budget and Management (DBM), Office of Information Technology (OIT) met with all 23 counties and Baltimore City to define the locations of their access Points of Presence (POPs) for net.work.Maryland. POPs are the endpoints of the network where users connect to net.work.Maryland. To date, 11 counties have defined their POP location. Others are awaiting more definitive cost information.

Funds in the fiscal 2002 allowance will be used to provide equipment at various hub locations throughout Maryland. These hubs will be connected by fiber optic cable. The system will consist of 15 high speed backbone nodes (with 7 nodes funded in fiscal 2002), and 44 local access nodes. The backbone nodes are core connection points for transmitting high speed information along the network. The local access nodes will afford local government and citizen access to net.work.Maryland. As shown in **Exhibit 1**, the seven backbone nodes to be constructed in fiscal 2002 will be located at Keyser's Ridge, Frostburg State University, and the cities of Hancock, Hagerstown, Catonsville, Annapolis, and Frederick.

Exhibit 1

**High Speed Data Network
Fiscal 2002**

Optical Core Switching Equipment at Backbone Nodes:	Quantity	Net Unit Cost	Total Cost
Keyser's Ridge	1	\$541,215	\$541,215
Frostburg State University	1	1,475,340	1,475,340
Hancock	1	714,269	714,269
Hagerstown	1	1,647,312	1,647,312
Catonsville	1	977,955	977,955
Annapolis	1	678,598	678,598
Frederick	<u>1</u>	<u>682,659</u>	<u>682,659</u>
	7	\$6,717,348	\$6,717,348
Access Node Consist of:			
Low end edge ATM switch	9	211,915	1,907,235
Optical layer amplifiers and equipment	9	24,750	222,750
State Treasury building access node	1	484,105	484,105
Test equipment, lightwave multimeters, etc.	n/a	94,481	94,481
Service and trouble desk computers	1	14,081	14,081
Network management, monitoring, and billing software	1	<u>400,000</u>	<u>400,000</u>
Total		\$7,946,680	\$9,840,000

Source: Department of Budget and Management

Construction Status

The State's construction contractor and resource sharing partner, Level III, is scheduled to complete the installation of fiber optic cable and conduit along major interstate routes and major State spurs (approximately 300 miles) by early March 2001. The original plan projected a December 2000 completion date. By October 2001, services will be available between Baltimore, College Park, and Annapolis. Service delivery for western and northern Maryland is planned for February 2002. Service delivery for the Eastern Shore and southern Maryland is planned for Fall 2002. The agency has advised that its out year capital spending plan has been modified. In the fiscal 2001 Capital Improvement Program annual expenditure of \$11.0 million each were projected for fiscal 2003 and 2004. This year the plan for these years only reflects \$5.0 million in each year. This will mean that the western and eastern segments cannot be built simultaneously.

Engineering Design

A detailed engineering design is almost complete for the net.work.Maryland backbone. The engineering contractor, Computer Sciences Corporation (CSC), has conducted detailed engineering assessments of optical switching technology that has been proposed for this project. An Engineering Advisory Group (EAG) was formed as a subcommittee of the High Speed Networking Task Force. The EAG is comprised of stakeholders from DBM, the Maryland Department of Transportation, Sailor (Maryland's Public Information Network), the University System of Maryland, and several federal labs. Their primary responsibilities include the review of the engineering design and architecture to ensure compliance with the goals and objectives of all stakeholders and the mission of net.work.Maryland. The EAG has recommended Ciena (a Linthicum, Maryland-based firm) as the manufacturer of the optical switches for the backbone of the network. Ciena was ranked first technically and had the best price.

Bay Bridge Crossing

The State is paying for the engineering design for the Chesapeake Bay Bridge crossing right-of-way owned by the Maryland Transportation Authority (MdTA). It will be designed to accommodate multiple tenants. MdTA is willing to pay for the bridge construction if a sufficient number of potential tenants can be identified to justify the expense. The State is confident that this crossing is of high value to many communications firms and that their lease payments would offset MdTA's investment. The cost of the bridge construction is estimated at \$7.5 million.

Fiber Optic Cable on the Eastern Shore

Many Eastern Shore counties have expressed concerns regarding a lack of fiber optic cable and infrastructure on the Eastern Shore for net.work.Maryland. The State has committed to use private sector telecommunications services (e.g., Verizon) to connect the county POPs to the network if there is no fiber optic cable close by. The Eastern Shore counties doubt Verizon's ability to offer these services because of previous problems with high capacity services in their region. The State continues to solicit resource sharing opportunities that will help to complete fiber optic facilities statewide.

Private Sector Access to net.work.Maryland

The 2000 *Joint Chairmen's Report* (page 52) directs DBM/OIT to provide a report on the regulatory and policy implications of private sector involvement in the network. DBM/OIT has been working to develop alternative solutions that encourage private sector use of net.work.Maryland.

Maryland is in the unique position of having title to telecommunications assets that can be used not only to fulfill the State's networking needs, but can also be leased to the private sector to fulfill the needs of Maryland's business community. The challenge is to do this in a manner that fulfills the vision for net.work.Maryland, while operating within the regulatory environment governed by the Telecommunications Act of 1934 and 1996, as well as pertinent Maryland law. After consideration of

DE.02FA0A - BPW - State Communications - PAYGO

several alternatives to these issues, examining various approaches by other states, and reviewing the opinions of telecommunications attorneys, the High Speed Data Task Force settled on three non-exclusive recommendations for private sector involvement in the network. The third should be pursued only if the first two options fail.

First, continue resource-sharing initiatives that offer excess capacity in return for cash and in-kind assets and services, including the offer of wavelengths from the State. In support of this, DBM is seeking a private letter ruling from the Public Service Commission and the Federal Communications Commission that concurs with the State’s position that dark fibers (unused network connectivity) and wavelengths are equivalent. Second, pursue outsourcing the operations and maintenance of the network that would allow provisioning of excess capacity to the private sector. Third, the option of last resort, the State becomes a carrier and offers services to both the public and private sectors.

Project Data

(\$ in Millions)

<i>Description</i>	<i>Prior Authorization</i>	<i>2002 Request</i>	<i>2003 Estimate</i>	<i>2004 Estimate</i>	<i>2005 Estimate</i>	<i>Total</i>
Planning	\$1.450	\$0.160	\$0.080	\$0.080	\$0.210	\$1.980
Equipment	15.150	9.840	4.920	4.920	12.790	47.620
Total	\$16.600	\$10.000	\$5.000	\$5.000	\$13.000	\$49.600

Total Project Cost: \$49,600,000

Approved Program Plan: Yes **Estimated Completion Date:** December 2004

Issues

1. Participation in net.work.Maryland May Be Cost Prohibitive for Some Local Governments

Connectivity to net.work.Maryland is voluntary for local governments. A survey conducted by DBM/OIT revealed there was significant demand for high speed bandwidth among Maryland municipalities. Early in the planning stages it was apparent that some local governments, particularly smaller counties and municipalities, lacked the financial resources needed to connect to the network. Some rural county governments are requesting technical and financial assistance in support of their internal county connectivity to net.work.Maryland. Specific funds for these activities were not included in the

net.work.Maryland budget.

Without significant investment in the technology infrastructure of some local jurisdictions, effective use of net.work.Maryland may be impaired. The State has committed to provide engineering support to Baltimore, Kent, and Talbot counties. The State plans to explore the use of university professionals to help the counties (as recommended by the Rural Caucus). Other alternatives include applying for Federal infrastructure grants and utilizing the Department of Housing Community Development's infrastructure program.

For some local areas, even with the needed technology, there is concern over whether they will be able to absorb the annual recurring costs of operating the network. The State must recover all of the recurring costs associated with net.work.Maryland because only capital funds have been appropriated for this project. The cost per unit of service on the network will be based on the total annual recurring costs divided by the number of units (i.e., the cost per circuit goes down as the number of subscribers increases). Therefore, it is in the best interest of the users that the network maximize participation. The agency advises that many counties have expressed concern that they will not be able to afford net.work.Maryland. The State needs to consider cost recovery models that are sensitive to the financial constraints of smaller units of government. The State could subsidize the recurring costs of some local governments for a fixed period of time or charge higher subscription fees to larger users (e.g., State agencies and universities). Another alternative that has broader implications is in exchange for providing last mile connectivity to local governments, excess capacity of the network could be made available to private interests. **The agency should be prepared to brief the committees on its plans to provide affordable and equitable access to the network for all State and local government agencies in Maryland, while also capturing revenues to cover the recurring costs to operate the network.**

2. Pilot Projects Are Slow in Getting Underway

This issue provides a status report on the first phase of pilot projects funded in fiscal 2000. The three projects include: Remote Treatment Planning for Radiation Oncology; Information Technology to Support Public Health; and Supply Chain Management. The objective of the projects is to identify the advantages provided by a net.work.Maryland infrastructure among rural and metropolitan sectors of Maryland, for surveillance and quick response to bio-terrorism, and the enhancement of electronic commerce opportunities.

- **Remote Treatment Planning for Radiation Oncology:** This project proposes to develop, implement, and demonstrate a prototype treatment planning capability for remote treatment planning and delivery. Specifically, the project proposes to demonstrate that the State network can facilitate the mutual use of equipment, personnel, and specialized time. Such an infrastructure will support research and specialty care at the medical facilities irrespective of location or region within the State.
- **Information Technology to Support Public Health:** This project proposes to provide high speed network connections to a number of State agencies, trauma centers, care delivery centers, schools and teleconsulting with specialists at the major trauma centers. In the first year, the project proposes to link agencies and trauma centers to support emergency care delivery in Maryland. During the second year, the project will provide educational materials to train health care professionals on the symptoms

DE.02FA0A - BPW - State Communications - PAYGO

and treatments for disease caused by terrorist bio-warfare agents. An additional goal in year two is to demonstrate how wireless video teleconferencing can support routine care delivery for minor emergencies in the school system.

- **Supply Chain Management:** This is an economic development project designed to demonstrate how Maryland's intermodal transport system, coupled with high speed connectivity, can significantly enhance electronic commerce. Using a supply chain model, one of the driving forces in the marketplace, real-time information can be exchanged among all levels of business partners. This information exchange, combined with an intermodal transport system, allows for the flow of shipments from suppliers to distribution to retail customers.

Current Status

In fiscal 2000, \$650,000 was encumbered in support of the Radiation Oncology project. This included \$500,000 for the remote oncology project between the Johns Hopkins Oncology Center (JHOC) and Peninsula Regional Medical Hospital (PRMC) in Salisbury, plus \$150,000 for the University of Maryland, Baltimore to evaluate the project.

The tasks planned for Phase I have been successfully completed, except for the live demonstration of the system in operation for legislators, sponsor personnel, and evaluators. This task was originally scheduled for the 2000 Maryland Technology Showcase (MTS). Because of the Verizon strike in the summer of 2000, the telecommunications provider for the State of Maryland had not installed the network at PRMC or JHOC, or at the Baltimore Convention Center, site of the 2000 MTS. At the request of DBM, Johns Hopkins University provided a video demonstration of the prototype system working across a temporary network it constructed to compensate for the Verizon delay. The installation of the telecommunications link between PRMC and JHOC was completed at the beginning of calendar year 2001.

The remaining \$1 million of the fiscal 2000 appropriation was released by the budget committees in July 2000 to support the Public Health Awareness and the Supply Chain Management pilot projects. Progress reports from the agency show the Supply Chain Management project is well underway. Some of the activities accomplished thus far include:

- commencement of initial discussions with public and private stakeholders is underway;
- initiation by technical staff of detailed work on portal architecture in order to ensure integration with Maryland's Mega-Portal;
- continuation of discussions and negotiations with Manugistics, to develop the State of Maryland's intermodal portal. Manugistics is a vendor with expertise in developing web-portals for delivering trucking information; and,
- initiation of draft work statements and task lists with Volpe National Transportation Systems Center, the firm selected to evaluate the project.

DE.02FA0A - BPW - State Communications - PAYGO

It is not clear when the State will receive a deliverable for this project or findings from the evaluation.

To date, no fiscal 2000 funds have been encumbered or spent for the Public Health Awareness pilot project. There is nothing to report on the development of this project.

The agency should provide a time-line for the receipt of the Supply Chain Management final report along with the evaluation. Further, the agency should be prepared to explain to the committees why there has been no activity on the Public Health Awareness project, and whether the remaining fiscal 2000 funds associated with the project will continue to remain encumbered. If unspent, these funds should revert to the general fund.

Recommended Actions

1. Concur with the Governor's allowance.

Executive's Operating Budget Impact Statement

(\$ in Millions)

	<i>FY 2002</i>	<i>FY 2003</i>	<i>FY 2004</i>	<i>FY 2005</i>	<i>Total</i>
Estimated Operating Cost	\$2.015	\$5.231	\$4.487	\$4.590	\$16.323
Estimated Staffing	0	0	0	0	0

The agency advises that operating costs include: operations, administration, maintenance, and provisioning for the network (45% of the total recurring costs); recurring circuit charges to connect county POPs to the network; equipment replacement/refresh for technology upgrades and enhancements; utility bills for electronics, and outside cable plant (infrastructure) maintenance and repair. The first lights on net.work.Maryland (network transmission begins) are not scheduled to come on until October 2001. **A recommendation in the Department of Budget and Management/Office of Information Technology's fiscal 2002 operating budget will show a 25% reduction for this activity to reflect the October 2001 start-up date.**

Capital Project Cost Estimate Worksheet

Department: Board of Public Works
Project Number: DE.02FA0A
Project Title: High Speed Data Network
Analyst: William J. Powell

Structure

New Construction:	0 Sq. Ft. X	\$0.00 Sq. Ft. =	0
New Construction:	0 Sq. Ft. X	\$0.00 Sq. Ft. =	0
Renovation:	0 Sq. Ft. X	\$0.00 Sq. Ft. =	0
Renovation:	0 Sq. Ft. X	\$0.00 Sq. Ft. =	0
Built-in Equipment			0
Demolition			0
Information Technology	0 GSF X	\$0.00 GSF =	0
Optical Switching Equipment			6,717,348
Miscellaneous-Other	Low end edge ATM switches		1,907,235
Miscellaneous-Other	Optical layer amplifiers and equipment		222,750
Miscellaneous-Other	Treasury building access node		484,105
Miscellaneous-Other	Test equipment, lightwave multimeters		94,481
Miscellaneous-Other	Service and trouble desk computers		14,081
Miscellaneous-Other	Network mgt. and monitoring software		400,000
SUBTOTAL			9,840,000
Regional Factor:	100.0%		0
SUBTOTAL			9,840,000
Escalation to midpoint:	0.00 Yrs. X	#DIV/0! =	0.00%
TOTAL COST OF STRUCTURE (Bid Cost)			9,840,000

Site Work and Utilities

Site Improvements:	0 + regional factor + mid-point escalation	0
Utilities:	0 + regional factor + mid-point escalation	0
PROJECT SUBTOTAL (Bid Cost)		9,840,000

Fees and Miscellaneous Costs

Total Construction Contingency	0.0%	0
A/E Fee through construction phase @	0.0%	0
Inspection Cost:	0.0%	0
Miscellaneous:		0
Miscellaneous:		0
Miscellaneous:		0
TOTAL COST OF PROJECT		9,840,000

Base cost per new square foot	\$0
Adjusted cost per new square foot (includes escalation and contingencies)	\$0
Base cost per renovated square foot	\$0
Adjusted cost per renovated square foot (includes escalation and contingencies)	\$0

**Object/Fund Difference Report
BPW - High Speed Data Network - PAYGO**

Objects	<u>Object/Fund</u>	FY00	FY01	FY02	FY01 - FY02	Percent
		<u>Actual</u>	<u>Working Appropriation</u>	<u>Allowance</u>	<u>Amount Change</u>	<u>Change</u>
14	Land & Structures	\$ 6,000,000	\$ 10,600,000	\$ 10,000,000	(\$ 600,000)	(5.7%)
Total Objects		\$ 6,000,000	\$ 10,600,000	\$ 10,000,000	(\$ 600,000)	(5.7%)
Funds						
01	General Fund	\$ 6,000,000	\$ 10,600,000	\$ 10,000,000	(\$ 600,000)	(5.7%)
Total Funds		\$ 6,000,000	\$ 10,600,000	\$ 10,000,000	(\$ 600,000)	(5.7%)