

STATE OF MARYLAND
INFORMATION TECHNOLOGY TRANSITION TEAM
REPORT TO GOVERNOR MARTIN O'MALLEY



DELIVERING ON THE PROMISE:

**USING INFORMATION TECHNOLOGY FOR A SMARTER,
STRONGER, AND MORE SUCCESSFUL MARYLAND**

JANUARY 19, 2007

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I. EXECUTIVE SUMMARY

The Information Technology Transition Team was convened on December 14th, 2006, with the mission of assessing Information Technology in the State of Maryland, and providing recommendations on ways to improve the delivery of these services. The group was also charged with proposing legislative initiatives, and assessing the State's budget to identify areas where potential savings could be realized. A final report containing actionable recommendations will be submitted by the end of January 2007.

The IT Transition Team, led by Ms. Belkis Leong-Hong, consists of a group of outstanding leaders in multiple information technology disciplines, each bringing a particular expertise to the work of the team. The members are:

| NAME | AFFILIATION | NAME | AFFILIATION |
|-----------------------|--|-------------------|---|
| Will Castleberry | Director, State Public Policy AOL | Martin Ma | CEO, ITTECOM, Inc. |
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| Michael Johnson | Dir. Of Infrastructure Services, BCPSS | Jason Ross | Director, Skyline Network Engineering |
| Ethan Kazi | Partner, Canton Group | Ashok Saxena | V.P. Programs, ECSI International, Inc. |
| Sean Keller | Co-Founder & COO, Sage Management | Robert Wallace | Pres, Bithgroup |
| Belkis Leong-Hong | Pres, Knowledge Advantage, Inc | Hugh Williams | Legislative Staff |
| Sasha Leonhardt | Maryland Transition Staff | | |

Information Technology (IT) is ubiquitous in our daily lives. There is no better example of this than the role it plays in the Maryland State Government. IT is critical in providing State services and essential in fulfilling Governor O'Malley's

commitment to “make government work more effectively so that it can become more efficient.” Indeed, IT is no longer a luxury, or a tool to increase productivity; but rather, IT is essential to accomplishing government’s core mission.

Governor elect O’Malley has charted a clear vision for the State of Maryland. Providing effective, IT services to State Agencies can help bring that vision to fruition. The O’Malley–Brown principle of, “making government work” frames the recommendations developed by the Transition Team. The report emphasizes clear performance metrics in order to provide visible evidence of accountability which is a stated goal of the new Administration. These performance metrics will be open and transparent to the public, and available through StateStat, a program modeled after Baltimore’s highly successful CitiStat.

As we developed this document, the Governor Elect’s stated goals were always at hand. Specifically the Governor Elect’s commitment to:

- Not only ***make government work, but also to make it work effectively so it is more efficient***, which requires that Maryland renew its commitment to deliver services faster, better, and make these services more accessible to the citizens of Maryland. This means that Maryland must ensure interoperability amongst its computer systems across agencies to reduce duplication, in order to save costs and time.
- To make Maryland a ***leader in improving public safety and homeland security*** which would require that Maryland has the kind of information systems that will allow information sharing, enable implementation of physical and information security measures, and deliver information that is accurate, secure, and timely to the first responders and security professionals. Such an enterprise will require Maryland to react in an agile manner to procure needed systems, services and products to support its mission.
- To ensure that government is ***accountable***, which requires all State Agencies to be accountable for carrying out their missions in the most effective manner. This means that the actions of Maryland’s government are open, transparent, performance driven, and citizens-focused.

With this charge in mind the IT Transition Group developed a set of recommendations addressing:

- IT Organization Structure
- IT Human Capital
- IT Acquisition
- IT Infrastructure

- IT Security
- IT Advanced Technologies

Details of these recommendations are presented in section III of this report.

II. CURRENT DEPARTMENTAL ASSESSMENT

A. Assessment of Current Management Team's Transition Report

The Transition group set out to evaluate the state of IT development and implementation in the State of Maryland. This was done by compiling publicly available data and through interviews with key individuals in the current administration.

Although a Transition Book was not provided to the IT Transition Team, the current management team-- headed by Mr. Ellis Kitchen, the State Chief of Information Technology (CIT), also known as the Chief Information Officer (CIO) of the State of Maryland-- was very responsive to our information requests, providing the team with significant background information, including current year budget information, and answers to the Team's detailed questions to the state CIO.

B. Analysis of Critical Trends

The IT Transition Team found that the prevailing decentralization of the management of IT assets across the state was suboptimal with respect to leveraging IT investments, interoperability, and delivering services to the citizens of Maryland. This decentralization makes it hard for the State CIT/CIO to even determine the total scope of IT assets across the State. Although Maryland has a Technical Reference Model and systems inventory, the decentralization nevertheless leads to problems in fully understanding the scope of resources within state government. The lack of a common state-wide IT standards, policies and procedures condones (if not encourages) the proliferation of systems that are stove-piped, monolithic in their functionalities, and higher overall costs for Maryland's taxpayers. Thus it is not surprising that in the last decade, there have been failed projects and disconnected developments. Although there have been some improvements in the recent past-- with increased programmatic and budgetary oversight by the State CIO's office— there were small increases in budget; there were no failed projects within the past four years; and there is the beginning of standards that cross-cut agencies. However, much remains to be done to facilitate the growth of an intelligent and responsive IT department that best serves the citizenry.

Critical to the success of IT in Maryland is that it must have responsible, accountable, and strong leadership, with the authority to make things happen. However, the current organizational relationship of the CIT/CIO to the Department of Budget and Management, the advisory role that it must play vis-a-vis the other 47 Departmental CIO's, the lack of direct access to the Chief Executive of the State makes it very difficult for the CIO function to operate in the most effective and efficient manner, and in being agile in helping the Governor in delivering his programs, policies, and strategic vision.

1. Organizational

Placement of the Chief Information Officer/Chief Information Technology as a division under the Secretary of Budget and Management presents the challenge that the CIO is not involved in strategic mission decisions, resulting in interpretive implementation, instead of proactive implementation of systems or initiatives to support the Governor's vision. Going forward, to help the Governor "Make Government Work," the CIO/CIT must have a seat at the table to ensure that the optimum solutions for strategic initiatives are implemented correctly.

Each of the Departments and Agencies within the State Government has its own CIO/CIT, who is independent of the State CIO, and only has minimal formal interaction with the State CIO through budget management and project oversight. There is a CIO forum, which gathers to discuss issues of interest. This is an advisory body, maybe even consultative, but not a decision-making body. The lack of a more formal organizational relationship limits collaboration, and could be an opportunity loss for working common problems, and for taking advantage of economy of scale for purchasing products and services.

2. Expenditures

Over the past 4 years, IT expenditures experienced a downward trend, both in reduction to budget as well as reduction in authorized positions. There were adverse effects, to include:

- Loss of highly skilled staff to the private sector or to other local or Federal Government entities;
- No centralized COOP facilities; no executable disaster recovery plan, thereby rendering the infrastructure and the agencies susceptible to critical problems – even as every agency is required to have a COOP plan.

These problems, along with a lack of central oversight for the IT budget, result in duplicative efforts by various agencies' CIOs. Funding for IT operations and for systems development by different agencies (i.e., Comptroller's, DOT, Health, etc) is not controlled by the State CIO. Departmental CIOs have the authority to purchase IT products and services without coordination from the State CIO, as long as they remain within the established procurement threshold, except for Major Information Technology Projects. This lack of budgetary control over IT investments across the state Government takes away opportunities to reduce duplicative development – to leverage volume and quantity buys. In very few instances (if any) do the Departmental CIO's pool the resources together to do a Maryland-wide project, which benefits all the elements of Maryland—the only major exception (which is incidentally a great success) is *networkMaryland*.

Funding practices for multi-year projects do not match contractual specifications—the need to re-justify each year for a multi-year contract, with no assurance that the project can be completed, disrupts delivery of products and services to the State.

The Office of Information Technology was appropriated the following funds for 2006 & 2007:

| Appropriations & Expenditures | FY 2006 Appropriations (\$Millions) | FY 2007 Allowance (\$Millions) | Amount Change (\$Millions) | Percent Change (%) |
|--|--|---------------------------------------|-----------------------------------|---------------------------|
| Salaries/Wages | \$9.037 | \$9.536 | \$0.499 | 5.5% |
| Technical & Spec Fees | 0.213 | 0.214 | 0.001 | 0.6% |
| Communication | 8.269 | 8.081 | -0.188 | -2.3% |
| Travel | 0.085 | 0.086 | 0.001 | 0.2% |
| Fuel & Utilities | 0.017 | 0.020 | 0.003 | 17.1% |
| Motor Vehicles | 0.002 | 0.005 | 0.003 | 95.6% |
| Contractual Services (ex. MIDPF) | 34.493 | 48.475 | 13.982 | 40.5% |
| Supplies & Materials | 0.516 | 0.171 | -0.344 | -66.7% |
| Equipment Replacement | 0.61 | 0.047 | -0.561 | -92.2% |
| Equipment Addition | 0.76 | 2.6 | 1.859 | 246.2% |
| Grants Subsidies, and Contributions | 0.010 | 0.010 | 0 | 0% |
| Fixed Charges | 0.232 | 0.262 | 0.030 | 13.3% |
| Total Appropriations | \$54.242 | \$69.527 | \$15.284 | 28.2% |

| Program/Unit Expenditures | FY 2006 Appropriation (\$Millions) | FY 2007 Allowance (\$Millions) | Amount Changes (\$Millions) | Percent Change (%) |
|--|---|---------------------------------------|------------------------------------|---------------------------|
| Executive Direction | \$2.135 | \$1.788 | -\$0.346 | -16.2% |
| Div. of Information Technology Investment Mgmt | 10.350 | 10.484 | 0.134 | 1.3% |
| Div. of Application Systems Mgmt | 6.796 | 6.113 | -0.682 | -10.0% |
| Div. of Telecommunications | 5.766 | 5.731 | -0.035 | -0.6% |
| Div. of Contracts Mgmt | 1.546 | 1.558 | 0.012 | 0.8% |

| | | | | |
|--|-----------------|-----------------|-----------------|--------------|
| Major IT – OIT | 2.500 | 0 | -2.500 | -100.0% |
| Div. of Security and Architecture | 1.346 | 2.033 | 0.687 | 51.0% |
| Telecommunications Access of Maryland | 6.830 | 7.401 | 0.570 | 8.4% |
| Major Information Technology Dev. Projects (MITDP) | 16.969 | 34.415 | 17.445 | 102.8% |
| Total Expenditures | \$54.242 | \$69.527 | \$15.282 | 28.2% |

The largest number shown above is contracts, and includes the Major IT Development Project Fund (MITDPF). The CIO has oversight over this fund. The increase from 2006 to 2007 goes to support continuance of multi-year ongoing projects, or new projects that have been approved by the legislature.

The approved FY07 MITDPF IT projects and their allocated funds are:

| Agency: Project | Total Project Cost | FY07 Approved Funding |
|--|---------------------------|------------------------------|
| State Board of Elections: Voter System | \$12,000,000 | \$5,000,000 |
| Comptroller: Computer Assisted Collections | 10,000,000 | 10,000,000 |
| Comptroller: Motor Fuel Tracking System | 1,000,000 | 1,000,000 |
| Assessment & Taxation: Assessment Valuation System | 6,000,000 | 2,000,000 |
| Budget & Management: Critical Systems Assessment | 1,000,000 | 0 |
| Budget & Management: State Radio System Planning & Design | 1,000,000 | 0 |
| Budget & Management: Statewide Disaster Recovery A&P | 1,500,000 | 1,000,000 |
| Budget & Management: Independent Verification and Validation | 1,000,000 | 400,000 |
| Budget & Management: Statewide Personnel System | 10,000,000 | 2,000,000 |
| Health & Mental Hygiene: Hospital Information System | 4,500,000 | 2,300,000 |
| Human Resources: Child Services System (CHESSIE) | 62,000,000 | 7,800,000 |
| Labor & Licensing: Wage Data Collection System | 3,000,000 | 0 |
| Labor & Licensing: Business Registry* | 10,000,000 | 0 |
| Public Safety: Offender Case Management System | 4,600,000 | 1,500,000 |
| Public Safety: Infrastructure Stabilization | 2,000,000 | 0 |
| Public Safety: Automated Finger Printing | 13,000,000 | 6,200,000 |
| Higher Education: Student Financial Aid System | 1,700,000 | 1,700,000 |
| Environment: Environmental Management System | 5,000,000 | 1,100,000 |
| Juvenile Services: Video Surveillance * | 5,500,000 | 0 |
| Juvenile Services: Statewide Education System | 2,500,000 | 1,300,000 |
| Total: | \$157,300,000 | \$43,300,000 |

*Submitted by OIT in the FY07 budget, subsequently cut by the Legislature.

3. Non-Tax Revenue

A major source of non-tax revenue for the OCIT is the Special Fund, which consists primarily of interest or investment revenue. In addition, the OCIT has been able to leverage its funding with reimbursable funds.

| <u>Funds</u> | <u>FY 2006</u> | <u>FY 2007</u> | <u>Percent Change</u> |
|-------------------|---------------------|---------------------|-----------------------|
| General Fund | \$ 28,986,643 | \$46,930,205 | 61.9% |
| Special Funds | \$ 7,296,288 | \$7,541,896 | 3.4% |
| Reimbursable Fund | \$17,959,871 | \$15,055,317 | -16.2% |
| Total | \$54,242,802 | \$69,527,418 | 28.2% |

4. Budgeted and Filled Positions

| <u>Appropriations</u> | <u>2006</u> | <u>2007</u> |
|-----------------------|---|---|
| Total Positions | 119 Regular 4 Contractual 123 positions total | 119 Regular 4 Contractual 123 positions total |
| Salaries/Wages | \$9.03 million | \$9.50 million |

According to the operating budget, there is an allocation in both 2006 and in 2007 of 119 Regular positions and 4 Contractual with a total salary allocation of over \$9 million. This is a reduction from FY 2005, where the regular positions appropriated were 123.50, and 5 contractual positions, for a total of 128.5 positions. OIT continues to shrink, losing 4.5 full time equivalent regular positions as a result of the FY2006 position cap abolition.

This disparity in salary and compensation for state IT employees has lagged behind federal (28% differential) and industry (43% differential), and has led to a crisis in recruitment and retention of Maryland Government's IT workforce. The Office of CIT continues to have a high turnover and vacancy rate is high at 12.6% (or 15 positions).

5. Service Level

OIT's mission is to provide statewide IT oversight and statewide information systems and networks. OIT gets high marks across the board for its service level

for *networkMaryland*, operation of the Maryland state portal, as well as the statewide wireless service. An initiative for making available an Indefinite Delivery/Indefinite Quantity (ID/IQ) Consulting and technical Services contract helped ameliorate the onerous delays in the procurement cycle. This contract is so successful that 2 years into the contract, it has already used more than half of the contractual ceiling. Moreover, 49% of awards so far have gone to MBEs, and 15% have gone to the Small Business Reserve (SBR).

6. Procurement and Contracts

According to the Agency CIO's and the State CIO, the lag time between the time that an IT requirement has been established to the time of actual delivery of products or services averages to over 2 years, often resulting in stale technology at the time of product delivery;

Procurement approval threshold is extremely stringent – perhaps outliving the original need for this stringency. Large multi-provider task order master contracts like CATS will help significantly to reduce this.

The levels of approval relative to the threshold also seems to be excessive, resulting in the long time lag.

C. Assessment of Existing Performance Measurement Infrastructure and Reporting Capabilities

Some of the selected performance measures that OIT reports are:

- Project oversight includes such metrics as:
 - On time development
 - On budget
 - Meet requirements (%)

- For Statewide IT and telecommunication services:
 - Availability and accuracy of ASM systems rated acceptable
 - Routine voice system services request completed within 72 hours
 - State agency requests for transport or Internet services via *networkMaryland* (% fulfilled)

D. Summary of Critical Trends

1. To summarize, the team's research revealed the following points:

1. The placement of the CIO as a division under the Secretary of Budget and Management presents the challenge that the CIO is not involved in strategic mission decisions.
2. Each of the Departments and Agencies within the State Government has a CIO, who does not report to the State CIO. They interact through a semi-formal CIO forum.
3. OIT lacks budgetary control over IT investments across the State Government, unless it collaborates with DBM's Office of Budget Analysis.
4. Over the past 4 years, IT expenditures have experienced a downward trend, both in reduction to budget as well as reduction in authorized positions.
5. There has been a loss of highly skilled staff to the private sector or to other local or Federal Government entities
6. Although DBM's Office of Budget Analysis participates in the OIT Portfolio Review of IT projects and may seek advice on funding IT initiatives, there is no review and approval authority of IT spending across the State for IT projects, and there is a lack of central oversight for the IT budget, thereby resulting in duplicative efforts by various agencies' CIOs.
7. Funding practices for multi-year projects do not match contractual specifications.
8. IT workforce salary for Maryland civil service personnel is significantly below market value, and does not compare favorably with neighboring local and Federal Government employees, resulting in loss of critical talents to other Government jurisdictions.
9. The lag time between the contractual time established and actual delivery is over 2 years for IT procurements.

III. IT TRANSITION TEAM RECOMMENDATIONS

This section presents the IT Transition Team's recommendations, intended to help transition the State of Maryland's delivery of IT services to an efficient and effective enabler for the implementation of the O'Malley-Brown vision for Maryland. Each of these will be explained in more detail. They include:

- Organization Structure – Create a Department of Technology/Chief Information Officer
- IT Human Capital – Outline actions to recruit and retain talented IT workers in the State
- IT Acquisition – Propose procurement reform and best practices
- IT Infrastructure – Centralize management and control of common, enterprise level infrastructure
- IT Security – Develop robust and consistent security and privacy policies for *all* agencies and departments in state government.
- IT Advanced Technologies – Promote better technology including a plan to migrate from IPV4 to IPV6.

A. IT Organization Structure Task Group

The Organization Structure task group aimed to evaluate the effectiveness and efficiencies of the current structure of Chief Information Office, IT governance and service delivery model in contrast to industry standards.

Problem Identification #1

Currently, the Chief of Information Technology (CIT) is one of four officers reporting to the secretary of the Department of Budget and Management. The IT budget is distributed among some 47 Agencies, each with a Chief Information Officer, and each independently managing an independent budget and independent IT infrastructure. To put this into perspective, 5 of the major Departments out of the 47 Agencies have a combined IT operating budget in excess of \$195 M, which represents about 25% of the State's IT operating budget. Compare this to the \$69M that the OCIT/CIO directly controls. This decentralized management, operation, and ownership of IT assets makes it difficult, time consuming, and costly to deliver state-wide services, such as common infrastructure and other enterprise wide services, such as a common email system.

Relationship with the other 47 CIT/CIOs are cordial; however, issues of common interest are addressed on a voluntary basis, and recommendations based on reviews of programs or services are advisory in nature. Currently, there is no mechanism in place to impose statewide standards for interoperability or for common acquisitions, although the CIT has developed a Technical Reference Model (TRM), which will serve as the foundation for statewide technical standards and architecture. Systems across departments and agencies are stove-piped, with little or no interoperability and sharing of information or computing assets. Thus, initiatives that may cross departments and agencies require significantly more effort and resources. Because of this organizational structure, the State CIT cannot effectively consolidate common services, and cannot effectively and directly communicate with the Governor and legislators regarding vital IT issues affecting the safety, effectiveness, and responsiveness of Maryland government.

Recommended Actions

The Chief Information Officer/Chief Information Technologist—as the top IT manager in the state—should serve as the Governor's advisor on all matters related to technology, and the utilization of technology to achieve the strategic goals of the Administration. To best accomplish this end, the CIO must be aligned with the Governor's vision and plans. We recommend making this position a cabinet-level position with policy responsibility over IT matters across the state agencies, enhanced budget and resources, oversight authority over IT expenditures beyond the MITDPF, programmatic oversight over large IT projects beyond the MITDPF,

authority to centralize common IT functions and assets. The CIO must have the authority to drive and implement changes in Maryland at a pace required to keep current with technology, and coordinate with other secretaries. In particular, the CIT will be able to be more responsive to the Governor's policy and strategic direction changes, reduce the cost of IT utilization by consolidation under a centralized IT organization, improve service delivery by streamlining currently redundant systems, provide consistent policy and standards statewide, coordinate best practices across agency boundaries, and otherwise ensure appropriate investment in technology. In particular, we recommend:

- Creating a new Department of Information Technology (DIT/CIO) and appoint a cabinet-level secretary. This Cabinet-level department will be responsible for the effective and efficient delivery of information technology services for the state agencies, will be accountable for the success or failures of these services, and will provide requisite visibility of IT as an enabler of mission accomplishment to the Governor, Legislature and the public. The Department of IT must be given sufficient resources to provide services consistent with best practices. In part, by consolidating all IT budgeting in one department, it will clarify the resources available for the DIT to achieve its mission.
- Consolidating common statewide IT services under the DIT/CIO. The identified services include, among others,
 - Enterprise Architecture and standards, enterprise initiatives
 - IT policies, resource management,
 - Technology and System Acquisitions;
 - Enterprise Information and Information System Security
 - Enterprise Project Management;
 - Research and Development;
 - Statewide Networking and Telecommunications; and
 - Consolidated Technology Services, including:
 - Information Systems and Data Center Management;
 - Shared Enterprise Services (all e-mail and collaboration software, security and anti-virus tools, directory services, budgeting and accounting, human resource, asset and procurement management applications);
 - Centralized Systems and Storage Management (all file and print servers; application and database servers; Internet and Intranet servers (through *networkMaryland*); Network Attached Storage and Storage Attached Network Systems);
 - Application Development and Database Architecture (Software standards, application frameworks, database schema, interoperability standards);
 - Security Management (operational procedures and coordinated security monitoring, analysis and correlation of security events, and

the distribution and application of information technology security measures);

- Planning Consulting and Project Management;
- Customer Services Management; and
- Common procurement of statewide services.
- Continuity of Operation; and Disaster Recovery and Planning,

Classification

- Primary organizational

Functional/Operational Area

Creation of a new Department. Organization directly affected will be IT and Department of Budget and Management. Various other agencies and other departments may be indirectly affected.

Estimated Annual Fiscal Impact

Recommend that detailed analysis and fiscal impact be further studied.

Estimated One-Time Implementation Cost

Recommend that fiscal impact be further studied and analyzed.

Barriers to Implementation

There may be a natural resistance to creating a new Cabinet level Department, without significantly more study to substantiate the resources implications, and the fiscal, legislative, political, and operational impact of such a move. Once the multi-dimensional impact is clear, then setting up the timetable for accomplishing this becomes more straightforward. This recommendation needs to be thoroughly briefed to the Secretary of the Department of Budget and Management and to other affected organizations so that there is a clear understanding regarding the necessity of this move, in the interest of achieving the vision and strategic goals of the O'Malley-Brown Administration.

The creation of the Department of Information Technology/CIO would require appropriate legislation as well as significant budgetary, personnel, and asset realignment.

Recommended Implementation Date

Further analysis is recommended. The Team recommends that this analysis begin as soon as possible, following acceptance of this report.

Next Steps

1. Study the fiscal impact of establishing the NEW state DIT/CIO as a cabinet level position. Convene a task group to provide further analysis to address all the fiscal, personnel, and assets issues due to the organizational changes proposed in this recommendation.
2. Prepare briefing package to the Governor, and with his approval to brief other Agency heads.
3. Prepare Budget requests to support new organization.
4. Draft legislation elevating the CIT to a cabinet level position and submit to the House and Senate leadership to be introduced in the 2008 Legislative Session.

Analysis

Three reasons exist for this initiative:

First, *Operational agility*: The increasing dependence on IT for all governmental operations makes IT a mission-critical function rather than a support function. In order for the DIT/CIO to respond with agility to the business and operational priorities of the Governor, it is essential that the DIT/CIO be able to communicate directly with the Governor.

Second, *cost savings from economies of scale*: The inter-agency nature of IT-related functions in the state—particularly the concern of standardizing an IT infrastructure across departments—requires that the DIT/CIO be more involved at a strategic level to generate economic benefits and other savings. With each of the 47 agencies having their own budgets, and their relative independence when buying IT goods and services, the risk of buying duplicative, and sometimes conflicting, technologies is always present. Where unique requirements exist to meet definitive functional needs, the Agency CIOs have the latitude to purchase or build a capability that meets their specific needs. At the point where these agencies need to communicate with other agencies, or to share information to meet a mission requirement, then statewide standards, methodologies, processes, and practices must prevail. Except in a few instances, that is not the case today. Therefore, where possible, consolidating similar requirements to purchase goods or services will yield a greater economy of scale, and it will also ensure compatibility and interoperability.

Third, *proactive service*: The DIT/CIO should drive initiatives for improved IT service delivery to better serve the different governmental agencies and their unique missions, so that government works, effectively and efficiently.

The DIT/ CIO must be a proactive leader in helping to formulate the Governor's and the State's vision of IT. The DIT/CIO should sit at the table with other Cabinet secretaries and participate actively in setting the strategic goals to improve the

delivery of governmental services to the citizens of Maryland. The CIO helps the Governor and other Cabinet members in finding the best technical solution to achieve the required policy ends, as well as advise the Governor directly on the best utilization of IT to achieve measurable results.

The Chief Information Officer's (CIO) roles and responsibilities are no longer confined to pure technical subjects, but rather it is significantly more robust and much more focused on employment of existing and emerging technology to solve a business problem, or to achieve a strategic goal. Thus, the CIO must be well versed in the business of the organization, be an expert in information technology, must be a strategic thinker, and excel in management of people and assets. The CIO acts as an enterprise architect by building and maintaining a comprehensive framework to manage and align an organization's business processes, IT hardware and software, local and wide area networks, people, operations, and projects within the organization's overall strategy. And last but not least, the CIO should be a good communicator and politically savvy. The relationship between the CIO and the top management has been proven to indicate success, understanding, and longevity of an organization and its mission – An Empirical Analysis of the Antecedents of CIO Role Effectiveness, a study by the Detlev Smatz (CKO under the Surgeon General USAF), Ritu Agarwal (Tyser Professor of Information Systems at UMD-College Park), and V. Sambamurthy (Eli Broad Professor of IT at MSU-East Lansing) reached these conclusions

- The hierarchical level of the CIO is positively related to CIO's role effectiveness.
- CIO's membership in the top management team will be positively related to the CIO's role effectiveness.
- The extent of CIO's networking with other members of the top management team will be positively related to the CIO's role effectiveness.
- Extent of trusting relationships between the CIO and the top management team will be positively related to the CIO's role effectiveness.
- Top management team and CIO engagements are positively related to CIO effectiveness, as perceived by the members of the top management team.

The value, in business, of keeping a CIO and CEO close, seeing the same vision, and focused on achieving the same mission will provide for the most effective governance, decision-making, and execution. In the Federal Government, this relationship has been codified into law, the Clinger-Cohen Act, which establishes the position of a CIO reporting directly to the head of the organization, with

significant budgetary control authority across the organization. The CIO sits at the executive table, and is included in the missions and strategies discussions.

With the increasing pace and change in technological development the importance of the CIO cannot be understated when seeking to achieve improvements in service, solve problems, and put in place standards for sharing, collaboration, and communication.

We strongly believe that Maryland must create a Department of Information Technology (DIT/CIO) to promote and expand the state's technology and economic base and to deliver technology services and solutions on par with the modern expectation of our government.

Agency mission-specific systems development should be a combined effort between the CIO and the agency, but overall management, development and control of these systems should remain at the agencies where the expertise is located. The CIT/CIO should retain oversight of the system implementation over a certain life cycle/cost threshold. Since agency systems are part of a larger group of statewide tactical systems, it is critical that these systems conform to state standards, common processes and state-wide IT policies, are interoperable, and are leveraged across agencies where possible for the needs for those systems.

The state is faced with an ongoing problem and expense in terms of legacy system migration and application/database standards. While the Functional Requirements of a system should be defined at the Agency level, the selection, development, and maintenance of enterprise level systems should be done by the DIT/CIO. This is the only way to ensure interoperability compliance and to benefit from the economies of scale achieved through application standardization and consolidation. IT expenditures on Enterprise Application Development projects account for a large portion of the budget and this can be reduced through such an effort. Also, the need for interoperable systems is critical in terms of disaster recovery (DR), continuity of Operations (COOP), and Emergency Management.

To achieve this end, the state should:

- Transition Common Infrastructure Information Technology assets to DIT/CIO.
- Keep Agency CIOs for each department reporting to the respective Department Secretary or Deputy-Secretary, but define a more formal relationship with the DIT/CIO. Agency CIO's are responsible for their agency specific systems, and will no longer manage the common infrastructure items such as networks, wireless, file/print, desktop, and telecommunications. They are the operational executives who make important strategic decisions on how to leverage technology for their agencies service delivery.

- Consolidate the procurement of common hardware, software and services, for example:
 - Servers and workstations
 - Enterprise software licenses
 - Office Application Software
- Consolidate ownership and responsibility of common infrastructure facilities such as Data centers, Disaster Recovery/COOP sites and radio / microwave towers to DIT/CIO.
- Retain oversight of Major IT Development Project (MITDP) to DIT/CIO while keeping execution responsibility with the agency for agency specific systems.
- Consolidate the development of standards and interoperability policies and guidelines for various IT efforts in various agencies and departments to the extent that they do not violate funding and other requirements of Federal or other agencies that fund the programs. Federal funds for agency-specific applications and systems should be managed by the agency receiving the federal grants. Federally funded projects that have multi-agency use and applicability or include general infrastructure support should be managed and funded through DIT/CIO.

This solution is a hybrid of centralization and distributed management by keeping distributed those tasks which are agency-specific and centralizing common services. This solution:

- Gives the Agencies the autonomy over the operational items that are truly important to the agencies mission
- Implements IT management best practice and standards, common in the business community.
- Helps to resolve the Structural deficit problem in IT management and
- Yields a much lower total cost of ownership for IT infrastructure management

Appendix B contains the current organizational structure for the State CIT/CIO. We recommend that the new Secretary of the DIT/CIO review the current organizational structure, and if necessary, organize the new Department in the most efficient and effective manner to meet the critical mission of this new Department. We suggest that the following organizational elements be considered for this new Department:

- Director of Architecture, Plans, Standards, and Policy
- Director of Technology and Infrastructure
- Director of Enterprise Systems and Services
- Director of Operations and Data Centers
- Director of Program Management and Oversight
- Director of Resources Management and Asset Management
- Director of Security
- Director of Testing and Evaluation

In addition, we recommend the establishment of a Major Projects Oversight Board – with 3 members: DIT/CIO (Chair), the DBM Secretary, and Secretary of the requesting Department. The CIO of the requesting department serves in the role of advocate. The Oversight board should be convened at times of major milestones for the project, for example: at project initiation; to give approval to proceed to development; following independent validation and verification, and prior to full operation—to name a few important milestones. This board is a decision-making board, with the authority to approve a project to go from one milestone to the next. The Director of Program Management and Oversight (listed above) would serve as the Secretariat for such a board.

B. IT Human Capital: Attract, Retain, and Promote Top Talent

Problem Identification #1: Pay Disparity

Even though IT services are becoming an increasingly vital and indispensable part of organizations, and the State's IT organizations have continued to provide vital services, it is done with increasingly fewer resources. Critical IT skills are leaving the State's service because the compensation system for state IT employees has lagged significantly behind the private sector, and other governmental jurisdictions. For example, even if the state can attract talented recent college graduates, it is unable to retain these employees because of the draw of higher salaries in the private sector (and this will be exacerbated in days to come, in light of the Governor's laudable goal of creating "new economic opportunities in homeland security, biotechnology, information technology, environmental technology, and defense"). Another way of looking at this is that the state is subsidizing the training of private IT workers who leave the state for more pay at the expense of its own IT programs.

IT workforce salary for Maryland civil service personnel is significantly below market value, and does not compare favorably with neighboring local and Federal Government employees, and it compares abominably to industry salary standards. As a point of comparison, a Senior Network Engineer in the State CIO's office earns \$84,000 per annum. By comparison, the same Senior Network Engineer, with similar responsibilities in a Federal Government Agency earns \$108,000 (GS-15 level). This is a salary differential of about 28%. In the private sector, this same Senior Network Engineer earns \$120,000 or more, which is a very conservative salary differential of about 43%.

The result is that the current vacancy rate within the State CIO's office is about 12.5% -- and it is not clear that this will improve in the near future, without some aggressive intervention.

Recommended Action

We recommend changing the compensation system for IT workers in Maryland to attract, retain, and promote top talent in IT. This is a particularly valuable investment because IT workers can contribute their technical expertise and will retain the institutional history unique to the mission of each individual agency. For example, the State could create a "Special Pay schedule for critical shortage categories" and retain the current pay schedule, but device a formula whereby the Special Pay Schedule starts at a step within a grade that is higher than the first step (for example: grade 10, step 7 as an entry grade)

Meeting the Promise:

A strong IT workforce is true to the Governor's promise to "make government work more effectively so it is more efficient."

Classification

Cost-savings.

Functional/Operational Area

Change of compensation structure for IT workers.

Estimated Annual Fiscal Impact

More study is required to ascertain the full fiscal impact

Estimated One-Time Implementation Cost

More study is required to ascertain the cost of implementation

Barriers to Implementation

This recommendation would require legislative change.

Recommended Implementation Date

Within one year

Next Steps

- Appoint task force to report on the labor market for IT workers, prepare comparison of salary scales based on "like functions," and to develop more detailed recommendations on how to institute this change.
- Task Force should also make recommendations on barriers or deterrents to recruiting, promoting, and retaining quality IT employees
- Study the fiscal impact of increasing the salaries of state IT workers
- Draft legislation and submit to the House and Senate leadership to be introduced in the 2008 legislative session

Analysis:

For some time now, Maryland has faced a staffing crisis of IT workers due to the inability to compensate employees adequately. The enactment of legislation allowing for a compensation system that is separate from the usual civil service pay

scale, the OIT will be in a position to implement a permanent solution and attract, retain, and promote top IT talent. This pay parity will ensure the continued ability of Maryland government to remain responsive to its citizens while ensuring the human capital to protect Maryland from vulnerabilities on the IT front.

Problem Identification #2: Recruitment and Retention Challenges

This problem appeared as an area of concern in multiple task groups' recommendation. The state has a limited IT staff with diverse skills that are not always applied in the most effective manner. State IT staffs have significantly lower salaries than the comparable jobs in the surrounding commercial, local and federal sectors, making IT recruitment and retention a major challenge.

One example of such a program would be the

During our discussions with the State CIO and four of the major Department's CIO, it became apparent that there was a crisis in the IT workforce across the board (see next recommendation). This recommendation also includes the establishment of an IT Career Management Office within the DIT/CIO organization that would be focused on establishing policies and programs that affect IT professionals statewide, with responsibility to:

- Establish statewide career development programs;
- Professional development programs;
- Establish an IT position registry (and may include an internal state of Maryland resume bank for individuals wishing to make changes)
- Review, modify and adopt an aggressive incentive program to retain highly critical IT skills;
- Conduct a comparative analysis of similar career fields in the region, to include other government jurisdiction, to determine pay and compensation parity
- Adopt best practices to recruit and retain the best and brightest IT professionals to the state of Maryland.

Recommended Action:

Centralizing the oversight of IT career management under one Agency and create a registry for IT workforce; institute programs and policies designed to attract, promote, and retain quality IT workforce; relax the rules to allow easy

movement or rotations of IT staff members between Agencies, to address most effectively and efficiently IT service delivery.

If state policy, regulations, or legislation are needed to remove some of the barriers to retaining a top quality workforce, then we recommend that these be examined in that context.

Classification:

Organizational, Cost savings.

Functional/Operational Area:

State CIT/ OIT

Estimated Annual Fiscal Impact:

Requires further study

Estimated One-Time Implementation Cost:

Requires further study for detailed analysis of cost and impact

Barriers to Implementation:

Budget constraints. Current salary schedule and compensation policies and existing compensation laws. May require legislative remedy

Recommended Implementation Date:

Immediate to June 2007

Next Steps:

Coordinate activity with changes to OIT structure

Analysis:

The state has limited IT resources and is faced not only with a large percentage of vacant IT positions, but an aging IT workforce. The technical skills needed by an agency can change over time, coupled with the difficulty of recruiting and retaining critical IT skills in the State, often forces the agency to turn to contractors to fill the gap. However, there are often resources within the state that could assist, but for whatever reason, they are not available to answer these new requirements.

Creating an IT Career Management Office in the DIT/CIO allows centralization of IT career management under one Agency, creates programs to improve the recruitment and retention of State IT employees, creates a registry for IT workforce; relaxes the rules to allow easy movement of IT staff members between Agencies, so as to address most effectively and efficiently IT service delivery. State agencies will need to find ways to offer higher pay, or additional benefits—such as paid tuition for advanced degrees, specialized training for certification, like Project Management certification, or other technical certification, to IT professionals to get them to stay.

C. IT Procurement and Acquisition Task Group

The Mission of the IT Procurement/Acquisition Task Group is to review the current procurement policies, procedures and contracts to ensure they meet the needs of State Government.

IT Procurement is different from traditional commodity procurements within the State because of the relatively short useful life of the products. IT hardware and software today only has an expected useful life of three years, as compared to the five year life span from as recent as 10 years ago for similar equipment. Since the technology is rapidly changing, the State must maintain contract vehicles that are dynamic enough to allow the State to keep pace with technology, but also provide the best value in terms of cost. The recommendations fall into several areas; many of them require revisions or update to COMAR. These recommendations are discussed in the following sections.

Recommendation # 1: Updating Information Technology Procurement Process

Change the IT procurement process for the state of Maryland to make it more efficient and more effective. Adopt best business practices in procurement from both industry and Government.

Problem Identification:

The Inflexibility of State's IT procurement process is resulting in:

- 1) Higher IT costs to the State
- 2) A dependency on antiquated Technologies
- 3) Loss of competitiveness

Recommended Action:

The State should develop more nimble IT procurement practices which focus on long-term cost saving and flexibility. The process should:

- 1) Allow for Multi-vendor Master Service (or products) Contracts. This will enable vendors to implement new technologies as they become available without requiring the State to re-bid the entire project.
- 2) Encourage State agencies to bid out entire IT systems, instead of individual components of the system.
- 3) Develop an expedited process – specifically in instances where federal approval is required.

- 4) Where feasible, adopt procurement best practices that work from both the public and the private sectors

Meeting the Promise:

Making Government Work more efficiently so it is more effective.

Classification:

- Cost Savings (both short and long term)
- Improved efficiencies
- Improved competitiveness

Functional/Operational Area:

DBM and Agency Procurement Offices

Estimated Annual Fiscal Impact:

Cost Savings to be recognized

Estimated One-Time Implementation Cost:

None

Barriers to Implementation:

Some changes may require changes to COMAR. There may be lingering concern that the procurement process may be compromised and more vulnerable to mismanagement

Recommended Implementation Date:

| | |
|---------|------------------------------------|
| Step I | Policy Implementation (July, 2007) |
| Step II | COMAR implementation (TDB – 2008) |

Next Steps:

- 1) Develop a “best practices¹” list for IT Procurement and determine how they differ from the State’s current practices.
- 2) Develop specific recommendations. Identify those that require a simple change in policy, and those which require changes in COMAR.
- 3) Implement policy changes.

¹ The National Governor’s Association, AeA and other groups provide “best practices” for State IT Procurement

- 4) Study potential ramifications in changing COMAR. Determine if changes are merited.
- 5) Change COMAR, if merited.

Analysis:

The State of Maryland has a uniform procurement process which does not distinguish between products. The process for procuring bus tires is identical to process for procuring IT services. Built in to the State's process is a rigidity that is designed to safeguard the integrity of the process, and to ensure the State saves money by purchasing items at the lowest price. This process may be effective in procuring commodities and other items in which:

- 1) There is little difference between products. (for the most part, a bus tire is a bus tire)
- 2) The products have a long life span. (the technology inherent in bus tires is not likely to change rapidly)
- 3) Cost savings occur when the items are purchased individually and in bulk.

Largely, these factors do not apply to Information Technology products. As a result, the State procurement process hinders cost savings by locking the state into long-term, inflexible contracts which result in antiquated technology. Further, the current State system is designed to lock in products and prices and avoid change. This is counterintuitive to IT products which become faster (or more efficient) and less expensive over time.

Developing more nimble procurement practices should not hinder the State in managing the quality and integrity of its IT contracts. On the contrary, frequent product review and more results-oriented evaluation of products will help the State procure more effective products and service. Today, Maryland's IT procurement process lags behind the Federal Government and our neighboring States, including Virginia. The inability of our procurement officers to provide State Agencies with efficient communications tools will seriously hinder its effectiveness and competitiveness. Updating the IT procurement process will solve that problem.

Recommendation #2: Improve the IT Procurement Cycle

IT Procurement is different from traditional commodity procurements within the State because of the relatively short useful life of the products. This set of recommendations focus on ensuring that the contract vehicles meet the needs of the State Agencies, procurement policies are up to date, and competition is maintained through the life of the contract. Our recommendations include the following:

- Review and update COMAR and procurement regulations to shorten the IT Procurement cycle
- Increase purchasing approval thresholds delegated to the DIT/CIO to meet the current requirements of the IT community.
- Expand upon the success of the Consulting and Technical Services (CATS) contract, increase the competition within the State, increase MBE/SBR participation, and ensure that mini-competitions occur for each IT procurement, thus reducing cost.
- Create a dedicated IT Procurement Advisory Group within the State Procurement Advisory Group that is focused on the unique purchasing opportunities and criteria for IT acquisition. This group will allow agencies to provide input for each new Statewide IT procurement to ensure it meets the needs of the State agencies.

Problem Identification:

The acquisition and procurement process for Information Technology used by the State is dated and very lengthy. The cause for this lengthy procurement cycle is multifold, amongst these: cumbersome and dated procurement COMAR and regulations; regulations that do not distinguish between commodity purchases and IT procurement; and unusually low approval thresholds delegated to high level officials in the State.

The consensus amongst the CIO's we talked to was that it was not unusual for a procurement to take more than 2 years, from the time that a need has been identified, and the product or service is finally purchased for the department. Where technology product shelf life is sometimes less than 3 years, by the time that the product is procured, there is less than 1 year of shelf life left, rendering the product technologically obsolete, at time of product delivery.

Recommended Action:

The following actions are recommended:

- Perform comprehensive review of COMAR and other statutory regulations for opportunities to streamline the acquisition and procurement of information technology hardware, software and services.
- Perform comprehensive review of all Department and Agency-level IT procurement regulations for opportunities to streamline and empower local CIO's.
- Identify barriers to implementation of IT procurement process improvements, and take steps to eliminate barriers
- If possible, immediately raise the spending thresholds for Department and Agency CIO's and Department Secretaries.

Meeting the Promise

Making Government Work more efficiently so it is more effective

Classification:

- Cost Savings
- Efficiency
- Organizational

Functional/Operational Area:

Department and Agency-level CIO functions.

Estimated Annual Fiscal Impact:

Further analysis necessary to assess.

Estimated One-Time Implementation Cost:

Further analysis necessary to assess.

Barriers to Implementation:

- COMAR
- State Legislature
- Inculcated practices
- Department and Agency-level regulations and practices

Recommended Implementation Date:

Within one year of acceptance.

Next Steps:

- Assemble smaller assessment team comprised of Subject Matter Experts (i.e., CIO's, CIT, Procurement Officers, Legal and IT Implementers)
- Lay out schedule of assessment with milestones
- Collaborate with State Legislature
- Develop realistic policies and regulations governing acquisition and procurement of information technology

Analysis:

Discussions with the State of Maryland Chief of Information technology, along with several Department-level Chief Information Officers revealed that the state's acquisition and procurement process for information technology is lengthy and dated. The governing laws and regulations place unrealistically low thresholds on purchase amounts of goods and services. As presented to the IT Transition Team, the Department or Agency CIO is only authorized to purchase goods up to \$25K. For goods between \$25K and \$200K, the Secretary of the Department of Budget and Management must approve, and for requirements over \$200K, the approval comes from the Board of Public Works, consisting of the Governor, the Comptroller, and the Treasurer. These low thresholds cause significantly more delays in executing a simple procurement, thereby hampering the accomplishment of mission.

The Functional area Secretary does have the authority to approve Emergency procurements (i.e., disaster relief), but must be able to provide compelling reasoning for engaging this clause. Further, the process of acquiring goods and services requires many levels of signature approval, and as such, can take years to execute a new contract. If the procurement is also using federal funds, then the process could go back and forth because the source of federal funds must also approve of the procurement.

The state's lengthy procurement process is hampering the ability to integrate new technologies into state business processes, to deliver services with agility, thus the payback period is lengthy making the justification even more difficult in constrained budget environments.

Conclusion:

The IT Procurement/Acquisition Task Group found that many agencies experienced numerous problems associated with procurement that can be remedied by changes to COMAR and internal procedures. These changes can help to eliminate direct costs by improving competition and indirectly by reducing the effort required for each procurement activity. It also became evident in our discussions with the various CIO's interviewed that technology selections were made heavily based on the availability of a contract to make the purchase. In addition to limiting the selection of available technology, many times, when utilizing the State contracts, limited competition increased the cost of the technology purchased. The CIO's also concede that the State's IT procurement process is not intuitive, and often requires dedicated staff just focused on purchasing, taking human resources away from the core IT mission of the Agency.

Following the recommendations above will reduce the cost of technology to the State and reduce the human resource effort required to complete procurements.

D. IT Infrastructure

The Information Technology (IT) Transition Team Infrastructure Task Group's Mission was to review the current Statewide IT infrastructure and make recommendations to improve the effectiveness and efficiency of IT throughout State Government. Major focus was placed on initiatives that will reduce overall IT expenditures, improve IT service delivery and reduce IT risk.

While there have been some major IT initiatives and improvements in the past 3 years, there is much work to be done in terms of improving the IT infrastructure of the state and mitigating a series of large IT risks that the state faces. Substantial budgetary savings can be achieved through the consolidation of IT infrastructure (staff and services) throughout the state. While there are a series of initiatives moving towards consolidation, they are limited in scope and lack Executive level support. The fiscal year allowance for 2007 is ~\$729M. IT consolidations typically yield between 10-15% in overall budgetary savings. Actual savings vary based on the type of technology solution and the existing IT environment. The networkMaryland™ project alone has reduced annual IT expenditures by over \$7M annually.

There are major opportunities for consolidating IT services throughout the state and in turn improving IT effectiveness and efficiency. These consolidation efforts will not be successful if they are not combined with Organization Structure changes and the associated Legislation changes (addressed by Organization Structure Task Group and Legislative Agenda Task Group). A solid Information Technology Infrastructure is critical for the Governor to "make government work more effectively so it is more efficient." The Information Technology infrastructure in Maryland needs to be brought up to the 21st century and requires Executive sponsorship in order to achieve this goal.

The IT infrastructure issues currently facing the state can be summarized into 3 areas:

Item 1: Make Information Technology a priority at the Executive Level. In order to properly leverage Information Technology to support the Mission of the Governor and the state, IT must be organizationally restructured. This topic is addressed in the Organization Structure recommendations of this report. The key message as IT Organizational Structure relates to IT Infrastructure is that Infrastructure consolidation efforts will remain limited in scope until the IT organization itself is consolidated and centrally managed.

Item 2: Eliminate Information Technology stovepipes, redundancy and duplicative efforts. Create an Information Technology Task Force to lead the IT infrastructure

changes within the state. Guiding principals of this Task Force will be to make Information Technology more effective and efficient throughout the state. There are existing IT initiatives in place that can be better leveraged and utilized. Since Organizational changes could take at least 18 months to implement, IT consolidation efforts should start immediately.

Item 3: Create a Statewide IT Disaster Recovery Planning & Data Center.

Recommendation #1: Establish Information Technology Task Force

Problem Identification:

Maryland State Information Technology requires major IT infrastructure changes. While the IT Transition team has identified many areas of potential consolidation and improvement, further analysis and review is required to maximize effectiveness to the state.

Recommended Action:

An Information Technology Task Force should be created to coordinate and lead the overall consolidation effort. This Task Force should report directly to the State CIO.

Meeting the Promise

Making Government Work more efficiently so it is more effective

Classification:

Organizational, Cost savings.

Functional/Operational Area:

State CIO/ OIT

Estimated Annual Fiscal Impact:

Fiscal savings will be based on consolidation efforts

Estimated One-Time Implementation Cost:

Task group should provide more detailed analysis of cost impact

Barriers to Implementation:

Budget allocation, Lack of State CIO Authority to mandate change, Agency Cooperation

Recommended Implementation Date:

Immediate

Next Steps:

Create IT Task Force. Recommend appointing head of task force from existing CIOs that also has Commercial and Federal experience.

Analysis:

There is a considerable amount of consolidation that can take place within the State of Maryland with regards to Information Technology enterprise-wide Services. Efforts on this front are well overdue and the fiscal savings alone are considerable. In order for this effort to be effective, a Task Force must be created to lead and plan the IT infrastructure consolidation efforts. There are immediate opportunities for consolidation that should be the initial focus of the Task Force's efforts such as Email, Help Desk and Web Services/Hosting/Maintenance. DBM currently has efforts in place such as a centralized Help Desk and Web Support group that could be leveraged for in support of the broader consolidation efforts. These items could yield results within 2-3 years. The Task Force should also review Statewide Disaster Recovery planning, centralized data center management, systems and storage management, back office Application Management, and Tactical Application Development procedures, as well as data and database management generally. Most systems in the state do not share data and cannot communicate. The design of new systems utilizing web services and leveraging rapid application development methodologies to reduce the overall development cost of applications should be adopted. The antiquated Waterfall methods of software development should be replaced with more agile software development methods.

Maryland has many Legacy systems that will need to be converted over the next several years. If properly managed in a consolidated fashion, this migration could allow Maryland to create application and database standards to be used by all systems in order to properly control the development of these systems to adhere to an overall Enterprise Architecture. The concept of a 'Software Factory' that manages all Tactical Application Development projects for Agencies should be explored amongst other concepts. In response to historical challenges with application development efforts, DHR has instituted many standards and developed an application framework that could be leveraged throughout the state. If the

conversion of these legacy systems is not properly managed, the state will likely waste millions of dollars.

Recommendation #2: Realizing the Full Potential of *networkMaryland*TM

Problem Identification:

The *networkMaryland*TM project has been completed, but the full potential of such a valuable State owned asset has not been fully leveraged. Additional services should be created to further leverage the existing network resources to help reduce costs and improve communications Statewide.

Recommended Action:

To remedy the problem identified above, the new DIT/CIO should work with the heads of State agencies and departments to fully explore the potentials of *networkMaryland*TM as a state-wide resource, and to create new services as needed. Some of these new services can include a common email system for all State agencies, particularly needed for smaller agencies and commissions. A common Voice over IP platform could be implemented to serve the entire State government and include valuable services such as video conferencing and teleworking.

Classification:

Organizational, Cost savings.

Functional/Operational Area:

*networkMaryland*TM serves the entire State government

Estimated Annual Fiscal Impact:

The fiscal impact will be based on the broader utilization of *networkMaryland*TM, the additional enterprise services that can be placed on *networkMaryland*TM, the increased productivity, and leased services disconnected.

Estimated One-Time Implementation Cost:

Further analysis will be required to capture the State agency requirements and implementation costs.

Barriers to Implementation:

The primary obstacle for this effort is the recent announcement that the network has been completed. It is very common in the State to look to complete a project and then move into the maintenance phase. The potential of this network is yet to be fully realized and the leadership should continue to leverage this very valuable asset.

Recommended Implementation Date:

FY 2007: Under direction of the new State CIT, the *networkMaryland*TM Group can do requirements gathering to identify the additional needs of the State Agencies

Next Steps:

Gather requirements from all customers regarding upcoming initiatives or IT needs. Further leverage the existing managed services contract to implement new services on the network as the requirement arises.

Analysis:

The State of Maryland has invested nearly \$30 million dollars in the build out of the State owned network known as *networkMaryland*TM. This network saves the government approximately \$7-10 million dollars a year in leased services and is capable of providing more services. The network also allows all agencies to communicate securely via the Statewide Government Intranet, creating a common routed network for inter-agency business. The core backbone was completed in the fall of 2006 and has been serving State agencies in some capacity for over three years. With the completion of a reliable core backbone, the State should continue to look for ways to further leverage this investment to reduce the IT costs across all State agencies.

*networkMaryland*TM was built to support the needs of State agencies with excess capacity for future growth. Many of the networks connections are under-utilized by design to ensure that as agencies migrated to the network, spare capacity for would available to meet new services as they are created. With those design parameters in mind, the Office of the State CIT/CIO should continue to push the *networkMaryland*TM group to find ways to create those new enterprise wide services and continue to consolidate services across the State. *networkMaryland*TM is designed so that it can continue to grow and to be upgraded in the future to ensure it meets the needs of the State agencies, unlike many of the State agencies networks that have reached the end of its technological life, this critical network should continue to be maintained like a utility and thus should continually grow and be updated.

To allow for the continual growth and update of the network, new services and additional functionalities should be created and old ones improved. Services such as video conferencing should be added to the network via a common service-hosting platform. A managed security solution could leverage the bandwidth of the network to reduce the number of firewalls managed within the State, thus improving overall network security in the State. For State agencies who would like to increase teleworking to reduce traffic and improve the working environment, a managed SSL/VPN solution could be leveraged via *networkMaryland*[™] to gain the economies of scale. The options are virtually costless and often have a high return on investment leveraging the large investment already made within the State.

Recommendation #3: Statewide IT Disaster Recovery Planning & Data Center Consolidation

Problem Identification:

Data Centers are scattered throughout the state making a statewide disaster recovery plan difficult to near impossible. In the event of a major disaster, Maryland IT would be unprepared and unable to adequately recover in a timely manner.

Recommended Action:

Consolidate Data Centers into 1 or 2 data centers in the state

Classification:

Organizational, Cost savings, Risk Mitigation

Functional/Operational Area:

OIT, State CIT, MEMA

Estimated Annual Fiscal Impact:

Unknown, study underway

Estimated One-Time Implementation Cost:

Tentative cost is \$30 million; Georgia spent \$50 million to create one.

Barriers to Implementation:

Budget, Agency Coordination

Recommended Implementation Date:

Complete Planning and prepare Budget in 2007

Next Steps:

Review status of existing work by OIT in this area.
Identify gaps of study in terms of a global view for disaster recovery to the entire state.

Analysis:

Maryland is lacking a comprehensive disaster recovery and continuity of operations plan. The first step towards managing this massive effort is to consolidate systems into a primary and backup facility to ensure recovery in the event of a disaster at the system level.

E. IT Security

This group was charged with looking at the information security posture in the State, to review the current management and handling of IT Security and Data Privacy issues within the Office of Information Technology (OIT) with the aim of identifying issues and making recommendations to ensure the security posture of the state's IT resources is maintained and improved.

Given the importance of the security, privacy, confidentiality, and integrity of the State's personal information, as well as the rise of information-related crimes, such as Identity Theft, security issues should be of paramount concern as the new administration is established. Recommendations fall into three general categories: organizational: establish an Office of the Information Security Officer and an Office of the Privacy Officer (these two recommendations are being integrated into the Organization recommendations in section III.A); training; technology refresh; accessibility; and architecture. These are detailed below:

Recommendation #1: Security Awareness Training

Problem Identification:

Currently, a security awareness campaign is in place within OIT and at MD State Agencies; however, there is no centralized management or oversight of either course materials or awareness training schedules.

Recommended Action:

It is recommended that the proposed Office of the Chief Information Security Officer be tasked to establish an electronic repository for the security awareness plans, training schedules, and course materials for all MD State agencies.

Further, it is recommended that mandatory reoccurring computer-based awareness training modules for all levels of staff (end users through high level technical support, contractors, managerial, and executive level positions) be included within each MD State agency's Security Awareness program. Records of all attempted and successful completion of computer-based awareness training modules must be recorded as a part of each employee and contractor's permanent employee record.

Classification:

Communications, Constituent Service

Functional/Operational Area:

This is to be implemented within the Office of the Security Officer in DIT/CIO

Estimated Annual Fiscal Impact:

The estimated annual fiscal impact is that associated with the development of computer-based awareness training modules which can be done either internally or through outside contractors, such as IT security training vendors.

Increasing investment in IT Security Awareness Training in a proactive manner is likely to reduce costs associated with dealing with potential security and privacy compromises in a reactive manner.

Estimated One-Time Implementation Cost:

The one-time implementation costs will be related to the development and distribution of computer-based awareness training modules which can be done either internally or through outside contractors, such as IT security training vendors.

Barriers to Implementation:

As security awareness programs are in place within OIT and many MD State agencies, there should be limited barriers to the inclusion of mandatory computer-based awareness training modules. This may especially be true for those instances where other components of a security awareness program can be replaced with the computer-based modules.

Recommended Implementation Date:

Efforts to realize this recommendation should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days following acceptance of these recommendations, include:

- Formally creating an electronic repository for security awareness plans, training schedules, and course materials for all MD State agencies.
- Seek information from IT Security training vendors to identify:
 - Vendors with existing computer-based security awareness training course offerings that can be adapted to MD State agencies.
 - Vendors on a contract vehicle that will facilitate the procurement of the computer-based security awareness training modules.

Analysis:

As IT Security and Data Privacy issues are of paramount importance, and end users are widely acknowledged as the ‘weakest link’ in the security posture of any organization, the State of Maryland should take the necessary steps to make improvements on its current and successful security awareness program across all MD State agencies.

Recommendation #2: Remote Access Capabilities**Problem Identification:**

Currently, MD State agencies offer limited remote access capabilities to their employees and contractors – limited primarily to VPN, dial-up, and remote exchange access.

Recommended Action:

Recommend a study to identify two (2) to three (3) alternatives available to MD State agencies to offer their employees and contractors secure remote access to agency technical resources.

This will involve establishing statewide standards for secure remote access to sensitive and confidential government information.

Classification:

Communications, Constituent Service

Functional/Operational Area:

This is to be implemented within the Office of the Security Officer in DIT/CIO

Estimated Annual Fiscal Impact:

The estimated annual fiscal impact of the study itself will be minimal, as the outcome of the study will be recommended process and procedures for providing secure remote access to MD State technology resources.

Increasing the availability of technology resources to MD State employees and contractors can be expected to greatly increase their productivity and morale.

Estimated One-Time Implementation Cost:

The one-time implementation costs will be related primarily to any consultant fees associated with the commissioned study.

Barriers to Implementation:

Given the rising interest in potential telecommuting, flex time, and work-at-home solutions, barriers to commissioning such a study are expected to be minimal.

Recommended Implementation Date:

Efforts to realize this recommendation should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days of the Governor's term include:

- Identifying the necessary internal and potentially external (IT security and networking consultants) resources required to conduct this study.
- Formally establish and charge a commission to conduct this study.

Analysis:

The limited access to the state's technology resources and data by state employees and contractors is an area of complaint within state government, and coupled with the rising interest in considering potential telecommuting, flex time, and work-at-home solutions, the OIT should proactively identify secure means of providing remote access to the state's technology resources.

Such solutions can greatly improve employee productivity as well as morale – helping to address the State's retention issue for qualified IT staff.

Recommendation #3: Technology Refresh for Security Devices

Problem Identification:

Currently, there is no Technology Refresh program in the State of Maryland, which complicates and handicaps efforts to maintain a current, state-of-the-art IT security and data privacy posture.

Recommended Action:

It is critical that the State of MD establish a Technology Refresh program for security devices, hardware, and software that will allow the replacement and/or upgrade of all security devices prior to their date of obsolescence and/or expiration of warranty and maintenance service (whichever comes first).

Such a refresh program is essential to maintaining an IT Security and Data Privacy posture.

Classification:

Constituent Service

Functional/Operational Area:

This is to be implemented at all MD State agencies State wide.

Estimated Annual Fiscal Impact:

The estimated annual fiscal impact of a Technology Refresh program for Security Devices will be based on the numbers of firewalls, intrusion detection/prevention systems, and other security devices, hardware, and software that are approaching their date of obsolescence and/or the expiration of their warranty and maintenance service contracts.

Increasing investment in IT Security and Data Privacy in a proactive manner is likely to reduce costs associated with dealing with potential security and privacy compromises in a reactive manner.

Estimated One-Time Implementation Cost:

A Technology Refresh program for Security Devices essentially involves the re-allocation of technology-related budgetary requests, and therefore there are no specific one-time costs.

Barriers to Implementation:

The reallocation of technology-related budgetary requests to a Technology Refresh program aimed at ensuring that critical security devices, hardware, and software do not become obsolete or operate past their warranty and maintenance periods may encounter resistance in areas where security is not considered a priority.

Recommended Implementation Date:

Efforts to realize this recommendation should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days of the Governor's term include:

- The Governor issuing a mandate to all MD State agencies that a Technology Refresh program for Security Devices must be included in all budget requests by state agencies.
- Begin to work with the Legislature to craft legislation formalizing a 'Technology Refresh program for Security Devices' line item in the budgets of MD State agencies.

Analysis:

Even an effective IT Security and Data Privacy posture cannot be maintained should the security devices, hardware, and software used to establish that posture become obsolete or remain in use past their warranty and maintenance period. Therefore, the state must take action to ensure that the necessary funds will be available to refresh critical security devices in a timely manner.

Increasing investment in IT Security and Data Privacy in a proactive manner is likely to reduce costs associated with dealing with potential security and privacy compromises in a reactive manner.

Recommendation #4: Revise the State's IT Security Policy and Standards Document

Problem Identification:

Currently, there is no defined and stated period of time in which MD State agencies must review and update their IT Security Program documentation, policies, and procedures. Although some CIO's say reviews are completed annually,

the Maryland DBM OIT Security Policy and Standards says that state agencies review and update their IT Security Program “as needed to conform to changes within the agency or in the State IT Security Program.” [Section 1.6 of the MD DBM OIT IT Security Policy and Standards, V1.5, 01/2007].

Recommended Action:

It is recommended that this passage be amended as follows:

“Each State agency will review and update its IT Security Program as needed to conform to changes within the agency or in the State IT Security Program and at a minimum on an annual basis.”

Classification:

Communications and Constituent Service

Functional/Operational Area:

This is to be implemented State wide at all MD State agencies.

Estimated Annual Fiscal Impact:

There is no estimated annual fiscal impact associated with revising the IT Security Policy and Standards Document as recommended.

Estimated One-Time Implementation Cost:

There is no estimated one-time implementation costs associated with revising the IT Security Policy and Standards Document as recommended.

Barriers to Implementation:

As a practical matter, MD State agencies are effectively required to review and update their IT Security Programs on an annual basis, due to planned or proposed technology change or changes in the State’s IT Security Policy and Standards, the barriers to the implementation of this recommendation should be limited.

Recommended Implementation Date:

Efforts to realize this recommendation should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days of the Governor's term include:

- The Chief of Information Technology should inform all MD State agencies of the intent to change the language of the IT Security Policy and Standards Document as recommended.
- The Chief of Information Technology should revise the IT Security Policy and Standards Document as recommended.

Analysis:

This recommendation is aimed at further clarifying OIT's language and intent with respect to ensuring MD State agencies give the necessary attention to their individual IT Security Programs.

Recommendation #5: Intrusion Detection/Prevention System

Problem Identification:

Currently, there is no standard intrusion detection/prevention system (IDS/IPS) among MD State agencies. Further, there is no consistent deployment of IDS/IPS technology among MD State agencies.

Recommended Action:

It is recommended that the Office of the Chief Information Security Officer commission a study, in collaboration with MD state agencies, to standardize on two (2) to three (3) commercial off-the-shelf (COTS) IDS/IPS products for deployment at various points in an agency's network architecture.

Classification:

Constituent Service

Functional/Operational Area:

This is to be implemented within the Office of the Security Officer in DIT/CIO

Estimated Annual Fiscal Impact:

The estimated annual fiscal impact of the commissioned study itself will be minimal as the outcome of the study will be the identification of two (2) to three (3)

COTS IDS/IPS products meeting the IT Security and Data Privacy needs of MD State agencies.

Standardizing security technologies can streamline the IDS/IPS procurement process, as well as potentially offer the state volume-purchase power with the vendors who offer one or more of the identified COTS IDS/IPS products.

Estimated One-Time Implementation Cost:

The one-time implementation costs will be related primarily to any consultant fees associated with the commissioned study.

Barriers to Implementation:

Given the lack of consistent deployment of IDS/IPS across MD State agencies and the lack of standardization on IDS/IPS product offerings, barriers to the implementation of such a commissioned study are expected to be minimal.

Recommended Implementation Date:

Efforts to realize this recommendation should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days of the Governor's term include:

- Identifying the necessary internal and potentially external (IT security and networking consultants) resources required to conduct this study.
- Formally establish and charge a commission to conduct this study.

Analysis:

As IT Security and Data Privacy issues are of paramount importance, the State of Maryland should standardize on two (2) to three (3) COTS IDS/IPS products that will meet the IT Security and Data Privacy needs of MD State agencies.

An IDS/IPS solution is widely recognized as an effective security measure that can, if implemented and managed properly, improve the security posture of an organization's infrastructure.

Recommendation #6: Security Architecture

Problem Identification:

Currently, security audits and assessments are preformed on the IT networks of Maryland State agencies through the Office of Legislative Audits as well as through independent third parties as commissioned by the OIT and individual agency CIOs. While these audits do provide information to the OIT and to the CIOs of State agencies related to improving their security posture, these audits are not performed against any commonly identified, or State-wide baseline secure network architecture. An example of this is that there is no standard intrusion detection/prevention system (IDS/IPS) among MD State agencies. Further, there is no consistent deployment of IDS/IPS technology among MD State agencies.

Recommended Action:

In addition to the network and IT security audits that are conducted by the OLA, and those commissioned by the OIT and agency CIO and conducted by outside third parties, the CISO should commission a focused security architectural assessment to focus on developing a State-wide standard security architecture. Specific elements of review of this security architectural review should include:

- Current and Existing Security Devices, including but not limited to:
 - IDS/IPS
 - Firewalls
 - Web filters and proxies
 - Access control solutions
- Current and Existing Security Procedures, including but not limited to:
 - Review of firewall, web filter, web proxy & other logs
 - Review of router configuration
 - Review of IDS/IPS rules and signatures
 - Password audits

The security architecture assessment should be performed at a minimum of every two years and preferably on an annual basis. The assessment should be conducted in collaboration with MD State agencies.

As expected outcomes of this assessment should be the identification of two (2) to three (3) commercial off-the-shelf (COTS) products for each security device of interest to MD State agencies, along with their optimal location within a network infrastructure. At a minimum, COTS products should be identified for the following devices:

- IDS/IPS
- Firewalls
- Anti-Virus

- Web Filters & Proxies
- Encryption Devices

Further, the assessment should identify a baseline for security procedures that can be implemented at each agency and address the schedule for performing a comprehensive:

- Review of firewall, web filter, web proxy & other logs
- Review of router configuration
- Review of IDS/IPS rules and signatures
- Password audits
- Reviewing user accounts and access privileges
- Physical Security of Data Center and other logical data stores

The identification of two (2) to three (3) COTS products for each security device avoids the risk of too much homogeneity among the networks of MD State agencies – where a security flaw in one network or agency can be exploited State-wide. Further, having two (2) to three (3) COTS products to select from still maintains the independence of individual State agency CIOs when making their individual purchasing decisions.

Classification:

Communication and Constituent Service

Functional/Operational Area:

This is to be implemented within the Office of the Security Officer in DIT/CIO

Estimated Annual Fiscal Impact:

The estimated annual fiscal impact of the commissioned study itself will be minimal as the initial outcome of the study will be the identification of a security architecture meeting the IT Security and Data Privacy needs of MD State agencies.

Standardizing on security technologies can streamline the procurement process for security devices, as well as potentially offer the State volume-purchasing power with the vendors who offer one or more of the identified CATS products.

Further, standardizing of IT security and data privacy procedural matters will help to minimize the IT security training needs of individual agency IT security staff.

Estimated One-Time Implementation Cost:

The one-time implementation costs will be related primarily to any consultant fees associated with the commissioned study.

Barriers to Implementation:

Barriers to the immediate implementation of a State-wide security architecture - especially if such an architecture involves either significant capital expense related to the purchase of new security devices, or significant changes to existing business processes – should be anticipated.

These barriers, while comprised more of the “human element” than technical, can be mitigated at least in part by including Agency personnel (e.g., CIOs, CISOs, and other technical and network staff) in the study, as well as by reviewing the developed security architecture in advance of its formal announcement and adoption.

Given the lack of consistent deployment and standardization of security devices, such as IDS/IPS and firewalls with the redundant, failover feature across MD State agencies, the implementation of at least elements of the security architecture should be attainable.

Recommended Implementation Date:

Efforts to commission and initiate this study should be undertaken immediately.

Next Steps:

The immediate next steps that can be taken in the first 90 days of the Governor’s term include:

- Identifying the necessary internal and potentially external (IT security and networking consultants) resources required to conduct this study.
- Formally establishing and charge a commission to conduct this study.

Analysis:

As IT Security and Data Privacy issues are of paramount importance, the State of Maryland should develop a standard IT security architecture that will provide a roadmap for all MD State agencies to follow in securing its data and IT resources from compromise – both in terms of the security devices, hardware, and

software that are used as well as the procedures that are followed by the IT security staff and indeed the entire agency staff.

Such a roadmap can also assist State agencies in the procurement process by formalizing the need for certain devices and products. In addition, selecting two (2) to three (3) COTS products for each required security device that will meet the IT Security and Data Privacy needs of MD State agencies may facilitate joint purchases by State agencies offering the potential for volume discounts.

Elements of a single, comprehensive security architecture are currently missing through the State's agencies and networks. An example of this is the fact that there is no widespread deployment of intrusion detection/prevention systems in the State of Maryland. An IDS/IPS solution is widely recognized as an effective security measure that can, if implemented and managed properly, improve the security posture of an organization's infrastructure.

Further, there is no consistent implementation of firewalls with redundant, failover capability. A firewall without such a feature becomes a single point of failure increasing the potential threat of and risks from a denial of service attack.

Therefore, the benefits of developing and deploying a comprehensive, statewide security architecture cannot be understated.

F. Advanced Technology

With the significant evolution of information technology over the last few years, it is important that Maryland be technologically capable of delivering on the promises made by the Governor and Lieutenant Governor. It is also critical that Maryland be a technological peer with its neighboring jurisdictions, to ensure connectivity and interoperability in times of crisis. Maryland is home to many high-technology firms, and advanced technologies in all forms are resident within the state. It is only fitting that the state Government should be brought up to date in its own capabilities. The next set of recommendations are aimed at addressing a very small subset of these technological advances.

Recommendation #1: Advanced Next Generation Internetworking Technology-IPv4-to-IPv6 Migration for Maryland

Problem Identification:

Current Internet Protocol Infrastructure (IPv4) will not be able to accommodate the growing number of global users and devices on the Internet, and they introduce overhead and limitations to the power of networking. IPv4 cannot support advanced security encryption technology.

Recommended Action:

The following are the recommended actions:

- Develop a multi-year team to take leadership of coordinating department planning
- Complete & Report Inventory of all IP compliant devices and technologies
- Determine fiscal & operational impacts and risks
- Transition Plan
- Transition

Classification:

Cost Savings, Organization Efficiency, Communication Improvement

Functional/Operational Area:

All Offices of Information Technology and Chief Information Officers

Estimated Annual Fiscal Impact:

The IPv6 transition will bring State Departments considerable cost and operational benefits, such as vastly expanding IP address spaces, improving the scalability and routing of data, providing easier configuration capabilities,

enhancing mobility features, boosting quality of service (QoS), strengthening security and enabling new applications.

Estimated One-Time Implementation Cost:

While it is hard to estimate one-time implementation cost, the cost will be from:

- Performing comprehensive site surveys
- Instituting facility build-outs
- Fulfilling IPv6 equipment acquisitions, installation, testing, turn-ups, training & operations, and maintenance support
- Putting together IPv6 communications architectures
- Drafting application transition guidelines

Barriers to Implementation:

- Departments' reluctance to give up existing IP infrastructure,
- Lack of budget,
- Lack of technical staff with IPv6 experience,
- Lack of hardware and software supporting IPv6.

Recommended Implementation Date:

FY2008 --Start 2008 and submit budget in 2007

Next Steps:

- Feasibility Study of Ipv6 Statewide implementation (Q2/2007)
- Requirements Analysis (Q2/2007)
- Development of a Statement of Work (SOW) (Q3/2007)
- Development of Request for a Proposal (RFP) (Q3/2007)
- Proposal evaluation (Q4/2007)
- Award of Contract (Q4/2007)
- Ordering of equipment (Q1/2008)
- Implement one Department –Migration from Ipv4 to IPV6 as Pilot Program (Start Q1/2008)
- Statewide IPv6 implementation (Q2/2009)

Analysis:

IPv6 is the next generation of the Internet Protocol (IP) and is now included as part of IP support in many products, including major computer operating systems. IPv6 was created to support the future growth of the Internet by providing relief for a projected future shortage of IP addresses with the present IP standard (IPv4). IP provides the addressing mechanism that defines how and where information, such as text, voice, and video, moves across interconnected networks,

including the Internet. With IPv6, IP addresses are lengthened from IPv4's 32 bits to 128 bits – an increase of address spaces from approximately 4.3 billion with IPv4 to about 3.4×10^{38} (several trillions) with IPv6.

The following summarizes a number of business benefits that IPv6 can provide:

- Lower network administration costs: The auto-configuration and hierarchical addressing features of IPv6 will make networks easy to manage.
- Optimized for next generation networks: Getting rid of NAT re-enables the peer-to-peer model and helps in deploying new applications. E.g. communications and mobility solutions such as VoIP
- Protection of company assets: Integrated IPSEC makes IPv6 inherently secure and provides for a unified security strategy for the entire network.
- Investment protection: The transition and translation suite of protocols helps in easy and planned migration from IPv4 and IPv6, while allowing for co-existence in the transition phase.

Recommendation #2: Advanced IP Telephony Solution for Maryland

Problem Identification:

For separate data system and voice system, the bandwidth of current Internet Protocol Infrastructure is not fully utilized; two separate technical teams need to support them respectively; the cost of legacy voice service is expensive. In addition, traditional telephony always is costly for all large government agencies, commercial companies, and organizations.

Recommended Action:

The following are the recommended actions:

- Develop a cross-organization/cross-department project team
- Survey capabilities and applications of VoIP
- Audit data network (LAN and WAN)
- Develop business plan and determine fiscal impacts
- Develop implementation plan
- Implementation and Maintenance

Classification:

Cost Savings, Organization Efficiency, Communication Improvement

Functional/Operational Area:

Office of Information Technology (OIT)

Estimated Annual Fiscal Impact:

The convergence of voice, video and data communications on an IP network lowers the total cost of ownership and operation by enabling cost savings for long distance calls and by integrating the infrastructure and management operations. Replacing many different telephone systems with a single state-of-the-art system will improve efficiency and simplify system management and maintenance.

Cost savings per user is projected between \$10~40 dollars per month per line converted.

Estimated One-Time Implementation Cost:

VoIP deployments are approximately equivalent in initial installation / material costs when compared to traditional telephony systems. However management and usage expenditures are dramatically lowered when using VoIP.

Barriers to Implementation:

- Departments' reluctance to give up existing legacy telephony system,
- Lack of budget,
- Lack of technical staff with VoIP experience.

Recommended Implementation Date:

Q2/FY2008 (Start 2008 and make budget in 2007)

Next Steps:

- Feasibility Study of VoIP Statewide implementation (Q2/2007)
- Requirements Analysis (Q2/2007)
- Development of a Statement of Work (SOW) (Q3/2007)
- Development of Request for a Proposal (RFP) (Q3/2007)
- Proposal evaluation (Q4/2007)
- Award of Contract (Q4/2007)
- Ordering of equipment (Q1/2008)
- Implement one Department with VoIP system as Pilot Program (Start Q1/2008)

Analysis:

VoIP implementation saves money on moves, adds, and changes, meaning that, 1) Telephone number is associated with an IP phone, not a location; 2) Take phone with you when move offices - simply plug into VoIP-ready jack.

VoIP implementation can realize local control of numbers and features, i.e. 1) Case can add and delete telephone numbers from IP phones and turn features on or off; 2) User controlled features through Web or telephone interface for forwarding and speed dial lists.

VoIP implementation can make connection to latest campus directory and other XML applications (Public Address system):

- The IP phones can access the Case phone directory, allowing users to find the most up-to-date telephone numbers right on their phones.
- Users will be able to store a Personal Address Book and Fast Dial list, either using a Web interface or through manually entering information on the IP phone set.
- The speakerphones can be used in emergencies as a Public Address system.

Recommendation #3: Implementation of an Advanced Real-Time Interactive Video Teleconferencing System

Problem Identification:

The offices of the state Government are scattered throughout the state of Maryland with major concentration in the Baltimore and Annapolis areas. Due to the geographically dispersed nature, management and staff are forced to travel to various locations to attend meetings, seminars, training etc. This results in travel expenses and waste of time leading to increase in expenses and inefficiencies in the administration.

Recommended Action:

It is recommended that the State of Maryland install an advanced real-time interactive video teleconferencing system to reduce travel expenses and increase efficiencies and improve communication among the state government personnel.

Classification:

Cost savings, organizational efficiencies, improved communication

Functional/Operational area:

Department of Information Technology (DIT)

Estimated Annual Fiscal Impact:

Recurring annual expense will be the cost of maintenance. This depends on the number of units and the type of maintenance required.

Estimated One-Time Implementation:

Total cost for implementation depends upon the number of units and the type of units installed.

Barriers to Implementation:

Budgetary constraints

Recommended Implementation Date:

Q2/ 2008

Next Steps:

- Feasibility study (Q2/2007)
- Requirements Analysis (Q2/2007)
- Development of a Statement of Work (SOW) (Q3/2007)
- Development of Request for a Proposal (RFP) (Q3/2007)
- Proposal evaluation (Q4/2007)
- Award of Contract (Q4/2007)
- Ordering of equipment (Q1/2008)
- Installation of VTC (Q1/2008)
- Training (Q2/2008)

Analysis:

Brief description of VTC

Video teleconferencing, commonly known as VTC, is simply stated, the simultaneous transmission of audio and video signals between two or more points for the purpose of interaction. These “virtual” meetings allow face-to-face collaboration, and information conveyance and exchange, over distance or to a location that can accommodate the intended group better.

Video Conference Systems

Video conferencing solutions exist in two basic forms: Dedicated systems and Desktop systems. Dedicated systems are usually complete integrated solutions that contain everything needed: microphones, display system, software (with hardware-

based codecs), camera, etc. Desktop systems are add-on products (software, cameras, etc.) that can be added to standard desktop computers.

APPENDICES

A. IT Budget Across Agencies:

Appropriations

SUMMARY OF OPERATING BUDGET APPROPRIATIONS
FOR THE FISCAL YEAR ENDING JUNE 30, 2007

| | | 2007 APPROPRIATIONS | | | | |
|---------------|--|---------------------|---------------|---------------|-------------|--------------------|
| | | GENERAL FUNDS | SPECIAL FUNDS | FEDERAL FUNDS | TOTAL FUNDS | REIMBURSABLE FUNDS |
| E00A03 | BUREAU OF REVENUE ESTIMATES | | | | | |
| E00A0301 | 24010301 ESTIMATING OF REVENUES | 484,150 | - | - | 484,150 | - |
| E00A04 | REVENUE ADMINISTRATION DIVISION | | | | | |
| E00A0401 | 24010401 REVENUE ADMINISTRATION | 31,689,899 | 2,413,966 | - | 34,103,865 | 22,636 |
| E00A0402 | 24010402 MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | 2,099,000 | - | 2,099,000 | - |
| E00A04 | TOTAL REVENUE ADMINISTRATION DIVISION | 31,689,899 | 4,512,966 | - | 36,202,865 | 22,636 |
| E00A05 | COMPLIANCE DIVISION | | | | | |
| E00A0501 | 24010501 COMPLIANCE ADMINISTRATION | 20,554,894 | 7,311,406 | - | 27,866,300 | - |
| E00A07 | REGULATORY AND ENFORCEMENT DIVISION | | | | | |
| E00A0701 | 24010701 REGULATORY AND ENFORCEMENT ADMINISTRATION | 3,766,110 | 4,715,723 | - | 8,481,833 | - |
| E00A09 | CENTRAL PAYROLL BUREAU | | | | | |
| E00A0901 | 24010901 PAYROLL MANAGEMENT | 3,681,882 | - | - | 3,681,882 | - |
| E00A10 | INFORMATION TECHNOLOGY DIVISION | | | | | |
| E00A1001 | 24011001 TECHNOLOGY SUPPORT AND COMPUTER CENTER OPERATIONS | - | - | - | - | 21,663,406 |
| E00 | TOTAL COMPTROLLER OF MARYLAND | 71,326,286 | 18,160,507 | - | 89,486,793 | 24,862,648 |

SUMMARY OF OPERATING BUDGET APPROPRIATIONS
FOR THE FISCAL YEAR ENDING JUNE 30, 2007

| | | 2007 APPROPRIATIONS | | | |
|---------------|--|---------------------|---------------|---------------|---------------|
| | | GENERAL FUNDS | SPECIAL FUNDS | FEDERAL FUNDS | TOTAL FUNDS |
| J00A04 | DEBT SERVICE REQUIREMENTS | | | | |
| J00A0401 | 29010401 DEBT SERVICE REQUIREMENTS | - | 119,944,998 | - | 119,944,998 |
| J00B01 | STATE HIGHWAY ADMINISTRATION | | | | |
| J00B0101 | 29020101 STATE SYSTEM CONSTRUCTION AND EQUIPMENT | - | 469,639,660 | 544,005,152 | 1,013,644,812 |
| J00B0102 | 29020102 STATE SYSTEM MAINTENANCE | - | 176,074,475 | 5,524,538 | 181,599,013 |
| J00B0103 | 29020103 COUNTY AND MUNICIPALITY CAPITAL FUNDS | - | 4,500,000 | 54,600,000 | 59,100,000 |
| J00B0104 | 29020104 HIGHWAY SAFETY OPERATING PROGRAM | - | 6,209,980 | 8,194,290 | 14,404,270 |
| J00B0105 | 29020105 COUNTY AND MUNICIPALITY FUNDS | - | 584,911,158 | - | 584,911,158 |
| J00B0108 | 29020108 MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | 2,600,000 | 3,000,000 | 5,600,000 |
| J00B01 | TOTAL STATE HIGHWAY ADMINISTRATION | - | 1,243,935,273 | 615,323,980 | 1,859,259,253 |
| J00D00 | MARYLAND PORT ADMINISTRATION | | | | |
| J00D0001 | 29040001 PORT OPERATIONS | - | 97,356,900 | - | 97,356,900 |
| J00D0002 | 29040002 PORT FACILITIES AND CAPITAL EQUIPMENT | - | 112,500,526 | 2,517,000 | 115,017,526 |
| J00D00 | TOTAL MARYLAND PORT ADMINISTRATION | - | 209,857,426 | 2,517,000 | 212,374,426 |
| J00E00 | MOTOR VEHICLE ADMINISTRATION | | | | |
| J00E0001 | 29050001 MOTOR VEHICLE OPERATIONS | - | 138,036,979 | 15,000 | 138,051,979 |
| J00E0003 | 29050003 FACILITIES AND CAPITAL EQUIPMENT | - | 20,747,077 | - | 20,747,077 |
| J00E0008 | 29050008 MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | 6,278,000 | - | 6,278,000 |
| J00E00 | TOTAL MOTOR VEHICLE ADMINISTRATION | - | 165,062,056 | 15,000 | 165,077,056 |
| J00H01 | MARYLAND TRANSIT ADMINISTRATION | | | | |
| J00H0101 | 29080101 TRANSIT ADMINISTRATION | - | 43,169,828 | - | 43,169,828 |
| J00H0102 | 29080102 BUS OPERATIONS | - | 173,392,260 | 30,278,599 | 203,670,859 |
| J00H0104 | 29080104 RAIL OPERATIONS | - | 130,997,755 | 12,604,351 | 143,602,106 |
| J00H0105 | 29080105 FACILITIES AND CAPITAL EQUIPMENT | - | 113,009,851 | 122,755,000 | 235,764,851 |
| J00H0106 | 29080106 STATEWIDE PROGRAMS OPERATIONS | - | 65,861,858 | 10,469,281 | 76,331,139 |
| J00H0108 | 29080108 MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | 13,068,000 | 1,651,000 | 14,719,000 |
| J00H01 | TOTAL MARYLAND TRANSIT ADMINISTRATION | - | 539,499,552 | 177,758,231 | 717,257,783 |
| J00I00 | MARYLAND AVIATION ADMINISTRATION | | | | |
| J00I0002 | 29090002 AIRPORT OPERATIONS | - | 169,622,303 | 279,945 | 169,902,248 |
| J00I0003 | 29090003 AIRPORT FACILITIES AND CAPITAL EQUIPMENT | - | 57,458,119 | 27,407,000 | 84,865,119 |
| J00I0008 | 29090008 MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | - | 214,000 | 214,000 |
| J00I00 | TOTAL MARYLAND AVIATION ADMINISTRATION | - | 227,080,422 | 279,900,945 | 254,981,367 |
| J00 | TOTAL DEPARTMENT OF TRANSPORTATION | - | 2,837,436,666 | 851,368,628 | 3,688,805,294 |
| K00 | DEPARTMENT OF NATURAL RESOURCES | | | | |
| K00A01 | OFFICE OF THE SECRETARY | | | | |
| K00A0101 | 30010101 SECRETARIAT | 1,758,308 | 1,941,264 | 87,755 | 3,787,327 |
| K00A0102 | 30010102 OFFICE OF THE ATTORNEY GENERAL | 557,574 | 611,355 | - | 1,168,929 |
| K00A0103 | 30010103 FINANCE AND ADMINISTRATIVE SERVICE | 2,404,530 | 1,907,121 | 139,137 | 4,450,788 |
| K00A0104 | 30010104 HUMAN RESOURCE SERVICE | 583,746 | 529,328 | - | 1,113,074 |
| K00A0105 | 30010105 INFORMATION TECHNOLOGY SERVICE | 1,682,710 | 2,034,330 | - | 3,717,040 |

| | | | | | | |
|------------------|--|------------|-------------|------------|-------------|-----------|
| M00 | DEPARTMENT OF HEALTH AND MENTAL HYGIENE | | | | | |
| M00A01 | OFFICE OF THE SECRETARY | | | | | |
| M00A010132010101 | EXECUTIVE DIRECTION | 10,941,428 | 306,049 | 642,969 | 11,890,446 | 918,580 |
| M00A010232010102 | FINANCIAL MANAGEMENT ADMINISTRATION | 4,544,475 | - | 2,235,939 | 6,780,414 | 390,167 |
| M00A010332010103 | OFFICE OF HEALTH CARE QUALITY | 9,426,204 | 465,336 | 5,308,519 | 15,200,059 | 27,149 |
| M00A010432010104 | HEALTH PROFESSIONALS BOARDS AND COMMISSION | 238,042 | 8,876,995 | - | 9,115,037 | 343,898 |
| M00A010532010105 | BOARD OF NURSING | - | 5,968,063 | - | 5,968,063 | - |
| M00A010632010106 | STATE BOARD OF PHYSICIANS | - | 7,765,087 | - | 7,765,087 | - |
| M00A01 | TOTAL OFFICE OF THE SECRETARY | 25,150,149 | 23,379,530 | 8,187,427 | 56,717,106 | 1,679,794 |
| M00C01 | OPERATIONS | | | | | |
| M00C010132030101 | EXECUTIVE DIRECTION | 6,837,188 | - | 2,508,610 | 9,345,798 | 379,998 |
| M00C010232030102 | INFORMATION RESOURCES MANAGEMENT ADMINISTRATION | 3,544,871 | - | 3,078,100 | 6,622,971 | 1,516,939 |
| M00C010432030104 | GENERAL SERVICES ADMINISTRATION | 2,322,657 | 30,000 | 3,663,510 | 6,016,167 | 783,042 |
| M00C01 | TOTAL OPERATIONS | 12,704,716 | 30,000 | 9,250,220 | 21,984,936 | 2,679,979 |
| J00 | DEPARTMENT OF TRANSPORTATION | | | | | |
| J00A01 | THE SECRETARY'S OFFICE | | | | | |
| J00A010129010101 | EXECUTIVE DIRECTION | - | 28,729,727 | 851,393 | 29,581,120 | - |
| J00A010229010102 | OPERATING GRANTS-IN-AID | - | 4,119,526 | 9,402,079 | 13,521,605 | - |
| J00A010329010103 | FACILITIES AND CAPITAL EQUIPMENT | - | 15,987,870 | 1,200,000 | 17,187,870 | - |
| J00A010429010104 | WASHINGTON METROPOLITAN AREA TRANSIT-OPERATING | - | 174,503,000 | - | 174,503,000 | - |
| J00A010529010105 | WASHINGTON METROPOLITAN AREA TRANSIT-CAPITAL | - | 73,585,000 | 16,400,000 | 89,985,000 | - |
| J00A010729010107 | OFFICE OF TRANSPORTATION TECHNOLOGY SERVICES | - | 34,481,816 | - | 34,481,816 | - |
| J00A010829010108 | MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | 650,000 | - | 650,000 | - |
| J00A01 | TOTAL THE SECRETARY'S OFFICE | - | 332,056,939 | 27,853,472 | 359,910,411 | - |
| Q00 | DEPARTMENT OF PUBLIC SAFETY AND CORRECTIONAL SERVICES | | | | | |
| Q00A01 | OFFICE OF THE SECRETARY | | | | | |
| Q00A010135010101 | GENERAL ADMINISTRATION | 31,439,598 | 739,492 | 72,075 | 32,251,165 | - |
| Q00A010235010102 | INFORMATION TECHNOLOGY AND COMMUNICATIONS DIVISION | 31,430,759 | 3,081,905 | 400,000 | 34,912,664 | 1,846,522 |
| Q00A010335010103 | INTERNAL INVESTIGATIVE UNIT | 1,941,854 | - | - | 1,941,854 | - |
| Q00A010435010104 | 9-1-1 EMERGENCY NUMBER SYSTEMS | - | 52,885,412 | - | 52,885,412 | - |
| Q00A010635010106 | DIVISION OF CAPITAL CONSTRUCTION AND FACILITIES MAINTENANCE | 1,844,347 | - | - | 1,844,347 | - |
| Q00A010835010108 | OFFICE OF TREATMENT SERVICES | 2,183,642 | 2,055,595 | - | 4,239,237 | 28,016 |
| Q00A01 | TOTAL OFFICE OF THE SECRETARY | 68,840,200 | 58,762,404 | 472,075 | 128,074,679 | 1,874,538 |

**SUMMARY OF OPERATING BUDGET APPROPRIATIONS
FOR THE FISCAL YEAR ENDING JUNE 30, 2007**

| | | 2007 APPROPRIATIONS | | | | |
|------------------|--|---------------------|---------------|---------------|-------------|--------------------|
| | | GENERAL FUNDS | SPECIAL FUNDS | FEDERAL FUNDS | TOTAL FUNDS | REIMBURSABLE FUNDS |
| T00 | DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT | | | | | |
| T00A00 | OFFICE OF THE SECRETARY | | | | | |
| T00A000138010001 | SECRETARIAT SERVICES | 2,147,324 | 160,447 | 23,521 | 2,331,292 | - |
| T00A000238010002 | MARYLAND ECONOMIC DEVELOPMENT COMMISSION | 5,510 | - | - | 5,510 | - |
| T00A000338010003 | OFFICE OF ASSISTANT ATTORNEY GENERAL | 92,073 | 1,308,625 | 2,398 | 1,403,096 | - |
| T00A00 | TOTAL OFFICE OF THE SECRETARY | 2,244,907 | 1,469,072 | 25,919 | 3,739,898 | - |
| T00B00 | DIVISION OF ADMINISTRATION & INFORMATION TECHNOLOGY | | | | | |
| T00B000138020001 | OFFICE OF ADMINISTRATION | 3,630,021 | 757,009 | 35,412 | 4,422,442 | 134,768 |
| P00 | DEPARTMENT OF LABOR, LICENSING, AND REGULATION | | | | | |
| P00A01 | OFFICE OF THE SECRETARY | | | | | |
| P00A010134010101 | EXECUTIVE DIRECTION | 608,588 | 321,778 | 1,421,832 | 2,352,198 | - |
| P00A010234010102 | PROGRAM ANALYSIS AND AUDIT | 35,545 | 56,342 | 254,098 | 345,985 | - |
| P00A010534010105 | LEGAL SERVICES | 1,413,298 | 824,714 | 580,308 | 2,818,320 | - |
| P00A010834010108 | EQUAL OPPORTUNITY AND PROGRAM EQUITY | 48,737 | 77,932 | 343,155 | 469,824 | - |
| P00A010934010109 | GOVERNOR'S WORKFORCE INVESTMENT BOARD | 93,820 | - | 824,802 | 918,622 | 373,622 |
| P00A011134010111 | APPEALS | - | 50,000 | 4,759,989 | 4,809,989 | - |
| P00A01 | TOTAL OFFICE OF THE SECRETARY | 2,199,988 | 1,330,766 | 8,184,184 | 11,714,938 | 373,622 |
| P00B01 | DIVISION OF ADMINISTRATION | | | | | |
| P00B010334020103 | OFFICE OF BUDGET AND FISCAL SERVICES | 469,042 | 689,232 | 3,149,823 | 4,308,097 | - |
| P00B010434020104 | OFFICE OF GENERAL SERVICES | 443,764 | 2,061,234 | 3,143,973 | 5,648,971 | - |
| P00B010534020105 | OFFICE OF INFORMATION TECHNOLOGY | - | - | - | - | 6,106,782 |
| P00B010634020106 | OFFICE OF PERSONNEL SERVICES | 194,485 | 304,512 | 1,360,099 | 1,859,096 | - |
| P00B01 | TOTAL DIVISION OF ADMINISTRATION | 1,107,291 | 3,054,978 | 7,653,895 | 11,816,164 | 6,106,782 |
| R00 | STATE DEPARTMENT OF EDUCATION | | | | | |
| R00A01 | HEADQUARTERS | | | | | |
| R00A010136010101 | OFFICE OF THE STATE SUPERINTENDENT | 7,799,340 | 258,115 | 6,846,307 | 14,903,762 | - |
| R00A010236010102 | DIVISION OF BUSINESS SERVICES | 2,225,203 | 58,429 | 7,160,547 | 9,444,179 | - |
| R00A010336010103 | DIVISION FOR LEADERSHIP DEVELOPMENT | 1,707,610 | - | 125,919 | 1,833,529 | - |
| R00A010436010104 | DIVISION OF ACCOUNTABILITY AND ASSESSMENT | 26,958,133 | 320,849 | 7,709,617 | 34,988,599 | 6,842 |
| R00A010536010105 | OFFICE OF INFORMATION TECHNOLOGY | 252,922 | - | 2,247,719 | 2,500,641 | - |
| R00A011036010110 | DIVISION OF EARLY CHILDHOOD DEVELOPMENT | 19,707,303 | - | 15,242,267 | 34,949,570 | - |
| R00A011136010111 | DIVISION OF INSTRUCTION | 6,700,114 | 137,174 | 4,010,911 | 10,848,199 | 61,741 |
| R00A011236010112 | DIVISION OF STUDENT AND SCHOOL SERVICES | 3,609,136 | 45,000 | 4,635,663 | 8,289,799 | 17,905 |
| R00A011336010113 | DIVISION OF SPECIAL EDUCATION/EARLY INTERVENTION SERVICES | 1,800,115 | - | 8,482,315 | 10,282,430 | - |
| R00A011436010114 | DIVISION OF CAREER TECHNOLOGY AND ADULT LEARNING | 1,931,602 | 756,814 | 3,074,045 | 5,762,461 | - |
| R00A011536010115 | DIVISION OF CORRECTIONAL EDUCATION | 19,596,480 | - | 1,729,673 | 21,326,153 | 360,000 |
| R00A011736010117 | DIVISION OF LIBRARY DEVELOPMENT AND SERVICES | 1,234,067 | - | 1,355,948 | 2,590,015 | - |
| R00A011836010118 | DIVISION OF CERTIFICATION AND ACCREDITATION | 2,941,036 | 459,931 | 824,667 | 4,225,634 | - |
| R00A011936010119 | HOME AND COMMUNITY BASED WAIVER FOR CHILDREN | - | - | - | - | - |
| S00A26 | DIVISION OF INFORMATION TECHNOLOGY | | | | | |
| S00A260137012601 | INFORMATION TECHNOLOGY | - | - | 1,583,957 | 1,235,595 | 2,819,552 |
| F50A01 | MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS FUND | | | | | |
| F50A0101 | MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS FUND | 31,415,000 | - | - | 31,415,000 | - |

| | | | | | |
|-------------------|---|------------|------------|------------|-------------|
| N00F00 | OFFICE OF TECHNOLOGY FOR HUMAN SERVICES | | | | |
| N00F0002 33060002 | MAJOR INFORMATION TECHNOLOGY DEVELOPMENT PROJECTS | - | - | 3,900,000 | 3,900,000 |
| N00F0004 33060004 | GENERAL ADMINISTRATION | 24,841,747 | 438,940 | 31,637,313 | 56,918,000 |
| N00F00 | TOTAL OFFICE OF TECHNOLOGY FOR HUMAN SERVICES | 24,841,747 | 438,940 | 35,537,313 | 60,818,000 |
| W00 | DEPARTMENT OF STATE POLICE | | | | |
| W00A01 | MARYLAND STATE POLICE | | | | |
| W00A010:41010101 | OFFICE OF THE SUPERINTENDENT | 12,524,560 | 437,539 | - | 12,962,099 |
| W00A010:41010102 | FIELD OPERATIONS BUREAU | 83,478,969 | 54,650,122 | - | 138,129,091 |
| W00A010:41010103 | HOMELAND SECURITY AND INVESTIGATION BUREAU | 29,326,654 | 68,641 | 368,000 | 29,763,295 |
| W00A010:41010104 | SUPPORT SERVICES BUREAU | 47,511,715 | 150,000 | 2,932,000 | 50,593,715 |
| W00A010:41010105 | STATE AID FOR POLICE PROTECTION FUND | 64,861,903 | - | - | 64,861,903 |
| W00A010:41010107 | LOCAL AID LAW ENFORCEMENT GRANTS | - | 599,946 | - | 599,946 |

Expenditures

The approved FY07 MITDPF IT projects and their allocated funds are:

| Agency: Project | Total Project Cost | FY07 Approved Funding |
|--|----------------------|-----------------------|
| State Board of Elections: Voter System | \$12,000,000 | \$5,000,000 |
| Comptroller: Computer Assisted Collections | 10,000,000 | 10,000,000 |
| Comptroller: Motor Fuel Tracking System | 1,000,000 | 1,000,000 |
| Assessment & Taxation: Assessment Valuation System | 6,000,000 | 2,000,000 |
| Budget & Management: Critical Systems Assessment | 1,000,000 | 0 |
| Budget & Management: State Radio System Planning & Design | 1,000,000 | 0 |
| Budget & Management: Statewide Disaster Recovery A&P | 1,500,000 | 1,000,000 |
| Budget & Management: Independent Verification and Validation | 1,000,000 | 400,000 |
| Budget & Management: Statewide Personnel System | 10,000,000 | 2,000,000 |
| Health & Mental Hygiene: Hospital Information System | 4,500,000 | 2,300,000 |
| Human Resources: Child Services System (CHESSIE) | 62,000,000 | 7,800,000 |
| Labor & Licensing: Wage Data Collection System | 3,000,000 | 0 |
| Labor & Licensing: Business Registry* | 10,000,000 | 0 |
| Public Safety: Offender Case Management System | 4,600,000 | 1,500,000 |
| Public Safety: Infrastructure Stabilization | 2,000,000 | 0 |
| Public Safety: Automated Finger Printing | 13,000,000 | 6,200,000 |
| Higher Education: Student Financial Aid System | 1,700,000 | 1,700,000 |
| Environment: Environmental Management System | 5,000,000 | 1,100,000 |
| Juvenile Services: Video Surveillance * | 5,500,000 | 0 |
| Juvenile Services: Statewide Education System | 2,500,000 | 1,300,000 |
| Total: | \$157,300,000 | \$43,300,000 |

*Submitted by OIT in the FY07 budget, subsequently cut by the Legislature.

Operating Budget

The five following agencies represent \$195 million (25%) of the State's IT operating budget for FY07. The DBM Office of Budget Analysis can provide additional details. Numbers are rounded for ease of computation.

| Agency | FY07 IT Operational Budget |
|---------------------------------------|----------------------------|
| Department of Transportation | \$34,000,000 |
| Department of Health & Mental Hygiene | 21,000,000 |
| Department of Public Safety | 42,000,000 |
| Department of Human Resources | 64,000,000 |
| Department of Budget & Management | 34,000,000 |

Total: \$195,000,000

The 2007 Operating Budget for the Office of Information Technology is listed as the following:

| Operation | General Fund (in millions) | Special Fund (in millions) | Total (in millions) |
|--|---------------------------------------|---------------------------------------|--------------------------------|
| State CIT | .519 | | |
| Enterprise Information System | 2.699 | .060 | |
| Applications System Management | 5.765 | | |
| Networks Division | | .079 | |
| Strategic Planning | 1.410 | | |
| Web Systems | 2.024 | | |
| Telecommunications | | 7.39 | |
| Major Information Technology Development Project Fund | 31.415 | | |
| Total | 43.823 | 7.538 | 19.961 |

The following is the 2007 appropriations for the Information Technology Departments or Information Resources:

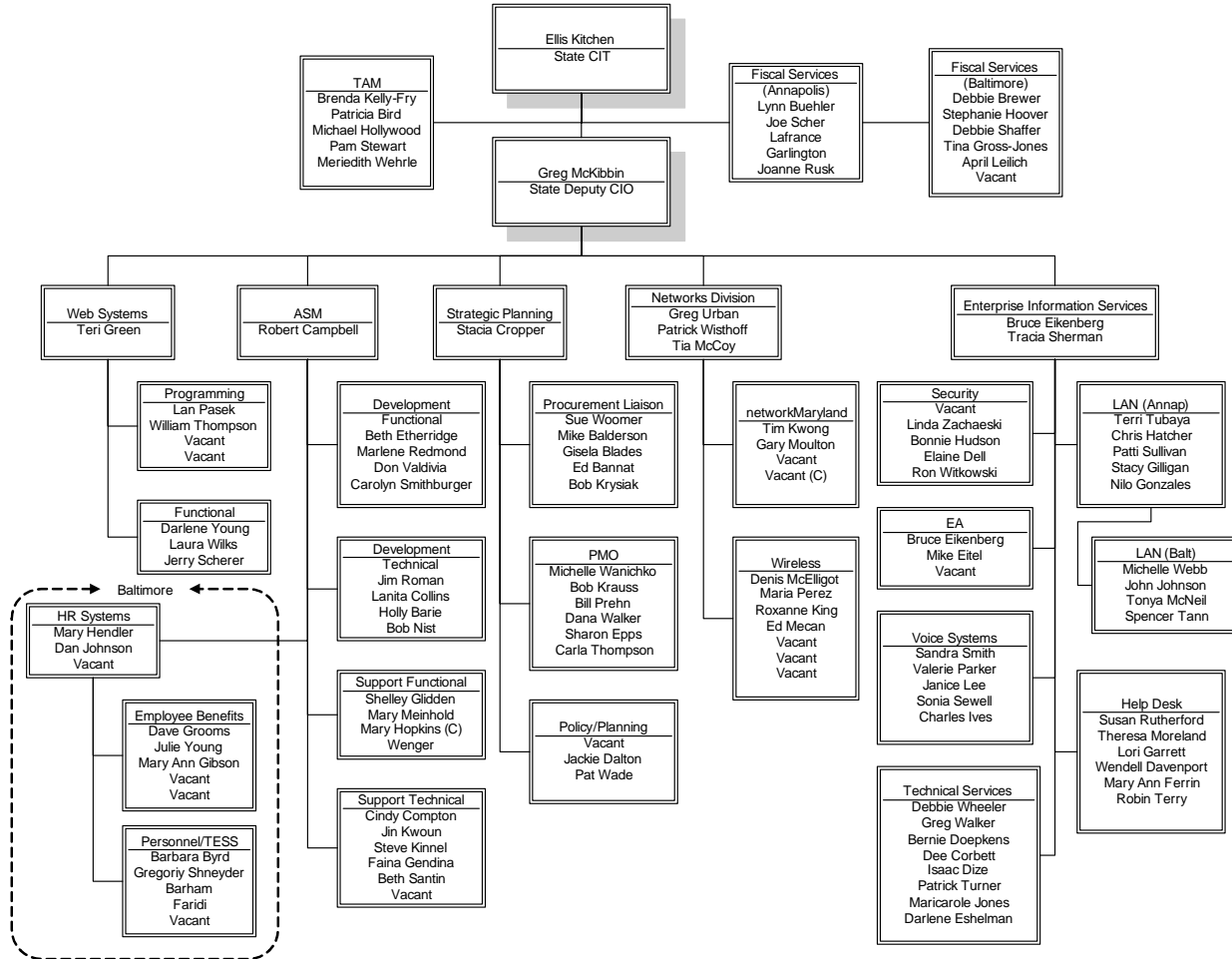
| Department | Special (in millions) | Federal (in millions) | Total Funding (in millions) |
|--|--------------------------------------|--------------------------------------|--|
| Transportation – IT Development Projects | .650 | | .650 |
| Transportation Technology | 34.481 | | 34.481 |
| State Highway IT Development | 2.6 | 3.0 | 5.6 |
| Motor Vehicle Administration IT | 6.27 | | 6.27 |
| Motor Transit Administration IT | 13 | 1.65 | 14.65 |
| Motor Aviation Administration | | .214 | .214 |
| Information Resources Management | | | 6.622 |
| Office of Technology for Human Services | | | 3.9 |
| Human Resources OIT | | | 6.1 |
| Probation and Corrective Services IT and Communication Division | | | 34.912 |
| Education OIT | | | 2.5 |
| Housing and Community Development OIT | | | 2.8 |
| Business Economic Development OIT | | | 4.422 |
| Natural Resources | | | 3.717 |
| State OIT | | | 19.9 |
| MD IT DPF | | | 31.415 |
| Total | | | 51.315 |

The following is the estimated revenue in 2007 from major departments:

| Department | General Fund (value in millions) | Special Funds (in millions) | Federal Fund (in millions) | Total Revenue (in millions) |
|--------------------------|---|--|---|--|
| Budget and Management | .688 | 31.9 | | |

| | | | | |
|-----------------------------------|--------------|--------------|--------------|--------------|
| Transportation | 24.0 | 2,590 | 851 | |
| Health and Mental Hygiene | 20 | 218 | 3,050 | |
| Probation and Corrective Services | 7.9 | 138 | 10 | |
| Education | 25.6 | 5.7 | 972 | |
| Business and Economic Development | | 51.9 | .695 | |
| Environment | .444 | 151 | 62 | |
| Juvenile Services | .235 | .143 | 15 | |
| State Police | 2.9 | 58 | 3.3 | |
| Totals | 1,058 | 3,244 | 5,650 | 9,952 |

B. Current DBM/OCIT Organization Chart



C. Martin O'Malley and Anthony Brown Ten Point Plan

Principle 1: We will make government work.

Principle 2: We will make government work more effectively.

Principle 3: We will make government work more effectively so it is more efficient

Principle 4: We will fight to make college education more affordable for all Marylanders, so we can expand economic opportunity and build a more just society. We will invest in school construction – to get our children out of trailers. And we will invest in K-12 education – including fully funding Thorton to reduce class sizes and improve public schools.

Principle 5: We will roll-up our sleeves to find the missing pieces of the healthcare puzzle in Maryland, so that responsible businesses that choose to cover their employees' healthcare can afford to do so.

Principle 6: We must choose to make Maryland a leader in improving public safety and homeland security at the same time, reforming Maryland's failed criminal justice system, including the Department of Juvenile Service, Parole and Probation, and Corrections.

Principle 7: We will invest Open Space dollars to purchase available land for conservation and public parks. We will make public decisions with world class scientists, as well as watermen and farmers, so that we begin to restore the health of the rivers and streams that determine the health of our Bay.

Principle 8: We choose to harness the tremendous power of Maryland's diverse economy, brain-power and talent pool for continued prosperity for all of our citizens, including expanded opportunities for minority and women-owned business.

Principle 9: We choose to advance a statewide vision for transportation, including mass transit, so that Maryland's character determines the future of growth instead of allowing growth to determine Maryland's future character.

Principle 10: We will put the public interest ahead of the special interest, standing up to powerful interests when they seek to make excessive profits at the expense of consumers and the working people of our State.

D. Advanced Information Technology

Pros and Cons of Dedicated and Desktop VTC Systems and Examples

1. Dedicated Systems:

a. Pros:

- Integrated Solution – Hardware and Software are specifically designed to work together.
- Low Latency – Less than 100ms
- Echo Cancellation - Hardware acoustic echo canceler on some systems
- GUI - User interface attempts to be intuitive; telephone analogies
- Vendor Support - One point of contact for both hardware and software support
- Scaling – Up to 14 simultaneous participants in one session.
- High Definition Resolution – Some systems support a resolution of up to 1280x720; referred sometimes as 720p.
- Audio/Video Equipment Integration – Easy to integrate 3rd party A/V equipment.

b. Cons:

- Price – Initial procurement and service contract costs can be expensive.
- Interoperability – While the underlying codecs are standards based, most vendors usually wrap the connection protocol in such a way to prevent interoperability of the higher quality codecs, with systems from other vendors. Some interoperability does exist though, using the older, lower quality codecs.
- Setup and Onsite Support – Complex systems may require specially trained staff for setup and onsite support.
- Proprietary Hardware and Software – Core system components are usually only manufactured/sold by one vendor.

c. System Examples:

Marconi ViPr:

- Up to 14 simultaneous participants
- Video feed resolution of up to 640x480 (1-to-1 chat)
- Low Latency
- Built in echo cancellation on some systems

Polycom HDX:

- Up to 8 simultaneous participants
- Video feed resolution of up to 1280x720 (1-to-1 chat)
- Low Latency

2. Desktop Systems:

a. Pros:

- Echo Cancellation - Software acoustic echo canceler on some systems
- High Definition Resolution – Some systems support a resolution of up to 1280x720; referred sometimes as 720p.
- Price – Software and hardware can be added to existing desktop computers, relatively inexpensively. New systems also have a low cost.
- Setup and Onsite System Support – Local support staff will have familiarity with the hardware and operating system. Due to the low cost and wide proliferation of desktop video conferencing software, local support staff has probably encountered

- some application variants.
- COTS Hardware – Hardware components are easy to acquire and cost less due to marketplace competition.
- Scaling - Large number of simultaneous participants (greater than 14) with some systems; limited only by hardware constraints.

b. Cons:

- High Latency – More than 100ms
- GUI – Some interfaces are not as easy as others. Steep learning curve.
- Vendor Support – Vendor support for conference application may be problematic at times due to diversity of underlying hardware and operating system configuration. Some software may only have community support, i.e. Some open source applications.
- Audio/Video Equipment Integration – A/V equipment is not as easy to integrate
- Onsite Application Support of Open Source Applications – Application support can be difficult due to lack of experience with the application and dependency software.

c. Desktop Examples:

iChat:

- Up to 4 simultaneous participants
- Video feed resolution of up to 640x480 (1-to-1 chat)
- Built in echo cancellation
- High Latency

Access Grid:

- Number of simultaneous participants bound by hardware (CPU, network, etc.)
- Video feed resolution of up to 640x480 (1-to-1 chat)
- High Latency

3. Some Examples VTC installations

The University of Maryland (UMATS)

69 locations connected with Polycom 4000 and Polycom FX
 Network: IP
 Typical Cost w/Current equipment
 Polycom VSX 8000 Media Center \$ 15,300

U.S. Army Research Laboratory

51 locations connected by Polycom FX, MP and VSX 8000
 Network: ISDN (line lease fee required) \$ unknown
 Typical Cost w/Current equipment
 Polycom VSX 8000 Media Center \$15,300

U.S. Army Research Laboratory

8 Locations connected by InSORS
 Network:IP (yearly licensing fee required) \$300
 Typical Cost w/Current equipment
 InSORS software, Computer, camera, hardware, monitor etc \$6000

U.S. Army Research Laboratory

5 Locations connected by ViPr
 Network: IP
 Typical Cost w/Current Equipment
ViPr Software, Computer, camera, hardware, monitor etc

E. Team Task Group Composition

IT Budget

| NAME | AFFILIATION |
|-----------------------|--|
| Sylvester Okey Ezeani | Pres, Uluga Enterprises Ltd |
| Quan Hoang | Founder, AnviCom -Command Federal |
| Ethan Kazi | Partner, Canton Group |
| Bel Leong-Hong | Pres, Knowledge Advantage, Inc. |
| Robert Padgett | LSP Consulting Group, In.c |
| Jason Ross | Director, Skyline Network Engineering, LLC |
| Ashok Saxena | V.P., Programs, ECSI International, Inc. |
| Robert Wallace | Pres./CEO, BithGroup Technologies |

IT Organization Structure

| NAME | AFFILIATION |
|-----------------------|--|
| Will Castleberry | Director, State Public Policy AOL |
| Chris DiPietro | CDI Consulting Services |
| Tim Fusing | Sr. Principal Account Manager, ARINC |
| Sylvester Okey Ezeani | Pres, Uluga Enterprises Ltd |
| Ethan Kazi | Partner, Canton Group |
| Belkis Leong-Hong | President, Knowledge Advantage, Inc. |
| Joe Nimely | Mayor's Office Of Employment |
| Rajan Natarajan | V.P., Business Dev, Artisys Corp. |
| Robert Padgett | LSP Consulting Group, Inc. |
| Jigar Patel | VPN Team Lead, Comtech, LLC |
| Jason Ross | Director, Skyline Network Engineering, LLC |
| Ashok Saxena | V.P., Programs ECSI International, Inc. |

IT Human Capital

| NAME | AFFILIATION | NAME | AFFILIATION |
|-----------------------|---|-------------------|---|
| Will Castleberry | Director, State Public Policy AOL | Martin Ma | CEO, ITTECOM, Inc |
| Michael Christiansen | Acct Exec, State and Local Govt Microsoft | Rajan Natarajan | V.P., Business Dev, Artisys Corp. |
| Chris DiPietro | CDI Consulting Services | Alexander Nguyen | Litigation Associate, Kirkland & Ellis, LLP |
| Lewis Eigen | Pres, SHS, Ltd. | Joe Nimely | Mayor's Office of Employment |
| Sylvester Okey Ezeani | Pres, Uluga Enterprises Ltd | Robert Padgett | LSP Consulting Group, Inc. |
| Ajay Gupta | Pres, G Security Inc. | Jigar Patel | VPN Team Lead, Comtech, LLC |
| Quan Hoang | Founder, AnviCom - Command Federal | Parbu Prubhakaran | Program Dir, ARL MSRC Raytheon |
| Michael Johnson | Dir. Of Infrastructure Services, BCPSS | Jason Ross | Director, Skyline Network Engineering |
| Ethan Kazi | Partner, Canton Group | Ashok Saxena | V.P. Programs, ECSI International, Inc. |
| Sean Keller | Co-Founder & COO, Sage Management | Robert Wallace | Pres, Bithgroup |
| Belkis Leong-Hong | Pres, Knowledge Advantage, Inc | Hugh Williams | Legislative Staff |

Recommendation came from several task groups.

IT Procurement/Acquisition

| NAME | AFFILIATION |
|------------------|--|
| Will Castleberry | Director, State Public Policy AOL |
| Sean Keller | Co-Founder & COO, Sage Management |
| Jason Ross | Director, Skyline Network Engineering, LLC |

IT Infrastructure

| NAME | AFFILIATION |
|-----------------------|--|
| Will Castleberry | Director, State Public Policy AOL |
| Christopher DiPietro | CDI Consulting Services |
| Sylvester Okey Ezeani | Pres, Uluga Enterprises Ltd |
| Ethan Kazi | Partner, Canton Group Services |
| Rajan Natarajan | V.P., Business Dev, Artisys Corp. |
| Joe Nimely | Mayor's Office of Employment |
| Robert Padgett | LSP Consulting Group, Inc. |
| Jigar Patel | VPN Team Lead, Comtech, LLC |
| Ashok Saxena | V.P. Programs, ECSI International, Inc. |
| Jason Ross | Director, Skyline Network Engineering, LLC |
| Robert Wallace | Pres./CEO, BithGroup Technologies |

Legislative Initiatives

| NAME | AFFILIATION |
|------------------|---|
| Quan Hoang | Founder, AnviCom -Command Federal |
| Alexander Nguyen | Litigation Associate, Kirkland & Ellis, LLP |
| Hugh Williams | Legislative Aide |

IT Security

| NAME | AFFILIATION |
|-----------------|--|
| Ajay Gupta | Pres, G Security, Inc. |
| Michael Johnson | Dir. Of Infrastructure Services, BCPSS |
| Jigar Patel | VPN Team Lead, Comtech, LLC |

Advanced Information Technology

| NAME | AFFILIATION |
|-----------------------|--|
| Lewis Eigen | Pres, SHS, Ltd. |
| Sylvester Okey Ezeani | Pres, Uluga Enterprises, Ltd. |
| Martin Ma | CEO ITTECOM, Inc. |
| Jigar Patel | VPN Team Lead, Comtech, LLC |
| Parbu Prubhakaran | Program Director, Raytheon Information Solutions |
| Ashok Saxena | V.P., Programs, ECSI International, Inc. |

F. Biographies (Alphabetized)

Will Castleberry

wcastleberry@aol.com

As Director of State Public Policy, Mr. Castleberry oversees the AOL's public policy for the 50 United States and supports AOL in developing thoughtful and effective business practices. He manages a team of more than 25 government consultants to assist Governors and state legislatures in drafting sound Internet, IT and business legislation.

In this capacity, he works directly with Governors, Attorneys General and Legislators to strengthen Internet child protection and privacy laws. He has helped draft model legislation to support states' efforts to combat online sexual predators, identity theft and Phishing. His current efforts include raising public awareness of the dangers of online predators.

From 1996 – 2002, Mr. Castleberry worked for Governor Parris N. Glendening in various capacities. During that time Mr. Castleberry served as a Special Assistant to the Governor, Assistant Secretary for Economic Policy, and in 2000, he was appointed Director of the State's Office of Global Investment and Technology.

Mr. Castleberry serves on several boards and commissions including Technology Committees for the Council of State Governments, the American Legislative Exchange Counsel, and the AeA. He also serves on the Government Affairs Committees for the Internet Alliance, the Information Technology Association of America and the Internet Commerce Coalition. From 1996 to 1999 he served as a member of Maryland's Critical Areas Commission.

Mr. Castleberry holds a Master of Science in Business from Johns Hopkins University and a Bachelor of Arts in English from the University of Maryland. He has completed post-graduate work in Business at Harvard University and the Wharton School of Business. He has also served as an Adjunct Professor of Business at the Johns Hopkins University.

He is a native Marylander and attended Severna Park High School. He now resides with his wife, Erin, and their three children in Potomac, Maryland.

Michael Christensen

michrist@microsoft.com

Mr. Christensen is an Account Executive for State and Local Government through Microsoft.

Christopher DiPetro

chris@cdi-consulting.net

For the past nine years, Chris DiPietro has owned and operated CDi Consulting Services, a consulting firm based in Baltimore. CDi provides government relations and association management services in the states of Maryland and Delaware. Mr. DiPietro offers comprehensive lobbying and consulting services to public, private and non-profit sector clients before legislative and administrative agencies at both the state and local levels of government. Since July 2001 Mr. DiPietro serves as a member of the board of directors of the Consumer Credit Counseling Service of

Maryland and Delaware. He currently holds the position of Vice-Chairperson for CCCS. Mr. DiPietro also serves the executive committee of the newly formed Maryland Coalition for Financial Literacy, a broad based coalition seeking to improve the financial literacy skills of Maryland's students and adults. Beginning in 2004 Mr. DiPietro also holds a position on the board of the Maryland Council on Economic Education.

Mr. DiPietro, who resides in Baltimore City, holds a Bachelors of Arts degree in business management from Washington College in Chestertown, MD.

Lewis Eigen

leigen@shs.net

A leading, award-winning, information scientist, social marketer, knowledge manager and educational technologist, Dr. Lewis Eigen is president the SHS division of ORC Macro. His experience spans the corporate world and includes high school and university teaching and research, private sector information technology, computer communications, and Government service. One of the earliest World Wide Web pioneers, he has held leadership positions in the public, academic, and private sectors—as the chief executive officer of a publicly traded educational materials and information corporation, an Associate Professor of Research and Educational Psychology (Temple University) and as Associate Director of the U.S. Job Corps of the Executive Office of the President.

Dr. Eigen has more than 100 professional journal articles in publications such as *Popular Electronics*, *Journal of Orthopsychiatry*, *Personnel Management*, *Journal of Educational Psychology*, *Alcohol Health & Research World*, *Lotus Magazine*, *PC Magazine*, 11 textbooks (published by SRA Division of IBM), 2 professional books (John Wiley & Sons), 2 popular books (McMillan and AMA), 2 video productions, more than 500 junior high school multimedia teaching units (Appleton Century Crofts), and 3 published computer program systems (IBM, ERI and REI). Personally developed some of the earliest Word Wide Web sites and managed several involving computer and technology access.

He holds an Ed.D., and M.A. from Columbia University awarded 1958 and 1961 and received his B.A. in Mathematics from Brown University in 1956, respectively.

Sylvester Okey Ezeani

uluga@hotmail.com

Mr. Ezeani is a public management and finance professional with years of government experience developing and implementing strategies for public sector organizations. Majority of his experience has been in the Correctional sector, primarily the Information Technology (IT) industries. Currently he serves as a Senior Network Engineer for the Government of District of Columbia, Department of Corrections.

Mr. Ezeani further developed and enhanced his skill as a Program Analyst during his time spent with the Department of Corrections. In this role, he worked on wide range of projects, from conducting cost benefit analysis for Correctional Privatization that saved the District Government about \$52,000,000.00 dollars. In 2000, Mr. Ezeani joined the D.C. Department of Corrections Information Technology as a Senior Network Engineer. In this role, he served as the chief advisor to the Information Services Director and worked closely with other senior executive management to coordinate the Network strategy and identify new initiatives.

Mr. Ezeani holds a B.A. degree in Economics from Howard University (1987) and a Master of Business Administration (M.B.A) from the University of the District of Columbia (1989). He also graduated from the George Washington University School of Business and Public Management Program for Excellence in Municipal Management as a certified Public Manager (CPM). He is married to his lovely wife, Charity, and has four children.

Tom Fusting

TFUSTING@arinc.com

Mr. John T. Fusting (Tom), Sr. Principal Account Manager develops Maryland State and Local business for ARINC in Annapolis. Tom Fusting has 21 years of experience progressing in communications engineering, information technology, program management, organization change management, and business development. His work experiences include Norfolk Southern Railroad, 1984-1986, Computer Sciences Corporation 1987-2006, and ARINC 2006 to current dedicating the past ten years of his career to Maryland IT management.

From 1996 to 2006 Mr. Fusting won and ran consecutive **Network Management Services (NMS)** Contracts worth \$220M with the Maryland Department of Transportation (**MDOT**) overhauling their network, systems, and IT governance. Under his guidance, MDOT earned the reputation of having the best managed IT shop in the State by facilitating significant organizational and process change management. As Program Manager for the **networkMaryland** program, he lit fiber optic backbone network throughout the State and won the recompetes in 2003. Mr. Fusting also won and managed the BWI Airport Smart Park system, the first such intelligent guidance system in the United States.

He graduated from Greater Baltimore Committee's (GBC), "The LEADERship" program class of 2004, and holds a MS degree in Electrical Engineering from Johns Hopkins University.

Ajay Gupta

agupta@mail.gsecurity.com

Mr. Gupta founded and has managed MD-based Gsecurity since 2002. He is a CISSP certified Information Security Professional with over 12 years experience within Information Technology, Security, and Data Privacy. Mr. Gupta has been involved in a wide range of professional projects for corporations, government agencies and non-profit organizations at both the hands-on and management level. In addition to his professional engagements, Mr. Gupta has served as an invited lecturer for numerous Public and Private Organizations across the globe and serves on and chairs many security and industry-related associations. He is currently heavily involved in economic development issues through serving on the Boards of the Technology Assistance Center Incubator and the International Business Strategy Advisory Council, as well as the Maryland India Business Roundtable.

Quan Hong

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In just over a decade, he led the growth of AnviCom from one employee and \$80 thousand in revenue to over 200 employees and \$33 million in revenues. The company has remained profitable and focused on web-enabling applications and network implementation services while doubling in size for

several consecutive years and graduating from the Small Business Administration's 8(a) program. Mr. Hoang led the acquisitions of two technology companies, the most recent being Niche Networks Inc., which brought expertise in Voice over IP and wireless networking technology as well as Cisco IP Telephony and Wireless LAN specialization and certifications to AnviCom. In 1999, he led the acquisition through merger of CareNet Systems of Euless, TX, a company offering software and services in the rapidly-growing medical practice management and billing arena. The AnviCare division was successfully spun off in 2002. His degrees include a Bachelor of Science in Aerospace Engineering from St. Louis University, Missouri, and a Master of Science in Business Administration, East Texas State University, Texas.

Michael Johnson

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Michael Johnson is currently the Director of Infrastructure (IT) for Baltimore City Public School System. In that capacity he is helping to lay the foundation that will enable the children of Baltimore City, through the use of technology, the ability to compete with the best public schools in the nation. Mr. Johnson is trained as an Electrical Engineer and is a trained Professional Project Manager. He has held senior technology positions at both IBM and AT&T. Personally Mr. Johnson is happily married to the love of his life Camille. They have two children Tiffany who is 23 and a graduate of Wharton Business School and Ty who is 15 and currently attends Bryn Mawr School in Baltimore City.

Ethan Kazi

ekazi@cantongroup.com

Mr. Ethan Kazi is the Chief Executive Officer and Co-Founder of The Canton Group, LLC. The Canton Group is an IT Services Firm specializing in Web Application Development, Managed Application Services, Data Center Engineering, and Network Security/Engineering Services. The Canton Group is a Maryland State MBE, CATS Master Contract holder, Certified 8a and GSA Schedule Holder. Mr. Kazi started as the firm's Chief Information Officer in 1998 and was responsible for planning, designing, developing, managing, and testing complex, mission critical IT systems. He primarily worked in the areas of Web based systems development and legacy systems conversions/integration. The overarching goals of Mr. Kazi's projects were maximizing interactive functionality and providing real-time data exchange. He has worked on a variety of IT projects throughout Maryland State Government for Maryland Department of Budget and Management, Maryland Department of Humans Resources, Maryland State Ethics Commission, Maryland Department of General Services, Maryland Aviation Administration, Maryland Transit Administration, Maryland State Retirement Agency, and Maryland Department of Transportation. In 2005, Mr. Kazi became the CEO of The Canton Group. He is responsible for the overall management of the organization and provides administrative and technical oversight to key business and project areas as necessary.

Sean Keller

sean.keller@sage-mgt.net

Sean P. Keller is the Co-Founder and Chief Operating Officer of Sage Management, a Management, Engineering and GIS Consulting firm located in Columbia, MD (www.sage-mgt.net). Prior to co-

founding Sage, Mr. Keller was employed in various technical, leadership and managerial positions in the US Defense Industry. In addition, Mr. Keller is a Faculty Adjunct at The Johns Hopkins University. In 2005, Mr. Keller retired from the US Air Force Reserve after nearly 22 years of service to his country. Mr. Keller holds a B.A. from the University of Maryland, College Park and a M.S. from The Johns Hopkins University. Active in the community, Mr. Keller serves on the Board of the Soccer Association of Columbia, is a Girls Soccer Coach and has served in various volunteer capacities at the Baltimore Basilica, to include the Bicentennial Committee. Mr. Keller resides in Clarksville, Maryland with his wife, Sheri, a Howard County Public School Teacher, and their daughters, Shayna and Sierra.

Bel Leong-Hong

belapadems@comcast.net

Belkis Leong-Hong is a member of the O'Malley-Brown Transition Team Steering Committee and the Team Leader for the IT Transition Team. She is the founder and President and CEO of Knowledge Advantage, Inc., a company specializing on Knowledge Management, IT management, and IT Workforce program, with clients in both the Federal Government and in the private sector. Ms Leong-Hong retired from DOD as the Deputy Assistant Secretary of Defense for Command, Control, Communications, and Intelligence in the Office of the Secretary of Defense and she was the Deputy Commander for the Joint Interoperability and Engineering Organization and the Director of the Corporate Information Management Office at the Defense Information Systems Agency (DISA). She was also the Principal Deputy Director of the Defense Security Service (DSS). She is an expert in data management and knowledge management. She is extremely active in her community, and in her professional societies, such as AFCEA where she was the President of its largest chapter, past president of Women in Technology, and is on the Advisory board of the KM conferences. She holds an MPA from American University, and a BS in Mathematics from Hunter College.

Sasha Leonhardt

sleonhardt@gov.state.md.us

Sasha Leonhardt was Deputy Director of Research and Policy on the O'Malley/Brown campaign, and was also director of technology and webmaster. He was the staff director for the IT Transition workgroup. He currently serves as Deputy Press Secretary to the Governor. Leonhardt graduate from Princeton University with an AB in Politics.

Martin Ma

martin.ma@ittecom.net

Summary

- Extensive Executive and Senior Management experiences in both large corporations and small businesses, such as Raytheon Company, Hughes Network Systems, Earth Satellite Corporation, and InfoTech & Telecom Engineering (ITTECOM), etc. in last 20 years.
- One of Key Chinese American Community Leaders for more than 20 years at Maryland and in the Great DC Metro Area.
- One of Key leaders from Asian Pacific Community who has been firmly supported Democrat Party's principles & philosophy; consistently participated most Democrat Party's activities; initialized and organized many fundraise and rally events for Democrat Party's candidates, including fundraise for Governor O'Malley, Senator Mikulski, Senator Ben Cardin, MC

Executive Ike Leggett, Delegate Susan Lee, Doug Duncan, etc.; and continuously contributed money and time to Democrat Party for more than 15 years.

Executive Experience

- President & CEO, ITTECOM, Inc. 2003 - President.
- Chief Executive Officer, HMW-ITTECOM, CJV, 2005- President.
- Chief Operating Officer, Zero & One – ITTECOM, 2004-2005.

Education

- Ph.D., Geospatial Information Technology, University of Oklahoma, Norman, OK, 1993
- Ph.D. Program (ABD), Satellite Digital Image Processing & Information Systems, University of Denver, Denver, Colorado, 1987-1989

Rajan Natarajan

natarajanmr@yahoo.com

Dr. Rajan Natarajan is the Team Leader for the Organization Structure Subgroup of the IT Transition Team. At present, Dr. Natarajan is the Vice President of Artisys Corporation and is responsible for overseeing business development and strategic partnerships. Over the past ten years, he has been dealing with several federal and state agencies providing IT consulting services and software solutions. He holds two Masters degrees and a Ph.D. in biosciences and an MBA from Michigan State University. He has authored more than 25 articles and publications. Dr. Natarajan was a recipient of National Science Foundation (NSF) Small Business Innovation Research award and Indian National Young Scientist Academic Merit award. Dr. Natarajan is an entrepreneur and active in various professional and non-profit organizations and also executive board member of the US India Chamber of Commerce and Maryland India Business Roundtable.

Alex Nguyen

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Experience

- Litigation Associate, Kirkland & Ellis LLP
- Public Interest Law Initiative Fellow, Legal Assistance Foundation
- Research Assistant, Jason Deparle's American Dream

Education

- J.D. Yale Law School 2003
- B.A. Social Studies, magna cum laude, Harvard University, 1999

Joe Nimely

joenimely@yahoo.com

Experience

- Network Administrator, Mayor’s Office of Baltimore Employment Div.
- Network Specialist/Helpdesk, Housing Authority of Baltimore City
- Network Team Leader, Computer Sciences Corporation

Education

- Master Degree Candidate in MIS
- Bachelor’s Degree in Information Technology from AIU

Robert Padgett

BobPadgett@cablespeed.com

Mr. Padgett is a Senior IT and business executive with more than 30 years of experience managing IT and business projects, leading cross-functional teams, sales, information systems, marketing, finance, customer service, logistics, and interfacing with IT and business executives and technical experts. An experienced relationship manager who works with IT and business executives to analyze business challenges and implement high impact solutions by leading and motivating individuals at all organizational levels. Proactive, analytical visionary, who formulates and implements creative methodologies to improve operations and quality, reduce operating expenses, shorten time to market for innovative offerings and maximize employee capabilities. I've been responsible for managing over three hundred employees (300 FTEs) with multiple annual budgets over \$30 million. The divisions which I have been responsible for are applications programming, technical (systems) support, database maintenance, computer operations, production control, networking, help desk, systems security, disaster recovery and vendor management. My career has also provided me with the opportunity to have worked in the “Outsourcing” sector both as a client and vendor.

Jigar Patel

jigarkumar_g_patel@yahoo.com

Experience

- VPN Team Lead, RAS Division, Center of Internetworking, Comtech, LLC, Vienna, VA – U.S. General Services Administration– March 2006 – Present
- Lead Security Instructor, Authsec Inc, Columbia MD, May 2005-Feb 2006

Education

- Masters In Ecommerce (Specialization: I.T Security) – SEMCOM College, SPU, V.V.Nagar, Gujarat/India
- B. Tech, D.T- SMC College Of Dairy Science, GAU, Anand, Gujarat/India

Prabu Prabhakaran

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Mr. Prabhakaran has more than 29 years of diversified experience in Information Technology for technical and business environments in positions of increasing responsibility in commercial and government organizations with a Ph. D. in Numerical Analysis (Computational Mathematics) and MBA in Information Systems Management. Mr. Prabhakaran is currently a Program Director of the Army Research Laboratory Major Shared Resource Center for the Raytheon Company/US Army. He was also a Vice-President of Scientific Support Studies for Sterling Software, Inc. partnering with NASA.

Mr. Prabhakaran has received his MBA in Management Information Systems, a Ph.D. for Applied Mathematics/Computer Science and holds an M.S. and B.S. in Mathematics.

Jason Ross

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The Team Leader for the IT Procurement/Acquisition Subgroup is Mr. Jason Ross, Director of Business Development for Skyline Network Engineering, LLC. Mr. Ross previously worked for the Department of Budget and Management (DBM), Office of Information Technology, Networks Division where he was the Division Director and reported directly to the State CIT. During his three and half year tenure at the State, Mr. Ross participated in numerous large IT procurements and RFP efforts, often serving as the Subject Matter Expert or the Evaluation Committee Chairman. Mr. Ross also used many of the Statewide contracts managed by DBM in the successful build-out of the State owned data network known as networkMaryland™. Today, Mr. Ross participates in the CATS contract, with Skyline Network Engineering, LLC being a Master Contractor and a Small Business Reserve (SBR) company. During this professional career, Mr. Ross has worked for telecommunications service providers such as Comcast, Digital Broadband Communications and Xspedius Communications. Mr. Ross has a Masters in Telecommunications from University College, University of Maryland and Bachelors from the University of Maryland.

Ashok Saxena

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Over 30 years of experience in managing the design/integration of systems of strategic importance to the nation. Vice-President of Programs at ECSI International, a public company, whose security systems protect many of the key assets of the US. One of his responsibilities is the management of a \$500M DoD IDIQ contract that includes the development of information standards and interoperability specs for four services of the DoD.

Over a period of 14 years, founded, operated and sold two companies. Companies manufactured hardware and developed software that spanned numerous applications and platforms. Clients included the DoD, NASA, NOAA, IBM, GM and Lockheed-Martin. One company was recognized in the Washington Post, Washingtonian magazine and in newspapers abroad. Invited speaker at the National Press Club on the role of Asian immigrants in American society.

Awarded President's Management award, Fairchild, a Fortune 500 company. Managed the design/integration of satellite communications systems, US/international fiber systems, IP telephony, microwave communications systems, software radios, encrypted wireless links and map based hand-held, devices for first responders.

Educated in Aerospace, Electrical and Mechanical Engineering. Graduate studies conducted at Virginia Tech and MIT. Served on several professional committees including the National Technical Committee on Computer Systems of the AIAA.

Robert Wallace

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Robert L. Wallace is an accomplished entrepreneur, author, business consultant and internationally known speaker. Mr. Wallace is the founder and Chairman of the Board of [The BITH GROUP, Inc.](http://www.bithgroup.com) (www.bithgroup.com), an information technology consulting firm that provides services in management consulting, telecommunications, wireless engineering, network security, software development, and helpdesk support. Mr. Wallace is also the founder of [Entreteach Learning Systems, LLC](#), an exciting new e-learning company designed to foster the development of minority and women entrepreneurs, intrapreneurs, and micro enterprises. His third company, Techcom, LLC, is a technology commercialization company. He is a high energy and widely successful entrepreneur, who has been sought after for over 27 years for his expertise in engineering, telecommunications, systems development, business development, intrapreneurship and entrepreneurship development. As an aspiring large systems engineer for IBM. Mr. Wallace, who had earned his Bachelor of Science degree in Mechanical Engineering and Applied Mechanics from the University of Pennsylvania and his MBA from the Tuck School of Business at Dartmouth College, was the ideal candidate for IBM's newly created engineering / manufacturing and Industrial Business unit.

Hugh Williams

a.hugh.williams@gmail.com

Mr. Williams is the Legislative Aide for Delegate Susan C. Lee, Montgomery County, Maryland. He worked on behalf of Del. Lee with consumer advocates, interest groups and citizens to pass seven of ten bills introduced by Del. Lee. Mr. Williams has extensive knowledge of the Maryland legislature and COMAR. He is also a Grassroots organizer on state and federal legislative campaigns, with hands-on experience in lobbying elected officials, coordinating media events, planning town/community meetings, writing/editing newsletters, testimony, op ed, etc. He received his BA from *Skidmore College Saratoga Springs, NY in 2001.*