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Department of Information Technology

Operating Budget Data

($ in Thousands)

	FY 17 Actual	FY 18 Working	FY 19 Allowance	FY 18-19 Change	% Change Prior Year
General Fund	$64,860	$57,555	$96,381	$38,826	67.5%
Adjustments	0	254	138	-115	
Adjusted General Fund	**$64,860**	**$57,809**	**$96,519**	**$38,711**	**67.0%**
Special Fund	9,485	11,086	17,248	6,163	55.6%
Adjustments	0	-8	4	13	
Adjusted Special Fund	**$9,485**	**$11,078**	**$17,253**	**$6,175**	**55.7%**
Federal Fund	36	0	0	0	
Adjusted Federal Fund	**$36**	**$0**	**$0**	**$0**	
Reimbursable Fund	73,136	49,713	49,084	-629	-1.3%
Adjustments	0	0	63	63	
Adjusted Reimbursable Fund	**$73,136**	**$49,713**	**$49,148**	**-$566**	**-1.1%**
Adjusted Grand Total	**$147,517**	**$118,600**	**$162,920**	**$44,320**	**37.4%**

Note: FY 18 Working includes targeted reversions, deficiencies, and across-the-board reductions. FY 19 Allowance includes contingent reductions and cost-of-living adjustments.

- The budget includes two general fund deficiency appropriations, $1,000,000 appropriated for the new One Portal major information technology (IT) project and a $516,251 reduction to infrastructure program salaries and wages, for a net general fund deficiency appropriation totaling $483,749. **The Department of Legislative Services (DLS) recommends that the One Portal major IT Project deficiency be approved and that the salary deficiency reduction total $668,000, an additional $172,000 reduction.**

- After adjusting for cost containment reductions, deficiencies and the cost-of-living adjustment, the fiscal 2019 budget increases by $44.3 million over the fiscal 2018 working appropriation.

Note: Numbers may not sum to total due to rounding.

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- Most of the increase is attributable to major IT project funding, which increases by $39.2 million.

Personnel Data

	FY 17 Actual	FY 18 Working	FY 19 Allowance	FY 18-19 Change
Regular Positions	248.60	234.60	234.60	0.00
Contractual FTEs	2.10	1.10	1.10	0.00
Total Personnel	**250.70**	**235.70**	**235.70**	**0.00**

Vacancy Data: Regular Positions

Turnover and Necessary Vacancies, Excluding New Positions	14.03	5.98%
Positions and Percentage Vacant as of 12/31/17	38.60	16.45%

- Although there is no increase in positions in fiscal 2019, there was a decrease in fiscal 2018, as two agencies left the Enterprise Tech Support Initiative. This initiative is discussed in the Issues section of this analysis.

- In fiscal 2018, the Department of Information Technology (DoIT) lost a 0.9 contractual full-time equivalent (FTE) in the State Chief of Information Technology's Office and 0.1 contractual FTE in Cybersecurity.

- The department continues to have a high turnover rate, which at 16% is greater than the statewide average.

Analysis in Brief

Major Trends

Cybersecurity: The department has published cybersecurity performance measures. The agency will provide vulnerability assessments, penetration tests, or audits to 20 agencies each fiscal year. A cybersecurity awareness program has also been implemented, and 80% of employees are participating.

Oversight of Major IT Projects: DoIT oversees State agency major IT projects. Since fiscal 2009, measures established to judge project success suggest that progress is being made as more projects remain on schedule and on budget. The percentage of projects whose costs deviated from the baseline scope or cost declined to 15% in fiscal 2017.

Web Systems Indicators: The Internet is essential in engaging citizens and providing services. DoIT increased the number of web applications by 9% in fiscal 2016 and 16% in fiscal 2017.

State Agency Support Indicators Should Change as the Department Reorganizes: The department also supports systems used by State agencies, such as telecommunications systems, wireless networks, a data network, and statewide financial and personnel systems. As discussed in the Issues section of this analysis, the department is implementing its Enterprise Tech Support Initiative. **DoIT should develop new indicators that reflect its changing workload.**

Issues

Review of Cybersecurity Standards, Policies, and Procedures: DoIT is responsible for developing, maintaining, and enforcing IT policies, procedures, and standards. The department is also required to provide technical assistance, advice, and recommendations concerning IT matters, which includes cybersecurity. Recent audit findings identified areas in which the State's cybersecurity efforts can be improved. Cybersecurity social engineering concepts also offer guidance for reducing security risks. Concerns are raised about staffing stability. **The department should brief the committees on its cybersecurity efforts.**

The Office of Rural Broadband Is Formed: In order to be responsive to concerns about the availability of broadband in rural areas of the State, on August 11, 2017, the Governor signed Executive Order 01.01.2017.14, which created the Office of Rural Broadband in DoIT. The office is required to assist local jurisdictions in their improvement of accessing high-speed Internet; identifying and coordinating the delivery of sources of funds, including federal funds specifically identified for this purpose; working with local economic development agencies to identify areas with a demand for better Internet services; investigating new technologies that would increase high-speed Internet availability; and developing policy, regulations, or legislation relevant to increasing broadband availability. DoIT has examined a number of approaches to enhance rural broadband. Affordability also seems to be a concern since some areas with broadband have comparatively low rates of broadband usage. A number of agencies are also supporting rural broadband efforts. **To get a comprehensive perspective, DLS**

recommends that DolT's Office of Rural Broadband report to the budget committees on the State's rural broadband efforts.

Enterprise Tech Support Initiative: DoIT began migrating day-to-day IT operations in fiscal 2016. Currently, approximately 9,500 State employees are served by DoIT. **DoIT should develop indicators that measure service quality and prepare a master plan for the Enterprise Tech Support Initiative.**

Status and Future of Data Centers: As IT systems have expanded, the demand to digitally store data has grown. This data is stored in various data centers across the State. Data storage is decentralized in different State agencies. The State does not have a master plan for data centers. **DLS recommends that DoIT develop a master plan for data centers. This plan should inventory current assets, project out-year data capacity needs, and compare the benefits of cloud storage compared to the State investing in capacity. Issues to examine with respect to cloud storage or State-built capacity include lifecycle costs, security needs, disaster recovery, and scalability.**

eMaryland Marketplace's Fiscal 2017 One-time Unfunded Deficiency: eMaryland Marketplace (eMM) is an Internet-based procurement system managed by the Department of General Services (DGS). In 2011, DGS entered into a five-year contract to develop and operate eMM. At the conclusion of the five-year contract, DGS elected not to exercise a five-year option to have Periscope Holdings, Inc. continue to operate eMM. It did, however, extend the contract for two months until it could devise an alternative arrangement. The department also approved a work order to develop an enhanced procurement system. The annual closeout audit identified $3.6 million related to this work that was provided prior to June 30, 2017. DoIT has received $1.0 million in related revenues to partially offset the cost of this compensation payment. Additional general funds totaling $2.6 million are required to cover the remaining fiscal 2017 expenses. **Unless additional information is made available in the Office of Legislative Audits findings, DLS recommends that the Administration propose a deficiency appropriation for the unpaid fiscal 2017 expenses.**

Operating Budget Recommended Actions

1. Adopt narrative to request a report on rural broadband.
2. Adopt narrative to request an Enterprise Tech Support Initiative Status Report and Master Plan.
3. Adopt narrative to request Enterprise Tech Support Initiative Performance Indicators.
4. Add budget bill language to authorize the transfer of general funds to other agencies.

Updates

IT Personnel Policy Report: The fiscal 2018 *Joint Chairmen's Report* (JCR) required that DoIT and the Department of Budget and Management update the budget committees on IT personnel policies in response to concerns about high turnover rates and low salaries. The conclusion is that some IT classifications may be considered for a salary adjustment through the Annual Salary Review process.

Report on the Status of the Agile Approach for Major IT Development Projects: The fiscal 2018 JCR required that DoIT update the budget committees on its implementation of the Agile approach for major IT development projects. The update summarizes the changes made to the major IT project development process.

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Department of Information Technology

Operating Budget Analysis

Chapter 9 of 2008 created the Department of Information Technology (DoIT). The department contains the following divisions:

- ***State Chief of Information Technology (IT):*** responsible for executive direction and major IT project oversight.

- ***Security:*** responsible for developing statewide security policies, enforcing policies, and supporting State agencies' security efforts.

- ***Application Systems Management (ASM):*** responsibilities include web systems, geographic information systems (GIS), and operating statewide systems such as the Financial Management Information System (FMIS) and the new Enterprise Budget System.

- ***Infrastructure:*** responsibilities include operating networkMaryland, the State's data network, voice systems, and maintaining and supporting day-to-day IT operations for Executive Branch agencies, which is referred to as the Enterprise Tech Support Initiative.

- ***Chief of Staff:*** responsible for administrative functions such as procurement and finance.

- ***Major IT Projects:*** development of major IT projects.

- ***Radio:*** operates Maryland First Responders interoperable Radio System Team, which is the State's 700 megahertz radio system.

- ***Telecommunications Access of Maryland (TAM):*** provides telecommunications relay service for Maryland's hearing and speech disabled citizens. The program also provides assistance telephone equipment for financially qualifying citizens with a variety of needs.

The department administers the Major Information Technology Development Project Fund (MITDPF). This is a nonlapsing fund that supports large IT initiatives as defined in Sections 3A-301 and 3A-302 of the State Finance and Procurement Article. Major IT development projects are projects that meet one or more of the following criteria:

- the estimated total cost of development equals or exceeds $1 million;

- the project is undertaken to support a critical business function associated with the public health, education, safety, or financial well-being of the citizens of Maryland; and/or

- the Secretary of Information Technology determines that the project requires the special attention and consideration given to a major IT development project.

Performance Analysis: Managing for Results

DoIT's Managing for Results (MFR) data reflects the mission of the office, providing statewide IT oversight as well as operating/overseeing the operation of statewide information systems and networks.

1. Cybersecurity

DoIT's first MFR goal is to provide "leadership and support to State agencies in areas of cybersecurity policy, risk and vulnerability assessment, technology implementation, awareness training, and incident response to raise the security posture of State government." The budget committees have expressed concerns about cybersecurity and have asked the department for MFR indicators that can better assess the State's progress. In response, DoIT has updated performance indicators. **Exhibit 1** shows actual data for fiscal 2015, 2016, and 2017, with 2018 projections.

Exhibit 1
Cybersecurity Performance Indicators
Fiscal 2015-2018 Est.

	2015	2016	2017	2018 Est.
Percent of Employees Compliant with Statewide Cybersecurity Awareness Training Programs	90%	90%	80%	80%
Certified Security Information Professionals Employed by State	1	1	5	8
Agencies with Data Loss Prevention Tools in Operation	n/a	n/a	2	4
Agencies with Vulnerability Assessment, Penetration Test, or Audit	20	20	20	20
Multi-agency Security Drills or Exercises	n/a	n/a	3	4

Source: Governor's Budget Books

Cybersecurity professionals have noted that the average employee is often the weakest link. Employees let hackers in by inadvertently providing passwords or loading malware into a system. To prevent against this, DoIT introduced a cybersecurity awareness training program in December 2013. The program is delivered to registered Executive Branch employees and contractors with a State email

account. It consists of monthly lessons on topics like passwords, working remotely, and data loss prevention. The service is provided by Security Mentor, a web-based training provider. The program was made mandatory by the previous Administration for Executive Branch employees. The training is provided at no cost to the agencies. A measure of employees' awareness is the percent of employees that are compliant with the awareness program. This indicator has declined from 90% in fiscal 2016 to 80% in fiscal 2017. **DoIT should be prepared to brief the committees on its employee cybersecurity awareness training programs. This should include a discussion of the availability of the programs and attempts to increase participation.**

2. Oversight of Major IT Projects

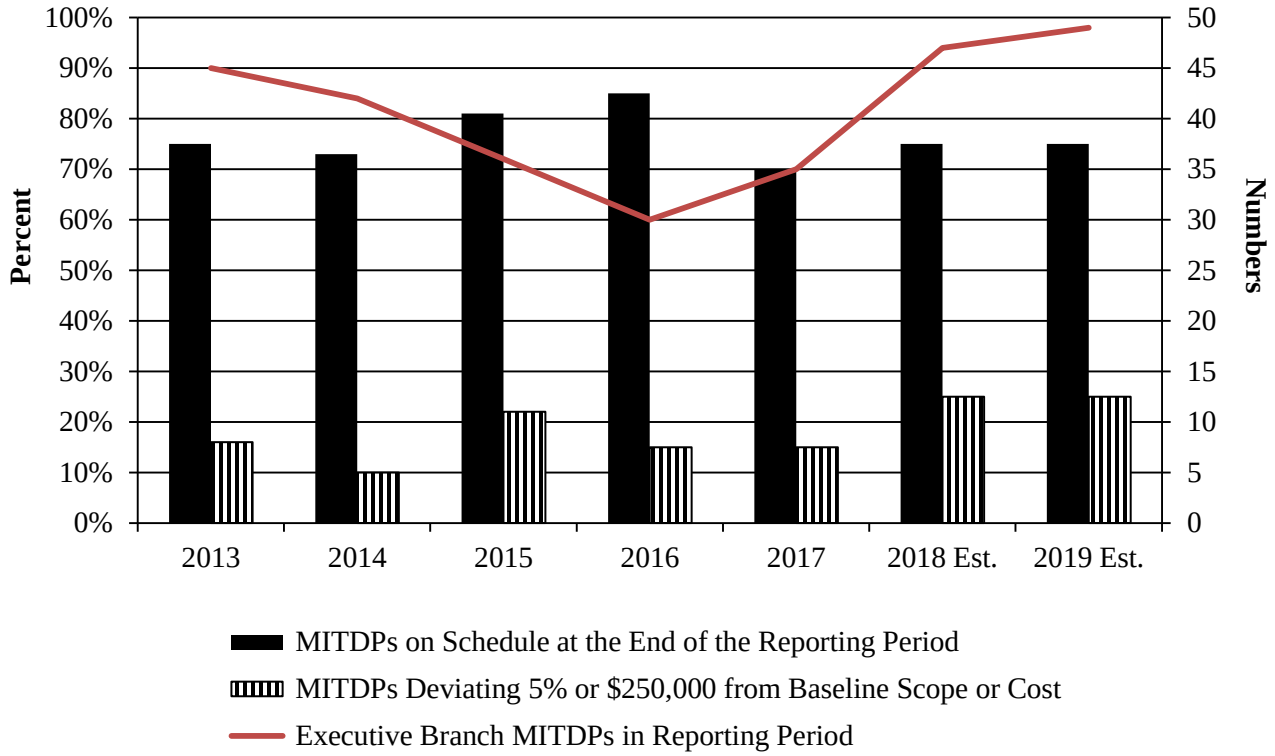
The fiscal 2019 budget includes $81.7 million for major IT project development, and the department's second MFR goal is that State agency IT systems meet State IT master plan objectives of consolidation, interoperability, and standardization. The objective is that all major IT development projects executed by Executive Branch agencies are successful. The department has a series of output measures that examine the extent to which major IT projects remain on schedule, on scope, and on budget.

Exhibit 2 shows that the number of projects declined from 45 in fiscal 2013 to 30 in fiscal 2016. Additional projects have been added, and the number of active projects is expected to increase to 49 in fiscal 2019. The number of projects that were on schedule at the end of each fiscal year has exceeded 70% in each year since fiscal 2013.

The percentage of projects deviating from baseline[1] costs (either 5% or $250,000) has ranged between 10% and 22% since fiscal 2013. DoIT advises that this is influenced by the timing of projects and replacement of program managers. The department has also reviewed the performance of the contract project managers and replaced some that it deemed were underperforming.

[1] A baseline can be prepared for the scope, schedule, or budget. It is the initial measurement that a project team manages and holds accountable. Deviation from the baseline in any of those areas is likely to result in a compensating action to get back into alignment with the baseline. For instance, if a project begins to slip from its baseline schedule, to get back on track, the project manager may need to add more resources or reduce the scope. Either of these actions could cause a baseline problem in the scope or cost areas. At that point, an effort is made to determine, according to the Project Management Plan (prepared in Phase 3, planning), how to mitigate risks that cause scope, schedule, or cost risks and then to establish a plan of action in the event that a risk becomes an issue. If circumstances make it necessary or desirable to establish a new baseline of cost, schedule, or scope, the process by which this is achieved is referred to as rebaselining.

Exhibit 2
Major Information Technology Project Planning Performance Measures
Fiscal 2013-2019 Est.



MITDP: Major Information Technology Development Project

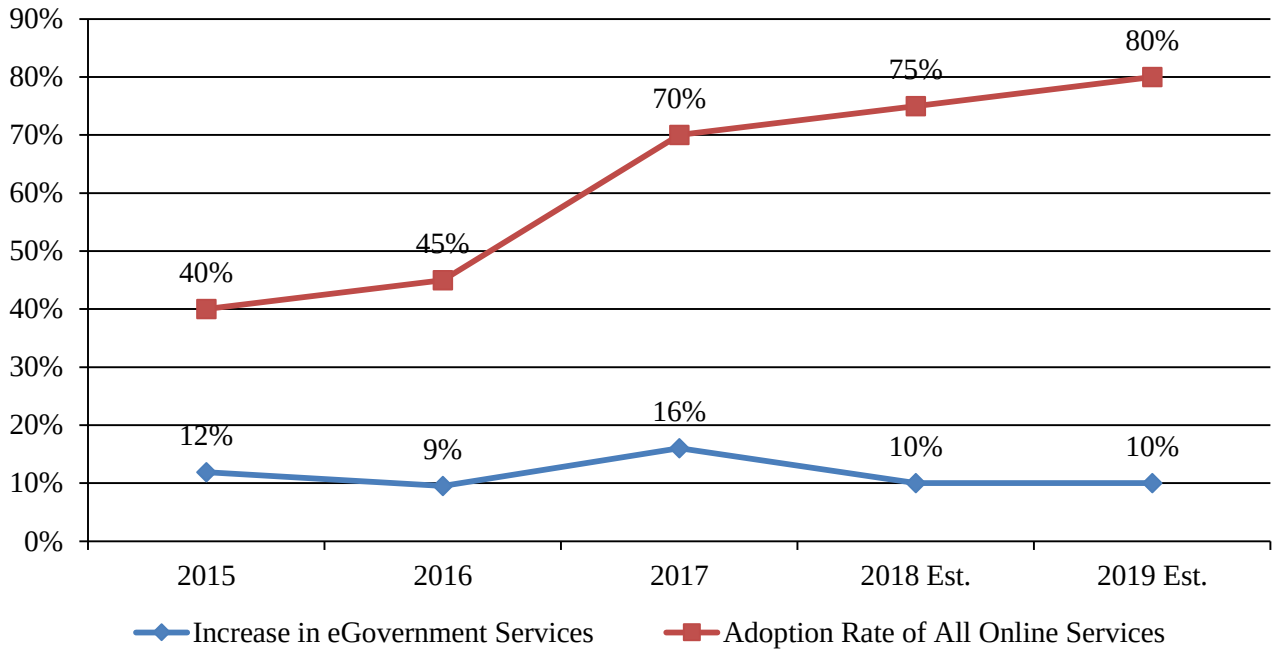
Source: Governor's Budget Books

3. Web Systems Indicators

DoIT's third MFR goal is to "provide efficient and high-quality on-line services to State agencies and the public." The Internet is essential in engaging citizens and providing services. Web services are one of the strategies by which higher standards can be realized at a lower cost. As the Internet has become ubiquitous, there are growing expectations from citizens that services are to be provided online.

To measure online performance, DoIT has developed indicators relating to what extent the number of services offered is increasing and to what extent the services are being adopted, as shown in **Exhibit 3**.

Exhibit 3
Web Indicators
Fiscal 2015-2019 Est.



Source: Governor's Budget Books

DoIT has made efforts to expand the number of services offered on the Internet. Since fiscal 2012, the State has had a master contract with NICUSA, Inc. (NIC) to develop websites, online services, and secure payment processing applications for State agencies. NIC has been developing eGovernment applications for over a decade. The State is not charged for this service; NIC generates revenues by implementing some commercially valuable services and pooling these revenues to support other applications. NIC advises that nonrevenue generating applications account for approximately 80% of applications. Maryland State agencies have begun developing applications with NIC, such as the Department of Commerce's (Commerce) Central Business Licensing and Registration portal, the Motor Vehicle Administration's Android Driver Practice Exam, the Maryland Emergency Management Agency (MEMA) Maryland Prepares application, and a Notary Public Online Registration and Renewal Service for the Secretary of State. DoIT's goal is to increase services 10% annually. The data shows that actual increases have been about 10% annually, with 16% growth in fiscal 2017.

DoIT also measures the adoption rate. This is the extent to which online services are replacing paper services. In fiscal 2015, 40% of paper services had been replaced by online services. This

increased to 70% in fiscal 2017. The data shows that the State is increasing the share of services performed online, even as new online services are introduced.

Every two years, the Center for Digital Government, the research and advisory arm of *Government Technology* magazine, evaluates state governments' ability to improve internal processes and better serve citizens. The next survey should be available in September 2018. In the 2016 survey, Utah received an A grade and the top ranking. The report notes that Utah now offers over 1,100 online services. DoIT advises that the number of online services offered in Maryland at the end of fiscal 2016 totaled 188. Maryland's grade was a B. Positive comments were that Maryland is implementing a new Public Safety Communication System and has an Open Data Council. The report also noted that "Maryland has continued to make strides on its citizen-facing Web portal, establishing a Central Business Licensing and Registration operation that aims to provide a one-stop shop for new commercial entities." It notes that the time it takes to register a business or establish tax accounts has declined from weeks to days. It is a one-stop shop so that individuals also do not have to visit a number of agencies, such as the Comptroller's Office; Commerce; and the Department of Labor, Licensing, and Regulation (DLLR).

The Department of Natural Resources has also had its AccessDNR mobile app recognized. The app services include directions to State facilities, activities and amenities by location, hunting season information by date, Maryland fish and shellfish identification, and regulations (hunting, fishing, and boating).

DoIT is also proposing a deficiency appropriation for a new major IT project to provide a single website that allows the State portal's visitors to search for all State licenses and permits. To fund the One Portal project, the budget includes a $1 million fiscal 2018 deficiency appropriation and $2 million in the fiscal 2019 MITDPF appropriation, with a total project cost of $6 million. **Appendix 2** provides specific project detail. **Once deployed, the Department of Legislative Services (DLS) recommends that the department should track the adoption rate for this project.**

It is encouraging that the State is expanding the number of services that are offered online and that some are being recognized. However, missing from the measures is any indication of the quality of Maryland.gov. There are numerous factors that contribute to a good website, including accessibility, navigation, content, security, speed, accuracy, and currency (up-to-date data). The department has added an indicator that measures customer satisfaction. **DoIT should be prepared to brief the committees on how it evaluates the quality of its websites.**

4. State Agency Support Indicators Should Change as the Department Reorganizes

Until fiscal 2017, DoIT had three programs that supported systems and State agencies. The programs were Enterprise Information Systems that operated a help desk and the local area networks in Annapolis and Baltimore; ASM that operated the FMIS, which supports the agency-based financial systems, and human resources systems such as the new statewide personnel system; and the Networks

Division that operated telephone systems, networkMaryland, and the State's wireless system. The department's MFR initiative also measured the effectiveness of these services.

In fiscal 2017, DoIT reorganized and most of these programs' operations are now performed by ASM and the infrastructure program. ASM now also includes functions like GIS, Google services, and web services. The infrastructure program supports telephone systems, networkMaryland, and State agency IT enterprise operations. The department has discontinued publishing performance data for these support functions. As discussed in the Issues section of this analysis, the department is implementing its Enterprise Tech Support Initiative. DLS' concern is that these indicators are out of date. **DoIT should develop new indicators that reflect its changing workload, including the Enterprise Tech Support Initiative's workload.**

Fiscal 2018 Actions

Proposed Deficiency

As introduced, the budget includes two general fund deficiency appropriations, $1 million appropriated for the new One Portal major IT project and a $516,251 reduction to infrastructure program salaries and wages, for a net general fund deficiency appropriation totaling $483,749.

The One Portal project proposes to provide a single website that will allow the State portal's visitors to search for all State licenses and permits, which total over 1,000. Project planning began in calendar 2017. To begin implementing the project in April 2018, $1 million is budgeted in fiscal 2018. **DLS recommends approval.**

The infrastructure program is reduced $516,251 in recognition of the transfer of 9 regular positons from DoIT to the Department of Juvenile Services (DJS). **Exhibit 4** shows that the fiscal 2018 general fund salary costs associated with these DJS position transfers totaled approximately $695,000. An additional transfer to the Department of Disabilities brings the general fund total to $771,000. These costs are offset by the transfer of a Maryland Department of Environment position into DoIT, resulting in net general fund savings of $688,000. **DLS recommends that language allowing the transfer of personnel funds to other agencies be adopted.**

Exhibit 4

Cost of Positions Transferred into and out of the Department of Information Technology

Fiscal 2017-2018

Program	Position	Salary and Fringe Benefits	GF Share	GF Salary and Fringe Benefits
Transferred to the Department of Housing and Community Development				
Infrastructure	Computer Network Specialist II	-$92,846	0%	$0
Infrastructure	IT Programmer Analyst I	-72,105	0%	0
Infrastructure	Computer Information Services Specialist Supervisor	-70,749	0%	0
Infrastructure	Computer Network Specialist II	-63,204	0%	0
Infrastructure	Computer Information Services Specialist II	-62,283	0%	0
Subtotal		***-$361,188***		***$0***
Transferred to the Department of Juvenile Services				
Infrastructure	IT Systems Technical Specialist Supervisor	-$101,277	100%	-$101,277
Infrastructure	Computer Network Specialist II	-82,383	100%	-82,383
Radio	IT Systems Technical Specialist	-82,383	100%	-82,383
Infrastructure	Computer Network Specialist II	-81,735	100%	-81,735
Infrastructure	Computer Network Specialist Lead	-78,428	100%	-78,428
Infrastructure	Computer Network Specialist II	-73,489	100%	-73,489
Infrastructure	Computer Network Specialist II	-69,424	100%	-69,424
Infrastructure	Computer Network Specialist II	-63,204	100%	-63,204
Infrastructure	Computer Network Specialist II	-63,204	100%	-63,204
Subtotal		***-$695,526***		***-$695,526***
Transfer to the Department of Disabilities				
Infrastructure	Computer Information Services Specialist II	-$75,137	100%	-$75,137
Transferred from the Maryland Department of the Environment				
Infrastructure	Computer Network Specialist II	$82,383	100%	$82,383
Total		**-$1,049,469**		**-$688,280**

GF: general funds
IT: information technology

Source: Department of Budget and Management

Cost Containment

General fund cost containment reductions in fiscal 2018 total $909,065. Savings are:

- $482,114 in the infrastructure program by negotiating better contract pricing and eliminating software;
- $200,000 by reducing the reliance on contractors by using regular positions;
- $145,000 in ASM by negotiating better contract pricing and eliminating software; and
- $81,951 by holding positions vacant.

Across-the-board Employee and Retiree Health Insurance Reduction

The budget bill includes an across-the-board reduction for employee and retiree health insurance in fiscal 2018 to reflect a surplus balance in the fund. This agency's share of this reduction is $230,159 in general funds and $8,148 in special funds.

Proposed Budget

The fiscal 2019 allowance proposes $162.9 million in spending. The largest fund sources are reimbursable funds ($49.1 million that is 30.2% of spending) and general funds ($96.4 million that is 59.2% of spending). **Exhibit 5** shows that the fiscal 2019 allowance is $44.3 million more than the fiscal 2018 working appropriation. A large and volatile share of the budget is funding for major IT projects that total $81.7 million in fiscal 2019.[2] Cash flow requirements for these projects change substantially from year to year. The fiscal 2019 major IT project spending is $39.2 million more than budgeted in fiscal 2018. Costs for departmental operations increase by $5.1 million.

[2] Major IT projects include the Statewide Personnel System, which totals $3.8 million in reimbursable funds, and the Central Collections Unit system projects, which totals $5.4 million in special funds, budgeted in DoIT operations.

Exhibit 5
Proposed Budget
Department of Information Technology
($ in Thousands)

How Much It Grows:	General Fund	Special Fund	Federal Fund	Reimb. Fund	Total
Fiscal 2017 Actual	$64,860	$9,485	$36	$73,136	$147,517
Fiscal 2018 Working Appropriation	57,809	11,078	0	49,713	118,600
Fiscal 2019 Allowance	96,519	17,253	0	49,148	162,920
Fiscal 2018-2019 Amount Change	$38,711	$6,175	$0	-$566	$44,320
Fiscal 2018-2019 Percent Change	67.0%	55.7%		-1.1%	37.4%

Where It Goes:

Personnel Expenses	
General salary increase	$206
Other salary and fringe benefits	-771
Retirement contributions	-210
Employee and retiree health insurance	238
Turnover adjustments	81
Network and Security Expenses	
Network consulting services, including engineering, web, and data	1,421
Hardware and software protocol upgrades to meet industry security standards	821
End-user licenses instead of software for three-year enterprise tech support contract	782
Network equipment deferred into fiscal 2019	285
High-speed cloud license contracts for enterprise tech support	164
Radio Operations	
Maintenance contracts	1,294
Telecommunications Access of Maryland	
Additional tablets	759
Restore funding for promotional publications and advertising	97
Restore funding for office assistance	75
Statewide Expenses	
Annapolis Data Center	683
Department of Information Technology service allocation	-117
Major Information Technology (IT) Projects and Oversight	
Statewide personnel system	-4,818
Central Collections Unit system modernization	3,798

Where It Goes:	
Major IT project oversight	446
Major IT Development Project Fund	
State agency major IT projects	39,256
Other	-170
Total	**$44,320**

Note: Numbers may not sum to total due to rounding.

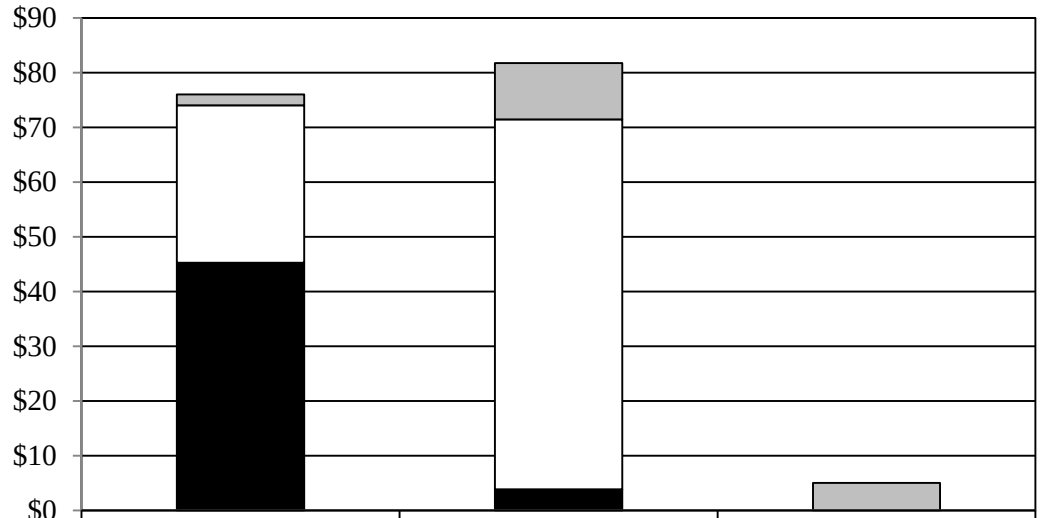
General Salary Increase

The fiscal 2019 allowance includes funds for a 2% general salary increase for all State employees, effective January 1, 2019. These funds are budgeted in the Department of Budget and Management's (DBM) statewide program and will be distributed to agencies during the fiscal year. This agency's share of the general salary increase is $138,483 in general funds, $4,473 in special funds, and $63,354 in reimbursable funds. In addition, employees will receive another 0.5% increase and a $500 bonus effective April 1, 2019, if actual fiscal 2018 general fund revenues exceed the December 2017 estimate by $75 million. These funds have not been budgeted. The Administration will need to process a deficiency appropriation if revenues are $75 million more than projected.

Operations and Project Spending

DoIT activities can be divided into three distinct functions: TAM provides telecommunications relay service for Maryland's hearing and speech disabled citizens; major IT projects provides oversight for State agencies developing major IT projects; and Operations supports the ongoing telecommunication and IT services in State agencies. **Exhibit 6** shows that the largest share of the DoIT appropriation supports major IT projects, which receive $81.7 million and is 50.2% of spending. Operations receives $76 million in total funds, which is 46.7% of spending. Another $5.0 million (3.1% of spending) supports TAM.

Exhibit 6
Spending by Purpose and Fund
Fiscal 2019
($ in Millions)



	Operations	Major IT Projects[1]	TAM
Special Funds	$2.0	$10.3	$5.0
General Funds	28.8	67.6	0.0
Reimbursable Funds	45.2	3.8	0.0

IT: information technology
TAM: Telecommunications Access of Maryland

[1] Major IT projects include the statewide personnel system and the Central Collection Unit System budgeted in Operations.

Source: Department of Budget and Management

Major IT Development Project Fund and Major IT Project Expenditures

Chapters 467 and 468 of 2002 created the MITDPF. The fund replaced the Information Technology Investment Fund, required all general funds appropriated for major IT projects to be held in the fund, and enhanced the oversight role of DoIT (then known as the Office of Information Technology) in approving projects from the fund.

MITDPF-funded Projects

Exhibit 7 shows fund transactions for the MITDPF for fiscal 2016 through the proposed budget in fiscal 2019. Fiscal 2019 includes a $67.6 million general fund appropriation, $4.9 million in special fund appropriations, and $0.3 million in interest earnings.

Exhibit 7
Major Information Technology Development Project Fund Data
Fiscal 2016-2019

	2016	2017	2018	2019
Opening Fund Balance	**$32,730,531**	**$45,522,085**	**$66,104,804**	**$0**
Revenues				
General Fund	$28,493,336	$34,942,697	$29,412,775	$67,600,896
Special Fund – Investment Interest	666,406	944,194	300,000	300,000
Special Fund – Carryover from Canceled Projects				4,863,949
Transfers to or from Other Agencies			-703,727	
Reimbursable Fund Transfers	3,361,089			
Resource Sharing Revenues	18,000	211,832		
Cost Containment	-823,731	-803,000		
Total Available Revenues	**$64,445,631**	**$80,817,808**	**$95,113,852**	**$72,764,845**
Expenditures				
Transferred to Agencies	-$18,923,546	-$14,713,004		
Anticipated Transfers			-$95,113,852	-$72,464,845
End-of-year Fund Balance	**$45,522,085**	**$66,104,804**	**$0**	**$300,000**

Source: Department of Information Technology; Department of Budget and Management; Department of Legislative Services

Large changes in annual major IT project spending are not unusual. There have been a number of years in which this spending has increased or decreased by well over $10.0 million. But the general fund increase in fiscal 2019 is unusually large due to cash flow needs for large projects and moving an unusually high number of projects from planning to implementation. Major factors contributing to the general fund increase in fiscal 2019 include:

- increasing project funding for the Maryland Department of Health's (MDH) Shared Human Services project funding from $6.5 million to $18.2 million;

- upgrading the State's telephone system from a Time Division Multiplexing technology to Voice over Internet Protocol. Costs for the migration are increased from $3 million to $10.5 million, including $4.5 million in special funds;

- including the planned $6.4 million for the Comptroller's tax system, which did not receive funding in fiscal 2018;

- including MDH's Electronic Health Records system's allowance of $4.5 million, compared to no appropriation in fiscal 2018;

- updating and separating the Department of Public Safety and Correctional Services' Electronic Health Records system, which receives $7.3 million in fiscal 2019; and

- adding $2.7 million for new projects, including $2 million for the One Portal project in fiscal 2019, in addition to the $1 million deficiency appropriation.

The special fund appropriations include $4.9 million from reallocated projects, as seen in **Exhibit 8**. As part of the budget process, the department regularly cancels funds if the projects are no longer needed and reappropriates that as special funds to support other projects.

Exhibit 8
Special Funds from Canceled Projects
($ in Thousands)

Project	Amount
DBM Enterprise Budget System Project Oversight	$438
MDH Medicaid Management Information System	1,690
MDH Medicaid Management Information System Oversight	527
MDH Long Term Support Services Tracking System	428
MDH Long Term Support Services Tracking System Oversight	100
Comptroller Integrated Tax System Oversight	221
DHS Shared Human Services Platform Oversight	340
DHS Enterprise Content Management Oversight	212
DSP Automated License and Regulation Oversight	152
Other Oversight	757
Total	**$4,864**

DBM: Department of Budget and Management
DHS: Department of Human Services
DSP: Department of State Police
MDH: Maryland Department of Health

Source: Department of Information Technology

Fiscal 2019 appropriations are detailed in **Exhibit 9**. The allowance includes funding for the following four new projects totaling $3.6 million: DoIT's One Portal ($2 million), the Office of the Public Defender's Case Management Replacement ($1.2 million), the Maryland State Department of Assessments and Taxation's Strategic Enterprise Application Assessment ($0.4 million), and the Office of the Attorney General's Case Management and Document Management ($25,000) projects.

Exhibit 9
Maryland Information Technology Development Project Fund
Projects Receiving Funding in Fiscal 2019

Agency	Project Name	Project Description	MITDPF Funding	Comment
Existing Projects				
State Board of Elections (SBE)	Agency Election Management System Modernization Project	Replace legacy ballot system that was developed in 1985. Integrate the new system with the new voting system and other systems, such as voter and candidate systems. Will link with existing data from MDVOTERS and conform with the Department of Information Technology (DoIT) security standards and SBE security policy.	$650,000	SBE advises that the current system vendor's sole source contract ends in February 2019. The project was to be completed by November 2016 but has been delayed. Concerns are that the information technology procurement request (ITPR) timeline is rudimentary so it is unclear to what extent any planning has been completed; aging legacy systems are often difficult to replace (stakeholders may be slow to adapt); and the availability of subject matter experts since priorities are to support elections. Nonetheless, the project is critical for the 2020 election. **The Department of Legislative Services (DLS) recommends approval.**
Comptroller	Integrated Tax System	Replace current State of Maryland Tax, Computer Aided Collection System, and other systems. Objectives are to integrate systems for efficiency, to simplify taxpayer compliance, reduce wait times, and improve security, including disaster recovery.	$6,407,705	Currently, the project has a contract with a vendor to provide information technology (IT) management consulting services. A Request for Proposals (RFP) for a commercial-off-the-shelf (COTS) product should be released in June 2018. Project includes risks, such as organizational culture (resistance to change) and implementation (technical personnel shifts to new technologies required). **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
Maryland Department of Health (MDH)	Medicaid Management Information System Modular Replacement	Implement federally required Medicaid changes and assess current system to develop a plan for replacing legacy system with modular-design system.	$4,033,119	This supports necessary changes and planning for a legacy system replacement. The prior replacement, in which the State spent $197 million, was failing and was terminated in fiscal 2015. The State was awarded an $81 million settlement. This is discussed in more detail in the Medicaid analysis. **Updates to the current system are required and the legacy system is becoming obsolete, so DLS recommends approval.**
MDH	Long Term Services and Support Tracking System	Implement a system to track long-term care services as well as develop a standardized assessment and in-home services verification tool. The system is key to the State's strategy to support home and community services for vulnerable Medicaid recipients.	$4,400,000	The appropriation supports development, integration and testing, operation and maintenance, and oversight costs. The scope has increased to include the Developmental Disabilities Administration (DDA) and testing components. The State is receiving $20.4 million in federal funds in fiscal 2019. The project is generally considered low risk and at this point most risk is associated with integrating DDA. **DLS recommends approval.**
MDH	Statewide Electronic Health Records System	Replace a legacy Computerized Hospital Record and Information System. The current system is over 25 years old. Goal is to procure a COTS product. Review of available products should begin this spring.	$4,680,000	The current system's deficiencies include the inability to process electronic records (including doctor's care instructions), inability to access the web, need for additional software to access other hospitals' systems, and outdated operating systems. High risks include interdependencies (interfaces with numerous hospitals and agencies); organizational culture (new web system to replace long-established paper-based system); and flexibility (COTS and agency will need to adapt). Subject matter experts have been hired. The RFP is expected to be released in June 2018. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
Department of Human Services (DHS)	Automated Financial System	Replace fiscal system that tracks payments, maintains transaction history, generates reports, and produces data for other systems. New system will interface with the Internet. The system is widely used by local offices.	$1,429,901	Project is still in the planning phase. DHS's fiscal 2018 appropriation also includes $736,615 in federal funds. The project's solution has been modified so that the Agile approach will be used. This delayed the bid for a vendor. The bid is under review and should be issued this year. **DLS recommends approval.**
DHS	Shared Human Services Platform	Integrate human services systems among State agencies. MDH, the Department of Juvenile Services, and Health Benefit Exchange are collaborating with DHS.	$18,229,422	Initial funding (totaling $13.9 million) was provided in a fiscal 2017 supplemental budget item in March 2016. These funds were restricted pending federal approval. Risks include interdependencies, organizational culture, implementation, and the large scope of this project. Federal funds totaling $62.1 million are also budgeted in fiscal 2019. **DLS recommends approval.**
Department of Public Safety and Correctional Services (DPSCS)	Computerized Criminal History Replacement	Replace the 30-year-old Identification Index and Arrest Disposition Reporting Systems. This replaces a mainframe system with a relational database and web interface. The goal is to find a COTS product.	$1,619,280	Concerns about the current systems are that the technology is antiquated so it is difficult to recruit staff to maintain the systems and that it is becoming increasingly difficult to provide adequate criminal history and background check data to law enforcement agencies. Risks include technical (migration from an antiquated mainframe to a web-based relational database) and supportability issues (24/7 support is required). Planning is almost complete and a vendor is expected to come on board in the first quarter of fiscal 2019. **DLS recommends approval.**
DPSCS	Electronic Patient Health Record (EPHR) Replacement	EPHR will replace an outdated system missing some components. MDH is building a similar system but DoIT concluded that separate systems should be built.	$7,280,000	Solution expected is a cloud-based COTS product. Risks include funding (fully State funded) and supportability (24/7 service). Business analysts have been procured and are developing an RFP to be released in June 2018. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
DPSCS	Maryland Automated Fingerprint Identification System Upgrade	Upgrade the current fingerprint identification system with a system that has fewer parts to monitor and requires less security upgrades.	$1,180,000	The current system will no longer be supported as of June 30, 2019. Only three vendors can provide the necessary services, one of which is the current vendor. DoIT did not identify any high-risk factors. **DLS recommends approval.**
Maryland State Department of Education	Maryland Direct Certification System (MDCS)	MDCS will centralize local school nutrition certification hosted by the State.	$10,000	This is considered a low-risk project using proven technologies. The U.S. Department of Agriculture is providing a $769,208 grant. **DLS recommends approval.**
Maryland Department of the Environment (MDE)	Lead Rental Certification and Accreditation	Migrate decentralized legacy systems and databases into a web-based relational database.	$916,152	MDE advises that the system is expected to use proven technology, which reduces risk. An objective is to reduce operational inefficiencies, increase transparency, and improve customer service. Contract award is expected in early calendar 2019. **DLS recommends approval.**
Department of State Police (DSP)	Automated Licensing and Registration Tracking System	Automate and streamline the process by which a citizen requests approval to purchase a firearm.	$500,000	The first phase, the licensing portal, has been implemented. Phase 2, the electronic form for the handgun permit application, should be implemented in April 2018. Phase 3, for security guards, dealers, and other components, has architecture similar to Phase 2 and should go live in 2020. **DLS recommends approval.**
DSP	Public Safety Communication System	Purchase radios for 700 megahertz communication system.	$1,487,589	Purchase of radios for DSP, MDH, and the Department of Juvenile Services**. DLS recommends approval.**
State Treasurer's Office	Financial Systems Modernization	Replace the State Treasurer's Treasury Management System	$1,402,715	The current system will no longer be supported after December 2018. The system supports banking interface, ledgers, payables, receivables, and other functions. High risks include interdependencies with other State agencies and the hard deadline. Implementation is scheduled to begin in the third quarter of fiscal 2018. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
DoIT	Enterprise Solutions Planning Initiative	Provide overhead for the Enterprise Planning Solution Initiative and the Scaled Agile framework development approach.	$1,400,000	This supports the centralized review of major IT projects to determine if a project is most appropriate as a minor project, stand-alone project, combined with another project, or scaled as an enterprise project. **DLS recommends approval.**
DoIT	eMaryland Marketplace (eMM): Statewide Pay-to-procure System	Replace current eMM procurement system with cloud-based, software-as-a-service system.	$1,150,000	The current contract expires on August 28, 2019. Since the State is the only user of this version, costs are excessive. Details concerning the system are discussed in the Issues section. **DLS recommends approval.**
DoIT	Statewide Voice over Internet Protocol (VoIP) Migration	Migrate the State's telephone system into VoIP. This replaces the older Time Division Multiplexing technology. Hardware, such as the private branch exchange (PBX) equipment, and software will be replaced.	$10,489,973[1]	Most PBXs are at the end of manufacturer support and need to be replaced. The Maryland Department of Agriculture has been successfully migrated. Anticipated fiscal 2019 migrations include the Goldstein Treasury Building and six multiservice centers. **DLS recommends approval.**
DoIT	Drone Detection and Response System	Develop a drone detection system to combat entry of contraband into State prison facilities.	$1,560,000	This is new technology. The Johns Hopkins University Applied Physics Laboratory has been procured to assist with developing requirements. This was initially funded as a supplemental deficiency in fiscal 2017. **DLS recommends approval.**
Subtotal Existing Projects			***$68,825,856***	
New Projects				
DoIT	Maryland One Stop (One Portal)	Develop a portal that directs Internet searches to the appropriate online form.	$2,000,000	Maryland State government has over 1,000 licenses or permits spread across State agencies. Not surprisingly, the high risk is interdependencies. Other risk factors are low and medium. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
Office of the Public Defender (OPD)	Case Management Replacement	Replace the current case management system that does not meet security requirements, is incompatible with applications, and is inaccessible outside OPD.	$1,206,000	OPD expects to deploy a web-based COTS, supported by a relational database. DoIT has not identified any high risks. **DLS recommends approval.**
Office of the Attorney General	Case Management and Document Management	Replace obsolete system with new web-based system.	$25,000	The RFP was issued in 2017, and a winning bidder has been selected. DoIT has not identified any high risks. **DLS recommends approval.**
State Department of Assessments and Taxation (SDAT)	Strategic Enterprise Application Assessment	Replace paper-based and mainframe systems with a cloud-based system.	$407,989	This project is generally medium risk. The RFP has been issued and SDAT is evaluating vendors. **DLS recommends approval.**
Subtotal New Projects			***$3,638,989***	
Total Fiscal 2019 Allowance			**$72,464,845**	
Fund Sources				
General Funds			$67,600,896	
Special Funds			$4,863,949	
Total Funds			**$72,464,845**	

MITPDF: Maryland Information Technology Development Project Fund

[1] Includes $4,863,949 in previously appropriated funds reappropriated as special funds.

Source: Department of Information Technology; Department of Budget and Management; Department of Legislative Services

Issues

1. Review of Cybersecurity Standards, Policies, and Procedures

The State manages a substantial amount of sensitive data. By law, the State is required to protect that data from inappropriate access and uses. The State must adopt appropriate standards, policies, and procedures to protect the data that it keeps.

Cybersecurity is a major concern for the State. The media routinely reports cybersecurity breaches, and many incidents are unreported. In recent years, the State has made efforts to identify weaknesses and make improvements. These include scrutinizing practices in audits and requesting improved performance measures. Cybersecurity is also the first MFR goal for the department. The budget committees have encouraged that DoIT manage a robust cybersecurity program by requiring improved performance indicators and appropriately deploying sufficient resources.

State Cybersecurity Initiatives

Maryland Cybersecurity Council

Chapter 358 of 2015 established the Maryland Cybersecurity Council. The council consists of several executive department secretaries and directors (or their designees) as well as representatives appointed by the Attorney General (AG) from businesses and companies around the State. In addition to the required members of the council, the President of the Senate and the Speaker of the House of Delegates each appoint two legislative members to serve on the council. Finally, the AG must also invite, as appropriate, specified directors and secretaries of federal security agencies to serve on the council. The council is chaired by the AG or the AG's designee. The University of Maryland University College provides staff for the council.

The Maryland Cybersecurity Council works with the National Institute of Standards and Technology[3] (NIST), as well as other federal agencies, private-sector businesses, and private cybersecurity experts to:

- identify critical infrastructure not covered by federal law or Executive Order 13636, review and conduct risk assessments to determine which local infrastructure sectors are at the greatest risk of cyber attacks and need the most enhanced cybersecurity measures;

- use federal guidance to identify categories of critical infrastructure as critical cyber infrastructure if cyber damage or unauthorized cyber access to the infrastructure could result in catastrophic consequences;

- assist infrastructure entities that are not covered by the executive order in complying with federal cybersecurity guidelines;

[3] NIST is an agency within the U.S. Department of Commerce that supports scientific research.

- assist private-sector cybersecurity businesses in adopting, adapting, and implementing the NIST cybersecurity framework of standards and practices;

- examine inconsistencies between State and federal laws regarding cybersecurity and recommend a comprehensive State strategic plan to ensure a coordinated and adaptable response to and recovery from cybersecurity attacks; and

- recommend any legislative changes considered necessary by the council to address cybersecurity issues.

On July 1, 2017, the council released its biennial report. Much of the report addresses issues that are beyond DoIT's responsibilities. But the report does have two new fiscal 2017 to 2019 recommendations that could directly affect DoIT operations. The council recommends legislation or policy changes that would require State IT procurements to include an independent security verification device or code readiness and/or system security readiness prior to acceptance. This addresses supply chain cybersecurity risks to data and the ability to provide services. The council did recognize that this could impact costs of goods and services as well as the business sector and asked that cost and business considerations be taken into account. The council also recommends that Maryland develop capability for sharing cybersecurity information and providing outreach support. **DoIT should be prepared to brief the committees on the council's work and recommendations that affect State agencies.**

Governor's Executive Order

In October 2017, Governor Lawrence J. Hogan, Jr. issued Executive Order 01.01.2017.22. The executive order clarifies that the Governor's Office of Homeland Security is responsible for "overseeing the implementation of a Cybersecurity Plan" that is to be completed by May 2018. The office is required to consult with DoIT, MEMA, and the Military Department, which are required to provide "support, analysis, and collaboration," including personnel.

Department's Cybersecurity Program

Section 3A–303 of the State Finance and Procurement Article gives DoIT the responsibility to develop, maintain, and enforce IT policies, procedures, and standards. The department is also required to provide technical assistance, advice, and recommendations concerning IT matters, which includes cybersecurity. This issue examines DoIT's cybersecurity program policies, procedures, and standards.

The department also recognizes the importance of enhanced cybersecurity efforts. In its fiscal 2018 strategic plan, DoIT notes that it "leads the state in the implementation of cybersecurity strategies, policies, and operations in preparation for response to cybersecurity events." DoIT is the primary resource for managed security services and the senior authority for best practices. Key components of the department's mission are to:

- protect and effectively monitor the security of the State's information environment;
- quickly identify, analyze, and respond to security threats and incidents;
- promulgate new and better ways to improve the State's security posture, as well as implement and integrate new security technologies to State Enterprise data systems;
- collaborate with the federal Department of Homeland Security and MEMA to meet cybersecurity requirements;
- assess agency programs, identify and quantify risks; and
- develop a roadmap to protect sensitive data aligned with State agency missions.

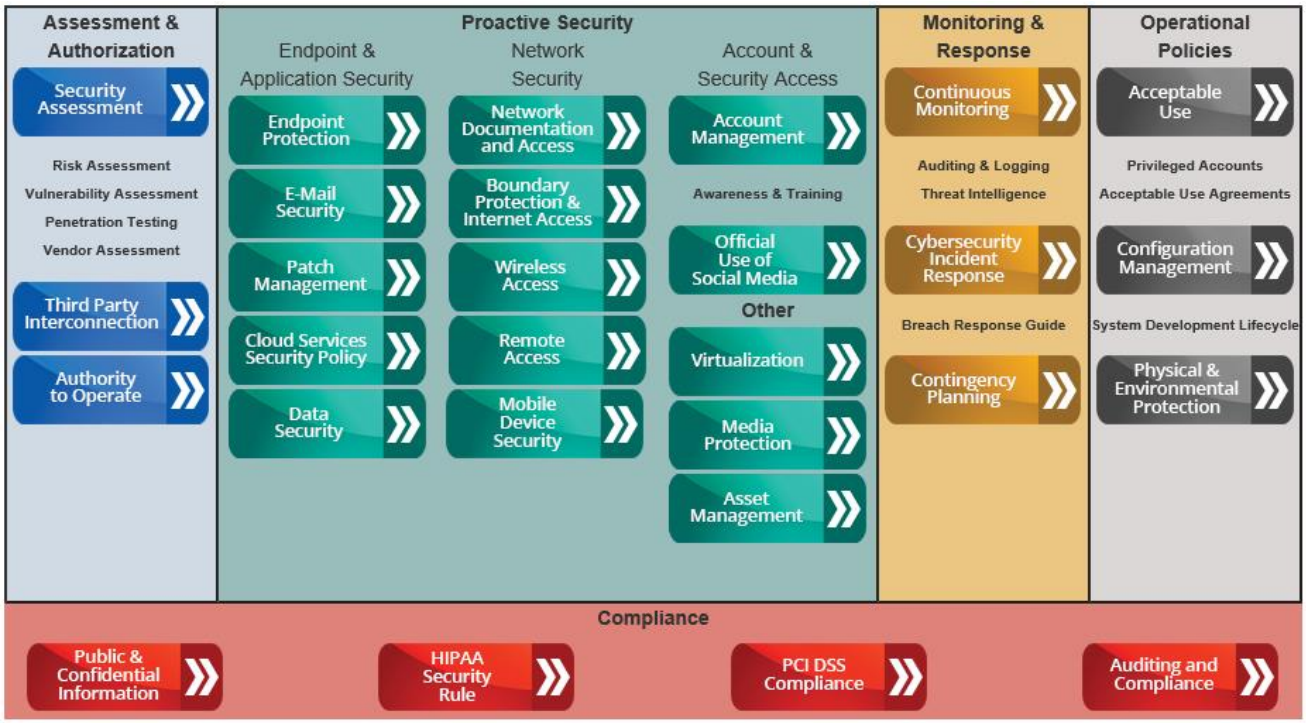
As required, DoIT has developed cybersecurity policies for State agencies. The department's cybersecurity program is guided by CIA principles, which are commonly recommended by cybersecurity professionals. CIA stands for:

- ***Confidentiality:*** keeping unauthorized individuals from obtaining data;
- ***Integrity:*** keeping data in its original form when stored, processed or transmitted; and
- ***Availability:*** keeping systems open so that they can be accessed when needed.

The policies are informed by standards developed by NIST as the framework behind the planning, procurement, development, and implementation of State IT and telecommunications systems.

DoIT's policies are available online. **Exhibit 10** shows the cybersecurity program policies on its website. Areas covered include email, data security, social media, contingency planning, and configuration management. DoIT offers a substantial amount of guidance for State agencies.

Exhibit 10
Cybersecurity Program Policy
Fiscal 2018



Source: Department of Information Technology

Potential Improvements

In addition to providing policy guidance, DoIT is required to enforce procedures. This section examines how well procedures are enforced and what resources are available to implement DoIT policies.

Recent Audit Findings

The Office of Legislative Audits (OLA) examines programs, policies, and procedures. Audit findings identify areas in which the State can improve its policies and procedures. This includes reviewing agencies' cybersecurity practices. Through its audits of agencies, OLA identifies findings that can address cybersecurity risks. **Exhibit 11** shows the most common findings since 2015. This can provide a guide that identifies what is at risk. The most common findings are that personal identifiable information is not protected and that anti-malware software is not used. Another common concern relates to the access rights that employees are granted. Over the three years shown in Exhibit 11,

there are 26 findings in which employees have administrative rights that they should not have, or employees have excessive network access.

Exhibit 11
Audit Instances
Audits Released in Calendar 2015 to 2017

Type of Audit Finding	Findings 2015	Findings 2016	Findings 2017	Total Findings
Most Common Findings (Five Findings or More in Each Year)				
Personal Identifiable Information	8	8	10	26
Anti-malware	5	8	6	19
Common Findings (More Than Five Findings in All Years)				
Administration Rights	6	4	4	14
Intrusion Detection Prevention System Problems	4	4	5	13
Excessive Network Level Access	2	6	4	12
Increasing Findings (At Least Five Findings That Increase or Stay Even Each Year)				
Available Software Security Not Used	0	1	5	6
Decreasing Findings (Findings Decline Substantially or Consistently)				
Log/Monitor Security Events	7	4	3	14
Unnecessary User/File Access	10	2	2	14
Firewall	5	4	3	12
Software Not Updated	5	5	2	12
Subtotal	***52***	***46***	***44***	***142***
Items with Less Than Five Findings	11	6	10	27
Total	**63**	**52**	**54**	**169**

Note: Findings observed less than five times include lack of a disaster recovery plan and backup file problems.

Source: Office of Legislative Audits

The audits show that there are policies with which State agencies are struggling to comply. Although agencies are given policy guidance, implementation has been uneven, and there are weaknesses in the State's cybersecurity defenses. **The department should brief the committees on how it plans to address these weaknesses, especially weaknesses that recur.**

Social Engineering

Cybersecurity weaknesses can be grouped into two categories, technical and personnel. Technical issues involve hardware or software weaknesses, such as using Windows WP, which is no longer supported by Microsoft. Personnel weaknesses include individual errors or individuals inadvertently providing crucial information to unauthorized users.

Many data breaches are not the result of technical inadequacies but are the result of human activity. Even if a system is free of any technical vulnerabilities, that system is vulnerable to social engineering. Social engineering is the use of deception to manipulate individuals into divulging confidential or personal information that may be used for fraudulent purposes. The purpose of social engineering is to have employees give unauthorized users vital information that can be used to compromise a system.

There is widespread concern about the IT systems' vulnerability to social engineering. A 2016 survey of organizations across a range of U.S. industrial sectors revealed that 60% of security leaders say their organizations were or may have been the victim of at least one targeted social engineering attack in the past year, and 65% of those who were attacked say that employee credentials were compromised as a result of the attacks.[4] A colorful, and possibly hyperbolic, description of social engineering notes that:

> The technical director of Symantec Security Response said that bad guys are generally not trying to exploit technical vulnerabilities in Windows. They are going after you instead. "You don't need as many technical skills to find one person who might be willing, in a moment of weakness, to open up an attachment that contains malicious content." Only about 3% of the malware they run into tries to exploit a technical flaw. The other 97% is trying to trick a user through some type of social engineering scheme, so in the end, it does not matter if your workstation is a PC or a Mac.[5]

Policies to reduce the risk of social engineering can be implemented. Specific defenses against social engineering include:

[4]https://www.scmagazineuk.com/60-of-enterprises-were-victims-of-social-engineering-attacks-in-2016/article/576060/.

[5] https://digitalguardian.com/blog/social-engineering-attacks-common-techniques-how-prevent-attack.

- ***Use of Technology:*** Organizations should invest in modern antivirus and anti-malware software that will help prevent and manage potential intrusions. This includes evaluating email filtering software that can identify and remove phishing attacks before they make it to an employee's inbox;

- ***Educating Staff:*** Social engineering attacks rely on either the naiveté or gullibility of staff. This includes providing them with regular security and awareness training that outlines common tactics and strategies that criminals will use; and

- ***Limit Information Access:*** Since many social engineering attacks rely on using privileged information to gain further access, limiting access is important.

As recent audits and MFR data show, the State is vulnerable to social engineering. Common audit findings reveal that not all agencies are using anti-malware software (insufficient use of technology). Administration rights and excessive network level access (insufficiently limiting information) are also common findings. In addition, MFR data shows that 80% of employees are compliant with the statewide Cybersecurity Awareness Training Program (insufficient staff education), meaning that 20% are not compliant. **The department should be prepared to brief the committees on its efforts to minimize the risks of social engineering.**

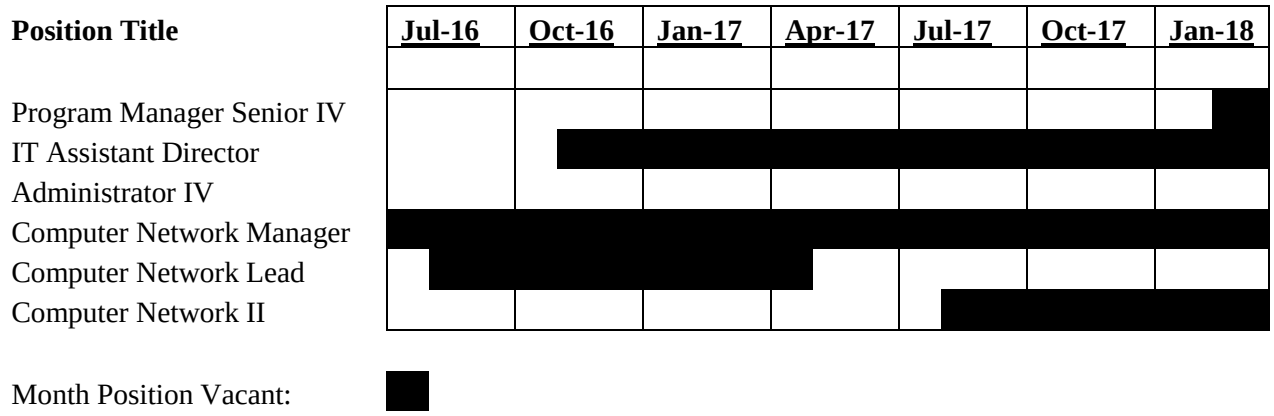
Personnel Are Required to Implement Cybersecurity Policies

Enforcing cybersecurity standards, policies, and procedures is the responsibility of DoIT's cybersecurity program. The program is a mix of State employees and contractors. Specifically, the program has six regular employees that are supplemented by contractors.

If the Maryland Cybersecurity Program is to enforce cybersecurity standards, policies, and procedures adequately, the program needs to have a stable and competent staff. Ideally, the program's employees' are properly trained and have the institutional knowledge necessary to effectively keep State IT systems secure. When necessary, contractors can provide support. But the Maryland Cybersecurity Program still needs State leadership. While contractors can provide valuable services, cybersecurity leadership should be provided by employees that are accountable to the State.

DLS is concerned about the stability of staffing for the Maryland Cybersecurity Program. A primary concern about the program is the high vacancy rates. **Exhibit 12** shows that the program has at least three of six positions vacant in 13 of the last 20 months. The State's cybersecurity director recently resigned and the program's vacancy rate is 44% since the beginning of fiscal 2018. In a January 2018 *Joint Chairmen's Report* (JCR) response, DoIT and DBM noted that State IT salaries tend to lag behind other jurisdictions. **DoIT should be prepared to brief the committees on the high vacancies in the Maryland Cybersecurity Program and any efforts to keep positions filled.**

Exhibit 12
Maryland Cybersecurity Program Vacancies
July 2016 to February 2018



IT: information technology

Source: Department of Budget and Management

In conclusion, keeping State IT systems secure is critical. This task is complicated by the nature of the threat. Cybersecurity threats are constantly evolving as cybercriminals try to stay one step ahead of the State's efforts to keep data safe. Unfortunately, cybersecurity has no finish line. Cyber threats will keep evolving. As the State neutralizes one threat, another emerges. The key to success is constant vigilance. The best that the State can do is ensure that sufficient resources are available to meet this threat. **The department should be prepared to brief the committees on its cybersecurity efforts.**

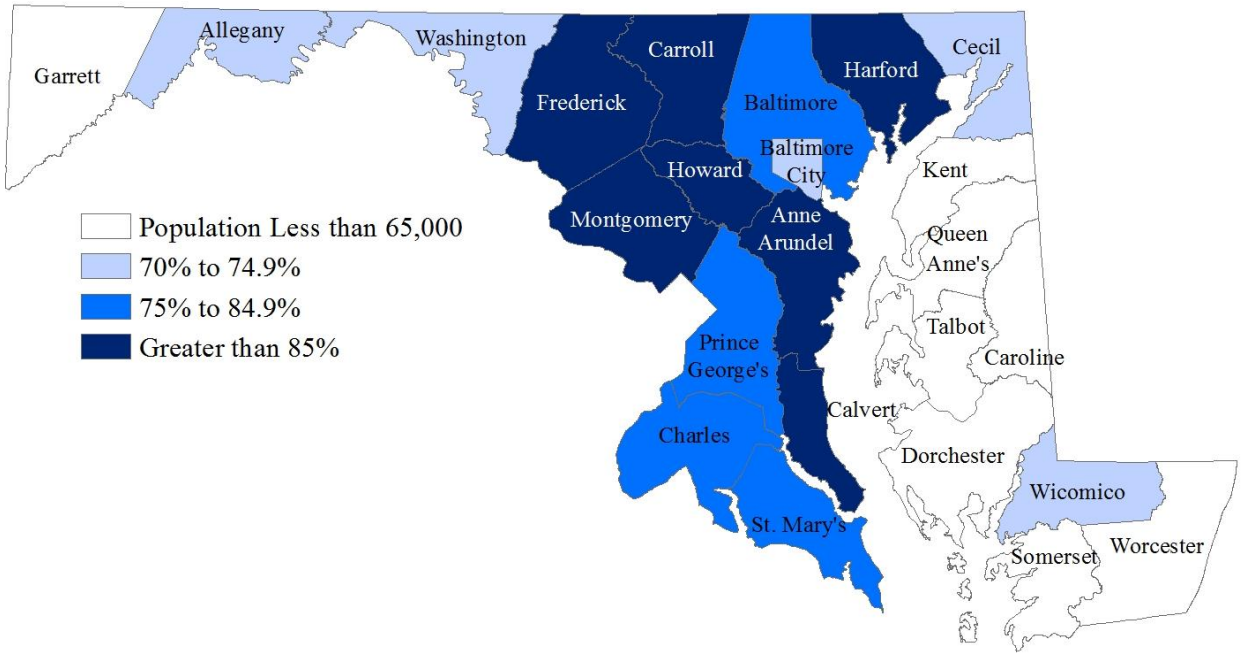
2. The Office of Rural Broadband Is Formed

Broadband, or high-speed Internet, enables the transmission of large amounts of data. Infrastructure for providing access to the Internet includes fiber-optic; cable; Digital Subscriber Lines (DSL), which uses unused telephone lines; and satellite. Broadband access via fiber-optic or cable is continuous and faster than nonbroadband Internet service that uses dial-up access through a standard telephone line.

While broadband is available to a majority of Maryland's households, it is not ubiquitous. The U.S. Census Bureau's American Community Survey collects data on the number of households per county that have broadband in their homes. Unfortunately, the data is only collected for counties with at least 65,000 inhabitants. For Maryland, this means that data is available for only 15 counties and Baltimore City. Of these jurisdictions, **Exhibit 13** shows that 7 counties have greater than 85% of households with broadband and 5 have less than 75% of households with broadband. No data is

available for 8 counties. Although there is no U.S. Census data for these 8 counties, since these are less populated rural counties, it is reasonable to expect that a number of them have lower rates of broadband availability.

Exhibit 13
Percent of Households with Broadband



Note: Data is not collected for counties with a population of less than 65,000.

Source: U.S. Census Bureau's American Community Survey, 2014

Of the 5 counties that have less than 75% of households with broadband, these figures are limited by two factors: availability and affordability. Four of these counties (Allegany, Cecil, Washington, and Wicomico) have the smallest populations among the 16 counties for which there is reported data. The fifth jurisdiction, Baltimore City, has high concentrations of poverty.

Task Force on Rural Internet, Broadband, Wireless, and Cellular Service

Chapters 620 and 621 of 2017 established the Task Force on Rural Internet, Broadband, Wireless, and Cellular Service to study and make recommendations regarding how Western Maryland counties; Southern Maryland counties; Eastern Shore counties; and Frederick, Carroll, and Harford counties can work together to obtain federal assistance to improve Internet, broadband, wireless, and

cellular services and accessibility to those areas of the State. The task force issued its report on November 30, 2017 and offered the following recommendations:

- Statutory and regulatory amendments should be reviewed and implemented to reduce obstacles and permitting challenges between private providers and State government.

- A complete inventory of all State and local government agency assets including cellular towers, water towers, and other structures should be completed within the next year.

- With its expertise and mission to support infrastructure and current funding programs, the Maryland Department of Housing and Community Development (DHCD) may be a better fit for the Office of Rural Broadband.

- There needs to be full development and further establishment of a scope of work or work plan for the Office of Rural Broadband.

- The State needs access to updated mapping to better educate constituents, and elected and appointed leaders. This updated mapping capability could be used to calculate the overall cost for universal service for the last mile of broadband and should include a complete survey of population and business density for underserved and unserved areas in each county. Local governments should be asked to help identify and prioritize unserved and underserved areas with opportunities for input by the Internet service providers.

- The task force should be extended for an additional year and its charge expanded to continue working on uncompleted tasks, such as development of a business and funding model for rural broadband deployment and identifying potential funding sources other than federal grants and financing options.

Governor Creates the Office of Rural Broadband

In order to be responsive to concerns about the availability of broadband in rural areas of the State, on June 28, 2017, the Governor signed Executive Order 01.01.2017.14 which created the Office of Rural Broadband in DoIT. The Governor will designate a rural broadband director. To date, this position has not been filled.

The office is required to assist local jurisdictions in the improvement of accessing high-speed Internet; identifying and coordinating the delivery of sources of funds including federal funds specifically identified for this purpose; working with local economic development agencies to identify areas with a demand for better Internet services; investigating new technologies that would increase high-speed Internet availability; and developing policy, regulations, or legislation relevant to increasing broadband availability.

Other State agencies involved with this effort are DHCD, the Maryland Department of Transportation (MDOT), Commerce, and the Maryland Department of Planning (MDP). The order required that these agencies report on their efforts to identify and coordinate resources and technology within 45 days of the signing of the order – this date has already passed and the reports have not been completed. The order also requires that State agencies work with local jurisdictions and other stakeholders, such as the Maryland Broadband Cooperative and the Rural Maryland Council. By April 2018, the office is required to have developed a demonstration project to increase the availability of broadband on both the Eastern Shore and in Western Maryland. **The department should be prepared to brief the committees on the status of the proposed demonstration project.**

The office will also need to settle on a definition for broadband/high-speed Internet service. The current Federal Communications Commission (FCC) definition is download speeds of 25 megabits per second. According to the website statista.com, the average Internet connection speed was 18.75 megabits per second in the first quarter of 2017.

Possible Approaches to Enhance Rural Broadband Availability

DoIT is examining the following approaches to address the lack of high-speed Internet access in rural areas:

- ***Use Unused Mid-mile Fiber:*** DoIT advises that there is unused fiber in rural areas of the State. DoIT could release a Request for Proposals (RFP) that allows a telecommunications company to use its unused fiber to expand Internet services in these areas.

- ***Adding Microwave Towers:*** There is already a system of towers and other broadband infrastructure throughout the State. Additional towers could be built and added to this system.

- ***Improved Cell Phone Technology:*** Current 4G cell phone technology provides download speeds of 4 to 12 megabits per second, which is slower than the FCC definition of broadband/high-speed Internet access. The next technology (5G) is expected to substantially increase download speeds. However, the technology is not yet completed and, insofar as it took two to three years to implement the last upgrade, it is unlikely to be available for a number of years.

- ***Reusing Copper Wires:*** In recent years, telecommunications companies have added fiber-optic cables and migrated services provided on copper cables to the newer fiber-optic cables, thus leaving copper cables unused. These unused copper cables could be used for high-speed Internet. Although copper cables provide less capacity, this may not be an issue since most will be used in less populated areas that require less capacity. It is also unclear as to the condition of the copper cables, the extent to which there are gaps in the copper cables, and the cost of preparing the copper cables for high-speed Internet.

- ***Use Television White Space:*** Television White Space refers to the unused television channels between the active ones in the very high frequency and the ultra-high frequency spectrum.

These are typically referred to as the "buffer" channels. In the past, these buffers were placed between active television channels to protect broadcasting interference. It has since been researched and proven that this unused spectrum can be used to provide broadband Internet access, while operating harmoniously with surrounding television channels. DoIT advises that this is being tested in Tennessee and North Carolina. It is unclear as to the extent that this technology can be used or how long it will be until the technology will be ready.

- ***Low-flying Satellite Systems:*** Satellites have been used to communicate for decades. However, this technology has not been effective with respect to high-speed Internet service. The problem is the gap in time between a satellite receiving a request and responding, known as extreme latency. To reduce this problem, companies such as Google and the Virgin Group have been experimenting with lower flying satellites. However, the technology is years away, if it will ever be deployed.

Despite these possible enhancements, the office will need to overcome the cost of implementation and other cost-related challenges. Currently, Internet providers are reluctant to invest in building the infrastructure required for high-speed Internet access in rural and other areas of the State. Factors adding to high costs include:

- ***Fixed Costs Spread over a Smaller Population:*** This makes recouping costs more challenging;

- ***Difficult Terrain in Western Maryland:*** DoIT advises that infrastructure is more expensive to build in mountainous and rocky terrain; and

- ***Larger Properties That May Require Long Lines on Some Properties:*** For example, some properties may have driveways that are thousands of feet long, requiring long cables from the line to the house.

While broadband is available to a majority of Maryland's households, it is not ubiquitous. While some households do not have broadband service because it is unavailable, there are also households without broadband service in areas that have broadband access. In addition to availability, broadband usage is also influenced by cost. **The department should be prepared to brief the committees on options to expand broadband availability.**

As technology evolves, new technologies are developed and technologies that previously were too expensive become affordable. One concern is that the State makes a substantial investment in a technology that soon becomes obsolete or is superseded by a superior or less expensive technology. As the agency reviews options, it should be careful to review technological developments.

Other Rural Broadband Efforts

In addition to DoIT examining options available to the State to expand broadband, other agencies are also committing resources for broadband. The Department of Agriculture provides grants to the Rural Maryland Council, which supports broadband initiatives. Commerce previously supported

the construction of fiber-optic cables on the Eastern Shore. The DHCD allowance includes general funds set aside for the Office of Rural Broadband. The Governor's executive order also charges MDOT and MDP to assist with rural broadband. **To get a comprehensive perspective on the State's rural broadband efforts, DLS recommends that DolT's Office of Rural Broadband report to the committees on the State's rural broadband efforts.**

3. Enterprise Tech Support Initiative

In fiscal 2016, DoIT implemented its Enterprise Tech Support Initiative. The goal of the initiative is that DoIT support day-to-day agency IT operations for Executive Branch agencies. The kinds of services that DoIT supports include Internet connections, application software, security, help desks, servers, and hardware. DoIT keeps staff near the agencies that it supports so that someone does not need to be dispatched every time there is a problem. The expectation is that this will reduce costs and improve services.

In order to provide agency technology support, DoIT increased its staff by transferring agency personnel into its budget. The increase in staffing from 134 at the beginning of fiscal 2016 to 249 at the end of fiscal 2017 is largely attributable to the Enterprise Tech Support Initiative.

Since fiscal 2017, two agencies have left the program. The Department of Juvenile Services (DJS) and DHCD are no longer participating in the Enterprise Tech Support Initiative. As a consequence, 9 regular DoIT positions have been transferred to DJS and 5 regular positions have been transferred to DHCD.

As of January 2018, the department is providing tech support for almost 10,000 employees. **Exhibit 14** shows that some, like the Office of the State Prosecutor, have few employees while others, like DLLR, have over 1,000.

Exhibit 14
Agencies Supported by the Enterprise Tech Support Initiative

Agency	Employees
Natural Resources	1,655
Labor, Licensing, and Regulation	1,611
Environment	969
Education	839
Higher Education Commission	653
Assessments and Taxation	602
Agriculture	526
Budget and Management	447
General Services	439

Agency	Employees
Military	425
Information Technology	296
Commerce	263
Executive Office of the Governor	185
Planning	149
Governor's Coordinating Offices	130
Maryland Emergency Management Agency	81
Aging	63
Energy Administration	52
Disability	37
Secretary of State	36
Veterans Affairs	34
Longitudinal Data Systems Center	13
Commission on Civil Rights	12
State Prosecutor	12
Total	**9,529**

Note: Includes contract employees.

Source: Department of Information Technology

At the close of fiscal 2017, the Comptroller's Office prepared Schedule F, which reports on accounts payables and commitments. The report identified $1.7 million related to services provided prior to June 30, 2017. DoIT advises that these expenses supported fiscal 2017 enterprise tech support costs. **DLS recommends that the Administration propose a deficiency appropriation for the unpaid fiscal 2017 expenses.**

As this initiative moves forward, these issues will need to be addressed.

- ***How Will Service Quality Be Measured?*** Through its service desk, DoIT now automatically sends those served a satisfaction rating survey. The department should also develop measures for these new day-to-day support services that it will be providing and should report these measures with its MFR data provided in the budget. The concern is that service quality could be deteriorating, but the General Assembly would be unaware because there are no reliable measures. How will DoIT measure the quality of the services it provides? **DoIT should develop MFR indicators that measure service quality.**

- ***What Will This Cost and What Will Be Saved?*** DoIT anticipates that it will receive a mix of general funds appropriated in its budget and reimbursable funds from other agencies. The department also anticipates that savings will be realized. As previously discussed, fiscal 2017

costs exceeded budgeted costs by $1.7 million. DoIT has not provided any data showing either costs or expenses associated with enterprise technology support. **The department should prepare a comprehensive report on anticipated costs and savings.**

- ***What is the Master Plan?*** Since fiscal 2017, DJS and DHCD positions have been transferred back into those agencies as tech support services are no longer provided for those agencies. After a period of rapid growth, it appears that the Enterprise Tech Support Initiative is retrenching. **The department should prepare a master plan for the Enterprise Tech Support Initiative.**

4. Status and Future of Data Centers

As IT systems have expanded, the demand to digitally store data has grown. This data is stored in various data centers across the State. Data storage is decentralized in different State agencies. As IT systems continue to become more sophisticated and expand, the demand to store data will increase. It is unclear how well the State's current decentralized approach to data centers can cope with increasing demands. Questions about the State's decentralized approach include:

- Since there is no inventory, what does the State own?
- How much capacity does the State have?
- How scalable are the data centers?
- How efficient are the data centers?
- How secure are the data centers?
- To what extent do the centers have disaster recovery plans?
- Given recent increases in the availability of cloud services, is it cost effective to move data into the cloud and reduce the State's reliance on maintaining data centers?
- What noncost factors should be considered when evaluating the costs and benefits of moving data into the cloud?

The State does not have a master plan for data centers. **DLS recommends that DoIT develop a master plan for data centers. This plan should inventory current assets, project out-year data capacity needs, and compare the benefits of cloud storage compared to the State investing in capacity. Issues to examine with respect to cloud storage or State-built capacity include lifecycle costs, security needs, disaster recovery, and scalability.**

5. eMaryland Marketplace's Fiscal 2017 One-time Unfunded Deficiency

eMaryland Marketplace (eMM) is an Internet-based procurement system managed by the Department of General Services (DGS). In 2011, DGS entered into a five-year contract with Periscope Holdings, Inc. (Periscope) to develop and operate eMM using its proprietary BuySpeed software. When the Board of Public Works (BPW) approved the contract, it authorized DGS to assess a 1% processing fee on vendors for electronic transactions carried out by DGS on eMM. Proceeds from the processing fee were to cover the cost of operating and maintaining eMM, including payments to Periscope. After two years of operation, proceeds from the fee more than covered the cost of operation, making eMM a self-supporting system.

The original five-year contract included a requirement that Periscope develop a tool to integrate eMM with other State financial systems. A 2013 audit by OLA found that Periscope had not carried out that task despite being paid in full by the State. In its response to the audit, DGS indicated that it would seek compensation from Periscope.

At the conclusion of the five-year contract, DGS elected not to exercise a five-year option to have Periscope continue to operate eMM. It did, however, extend the contract for two months until it could devise an alternative arrangement. Around the same time, responsibility for day-to-day management of eMM was transferred to DoIT. Instead of initiating a competitive procurement to replace eMM, DoIT issued a work order request to NIC, a vendor under contract with DoIT to develop Internet-based software for State agencies, under an existing task order contract that included the continued operation of eMM, to develop an integrated procure-to-pay system (including integration with State financial systems), and implement a standardized strategic sourcing program, including collection and analysis of State spending data. NIC submitted a work order proposal, which DoIT accepted, that went into effect in October 2016. NIC subcontracted with Periscope to carry out the work order.

About three months after the work order went into effect, the Comptroller's Office notified DoIT that it violated a Memorandum of Understanding (MOU) among the Comptroller, DoIT, and DBM. The MOU required that any changes affecting a specified component of the State's financial accounting system be reported to and approved by the Comptroller's Office. As a result, Periscope's work on the task order was suspended on or about March 1, 2017.

In July 2016, BPW approved the contract to the vendor that provides DGS' procurement software. The approved BPW item pays Periscope almost $7.3 million over the next two years for the operation and maintenance of eMM; roughly half of that amount is for completed work, and the other half is for the continued operation of eMM in fiscal 2018 and 2019. After BPW approved continuing the eMM contract, DLS recommended that OLA review this procurement. The Joint Audit Committee concurred and requested that OLA audit the eMM procurement. OLA advises that the audit should be ready by the end of February 2018. OLA is prepared to brief the committees on the audit findings pertaining to eMM and this procurement.

At the end of fiscal 2017, OLA prepared its annual closeout audit, which was released in January 2018. After reviewing the documentation, OLA identified $3.6 million related to services

provided prior to June 30, 2017. DoIT has received $1.0 million in related revenues to partially offset the cost of this compensation payment. Additional general funds totaling $2.6 million are required to cover the remaining fiscal 2017 expenses. **Unless additional information is made available in OLA's audit, DLS recommends that the Administration propose a deficiency appropriation for the unpaid fiscal 2017 expenses.**

Operating Budget Recommended Actions

1. Adopt the following narrative:

Report on Rural Broadband: In June 2017, the Governor signed an executive order that created the Office of Rural Broadband within the Department of Information Technology (DoIT). The office is required to assist local jurisdictions in their improvement of accessing of high-speed Internet; identifying and coordinating the delivery of sources of funds including federal funds specifically identified for this purpose; working with local economic development agencies to identify areas with a demand for better Internet services; investigating new technologies that would increase high-speed Internet availability; and developing policy, regulations, or legislation relevant to increasing broadband availability. Other State agencies involved with this effort are the Department of Housing and Community Development, the Maryland Department of Transportation, the Department of Commerce, the Maryland Department of Planning, and the Maryland Department of Agriculture. To get comprehensive perspective on the State's rural broadband efforts, the Office of Rural Broadband should report on the State's rural broadband efforts. This should include a summary of resources and technologies that can be used, the responsibilities of agencies supporting rural broadband initiatives or spending, State expenditures supporting rural broadband access, updates on any demonstration or pilot projects, and a strategic vision for rural broadband. The report should be completed by October 12, 2018.

Information Request	Author	Due Date
Report on rural broadband	DoIT's Office of Rural Broadband	October 12, 2018

2. Adopt the following narrative:

Enterprise Tech Support Initiative Status Report and Master Plan: Since fiscal 2016, the Administration has implemented the Enterprise Tech Support Initiative. Participating agencies' information technology (IT) services are supported by the Department of Information Technology (DoIT). The number of employees supported by DoIT increased from approximately 1,300 in fiscal 2015 to 12,000 in fiscal 2016. The Department of Juvenile Services and the Department of Housing and Community Development are no longer receiving DoIT service, reducing the number of employees served to under 10,000. The department should provide a status report on the initiative. The report should discuss which agencies are supported by DoIT, the cost to DoIT for supporting these agencies, costs saved or avoided, and how the quality of the support provided by DoIT will be measured. The report should also include DoIT's master plan for this initiative. This report should be submitted to the budget committees by December 1, 2018.

Information Request	Author	Due Date
Enterprise Tech Support Initiative status report and master plan	DoIT	December 1, 2018

3. Adopt the following narrative:

Enterprise Tech Support Initiative Performance Indicators: Since fiscal 2016, the Administration has implemented the Enterprise Tech Support Initiative. Participating agencies' information technology (IT) services are supported by the Department of Information Technology (DoIT). Approximately 10,000 employees are receiving IT support services. DoIT no longer publishes performance measures for the IT services it provides. The department should provide managing for results (MFR) performance goals, objectives, and indicators for its Enterprise Tech Support Initiative. The MFR indicators should be provided with the fiscal 2020 budget.

Information Request	Author	Due Date
Enterprise Tech Support Initiative performance indicators	DoIT	With the fiscal 2020 budget books

4. Add the following language to the general fund appropriation:

Provided that the transfer of up to $172,000 in general funds to other State agencies is authorized.

Explanation: The Department of Information Technology has transferred 15.0 positions to other agencies. The salary and fringe benefit costs total approximately $688,000. The deficiency appropriation reduces fiscal 2018 appropriations by $516,251. This allows the transfer of additional funds to other agencies.

Updates

1. IT Personnel Policy Report

The fiscal 2018 JCR required that DoIT and DBM update the budget committees on IT personnel policies in response to concerns about high turnover rates and low salaries. The report noted that an analysis of 52 IT classifications revealed that IT vacancy rates, turnover rates, and resignation rates are higher than the statewide average. The report also noted that "salaries lag behind the survey jurisdictions an average of -6% against the states surveyed and -39% against the metro counties." The conclusion is that some IT classifications may be considered for a salary adjustment through the Annual Salary Review process. "In particular, the IT functional analyst and IT programmer analyst series may benefit from an in-depth review because of the relatively high numbers of positions, the vacancy rates, and the disparities in pay."

2. Report on the Status of the Agile Approach for Major IT Development Projects

The fiscal 2018 JCR required that DoIT update the budget committees on its implementation of the Agile approach for major IT development projects.

Since the Office of Information Technology (DoIT's predecessor) assumed responsibility for major IT project development oversight, the agency used the waterfall approach to project management. This approach begins with thoroughly planning all aspects of a project. At the end of the planning period, a functional review document is prepared. This document has detailed specifications that can be used in a request for proposal when bidding the project. The vendor then implements the project based on these specifications.

By contrast, the Agile[6] approach does not complete planning prior to beginning to build the software. Instead, the Agile approach develops a high-level plan instead of a detailed plan of all requirements. Projects are divided into a number of tracks. These are usually implemented simultaneously. Each track is broken down so that there are a number of sequential parts to build. The parts are planned and then built over a two-week period called a sprint. This is tested and another part is planned. After a series of sprints, there is a program increment (a usable component). This approach uses the plan-do-check-act approach, which is a repetitive four-stage model for continuous improvement in business process management that is repeated until the project is done.

The key to the Agile approach is that it involves iterations. Small teams work together with stakeholders to define quick prototypes, proof of concepts, or other visual means to describe the problem to be solved. The team defines the requirements for the iteration, develops the code, defines and runs integrated testing scripts, and users test the result.

[6] Specifically, DoIT is using the Scaled Agile Framework.

DoIT's approach is to guide iterative development using the Agile framework without prescribing a specific methodology. This allows agencies to select a vendor whose development methodology is best suited for a particular environment and implementation. The approach provides agencies with the ability to use the Agile process while maintaining a more rigid up-front planning process. This does not reduce the planning process. Instead it requires constant planning whereby the responsibility for each role is explicitly understood.

DoIT has also modified reports to align with the new approach. Major IT project request reports have been revised. The department continues to perform monthly performance reviews and has charts that provide key information and an overall view of the health of a project. To streamline the process, DoIT is developing an Agile Resource Task Order RFP, which should be released before April 2018. This intends to create a qualified pool of Agile resources that can be used on an as-needed basis.

Appendix 1
Current and Prior Year Budgets
Department of Information Technology
($ in Thousands)

	General Fund	Special Fund	Federal Fund	Reimb. Fund	Total
Fiscal 2017					
Legislative Appropriation	$55,962	$26,022	$397	$62,518	$144,899
Deficiency Appropriation	4,006	0	0	0	4,006
Cost Containment	-803	0	0	0	-803
Budget Amendments	6,195	1,773	0	10,618	18,586
Reversions and Cancellations	-500	-18,310	-361	0	-19,171
Actual Expenditures	**$64,860**	**$9,485**	**$36**	**$73,136**	**$147,517**
Fiscal 2018					
Legislative Appropriation	$59,168	$11,086	$0	$49,713	$119,967
Cost Containment	-909	0	0	0	-909
Budget Amendments	-704	0	0	0	-704
Working Appropriation	**$57,555**	**$11,086**	**$0**	**$49,713**	**$118,354**

Note: The fiscal 2018 appropriation does not include deficiencies, targeted reversions, or across-the-board reductions. Numbers may not sum to total due to rounding.

Fiscal 2017

Fiscal 2017 actual expenditures totaled $147.5 million, which is $2.6 million more than the initial legislative appropriation. The following additional deficiency appropriations totaling $4.0 million were provided:

- $1,285,785 for prior year expenditures for software and hardware in the Secretary's Office;
- $1,184,000 for information technology (IT) infrastructure supporting software licensing for the Microsoft contract that was rebid toward the end of calendar 2016;
- $1,000,000 for the major IT development program to support a pilot drone detection program at the Department of Public Safety and Correctional Services; and
- $536,242 for geographic information systems services in Application Systems Management.

Cost containment reduced major IT project development oversight spending by $803,000, while budget amendments added another $18.6 million to spending. Budget amendments include:

- adding $12.4 million ($6.1 million in general funds and $6.3 million in reimbursable funds) to support statewide enterprise operations;
- adding $2.2 million in reimbursable funds to support additional NetworkMaryland services in State agencies;
- adding $1.8 million in special funds from the Dedicated Purpose Account to replace obsolete IT equipment and software replacement in State agencies;
- adding $1.5 million in reimbursable funds to support interactive voice response, integrative predictive dialer, and automatic call distribution for the Central Collection Unit's new contact center;
- adding $567,810 in reimbursable funds to provide additional web services to State agencies;
- adding $179,278 ($174,480 in general funds and $4,798 in special funds) to provide employee increments; and
- reducing special funds by $60,952 to realign telecommunications costs.

There were no general fund reversions. Special fund cancellations total $18.3 million. Specific cancellations are:

- $13.1 million for the Comptroller's Integrated Tax System, which has spent less than $500,000 through fiscal 2017;

- $2.6 million for the Medicaid Management Information System project, which has been canceled;

- $2.5 million for 700 megahertz radios for the Department of Natural Resources; and

- approximately $93,000 in the telecommunications, program evaluation, and interpreting services at Telecommunications Access of Maryland.

DoIT also canceled $360,885 in federal funds. These funds support radio planning activities that are complete, and the funds are no longer needed.

Finally, $500,000 in general funds were reverted. The department was required to submit a report to the General Assembly about the status of the statewide enterprise operations. The report was not submitted so the funds were reverted.

Fiscal 2018

Fiscal 2018 legislative appropriations total $120 million. Cost containment reduced general fund appropriations by $909,065, as discussed in the Operating Budget section, and a budget amendment reduced general funds another $703,727. The amendment transfers general funds from the Major Information Technology Development Project Fund to the State Board of Elections. These funds support the New Voting System Replacement Project and the Agency Election System Management major IT projects. The fiscal 2018 working appropriation totals $118.4 million of which $57.6 million is general funds.

Appendix 2
Major Information Technology Projects
Department of Information Technology
Maryland One Stop (One Portal)

Project Status	Implementation.	**New/Ongoing Project:**	New.
Project Description:	To provide a single website that allows the State portal's visitors to search for all State licenses and permits.		
Project Business Goals:	Identified goals include (1) going paperless; (2) creating a quality digital experience; and (3) modernizing legacy applications, through Agile methods, by releasing minimum viable product early, testing with users, and adding features.		
Estimated Total Project Cost:	$6,000,000	**Estimated Planning Project Cost:**	n/a
Project Start Date:	April 1, 2018.	**Projected Completion Date:**	June 30, 2019.
Schedule Status:	Scheduled to begin when the budget is enacted and the deficiency appropriation is available.		
Cost Status:	Initial cost estimate is provided.		
Scope Status:	Provide one-stop site for over 1,000 State forms across State government.		
Project Management Oversight Status:	The Department of Information Technology is providing project oversight.		
Identifiable Risks:	High-risk factors are interdependencies and costs.		
Additional Comments:	Major information technology project request identifies $6 million in costs but Appendix N of the budget book only reflects $5 million. Additional funds may need to be identified to complete this project.		

Fiscal Year Funding ($ in Thousands)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Balance to Complete**	**Total**
Personnel Services	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Professional and Outside Services	1,000.0	2,000.0	2,000.0	0.0	0.0	0.0	0.0	5.0
Other Expenditures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Funding	**$1,000.0**	**$2,000.0**	**$2,000.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$5.0**

Appendix 3
Major Information Technology Projects
Department of Information Technology
eMaryland Marketplace (eMM)

Project Status	Implementation.	**New/Ongoing Project:**	Ongoing.
Project Description:	Self-funding procure-to-pay solution that supports sourcing, receiving, vendor registration and management, solicitation, quotes, accounts payable, and requisitioning.		
Project Business Goals:	Increase transparency and accountability on purchases, improve customer service, decrease cycle times, and reduce "maverick" spending and operating costs.		
Estimated Total Project Cost:	$1,595,000	**Estimated Planning Project Cost:**	n/a
Project Start Date:	January 1, 2018.	**Projected Completion Date:**	June 30, 2019.
Schedule Status:	The current procurement system expires on August 28, 2019. This procurement is scheduled to be deployed prior to the current system's expiration.		
Cost Status:	On budget.		
Scope Status:	No change.		
Project Management Oversight Status:	The Department of Information Technology is providing project oversight.		
Identifiable Risks:	High risk relates to sponsorship. The new system must be in place when the old system expires. To meet project objectives, control agencies need to remain engaged and adhere to the schedule. Agency commitment to training is also essential.		
Additional Comments:	None.		

Fiscal Year Funding ($ in Thousands)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Balance to Complete**	**Total**
Personnel Services	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Professional and Outside Services	445.0	1,150.0	0.0	0.0	0.0	0.0	0.0	1,595.0
Other Expenditures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Funding	**$445.0**	**$1,150.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$1,595.0**

Appendix 4
Major Information Technology Projects
Department of Information Technology
Enterprise Solution Planning Initiative (ESPI)

Project Status	Planning.	**New/Ongoing Project:**	Ongoing.
Project Description:	Provide integrated planning support to information technology projects received to combine planning activities that have traditionally occurred in siloes.		
Project Business Goals:	(1) Centralize planning; (2) ensure solutions are scaled at an appropriate level, and apply enterprise model to reduce duplicative systems; (3) support Agile approach to system development; (4) influence common modeling, designing, and coding practices for systems architecture; and (5) ensure priority needs/solutions are addressed timely and funded appropriately.		
Estimated Total Project Cost:	$9,242,480	**Estimated Planning Project Cost:**	n/a
Project Start Date:	Ongoing.	**Projected Completion Date:**	Ongoing.
Schedule Status:	n/a		
Cost Status:	On budget.		
Scope Status:	No change.		
Project Management Oversight Status:	n/a		
Identifiable Risks:	High risk is agency interdependencies. This project interfaces across agency systems and platforms to commonalities.		
Additional Comments:	None.		

Fiscal Year Funding ($ in Thousands)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Balance to Complete**	**Total**
Personnel Services	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Professional and Outside Services	2,242.5	1,400.0	1,400.0	1,400.0	1,400.0	1,400.0	0.0	9,242.5
Other Expenditures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Funding	**$2,242.5**	**$1,400.0**	**$1,400.0**	**$1,400.0**	**$1,400.0**	**$1,400.0**	**$0.0**	**$9,242.5**

Appendix 5
Major Information Technology Projects
Department of Information Technology
Statewide Voice over Internet Protocol (VoIP) Phone Service Transition Project

Project Status	Planning.	**New/Ongoing Project:**	Ongoing.
Project Description:	Migrate the State's telephone system into VoIP. This replaces older Time Division Multiplexing technology. Hardware, such as private branch exchange (PBX) equipment, and software will be replaced.		
Project Business Goals:	Enhance communications and modernize infrastructure to reduce duplication and enhance capabilities.		
Estimated Total Project Cost:	$40,702,172	**Estimated Planning Project Cost:**	n/a
Project Start Date:	April 1, 2016.	**Projected Completion Date:**	June 30, 2022.
Schedule Status:	On schedule.		
Cost Status:	This is a multi-year project to replace telephone infrastructure. Costs are being refined and additional appropriations may be required.		
Scope Status:	No change.		
Project Management Oversight Status:	The Department of Information Technology is providing project oversight.		
Identifiable Risks:	High risk is funding since this project is expensive and network hardware upgrades and configuration changes may be needed.		
Additional Comments:	Most PBXs are at the end of manufacturer support and need to be replaced. The Maryland Department of Agriculture has been successfully migrated. Anticipated fiscal 2019 migrations include the Goldstein Treasury Building and six multiservice centers.		

Fiscal Year Funding ($ in Thousands)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Balance to Complete**	**Total**
Personnel Services	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Professional and Outside Services	3,000.0	12,086.6	12,086.6	6,764.5	6.764.5	0.0	0.0	40,702.2
Other Expenditures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Funding	**$3,000.0**	**$12,086.6**	**$12,086.6**	**$6,764.5**	**$6,764.5**	**$0.0**	**$0.0**	**$40,702.2**

Appendix 6
Major Information Technology Projects
Department of Information Technology
Drone Detection and Response System

Project Status	Planning.	**New/Ongoing Project:**	Ongoing.
Project Description:	Implement a system that can detect and respond to drones that unlawfully enter contraband into the Maryland State prison system. The project is in two phases. Phase 1 procures a subject matter expert and Phase 2 procures a vendor to deliver and implement the system.		
Project Business Goals:	Increase security at Department of Public Safety and Correctional Services' facilities.		
Estimated Total Project Cost:	$2,810,000	**Estimated Planning Project Cost:**	n/a
Project Start Date:	May 2017.	**Projected Completion Date:**	n/a
Schedule Status:	A subject matter expert is expected to be on board by April 2018.		
Cost Status:	On budget.		
Scope Status:	This implementation is for two pilot sites in Hagerstown.		
Project Management Oversight Status:	The Department of Information Technology is providing project oversight.		
Identifiable Risks:	Technology is a risk as it could lead to unforeseen issues and delays. There are implementation risks since the system will need to be designed to handle a wide range of products on a continuous basis.		
Additional Comments:	Once implemented, the system could be scalable so that other institutions or agencies can deploy the system.		

Fiscal Year Funding ($ in Thousands)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Balance to Complete**	**Total**
Personnel Services	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Professional and Outside Services	1,250.0	1,560.0	0.0	0.0	0.0	0.0	0.0	2,810.0
Other Expenditures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Funding	**$1,250.0**	**$1,560.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$2,810.0**

Appendix 7
Object/Fund Difference Report
Department of Information Technology

Object/Fund	FY 17 Actual	FY 18 Working Appropriation	FY 19 Allowance	FY 18 - FY 19 Amount Change	Percent Change
Positions					
01 Regular	248.60	234.60	234.60	0.00	0%
02 Contractual	2.10	1.10	1.10	0.00	0%
Total Positions	**250.70**	**235.70**	**235.70**	**0.00**	**0%**
Objects					
01 Salaries and Wages	$ 22,618,566	$ 25,620,295	$ 24,204,350	-$ 1,415,945	-5.5%
02 Technical and Spec. Fees	121,912	116,135	129,423	13,288	11.4%
03 Communication	8,234,158	8,701,234	8,555,615	-145,619	-1.7%
04 Travel	101,662	44,376	84,145	39,769	89.6%
06 Fuel and Utilities	47,038	201,000	45,500	-155,500	-77.4%
07 Motor Vehicles	5,487	4,590	7,420	2,830	61.7%
08 Contractual Services	114,256,721	81,164,032	126,846,379	45,682,347	56.3%
09 Supplies and Materials	136,601	96,100	80,250	-15,850	-16.5%
10 Equipment – Replacement	1,347,696	1,460,520	1,919,874	459,354	31.5%
11 Equipment – Additional	354,050	400,000	430,000	30,000	7.5%
13 Fixed Charges	293,245	545,806	410,746	-135,060	-24.7%
Total Objects	**$ 147,517,136**	**$ 118,354,088**	**$ 162,713,702**	**$ 44,359,614**	**37.5%**
Funds					
01 General Fund	$ 64,860,215	$ 57,555,098	$ 96,380,904	$ 38,825,806	67.5%
03 Special Fund	9,484,570	11,085,684	17,248,372	6,162,688	55.6%
05 Federal Fund	36,190	0	0	0	0.0%
09 Reimbursable Fund	73,136,161	49,713,306	49,084,426	-628,880	-1.3%
Total Funds	**$ 147,517,136**	**$ 118,354,088**	**$ 162,713,702**	**$ 44,359,614**	**37.5%**

Note: The fiscal 2018 appropriation does not include deficiencies, targeted reversions, or across-the-board reductions. The fiscal 2019 allowance does not include contingent reductions or cost-of-living adjustments.

Appendix 8
Fiscal Summary
Department of Information Technology

Program/Unit	FY 17 Actual	FY 18 Wrk Approp	FY 19 Allowance	Change	FY 18 - FY 19 % Change
0A Major IT Development Project Fund	$ 34,139,697	$ 32,209,048	$ 72,464,845	$ 40,255,797	125.0%
0B Office of Information Technology	113,377,439	86,145,040	90,248,857	4,103,817	4.8%
Total Expenditures	**$ 147,517,136**	**$ 118,354,088**	**$ 162,713,702**	**$ 44,359,614**	**37.5%**
General Fund	$ 64,860,215	$ 57,555,098	$ 96,380,904	$ 38,825,806	67.5%
Special Fund	9,484,570	11,085,684	17,248,372	6,162,688	55.6%
Federal Fund	36,190	0	0	0	0.0%
Total Appropriations	**$ 74,380,975**	**$ 68,640,782**	**$ 113,629,276**	**$ 44,988,494**	**65.5%**
Reimbursable Fund	$ 73,136,161	$ 49,713,306	$ 49,084,426	-$ 628,880	-1.3%
Total Funds	**$ 147,517,136**	**$ 118,354,088**	**$ 162,713,702**	**$ 44,359,614**	**37.5%**

IT: information technology

Note: The fiscal 2018 appropriation does not include deficiencies, targeted reversions, or across-the-board reductions. The fiscal 2019 allowance does not include contingent reductions or cost-of-living adjustments.