# F50
Department of Information Technology

Executive Summary

The Department of Information Technology (DoIT) supports information technology (IT) needs in State agencies. This includes operations, major IT project development, security, web services, application management, the State's 700 megahertz first responder radio system, and telecommunications relay systems for hearing- and speech-disabled individuals.

Operating Budget Summary

Fiscal 2021 Budget Increases $5.2 Million or 2.4% to $223.3 Million
($ in Millions)
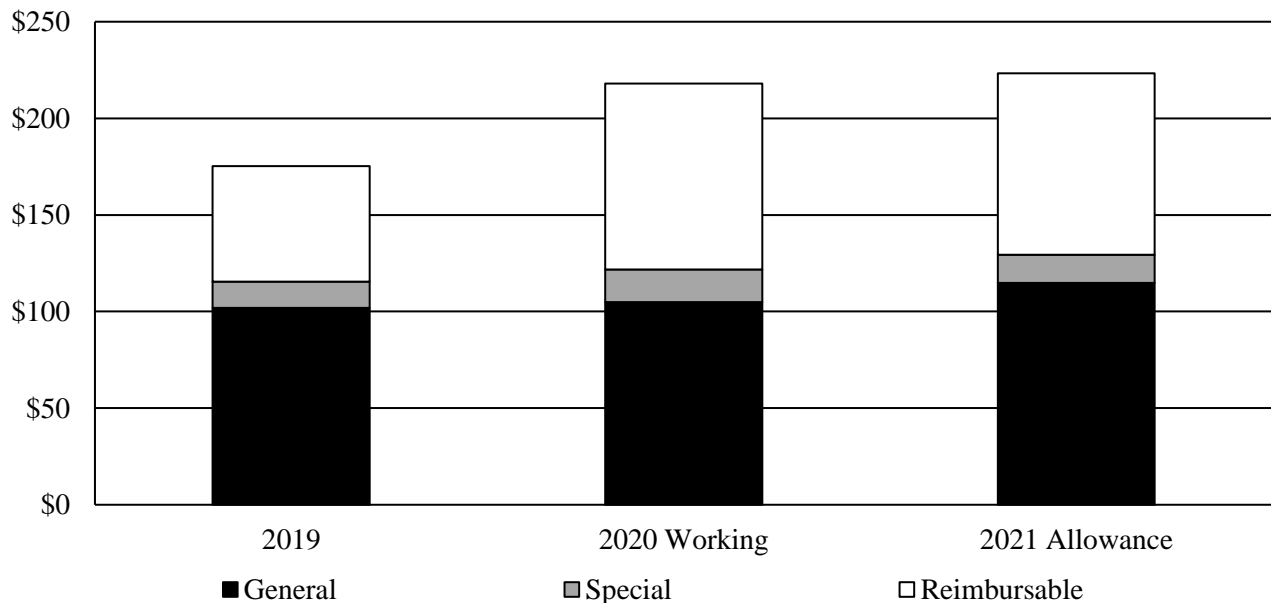
Note: Numbers may not sum due to rounding. The fiscal 2020 appropriation includes deficiencies, planned reversions, and general salary increases. The fiscal 2021 allowance includes contingent reductions and general salary increases.

- Increases in fiscal 2020 and 2021 spending are primarily attributable to major IT project development spending as general fund appropriations increase from $68 million in fiscal 2019 to $89 million in fiscal 2020 and $97 million in fiscal 2021.

- Vacancies remain high; DoIT has 57 positions vacant in January 2020, which is 25% of the workforce.

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Key Observations

- *Audits Identify Cybersecurity Weaknesses in State Agencies:* Common findings are unsecured personally identifiable information and not sufficiently vetting third-party vendors.

- *Additional Resources Are Provided to Improve Cybersecurity:* The fiscal 2021 budget includes $10 million to migrate agencies into a Security Operations Center that provides an enhanced firewall, endpoint security, patching, and other defenses.

- *Agencies Appear to Be Struggling with Major Information Technology Development Projects:* Some projects are delayed, and federal grants have been lost.

- *High Vacancies:* As of January 2020, 25% of positions are vacant.

Operating Budget Recommended Actions

		Funds
1.	Add language that abolishes 15 regular positions, reduces funds, and restricts funds for salary enhancements to reduce vacancy rates.	
2.	Reduce funding for the Medicaid Management Information System II replacement information technology development project based on expectations of program spending in fiscal 2020 and 2021.	$ 1,000,000
3.	Reduce funding for the Maryland Total Human-services Information NetworK Major Information Technology Development Project to reflect anticipated spending in fiscal 2020 and 2021.	16,500,000
4.	Reduce funding for the Integrated Tax System Major Information Technology Development Project based on anticipated spending needs in fiscal 2021.	2,000,000
5.	Reduce general funds appropriated in the Major Information Technology Development Fund and authorize a budget amendment to appropriate special funds anticipated from resource sharing agreements.	2,000,000

6. Adopt narrative requesting a report on the total costs of the Maryland Total Human-services Integrated NetworK major information technology project.

7. Add a section reducing reimbursable funds budgeted in the Department of Information Technology.

Total Reductions   **$ 21,500,000**

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Department of Information Technology

Operating Budget Analysis

Program Description

The Department of Information Technology (DoIT) contains the following programs:

- *State Chief of Information Technology:* Responsible for executive direction and major information technology (IT) project oversight. This includes a chief operating officer and a chief data officer as well as enterprise architecture, project management, communication, and legislation.

- *Security Management:* Responsible for developing statewide security policies, enforcing policies, and supporting State agencies' security efforts. This includes cyber incident response, cyber risk and strategic analysis, vulnerability detection and assessment, intelligence and investigation, and software assurance.

- *Application Systems Management:* Responsibilities include application development, web systems, geographic information systems, and operating statewide systems, such as the Financial Management Information System.

- *Infrastructure:* Responsibilities include operating networkMaryland, the State's data network, voice systems, and maintaining and supporting shared services day-to-day operations for Executive Branch agencies.

- *Chief of Staff:* Provides departmentwide administrative support.

- *Radio or Statewide Interoperable Communications Division:* Operates the Maryland First Responders interoperable Radio System Team (MD FiRST) that is the State's 700 megahertz (MHz) radio system. The system is used by State, local, and federal first responders.

- *Telecommunications Access of Maryland (TAM):* Provides telecommunications relay service for Maryland's hearing- and speech-disabled citizens. The program also provides assistance with 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 Information Technology Development Projects (MITDP) 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 MITDP.
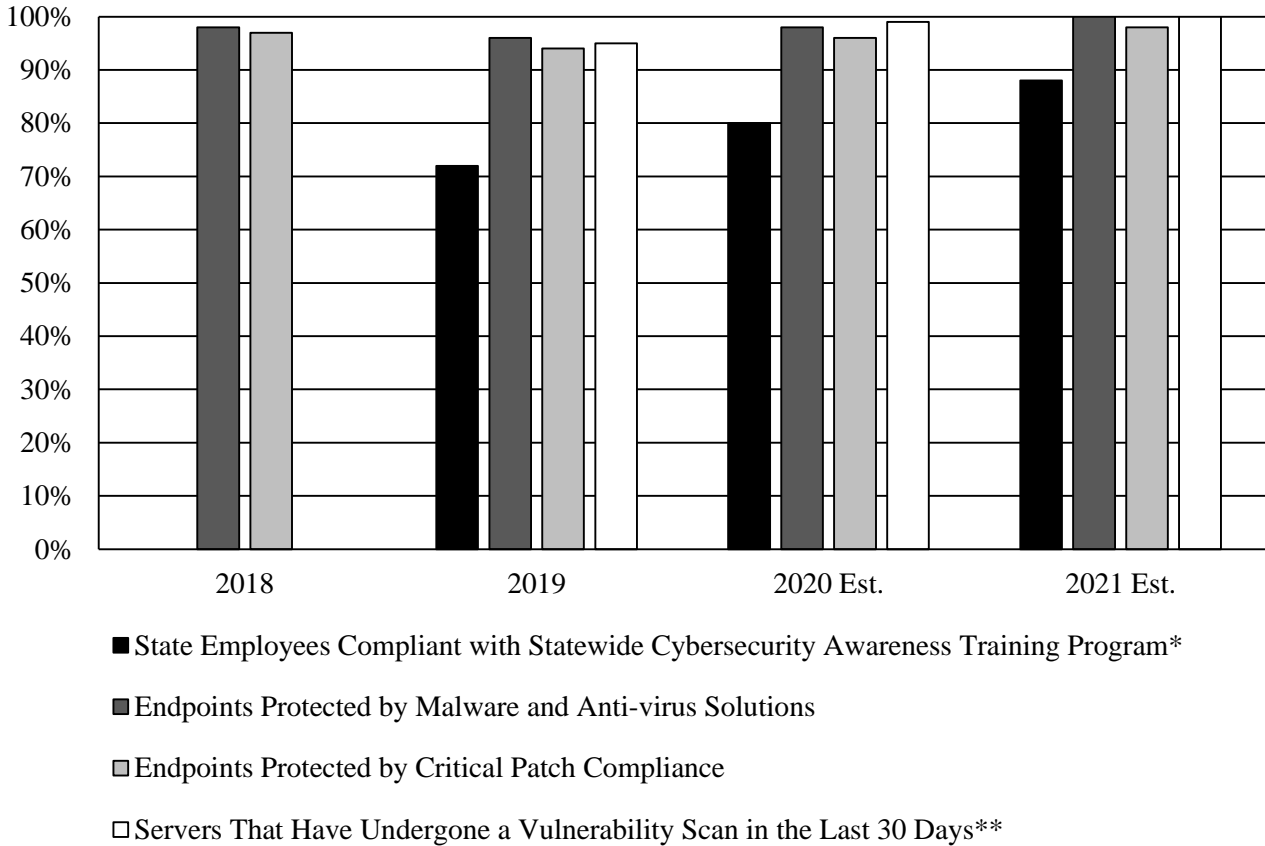
Performance Analysis: Managing for Results

1. Cybersecurity

DoIT's first Managing for Results (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 performance indicators that can better assess the State's progress. In response, DoIT has updated its performance indicators. **Exhibit 1** shows actual data for fiscal 2018 and 2019 with projections for fiscal 2020 and 2021.

Measurement for endpoint protections and scanning servers are 94% or higher. However, the number of employees compliant with cybersecurity training is 72%. 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. As such, employee cybersecurity training is probably the most effective defensive measure an organization can take. **The department should be prepared to brief the budget committees on steps taken to improve compliance with employee cybersecurity awareness training.**

Exhibit 1
Cybersecurity Indicators
Fiscal 2018-2021 Est.

■ State Employees Compliant with Statewide Cybersecurity Awareness Training Program*

■ Endpoints Protected by Malware and Anti-virus Solutions

□ Endpoints Protected by Critical Patch Compliance

□ Servers That Have Undergone a Vulnerability Scan in the Last 30 Days**

* No cybersecurity training was provided during fiscal 2018 due to a lapse in the contract.
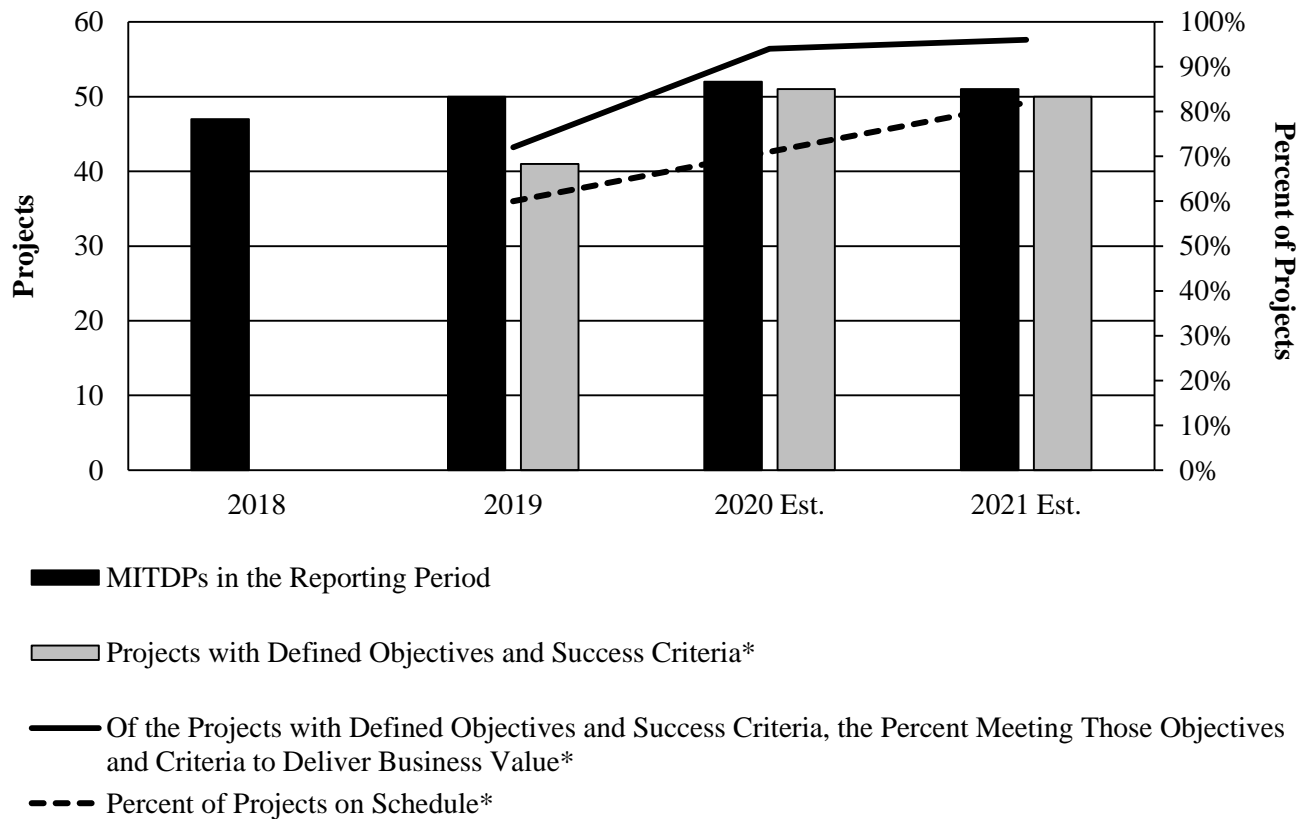** New indicator.

Source: Governor's Fiscal 2021 Budget Books

2.   Oversight of Major IT Projects

The fiscal 2021 budget includes $105 million funded by the MITDPF. DoIT expects to oversee 51 projects in fiscal 2021. 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 MITDPs 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.

In the fiscal 2020 *Joint Chairmen's Report* (JCR), DoIT was asked to update its MFR indicators for major IT projects to include indicators to measure the attributes of Agile projects, which is now the department's preferred development approach. New indicators are included, and three of the new indicators are shown in **Exhibit 2**. The department is now measuring the number of projects with defined objectives and success criteria. Most projects without these criteria in fiscal 2019 are in early stages of development, and DoIT anticipates that defined objectives and success criteria will be developed. For the Maryland Department of Labor, the scope of the Unemployed Insurance Technology Modernization project was being reevaluated. In fiscal 2019, 72% of projects with defined criteria were meeting them, and 60% of projects were on schedule. **DoIT should be prepared to brief the committees on strategies and actions taken to improve these measures.**

Exhibit 2
Major Information Technology Development Project Indicators
Fiscal 2018-2021 Est.

MITDPs in the Reporting Period

Projects with Defined Objectives and Success Criteria*

Of the Projects with Defined Objectives and Success Criteria, the Percent Meeting Those Objectives and Criteria to Deliver Business Value*

- - - Percent of Projects on Schedule*

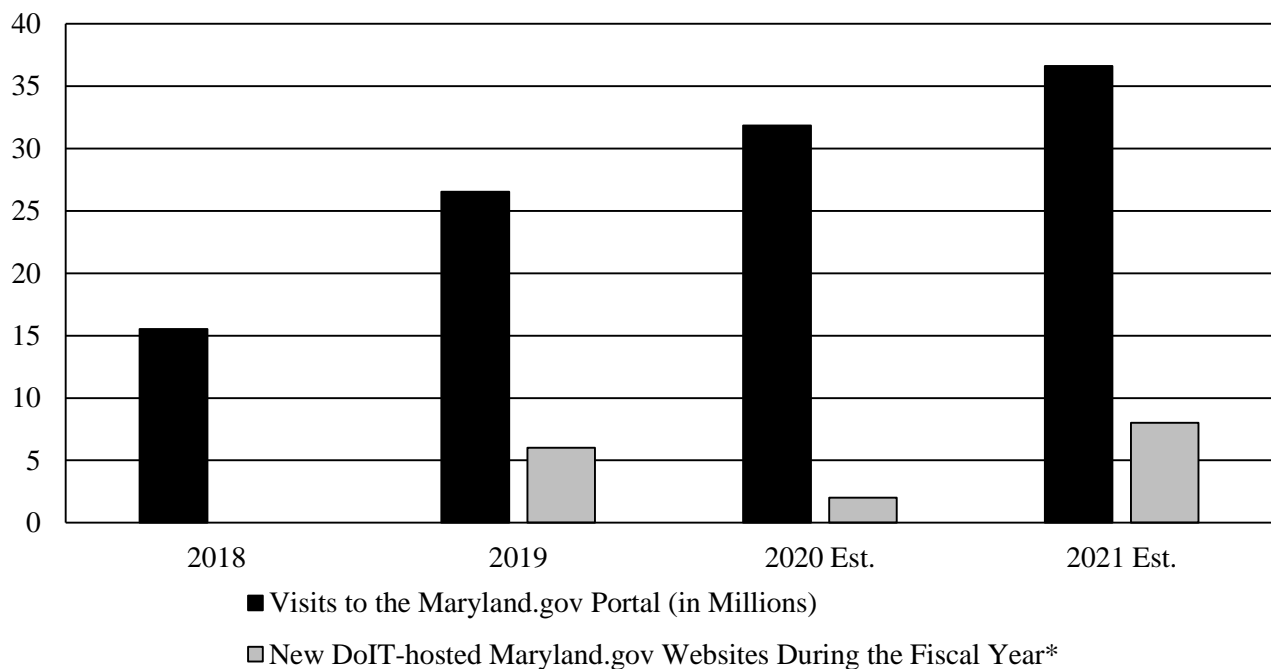MITDP: Major Information Technology Development Project

* New indicator.

Source: Governor's Fiscal 2021 Budget Books

3.   Online Services Provided to the Public and State Agencies

DoIT has a goal to provide efficient online services to the public and to support State agencies. Objectives include keeping websites available 99% of the time and expanding services. **Exhibit 3** shows that DoIT-supported portals, which totaled 80 at the end of fiscal 2019, had over 25 million visits that year. The department anticipates adding two portals in fiscal 2020 and eight in fiscal 2021.

Exhibit 3
Online Services Indicators
Fiscal 2018-2021 Est.

■ Visits to the Maryland.gov Portal (in Millions)

▢ New DoIT-hosted Maryland.gov Websites During the Fiscal Year*

DoIT: Department of Information Technology

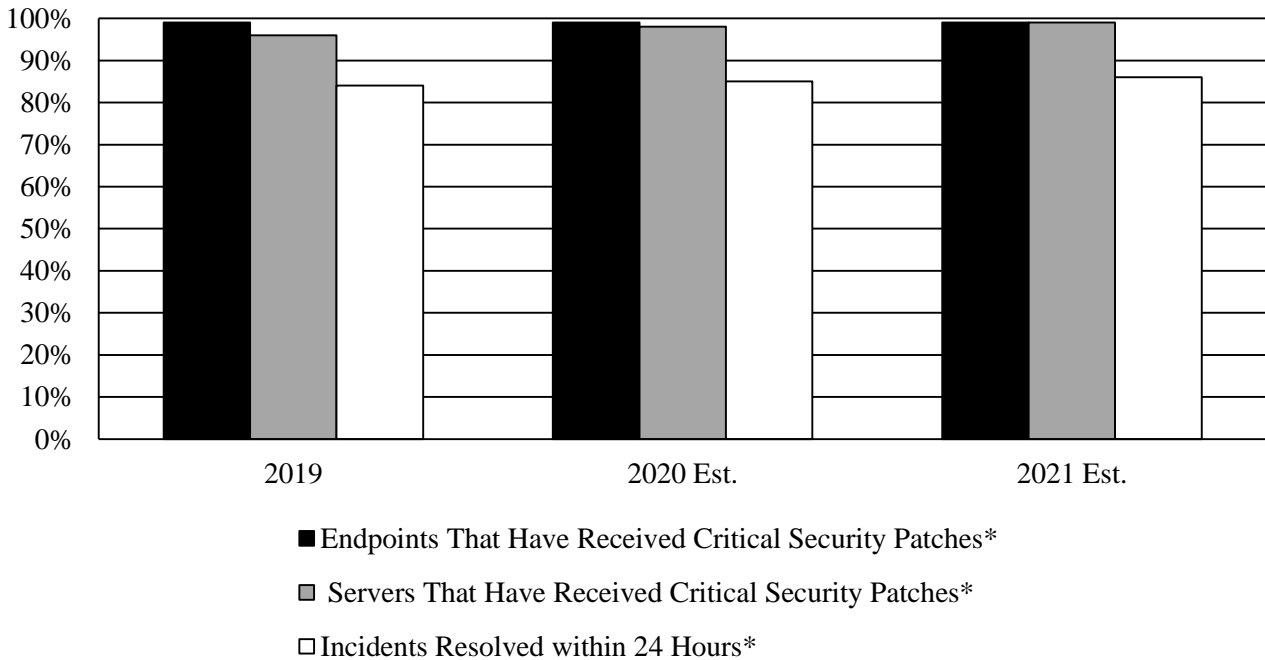* New Indicator

Source: Governor's Fiscal 2021 Budget Books

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 most recent evaluation was released in November 2018. In the survey, Georgia, Michigan, Missouri, Ohio, and Utah received an A grade and topped the rankings. Maryland's grade was a B+. Positive comments were made about DoIT's consolidation of IT services through enterprise IT services, which "consolidate commodity services with cross-agency similarity, leading,

ultimately, to an improved cybersecurity posture and streamlined operations." The One Stop Portal project was also mentioned as an opportunity to "improve the user experience." A summary of the One Stop Portal project is provided in **Appendix 4**.

4. Support Services for State Agencies

DoIT's fourth goal is to provide "efficient and high-quality IT services to State agencies." Among other things, this addresses the State's consolidated IT operations through the enterprise IT shared services initiative. DoIT had been asked to develop new indicators to measure service quality and has obliged. All the indicators shown in **Exhibit 4** are new indicators. In fiscal 2019, 99% of endpoints received critical security patches, and 96% of servers received critical security patches. DoIT advises that the service desk received over 76,000 tickets in fiscal 2019. The data also show that 84% of incidents were resolved in 24 hours.

Exhibit 4
Agency Services Indicators
Fiscal 2019-2021 Est.

■ Endpoints That Have Received Critical Security Patches*

▢ Servers That Have Received Critical Security Patches*

▢ Incidents Resolved within 24 Hours*

* New indicator.

Source: Governor's Fiscal 2021 Budget Books

Fiscal 2020

Proposed Deficiencies

Major IT Projects

The budget bill includes $27,222,710 for Department of Human Services' (DHS) Maryland Total Human-services Integrated NetworK (MD THINK), which is a shared human services platform. Additional funds are required for the shared platform; Eligibility and Enrollment systems; the Child, Juvenile, and Adult Management System (CJAMS); and the Child Support Management System. This project is reviewed in the major IT section of this analysis and the DHS Administration analysis (N00A01).

The budget bill also includes $637,967 for the State Treasurer's Office's (STO) Financial Systems Modernization major IT project. This project is being implemented while STO is transitioning its statewide depository banking service from Bank of America to Wells Fargo. This is the first change in vendors in decades and requires additional resources and programming to integrate systems. Wells Fargo will also be providing enhanced services, like remote deposit capture of checks that were not previously offered.

The budget bill is adding a new project with the deficiency appropriations. The State Board of Elections (SBE) is receiving $125,000 for a project manager for the pollbook major IT project.
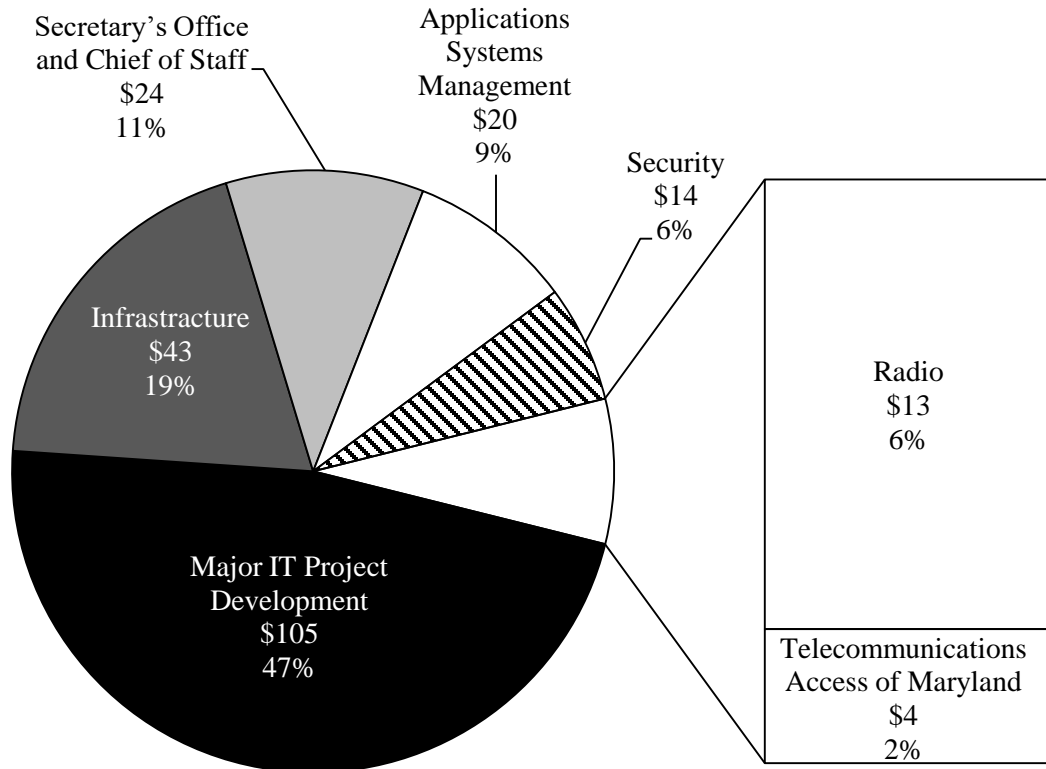
Procurement Reform

Chapter 590 of 2017 reformed State procurement. This includes consolidating procurement in the Department of General Services (DGS). Consistent with the mandate to move procurement activities into DGS, 3 assistant Attorney General positions were transferred from DoIT into DGS. The deficiency appropriation reduces DoIT appropriations by $283,683 in general funds for the salaries and fringe benefits.

Fiscal 2021 Overview of Agency Spending

Exhibit 5 shows that major IT project development and infrastructure account for 66.4% of DoIT's spending. Infrastructure includes end user applications and support, local and wide area network (WAN) support, networkMaryland, and voice communication. These services are included in the enterprise IT shared service services offered by DoIT.

The next two charts group the department by (1) major IT development and (2) operations. Major IT project development only includes funds for IT development and third-party oversight. Operations includes administration, DoIT staff overseeing major IT, network, security, applications, radio, and TAM programs.

Exhibit 5
Overview of Agency Spending
Fiscal 2021 Allowance
($ in Millions)

Secretary's Office
and Chief of Staff
$24
11%

Applications
Systems
Management
$20
9%

Security
$14
6%

Infrastracture
$43
19%

Radio
$13
6%

Major IT Project
Development
$105
47%

Telecommunications
Access of Maryland
$4
2%

IT: information technology

Source: Governor's Fiscal 2021 Budget Books

The department relies heavily on contracts to provide services. **Exhibit 6** shows that contracts for major IT project development and operations are 84% of spending. This is over six times as much as salaries and fringe benefits. Operating contracts support applications, web systems, security, and personnel needs.

Exhibit 6
Objects by Agency
Fiscal 2021
($ in Millions)
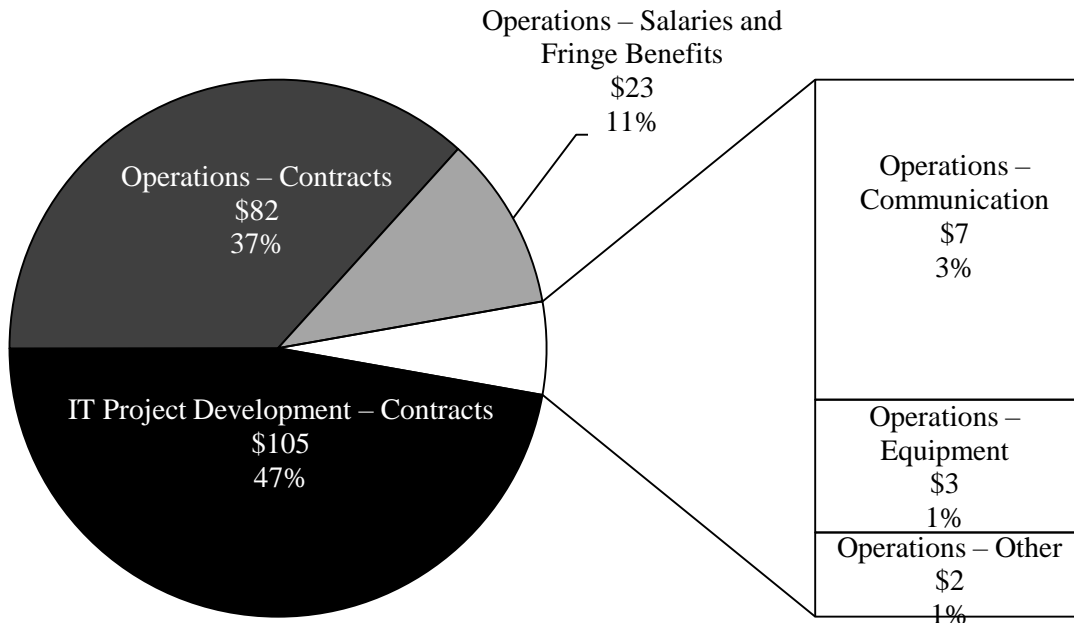
IT: information technology

Source: Governor's Fiscal 2021 Budget Books

Proposed Budget Change

Exhibit 7 shows that the fiscal 2021 allowance is $223.3 million, which is 2.4% more than the fiscal 2020 working appropriation with proposed deficiencies. The largest changes relate to the first two MFR indicators, cybersecurity and major IT project development. With respect to cybersecurity, DoIT receives $10 million to migrate agencies into the Security Operations Center, and will receive $5 million from the Dedicated Purpose Account for cybersecurity assessments.

The Security Operations Center allows DoIT to use more consistent products to standardize more operations. This helps Executive Branch agencies comply with State laws requiring the protection of data, reduce risk by applying foundational controls across agencies, and standardize and rationalize the tools used to achieve economies of scale and reduce costs. Concerns have been raised that while DoIT is responsible for cybersecurity policy and guidance, DoIT does not have sufficient resources or authority to enforce cybersecurity standards. This initiative is addressing those concerns. Cybersecurity issues are addressed in more detail in Issue 1.

Exhibit 7
Proposed Budget
Department of Information Technology
($ in Thousands)

How Much It Grows:	General Fund	Special Fund	Reimb. Fund	Total
Fiscal 2019 Actual	$101,862	$13,594	$59,812	$175,268
Fiscal 2020 Working Appropriation	104,885	16,901	96,283	218,070
Fiscal 2021 Allowance	114,888	14,599	93,806	223,293
Fiscal 2020-2021 Amount Change	$10,003	-$2,302	-$2,477	$5,224
Fiscal 2020-2021 Percent Change	9.5%	-13.6%	-2.6%	2.4%

Where It Goes:	Change
Personnel Expenses	
Increments and other compensation	$501
Turnover adjustments	477
Fiscal 2020 deficiency transfers 3 positions to Department of General Services	284
Fiscal 2021 2% annual salary increase effective January 1, 2021	193
Retirement contributions	132
Annualize January 1, 2020 1% salary increase	96
Employee and retiree health insurance	81
Abolished 10 long-term vacancies	-737
Cybersecurity	
Security Operations Center Migration	10,000
Radio Operations	
Maintenance and repair contracts	2,353
Other Operations	
Major Information Technology Project oversight	5,415
Equipment to expand private cloud data center to migrate legacy data centers	686
Maintenance costs attributable to data center migrations and networkMaryland 100 gigabits per second expansion	484
Consolidating Department of Natural Resources and Maryland Department of the Environment Microsoft licensing	-390
Department of Information Technology (DoIT) shared services allocation	-454
Fiscal 2020 SharePoint ServiceNow upgrades and transition to Qlik	-488
Adjusting tablet program to reflect demand	-650
One-time technical assistance for Maryland Department of Health systems	-765
Other infrastructure consulting contracts	-1,345
Major Information Technology Projects and Oversight	
Statewide Major Information Technology Development Project Fund (MITDPF)	12,015
Net costs of DoIT information technology projects budgeted in the MITDPF	-22,160
Other Changes	-1
Total	**$5,224**

Note: Numbers may not sum due to rounding. The fiscal 2020 appropriation includes deficiencies, planned reversions, and general salary increases. The fiscal 2021 allowance includes contingent reductions and general salary increases.

Personnel Data

	FY 19 Actual	FY 20 Working	FY 21 Allowance	FY 20-21 Change
Regular Positions	234.60	220.60	210.60	-10.00
Contractual FTEs	1.00	1.10	1.20	0.10
Total Personnel	**235.60**	**221.70**	**211.80**	**-9.90**

Vacancy Data: Regular Positions

Turnover and Necessary Vacancies, Excluding New Positions	12.95	6.15%
Positions and Percentage Vacant as of 12/31/19	54.60	24.75%
Vacancies Above Turnover	41.65	

- 10 long-term vacant positions are abolished at the end of fiscal 2020.

- As in recent years, vacancies remain high. As of January 2020, DoIT had 55 vacant positions, which is 42 more than budgeted turnover.

Since January 2018, the department's vacancies have ranged from a low of 39 to a high of 55. **Exhibit 8** shows that vacant positions have been two to three times more than budgeted turnover.

Exhibit 8
Positions Vacant and Budgeted Turnover
January 2018 to January 2020
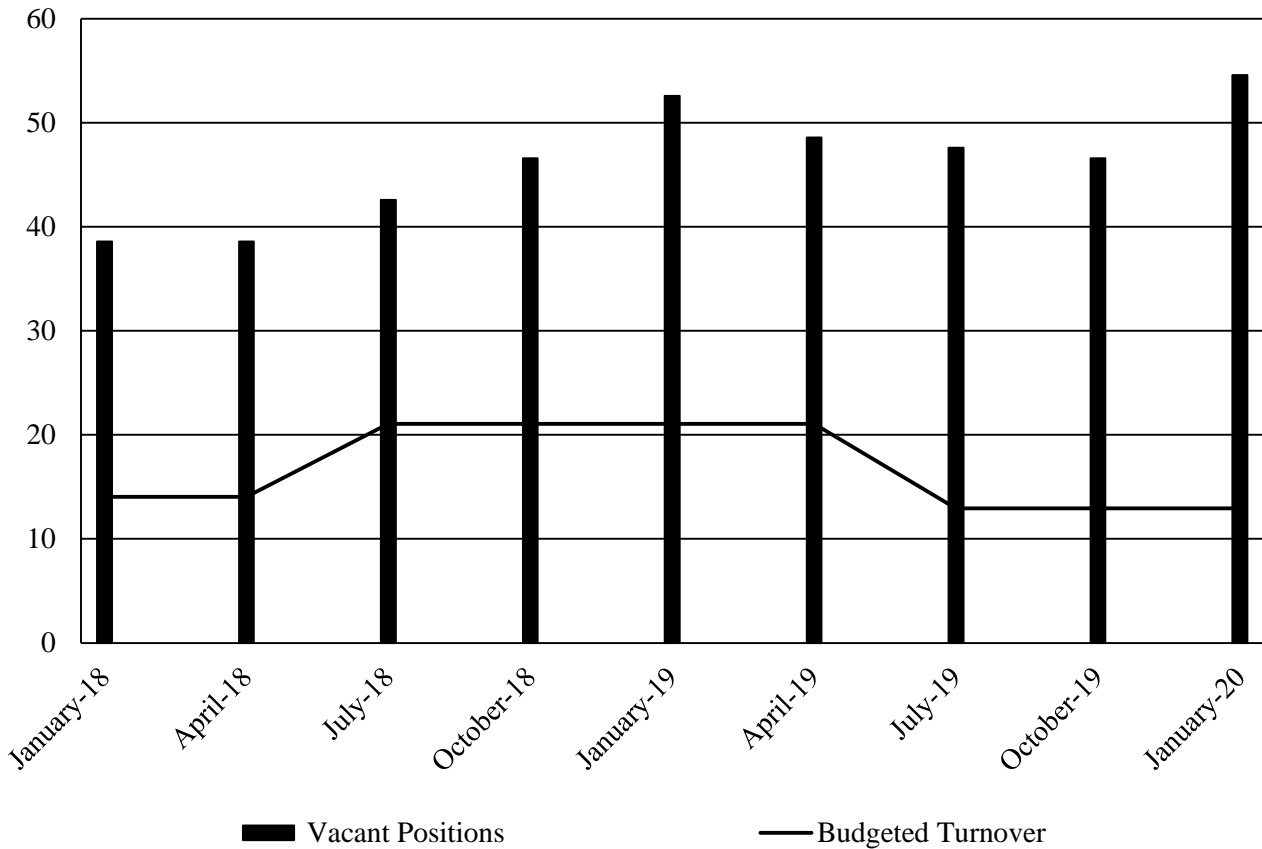
Source: Department of Budget and Management

Low IT Salaries and DoIT's Response

A 2018 JCR required that DoIT and the Department of Budget and Management (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 of the report was that some IT classifications may be considered for a salary adjustment through the Annual Salary Review (ASR) process, which compares the salaries of State positions to other similar positions to determine if salary increases are warranted.

In spite of recommending ASRs, none have been provided for DoIT positions. Low salaries seem to be one reason why DoIT has a high vacancy rate.

DBM's Standard Salary Schedule provides the salaries for most DoIT employees. The schedule begins at base, and then adds 20 steps in each grade so that there are a total of 21 different salaries. Grade 9, the tenth in the scale, is referred to as the midpoint. The schedule gives larger raises for employees on the lower end of the scale. Step increases are approximately 4% for steps 1 to 5. After step 5, raises are about 2%.

As DoIT salaries tend to be lower than the salaries for similar positions with other jurisdictions, DoIT is compensating for the State's lower salary schedule by hiring new staff at well above the base salary. In calendar 2019, DoIT hired 17 employees that were still on the payroll on January 1, 2020. **Exhibit 9** shows that most of the positions were hired at step 14 or above. These employees have only six steps to reach the top of the scale, thereby leaving much less room for salary enhancements for employees that stay in State service.

Exhibit 9
Steps of Employees Hired Since December 31, 2018

	Positions	Percent of Total
Step 0 to 13	8	47.1%
Step 14 to 20	9	52.9%
Total	**17**	**100.0%**

Note: Excludes one Executive Pay Plan position since the Executive Pay Plan does not have steps.

Source: Department of Budget and Management

For example, at DoIT, the most common grade is grade 17, which covers 23% (51 of 220.6) of all DoIT positions. An employee hired at step 14 earns a salary of $71,333, which is $21,362 above the base. This leaves only $8,663 in raises until the employee reaches top pay. There is anecdotal evidence suggesting that it is common for employees to enter State service to gain experience and then leave for higher pay in different jurisdictions.

High Vacancies Reduce Effectiveness

Key to effective IT project development and cybersecurity is having qualified State employees managing resources dedicated to developing projects successfully and protecting cybersecurity. While DoIT will always rely heavily on contracts (in fiscal 2021, the budget for contracts is more than eight times the budget for personnel), the department also needs State employees dedicated to managing this work with the State's best interest in mind. As noted above, DoIT struggles with high turnover and vacancies. This vacancy level inevitably impacts its ability to monitor and appropriately intervene in

major IT project development and implement necessary cybersecurity. Vacancies in key positions can lead to a lack of focus, an inability to manage effectively, delayed response to problems with major IT projects, and not adequately addressing cybersecurity audit findings.

The fiscal 2021 budget deletes 10 long-term vacant positions at the end of fiscal 2020. The Department of Legislative Services (DLS) identified an additional 15 positions that have been vacant since calendar 2018. **Exhibit 10** shows that the salaries and fringe benefits for these positions exceed $1.5 million. In addition, the fiscal 2021 budget reduces the turnover rate from 8.2% in fiscal 2020 to 6.2% in fiscal 2021 by adding approximately $477,000 to the DoIT budget. Eliminating long-term vacancies and keeping the turnover rate at 8.2% reduces fiscal 2021 spending by $2 million. This action would reduce vacant positions to 29.6 and necessary vacancies to 17.3, which still leaves DoIT with 12.3 vacant positions above turnover. **DLS recommends that the 15 long-term vacant positions be abolished and that the fiscal 2021 turnover rate remain at 8.2%. DLS further recommends that the savings be used to reduce the fiscal 2021 budget by $1 million and that $1 million be restricted so that the funds can only be used to reclassify positions into a new salary scale for IT employees that increases salaries.**

Exhibit 10
Positions Vacant Over 12 Months and
Additional Funds to Reduce Budgeted Turnover
Fiscal 2021

Description	Positions	Total Salaries	Salaries and Benefits
Position Vacant More than 12 Months	15.00	$1,115,050	$1,520,344
Funds to Reduce Budgeted Turnover			477,105
Total	**15.00**	**$1,115,050**	**$1,997,449**

Source: Department of Budget and Management

MITDPF and Major IT Project Expenditures

Chapters 467 and 468 of 2002 created the MITDPF. The law requires that all general funds appropriated for major IT projects be held in the fund. DoIT is responsible for major IT project oversight and releasing funds.

DoIT Transitions MITDP Approach to Scaled Agile Framework

The major IT project development approaches that DoIT has used are Waterfall and Agile. Waterfall 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 Proposals (RFP) when bidding the project. The vendor then implements the project based

on these specifications. It is not unusual for a project to take two years to plan and three years to implement. There are 10 phases to the Waterfall approach.

By contrast, the Agile[1] 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. Waterfall is being phased out, and all new projects are using Agile. DoIT's MFR indicators note that 68% of major IT projects developed in fiscal 2019 used the Agile approach.

MITDPF-funded Projects

Exhibit 11 shows fund transactions for the MITDPF for fiscal 2018 through the proposed budget in fiscal 2021. Fiscal 2021 includes a $95.6 million general fund appropriation, $8.6 million in special fund appropriations, and $0.3 million in interest earnings. There is also $28 million in fiscal 2020 general fund deficiency appropriations.

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

Exhibit 11
Major Information Technology Development Project Fund
Fiscal 2018-2021
($ in Thousands)

	2018	2019	2020	2021
Opening Fund Balance	$62,605	$79,113	$114,155	$1,100
Revenues				
General Fund	$29,413	$67,601	$61,302	$96,553
General Fund – Deficiency Appropriation	1,000	0	27,986	0
General Fund – Reversion	-500	0	0	0
Special Fund – Investment Interest	1,420	2,744	300	300
Special Fund – Carryover from Fund Balance	3,500	4,864	3,900	8,650
Transfers from Other Agencies	164	2,341	0	0
Resource Sharing Revenues	1,227	3,100	1,100	1,100
Project Reimbursement	3,864	0	0	0
Total Available Revenues	$102,692	$159,762	$208,743	$107,703
Expenditures				
Transferred to Agencies	-$18,715	-$41,708	-$171,007	-$105,203
Proposed Deficiencies	0	0	-27,986	0
Adjustments				
Available Fund Balance to be Appropriated in a Subsequent Year	-4,864	-3,900	-8,650	-300
End-of-year Fund Balance	$79,113	$114,155	$1,100	$2,200

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

Exhibit 12 shows that general fund appropriations into the MITDPF have increased substantially since fiscal 2018. Funding in fiscal 2021 is more than in any previous year with 23 projects funded. Examples of large fiscal 2021 expenditures in excess of $5 million include:

- $34.6 million for the Maryland DHS' Shared Human Services project;

- $16.2 million for the Comptroller's Integrated Tax System (ITS);

- $6.5 million for the Department of Natural Resources (DNR) Modernization and OneStop Integration project;

- $6.5 million for the Medicaid Management Information System, also known as Medicaid Enterprise System Modular Transformation;

- $5.6 million for the Maryland Department of Health's (MDH) Computerized Hospital Record and Information System; and

- $5 million for DGS' eMaryland Marketplace Advantage.

Exhibit 12
General Fund Appropriations into the MITDPF
Fiscal 2012-2021
($ in Millions)
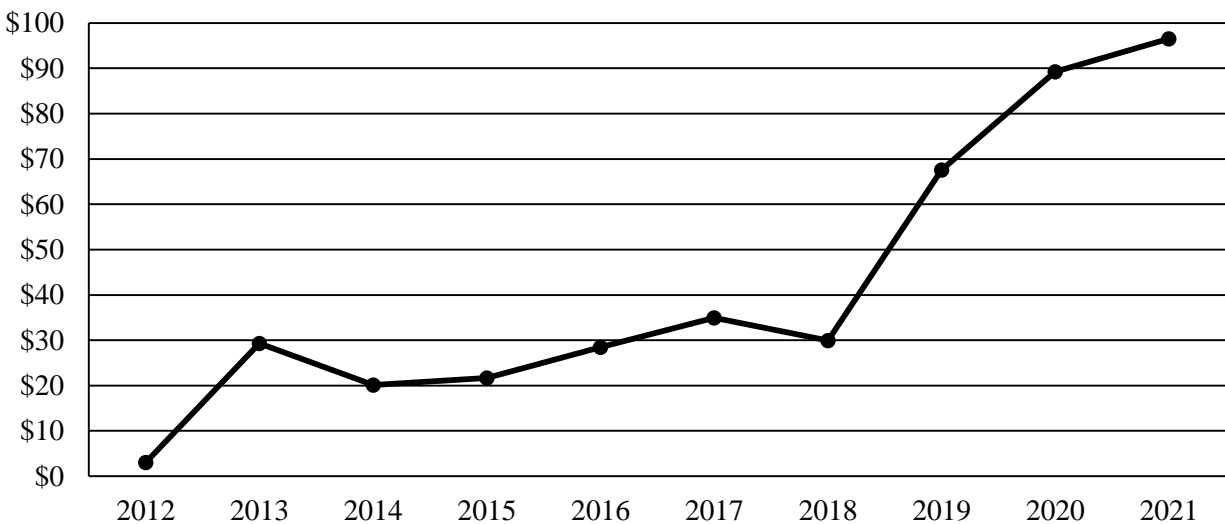
MITDPF: Major Information Technology Development Project Fund

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

As part of the budget process, the department regularly cancels funds if the projects are no longer needed and reappropriates them as special funds to support other projects. Generally, these projects are operational and are ending development. Revenues deposited into the MITDPF, which are primarily from resource-sharing agreements (RSA) and interest earnings, are also appropriated as special funds. **Exhibit 13** shows the sources of the $8.7 million special fund appropriation.

Exhibit 13
Canceled Funds Appropriated as Special Funds
Fiscal 2021
($ in Thousands)

Agency or Resource Sharing Agreement Partner	Amount
Department of State Police Radio Equipment	$1,155
Revenues from Projects	
Department of Information Technology Oversight	$946
Department of Human Services	638
Maryland Department of Health	597
Oversight: Department of Public Safety and Correctional Services	343
State Comptroller's Office	156
Maryland Department of Labor	100
State Treasurer's Office	53
Department of State Police	42
Maryland Department of the Environment	26
Office of the Public Defender	24
State Department of Assessments and Taxation	12
Office of the Attorney General	9
State Board of Elections	9
Subtotal	*$2,956*
Revenues from Resource-sharing Agreements	
Crown Castle	$1,616
Sprint	1,325
T-Mobile	748
Washington Suburban Sanitary Commission	206
Americen Tower	127
Other	119
Iheart Media	99
Verizon	94
US Cellular	65
AT&T	44
Hubbard Radio	37
CSX	29
Comcast	16
Bay Country Communications	12
Subtotal	*$4,539*
Total	**$8,650**

Source: Governor's Fiscal 2021 Budget Books

With respect to RSA revenues listed in Exhibit 13, these include revenues from prior years. DoIT anticipates $1.1 million in new revenues annually beginning in fiscal 2020. With these additional revenues, as shown in Exhibit 11, DLS projects that the MITDPF ends fiscal 2021 with a $2.2 million fund balance. These funds could support major IT projects, which reduces the need to appropriate general funds. **DLS recommends that the general fund appropriation be reduced by $2 million and that the budget bill authorize a budget amendment that allows DoIT to appropriate up to $2 million in RSA revenues deposited into the MITDPF in fiscal 2020 and 2021.**

Major IT Project Recommendations and Discussion

DHS' MD THINK: MD THINK is a shared human services platform. The objective is to keep individual data in one system instead of numerous silos throughout State government. The long-term care module is operational, and the child welfare portion of CJAMS is being piloted. The estimated total cost of the project as listed in the Governor's budget books is $467.7 million ($114.8 million in general funds and $352.9 million in federal funds), and the fiscal 2021 appropriation is $34.6 million in general funds and $106.2 million in federal funds. The budget bill also includes $27.2 million in general funds and $33.9 million in federal fund deficiencies. **Exhibit 14** shows that DoIT anticipates that MD THINK's account will end fiscal 2021 with a $16.5 million fund balance. **To limit end-of-year fund balances, DLS recommends that the fiscal 2021 general fund appropriation be reduced by $16.5 million.**

Exhibit 14
MD THINK Project General Fund Cash Flows
Fiscal 2015-2021
($ in Thousands)

Fiscal Year	General Funds	Proposed Deficiency	General Fund Spending	General Fund Balance
Prior to 2019	$20,314	$0	$4,780	$15,534
2019	18,229	0	21,772	11,992
2020	22,045	27,223	43,978	17,282
2021	34,622	0	35,398	16,506

MD THINK: Maryland Total Human-services Integrated NetworK

Source: Governor's Fiscal 2021 Budget Highlights

Comptroller's Office's ITS: The Comptroller's ITS replaces legacy tax (State of Maryland Tax system or SMART) and collection (Computer Assisted Collection System or CACS) systems. In addition to modernizing the legacy system, ITS integrates the tax processing system with a data warehouse to provide enhanced reporting. This phase of the project was first funded in fiscal 2016. The

estimated total cost of the project is $149.5 million, and the fiscal 2021 appropriations total $16.1 million in general funds and $10.8 million in special funds. The source of special funds is local governments, which also receive a share of State income taxes. The project did not receive funding in fiscal 2018 because prior year appropriations were not being spent as development was not moving as quickly as anticipated. **Exhibit 15** shows that the project has been spending less than anticipated and built up a cash balance totaling $26 million at the end of fiscal 2019. The budget anticipates that fiscal 2021 spending will total $53 million, which is 2.5 times what was spent for the entire project for the five years prior to fiscal 2021. **To limit end-of-year fund balances, DLS recommends that the fiscal 2021 general fund appropriation be reduced by $2 million.**

Exhibit 15
Comptroller's Integrated Tax System Project Cash Flows
Fiscal 2016-2021
($ in Thousands)

Fiscal Year	General Funds	Special Funds	Reimb. Funds	Total Funds	Spending	Fund Balance
Prior to 2019	$1,555	$9,800	$13,145	$24,500	$359	$24,141
2019	6,408	8,542	0	14,950	12,888	26,203
2020	3,022	5,348	0	8,370	8,370	26,203
2021	16,139	10,759	0	26,898	53,101	0

Source: Governor's Budget Highlights Fiscal Year 2021

SBE's Major IT Project Management: SBE is developing several projects:

- ***Agency Elections Management System (AEMS):*** AEMS replaces SBE's legacy election system developed in 1985 that has become expensive and difficult to maintain. Funding for AEMS was initially provided in fiscal 2017. At the time, the objective was to have the new system in place for the 2018 elections. The project has been delayed. In December 2019, SBE identified scores of unresolved issues that DoIT or DLS were aware of. Since AEMS is not ready, SBE has extended the contract of the legacy system through the 2020 election. Ideally, AEMS will be tested by running in parallel with the legacy system. If tests are successful, the legacy system could be phased out after the 2020 election. Total costs are $4.4 million, split evenly between general and special funds.

- ***Pollbook Project:*** This project procures and implements a new pollbook system, which is used for voter registration and related voter functions. New functions are needed that are not available in the current system. The project's goals are to have an efficient check-in process, data integrity, real-time monitoring, quicker identification and resolution of issues, and seamless integration with other systems. The project was introduced as a deficiency appropriation in the

fiscal 2021 budget. The Information Technology Project Report provided by DoIT was late but has been received. DBM projects $30.2 million for this project through fiscal 2024 with $9.3 million in general funds. Although this project is planned to be used in fiscal 2022, although not in parallel to the legacy system, funding is projected through fiscal 2024 due to financing through STO.

- *WAN:* SBE had planned to establish a WAN at polling places in the State's six largest jurisdictions (Baltimore City and Anne Arundel, Baltimore, Howard, Montgomery, and Prince George's counties) for the 2020 elections, including the 7th Congressional District special primary election on February 4 and the April 28 regular primary election. WAN allows SBE to receive pollbook transaction information (including same day registration information) from those jurisdictions in real time during Election Day, rather than the information being uploaded when the pollbooks arrive back at local board of elections offices after the polls close. There were reports that the network caused a slowdown in transmitting information during the 7th Congressional district primary election on February 4. Local officials and good government advocates also expressed concerns about the network. SBE has announced that the six largest jurisdictions are no longer required to use the wireless network. DoIT advises that this project has not received any oversight from DoIT.

Additionally, SBE has a contract to manage MDVOTERS, which is the system that manages elections. This contract was to expire on December 31, 2019. To avoid a lapse in the contract, SBE requested a supplemental item for the final Board of Public Works (BPW) meeting on December 18, 2019. The December meeting was subsequently canceled, and SBE had to enter into a temporary contract extension until the contract was approved by BPW on January 8, 2020.

These projects raise the following concerns:

- *SBE Appears to Struggle with Elections-related Major IT Project Development:* The AEMS project has been delayed, pollbook IT project reports were received late and do not provide much detail, concerns have been raised about WAN, and the MDVOTERS contract renewal was a supplemental item for BPW less than two weeks before the contract expiration date indicating a lack of preplanning.

- *There Is a Lack of DoIT Oversight:* DoIT is not providing any oversight for WAN and, as noted, DoIT was not aware of the issues related to AEMS that SBE raised in December 2019. SBE reports that a project to upgrade the voting system would also not be a major IT project. Section 3A-301 (f) of the State Finance and Procurement Article defines major IT projects. The definition includes projects that the Secretary of Information Technology determines require special attention due to "the impact of the project on the public or local governments." It is clear that elections have an impact on the public, so the WAN project should be receiving DoIT oversight. This would require SBE to prepare IT project reports and provide information about goals, technology used, risks, schedules, and costs.

- *SBE Does Not Notify State Agencies and Boards in a Timely Manner:* For example, because SBE was late in notifying agencies about the expiring MDVOTERS contract, there was insufficient time to adequately address all the questions about the item. Additionally, there does not appear to have been any review of the WAN project by State agencies prior to its implementation.

DLS recommends language requiring that SBE report quarterly on its major IT program.

Department of State Police's (DSP) Automated Licensing and Registration Tracking System (ALRTS): The Firearm Safety Act (Chapter 427 of 2013) mandated that DSP automate and streamline the process by which a citizen of Maryland requests approval to purchase or carry a firearm. ALRTS implements this legislation. The project was first funded in fiscal 2013. Estimated costs total $8.6 million of which $8 million is general funds and $584,400 in federal funds have been expended. Fiscal 2021 includes $315,000 in general funds. Completed modules include (1) portal development; (2) processing the 77R application and affidavit to purchase, rent, or transfer a firearm; (3) converting the database from Oracle to Structured Query Language; and (4) automated handgun permit process without electronic payment services. Modules to complete include the automated public-facing dealer registration process and an automated machine gun registration. These modules have been delayed due to the State stopping work with a vendor for this project (NICUSA). The vendor's contract expired in July 24, 2019, and BPW approved a one-year extension. The issues with the vendor relate to development costs, user fees, and banking services. DoIT advises that it is working on a transition plan to determine which apps can be moved to the OneStop and will prepare an RFP on those that are not transitioning to OneStop. **The department should be prepared to brief the committees on the status of the NICUSA contract and how this will affect ALRTS.**

Department of Public Safety and Correctional Services (DPSCS) Computerized Criminal History Replacement: This replaces the two legacy mainframe systems, which includes the Arrest Disposition Reporting systems. The new system should eliminate redundant data entry, reduce errors, integrate data to allow improved information sharing, and improve reporting. This project was initially funded in fiscal 2017. At the time, the total project cost was $7.35 million of which $370,000 was general funds and $6.98 million was federal funds[2], resulting in a 95% federal fund share. An RFP has been released, and bids were received three years after the initial appropriations. DPSCS anticipates having BPW approve the contract in the second half of fiscal 2020. Federal funds expired on September 30, 2019, and the State was unable to get an extension. Federal spending on this project totaled approximately $404,000 through the end of fiscal 2019, meaning the loss of as much as $6.95 million in federal support. This reverses the funding ratio; 95% of the project will now need to be funded with general funds. This is an example of DPSCS struggling to complete a project. DPSCS may need additional resources from DoIT, and DPSCS has a history of high vacancies, which exacerbates its struggles with implementing major IT projects. **DoIT should brief the committees on the delays that led to this loss of federal funds and steps taken to improve DPSCS's ability to implement major IT projects and avoid losing federal funds available for developing major IT projects.**

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[2] $2.3 million was appropriated in the fiscal 2017 budget, and the remaining $4.7 million was planned from fiscal 2018 to 2020.

Budget Requests Funding for 23 MITDPs

Fiscal 2021 appropriations are detailed in **Exhibit 16**. The allowance includes funding for the following four new projects totaling $12.4 million: SBE's Pollbook Project ($1.1 million); DNR's Modernization and OneStop Integration Project ($6.5 million); DoIT's networkMaryland 100G Backbone Upgrade ($2.3 million); and Governor's Grants Office Statewide Grant System ($2.5 million).

Exhibit 16
General Fund Appropriations into the MITDPF
Fiscal 2012-2021
($ in Thousands)

Agency	Project Name	Project Description	MITDPF Funding	Comment
Ongoing Projects				
State Board of Elections (SBE)	Agency Election Management System (AEMS) Modernization Project	Replace legacy ballot system that was developed in 1985. Integrate with the new voting system and other systems, such as voter and candidate systems. Will link existing data from MDVOTERS and conform with the Department of Information Technology (DoIT) and SBE security policies and standards.	$228	The project continues to be behind schedule. In December 2019, SBE identified scores of unresolved issues. SBE has extended the contract of the legacy system through the 2020 election. Ideally, AEMS will be tested by running in parallel with the legacy system. If tests are successful, the legacy system could be phased out after 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.	16,139	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 was awarded in October 2018. Project includes risks, such as organizational culture (resistance to change) and implementation (technical personnel shifts to new technologies required). Document scanning and management delays are creating issues that need to be resolved. The project schedule is under review. **DLS recommends reducing by $2 million.**
Maryland Department of Health (MDH)	Medicaid Enterprise Systems Modular Transformation	Procurement of a modern Medicaid Management Information System (MMIS) system to replace current system, which is antiquated and inflexible. Three key goals are	6,543	MDH has completed the required assessment and documentation to receive enhanced federal fund participation for federal fiscal 2019 through 2021. Identified high risks include resource availability including Medicaid subject matter

Agency	Project Name	Project Description	MITDPF Funding	Comment
		real-time adjudication of claims, a new financial management system to automate the federal fund claims process, and improved reporting capability. Project will cover all aspects of the Medicaid program such as pharmacy, provider management, claims processing, decision support as well as migration to the Maryland Total Human-services Information NetworK (MD THINK) cloud solution.		experts; interdependencies with MD THINK as well as other modules within the Medicaid system; and the need for significant oversight and strong project management. Previous efforts to replace MMIS II have been unsuccessful. However, the current effort is taking a different approach (Agile) in comparison to prior attempts. An Independent Verification and Validation to perform an initial baseline assessment of the project as a whole is scheduled to go to the Board of Public Works on February 19, 2020. **DLS recommends reducing by $1million.**
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.	500	The appropriation supports oversight costs. The State is receiving $29.6 million in federal funds in fiscal 2021. Out-year State cost estimates increased due to adding functionality for the Developmental Disabilities Administration (DDA). The project is generally considered low risk and, at this point, most risk is associated with integrating with DDA. Some concerns have been raised about the success of the pilot program being undertaken for DDA providers. **DLS recommends approval.**
MDH	Statewide Electronic Health Records (EHR) 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. EHR should improve operational efficiency, hospital planning, evaluation and accreditation, patient care and safety, and data security.	5,558	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). Hospital

Agency	Project Name	Project Description	MITDPF Funding	Comment
				infrastructure enhancements are underway. Integration requirements are being reviewed and records are being digitized. **DLS recommends approval.**
MDH	Integrated Electronic Vital Records Registration System	Replace legacy paper and electronic system with a system that will allow eligible professionals, hospitals, and health departments to submit data electronically. It should include improved pharmacy and medical records. It modifies a California system that is integrated into MD THINK.	4,155	University of California, San Diego (UCSD) is customizing software. Pilot program to support REAL ID is almost complete. A pilot for migrating the legacy birth system is underway. Integration with MD THINK is underway but delayed. High risks include resource availability (UCSD staff has high turnover, which causes delays) and supportability (no source code for legacy birth system). **DLS recommends approval.**
MDH	Migration of the Cloud Data Center	Migrate all systems in the MDH data center into the cloud, including systems that support Medicaid, the Behavioral Health Administration, DDA, and certain boards. The cloud solution will need to comply with State and federal privacy laws and security policies.	1,000	An inventory of data center systems, third-party assessment, documentation, and planning of cloud-readiness for MDH systems has been completed. MDH is reviewing options to replace end-of-life technologies. The distributed nature of data complicates content, utilization, and access questions, which is a high risk. Another high risk is resource availability. The project needs a clear leader to coordinate across agencies with stakeholders, which is often challenging. **DLS recommends approval.**
Department of Human Services (DHS)	MD THINK	Integrate human services systems among State agencies. MDH, the Department of Juvenile Services, and the Maryland Health Benefit Exchange (MHBE) are collaborating with DHS. The objective is to provide a streamlined application process for customers and workers.	34,622	Eligibility and Enrollment demonstrations are currently being conducted. MHBE has successfully moved onto the platform. Several components of the platform are delayed. Risks include interdependencies, organizational culture, implementation, and the large scope of this project. Federal funds totaling $67.4 million are also budgeted in fiscal 2020. **DLS**

Agency	Project Name	Project Description	MITDPF Funding	Comment
				recommends reducing by $16.5 million.
Department of Public Safety and Correctional Services (DPSCS)	Electronic Patient Health Record (EPHR) Replacement	EPHR will replace an outdated system with a comprehensive health records system that interacts with inpatient, social work, and mental health systems.	50	DPSCS reviewed bids and amended bids to allow for a cloud solution. A new RFP should be released in the third quarter of fiscal 2020. No project funds in fiscal 2021, only oversight costs. Risks include funding (fully State funded) and supportability (24/7 service). **DLS recommends approval.**
DPSCS	Maryland Automated Fingerprinting Identification System Upgrade	Upgrade the current fingerprint identification system with a system that has fewer parts to monitor and requires less security upgrades.	1,420	The contractor will no longer be supporting the current contract as of April 2021. The contractor has agreed to support it until a new system is in place. The bids are being evaluated, and an award is expected to be made this spring. DoIT did not identify any high-risk factors. **DLS recommends approval.**
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.	1,775	The project has been delayed, but the RFP is expected to be awarded in fiscal 2020. A $7 million federal grant has expired so additional general funds will be required. Risks include technical (migration from an antiquated mainframe to a web-based relational database) and supportability issues (24/7 support is required). **DLS recommends approval.**
Maryland Department of the Environment (MDE)	Permit Tracking System Modernization	Enhance permit tracking by adding a component that allows access through the Internet.	528	Five of the planned 11 releases have been completed. This is for permits and compliance related to the Air and Radiation Administration, the Land and Materials Administration, and the Water and Science Administration. This project involves less risk, and this is the final appropriation. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
Department of State Police	Automated Licensing and Registration Tracking System	Automate and streamline the process by which a citizen requests approval to purchase a firearm.	315	Deployment of the handgun permit application process in the licensing portal was completed on October 1, 2019. Applicants for a handgun permit are required to send payment via the United States Postal Service to the Licensing Division until Maryland State Police is able to offer electronic payment options. Functionality to be added includes fully automated machine gun registration and fully automated dealer registration process. There have been some contractor issues, which are discussed above. **DLS recommends approval.**
State Treasurer's Office (STO)	Financial Systems Modernization	Replace the State Treasurer's Treasury Management System. The current system will no longer be supported, but STO was able to purchase extensions.	1,025	The system supports banking interface, ledgers, payables, receivables, and other functions. The project has experienced several cost increases, which are largely attributed to the banking transition (from Bank of America to Wells Fargo). High risks include interdependencies with other State agencies and the hard deadline. The last appropriation for this project is in fiscal 2021. **DLS recommends approval.**
Department of General Services	eMaryland Marketplace (eMM): Statewide Pay-to-procure System	Replace current eMM procurement system with a cloud-based, software-as-a-service system.	8,500	The prior contract expired on August 28, 2019. Release 1.0, which is a cloud-based transaction system, went live in August 2019 prior to the previous contract expiring. Additional releases allow for reverse auctions and contract management (released spring 2020), financial integration (summer 2020) and advanced payment systems and vendor integration. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
DoIT	Enterprise Solutions Planning Initiative	Central review and planning for statewide IT needs. Assist in implementing the Scaled Agile Framework development approach.	1,400	A new information system for managing major IT projects has been implemented. Improved data, project, and document management systems are being planned. Processes and technologies are also standardized. **DLS recommends approval.**
DoIT	Maryland One Stop	Develop a portal that directs internet searches to the appropriate online form.	7,300	OneStop platform was launched in July 2019. Agencies developing interfaces for OneStop include the Maryland Department of Labor, MDE, the Maryland Department of Transportation, MDH, the Maryland Department of Agriculture, and the State Department of Assessments and Taxation (SDAT). This project is low and medium risk. **DLS recommends approval.**
Office of the Attorney General	Case Management and Document Management	Replace obsolete system with new web-based system.	788	This is being implemented. Workflow and data conversion planning is complete. There have been delays in data conversion and testing. eDefender workflows are being tailored. Pilot is expected before the end of fiscal 2020. DoIT has not identified any high risks. **DLS recommends approval.**
SDAT	Strategic Enterprise Application Assessment	Replace paper-based and mainframe systems with cloud-based system.	957	The first phase to bring homestead and revenue tax credits on line has been implemented. The second phase to enhance and verify applications is scheduled to be completed in spring 2020. The final phase replacing the legacy system is scheduled for completion in February 2021. Risks considered low to medium. **DLS recommends approval.**
Subtotal			*$92,801*	

Agency	Project Name	Project Description	MITDPF Funding	Comment
New Projects				
SBE	Pollbook Project	Procure and implement a new pollbook system, which is used for voter registration and related voter functions. The 2020 election will be the thirteenth year using hardware with a 10-year life. New functions are needed that are not available in the current system.	$1,151	The budget also proposes a $125,000 general fund and $125,000 special fund deficiency appropriation for a project manager contract. The project's goals are to have an efficient check-in process, data integrity, real-time monitoring, quicker identification and resolution of issues, and seamless integration with other systems. Though not listed as a high risk by SBE, DLS is concerned that security is a high risk in the current environment. **DLS recommends approval.**
Department of Natural Resources (DNR)	DNR Modernization and OneStop Integration Project	Implement a web-based platform that is integrated with internal and external systems. The current system is not integrated, which leads to manual entry, duplicative reporting, and incorrect reports.	$6,500	DNR notes that licenses and permit sales have declined and suggests that this is, at least partly, attributable to the system. The new systems goals are to integrate with other systems, reduce inefficiencies and redundancies, and increase customer satisfaction. High risk is funding since DNR has identified unique needs that need to be added to the OneStop portal, which will be costly. **DLS recommends approval.**
DoIT	networkMaryland 100G Backbone Upgrade	Redesign and configure the network's backbone to increase to maximum of 100 gigabits per second (Gbps) (billions of bits per second). The network is a partial mesh design that has grown organically based on available assets.	$2,250	Demand for bandwidth has grown from largest needs totaling 500 megabits per second (millions of bits per second) five years ago to over 1 Gbps today. DoIT has finalized network design, determined fiber work needed, selected potential vendors, and received equipment pricing. This infrastructure project is low and medium risk. Fiscal 2021 is the only year in which appropriations are expected. **DLS recommends approval.**

Agency	Project Name	Project Description	MITDPF Funding	Comment
Governor's Grants Office	Enterprise Grant Management Solution	There is no centralized system for grant tracking and reporting grants. The system will integrate existing statewide accounting and personnel systems to report on the use of grant funds.	$2,500	An RFP for a cloud-based system is being drafted. The Grants office has been working with State agencies to identify requirements. DoIT has not identified any high risks associated with this project. **DLS recommends approval.**

Subtotal			*$12,401*	
Total Fiscal 2021 Allowance			**$105,203**	

Fund Sources	
General Funds	$96,553
Special Funds	8,650
Total Funds	**$105,203**

MITDPF: Major Information Technology Development Project Fund

[1] Project that receives special funds.

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

Out-Year Forecast

Major IT projects require substantial financial commitments and take years to complete. **Exhibit 17** shows the expected out-year costs of major IT projects. In fiscal 2022, $247 million in total appropriations and $93 million in general fund appropriations are expected. Fiscal 2022 general fund spending is similar to fiscal 2021 spending as large projects like MD THINK and the Comptroller's ITS project continue. Reduced general fund costs in fiscal 2023 are largely attributable to projects at the end of their development cycle. If new projects are added, the scope of currently budgeted projects expand, or costs for currently budgeted projects increase, fiscal 2023 and 2024 costs could be higher.

Exhibit 17
Major Information Technology Development Project Fund
Projected Out-year Expenditures
Fiscal 2022-2024
($ in Millions)

	2022	2023	2024
Other Fund Costs	$153.9	$144.0	$158.2
General Fund Costs	92.7	48.3	53.7

■ General Fund Costs □ Other Fund Costs
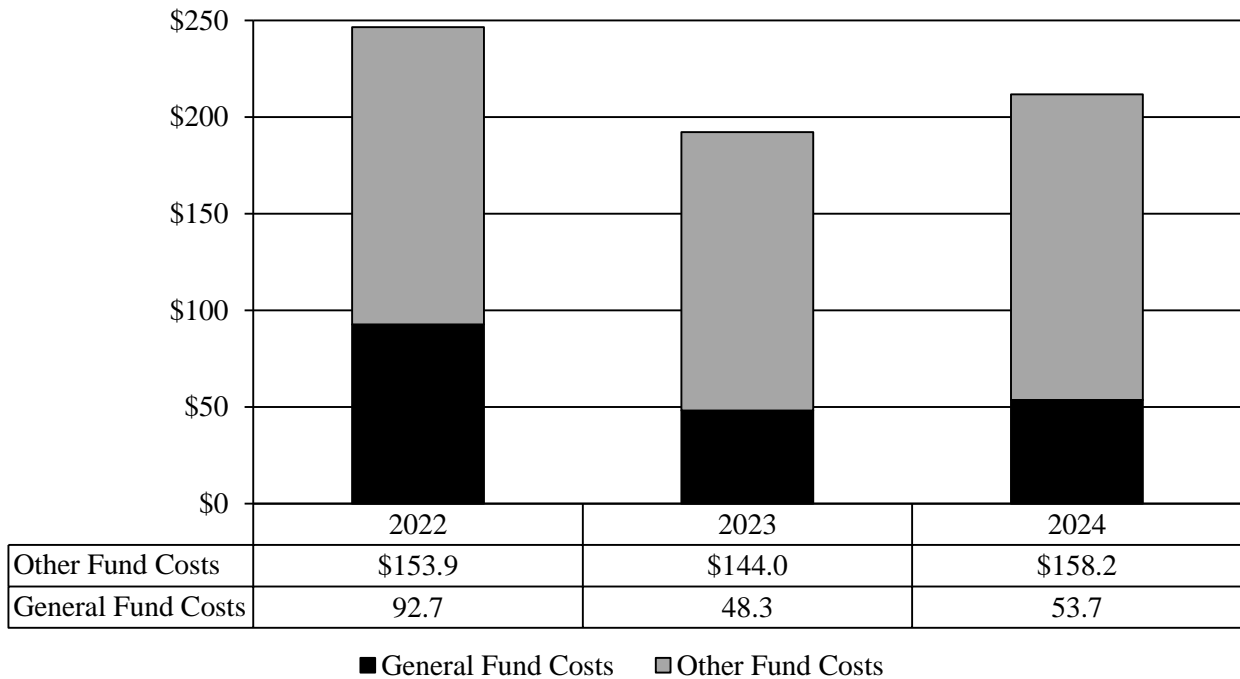
Source: Governor's Fiscal 2021 Budget Books

Issues

1.   **Overview of State Cybersecurity**

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 through 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.

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 include cybersecurity. This issue examines DoIT's cybersecurity program policies, procedures, and standards.

In recognition of the importance of cybersecurity, the Governor issued an executive order in June 2019 that created a State Chief Information Security Officer (SCISO) that is appointed by the Governor and reports to the Secretary of Information Technology. SCISO is also DoIT's Chief Information Security Officer, who supervises the Office of Security Management. The office is responsible for the direction, coordination, and implementation of the overall cybersecurity strategy and policy for the Executive Branch, which includes:

- establishing standards to categorize all information and information systems collected or maintained by agencies;

- establishing guidelines and security requirements governing the types of information and information systems included in each category;

- determining whether a system should be allowed to continue to operate or be connected to State systems, including networkMaryland;

- management of security awareness training for employees; and

- assisting in the development of data management, governance, and specification standards to promote standardization and reduce risk.

The order also created the Maryland Cybersecurity Coordinating Council (MCCC). The council includes the agency head or senior staff member designated by the agency head from (1) the Governor's Office of Homeland Security; (2) DBM; (3) DGS; (4) DHS; (5) DPSCS; (6) MDH; (7) the Military Department; (8) the Maryland Emergency Management Agency; (9) DSP; and (10) the Maryland Department of Transportation.

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. These objectives are also defined in the Federal Information Security Management Act. 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 the National Institute of Standards and Technology as the framework behind the planning, procurement, development, and implementation of State IT and telecommunications systems. DoIT's policies are available online. Areas covered include email, data security, social media, contingency planning, and configuration management. DoIT offers a substantial amount of guidance for State agencies. In June 2019, DoIT released version 1.2 of the *State of Maryland Information Security Manual*, which summarizes State cybersecurity policies.

Historically, State IT has been decentralized. In response to a request to review cybersecurity practices in the fiscal 2019 JCR, DoIT acknowledged that there are difficulties in securing multiple data centers. A concern about DoIT's role is that the department lacks the ability to enforce policies in the State's federated system. DoIT can make policies but cannot make agencies adhere to those policies. Creating MCCC with SCISO as chair raises DoIT's visibility. However, it is unclear exactly how this will lead to improved cybersecurity practices. **The department should brief the committees on the role of the new SCISO. This should include a discussion of actions taken by MCCC to improve cybersecurity.**

Findings from State Agency Audits

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, OLA identifies findings that, if addressed, can reduce cybersecurity risks. **Exhibit 18** shows the most common findings since 2015. The audit findings are put into two broad categories: data security; and inadequate system management and control. The most common findings in fiscal 2019 are that (1) personal identifiable information (PII) is not protected; and (2) there is a lack of adequate System and Organizations Controls (SOC) 2 type 2 reports.

Exhibit 18
Audit Instances
Audits Released Calendar 2015-2019

Type of Audit Finding	Average Annual Findings 2015-2018	Findings 2019	Total Findings
Data Security Findings			
Personal Identifiable Information	8	12	42
Unnecessary User/File Access	4	7	22
Administration Rights	4	5	20
Excessive Network Level Access	3	0	13
Subtotal	*18*	*24*	*97*
System Management and Control Findings			
No or Inadequate SOC Review	2	9	18
Anti-malware	5	5	26
Log/Monitor Security Events	4	3	18
Software Not Updated	4	3	17
Intrusion Detection Prevention System Problems	4	3	17
Firewall Deficiencies	3	3	15
No or Inadequate Disaster Recovery Plan	1	2	6
Available Software Security Not Used	2	1	7
Subtotal	*24*	*29*	*124*
Other Findings	5	2	23
Total	**47**	**55**	**244**

SOC: System and Organizations Control

Note: Average number of findings do not sum due to rounding.

Source: Office of Legislative Audits

Much Personal Identifiable Information Does Not Have Adequate Security Controls

Sections 10-1301 to 10-1308 of the State Government Article define PII as an individual's (1) first name or first initial and last name; (2) personal mark; or (3) unique biometric or genetic print or image, in combination with one or more of the following:

- Social Security number;

- driver's license number, State identification number, or other individual identification number issued by a unit of State government;

- passport or other identification number issued by the federal government;

- individual taxpayer identification number; or

- financial account number, credit card number, or debit card number that, in combination with any required security code, access code, or password, that would permit access to an individual's account.

Sections 14-3501 to 14-3508 of the Commercial Law Article also include health information, including mental health and health insurance information, as PII.

Maryland State government is decentralized so that many different agencies store data. Often the same PII data, such as same name and Social Security number, is stored in multiple agencies. It is common for individuals to have their income tax, property tax, motor vehicle, professional licensing, State university, health, human services, and court records stored in State systems. In sum, this is a massive number of PII records in State databases. Based on findings in audit reports from fiscal 2014 to 2020, OLA estimates that approximately 37.9 million PII records existed without having adequate PII security controls. That is more than six records for each person residing in Maryland.

SOC Reports Are Needed to Ensure That Data Stored by Third Parties Is Safe

SOC 2 type 2 reports are a third-party report that evaluates an IT service provider's controls. SOC 2 type 2 reports are unique to each organization. When developing a system, the service provider evaluates requirements, decides which ones are relevant to their business practices, and implements controls to fit those requirements. OLA advises that the SOC reports can include an evaluation of system security, availability, processing integrity, confidentiality, and privacy trust principles. The SOC audit is an opinion on how that organization's controls fit the requirements.

In recent years, the State has been moving more data to the cloud. The State recently moved its personnel system into the cloud. The fiscal 2021 budget supports cloud-based projects like MD THINK at DHS, Statewide Electronic Health Records at MDH, Migrate MDH Data Center to the Cloud, STO Financial System Modernization, and eMaryland Marketplace Procurement solution at DGS. These systems contain individual health records, financial records, and State vendors' data. The State is responsible for ensuring that this data is safe. To encourage best practices, SOC 2 type 2 reports should be required.

Recent DoIT Actions

Concerns have been raised that while DoIT is responsible for cybersecurity policy and guidance, DoIT does not have sufficient resources or authority to enforce cybersecurity standards. To address these concerns, the fiscal 2020 budget includes $10 million to migrate agencies into SOC, which includes:

- moving agency traffic behind a DoIT managed firewall;

- deploying tools that provide endpoint security, inventory, and patching;

- eliminating and replacing infrastructure that is end-of-life and no longer supported;

- moving State applications and data to hosting centers, which are resilient and redundant; and

- managing rights based on least-privileged access approach.

2.   Ransomware Attacks Also Pose a Cybersecurity Threat

2019:   The Year Ransomware Targeted State & Local Governments is the title of a December 23, 2019 post on govtech.com. The article notes that the "surge in successful, targeted ransomware attacks against governments and hospitals is the top 2019 cybersecurity story. Examples of ransomware attacks in 2019 include multiple attacks against the state of Louisiana and the state declaring a state of emergency; 22 Texas towns hit in a cyberattack; Baltimore City's ransomware attack; two Florida cities paying hackers; New Orleans declaring a state of emergency; and Pascagoula, Mississippi's attack.

Ransomware has become a threat to state and local governments. The effects of ransomware attacks include temporary disruptions in services, lost revenues, and increased costs. In response to the November 2019 ransomware attack, Louisiana shut off web services and websites for most State agencies. Though not all computers and servers were affected, the State chose to shut many down to quarantine the malware. The May 7, 2019 ransomware attack on Baltimore City cost the city $18 million in additional expenses and lost revenues according to the city budget office. City services were also disrupted by the attack.

Ransomware is a type of malware (malicious software) that prevents users from accessing their system or files and demands a ransom payment to regain access. Ransomware can infect computers through malspam (malicious spam) or malvertising (malicious advertising). Ransomware attacks affect the accessibility of web systems, which lead to a loss of services, increased costs, and reduced revenues.

Malspam uses social engineering to trick users into opening attachments or clicking on links that appear to be legitimate. The malware is then loaded into the user's computer. Malvertising is using online advertising to distribute malware. The malvertiser submits an ad with malware to third-party

vendors who then distribute it to the websites. Users then load the malware onto their computer without being aware that there is malicious software imbedded in the site. Although online vendors are aware of malvertising and are taking steps to prevent it, it is difficult to eliminate malvertising.

Avoiding ransomware is complicated because ransomware exploits vulnerabilities attributable to social engineering and technical issues. As such, a robust ransomware defense needs to address social engineering and provide technical solutions.

Personnel and Technical Issues Can Make Systems Vulnerable

Cybersecurity weaknesses can be grouped into two categories – technical and personnel. Technical issues involve hardware or software weaknesses, such as using the Windows phone application that 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. Poor practices, like weak passwords, can also lead to vulnerabilities. Cyberattacks include "password spraying," which is a brute-force attack on many usernames or accounts to find commonly used passwords to gain access into 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.[3] It is commonly accepted that social engineering is the most significant vulnerability to most systems.

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

- *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 staff with regular security and awareness training that outlines common tactics and strategies that criminals will use.

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

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

In addition to combatting threats from social engineering, other technical solutions include making sure that all systems and software have the latest patches, backing up files regularly and having a recovery plan, using antivirus software and a firewall, and employing content scanning and filtering on servers to find known threats.

Insurance Can Mitigate Ransomware Costs but Not without Risks: Insurance can mitigate damages associated with ransomware attacks. Since the May 2019 attack, Baltimore City has purchased insurance. The City of Houston has also purchased insurance and Maryland municipalities that belong to the Local Government Insurance Trust (LGIT) receive $1 million of cyber insurance coverage with a standard insurance package. Advantages to having insurance are that:

- the typical insurer will assess current practices and require the insured to correct deficiencies; and

- if the hackers' attacks are successful, the insurance company will cover expenses.

However, insurance also has some risks. One risk is that coverage may not be sufficient. LGIT offers up to $1 million of coverage, which is substantially less than the $18 million in losses incurred by Baltimore City. There also could be gaps in coverage, such as clauses that deny claims. If there is a clause that denies coverage for negligence, it is possible that a claim could be denied if a single patch was not installed on a timely basis.

Audit Findings Suggest Ransomware Vulnerabilities

There are technical solutions that the State can employ to protect against ransomware attacks. **Exhibit 19** lists these solutions with audit findings showing that best practices were not observed. Calendar 2019 audits include 28 findings that suggest vulnerabilities to ransomware attacks. This is consistent with the average number of findings in the prior four years.

Exhibit 19
Audit Findings Associated with Ransomware Protections
Audits Released Calendar 2015–2019

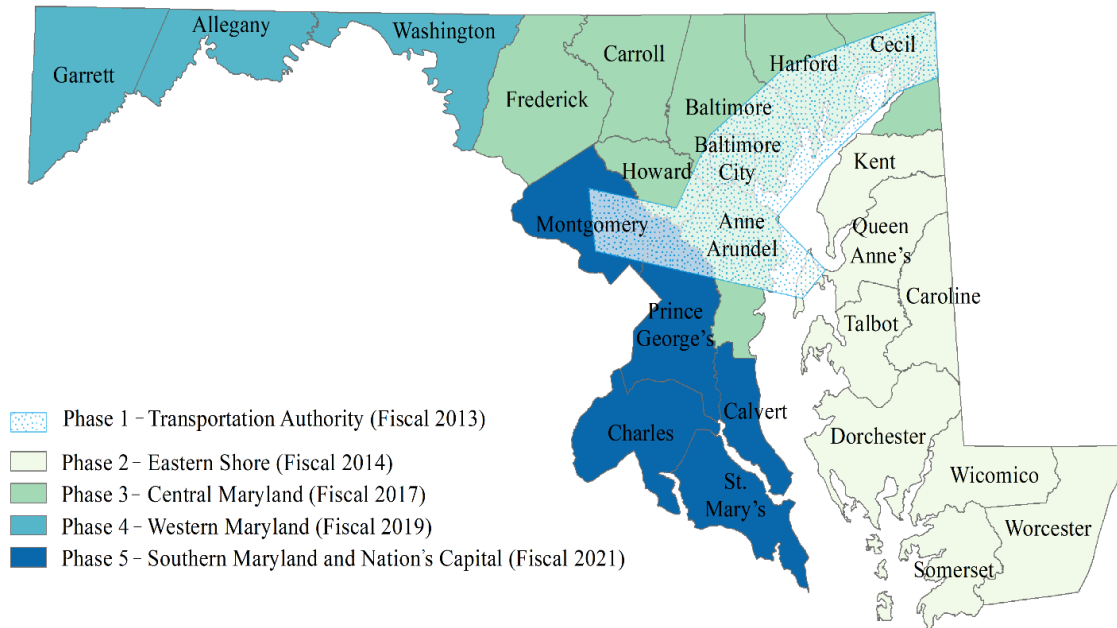| Ransomware Protections	Average Annual Findings 2015-2018	Findings 2019
Restrict Privileges	11	12
Install Latest Patches and Software	5	4
Backup Files and Disaster Recovery Plan	1	2
Deploy Antivirus Software and a Firewall	6	7
Employ Content Scanning and Filters	4	3
Total	**27**	**28**

Source: Office of Legislative Audits

The number of audit findings suggest that some State agencies are vulnerable to ransomware attacks. **The department should be prepared to discuss what it is doing to protect the State against ransomware. This should include a discussion of how current vulnerabilities are addressed.**

3. Maryland FiRST Radio Maintenance and Equipment Replacement

MD FiRST (Maryland First Responder Radio System Team) is an integrated statewide public safety wireless communication system and the primary radio communication system for all State and many county first responders throughout the State. The system uses the Public Safety 700 MHz spectrum licensed to the State by the Federal Communications Commission. The system supports over 24,000 primary users from State agencies and eight counties and over 41,000 interoperability users from the remaining counties, federal, and neighboring state first responder agencies. **Exhibit 20** depicts the five phases of the project. The first phase was completed in fiscal 2013, and the final phase is expected to be operational by winter 2021.

Exhibit 20
Schedule for Implementing Maryland FiRST
Fiscal Years That Regions Become Operational

Phase 1 – Transportation Authority (Fiscal 2013)
Phase 2 – Eastern Shore (Fiscal 2014)
Phase 3 – Central Maryland (Fiscal 2017)
Phase 4 – Western Maryland (Fiscal 2019)
Phase 5 – Southern Maryland and Nation's Capital (Fiscal 2021)

Maryland FiRST: First Responders Interoperable Radio System Team

Source: Department of Information Technology

Phases 1 through 4 of the project were implemented using T1 telecommunications technology in an effort to maximize the use of existing State assets (a legacy T1 based microwave network). The 700 MHz system vendor, Motorola, has announced that it will cease support of T-1 technology in 2022. Though Motorola will continue to support T-1 technology on the Maryland FiRST system as currently configured until 2022, Maryland FiRST will no longer be able to receive system upgrades after 2020.

DoIT has initiated a plan with Motorola to convert phases 1 through 4 to Ethernet technology before the system reaches end-of-life support at a cost of approximately $21 million. Ethernet is the current radio industry standard for backhaul and provides capabilities that T-1 technology did not offer. Ethernet has the capability of carrying more data throughout the system as it has greater bandwidth than T-1. In addition, it provides greater resilience due to the nature of its routing capabilities. Phase 5 of the project was designed and is being implemented utilizing Ethernet. There is discussion of the capital construction in the DoIT capital budget analysis (FB04).

The State 700 MHz radio system is categorized as a digital P25 trunked Land Mobile Radio (LMR) system. LMRs contain the following basic components, all requiring annual operations and maintenance (O&M) support and lifecycle replacement:

- ***Dispatch Subsystem:*** These are the consoles used by dispatchers located in communication centers and 911 centers throughout the State.

- ***Control Subsystem (Master Sites):*** This is the computer "brain" of LMR, which includes the hardware and software required to operate the radio subsystem. The system has three master core sites and three backup sites.

- ***Communication Site Infrastructure:*** This includes land, towers, antennas, and building/shelters; power, electrical, generators, uninterruptable power supplies systems and grounding; alarm systems; and heating, ventilation, and air conditioning systems. Once complete, DoIT anticipates that there will be 170 sites in operation.

- ***Communication Site Radio Equipment (Radio Subsystem):*** This includes base station radios, site controllers, antenna combining system, and switches and routers at 170 tower sites.

- ***Transport Subsystems:*** These are the backbone networks that include the fiber optic and microwave systems that connect all the components of LMR.

- ***Subscriber Radio Subsystem:*** Subscriber units are mobile (vehicle mounted) and portable (handheld) radios. Part of this category is the associated accessories and attachments for these radios.

Maintenance and Lifecycle Replacement Costs

The State incurs annual O&M costs to support MD FiRST. These costs are realized as MD FiRST radio systems phases complete construction, become operational, and phase components come out of warranty. The annual O&M costs will continue to increase until the project is completed and all components come out of warranty. A steady O&M budget level is expected to be achieved in fiscal 2023 with inflationary growth thereafter.

In addition, the State will have to start budgeting for lifecycle replacement and upgrades as the various hardware components of the system reach end-of-life and software upgrades are required. Lifecycle replacement will also need to be budgeted for the first responder subscriber equipment (radios).

Radio purchases for the various State agencies that utilize MD FiRST were budgeted in the MITDPF at a cost of approximately $70 million over the course of 8 years. DoIT advises that the vendor's recommended notional lifecycle replacement schedule for digital subscriber unit radios is 7 to 8 years. However, due to the high cost of each unit, DoIT recommends a 10- to 15-year replacement cycle. **Exhibit 21** shows the anticipated cost of O&M radio lifecycle replacement costs.

Exhibit 21
Radio Program Costs
Fiscal 2021-2025
($ in Millions)

	2021	2022	2023	2024	2025
Operation and Maintenance	$13.4	$14.8	$15.8	$16.2	$16.7
Lifecycle Equipment Replacement	0.0	1.0	1.0	2.0	4.0
Total	**$13.4**	**$15.8**	**$16.8**	**$18.2**	**$20.7**

Source: Department of Information Technology

Maryland FiRST Maintenance Contract

The maintenance of dispatch subsystems, master sites, and radio subsystem components of the MD FiRST system are covered by a maintenance contract with Motorola. The current contract runs until November 2022, with an option year to November 2023. The maintenance can be divided into two parts:

- day-to-day O&M and break/fix activity; and

- two critical services that maintain the security of the system and keep the system technologically up to date.

With respect to security and modernization, the Security Update Service (SUS) provides the latest security updates and patches to the radio system and the System Upgrade Assurance (SUA II) program ensures the system software and hardware is kept updated. The SUA program reduces the lifecycle replacement cost of the backend of the radio system and minimizes the risk of obsolescence so the State will not be faced with having to do a wholesale replacement of the radio system in 15 or 20 years.

Since the radio system and associated software is a proprietary product of Motorola, they are the only vendor that can provide SUS and SUA II services. However, a competitive solicitation to conduct break/fix activity can be pursued. Since the MD FiRST radio system needs to be always up to support first responders, a vendor's competency and speed of reaction to outages and maintenance is critical. This will require the State to qualify bidders to ensure that repairs will be done quickly and effectively. The complicated nature of the system may further limit the number of vendors qualified to maintain the system. **DoIT should brief the committees on its efforts to rebid the interoperability radio system O&M and lifecycle replacement contracts. This should include how to increase the number of qualified bidders.**

Operating Budget Recommended Actions

1. Add the following language:

   <u>Provided that 15 regular positions shall be reduced from the budget of the Department of Information Technology (DoIT), and that $60,000 in general funds, $40,000 in special funds, and $900,000 in reimbursable funds associated with these positions may not be expended for that purpose but instead may be used only for the purpose of enhancing DoIT salaries by creating a new salary scale for information technology positions. The Department of Budget and Management and DoIT should report on salary actions to the budget committees by September 4, 2020. Funds not expended for this restricted purpose may not be transferred by budget amendment or otherwise to any other purpose and shall revert to the General Fund or be canceled.</u>

   <u>Further provided that the budget of DoIT shall be reduced by $60,000 in general funds and $40,000 in special funds.</u>

   Explanation: DoIT's vacancy rates have been between 16% and 25% since January 2018. There currently are 55 vacant positions, which is 42 positions above the budgeted turnover rate for fiscal 2021. This action abolishes 15 regular positions that have been vacant for over one year and also increases the fiscal 2021 budget turnover rate to the level in fiscal 2020. Savings will be used to cut the DoIT budget by $1 million with $1 million restricted for salary enhancements. The Department of Budget and Management and DoIT shall create a new salary scale for information technology positions and report to the budget committees on the salary scales and enhancements by September 4, 2020.

Information Request	**Author**	**Due Date**
Report on salary actions	DoIT	September 4, 2020

	Amount **Reduction**

2. Reduce funding for the Medicaid Management Information System II replacement information technology development project based on expectations of program spending in fiscal 2020 and 2021. $ 1,000,000 GF

3. Reduce funding for the Maryland Total   16,500,000 GF
    Human-services Information NetworK Major
    Information Technology Development Project to
    reflect anticipated spending in fiscal 2020 and 2021.

4. Reduce funding for the Integrated Tax System Major   2,000,000 GF
    Information Technology Development Project based
    on anticipated spending needs in fiscal 2021.

5. Reduce general funds appropriated in the Major   2,000,000 GF
    Information Technology Development Fund
    (MITDPF). The Department of Information
    Technology (DoIT) estimates that annual revenues
    from resource sharing agreements (RSA) are
    $1.1 million. These funds are deposited into the
    MITDPF. The MITDPF does not reflect these
    revenues for fiscal 2020 and 2021. Recognizing these
    revenues provides an additional $2 million enabling a
    general fund reduction of the same amount. DoIT is
    authorized to appropriate up to $2 million RSA
    revenues deposited into the MITDPF in fiscal 2020
    and 2021.

6. Adopt the following narrative:

    **Total Statewide Costs of the Department of Human Services' Maryland Total
    Human-services Integrated NetworK:** The Maryland Total Human-services Integrated
    NetworK (MD THINK) is a shared human services platform. The objective is to keep individual
    data in one system instead of numerous silos throughout State government. Other State systems,
    such as the Maryland Department of Health's Medicaid Management Information System, are
    being migrated onto MD THINK. Appendix N of the Governor's Budget Highlights for fiscal
    2021 shows that the total cost to the Department of Human Services is $468 million. These
    costs do not include all costs borne by State agencies to migrate onto MD THINK. The
    Department of Information Technology (DoIT) should report to the committees on the total
    estimated cost of MD THINK. This should include costs by year and also costs incurred as well
    as required in the future of all State agencies by State agency. The report should be submitted
    by September 4, 2020.

Information Request	Author	Due Date
Report on total costs of MD THINK	DoIT	September 4, 2020

7.   Add the following section:

Section XX   Department of Information Technology Position Reduction Savings

SECTION XX. AND BE IT FURTHER ENACTED, That the reimbursable funds appropriation in the Department of Information Technology programs F50B04.01 State Chief of Information Technology, F50B04.02 Security, F50B04.03 Application Systems Management, and F50B04.04 Infrastructure, shall be reduced by a total of $900,000. Funding shall be reduced from within programs in the Executive Branch, Legislative Branch, and Judicial Branch agencies in Section 1 of this Act in accordance with a schedule determined by the Governor, the Presiding Officers, and the Chief Judge. The reduction shall equal at least the amount indicated for the funds listed:

Fund	Amount
General	$540,000
Special	$180,000
Federal	$180,000

Explanation: This reduces reimbursable funds for 15 regular positions in the Department of Information Technology that are abolished. The positions have been vacant for over one year.

Total General Fund Reductions	**$ 21,500,000**

Appendix 1
2019 *Joint Chairmen's Report* **Responses from Agency**

The 2019 *Joint Chairmen's Report* (JCR) requested that the Department of Information Technology (DoIT) prepare one report. Electronic copies of the full JCR responses can be found on the Department of Legislative Services Library website.

- ***Managing for Results (MFR) Indicators for Major Information Technology (IT) Projects Developed Using Agile:*** With respect to developing major IT projects, DoIT has transitioned from the Waterfall method to the Agile method. DoIT had not updated its MFR indicators to reflect the new design approach. As discussed in the second MFR goal, new Agile MFR indicators have been added to DoIT's fiscal 2021 MFR indicators.

Appendix 2
Department of Information Technology as a Service Provider (Shared Services) Audit Findings

Audit Period for Last Audit:	August 2017 – December 2017
Issue Date:	March 2019
Number of Findings:	5
Number of Repeat Findings:	n/a
% of Repeat Findings:	n/a
Rating: (if applicable)	n/a

Finding 1:   The Department of Information Technology (DoIT) had not updated the *Information Security Policy* applicable to the Executive Branch and independent State agencies for almost six years despite new and increasing information technology (IT) security risks. Without updated information security requirements, State agencies were not assisted in addressing the increasing security risks arising from new information system technologies and security threats. According to industry literature, for the almost six-year period since the Information Security Policy was last updated (February 2013), IT security risks have grown in scope and at an increasing rate with industry groups recognizing the increased risks related to IT security. For example, the National Association of State Chief Information Officers' (NASCIO) annually surveys state chief information officers (CIO) to identify and prioritize the top IT policy and technology issues facing state governments and publishes a related annual Top Ten Priorities list. For each year from 2015 to 2018, the described NASCIO IT surveys ranked IT Security and Risk Management as the number one priority among all state CIOs. DoIT responded that it was in the process of updating the manual. The Office of Legislative Audits (OLA) recommends that this be updated. A new *State of Maryland Information Technology Security Manual* was posted online in June 2019.

Finding 2:   DoIT did not have an IT disaster recovery plan (DRP) for its third-party operated enterprise services hosting data center to aid in the recovery of related information systems operations. According to DoIT's enterprise services records as of August 2018, 24 State customer agencies were fully using DoIT enterprise services that were operating on this third-party hosted data center's infrastructure, and 8 other State customer agencies were partially using some form of the aforementioned hosted enterprise services. Without a complete and tested DRP, a disaster could cause significant delays (for an undetermined period of time) in restoring information systems operations for over 30 State enterprise services customer agencies, beyond the expected delays that would exist in a planned recovery scenario. OLA recommends that DoIT comply with State of Maryland *Information Technology Disaster Recovery Guidelines*. DoIT acknowledged that the DRP in place at the time of the audit did not address all requirements identified in the guidelines.

Finding 3: DoIT lacked assurance that adequate IT security and operational controls existed over its State enterprise services operations hosted by its third-party data center hosting service provider. After OLA inquiries, DoIT contacted the service provider and found that the service provider had a System and Organization Controls (SOC) 2 Type 2 review performed, with a related report issued on December 12, 2016, covering the period of November 1, 2015, to October 31, 2016. In response to OLA's request, DoIT obtained the SOC report from the service provider. OLA's review of the report disclosed that it identified seven control weaknesses for the service organization's system description and the suitability of the design and operating effectiveness of controls, but the control issues pertained to the hosting service provider's data centers in locations other than the Baltimore location. OLA recommends that DoIT obtain SOC 2 type 2 reviews of all outsourced services and review them to take appropriate actions to ensure that all critical operational and security-related controls are addressed. DoIT agrees to take corrective actions.

Finding 4: Operating system software updates were not applied to network devices in use on DoIT-managed customer agencies' networks and on DoIT-only networks. OLA's November 2017 test of 10 customer agency and/or DoIT network devices disclosed that 8 of the 10 network devices had outdated operating system software installed with 4 of these devices running a software version that was no longer supported by the device manufacturer. OLA recommends that DoIT identify all critical network devices with obsolete operating system software (no longer supported by the manufacturer) and develop a plan to migrate those devices to manufacturer-supported operating software. DoIT should also develop procedures to regularly identify software updates necessary to eliminate significant security or operational vulnerabilities. DoIT will take steps to comply. DoIT did not do this when it implemented shared services; the department assumed responsibility for the IT operations of 30 agencies, a number of which were end-of-support so that the operations were no longer supported by the manufacturer.

Finding 5: DoIT's enterprise services operation lacked procedures for maintaining malware protection controls on customer agencies' workstations. DoIT did not properly control the assignment of local administrative rights on enterprise services customer agencies' workstations. DoIT-supported customer agencies' workstations had not been updated with the latest releases for three application software products that are known to have ongoing security-related vulnerabilities. OLA recommends that DoIT address these issues. As with Finding 4, DoIT notes that it inherited operational control of State agency IT. DoIT is taking steps to migrate agency IT operations into a more secure operating environment.

Appendix 3
Major Information Technology Project
Department of Information Technology
One Portal

New/Ongoing: Ongoing							
Start Date: November 30, 2017				**Est. Completion Date:** June 30, 2023			
Implementation Strategy: Agile							

($ in Millions)	Prior Year	2020	2021	2022	2023	2024	Remainder	Total
GF	$2.000	$4.968	$5.300	$6.400	$3.500	$0.000	$0.000	$22.168
SF	0.000	0.000	2.000	0.000	0.000	0.000	0.000	2.000
Total	**$2.000**	**$4.968**	**$7.300**	**$6.400**	**$3.500**	**$0.000**	**$0.000**	**$24.168**

- *Project Summary*: This project provides a consolidated, easy-to-find portal for State-issued licenses and permits. The Department of Information Technology (DoIT) works with agencies to bring their processes online.

- *Need:* Before this project was implemented, DoIT estimated that Maryland had over 1,000 forms online spread across State agency websites. Many of these forms are only available to download, complete manually on paper, and return via U.S. mail. There was no interagency coordination for such a common processes as license processing so license processing tasks are duplicated many times throughout the State government apparatus.

- *Observations and Milestones:* Currently, the project supports form creation for eight State agencies, including the Maryland Department of Labor, the Maryland Department of the Environment, the Maryland Department of Health, the Maryland Department of Transportation, the Maryland Higher Education Commission, the Maryland Medical Cannabis Commission, the State Department of Assessments and Taxation, and the Maryland Department of Agriculture.

- *Changes:* In last year's major information technology plan, fiscal 2020 was the last year that this project received funding, and project costs totaled $7 million. Funding has been extended through fiscal 2023 and increased to $24 million as more licenses and permits for migration to the portal. It is unclear at this point what the total scope of this project is.

Appendix 4
Major Information Technology Project
Department of Information Technology
networkMaryland 100 G Backbone Upgrade

New/Ongoing: New							
Start Date: March 1, 2019				**Est. Completion Date:** December 31, 2020			
Implementation Strategy: Infrastructure Project							
($ in Millions)	**Prior Year**	**2020**	**2021**	**2022**	**2023**	**2024**	**Remainder**	**Total**
GF	$0.000	$0.000	$2.250	$0.000	$0.000	$0.000	$0.000	**$2.250**
Total	**$0.000**	**$0.000**	**$2.250**	**$0.000**	**$0.000**	**$0.000**	**$0.000**	**$2.250**

- *Project Summary:* networkMaryland's infrastructure is currently a partial mesh design that has grown organically over time based on the availability of fiber assets. This network is anchored by a number of core sites strategically located throughout the State where network traffic and services aggregate. This project will redesign and reengineer the backbone network to apply current technologies to increase maximum bandwidth to 100 gigabits per second (Gbps). Design and engineering has begun. The Department of Information Technology advises that costs for this infrastructure improvement should not exceed that is budgeted in fiscal 2021.

- *Need:* Five years ago, the largest bandwidth required for a single circuit was 5 megabits per second. Now there are dozens of subscribers that require more than 1 Gbps per second, and aggregated traffic often requires more than 5 Gbps per second. As more sophisticated systems are introduced that involve more agencies and the public, the need for bandwidth is expected to continue to increase.

- *Other Comments:* The funding will allow completion of the 100 Gbps ring supporting the Annapolis, Baltimore, and nation's capital suburbs points of presence. These sites, 10 in total, represent those sites where traffic in excess of the current 10 Gbps is expected in the near future. Sites in Western, Southern, and Eastern Maryland are sufficient for the foreseeable future. If and when an issue is identified in the more remote locations, it will be addressed at that time.

Appendix 5
Major Information Technology Project
Department of Information Technology
Enterprise Solutions Planning Initiative

New/Ongoing: Ongoing								
Start Date: July 1, 2017				**Est. Completion Date:** Ongoing development costs.				
Implementation Strategy: Agile								
($ in Millions)	**Prior Year**	**2020**	**2021**	**2022**	**2023**	**2024**	**Remainder**	**Total**
GF	$2.342	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$2.342
SF	0.500	1.400	1.400	1.400	2.280	2.280	0.000	9.260
Total	**$2.842**	**$1.400**	**1.400**	**1.400**	**2.280**	**2.280**	**$0.000**	**$11.602**

- *Project Summary:* Provide integrated planning support to information technology projects received to combine planning activities that have traditionally occurred in silos. This includes (1) centralized planning; (2) ensuring that solutions are scaled at an appropriate level and apply enterprise model to reduce duplicative systems; (3) supporting the Agile approach to system development; (4) influencing common modeling, designing, and coding practices for systems architecture; and (5) ensuring that priority needs/solutions are addressed timely and funded appropriately.

- *Need:* This is consistent with the Department of Information Technology's mission to support major information technology project development.

- *Changes:* Anticipated appropriations for fiscal 2021 and 2022 are $880,000 less than previously budgeted.

Object/Fund	FY 19 Actual	FY 20 Working Appropriation	FY 21 Allowance	FY 20 - FY 21 Amount Change	Percent Change
Positions					
01 Regular	234.60	220.60	210.60	-10.00	-4.5%
02 Contractual	1.00	1.10	1.20	0.10	9.1%
Total Positions	**235.60**	**221.70**	**211.80**	**-9.90**	**-4.5%**
Objects					
01 Salaries and Wages	$ 21,843,332	$ 22,984,220	$ 23,438,145	$ 453,925	2.0%
02 Technical and Special Fees	47,199	114,737	46,377	-68,360	-59.6%
03 Communication	7,888,272	7,788,244	7,407,189	-381,055	-4.9%
04 Travel	107,255	83,020	254,280	171,260	206.3%
06 Fuel and Utilities	24,155	61,500	83,422	21,922	35.6%
07 Motor Vehicles	9,785	7,420	6,420	-1,000	-13.5%
08 Contractual Services	133,501,966	155,362,544	187,041,894	31,679,350	20.4%
09 Supplies and Materials	100,534	82,750	69,500	-13,250	-16.0%
10 Equipment – Replacement	11,035,876	2,924,859	3,069,785	144,926	5.0%
11 Equipment – Additional	258,011	430,000	955,000	525,000	122.1%
13 Fixed Charges	451,520	431,968	536,194	104,226	24.1%
Total Objects	**$ 175,267,905**	**$ 190,271,262**	**$ 222,908,206**	**$ 32,636,944**	**17.2%**
Funds					
01 General Fund	$ 101,861,779	$ 77,167,606	$ 114,824,971	$ 37,657,365	48.8%
03 Special Fund	13,593,731	16,898,983	14,590,450	-2,308,533	-13.7%
09 Reimbursable Fund	59,812,395	96,204,673	93,492,785	-2,711,888	-2.8%
Total Funds	**$ 175,267,905**	**$ 190,271,262**	**$ 222,908,206**	**$ 32,636,944**	**17.2%**

Note: The fiscal 2020 appropriation does not include deficiencies, planned reversions, or general salary increases. The fiscal 2021 allowance does not include contingent reductions or general salary increases.

Fiscal Summary
Department of Information Technology

Program/Unit	FY 19 Actual	FY 20 Wrk Approp	FY 21 Allowance	Change	FY 20 - FY 21 % Change
0A Major IT Development Project Fund	$ 67,600,896	$ 65,202,399	$ 105,202,566	$ 40,000,167	61.3%
0B Office of Information Technology	107,667,009	125,068,863	117,705,640	-7,363,223	-5.9%
Total Expenditures	**$ 175,267,905**	**$ 190,271,262**	**$ 222,908,206**	**$ 32,636,944**	**17.2%**
General Fund	$ 101,861,779	$ 77,167,606	$ 114,824,971	$ 37,657,365	48.8%
Special Fund	13,593,731	16,898,983	14,590,450	-2,308,533	-13.7%
Total Appropriations	**$ 115,455,510**	**$ 94,066,589**	**$ 129,415,421**	**$ 35,348,832**	**37.6%**
Reimbursable Fund	$ 59,812,395	$ 96,204,673	$ 93,492,785	-$ 2,711,888	-2.8%
Total Funds	**$ 175,267,905**	**$ 190,271,262**	**$ 222,908,206**	**$ 32,636,944**	**17.2%**

Note: The fiscal 2020 appropriation does not include deficiencies, planned reversions, or general salary increases. The fiscal 2021 allowance does not include contingent reductions or general salary increases.