



**INDEPENDENT MODERNIZE MARYLAND OVERSIGHT
COMMISSION**

INITIAL REPORT

DECEMBER 20, 2023

December 20, 2023

The Honorable Wes Moore
Governor, State of Maryland
100 State Circle
Annapolis, MD 21401

The Honorable Bill Ferguson
Senate President
State House, H-107
Annapolis MD 21401

The Honorable Adrienne A. Jones
Speaker of the House of Delegates
State House, H-101
Annapolis, Maryland 21401

The Honorable Guy Guzzone
Budget and Taxation Committee
3 W Miller Senate Building
Annapolis, Maryland 21401

The Honorable Brian J. Feldman
Education, Energy, and Environment Committee
2 W Miller Senate Building
Annapolis, Maryland 21401

The Honorable Ben Barnes
Appropriations Committee
121 House Office Building
Annapolis, Maryland 21401

The Honorable Joseline A. Pena-Melnyk
Health and Government Operations Committee
241 House Office Building
Annapolis, Maryland 21401

The Honorable Katie Fry Hester and The Honorable Anne Kaiser
Joint Committee on Cybersecurity, Information Technology, and Biotechnology
Annapolis Maryland, 21401

Re: Report required by § 3.5-316(f) (MSAR # 14230) of the State Finance and Procurement Article

Ladies and Gentlemen,

The Modernize Maryland Oversight Commission was established by House Bill 1205 during the 2022 session. Its purpose is to “(1) ensure the confidentiality, integrity, and availability of information held by the State concerning State residents and (2) advise the Secretary and State Chief Information Security Officer on a) the appropriate information technology and cybersecurity investments and upgrades; b) the funding sources for the appropriate information technology and cybersecurity upgrades; and c) future mechanisms for the procurement of the appropriate information technology and cybersecurity upgrades, including ways to increase the efficiency of procurements made for information technology and cybersecurity upgrades”.

This initial report focuses on Part 2 of the Commission’s statutory charge. It makes 20 recommendations that were adopted unanimously by the Commission at its December 14th meeting. These recommendations span modernization funding, governance, advice and oversight, planning, management, and IT organization; and procurement, adopting a ‘whole of state government’ mindset.

First, modernization is an opportunity to not only focus on legacy modernization to produce more secure, reliable, and maintainable systems at optimal costs but also to rethink and transform how the business of government is done and how a practical end-to-end experience of IT services is delivered to the citizens from their point of view. Drawing parallels from our roles in the cybersecurity private sector, we have observed vendors shifting over the past few years to a

cybersecurity platform-based approach in delivering cybersecurity solutions to their customers rather than a disparate best-of-breed point solution approach. That mindset of providing a holistic solution improves the total cost of ownership, adoption, and maintenance for the end customer and significantly enhances the customer's experience. The platform-based approach has accelerated the establishment of deeper alliances between cybersecurity vendors, with the vital beneficiary being a much improved end-to-end experience for their customers.

Second, with that lens into modernization, the state must establish a dedicated modernization IT investment fund with funding direction from a cross-functional IT Modernization Investment Board. Along with this, there must also be the proper structure in place to ensure transparency and accountability on the progress in addressing modernization objectives across the Executive Branch.

Third, as we execute these goals, we must seek ways to deliver value to the citizens often. Many of us have not only seen the technology revolution from the birth of a silicon chip and its evolution but also personally experienced how the value in the form of millions of products and technologies built with that fundamental component has transformed our lives. We are fortunate to be part of a second similar technology revolution in our lifetime with Generative AI. While the technology around large language models evolves every day, the value from applications and services built on that underlying technology is visible daily with incremental improvements, intending to continually improve the end user's experience. From our shoes in the private sector, the key to remaining competitive in the markets we compete in while leveraging such technologies is to deliver value early and often.

Finally, this report is delivered at the end of the first year of the Moore-Miller Administration. There is clearly a sense of excitement within the new team that Secretary Savage has put together at DoIT. We recognize, however, that the Administration's vision "to bring Maryland to the forefront of cutting-edge and emergent technology in better service of our State" cannot be achieved unless the Department is properly resourced and empowered. Given the technical debt of the State, we believe achieving this strategy is likely a multi-billion and multi-year endeavor if taken seriously.

We would like to thank all members of the Commission for the time and effort spent in arriving at this report. We hope the recommendations will prove valuable to the policy discussions during the upcoming 2024 session of the General Assembly.

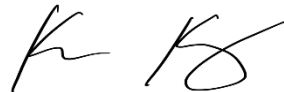
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For questions about the report, please contact us or Dr. Gregory von Lehmen, Interim
Commission Staff, University of Maryland Global Campus, at Gregory.vonlehmen@umgc.edu
or 301-832-7488.

Respectfully,



Manoj Srivastava
Chair, Modernize Maryland Oversight
Commission
Member, Maryland Chamber of Commerce



Ken Kurz
Vice-Chair, Modernize Maryland
Oversight Commission
Member, Board of Directors
Cybersecurity Association of
Maryland, Inc.

cc: Secretary Katie Savage and State CISO Greg Rogers, Department of Information
Technology
Sarah Albert, Department of Legislative Services (5 copies)

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Executive Summary

The Modernize Maryland Oversight Commission was established by statute to (1) “ensure the confidentiality, integrity, and availability of information held by the State concerning State residents; and (2) advise the Secretary and State Chief Information Security Officer on I) (t)he appropriate information technology and cybersecurity investments and upgrades; II) the funding sources for the appropriate information technology and cybersecurity upgrades; and III) future mechanisms for the procurement of the appropriate information technology and cybersecurity upgrades, including ways to increase the efficiency of procurements made for information technology and cybersecurity upgrades.”¹

In this initial report, the Commission unanimously adopted 20 recommendations for the consideration of the Secretary of the Department of Information Technology (DoIT) and the State Chief Information Security Officer. These recommendations concern modernization funding, governance, advice and oversight, planning, management, and IT organization; and procurement, adopting a ‘whole of state government’ mindset.

Recommendation 1 (Funding). That the State establish a dedicated IT investment fund over and above DoIT’s annual operating budget to finance the replacement of legacy IT systems, process transformation, and effective digital government across the Executive Branch. As described below, decisions about how investments funds would be made by an IT Modernization Investment Board (Recommendation 2).

- *Recommendation 1.1. That the IT investment fund should eventually replace the Major IT Development Projects (MITDP) process.*
- *Recommendation 1.2. That DoIT should hire a consultant to complete the required list of legacy systems and prioritize the associated risk.*
- *Recommendation 1.3. That DoIT work with the agencies to develop a five-year projection of funding needs to modernize.*
- *Recommendation 1.4. That the IT investment fund should be bond-funded to the extent practicable.*
- *Recommendation 1.5. That there should be guardrails to ensure compliance with the Investment Fund process.*

Recommendation 2 (Governance). That the General Assembly establish a Maryland Technology Investment Board of at least five and no more than seven members. This board should be chaired by the DoIT Secretary and include multi-agency representation, a public representative appointed by the Governor, and other members as appropriate.

- *Recommendation 2.1. That the board shall have the authority to evaluate and approve IT modernization investment proposals for the Executive Branch to be financed by the Maryland Technology Management Fund and shall monitor the implementation of financed projects.*
- *Recommendation 2.2. That DoIT ensure there is an Enterprise Architecture (EA) and standards to guide modernization across the Executive Branch and that all modernization be consistent with this EA and those standards.*

¹ Maryland Code Ann., State Finance & Procurement § 3.5-317 (C).

Recommendation 3 (Advice and Oversight). That the charter, membership, and authorities of the Modernize Maryland Oversight Commission be amended to establish the Commission as an advisory board with the purpose of identifying best modernization practices, formulating recommendations for the State Executive Branch and the General Assembly, and providing transparency about the progress in addressing modernization objectives across the Executive Branch.

- *Recommendation 3.1. That the MITDP report be modified to summarize and publicize modernization progress of the Executive Branch.*
- *Recommendation 3.2. That the Commission include a member from the Office of Legislative Audits.*
- *Recommendation 3.3. That the Commission be appropriately staffed.*

Recommendation 4 (Planning, Management, and IT Organization). Modernization investments should certainly be consistent with the State’s IT strategic goals but where possible seek ways of delivering value early through incremental improvements.

- *Recommendation 4.1. That DoIT produce a new strategic plan by December 1, 2024, with goals that are SMART.*
- *Recommendation 4.2. That the DoIT IT Council serve as a coordinating body between the Secretary and agency CIOs.*
- *Recommendation 4.3. That DoIT develop a strategy for centralization of IT management across the Executive Branch under DoIT by considering various models seen by the Commission, such as leaving local IT budgets and IT staff with the agencies while changing IT staff reporting lines and carving out certain units of State government as exceptions from centralization where appropriate due to limitations of federal law, complexity of operations, or other considerations.*

Recommendation 5 (Procurement). That IT procurements of \$2 million or less be exempt from Board of Public Works approval.

- *Recommendation 5.1. That the \$2 million cap be adjusted annually to pace with inflation.*
- *Recommendation 5.2. That with a view to more far-reaching reform, the State engage a contractor to conduct a comprehensive, data-driven review of its procurement processes to recommend changes to produce a more agile procurement regime to support IT modernization and other major State procurements.*

These recommendations were informed by the following sources of information.

The experience of the Federal government. A 2021 GAO report estimated that out of Congressional appropriations of more than \$100 billion annually for federal agency IT, 80% of the spend is on existing infrastructure, including legacy systems.² Through a series of statutes, Congress has driven best practices for selecting and managing IT investments, created a vehicle for funding modernization, and developed a scorecard for tracking modernization efforts.³ Out of

² See Government Accounting Office (2021, April 27) above, page 1.

³ In addition to the foregoing GAO report, see for example: Government Accounting Office (2004, March). Information technology investment management: A framework for Assessing and improving process maturity. (GAO-04-394G). <https://www.gao.gov/assets/gao-04-394g.pdf>; and Government Accounting Office (2021,

this experience has come models for governance, funding, and managing IT modernization that are instructive.

The experience of other states. The Commission benefited from information shared by CIOs and staff of states that have been engaged in modernizing their digital infrastructure. These states include Nebraska, Connecticut, Michigan, Utah, and Georgia. In each case, representatives were asked to discuss how they were making IT investment decisions, how they were funding investments, their procurement processes, how they managed their implementations, and any other lessons learned that they would want to share.⁴ The states represented a mix of IT organizational models, including both centralized IT management within the Executive Branch and federated management like Maryland's.

Best procurement practices as shared by several presenters to the Commission. Representatives of the National Association Of State CIOs (NASCIO) and the National Association of State Purchasing Officers (NASPO) discussed their joint taskforce report on procurement reform.⁵ In addition, the new CIO for the Office of the Maryland Comptroller shared his experience with procurement in his former role as Baltimore County CIO, describing the strategies used by his office and the County procurement office that contributed to agile and successful procurements.

Two unpublished consultant reports commissioned by the Department of Information Technology (DoIT). Pursuant to the Commission's enabling statute, DoIT engaged a consultant to a) evaluate how DoIT has made IT investment decisions and to recommend corresponding improvements, and b) assess the performance and capacity of Office of Security Management and to make corresponding cybersecurity recommendations. These reports were completed in December 2022 and reflect the status quo as of that date.

The utility of any report is a function in part of the quality of the information supporting it. The Commission is grateful for the assistance of NASCIO in arranging many of the presentations from which this report benefited. Likewise, the Commission's work would not have been possible without staff support. For that assistance, the Commission expresses its appreciation to the University of Maryland Global Campus and the Center for Health and Homeland Security.⁶

December). Technology modernization fund: Implementation of recommendations can improve fee collection and proposal cost estimates. (GAO-22-105117). <https://www.gao.gov/assets/720/718168.pdf>

⁴ The Nebraska CIO shared his responses to the questions in writing. The other state representatives made presentations to the Commission at four meetings that occurred in September, October, and November. Meeting recordings and transcripts can be accessed at <https://doit.maryland.gov/cybersecurity/Pages/immoc.aspx>

⁵ Joint Task Force of the National Association of State CIOs and the National Association of State Procurement Officers (2017, September 19). State IT procurement negotiations: Working together to reform and transform. (Page 1). <https://www.nascio.org/resource-center/resources/state-it-procurement-negotiations-working-together-to-reform-and-transform/>

⁶ Dr. Greg von Lehmen, University of Maryland Global Campus, staffed the Commission and drafted this report. The summary of state CIO presentations was prepared by Katherine Mandarano and Alexandra Barczak, legal interns at the University of Maryland Center for Health and Homeland Security.

The Moore-Miller administration is committed to providing reliable, secure, and accessible IT infrastructure for all Marylanders... We are moving quickly, not only to modernize operations, but to bring Maryland to the forefront of cutting-edge and emergent technology in better service of our state.

—Governor Wes Moore⁷

Introduction

The Modernize Maryland Oversight Commission was created as part of a legislative package that passed the General Assembly in 2022.⁸ This benchmark legislation was informed by a report⁹ of the Maryland Cybersecurity Council and grew out of a concern for the cybersecurity of State and local government. One of the report’s findings was that 40% of State Executive Branch agencies had at least one legacy system as assessed by the agencies themselves.¹⁰ Because such systems constitute a heightened cybersecurity risk, the legislation established the Commission to help put the State on a modernization path. But legacy systems create other challenges beyond cybersecurity risk, and modernization therefore serves other purposes.

Legacy “systems”—hardware and software—are systems that are outmoded or obsolete.¹¹ Legacy systems impose a variety of other costs on governments and the residents they serve. These include the tendency to fail under conditions exceeding their design, lack of flexibility to accommodate changing regulatory requirements, increased maintenance costs, and staffing challenges.¹² The latter was highlighted during COVID with urgent calls in some states for COBOL programmers.¹³

⁷ Office of the Governor (8/16/2023). Governor Moore announces major action to rebuild state government and modernize Maryland Department of Information Technology services and operations (Press Release).

<https://governor.maryland.gov/news/press/pages/governor-moore-announces-major-action-to-rebuild-state-government-and-modernize-maryland-department-of-information-technolo.aspx>

⁸ The Commission was established by SB 811/HB 1205 (2022 Session).

<https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/HB1205/?ys=2022rs>. The other two bills were SB 812/HB 1346 (2022 Session) at <https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/SB0812/?ys=2022rs>; and SB 754/HB 1202 (2022 Session) at

<https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/SB0754/?ys=2022rs>

⁹ The Maryland Cyber Security Council Ad Hoc Committee on State and Local Government Cybersecurity (2021). Maryland state and local government: analysis and recommendations.

<https://www.umgc.edu/content/dam/umgc/documents/md-cybersecurity-council/maryland-state-and-local-government-cybersecurity-analysis-and-recommendations.pdf>

¹⁰ See Note 9, p. 6. The challenge of legacy systems in state government is a national one. See National Association of State CIOs and VMware (2022). Application modernization is an imperative. (p. 14).

<https://www.nascio.org/resource-center/resources/application-modernization/>

¹¹ This is the definition in federal statute. See Modernizing Government Technology (MGT). National Defense Authorization Act for Fiscal Year 2018, Pub. L. No. 115-91, Div. A, Title X, Subtitle G (2017).

<https://www.congress.gov/115/plaws/publ91/PLAW-115publ91.pdf>. See also Charette, Robert (2020, August 28). Inside the hidden world of legacy systems. IEEE Spectrum. <https://spectrum.ieee.org/inside-hidden-world-legacy-it-systems>

¹² Government Accounting Office (2021, April 27). Information technology: Agencies need to develop modernization plans for critical legacy systems. (GAO 21-524T) (Pages 2-3). <https://www.gao.gov/assets/gao-21-524t.pdf>

¹³ Kelly, Makena (2020, April 14). Unemployment checks are being held up by a coding language almost nobody knows. The Verge. <https://www.theverge.com/2020/4/14/21219561/coronavirus-pandemic-unemployment-systems->

Maryland State government owns its share of this technical debt some of which has been exposed in recent years. During COVID, the Maryland Department of Health suffered a major cyber attack that disrupted critical services for an extended period of time.¹⁴ It was reported that increased SNAP caseload caused by the pandemic led to system breakdowns at the Department of Human Services.¹⁵ In March of this year, the Office of the Comptroller General announced that an outage of its aging system temporarily precluded the Office from processing tax returns and refunds.¹⁶ The Maryland Department of Health and the Maryland Department of Labor relies on COBOL mainframes, with an exposure to the shortage of programmers who know the language.¹⁷

Modernization can produce greater security and result in systems that are more reliable and easier to staff and maintain. But modernization should do more. It is an opportunity to transform how the business of government is done, reduce costs, and provide more convenient ways for residents to receive benefits and services.

While modernization may be as straightforward as replacing an older system with a newer, faster, more secure system that does the same thing, such a decision should be a conclusion, not a starting premise. Modernization is an opportunity to rethink business processes within and across departments, evaluate IT investments from a portfolio perspective, and explore where efficiencies and cost reductions can be achieved. “We’re trying to focus not just on legacy modernization”, the Michigan CIO told the Commission, “but also on how we’re transforming the way we’re conducting or delivering IT services.”¹⁸

This perspective naturally leads to a discussion about what applications and other infrastructure can be consolidated across departments and agencies and provided centrally. To do this properly requires strong technology governance. As the Connecticut CIO stated, “Most of what we’ve done within the agencies since 2021, we’ve been centralizing and so we call that process optimization. Because it’s not necessarily about how we’re organized. It’s more about what we’re doing with technology and how we’re changing, how we deliver it”.¹⁹ Here, of course, there is a

[cobol-legacy-software-infrastructure](#). But see also Miller, Ben (2021, March). An apology to COBOL: Maybe old technology isn’t the real problem. Government Technology. <https://www.govtech.com/opinion/an-apology-to-cobol-maybe-old-technology-isnt-the-real-problem.html>

¹⁴ Miller, Haillie (2022, January 12). Maryland Department of Health confirms ransomware attack crippled its systems last month. <https://www.baltimoresun.com/2022/01/12/maryland-department-of-health-confirms-ransomware-attack-crippled-its-systems-last-month/>

¹⁵ Kurtz, Josh (2022, September 21). Md officials: SNAP helped thousands during the pandemic, but challenges navigating the system remain. Maryland Matters. <https://www.marylandmatters.org/2022/09/21/md-officials-snap-helped-thousands-during-pandemic-but-challenges-navigating-system-remain/>

¹⁶ Sears, Brian (2023, March 9). Aging software failure hobbles processing of tax returns, refunds. Maryland Matters. <https://www.marylandmatters.org/2023/03/09/comptroller-delay-taxes-refund/>. This has resulted in a modernization planning effort. See Gaskill, Hanna (2023, April 26). New Maryland comptroller pushes for tax system modernization. Government Technology (originally published in the Baltimore Sun). <https://www.govtech.com/gov-experience/new-maryland-comptroller-pushes-for-tax-system-modernization>

¹⁷ Baca, Nathan (2020, May 13). This 60-year old programming language could be delaying your unemployment check. <https://www.wusa9.com/article/news/health/coronavirus/60-year-old-computer-language-could-be-delaying-your-unemployment-benefits-check/65-b380fc1b-4a97-41c7-bc82-69104745f71a>

¹⁸ Presentation by Mark Raymond, Connecticut CIO, on September 27, 2022 at 14-15 in the transcript.

¹⁹ Presentation by Laura Clark, Michigan CIO, on October 16, 2022, at 145-146 in the transcript.

balance. As the Utah CIO noted, “you're never going to get away from needing to take care of the agency specific needs because you have to focus on those to deliver value, too. So you've got to get that balance right of centralization versus decentralization”.²⁰

Finally, as an additional task, modernization is necessary to carry forward the promise of digital government. This is certainly true in Maryland.²¹ While the transformation of internal business processes and new systems may be necessary, it is not sufficient for the provision of responsive public services. To realize the promise of digital government, services must be designed around the residents and organizations accessing State services. The Michigan CIO captured this point well: “We have a requirement at the State of Michigan, where you have to look at your business processes and do a lean process improvement before you do IT and that was a very good conversation between the business and IT....But it didn't bring in the end user into those conversations. So a lot of what we were doing was still designing digital processes that didn't make sense for the person that actually was trying to get a service from the State of Michigan.”²²

Placing service recipients at the center requires thinking about all the touchpoints relevant to them. When viewed from the standpoint of interrelated needs, the separation of programs, systems, and access points can constitute a barrier to effective service. The Utah CIO captured this challenge in his remarks to the Commission:

Take the user journey of some of our most fragile members of our society....[T]ake the single mother. Let's say she's got a couple of kids. She's working part time, but she's not able to make ends meet in terms of making rent or having enough food or money for diapers or formula. And so we have social services that can help her....Say she finds out about the...WIC program. She goes and fills out all the application process for that, and then she gets to the end. It's like great. But then, what about SNAP or child health child health insurance, or you know... renters assistance, or some of these other things. Right now, she has to start over at the bottom of a mountain of bureaucratic paperwork, looking up.....That application process can be so cumbersome that she never gets through it so we never get her the help because she just can't get through all of this application process.²³

The question is how to get the end-user input needed for this aspect of modernization. The Connecticut CIO noted that the user journey does not come easy for agency staff precisely because they are programmatically organized. It does not “come naturally. They've spent long careers working along programmatic lines. They know very well what it is that they do. They don't often see what other touch points there are for the individuals”²⁴.

²⁰ Presentation by Alan Fuller, Utah CIO, on October 27, 2023, at 171-172 in the transcript.

²¹ See Note 7.

²² Laura Clark, Michigan CIO, at 153-155 in the transcript. See also comments by Mark Raymond, Connecticut CIO, at 31ff in the transcript.

²³ Alan Fuller, Utah CIO, at 195 – 198 in the transcript.

²⁴ Mark Raymond, Connecticut CIO, at 103 in the transcript.

The CIOs undertaking the modernization/transformation for their states pointed to ways of bringing the citizen perspective into the conversation. These include convening listening session with nonprofit groups advocating for or otherwise supporting different constituencies and building intercept points into websites to collect and analyze data on traffic, number of transactions, drops offs, etc.²⁵ But the feedback from the users itself is not a silver bullet. Support groups, for example, also tend to be defined along programmatic lines making it difficult for them to see “what different looks like”. A necessary ingredient for success by those responsible for modernization/transformation is thinking about benefits or services and how they are interrelated with respect to classes of recipients.²⁶

It is with an awareness of these different objectives of modernization that the Commission approached its work in its initial year. The resulting recommendations are discussed below. As noted in the Executive Summary, these are supported by the effort to understand best practices by consulting CIOs from other states and various other experts. While the verbatim record of these presentations can be found on the Commission’s website, a summary of the information shared by the state CIOs in particular has been provided in Appendix A to this report.

Recommendations and Supporting Discussion

Recommendation 1 (Funding). That the State establish a dedicated IT investment fund over and above DoIT’s annual operating budget to finance the replacement of legacy IT systems, process transformation, and effective digital government across the Executive Branch. As described below, decisions about how investments funds would be made by an IT Modernization Investment Board (Recommendation 2).

- *Recommendation 1.1. That the IT investment fund should eventually replace the Major IT Development Projects (MITDP) process.*
- *Recommendation 1.2. That DoIT should hire a consultant to complete the required list of legacy systems and prioritize the associated risk.*
- *Recommendation 1.3. That DoIT work with the agencies to develop a five-year projection of funding needs to modernize.*
- *Recommendation 1.4. That the IT investment fund should be bond-funded to the extent practicable.*
- *Recommendation 1.5. That there should be guardrails to ensure compliance with the Investment Fund process.*

Maryland’s MITDP process provides funds that are attached to specific projects approved as part of the normal capital budgeting process. While this varies from year to year, the average over the last 10 years (FY 2015 to FY 2024) has been approximately \$65.3 million year. With a high of \$116 million in FY 2023 and a low of \$21.2 million in FY 2015.²⁷ Some projects also receive federal funds, like MD THINK, and special funds, like FMIS. Not all agencies’ major IT projects

²⁵ See, for example, Mark Raymond, Connecticut CIO, at 77 in the transcript and Alan Fuller, Utah CIO, at 119ff in the transcript.

²⁶ Mark Raymond, Connecticut CIO, at 100-101 in the transcript.

²⁷ Dollar figures provided by DoIT.

are required to have DoIT oversight. The judiciary, legislature, and higher education institutions do not have DoIT oversight.

Michigan's funding model is similar to Maryland's. Its modernization fund varies from year to year and is tied to specific projects approved as part of the State's budget and appropriations process. In the current fiscal year, the Michigan CIO indicated that her state legislature had appropriated \$41 million for modernization.²⁸ Connecticut has established an enterprise modernization fund apart from its normal O&M budget but finances it differently. Dollars in that fund are attached to specific projects approved by the State's legislature. The fund, however, is capitalized through short-term bonds of five-year duration with the interest paid out of the State CIOs budget.²⁹ The state operates on a biennial budget cycle. Depending on the biennium, the figures for Connecticut's modernization fund have ranged from \$50 - \$85 million.

There are, however, drawbacks to modernizing in this way. Tying IT investments to the annual budget process results in funding ups and downs and makes modernization progress episodic.³⁰ To address these problems, the Commission's recommendation is modelled on the federal Technology Management Fund (TMF). Congress established the TMF in 2017 through the Modernize Government Technology Act. The initial appropriation was \$170 million. This was followed by an additional \$1 billion in 2021 as part of the American Rescue Plan Act. The fund does not supplant modernization appropriations that departments or agencies may individually receive but constitutes an additional source of modernization funding.

As a source of modernization capital, the TMF is flexible and not tied to specific modernization projects approved by Congress. Which modernization projects are funded is determined by the evaluation of the fund's Modernization Investment Board chaired by the Federal CIO.³¹ The fund is structured like a bank and is intended in part to recapitalize itself. Investment awards are treated as loans which departments or agencies are expected to pay back in whole or in part from savings resulting from the investment. How much is to be repaid is based on savings that are estimated as part of the modernization proposal. This benefit/cost analysis is an important data point in the Board's evaluation of the proposal. The GAO has noted some teething issues with the TMF, but these are being addressed.³² Currently, the TMF has 48 investments across 27 different federal agencies totaling \$780 million.³³

Minnesota is an example of a state that has implemented a technology modernization fund similar to the federal model.³⁴ The fund was capitalized in 2023 with a \$40 million appropriation. It is not tied to particular projects approved by the state legislature but intended to be a flexible

²⁸ Laura Clark, Michigan CIO, at 59ff in the transcript.

²⁹ Mark Raymond, Connecticut CIO, at 150ff in the transcript.

³⁰ Presentation by Dan Wolf, Director, Alliance for Digital Innovation, on November 30, 2023, at 33ff in the transcript.

³¹ For an overview of the process, see Technology Modernization Fund at <https://tmf.cio.gov/process/>

³² See Government Account Office (2021, December 10). Technology Modernization Fund: Implementation of Recommendations Can Improve Fee Collection and Proposal Cost Estimates (GAO-22-105117).

<https://www.gao.gov/products/gao-22-105117> See also in this connection, Dan Wolf, Director, Alliance for Digital Innovation, at 86ff in the transcript.

³³ Dan Wolf, Director, Alliance for Digital Innovation, at 63 in the transcript.

³⁴ See Minnesota IT Services Technology Modernization Fund at <https://mn.gov/mnit/about-mnit/tmf/>

source of financing for modernization within a broad scope defined in law.³⁵ The process is designed for project proposals to come from the departments and agencies, but the investment criteria drive certain priorities.³⁶ The initial emphasis of the fund is on modernization projects of \$1 million or less that can be completed within one year. The Minnesota Department of IT's Modernization Steering Team both approves investment requests and monitors the implementation of the modernization plan. Unlike the federal model, the fund is not structured to capture savings as a result of investments; funds are awards and not loans. Other states have taken steps toward technology modernization funds.³⁷

State CIOs provided examples of returns on investments that resulted from modernization. The Utah CIO noted that their modernization has resulted in the consolidation of some systems resulting in \$20 million per year in audited savings.³⁸ Part of those savings was due to a reduction of 200 staff that came with the transition to an enterprise email system from separate, agency-serviced email systems.³⁹ The Connecticut CIO noted that economies have resulted from the extension of digital government. "The fact of the matter is, if I've got 60% of my transactions that are coming online, and I was serving a hundred percent of folks in the office....I don't need that [office] space to be doing that anymore."⁴⁰

Recommendation 2 (Governance). That the General Assembly establish a Maryland Technology Investment Board of at least five and no more than seven members. This board should be chaired by the DoIT Secretary and include multi-agency representation, a public representative appointed by the Governor, and other members as appropriate.

- *Recommendation 2.1. That the board shall have the authority to evaluate and approve IT modernization investment proposals for the Executive Branch to be financed by the Maryland Technology Management Fund and shall monitor the implementation of financed projects.*
- *Recommendation 2.2. That DoIT ensure there is an Enterprise Architecture (EA) and standards to guide modernization across the Executive Branch and that all modernization be consistent with this EA and those standards.*

The first task of the board would be the development and approval of guiding policies, roles, responsibilities, to provide a role for agency-level boards where appropriate, and to commit to an investment model against which it can mature its modernization governance over time. The corollary to this recommendation is that the General Assembly fund the staff and systems needed to support a strong governance regime. This board would take over the planning and budgeting

³⁵ Dan Wolf, Director of the Alliance for Digital Innovation, at 165ff in the transcript. "They have a budget language [in Minnesota] that established their targeted application modernization program...That was a priority of the Governor's office to modernize targeted applications through Fiscal Year 28 with a priority on applications that improve user experiences with digital services, enable service delivery transformation, and quote systematically address aging technology. So it was very broad..."

³⁶ See Note 34. These priorities or criteria are: "improves the customer experience, provides digital service delivery, addresses a security risk, modernizes a business process, improves resiliency, operational efficiency, and/or risk reduction; aligns to the One Minnesota Plan, moves to a shared or market-based technology solution, or leverages AI or automation".

³⁷ See Appendix B.

³⁸ Alan Fuller, Utah CIO, at 27 ff in the transcript.

³⁹ Alan Fuller, Utah CIO, at 33ff in the transcript.

⁴⁰ Mark Raymond, Connecticut CIO, at 234 ff in the transcript.

functions that are now placed in statute for the Modernize Maryland Oversight Commission, which changes are addressed in Recommendation 3 below.

As an approach, the GAO's IT investment management model (ITIM) may be particularly useful to the State Executive Branch as it has been developed in consultation with subject matter experts and designed specifically for government departments and agencies.⁴¹ A key virtue of GAO's model is that it is a maturity model, recognizing that governance is a journey from an awareness of need to highly developed and supported IT investment processes. The initial milestone in the maturation journey is the establishment of a board. This is foundational to subsequent milestones that include the development of objective and repeatable IT investment and management processes and defined criteria to inform investment recommendations and the movement from disciplined project-based decisions to investment decisions that take a portfolio-based approach.

States have implemented boards to guide their modernization investments. These are shaped by their state executive branch context and particular budget processes. In Michigan, for example, the IT investment board is chaired by the State CIO with multi-departmental representation spanning the executive branch: health and human services, the state police, licensing and regulation, environmental affairs, the state budget office, treasury, and procurement, among others. Annually, Michigan Executive Branch agencies make IT investment requests to the board which are evaluated according to their value in advancing the broad IT strategic goals of the State. These goals are effective government, efficient IT management, improved customer or workforce experience, and security and privacy. The evaluation criteria for each goal have been articulated with point values assigned to each in order to aid board evaluation. The recommendations by the board based on this information are considered by the governor's office in its budget proposal for IT investments in the next fiscal year. The Department of IT oversees the implementation of approved investments and requires agencies to show auditable benefits realized up to three years after project completion. This information is tracked by the Department of Information Technology and is included in its annual reports to the legislature.⁴²

Recommendation 3 (Advice and Oversight). That the charter, membership, and authorities of the Modernize Maryland Oversight Commission be amended to establish the Commission as an advisory board with the purpose of identifying best modernization practices, formulating recommendations for the State Executive Branch and the General Assembly, and providing transparency about the progress in addressing modernization objectives across the Executive Branch.

- *Recommendation 3.1. That the MITDP report be modified to summarize and publicize modernization progress of the Executive Branch.*
- *Recommendation 3.2. That the Commission include a member from the Office of Legislative Audits.*
- *Recommendation 3.3. That the Commission be appropriately staffed.*

⁴¹ See Note 3, GAO-04-394G. See also Government Accounting Office (2014, December). Information technology: HUD can take additional actions to Improve its governance. (GAO-15-56). <https://www.gao.gov/products/gao-15-56>

⁴² Laura Clark, Michigan CIO, at 63 ff in the transcript. See also Mark Raymond, Connecticut CIO, at 168ff in the transcript and Nebraska's IT Commission at <https://nitc.nebraska.gov/commission/about.html>.

This recommendation of the Commission is based on the view that the active planning and budgeting described in the State Finance & Procurement § 3.5-315 should be done by DoIT in conjunction with Executive Branch agencies. As recalibrated, the Commission’s role would be to continue to gather modernization best practices, making recommendations, and tracking both the material progress in modernization across the Executive Branch and the maturity of DoIT’s policies and processes governing modernization.

An example of how such tracking might be done is the federal “FITARA” scorecard.⁴³ The scorecard is used to grade covered federal agencies on their progress in realizing certain statutory requirements and other important IT objectives.⁴⁴ The scorecard is compiled twice each year by the staff of the US House Committee on Oversight and Accountability. There have been sixteen iterations of the scorecard to date, and the GAO has characterized it as an effective oversight tool.⁴⁵

Recommendation 4 (Planning, Management, and IT Organization). Modernization investments should certainly be consistent with the State’s IT strategic goals but where possible seek ways of delivering value early through incremental improvements.

- *Recommendation 4.1. That DoIT produce a new strategic plan by December 1, 2024, with goals that are SMART.⁴⁶*
- *Recommendation 4.2. That the DoIT IT Council serve as a coordinating body between the Secretary and agency CIOs.*
- *Recommendation 4.3. That DoIT develop a strategy for centralization of IT management across the Executive Branch under DoIT by considering various models seen by the Commission, such as leaving local IT budgets and staff with the agencies while changing IT reporting lines and carving out certain units of State government as exceptions from*

⁴³ This is an acronym for Federal Information Technology Acquisition Reform Act of 2014 (FITARA) which was enacted to achieve a number of objectives, including better security and cost savings from IT investments by federal agencies. The so-called ‘FITARA’ scorecard has evolved to include requirements of other legislation. These are the Federal Information Security Modernization Act of 2014 (FISMA) Making Electronic Government Accountable By Yielding Tangible Efficiencies Act of 2016 (MEGABYTE) and Modernizing Government Technology (MGT) Act. See Government Accounting Office (2022, January 20). Information Technology: Biannual scorecards have evolved and served as effective oversight tools. (GAO-22-105659)

<https://www.gao.gov/products/gao-22-105659>. See also Government Accounting Office. What is FITARA. <https://handbook.tts.gsa.gov/general-information-and-resources/tech-policies/fitara/>

⁴⁴ These objectives are incremental development, cybersecurity risk management, portfolio review savings, data center optimization, software licensing, reinvesting savings into further modernization, cybersecurity, CIO direct reporting to agency or department head, telecommunications services transition. See Note 43, GAO-22-105659. (pp. 5-6)

⁴⁵ The latest scorecard can be found at The Federal IT Dashboard. <https://www.itdashboard.gov> and the more easily digestible MeriTalk (2023, September). FITARA Dashboard. <https://fitara.meritalk.com/>.

⁴⁶ SMART is an acronym for specific, measurable, achievable, relevant, and time-bound. Recommendations 4.1 and 4.3 are advisory to the DoIT Secretary under Maryland Code Ann., State Finance and Procurement Article § 3.5-303(a)(4)(i). “The Secretary is responsible for carrying out the following duties... (4) developing and maintaining a statewide information technology master plan that will: (i) centralize the management and direction of information technology policy within the Executive Branch of State government under the control of the Department..” The current plan can be found here: <https://doit.maryland.gov/Publications/Information-Technology-Master-Plan-2020-2023.pdf>.

centralization due to limitations of federal law, complexity of operations, or other considerations.

All of the states presenting to the Commission had IT strategic plans that guided their modernization efforts and anchored their modernization investment criteria. But state CIOs cautioned against overplanning and allowing room for quick wins and incrementalism in pursuing strategic goals. For example, in response to a Commission question about strategic planning, the Connecticut CIO responded that “We had enough evidence to know what is the right thing to do, and we bring people along to the [modernization] concept. But we did not do this massive strategic [modernization] plan because it would have been outdated by the time we finished with it.”⁴⁷ Similarly, the Michigan CIO referred to “perpetual modernization”, framing it less as a strategic planning process and “more from an ongoing asset management approach similar to what you would think from a transportation department or infrastructure legacy, support, and asset management” mindset.⁴⁸ Several themes stood out in this connection in the presentations to the Commission.

As part of their modernization, the state CIOs providing information to the Commission mentioned large modernization projects that they had undertaken or were in the process of completing. These included Utah (Medicaid system, State payroll system, Executive Branch human capital management system),⁴⁹ Connecticut (Medicaid system),⁵⁰ Michigan (Executive Branch budget and finance ERP, Treasury Department tax system, health and human services systems),⁵¹ and Georgia (transition from a large state-owned and state-operated data center to AWS, Oracle, and Azure cloud environments).⁵²

Similarly, Maryland is updating its tax system, FEMIS. However this is just the tip of the iceberg. The legacy servers that are currently maintained by the Comptroller’s office also host 90+ other applications used across the state. Given that the Comptroller’s office will be entirely in the cloud by 2028 – and will cease maintaining these servers – the state must chart a strategic path for the other agencies to migrate to the cloud over the next 3-5 years.

At the same time, CIOs cautioned against the “big bang” approach to modernization in favor of incremental or successive improvements even with large projects. The Connecticut CIO noted, for example, that “Our health and human service integrated eligibility system we started with, you know, primarily Medicaid...And then we've added other agencies to it that aren't necessarily part of our department of social services. But deliver eligibility services and grants. We're just starting along that way.”⁵³ Similarly, the Georgia Technology Authority (GTA), responsive to an Executive Order, undertook a major infrastructure project to move from a state-owned and state-operated data center to commercial cloud services. However, as a result of various

⁴⁷ Mark Raymond, Connecticut CIO, at 132 in the transcript.

⁴⁸ Laura Clark, Michigan CIO, at 148 in the transcript.

⁴⁹ Alan Fuller, Utah CIO, at 47 and 111 in the transcript.

⁵⁰ Mark Raymond, Connecticut CIO, at 70 in the transcript.

⁵¹ Laura Clark, Michigan CIO, at 54 – 57 in the transcript.

⁵² Presentation by Erica Keller and Brent Palladino, Georgia Technology Authority, on November 15, 2023, at 40ff in the transcript.

⁵³ Mark Raymond, Connecticut CIO, at 71 in the transcript.

constraints GTA implemented this as a ‘lift and shift’—moving applications as they were—leaving the process of optimizing applications until later.⁵⁴

With respect to investments to advance digital government specifically, CIOs advised focusing on delivering value early and successively. “Rather than creating a strategy binder that will sit on a shelf, this is all about getting started through small steps. Finding and fixing initial challenges will set you on the path to modernization with the goal of achieving "optimal, not perfect" performance.”⁵⁵ The Utah CIO illustrated this process:

[The] idea here is, it's a marathon of small changes...So...the DMV has a website where people can come in and make these appointments so they can don't have to wait in line. [But] people couldn't find on the website how to make their appointment. And through our Qualtrics feedback that we're gettingWe can see these complaints. ‘I can't see how to how to make my appointment’. So the DMV looked at the data, and they were able to....make it [the appointment link] more prominent with a bigger font. And we could see in the data satisfaction scores go up and complaints go down...⁵⁶

This is consistent with the “Lean” approach recommended by the Nebraska CIO. He advised that improving digital government should not automatically start with a discussion of backend legacy systems. Instead, it should start at the front end, with what the resident or organization sees, to determine what the problems are and if changes to the interface can solve them. This produces value more quickly while husbanding investment funds for legacy systems that really must be replaced.

I advise our teams to begin by examining the external and internal customer touchpoints – the front end portal. Taking a Lean approach allows for quick wins and visible value. When updating business processes and delivering enhanced customer-facing portals, Lean can serve product functionality. Lean limits back-end changes to legacy systems except for those that are necessary to support the portal and improve the process.⁵⁷

A key question for the Commission was how to ensure that modernization moves forward across the State Executive Branch. This is a question because of the federated nature of the Executive Branch in Maryland with agencies having their own IT budgets and CIOs. The availability of financing through a modernization fund would be an incentive for agencies to pursue modernization initiatives. Moreover, the commitment of the Governor to modernization and digital government is a significant factor. Still, centralizing IT management under the State Department of Information Technology—as three of the presenting states had done (Utah, Michigan, and to some extent, Nebraska)—would likely more easily realize consolidation of

⁵⁴ Erica Keller, Georgia Technology Authority, at 73ff in the transcript.

⁵⁵ National Association of State CIOs (2022). Application modernization is an imperative for state governments. (p. 29) <https://www.nascio.org/resource-center/resources/application-modernization/>

⁵⁶ Alan Fuller, Utah CIO, at 117 – 121 in the transcript.

⁵⁷ Ed Toner, Nebraska CIO, Platform Modernization, CIO Blog at <https://cio.nebraska.gov/blog/2019/03/modernization.html>

applications and IT cost reductions. It is for this reason, that the Commission recommends that DoIT produce a plan for IT centralization akin to the current requirement for cybersecurity across the Executive Branch.⁵⁸

Recommendation 5 (Procurement). That IT procurements of \$2 million or less be exempt from Board of Public Works approval.

- *Recommendation 5.1. That the \$2 million cap be adjusted annually to pace with inflation.*
- *Recommendation 5.2. That with a view to more far-reaching reform, the State engage a contractor to conduct a comprehensive, data-driven review of its procurement processes to recommend changes to produce a more agile procurement regime to support IT modernization and other major State procurements.*

There is a direct relationship between the level of technical debt and the importance of procurement on the path to modernization. In most states, the technical debt is high. A recent NASCIO study notes, for example, that the typical state has more than a thousand applications that run on its infrastructure and provide critical services for the agencies and the public. Yet almost half of State CIOs indicate that a majority of their applications are legacy systems.⁵⁹ For larger IT projects, whether for applications or infrastructure, the pace of modernization is greatly impacted by the pace of procurement.

From presenters, the Commission heard about challenges that are common to state government procurements:

- Procurement laws and regulations written to buy goods instead of services
- Overly prescriptive RFPs
- Lack of flexibility and agility, long time to award contract (18 months to 2 years)
- Procurement process focuses on lowest cost vs. best value solution, and cybersecurity an afterthought⁶⁰

The Commission also heard different recommendations for improving procurement. These included:

- Removing unlimited liability
- Introducing more flexible terms and conditions
- Not requiring performance bonds from vendors
- Leveraging enterprise architecture
- Building cybersecurity in from the start
- Improving the negotiations process⁶¹

With a focus on process, it was recommended that a procurement start with a pre-solicitation meeting with potential vendors to discuss a one-page statement about the problem the state wants to solve; that evaluation of proposals at the formal stage be more dynamic and less robotic,

⁵⁸ See SB 812/HB 1346 (2022 Session) at https://mgaleg.maryland.gov/2022RS/chapters_noln/Ch_242_sb0812E.pdf

⁵⁹ See National Association of State CIOs (NASCIO) and VMware (2022). Application modernization is an imperative. (p. 14). <https://www.nascio.org/resource-center/resources/application-modernization/>

⁶⁰ Presentation by Meredith Ward, Deputy Director, NASCIO, on November 6, 2023, at 34ff in the transcript

⁶¹ See previous note at 46ff in the transcript.

negotiations be agile, and over-governance of teaming agreements and subcontracts be avoided.⁶²

The Commission has been advised that Maryland has responded to some of these issues. The State has eliminated unlimited liability except for a very narrow category of events, for example. Still the Commission believes more can be done. For a start, exempting procurements under \$2 million from BPW approval would allow many procurements to move more quickly. This ceiling, moreover, should be move with inflation. The Maryland Department of General Services (DGS) estimates that implementing this change would still allow the Board to review 93.8% of the money spent.⁶³

The more far-reaching recommendation is to assist the review process by the Procurement Improvement Council (PIC) that appears to be reconvening after a year's hiatus. The changes in policy and COMAR that the PIC working group has been discussing work too much within the existing legal framework and do not offer the comprehensive review needed for effective procurement reform. The recommendation is to engage a comprehensive review by an outside entity to identify both needed systems and changes in processes to reduce the long timelines for many procurements.

Conclusion

The Commission's 20 recommendations are by statute advisory to the Secretary of the Department of Information Technology and the State Chief Information Security Officer. These cover modernization governance, funding, planning and management, and procurement. The Commission looks forward to continuing to contribute to Maryland's modernization effort in some form in the years ahead.

More Information about the Report

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⁶² Presentation by David Gragan, Chief Operating Officer, NASPO, on November 6, 2023, at 100ff in the transcript.

⁶³ Data provided by the Acting Chief Procurement Officer at DGS.

APPENDIX A
SUMMARY OF STATE CIO PRESENTATIONS
TO THE MODERNIZE MARYLAND OVERSIGHT COMMISSION

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Michigan CIO

a. Modernization efforts

In Michigan, Information Technology (IT) is completely centralized under the Department of Technology, Management, and Budget (DTMB). DTMB has an annual budget of \$1.8 billion with about 2,900 State employees under its jurisdiction. DTMB also provides services and supports twenty State agencies. DTMB centralized in 2001, but it took the State around ten to fifteen years to get people on board with the centralized culture. This culture is based on the following four goals:

- Effective government.
- Efficient IT management.
- Customer and workforce experience.
- Security and privacy.

Michigan uses a set of evaluation criteria based upon DTMB's four modernization goals to prioritize modernization projects. As to effective government, the Board of Michigan's IT Investment Fund (ITIF) (see Section c.), will score a modernization proposal higher if it creates opportunities for innovation and operational effectiveness that align with agency needs. The Board will score a proposal higher under efficient IT management if it provides for accountable cost reduction and transparent decision-making. As to customer and workforce experience, the Board's analysis is focused entirely on end users' access to services. Lastly, a proposal will be scored higher if it identifies and mitigates security risks while protecting privacy.

The Board has also identified a few "bonus" areas in their evaluation criteria in modernization areas they are trying to kick-start from an enterprise level. These bonus areas include Human Centered Design (HCD), organizational change management, DevSecOps, and Cloud Native development.

The Human Centered Design approach is all about prioritizing the end user and how users are impacted when using State services. To be successful, this approach requires communication and outreach with the customer at the onset to learn about the barriers users encounter when trying to conduct business with Michigan, and then designing the new systems to function better for the user.

One of Michigan's main priorities under the umbrella of organizational change management is to move the State's systems to "Zero Trust Architecture." Zero Trust means that an organization has eliminated implicit trust once a user is inside a system, instead continuously validating at every stage of a digital interaction. The approach to this goal must take into consideration Michigan's human centered design approach in that Michigan is also trying to avoid any sort of friction that State employees or customers would encounter with Zero Trust's additional steps.

DevSecOps stands for development, security, and operations. This is the practice of integrating security testing at every stage of the software development process. Michigan is trying to get into a more streamlined delivery approach so DTMB can develop and push

software into production quicker. For example, DTMB is trying to build smaller snippets of code and more service based applications so they can streamline the verification, checking, and deployment.

As to Cloud Native development or Cloud Smart adoption, Michigan previously owned and operated their own cloud infrastructure known as Next Generation Digital Infrastructure (NGDI). Operating its own cloud required DTMB to lift and shift all of its applications onto NGDI, which was a long and tedious process. Michigan is now trying to change to a multi-cloud approach, which is different from the old way of developing applications. Michigan has actually completed a formal Request for Proposal (RFP) and awarded infrastructure to three different cloud providers. Michigan is trying to avoid another lift and shift situation because it does not give DTMB scalability or the flexibility to address consumer evolving needs. For example, the tax system has a very high volume from January to mid-May. The new cloud system would allow Michigan to scale up for this time period, and then roll the infrastructure back once the volume reduces again.

One of the hurdles Michigan has faced is cultivating a technologically fluent workforce. As to workers with multi-cloud expertise, they have found success in taking the time and money to invest in its existing staff and making use of resources like training programs. Michigan has also brought in consulting firms to fill the workforce gaps when needed.

Michigan has also prioritized artificial intelligence (AI) as an area for development. Specifically, DTMB wants to look at how AI is going to impact the way Michigan conducts its business in the future, how it could assist State employees in their day-to-day, as well as how the public interacts with AI services.

b. Procurement

Procurement is centralized in Michigan, falling on the management and budget side of DTMB's activities. Annually, DTMB spends about \$2.5 billion on procurement.

c. Funding

The DTMB is funded through various ways. As of 2023, the Department gets around \$7.2 million from federal revenue and \$606.6 million from its general fund. DTMB is primarily funded through cost recovery. Each of the State agencies are given money every year through the budget process and are then required to pay a certain amount of that sum back to DTMB. In addition to this billback model, DTMB does cost recovery for time and materials, as well as rated services. The DTMB also makes use of inner department grants (IDGs).

Michigan is also unique in that it has the ITIF. This fund is directly appropriated into the DTMB budget rather than given directly to the State agencies. This fund is designed to support IT projects that modernize legacy IT systems and use technology to advance transformative change in service delivery to residents and businesses across the State.

The ITIF has an annual, ongoing operational budget of \$35 million, but the DTMB asks for additional capital on top of the annual baseline each year. For example, DTMB asked for additional capital of \$41 million for the coming year. Michigan has found great success using

this fund, as they previously completed projects for State agencies using general funds and found it difficult to consistently find innovation money.

Because the ITIF is directly appropriated into the DTMB budget, additional governance was deemed necessary to ensure that the funds were being spent judiciously and for the correct purposes. Governance for ITIF is headed by a multi-agency board, which is led by the Chief Information Officer (CIO).

As to process, State agencies seeking funding from ITIF for modernization projects put together a budget and proposal request. The agency will then present its proposal to the Board. The Board evaluates proposals on a 100 point scale using the evaluation criteria discussed above. The Board will then prioritize the proposals and set forth their recommendations to the State budget. From here, the DTMB director will look at the Board's recommendations, and if the Director concurs, they will take the recommendations to the Governor's budget and the Governor will assess the proposals. If the Governor decides that the proposals align with her priorities and are a good investment for Michigan, she will take the recommendations to the State Legislature as part of her annual budget process. Once the proposals are in front of the Legislature, the CIO, and the Department Director will present the recommendations to the Appropriations Committee. The Committee will discuss the recommendations until the final budget is approved for the fiscal year.

Once budgets are approved and the funding is actually provided to the requesting State agency, the Board implements a rigorous project management oversight process. Recipients of ITIF funds have to submit specific reports which include benefits realization. This means recipients have to outline what they are expecting to accomplish with the funding and then the Board works with them to monitor whether they actually realize those benefits. This process can take up to three years past the implementation of a new system to ensure that benefits are being realized and the money is being spent appropriately.

On top of oversight, the Board works hand in hand on the implementation of modernization projects. For example, members may actually rewrite code or work alongside the system integrator to build out the new system.

Utah CIO

a. Modernization efforts

Utah operated a federated IT model up until 2006, when it centralized all of its IT services into a single Division of Technology Services (DTS). Utah also centralized all of the State's data centers into two main centers: one main center and a secondary center for failover and network redundancy. Takeaways from moving from a federated model to a centralized model included having strong leadership and incentivizing people with the benefits of such a move, such as how much money it will save taxpayers. It is estimated that Utah saved \$20 million from centralization.

Utah's DTS is a full service organization that does everything from application development and support; cybersecurity; state network and Wi-Fi; data centers; cloud hosting; help desk support; computer support; mapping GIS services; and other services. DTS serves all of

Utah's large executive branch agencies like its Health and Human Services, but it does not serve State universities, K-12, or the State Legislature.

Utah has identified four main modernization goals for the State:

- Deliver first class customer service digitally
- Improve employee retention drive
- Find the best investment for Utah's resources
- Identify and explore emerging innovative technologies

Utah's modernization efforts are centered around application improvements, which includes moving applications to the cloud and upgrading technical debt. Technical debt means Utah has software running in older, outdated types of technology. Utah has struggled with funding to modernize its applications. To overcome this hardship, Utah has adopted a modernization strategy where it is focusing on making its applications easier to support, integrate, update, enhance, and to lower the total cost of ownership in order to free up resources to work on resolving this technical debt.

Utah has employed an evaluation criterion for choosing which applications to prioritize in its modernization efforts. Utah has based this methodology on the acronym TIME, which stands for tolerate, invest, migrate, or eliminate. Accordingly, the criteria is broken up into three categories:

- Technical fitness, or how up to date the application is and how well the technology meets its needs
- Business fitness, or how well the application is serving the needs of the business
- Cost fitness, how expensive the application is relative to the services the application is meant to provide

DTS will then go through each application in its portfolio and grade the applications on this scale. If an application is in a lower quadrant of the scale, such as when an application is old and outdated or is not a good business fit, those are the applications DTS wants to eliminate. If an application has high technical fitness but is not meeting the business needs, then DTS will tolerate the application, but focus on how it can improve the application's functionality to meet the business needs. DTS is currently prioritizing those applications that are high in technical fitness and business fitness.

b. Procurement

When Utah centralized its IT services, the Legislature passed a statute mandating that all IT procurement must be approved by the CIO. The CIO's goal in this role is to be strategic about the way Utah is buying and negotiating with vendors and to take advantage of economies of scales.

As to the procurement process, the CIO collaborates with the State's purchasing office to make a decision. Generally, Utah uses the National Association of State Procurement Officials (NASPO) contracts for procurement. This means that if an agency wants to buy something through a NASPO contract, the State does not have to go through the formal RFP process, saving Utah time and money. Sometimes procurement still has to go through the

RFP process, when Utah is contracting for a larger, more complex project with a lot of different vendors involved. Utah also has an approved purchase list, which means that a State agency seeking to purchase something from the approved list does not have to get approval from the CIO, rather they just need to go through their own internal approvals, streamlining the process.

c. Funding

While Utah centralized its IT services, it did not centralize the funds. Funding primarily goes to State agencies and DTS then bills the agencies for its services. DTS has a series of rates, which includes a rate sheet with specific prices for the corresponding services DTS offers. A Rate Board oversees the rate process and approves the set prices. The Board is made up of members from the agencies DTS serves.

Utah has found it difficult to fund innovation under its current funding model because agencies are reluctant to pay for a service that has not been developed yet. Accordingly, for innovation projects DTS is often forced to go directly to the State Legislature to obtain funding.

As to how Utah funds its modernization efforts, the State relies on a few different sources. Firstly, State agencies can directly go the Legislature and get State general funds. For example, Utah's correctional facilities were able to get funding directly from the Legislature to upgrade their electronic health records for inmates. Utah also relies on funding from the federal government, as the State has been able to upgrade and modernize its health and human services system using American Rescue Plan Act funding. Lastly, Utah relies on a mix of general funding for the initial implementation of a new system and then will return to billing the individual State agencies for ongoing costs and maintenance.

Connecticut CIO

a. Modernization efforts

Connecticut has identified four high-end priorities for its modernization efforts. The first priority is digital governance, meaning lifting all aspects of government services and responsibilities and bringing them online. Connecticut is very focused on improving the user experience. Accordingly, almost everything Connecticut is doing from a modernization perspective is from the lens of what is the user experience and how the State can better serve the public.

Some of the strategies Connecticut has successfully employed to improve the user experience is to prioritize connecting with users through surveys and research initiatives. The State has also focused on eliminating paper processes to make transactions easier to use and more secure, which in turn, frees up people and resources for more complex issues needing attention. Connecticut has also employed a governance team and a product owner.

Connecticut's move to digital governance is not focused on ripping out and replacing all of its systems at the same time. Rather, the State is trying to focus on inviting people from the

different agencies it serves and starting a conversation about priorities and moving forward in a more holistic manner.

The second high-end priority is optimization. This includes the process of centralizing their IT services, as Connecticut previously had a decentralized form of technology governance. But optimization also includes a focus on what the State is currently doing with technology and how that can be changed to better deliver services. Connecticut realized that the technology was evolving much quicker than its decentralized structure could support. Accordingly, centralization is focused on bringing resources and people with specialized technical skills together to better serve the agencies. Centralization was difficult for Connecticut and the main takeaway was to take the time and effort with the people making the shift to build trust about the process.

The third priority is cybersecurity. Connecticut has made a big push to protect the data that is in its care. Connecticut currently has around \$13 million to raise the level of cybersecurity protection across the State government. The State is focusing on special funding, tools, and skill building, as well as getting a better understanding of what the cyber threat landscape looks like and what Connecticut can do to be more secure in this environment.

The last high-end priority for the State is AI. Connecticut passed an AI related law earlier this year setting out some minimum standards for the State to undertake in the executive branch. Connecticut has also created an AI working group to research ways in which to maximize this technology not only for the government, but also for businesses in Connecticut.

b. Procurement

Connecticut handles IT procurement through master contracts. This allows vendors to agree on basic terms at the outset of the business relationship, speeding up the negotiation process for future projects. The contracts are initially for three to four years with an option to extend on top of that. These contracts usually take about three to four months. Connecticut usually gets multiple bids on statements of work, which has allowed the State to respond quicker to emerging trends. Connecticut will also use multi-state collaborative contracts, including NASPO contracts. The State's last resort is the RFP process because it takes an average of eighteen months to complete and by that time, the technology has often changed.

c. Funding

One of the main ways that Connecticut funds its modernization efforts is through a capital program called capital investment. This Program started in 2012 and is currently at about \$65 million. The Program is solely for creating new or transformed capabilities which allows the State to be more flexible and take on projects quicker than if the funds were used for ongoing operations.

The Program is headed by a Committee that is chaired by the Secretary of the Office of Policy and Management in the Budget group and the Commissioner of Administrative Services. The Committee is made up of members from a number of representative agencies. Committee members are tasked with representing the broader community perspective, not just their own agency's interests.

The program is entirely capital funded through the sale of five year short bonds. The debt service comes out of the State's operating budget, but the fund is all capital. The overall amount that is available gets set and approved by the Legislature. The Committee then says how they would like to spend the funds and goes to the Bond Commission, who actually authorizes the sale of the bonds and the release of the funds. The State also relies on federal programs for funding.

Nebraska CIO (From provided blogs)

a. Modernization efforts

Nebraska is approaching modernization by focusing on incremental modernization of Applications, preferably via Commercial off-the-shelf (COTS) technology. Rather than trying to be the first in line chasing new innovation, the State will move cautiously to use solutions that have a history of demonstrated success while also leveraging or expanding the use of existing technologies. The State takes a methodical approach to modernization when it comes to legacy systems which involves source code organization, maintaining available documentation and code comments with easy-to-follow coding conventions. By maintaining current systems, this allows for functionality of old systems with integration of updated ones. In order to modernize, due diligence must be done so that the issues of the current platform do not reappear in the quest to eliminate the problems through new platforms. Code must be maintained and deployed properly throughout its lifecycle. Thus, to avoid the same issues reappearing if they are not resolved before replacement, rather than implementing a "rip and replace" strategy, it was recommended to take a Lean approach which limits back-end changes to legacy systems except for those that are necessary and improve the process. After each phase, a team continues evaluating and implementing further improvements until a fully functional interface with modern technological capabilities is built. Where possible, the State has moved applications to the cloud with minor changes. This strategy shows a hybrid approach, connecting some current on-prem systems with the newly introduced cloud to ensure a smooth conversion to modern technology only after committing the resources and operational oversight needed for stabilization and maintenance of the current systems.

Six key initiatives have been identified by the Nebraska IT Commission to achieve this incremental modernization, all of which promote the effective use of technology within the State of Nebraska, as well as education, economic development, local government, and health care. The first two, State Government IT Strategy and Nebraska Spatial Data Infrastructure (NESDI), address the need to take on an enterprise approach to IT in order to achieve the State's IT priorities of security, availability, and consolidation. The last four, Network Nebraska, Digital Education, Rural Broadband and Community IT Development, and Health, address using technology in education, economic development, and healthcare.

The State Government IT Strategy directs the Nebraska state government to develop and implement a comprehensive strategy for use of information technology. It will utilize a hybrid centralization model combining elements of both the centralized and decentralized IT management models to meet the top priorities of security, consolidation, and availability. The

Nebraska Spatial Data Infrastructure (NESDI) is designed to develop and foster an environment and infrastructure that optimizes the efficient use of geospatial technology, data, and services to address a wide variety of business and government challenges within the state that will enhance the economy, safety, environment, and quality of life for Nebraskans.

Network Nebraska interconnects several hundred education entities through a broadband, scalable telecommunications infrastructure that optimizes the quality of service to every public entity in the State of Nebraska, providing aggregated Internet and commercial peering services extending out to the furthest corners of the state. Digital Education involves the coordination and promotion of several major systems and applications statewide to promote the effective and efficient integration of technology into the instructional, learning, and administrative processes and to utilize technology to deliver enhanced digital educational opportunities to students at all levels throughout Nebraska. Rural Broadband and Community IT Development is an initiative to support efforts which accelerate the deployment of broadband services in unserved and underserved rural areas of the state and to address issues related to the adoption and utilization of broadband technologies. eHealth is designed to support the adoption of telehealth and health information exchange technologies in Nebraska and to support the use of health IT to help patients access their health information and better manage their care.

b. Procurement

Nebraska is taking a methodic approach by identifying the appropriate strategic partners and vendors to assist with their migration project. Rather than eliminating staff, the goal is to retrain existing positions to understand and enhance their skills by learning the cloud equivalent. This allows for more focus on innovation and improvements to virtual infrastructure and networking instead of purchasing physical infrastructure and setting that up in the data centers. Nebraska’s model for procurement was described as “No different than any other State procurement process from what I understand and no easier or faster.”

c. Funding those initiatives

Nebraska is funding its modernization through appropriations. Funding comes from tax revenue. Funding for some of these initiatives is rather scarce and may require additional funding for implementation. For the Rural Broadband and Community IT Development modernization effort, funding comes from federal funding that is available for broadband deployment and digital equity initiatives.

APPENDIX B
STATE TECHNOLOGY FUND OVERVIEW
From Presentation to the Commission
by Dan Wolf
Director, Alliance for Digital Innovation
November 30, 2023

State	Source	Loan?	Summary
California	Cal. Gov Code § 11546.45	N	California Technology Modernization Fund <ul style="list-style-type: none"> - Aimed at small, low risk/cost projects (Less than \$5M) - Target project delivery less than 12 months - Initial investment of \$25M through FY 28
Virginia	Va. Code §§ 2.2-2022 through 2.2-2024	N	Virginia Technology Infrastructure Fund <ul style="list-style-type: none"> - Uses savings accrued from reductions in cost of services and other IT projects - Has not been implemented (yet)
Texas	Texas Gov. Code § 2054.577	N	Texas Technology Improvement & Modernization Fund <ul style="list-style-type: none"> - Oversight committee from legislative & executive branches - Initial investment of \$200M in 2021 but funds repurposed to specific modernization projects by the state legislature in 2023

STATE	SOURCE	LOAN?	SUMMARY
ILLINOIS	APPROPRIATIONS ACT SB 2406 (103 RD GENERAL ASSEMBLY)	TBD	ILLINOIS CAPITAL FACILITY AND TECHNOLOGY MODERNIZATION FUND - APPLIES TO REAL PROPERTY AND IT MODERNIZATION - NEWLY CREATED IN 2023
MINNESOTA	APPROPRIATIONS ACT HF 1830 ART. 1 § 10(D)	N	TARGETED APPLICATION MODERNIZATION PROGRAM - \$40M TO MODERNIZE TARGETED APPLICATIONS THROUGH FY 27 - MANAGED BY THE STATE CIO
MASSACHUSETTS (PENDING)	SENATE BILL 26 (2023)	Y	MASSACHUSETTS INNOVATION FUND - <i>STILL UNDER CONSIDERATION BY LEGISLATURE</i> - MODELED ON COMBINATION OF US TMF, TEXAS, AND VIRGINIA - LOAN REPAYMENT WITHIN SEVEN YEARS

APPENDIX C
MODERNIZE MARYLAND OVERSIGHT COMMISSION
PARTICIPATING MEMBERS

Voting Members

Commission Chair

Manoj Srivastava

Deputy Chief Technology Officer

Tenable

Member, Maryland Chamber of Commerce

Commission Vice Chair

Ken Kurz

Vice President - Information Technology / Chief Information Officer (CIO)

COPT Defense Properties

Member, Board of Directors, Cybersecurity Association of Maryland, Inc.

Katie Savage

Secretary

Maryland Department of Information Technology

Gregory Rogers

State Chief Information Security Officer

Maryland Department of Information Technology

Mark Cather, Esq.

Chief Information Security and Privacy Officer

University System of Maryland

Ken Hlavacek

Director, Cybersecurity and Privacy Officer

Maryland Department of Transportation

Stanley Lofton

Chief Information Officer

Maryland Department of Public Safety and Corrections

Michael Piercy

Senior Advisor for Program Innovation, MD THINK, Maryland Department of Human Services

Non-voting Advisory Members

Senator Katie Fry Hester and Delegate Anne Kaiser, Co-chairs, Joint Committee on Cybersecurity, Information Technology, and Biotechnology