



February 24, 2017

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Senators and Representatives,

I am pleased to present the 2017-2022 State of Minnesota Information and Telecommunications Technology Systems and Services Master Plan in accordance with Minnesota Statutes 16E.03, Subd. 2, paragraph (1).

Technology advances quickly, priorities shift, and new challenges constantly emerge. To be successful in achieving its mission of continuous improvement, efficiency, reliability and capability in information technology, the State of Minnesota will need to look beyond the imperatives of the moment and plan for the future.

After successful completion of the foundational aspects of consolidating information technology in Minnesota, the State is beginning to realize the true operating power that a consolidated IT organization can deliver. The strategies laid out in the IT Master Plan will enhance state government's ability to protect sensitive data from growing cybersecurity threats, reduce costs, and deliver world-class services to the public.

The release of this Master Plan comes at a unique time for the State of Minnesota. We face in the near future a once-in-a-generation convergence of technology advances and transition in the state workforce. Advancements in cloud computing and data analytics present significant opportunities for innovation in government services and increased efficiency, but only if the State takes action to address aging, obsolete technology that prevents us from realizing these opportunities. It is critical that we harness the power of new technologies and public-private technology partnerships to manage the period of transition ahead and create a more integrated, intelligent, and innovative state government.

Technology can help us change how people connect to their government, find what they need, and access services efficiently and effectively. As the State's Chief Information Officer, I look forward to working with you to realize the opportunities and address the challenges before us in the years ahead.

Sincerely,

A handwritten signature in black ink, appearing to read "T. A. Baden Jr.", written in a cursive style.

Thomas A. Baden Jr.

Commissioner and State Chief Information Officer

CC: Sen. Jim Carlson, Rep. Sheldon Johnson, Rep. Michael Nelson, Sen. Mark Koran, Rep. Jim Nash, Rep. Cindy Pugh



# MASTER PLAN

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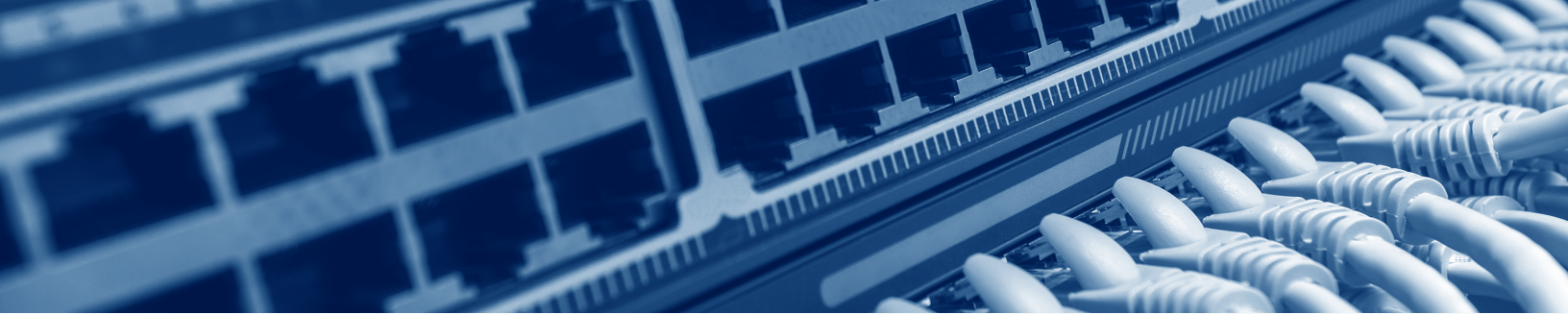
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# INTRODUCTION



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## Purpose

The State of Minnesota Information and Telecommunications Technology Systems and Services Master Plan is a high-level strategic document revised biennially for the Governor and the Minnesota legislature.

The purpose of this plan is to set the long term vision for technology strategy and help guide investments for the State of Minnesota’s executive branch agencies. Minnesota IT Services sets priorities based on the technology needs of the state’s programs and manages IT resources efficiently while maintaining the safety and integrity of the information in its care. The Master Plan is meant to serve as a strategic foundation that will help the agency set priorities, timetables and goals, and help leverage new investments for the greatest value.

The IT Master Plan is updated and presented at the beginning of each regular legislative session in odd-numbered years. This corresponds with the presentation of the state’s operating budgets and assures coordination between policy decisions and the investments in systems that enable and support implementation of business direction.

The plan is formulated with input from executive branch agency leadership and IT employees and management.



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## Methodology

The planning window for this Master Plan extended from January 2016 to October 2016 and involved information-gathering and input from a variety of stakeholders in executive branch information technology. Discussions and “listening sessions” were conducted in person to gather and validate input. This Master Plan was reviewed by the Technology Advisory Committee, a governance body established in statute and representing agency leadership, as well as representation from the private sector, state labor and local government.

The Master Plan fits into Minnesota IT Services’ planning activity that includes both long-term and short-term business and IT planning spread through the cycle of the state’s biennial budgeting process.



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## About Minnesota IT Services

In 2011, state law was amended to unify the management and delivery of state agency information technology services, systems, budgets and staff under Minnesota IT Services (then known as the Office of Enterprise Technology (OET)) and the leadership of the state's Chief Information Officer. This combined the former office of OET, which was responsible for setting IT direction, standards and policies for the state and managing oversight and compliance of those standards, with the other cabinet-level agencies. The Minnesota IT Services organization now encompasses over 2,200 staff and a \$450 million+ budget that is almost entirely funded through chargebacks for services and staff provided to executive branch agencies.

Utilizing a hybrid model of enterprise and locally-delivered services, MNIT seeks to maximize the buying power of the state and gain efficiencies through the delivery of shared, enterprise services and centers of excellence, while maintaining locally-dedicated teams who are embedded in state agencies where they can best deliver application development and software support.

Roughly half of MNIT's budget funds the purchase of tools and services from private sector technology providers, with MNIT acting as the centralized IT procurement entity for all state agencies. In addition, MNIT brokers the collective purchase of IT network services utilized by Minnesota cities, counties, school districts and higher education institutions. By harnessing the collective buying power of Minnesota government, MNIT eliminates duplication, reduces costs, and ensures high levels of service for government operations in all corners of the state.





# GUIDING PRINCIPLES

The following principals have been developed with MNIT's executive team and state leadership and, along with our governance structure, provide the strategic framework for Minnesota IT Services. These principals are reviewed regularly and help define how we do business.

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## Mission

We partner with Minnesota state agencies to deliver technology solutions that transform how government connects to provide services for the people of Minnesota.

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## Vision

**Partners in Performance** – We will become the true and trusted partners for all state agencies, using our knowledge to help further the work of government.

**Diversify our Workforce** – We will create a workforce that includes a variety of backgrounds, styles, perspectives, values and beliefs, and that is representative of the face of Minnesota.

**Moving Government Forward** – We will partner with private industry to empower our workforce to provide the best market solutions in a blended service delivery model.

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## Values

**Partner** – We work across our organization and with agencies to build partnerships that ensure success. Bringing together the business of state government and the complexity of technology, we provide solutions that benefit all Minnesotans.

**Deliver** – The pride we take in our work and the confidence we have in our expertise means we meet the promise of business value by delivering quality IT solutions on time and on budget.

**Transform** – We seek better ways to work. By combining the best of process and creativity, we continuously look for new ways to make government better.

**Connect** – We know our ultimate customer is any Minnesotan who needs our service to support themselves, their family and their work. We do not do IT for IT's sake; rather we work for those who depend on state services in their daily lives.



# FIVE YEAR STRATEGIES



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## IT Consolidation Background

Laws of Minnesota 2011, First Special Session chapter 10, article 4 mandates the consolidation of Minnesota executive branch information technology (IT) under the State Chief Information Officer (CIO.)

The intent of the Legislature and the Governor was to bring all the IT resources of the state under the authority and direction of a single entity in order to 1) increase accountability for the efficient and effective management of IT through a single view; 2) improve IT's effectiveness in meeting the business needs of state government and increase the potential for technology-driven improvements to government service; 3) foster collaboration and shared service opportunities; and 4) find and capitalize on opportunities for efficiencies.

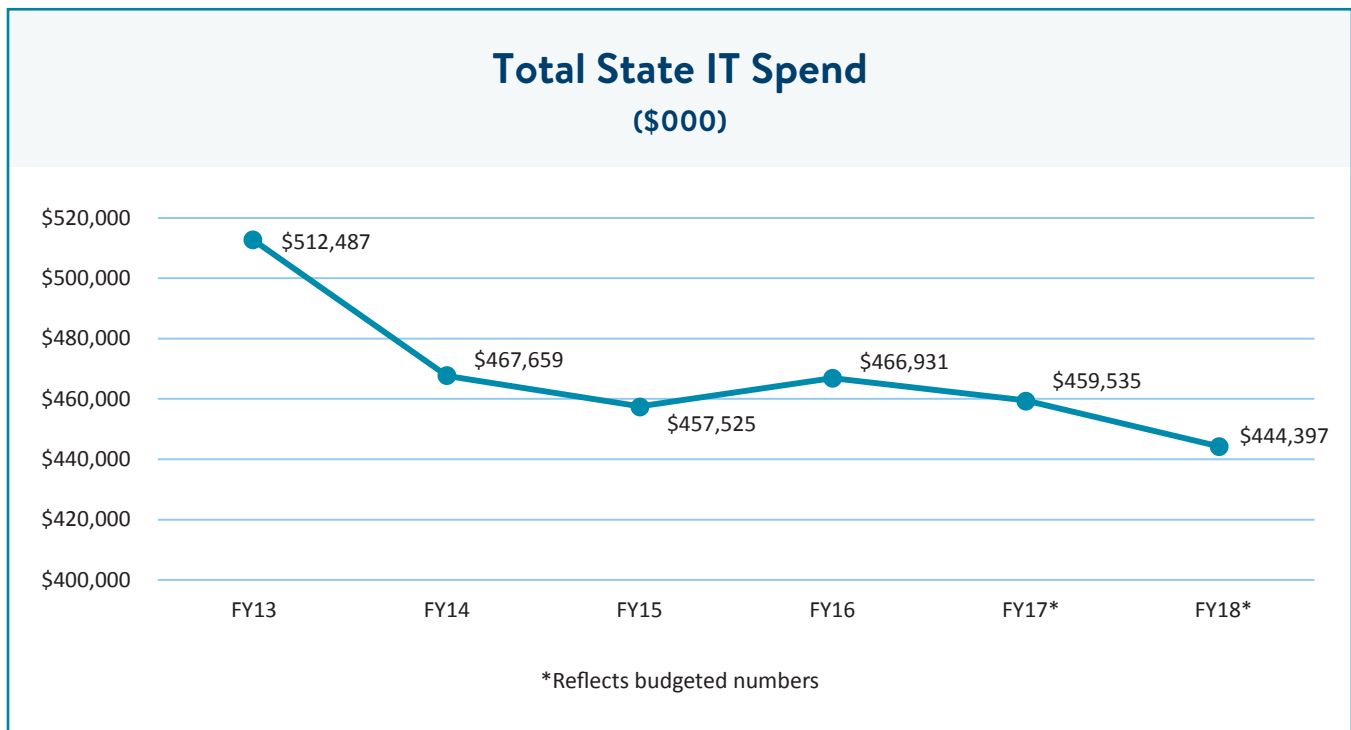
The IT Consolidation Act called for:

*Powers, duties, responsibilities, personnel, and assets relating to functions assigned to the chief information officer... are transferred to the Office of Enterprise Technology from all other state agencies... by October 1, 2011, with the exception of state agency chief information officers which are transferred 30 days after final enactment. By July 1, 2013, the state chief information officer shall control and direct all information and telecommunication technology spending authorized under Minnesota Statutes, section 16E.016.2*

From the time the State of Minnesota began IT consolidation in late 2011 to the preparation of this report in 2017, the agency has achieved its primary goals: consolidating people, dollars and assets, delivering cost-savings and improving efficiency.

Minnesota IT Services has achieved full, 100 percent consolidation of staff and resources. Today, we have also achieved over 90 percent financial consolidation, and will, within the scope of this plan, achieve full 100 percent financial consolidation – allowing the state to begin to build centralized records of technology investments, as well as directly manage and monitor costs, anticipate needs and future volume demand.





Since consolidation, MNIT has realized roughly \$60 million in cost avoidance as of 2016.

After successfully completing these foundational aspects of consolidating technology in Minnesota, we are now moving toward the true operating power that a consolidated IT organization can deliver for the enterprise. Looking forward, MNIT is moving its strategic focus towards the delivery of services. While we must continue to manage costs, we are also pivoting to become a more digital Minnesota, just like the private sector. As this digital transformation takes place, we have to be concerned with the safety and security of our information. We need to enhance the speed of our delivery, with a blend of internal and externally-procured services.

In order to improve cybersecurity and efficiency, Minnesota IT Services is beginning the process of planning for and investing in modernization for high-risk IT systems and developing an enterprise roadmap, with a focus on the modernization of Minnesota's IT portfolio. Moving state government to modern infrastructure and cloud-based solutions is a fundamental necessity to building a digital government that is responsive to citizen needs and secure by design. Doing so will enhance state government's ability to protect sensitive data, reduce costs, and deliver world-class services to the public.

It is the vision of the State CIO and agency leadership to not just gain the efficiency of combined services, but also to reform and improve the delivery of information technology through the tools afforded the executive branch through this legislation.



## Cybersecurity

Minnesota will be a leader among state government, charged with protecting data and applications against external and internal threats. Facing unprecedented challenges, information security is now our number one priority and the top priority for governors across the nation. Advanced attacks are becoming more sophisticated and more common, testing the limits of existing capabilities.

According to more than half of state security leaders in the U.S., an advanced attack will affect their organization in the next year. The pervasiveness of these threats means Chief Information Security Officers must quickly develop cutting-edge threat intelligence competencies.

STRATEGY	ACTION
<b>Implement the security foundation.</b> Minnesota IT Services has done extensive work to design a solid security foundation for the executive branch of state government. Work is now underway to implement that foundation, which includes a comprehensive Service Delivery Model, Policy and Standard Framework and an Information Security Strategic Plan.	Implement the foundational pillars of our Enterprise Security Program, including the 18 strategies in our newly updated Information Security Strategic Plan.
<b>Provide leadership to other levels, units, and branches of government.</b> State leaders will need to partner much more effectively to address the increasing barrage of advanced and persistent threats. Minnesota IT Services hopes to serve as a thought leader to make all Minnesota government entities more secure.	Realize intergovernmental resource sharing, implement formal processes to disseminate cyber threat intelligence and create a Minnesota Government Information Sharing and Analysis Organization.
<b>Improve Minnesota's cybersecurity workforce.</b> Cybersecurity has a zero percent unemployment rate. Both public and private sector organizations are scrambling to attract and retain talent, but the pool of qualified candidates simply does not exist.	Partner with academia to address the talent shortcomings that currently exist, promoting cybersecurity careers and innovative programs like Scholarship for Service.



## IT Leadership for our Partners

Building on IT consolidation, Minnesota IT Services is poised to transition into the next phase of IT maturity—moving beyond serving as an “order taker” fulfilling technology needs, to a leadership role. As a leader and partner, MNIT will provide State of Minnesota agencies with solutions that are targeted to solve business problems, while remaining focused on enterprise efficiencies and state agency partnerships. This model will leverage the state’s information technology portfolio, take into account industry best practice, and promote enterprise business and technology solutions to both solve business needs and maximize the benefits of shared services.

STRATEGY	ACTION
<b>Provide technology leadership and education to state agencies to improve processes and enhance decision-making.</b>	<ul style="list-style-type: none"> <li>Align with agencies as equal partners to identify areas where digitization can most effectively make government smarter, more efficient and more accessible for Minnesotans.</li> <li>Provide a high-level perspective and technology expertise to state government to bring together and balance state agencies’ individual goals with solutions available in the State of Minnesota’s technology portfolio, and the private industry marketplace.</li> </ul>
<b>Create enterprise strategies around solutions and elevate business problems that share common technology solutions.</b>	<ul style="list-style-type: none"> <li>Utilize the IT governance framework to evaluate business needs, priorities and areas where technology can provide value and enhance services for Minnesotans, and work to ensure that diverse business needs can be addressed through enterprise strategies.</li> <li>Develop enterprise technologies to reduce duplication, enable integration and save dollars.</li> </ul>

STRATEGY	ACTION
<b>Partner with agencies to use technology to connect with Minnesotans and provide better online government services.</b>	<ul style="list-style-type: none"> <li>• Develop and procure systems that are accessible and usable by all Minnesotans.</li> <li>• Implement enterprise communication platforms that strengthen the State of Minnesota's ability to deliver services digitally and connect with Minnesotans.</li> <li>• Develop mobile applications that provide secure public access to government services and information.</li> </ul>
<b>Implement data management strategies that help agencies to manage data as a strategic information asset.</b>	<ul style="list-style-type: none"> <li>• Protect and secure Minnesotans' private data.</li> <li>• Engage in cross-agency data governance processes to help implement technology solutions.</li> <li>• Develop and execute architecture, policies, practices and procedures that properly manage the full data life-cycle needs of the enterprise.</li> </ul>
<b>Harness the power of the State of Minnesota enterprise to reduce the time it takes to deliver solutions, leverage the economy of scale, and build on our shared experience.</b>	<ul style="list-style-type: none"> <li>• Provide technology leadership expertise to our partners to identify the best solutions for individual and shared problems.</li> <li>• Leverage our buying power as the State of Minnesota enterprise to drive down the cost of shared technology needs.</li> <li>• Implement applications portfolio rationalization to plan for the future and anticipate needs.</li> <li>• Implement technology standards to ensure our state can invest, plan and prioritize for technology needs – both today, and for the future of our state.</li> </ul>



## Smart IT Investments

The way that technology is purchased and delivered in government is changing rapidly as “Everything as a Service” (XaaS) cloud computing strategies become more common. These new models of service delivery also change how the government consumes, measures and pays for these services. “Infrastructure as a Service” (IaaS), “Platform as a Service” (PaaS), and “Software as a Service” (SaaS) offer many benefits to the enterprise. For example, the ability to scale and offer multi-tenancy allows resources and costs to be shared among agencies, and lets agencies choose how much of the service they need, and when to use it. As Minnesota invests in new technologies, we will look for the most efficient way to deploy them.

Minnesota IT Services has implemented a transformative delivery model that shifts the agency from a service provider model to a true partnership with each State of Minnesota agency. We will use our Governance Framework to ensure that feedback from agency leaders is incorporated into the services that we provide and that the cost of the service is transparent. Our partners will help us determine if a service should be delivered centrally for the enterprise, locally due to highly customized business needs, or through a third party. We will make smart IT investments that deliver quality services at a good value for the state.



*Services provided by Minnesota IT Services*

STRATEGY	ACTION
<p><b>Provide the agility and transparency necessary for agencies to make and adjust IT investment decisions based on their business need.</b></p>	<ul style="list-style-type: none"> <li>• Transparency in MNIT’s rate and billing methodologies.</li> <li>• Maintain a plain language description of the enterprise services along with the tiers and add-ons available to agencies to help agencies make IT spending decisions.</li> <li>• Streamline and modernize procurement processes for IT products and services.</li> </ul>



STRATEGY	ACTION
<b>Advance investment in IT for mission-critical systems and services.</b>	<ul style="list-style-type: none"><li>• Manage the state's application inventory to build a strategic roadmap for modernization of critical systems.</li><li>• Advocate for investment in modern IT systems and move away from once-in-a-generation investments.</li><li>• Strategically invest in life-cycle replacement of hardware inventory to maintain supportability, availability and security.</li></ul>



## Deliver

We will be measured by how well we successfully deliver for the State of Minnesota and how well it is working for Minnesotans. We will deliver solutions with full IT life cycle management that are sustainable and take into account rapidly changing IT best practices. We will recruit and maintain a workforce that has the knowledge and skills to help implement Minnesota's technology vision.

STRATEGY	ACTION
<b>Excel at the execution and delivery of Minnesota's technology priorities.</b>	<ul style="list-style-type: none"> <li>• Manage the portfolio of active technology projects across the State of Minnesota. Clearly define new projects, manage and monitor progress, and ensure solutions will be delivered on time and on budget.</li> <li>• Continue the development of mature project portfolio management practices to provide the leadership, expertise and guidance to end technology projects that are not delivering as promised, and prevent further expenditure.</li> <li>• Work across the State of Minnesota to help modernize its largest IT platforms more quickly and efficiently.</li> </ul>
<b>In a fast-paced and quickly developing technology environment, ensure the State of Minnesota is in alignment with technology industry best practices and emerging developments.</b>	<ul style="list-style-type: none"> <li>• As technology leaders for the State of Minnesota, pursue alignment with IT industry standards across the spectrum of responsibilities that Minnesota IT Services touches—from providing services, to managing projects, to building systems – and more.</li> <li>• Implement evolving industry best practices to ensure our state IT infrastructure has the ability to transform to meet business needs efficiently and effectively.</li> </ul>

STRATEGY	ACTION
<b>Plan for the future of technology in Minnesota to ensure our state can succeed in the digital economy.</b>	<ul style="list-style-type: none"> <li>• Involve state agency leaders and chief business technology officers in collaborative decision making.</li> <li>• Ensure state agencies have cost-effective solutions to meet and manage their technology needs, while planning for the future and life cycle of technology in the state.</li> <li>• Help state agency partners explore better ways to harness the power of the data and technologies they already have.</li> </ul>
<b>Ensure the state's information technology workforce has the knowledge and skills to keep up with changing industry best practices, support the state's technology infrastructure and implement Minnesota's technology vision.</b>	<ul style="list-style-type: none"> <li>• Utilize public-private sector partnerships to increase our effectiveness and delivery.</li> <li>• Build a talent pipeline that gives us the flexibility to build and invest in a future state workforce, utilizing innovative staffing and recruitment strategies that grow entry level talent into state IT career professionals.</li> <li>• Meet the state's IT workforce needs through diverse recruitment strategies that harness talent in communities and locations across Minnesota.</li> </ul>
<b>Ensure that technology is accessible and easy to use for business partners and for all Minnesotans.</b>	<ul style="list-style-type: none"> <li>• Provide education and skill-building opportunities so that all users have the knowledge necessary to leverage and harness the technology at their fingertips.</li> <li>• Design and deliver user-focused technology that makes dealing with government easier, simpler and better for the people of our state, including people with disabilities.</li> </ul>



# CHALLENGES & OPPORTUNITIES

The State of Minnesota faces significant economic, social and technological policy challenges in the next biennium and beyond that will influence its direction, goals and priorities for information technology. The following factors are areas of concern, but also of opportunity, for the State of Minnesota, and for Minnesota IT Services going forward.

Technology advances quickly, priorities shift, and new challenges constantly emerge. To be successful in achieving its mission of continuous improvement, efficiency, reliability and capability in information technology, the State of Minnesota will need to look beyond the imperatives of the moment and plan for the future. The purpose of this section is to share the early warning signs arising from our management of the state's technology portfolio, as well as to identify areas in which investment and strategy will be required to meet the intent of the law. MNIT's commitment remains to work, wherever possible, within the granted authority and partnerships to address them systematically.



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## Cybersecurity

The vast majority of cybersecurity priorities in this plan address shortcomings in executive branch defenses that have accrued from years of underinvestment. We are seeing increasing cyber-attacks on both state and federal government, and these attacks are growing in frequency and sophistication. Citizens expect government leaders to protect their data, regardless of whether it is in the custody of state or local government, other branches, constitutional offices, or higher education institutions. Citizens also expect government leaders to collaborate to use taxpayer resources judiciously, particularly in costly and high-risk areas like cybersecurity. As Minnesota IT Services works to build the cybersecurity capabilities that citizens expect, we also see an opportunity to extend these services and share threat intelligence with other government entities. We are calling this future opportunity the Minnesota Government Information Sharing and Analysis Organization, and we hope to begin its planning and development over the next five years. Given the cost of cybersecurity solutions, extremely high demand for talent and expanding threat landscape, the success of all Minnesota government entities will be incumbent on how well we share resources, tools, talent and information to address threats and protect the people of our state.



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## IT Modernization (accrued IT debt)

It is critical that Minnesota IT Services' leaders, state agency partners, and policymakers examine the impact of continued operations with aging legacy IT systems. These discussions must include the impact of aging IT systems on business operations and efficiency, information security, and the ability of state government to engage effectively with Minnesotans in the digital age.

In our efforts to build and manage the State of Minnesota's technology portfolio, Minnesota IT Services has found a substantial gap in agency technology environments, precipitated by disproportionate and disparate IT investments made by various agencies over the past few decades. Such discrepancies leave some state IT operations underfunded and thus unable to provide the most efficient and effective solution for Minnesotans. Of particular concern is the age of legacy systems and infrastructure in Minnesota, including some major systems upon which the public depends. A large amount of state IT equipment has completed normal life cycles and carries security and business continuity risks to operate. These assets need to be refreshed in order to maintain effectiveness and provide further efficiencies for state government. As systems reach the end of life or as new technologies that can improve government services become cost effective, the state will need to refresh and reinvest.

Before investing in modernization, Minnesota must fully understand the scale and scope of where this is occurring. Today we finally have the datapoints necessary to begin to understand the breadth and depth of the full problem. It is important for all state leaders to recognize that modernization will carry significant costs.

As IT leaders, we hope to lead the state in investing strategically and wisely to ensure critical services are delivered, while constantly watching for opportunities to improve efficiency and reduce overall costs.

Minnesota has an opportunity to not only upgrade technology, but to revisit the whole process of how government conducts business and to find new ways to leverage existing technology and strategies to solve broader problems in our state.





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## Workforce

Building our technology workforce and finding innovative solutions to carry out the business of the state are key to Minnesota's success going forward. In the coming years, Minnesota will face major challenges to retain its quality workforce and attract new staff. The State of Minnesota also faces a major wave of retirements of highly proficient technical specialists in the near future. There are more jobs for skilled workers in the tech sector in our state than there are the people to fill them.

As we strive to build an agile and equitable workforce environment that attracts talented people and builds strong information technology careers, Minnesota must develop a recruiting model to train talent from entry level up and meet the challenge of a significant shift in our state workforce created by the retirement bubble.

