

Technology Trends:

State and Local
Government Perspective





Technology Trends

Executive Summary

Technology is evolving faster than ever. Keeping up with the latest tech trends allows state and local governments to improve operations, effectively serve citizens and impact political outcomes. Such governments are faced with unique challenges, including aging workforces, tighter budgets, political uncertainty and cyber threats. Rapid technology adoption, especially amongst millennials, can quickly outpace in-house technology capabilities. State and local government agencies that don't keep up with major tech trends run the risk of being left behind. In fact, government agencies have typically lagged the private sector in the adoption of new technologies. This article considers the inherent tech-related challenges we have observed in the public sector. Four technology trend areas are presented:

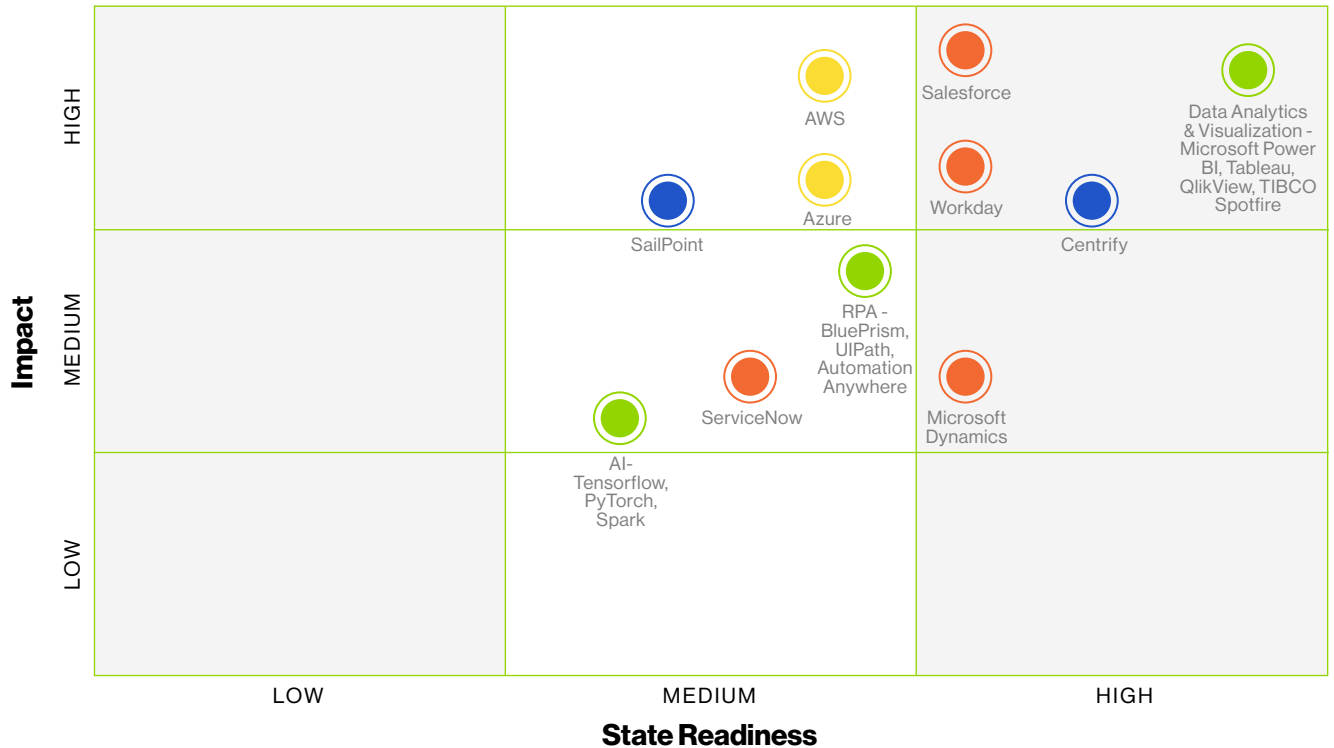
- **Analytics and Intelligent Automation** – Developments around the group of technologies associated with advanced analytics, data visualization, artificial intelligence, robotic process automation and machine learning continue to be noteworthy. Federal government spending on analytics and intelligent automation has more than tripled since 2017 and grew by 70% in 2019.¹ This trend is expected to continue.
- **Cloud Expansion** – Software as a service (SaaS), infrastructure as a service (IaaS), platforms as a service (PaaS) and cloud support services expansion trends are projected to continue in 2020. According to an October 2019 CIO survey by NASCIO, 48% of state governments plan to shrink their state-owned data centers and 92% plan to increase cloud services over the next three years.¹
- **Modern Technology Platforms** – These product- and web-based end-user platforms make government operations and customer services more efficient and minimize custom development. Federal government spending on digital services grew by \$5.3 billion in 2019.¹
- **Cybersecurity** – Technologies associated with protection of systems, networks and programs from digital attacks reflect a trend toward increased implementation of cyber defenses. Driven by the government's need to evolve beyond perimeter-based protections, federal contract spending on cybersecurity rose sharply to match an unprecedented fiscal 2019 cybersecurity budget request of \$17.4 billion.¹

For each of the identified areas, associated technologies and success stories are presented, along with answers to the following key questions:

- Why should government agencies care about the specific technology trend? What are the associated benefits?
- What are some use cases for government adoption of the related technologies?
- What potential risks need to be mitigated?
- What should government organizations do to successfully embrace the associated technologies?

1. Bloomberg Government Data

Prioritize Guidehouse Tech Solutions for State and Local Government



Analytics and Intelligent Automation



Cloud Expansion



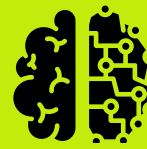
Modern Technology Platforms



Cybersecurity

Analytics and Intelligent Automation

Data-driven decision-making, visualization and selective automation increase citizen value



Data analytics shifts the focus of government agencies from dashboard reporting of reactive indicators to autonomous processes that help people make better decisions in real time. Data analytical technologies have enabled government agencies to categorize relevant information and analyze massive historical data sets—including millions of pages of unstructured text—in order to identify patterns and forecast potential problems. Implementation of data analytics thereby enables agencies to focus on problem prevention, as opposed to post-facto reaction. Robotic process automation (RPA), an application of technology that is governed by business logic and structured inputs, is aimed at automating enterprise processes. Using RPA tools, state and local government agencies can configure software to capture and interpret applications for processing transactions, manipulating data, triggering responses and communicating with other digital systems. Initially, RPA was designed to complete administrative work using static rule sets and sophisticated macros. Now, it is evolving to accomplish more advanced functions, such as analyzing unstructured data sets using natural language processing (NLP) and content analytics.

Artificial intelligence (AI) emphasizes the creation of intelligent machines that work and react like humans. AI is being utilized for a wide range of activities, including medical diagnosis, electronic trading, robot control and remote sensing. It has the potential to enhance almost everything government does, from education and health care to policing and defense. In the near future, designing and deploying custom AI-based systems will remain an expensive proposition. For this reason, most AI applications will continue to be accessed through providers of as-a-service platforms, which allow organizations to simply feed in data and pay for the computing resources used. In 2020, we will see wider adoption and a growing pool of providers that are likely to start offering more tailored applications and services for specialized tasks.

Business Use Cases	Potential Benefits	Impediments
• Prevention of fraud by detecting improper or mischaracterized social welfare payments • AI-enabled traffic lighting to reduce wait time and idling • RPA to scan and index verification documents required for driver's license renewal • Early crime detection using predictive analysis • AI-powered chatbots to respond to child support case information requests from customers	• Enables better resource utilization, reduces staffing costs and human error, improves effectiveness of citizen-centric programs • RPA shifts focus from repeatable and administrative work to higher-value tasks • Generates higher productivity, since automation programs can be run 24 hours a day, seven days a week • Serves as a catalyst for economic development by creating skilled employment opportunities	• Lack of adequate skills in government for advanced data analytics • Regulation regarding data privacy and accessibility is not standardized and is continually evolving • Potential for algorithmic bias and elimination of jobs

Success Stories

Data Analytics: For a U.S. intelligence agency, Guidehouse developed an intelligent analytics solution to produce **live, interactive data models and dashboards** on position and talent requirements, job placements and assignments. This allowed leadership to understand the makeup of the workforce, enhance workforce planning and training, and predict and comprehend **reasons for attrition**.

RPA: For the General Services Administration, Guidehouse developed bots using **optical character recognition** and email integration to reconcile systems of record across multiple disconnected systems. Bot implementation decreased the time required for various reconciliations by **90–99%**. In addition, the automated actions performed are auditable and execute tasks with **zero errors**.

AI: For a U.S. Intelligence agency, Guidehouse used **machine learning to predict case complexity scores** for incoming **clearance investigations** in order to help adjudicators and investigators prioritize cases more efficiently. We also developed an **AI solution to help predict and prevent network outages** before they happen. More than **100,000** potential outages have been prevented to date.

Guidehouse Perspective

How to Create a Successful Program

A successful analytics and automation program requires a long-term vision backed by policy, effective program governance and skillful change management. Our recommendations to state and local agencies looking to embrace advanced analytics and intelligent automation are:

- Define analytics and automation strategy to meet specific business objectives, such as reducing costs or improving customer service. Establish data governance processes on the collection, storage and use of data for predictive analytics.
- Create a roadmap for investments in analytical and automation services. Select the right use cases to pilot and devise a long-term plan to scale them.
- Choose organization-enabling technology and pilot identified use cases. Maintain frequent gate reviews to measure the effectiveness of the program, access business priorities and take corrective action when necessary.
- Invest in dedicated program governance and change management to ensure the appropriate processes are automated, conflicts are avoided, people are trained on predictive models and costs are controlled.

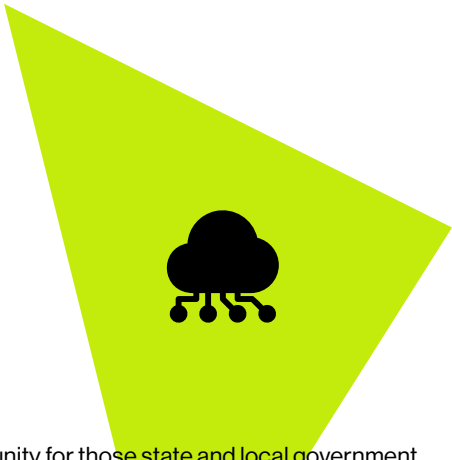
How Can Guidehouse Help?

Guidehouse is technology-agnostic, offering a unique approach in the market to deliver the optimal tools to meet each client's needs. Our professionals are trained and certified in a wide range of open-source data analytics, visualization, RPA and AI solutions. Below are the analytics and automation offerings we've identified as most suitable for our government clients:

- **Data Analytics and Visualization** – Guidehouse has a dedicated advanced analytics and data visualization team with capabilities in statistical modeling, big data, data warehousing and data mining to help businesses use data to drive their decision-making. Our strongest technology suite in this domain includes Microsoft Power BI, Tableau, QlikView and TIBCO Spotfire as the go-to platforms for our clients.
- **Robotic Process Automation (RPA)** – Automating high-volume and repeatable tasks allows our clients to more effectively deploy their resources. From RPA pilots to centers of excellence (COEs), our automation capabilities use the leading software platforms Blue Prism, UiPath and Automation Anywhere to generate an optimal AI ecosystem.
- **Artificial Intelligence (AI)** – Our AI capabilities encompass strategy through execution on multiple client projects in the public sector. For machine learning and AI solutions (such as NLP), we bring a toolbox of analytic applications, including several open-source and cloud options that help clients kick-start their journey. Our specialists are trained to use TensorFlow, PyTorch, Spark and all of the major cloud providers.

Cloud Expansion

SaaS, PaaS and IaaS solutions enable on-demand availability of computing resources



Cloud expansion represents a significant opportunity for those state and local government agencies wherein the majority of business applications are still hosted on-premises. Cloud is the foundational setting for emerging technologies such as AI, RPA and the modern technology platforms discussed in this article. Cloud providers have automated traditional infrastructure and security management tasks. As a result, technical resources are interacting less and less with the underlying system infrastructure and focusing on higher-value activities that more directly support mission outcomes. Migration to the cloud may or may not have a direct cost advantage; however, the investment is justified by the ways cloud expansion breaks down functional silos, enables emerging technologies and connects various stakeholders. Cloud also enables centralized security controls (administered by the cloud service provider), thereby eliminating the need for some in-house cyber threat defense mechanisms.

Business Use Cases	Potential Benefits	Impediments
• Integrated eligibility solutions for health and human service programs hosted in the cloud • Cloud applications for seasonal functions such as tax filings and health care enrollment • 311 city solutions and contact center applications	• Cloud migration shifts focus to mission-specific tasks, as opposed to infrastructure operations • Eliminates the capital expenses of buying hardware and software, setting up and running on-site data centers • Saves time, as even vast amounts of computing resources can be provisioned in minutes • Offers the reliability and scalability associated with cloud services	• Conflicting state, federal and international regulations on data privacy, security, data use • Challenges around interoperability (the ability of devices to communicate with each other) • Increasing cybersecurity concerns

Success Stories

AWS: Seminole County Public Schools (SCPS) used an AWS-hosted **content management and customer experience platform**, which helped non-technical staff collaborate on, refine, publish and update content over time. Leveraging this solution improved the **quality, accuracy and search engine capabilities** of SCPS' web presence. The school system's website program won an **AWS Public Sector "City on a Cloud" Award** for its innovation.

Azure: Florida's Department of Environmental Protection uses a geographic information system on Azure to help the state better **prepare for environmental threats**. With key systems available via the Azure cloud, people can access the data they need, when they need it. Staff can now **tweak configurations** on the fly, whether in the field or in the office. Monitoring tools provide insight on just about everything, from **web traffic to hardware consumption**.

Guidehouse Perspective

How to Create a Successful Program

Cloud expansion often entails a fundamental change in roles and responsibilities, especially for infrastructure personnel. It is typically associated with co-existing on-premise and cloud-hosted applications requiring different management processes. The critical success factors for cloud expansion are:

- **Clear Conception of Business Drivers and Organization Capabilities:** Define rationale for moving to the cloud; SWOT analysis of existing people, processes and technology operations.
- **Thorough Understanding of Cloud Operations and Cost Factors:** Consider licenses, supported environments, SLAs.
- **Global Design:** Specify cloud requirements, architecture; select the right provider and implementation partner.
- **Project Management and Governance:** Introduce cloud-focused policies that are not vendor- or location-specific, and define clear processes, roles and responsibilities for governance.
- **Data Migration:** Dedicate resources to ensure complete data conversion as required for business continuity.
- **Change Management:** Spend time ensuring everyone is comfortable with the new paradigm and is able to take full advantage of the increased availability and flexibility available with cloud expansion.

How Can Guidehouse Help?

Guidehouse provides services that help agencies define their cloud strategy, taking readiness, security and compliance, and governance into account. We also assist in the execution of cloud migration planning and delivery. We work with all major cloud providers, but consider the solution offerings below to be the most applicable to our government clients:

- **Amazon Web Services (AWS)** – Guidehouse partners with AWS to deliver a comprehensive global cloud infrastructure that allows client organizations to quickly innovate, experiment and iterate. Through our experience working with AWS, we've learned that the platform is OS- and language-agnostic, making it open and flexible, highly secure and conducive to easy integration with open-source technologies.
- **Microsoft Azure** – Guidehouse provides a full range of services using the Azure cloud platform, which allows us to deliver holistic solutions and sophisticated IT infrastructures to our public-sector clients. Microsoft Azure has a complete set of integrated cloud offerings, including IaaS, PaaS and SaaS. It's also cost efficient and suitable for client agencies looking for Windows and SQL Server integration.

Modern Technology Platforms

Product-based technologies support multi-channel access and minimize the need for custom development



State and local government agencies have moved away from procuring custom-developed business applications and toward reliance on cloud-hosted product technologies, such as Salesforce and Workday, for their business needs. In the past, off-the-shelf software was expensive; as well, it entailed committing to a range of setup, maintenance, consulting and training costs. Assessing the pros and cons of building software versus buying off-the-shelf software made sense, and was in fact a routine exercise in many large procurements. Today, thanks to the explosion of cloud-based software, it seems that there is a cheap, lightweight and configurable solution for practically any business problem. State and local agencies are adopting strategies that would first eliminate existing product-based technologies as viable solutions prior to evaluating bids for custom development.

Business Use Cases	Potential Benefits	Impediments
• Salesforce solution to allow customers to apply for social security benefits • Contact center solution for customer relationship management • Case management solutions for departments of motor vehicles, court systems and child welfare agencies	• Boosts cost-effectiveness due to cost-sharing across a large user base • Allows shorter launch cycle, since the framework is available and time is required only for configuration • Cloud company ensures that software is online, enabling focus on core business requirements • Provides easier access to resources through product technology	• The technology landscape changes rapidly through acquisitions and emerging products which may impact product support or necessitate enhancements • System security and availability are controlled by the product

Success Stories

Salesforce: For a State of California employment agency, Guidehouse implemented Salesforce's Service and Community Clouds to **modernize** the agency's platform, **increase automation** of business processes and **maximize access to agency services**. The project followed a hybrid agile method to allow rapid prototyping, and resulted in the replacement of multiple legacy platforms, streamlined business processes, increased access to contract data and improved system availability.

Workday: For a Maryland-based public university, the Guidehouse-supported integration of Workday's Full Platform – Finance, Human Capital, Payroll, Recruiting, Expenses helped alleviate challenges associated with **disconnected teams**, **cumbersome hiring processes** and dependency on **ad-hoc reports**. This solution resulted in systems consolidation, rationalization of reports, automated hiring processes and configurable workflow management.

Microsoft Dynamics: For the National Institutes of Health (NIH), Guidehouse implemented an end-to-end Microsoft Dynamics solution that **integrates fragmented administrative functions** and enables **real-time decision-making**. This approach eliminated paper routing, helped staff share best practices, provided a central point to track activities and workload, and supplied leadership with customized dashboards for decision-making.

ServiceNow: The Tennessee Department of Human Services used ServiceNow Customer Service Management to **cut inquiry assignment time** from 36 hours to 100 seconds. It also essentially eliminated **untimely inquiries**, and reduced the time to resolve escalated inquiries by 60%. The implementation created a seamless customer experience, simplified service delivery and information sharing, and unified disconnected workflows.

Guidehouse Perspective

How to Create a Successful Program

Budget constraints often prevent state and local CIOs from upgrading technology platforms. Guidehouse recommends value-based contracts with modern technology platform service providers to demonstrate return and facilitate the acquisition of necessary funding. State and local governments require short- and long-term IT roadmaps and funding strategies to carefully prioritize, select and replace legacy applications with modern enterprise platforms. Our recommendations to state and local agencies looking to embrace modern technology platforms are:

- Perform application rationalization to identify systems to replace, merge, decommission and upgrade.
- Determine funding streams for each business application.
- Select a suitable modern technology platform considering synergies with existing personnel and resources:
 - business priorities, operating costs, data access requirements, customer support processes, available data migration and training options, concurrent and sequential testing, product maturity, disaster recovery processes, integration options, environmental supports.
- Hire and train staff to develop the required skill sets needed to support the modern technology platform.

How Can Guidehouse Help?

Guidehouse provides strategy through implementation and maintenance services encompassing all software development lifecycles for multiple modern technology platforms. We find the following platforms most relevant to government agencies:

- **Salesforce** – Guidehouse partners with Salesforce to deliver transformative change that drives citizen-centric government solutions by means of Salesforce certified consultants, deep domain depth and qualifications from multiple engagements. Our combined practice toolkit contains numerous templates, tools and reference materials, including standardized processes and methods, training materials and a Salesforce knowledge base derived from hundreds of projects. Together, we are able to combine this extensive expertise within one integrated, seamless Salesforce implementation team.
- **Workday** – Our Workday practice helps organizations deploy the power of Workday's innovative technology, and, in the process, modernize the way their finance and human resources teams collaborate. Through our Workday-powered transformation projects, we help government agencies define their strategy and approach so they can effectively build agility, automate day-to-day tasks and integrate the data and planning abilities of finance and HR in one seamless system. These solutions allow agencies to better align their business strategies and ensure that the right skills and resources are available to support citizens.
- **Microsoft Dynamics** – Our Microsoft Dynamics consulting practice is focused on current Microsoft Dynamics products, including Microsoft Dynamics 365, Enterprise Edition – Operations, Field Service, Sales, Customer Service, Marketing and Finance. Our team is focused on helping government agencies identify, design and capture business opportunities by providing end-to-end services, including implementation, integration, data migration, training and upgrades.
- **ServiceNow** – Guidehouse provides expertise in the ServiceNow platform space to government agencies looking to implement ServiceNow for the first time, add modules, upgrade to the latest version, administer an existing instance, or add functionality. ServiceNow platform features, such as approvals, email notifications and extensive integration points, provide an expedient foundational framework that allows agency resources to devote more time to building the core application.

Cybersecurity Technologies

Cybersecurity requires employee, process and technology alignment to prevent digital threats



Government services are increasingly placed at risk by the new technologies that enable improved citizen and employee experiences. Sophisticated cybercriminals, hackers and malicious actors now attack state and local government technology systems daily, seeking to inflict financial, reputational and physical damages to their targets. By virtue of their large organizational structures, limited budgets and complex political landscapes, government IT departments face a myriad of challenges in responding to these threats. Our cybersecurity focus is on the two areas with the largest impact on state and local governments.

Endpoint Security refers to safeguarding endpoints, or end-user devices (such as desktops, laptops and mobile devices), which serve as points of access to an enterprise network and create points of entry that can be exploited by malicious actors. Endpoint security software protects these points of entry from risky activity and/or malicious attack. When government agencies can ensure endpoint compliance with data security standards, they can maintain greater control over the growing number and variety of access points to the network. Identity and Access Management (IAM) provides the right people with access to the right resources by requiring the appropriate level of authentication. This helps organizations tackle the following needs: user provisioning, single sign-on (SSO), privileged access management (PAM), password management, role-based access control, multi-factor authentication, compliance and user recertification, and identity proofing

Business Use Cases	Potential Benefits	Impediments
• Cybersecurity technologies applied to election processes to prevent counterfeit voting • Encryption of payment information used for health insurance premiums • Digital identity management for e-voting, social welfare and other government services • Intelligent interfaces designed to prompt citizens misreporting tax information and improve government outcomes	• Protects system against viruses, worms, spyware and other unwanted programs • Guards data privacy and prevents data theft • Improves customer service by providing a single experience when interacting with all government services • Reduces fraud and abuse of government programs	• Firewalls can be difficult to configure correctly and make the system slower to use • Programs require continuous monitoring and frequent upgrades • Growing risk of state surveillance impacting human rights

Success Stories

Centrify: Guidehouse designed and implemented an Enterprise IAM approach for the Commonwealth of Massachusetts to address its business and technical requirements. Our system provided a **centralized and uniform solution** using Centrify's Infrastructure Service and Idaptive Application Service offerings. The team integrated SSO with **38 web applications**, migrated **270+ privileged users** to a Centrify-credentialed vault and on-boarded **160+ servers** into a PAM suite.

SailPoint: Guidehouse is partnering with the State of Florida's Department of Transportation to implement SailPoint's IdentityIQ solution to replace their homegrown identity administration with a tool that supports governance of agency users. Successful implementation of this identity administration and governance program leads to **automated access provisioning/deprovisioning, automated access requests and approvals, and access certification** for thousands of users across multiple applications

Guidehouse Perspective

How to Create a Successful Program

Cyber assessments are the first step in developing a robust cybersecurity posture. They involve evaluating an organization's risks, reviewing existing technology policies and business processes, and identifying new policies and programs to further cybersecurity goals. The best cybersecurity policies are thoughtful about the people and processes embedded in any technology system, and attentive to how cybersecurity policies are communicated and interpreted by users. The critical success factors for cybersecurity management are supported by these measures:

- Develop an enterprise-wide cybersecurity program charter endorsed by leadership.
- Create a cybersecurity project work plan, the first task of which is to develop a comprehensive cybersecurity policy. Factor in disaster recovery, as well as regular monitoring and testing of digital defenses to identify weaknesses.
- Select the appropriate cybersecurity technologies depending on the organization and risk of threats. Ensure the technology is always run on the latest available version, in order to shield "open doors" from evolving exposures.
- Maintain backup systems, information separation and physical protections; these remain critical for security planning.
- Encourage employee training to stay on top of current trends using approved sources.

How Can Guidehouse Help?

Guidehouse provides a full suite of cybersecurity services, including cyber assessment and policy development, cybersecurity risk programs, recovery, security compliance/audit preparation, IAM, incident response, vulnerability assessment and mitigation. Our specialized approaches to the unique cybersecurity needs of state and local governments deliver endpoint security and IAM using two key partners:

- **Centrify** – Guidehouse has a dedicated cybersecurity team that specializes in Centrify implementations designed to restrict access to an organization's critical IT assets and privileged accounts via tools and technologies that review, analyze and secure master account access. Together, on multiple public-sector engagements, we are redefining PAM by delivering cloud-ready Zero Trust Privilege to secure access to infrastructure, DevOps, cloud, containers, big data and other modern enterprise use cases.
- **SailPoint** – Guidehouse is a trusted SailPoint implementation partner for role management, access request management and compliance management approaches that help agencies increase control over user access, streamline IT compliance processes and reduce the risks of fraud. Our SailPoint solutions help government agencies create, administer and verify role-based access to enterprise applications, while ensuring policy enforcement and enhancing activity-monitoring capabilities.

Conclusion

Technology has transformed government and continues to make life easier for consumers of government services. It has increased access to critical services, reduced processing timelines, expanded citizen engagement and rendered governments more efficient. While progress is being made, state and local agencies still lag behind their private-sector counterparts. Some state and local agencies have demonstrated a great appetite for tech modernization and are making waves applying emerging technologies to improve citizen services. Other state and local agencies have been slow to respond, but opportunities vis-à-vis the technologies listed in this article remain significant. Deploying technology in government does increase security risks; thus, agencies must develop a thoughtful and coordinated approach as they prepare for the new technologies required to realize business value. The key trends and ideas introduced in this article provide a short list of tech priorities that should be top of mind for state and local government leaders in 2020. Our goal is to provide you with pointers that will enable you to better engage with constituents, make informed decisions and do more within the budget and resource constraints we often encounter during our work with state and local government agencies. We hope these ideas will help inform and guide your thinking as you explore opportunities to improve your service offerings to citizens.



About Guidehouse

Guidehouse is a leading global provider of consulting services to the public and commercial markets with broad capabilities in management, technology, and risk consulting. We help clients address their toughest challenges with a focus on markets and clients facing transformational change, technology-driven innovation and significant regulatory pressure. Across a range of advisory, consulting, outsourcing, and technology/analytics services, we help clients create scalable, innovative solutions that prepare them for future growth and success. Headquartered in Washington DC, the company has more than 7,000 professionals in more than 50 locations. Guidehouse is a Veritas Capital portfolio company, led by seasoned professionals with proven and diverse expertise in traditional and emerging technologies, markets and agenda-setting issues driving national and global economies. For more information, please visit: **www.guidehouse.com**.