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13. Abstract

Artificial Intelligence (AI) is increasingly shaping the way state Departments of Transportation (DOTs) approach both research and daily operations. This powerful technology creates new opportunities for improving efficiency, supporting decision-making, and streamlining agency workflows, but it also presents new challenges, including concerns about data bias, accuracy, privacy, and reliability.

This research addresses several questions frequently asked by DOT managers about AI: How is AI being applied by other transportation agencies? What policies may limit or facilitate AI adoption? What does AI adoption look like in practice?

The research catalogs more than 60 AI use cases across five functional areas: agency-wide applications, asset management, engineering and safety, planning and programming, and transportation systems management and operations. Applications are particularly plentiful in asset management, where

computer vision is used for inventory creation and condition monitoring, and traffic operations, where AI supports incident detection, signal optimization, and real-time traffic management. The report also profiles the current AI policy environments of STC member states, identifying common themes requiring approval processes.

This research finds that AI is already in widespread use among state transportation agencies, with AI boosting efficiency and augmenting, rather than replacing, agency staff. The policy environments for AI use vary significantly between states; while no states prohibit AI use, some require AI-based solutions to be vetted and approved by centralized statewide authorities, which can inhibit smaller-scale or exploratory applications. Most state agencies will acquire AI through vendors rather than building solutions in-house, making procurement frameworks a critical governance mechanism.

The report concludes with practical implementation guidance emphasizing the importance of comprehensive strategic planning, phased deployment beginning with low-risk applications, robust data governance, workforce development, and transparency with both staff and the public to build durable trust in AI adoption.

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Louisiana Transportation Research Center

The contents of this report reflect the views of the author/principal investigator, who is responsible for the facts and the accuracy of the data presented herein. In keeping with its subject matter, portions of this report were prepared with the assistance of AI. Any AI-generated content has been reviewed for accuracy and edited for consistency.

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Abstract

Artificial Intelligence (AI) is increasingly shaping the way state Departments of Transportation (DOTs) approach both research and daily operations. This powerful technology creates new opportunities for improving efficiency, supporting decision-making, and streamlining agency workflows, but it also presents new challenges, including concerns about data bias, accuracy, privacy, and reliability.

This research addresses several questions frequently asked by DOT managers about AI: How is AI being applied by other transportation agencies? What policies may limit or facilitate AI adoption? What does AI adoption look like in practice?

The research catalogs more than 60 AI use cases across five functional areas: agency-wide applications, asset management, engineering and safety, planning and programming, and transportation systems management and operations. Applications are particularly plentiful in asset management, where computer vision is used for inventory creation and condition monitoring, and traffic operations, where AI supports incident detection, signal optimization, and real-time traffic management. The report also profiles the current AI policy environments of STC member states, identifying common themes requiring approval processes.

This research finds that AI is already in widespread use among state transportation agencies, with AI boosting efficiency and augmenting, rather than replacing, agency staff. The policy environments for AI use vary significantly between states; while no states prohibit AI use, some require AI-based solutions to be vetted and approved by centralized statewide authorities, which can inhibit smaller-scale or exploratory applications. Most state agencies will acquire AI through vendors rather than building solutions in-house, making procurement frameworks a critical governance mechanism.

The report concludes with practical implementation guidance emphasizing the importance of comprehensive strategic planning, phased deployment beginning with low-risk applications, robust data governance, workforce development, and transparency with both staff and the public to build durable trust in AI adoption.

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Implementation Statement

This report answers three key questions about AI frequently posed by transportation agencies: What are the current practical applications of AI within state transportation agencies? What policies limit or promote AI adoption? How does a state agency implement AI-powered solutions?

The implementation of this research takes two forms: first, in identifying opportunities at one's own agency based on examples of how AI is being used at other transportation agencies; and second, in understanding and applying the practical steps and considerations to support new AI implementation. Users of this research will gain a clearer understanding of what AI is and how it is being used practically in the transportation industry, as well as inspiration to adopt AI within their own agencies.

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Introduction

Artificial Intelligence (AI) is increasingly shaping the way state Departments of Transportation (DOTs) approach both research and daily operations. Recent advances in machine-learning, computer vision, and generative AI offer new opportunities for improving efficiency, supporting decision-making, and streamlining tasks such as document review and traffic analysis. The rapid adoption of these technologies also brings challenges, including concerns about data bias, accuracy, privacy, and reliability.

This research addresses several questions frequently asked by DOT managers about AI:

1. How is AI being applied by other transportation agencies, and what are the ways my agency could be implementing AI?
2. What policies may limit or facilitate AI adoption?
3. What does AI adoption look like?

This project aims to provide the Southeast Transportation Consortium (STC) and its member state DOTs with a clear overview of current AI applications, policies, and strategies for implementation. By synthesizing research and practitioner insights from across the industry, the report supports knowledge sharing, identifies strategies for effective AI adoption, and offers recommendations for scaling successful approaches within transportation agencies.

This report presents the project findings and recommendations. It describes more than 60 current uses of AI within state DOTs, profiles the current AI policies of STC member states, and presents practical advice gleaned from practitioners for AI implementation.

Types of AI

While one often hears about AI in headlines, many forms of AI have quietly been part of daily life for years; examples include voice assistants (e.g., Siri, Alexa), doorbell cameras that can identify objects and people, or self-learning “smart” thermostats.

The AI used today is generally referred to by industry practitioners as "Narrow AI." This is AI designed to perform specific tasks, such as recognizing faces in photos, translating languages, or recommending a route to work. Narrow AI can be divided into two main types: Analytical AI and Generative AI.

Analytical AI focuses on understanding patterns and making predictions. For example, it can convert spoken words into text, recognize images, or forecast the weather. These tools often use neural networks, which are mathematical models loosely inspired by how the human brain works. More advanced versions, called deep learning, use many layers of these networks to find patterns in large and complex data.

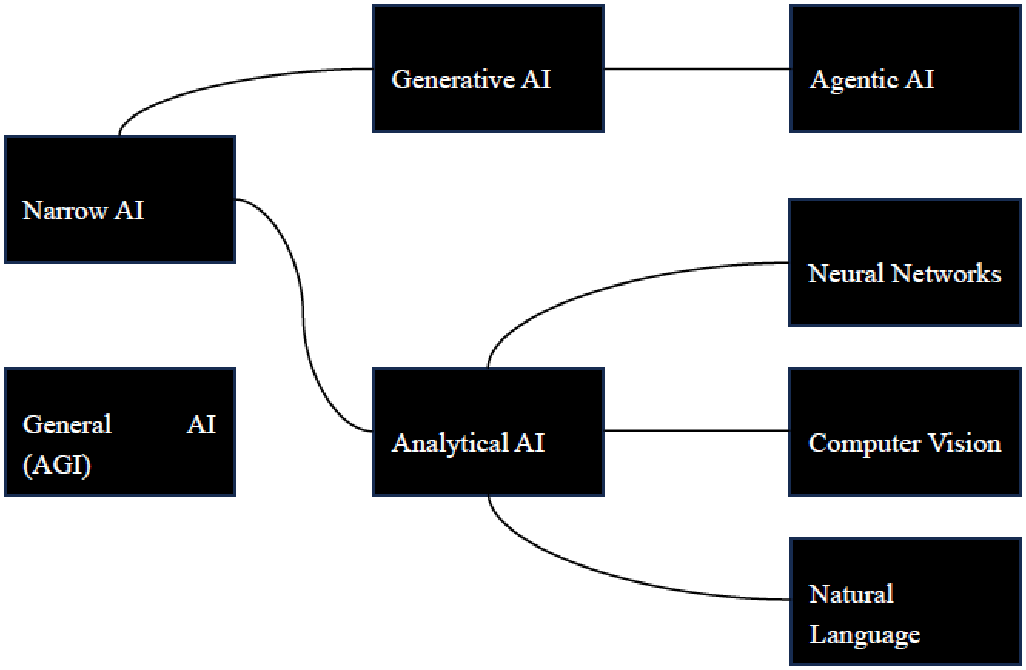
Generative AI creates new content from massive training data and can perform tasks like writing essays, making images, or composing music. Tools like ChatGPT use large language models (LLMs) to generate text that mimics how humans write or speak. These models use a transformer architecture, which helps the AI predict what comes next in a sentence based on the words it has been given.

The next anticipated major evolution in generative AI is Agentic AI, which empowers AI to act as an agent, connecting and operating disparate and complex systems. This is AI that not only makes predictions or generates content but can take actions with real-world impacts. Think of it as an assistant that not only spots problems but also takes steps to solve them. For example, a transportation agency using analytical AI can spot potholes from dashcam footage. Agentic AI could create a work order, plan the repair route, and even adapt the schedule based on staff needs or weather conditions. Over time, the AI agent would learn preferences and constraints, such as which workers have lifting restrictions or which repairs require warm weather, saving supervisors time and improving operations.

Finally, AI researchers are working towards Artificial General Intelligence (AGI), which describes the theoretical evolution of AI in which AI can perform any intellectual task that a human can, including the ability to train new AI. It is theorized that once AI can be used to train new AI, subsequent generations will achieve Artificial Super Intelligence (ASI), a point at which artificial intelligence surpasses human intelligence altogether. Experts disagree on the probable timeline of achieving ASI, with some experts predicting ASI by 2028, while other experts say ASI is technically infeasible and will never be achieved [1].

A summary of these AI categories is provided in Figure 1. This research focused on Narrow AI and how the transportation industry is leveraging these technologies to meet goals and advance its vision.

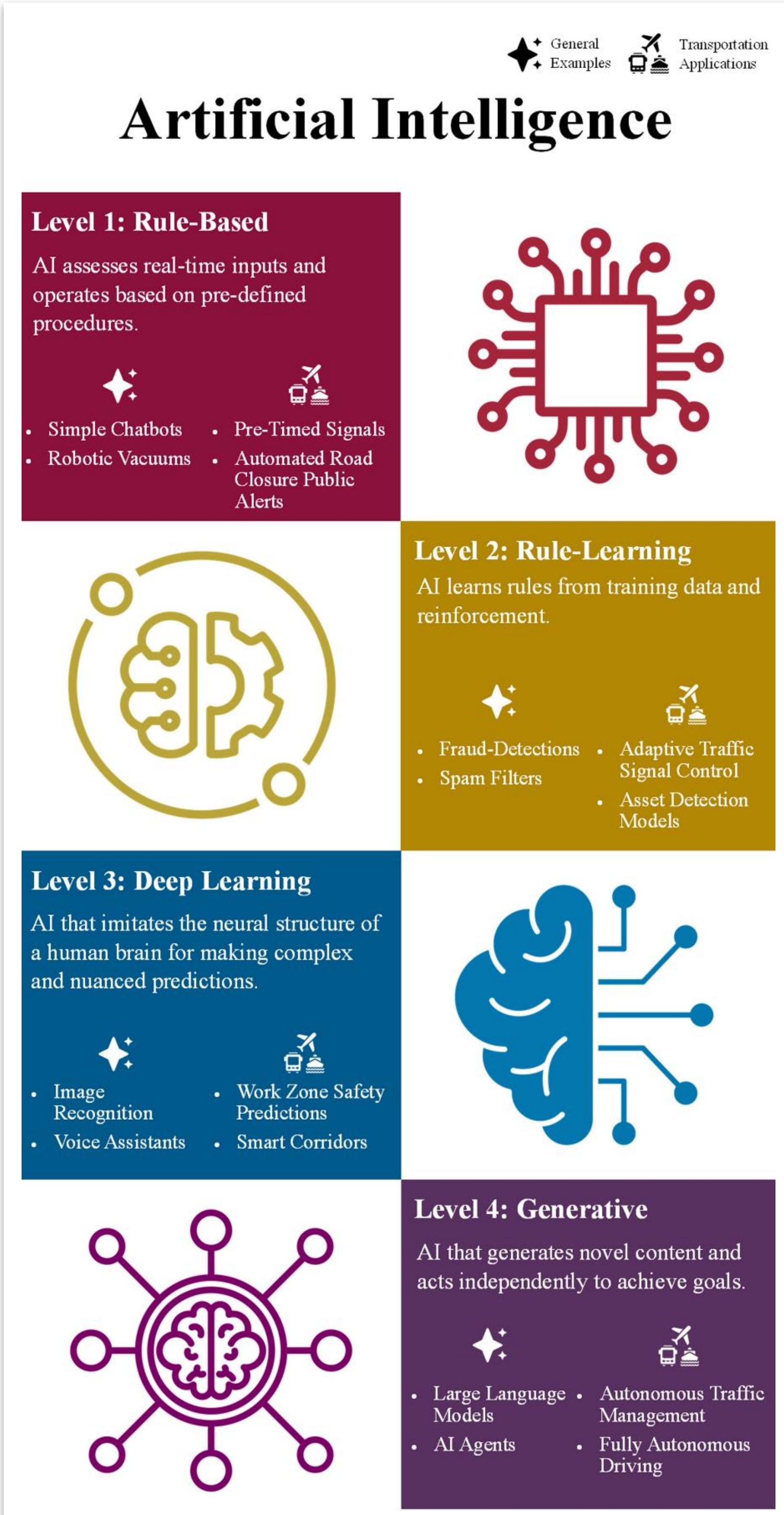
Figure 1. Artificial Intelligence (AI) categories



Hierarchy of AI Technologies

To establish clear boundaries for discussing AI within this report, High Street has developed a structured hierarchy of AI technologies; see Figure 2. This framework, informed by the comprehensive literature review conducted for this research, illustrates the progressive spectrum of AI capabilities. This hierarchy may serve as a practical guide for practitioners when evaluating, selecting, or piloting new AI tools in transportation and related domains.

Figure 2. Hierarchy of AI



Level 1: Rule-Based AI

Rule-Based AI represents the most fundamental tier of AI systems. These solutions operate strictly on predefined rules and logic, applying deterministic procedures to process real-time inputs. These systems excel in environments where conditions are predictable and decision-making can be codified into explicit instructions. Common applications include operating pre-timed traffic signals and automated road closure alerts.

Level 2: Rule-Learning AI

At this level, AI systems advance beyond static rules by learning patterns and decision rules from historical data and reinforcement feedback. Rule-Learning AI adapts over time, improving accuracy and efficiency as it encounters new scenarios. This approach is particularly useful for dynamic operational contexts, such as optimizing traffic signals or predicting maintenance needs based on deterioration rates.

Level 3: Deep Learning AI

Deep Learning AI introduces a significant leap in complexity and capability. These systems leverage artificial neural networks modeled after the human brain to process vast datasets and identify intricate patterns. Deep learning enables nuanced predictions and classifications, making it indispensable for tasks such as image recognition in roadway inspections, natural language processing for voice assistants, and advanced traffic forecasting, as demonstrated in SMART Corridors.

Level 4: Generative AI

Generative AI represents the cutting edge of AI innovation. Unlike previous levels, these systems can create new content. Generative AI can produce novel content and autonomously pursue defined objectives. Common applications include Large Language Models (e.g., Chat GPT or Microsoft Copilot) and accompanying AI agents. In transportation planning, this technology includes autonomous traffic management and fully autonomous driving. This technology may soon begin generating design alternatives for infrastructure projects, drafting technical documentation, or modeling future travel behaviors under various policy scenarios.

Objective

The objectives of the project were to:

- Enhance regional knowledge sharing of AI practices and opportunities;
- Provide a state-of-the-practice overview of AI tools and solutions currently deployed in practice among peer transportation agencies;
- Identify best practices and barriers for AI adoption;
- Recommend strategies for broader AI integration and application; and
- Document and disseminate findings.

Scope

This project synthesized Artificial Intelligence (AI) solutions and implementations in practice by state Department of Transportations (DOTs) or other statewide agencies. Researchers performed a review of relevant state agency policies, practices, and implementation guidance currently available related to AI technologies within the transportation sector. Practitioners were engaged through interviews to supplement the desk research performed. The research team aimed to provide a broad perspective on where and how AI is currently being used at state DOTs in the STC region and beyond, as well as how it can be most effectively deployed while setting guardrails for responsible use.

Methodology

This research project was planned and executed in two phases. The project began with foundational research and a literature review, during which the research team cast a wide net to compile a comprehensive, illustrative card catalog of practical applications of AI. This was followed by a second, practitioner-focused phase that drew out real-world insights on AI policy and implementation.

The research team implemented a targeted approach to this project's literature review, noting that the recently published NCHRP report "Artificial Intelligence Opportunities for State and Local DOTs: A Research Roadmap" reviewed and summarized more than 17,000 papers and journal articles relating to machine-learning and AI [2]. Rather than attempting a broad summary, the research team focused on cataloging real-world applications of AI in practice within state Departments of Transportation (DOTs) and other public-sector transportation agencies. The literature review was organized by agency function. The project panel directed the research team to emphasize traffic operations, roadway maintenance, and engineering applications. The team identified application examples by drawing on its prior work and by searching industry and academic publications, including a scan of ROSA P and National Institute of Standards and Technology paper archives, proceedings from recent workshops and symposia, and referrals from agency practitioners and vendors.

The results are organized into three sections:

1. AI Policy Environment
2. Use Case Catalog
3. Implementation Guidance

These sections are briefly described below.

AI Policy Environment: Many states have established policies or guidance governing AI use. This section summarizes the nationwide state of practice, common themes, and existing policies among the STC member states that practitioners should be aware of when considering their own AI implementation.

AI-related webinars and conferences have identified some state agencies as leaders in developing AI guidance, policies, and roadmaps. Following a review of these resources, the research team catalogued and reviewed resources from STC member states, including DOTs and other agencies. Finally, to gather further details on policy development and implementation, the research team organized a series of interviews with some STC member states. This section culminates in a review of common policy elements and recommendations for how DOT leadership can advance AI projects, given the varying state AI governance structures.

Use Case Catalog: The research team identified existing AI implementations within state DOTs. For each identified use case, the team cataloged a brief description, the agency functional area, the AI technology used, an order of magnitude estimate of implementation costs, the use case maturity, relevant vendors, a list of agencies known to have implemented the same solution, and at least one point of contact.

The research team ultimately cataloged some 60 use cases. A selection of these use case summaries were presented to the panel at an in-person meeting in Billings, MT, on July 14, 2025, at which the panel provided direction to focus the Phase 2 practitioner outreach on AI policy and implementation considerations.

Implementation Guidance: In addition to detailing existing and planned AI policies for state DOTs, the research team documented guidance on pragmatically implementing AI technologies at these agencies. This synthesis was performed by integrating insights from national recommendations, agency experiences, and detailed project profiles. The research team surveyed STC members to identify which cataloged AI use cases were most interesting to the panel, then reached out directly to eight DOTs that sponsored the top-ranking AI projects, based on the survey results, to gather information on costs, risks, and implementation details. The team also identified best practices and effective implementation frameworks drawn from presentations or discussions with agencies that have already adopted significant AI solutions, including the Texas and North Carolina DOTs. Through this comprehensive, hands-on approach, the research team compiled actionable strategies, risk management techniques, and real-world examples of how AI technologies can progress from initial ideas to actual projects or programs.

AI Policy Environment

The risks associated with AI accompany the benefits it offers. State policy-making bodies and agencies have begun passing executive orders, policies, and implementation plans to address these risks and place guardrails around AI deployment. This section summarizes the current policy environment within each STC member state and analyzes crosscutting themes in nationwide AI governance that STC agencies can use when establishing their own internal policies.

The research team began by reviewing industry resources and STC member state policies and guidance to identify key themes. Next, interviews and an evaluation of STC members' stated guidance structure helped identify the impact these policies have on DOTs' progress in AI projects. This review section analyzes themes across state policies and provides a high-level summary of which STC members have policies and guidance in place.

NIST AI Risk Management Framework

The National Institute for Standards and Technology (NIST) published the *AI Risk Management Framework* (AI RMF) in 2023 to "to better manage risks to individuals, organizations, and society associated with [AI]" [3]. Multiple states reference and employ this AI RMF in their policies.

The AI RMF is an adaptable, voluntary, and non-sector-specific framework designed to increase responsibility in developing and implementing AI. The document achieves this in two parts, first evaluating AI risks and outlining trustworthy AI and next introducing a framework that agencies can employ to address the risks. The NIST RMF defines risk as a measure of the potential for undesirable outcomes. It reflects the possibility, uncertainty, and exposure that exist before, during, and after system operation. Therefore, risks can exist even when no harm has occurred.

State DOT leadership should review the AI RMF to better understand how to ensure their staff and projects employ AI responsibly.

Key Components of AI Policies

AI Risks and Harms

Harm is defined as the negative outcomes that can come about from both risk (i.e., unintentional harm) and misuse (i.e., intentional harm). The primary purpose of AI policies and guidance is to address the risks of AI. Industry and policy research have identified the following risks associated with AI use:

- **Validity & Reliability Risk:** inability to provide desired outputs or outcomes which are timely, accurate, and properly generalizable (i.e., able to perform under different circumstances).
- **Safety Risk:** endangerment of human life, health, property, or the environment.
- **Security & Resilience Risk:** insufficient protection against attacks and the ability to return to a stable state after disruption.
- **Accountability & Transparency Risk:** lack of clarity behind the decisions regarding model design, data selection, and implementation (i.e., transparency), as well as the inability to verify correct function and application (i.e., accountability).
- **Explainability & Interpretability Risk:** inability to explain the AI model or properly interpret the output, including the context in which it should be applied.
- **Privacy & Data Governance Risk:** inappropriate data use, unintended inference, or loss of control over sensitive information.
- **Bias Risk:** while contextually dependent, producing outputs with unequal or inconsistent impacts, such as embedding, amplifying, or spreading uneven patterns in data or modeling choices. These biases can be systemic, computational and statistical, and human-cognitive.
- **Risk of Overreliance:** relying too heavily on AI and failing to apply judgment, expertise, or common sense when implementing AI and reviewing output.

Intentional misuse encompasses both failing to adhere to AI policies and more malicious actions, such as the use of deepfakes in political ads, fraud, or surveillance. Regulations covering intentional misuse are beyond the scope of this research. These rules have generally been promulgated separately from policies directing the beneficial use of AI by state agency staff.

While many statewide policies have been established, the liability and accountability landscape for AI is still largely uncharted territory. When an AI-assisted decision contributes to traffic injuries or produces a discriminatory outcome, the legal frameworks for assigning responsibility are still being developed. Agencies should carefully consider where they are comfortable deploying AI in consequential decisions versus using it for internal efficiency gains with human oversight.

Defining AI

AI policies often include a definition. Some states, such as Georgia, employ a general definition: "a machine-based system that can, based on a given set of human-defined objectives, make predictions, recommendations, or decisions influencing a real or virtual environment." A general definition like this could encompass advanced AI models, such as generative AI (GenAI), as well as simpler machine-learning models. The specificity of the definition becomes important in governance, as any model a DOT may want to employ could be labeled AI and may require review by a separate agency.

Some agencies provide guidance for specific types of AI. For example, North Carolina has a "Publicly Available Generative AI" that guides the use of AI products that have not undergone the procurement process, such as ChatGPT, Grok, or other publicly available AI tools. Specifying the types of AI and acknowledging how each may affect how people interact with tools can help ensure staff are properly trained to prevent risks and misuse.

AI Inventory

State governments often begin AI policy development with an AI inventory, surveying agencies to identify the tools employees are using, how often they use them, and for what purposes. This inventory gives leaders a clear picture of current AI adoption across state agencies. For example, Alabama conducted an inventory as part of its Generative AI Task Force Final Report, which documented the platforms, vendors, capabilities, and safety practices in use throughout the state. These insights enable policymakers to assess the level of adoption maturity across agencies and align standards and procedures with current AI use.

Human in the Loop

Nearly all statewide AI policies include a "human in the loop" (HITL) requirement, which ensures human involvement and review when using AI systems. This requirement prohibits AI systems from acting autonomously and making real-world decisions without human review and approval. HITL can include controlling the types of data AI can access, reviewing outputs for inaccuracies or biases, and ensuring that an AI is needed and used correctly.

While most AI systems currently require human involvement due to technological limitations, HITL requirements may become more significant and binding as AI agents become more widespread. Virginia's statewide policy, for example, requires HITL when "AI Systems are integrated into Mission Essential and Business Critical business processes." HITL requirements may serve as a "bridge" policy toward a future in which AI agents and tools are better trusted and established, but they are an essential feature of today's AI policy landscape.

Data Security, Ownership, and Management

Data governance for AI can include requirements for how data is used, specifically ensuring it is handled in accordance with privacy and sensitivity standards and that management, ownership, and accuracy responsibilities are specified. States approach these requirements in different ways. Some policies focus on data sensitivity controls, ranging from prohibiting any use of sensitive data with AI services to limiting the use of sensitive data to specific state-provided tools or services. Other states require that sensitive or copyrighted data not be disclosed by AI outputs. For example, Tennessee's statewide policy includes a data classification designation table that categorizes data by sensitivity, with corresponding actions that a user must follow before using the data with AI [4].

Other states emphasize broader AI data governance specifications. For example, Virginia requires agencies and AI system suppliers to create plans for data storage and maintenance, specifies the data formats permitted for inputs and outputs, and mandates the integration of AI systems into existing data platforms. Virginia also states that agencies are responsible for documenting data collection, transformation, and processing to ensure accuracy [5].

Some states address data ownership within AI vendor contracts. Georgia specifies that agreements with AI providers must clearly define data ownership, noting that data may be used in model development, created during intermediary processing steps, or included in system outputs [6].

Finally, agencies with decades of inconsistently formatted, siloed, or poorly documented data will find AI tools underwhelming—or worse, confidently wrong. This underscores the urgency of making foundational investments in data standardization, documentation, and governance.

Staff Training

Many states recognize the need to prepare staff to correctly use AI, especially considering its evolving state. Some STC states provide a variety of training, such as North Carolina's AI Accelerator, which provides links to courses offered by industry and academia. Other states, such as Georgia, require the training for staff: "[Commonwealth Office Of Technology] shall mandate a minimum level of AI training for users and agencies responsible for the business processes that are incorporating generative AI" [6]. In either case, preparing staff is essential to ensure AI is used effectively and responsibly, and that risks, such as data privacy issues, are minimized, especially as the technology continues to evolve and requires ongoing training. Workforce readiness is discussed in greater detail in the Implementation Guidance section.

Governance

Statewide AI policies often establish governance requirements that agencies, including DOTs, must follow before adopting, procuring, or deploying AI systems. While states vary widely in their approach, many have created decision-making bodies and oversight roles. They also commonly require processes such as risk assessments, CIO or technology-authority approvals, enterprise data-governance alignment, and registration or reporting of AI tools. Agencies must navigate their state's specific governance processes to ensure that AI efforts align with broader statewide expectations. Table 1 provides a summary of state policies and governance as of November 2025.

Table 1. State AI Policy Summary

No Statewide Policy	Non-Binding Statewide Guidance	Binding Statewide Policy, Prior Approval Not Required	Binding Statewide Policy, Approval Required
• Alaska • Arkansas • Florida • Hawaii • Idaho • Iowa • Michigan • Mississippi	• Illinois • Oregon • South Dakota	• Alabama • Arizona • California • Connecticut • Delaware • Kansas • Maine • Maryland	• Colorado (AI risk assessments and approval from OIT required) • Georgia (agencies to report all AI usage to the GTA and receive approval to procure any AI tool) • Kentucky (fairness and bias, privacy, security, and training evaluation required)

No Statewide Policy	Non-Binding Statewide Guidance	Binding Statewide Policy, Prior Approval Not Required	Binding Statewide Policy, Approval Required
• Missouri • Nebraska • New Mexico • Rhode Island • South Carolina • Vermont • West Virginia • Wisconsin • Wyoming		• Massachusetts • Minnesota • Montana • Nevada • New Hampshire • New Jersey • New York • North Carolina • North Dakota • Pennsylvania • Texas • Utah • Washington • Washington, D.C.	• Indiana (all AI use requires approval, readiness/maturity assessments, and annual re-evaluation) • Louisiana (all AI-enabled software, applications, tools, and services require OTS review) • Ohio (AI Council approval for GenAI) • Oklahoma (security review required) • Tennessee (review/approval required by state AI council) • Virginia (requires four levels of approval before AI deployment)

State-Level Summary of AI Policies

This section provides an overview of officially adopted statewide policies governing the use of artificial intelligence, especially generative AI, across STC member states. A summary for the remaining states is included in Appendix A. For each state with a policy in place, this section identifies the state agency or authority responsible for issuing the policy and offers a summary of its major provisions. Hyperlinks to all policies are provided in the report references. Statewide AI policies and standards are most commonly issued by a statewide IT office, although in some cases they stem from a governor's executive order or legislative action. Many states have also convened task forces to study AI and produce recommendations; while most task force outputs are advisory, some have informed executive orders or new statutes.

Alabama

Statewide AI Policy: The Alabama Secretary of Office of Information Technology (OIT) passed the *Artificial Intelligence Governance Policy, Al-GV-P1*, in January 2025. The policy is primarily based largely on the NIST AI RMF and outlines precautions and actions that the state must take to mitigate the risks of AI. Agencies can pursue procurement and implementation of AI, but they must adhere to the risk management outlined in the policy and any additional standards and procedures developed by the OIT [7].

AI Policy Governance: Agencies must adhere to the policy, which may include periodic reporting to the OIT demonstrating that AI development, deployment, and use comply with the policy. It also instructs the state to create a governance or oversight board, define risk tolerance levels, and implement additional AI security and standards.

Arkansas

Statewide AI Policy: As of November 2025, Arkansas had not passed a statewide AI policy. The Arkansas legislature passed Act 848 (HB 1958) on April 17, 2025, requiring each public entity to adopt policies on technology, cybersecurity, and AI/automated decision-making tools. The act mandates human-in-the-loop final decisions. The Act also requires the development of employee training on AI [8].

AI Policy Governance: No separate review or approvals identified to develop or implement AI solutions as of the time of writing.

Florida

Statewide AI Policy: No statewide Florida policy governing AI use by state agencies has been identified. However, the Florida DOT has adopted a concise AI Policy (Topic No. 010-325-065-b, Sept. 9, 2025) that requires human-in-the-loop use, disclosure of use, and review of AI outputs to ensure they are free of inaccuracies and sensitive information [9].

AI Policy Governance: No separate review or approvals were identified to develop or implement AI solutions.

Georgia

Statewide AI Policy: Georgia Technology Authority published a statewide security policy, *Artificial Intelligence Responsible Use Guidelines (GS-23-001)* [6], in October 2023 and a security standard, *Artificial Intelligence Responsible Use (SS-23-002)* [10], in December 2023. The policy and standard collectively provide detailed instructions for the responsible use of AI, including preventing AI risks, ensuring the review of outputs, and outlining the approvals required for AI use.

AI Policy Governance: The standard requires agencies to report all AI use to the GTA and to obtain the GTA's approval before procuring any AI tool. The standards required for approval include adhering to policies and the NIST AI RMF, as well as other explicit checks and assurances.

Kentucky

Statewide AI Policy: Kentucky's Commonwealth Office of Technology (COT), Office of the Chief Information Officer (CIO) published *CIO-126: Artificial Intelligence Policy* in October 2025 [11]. The policy requires HITL review, disclosure of AI-based content, and explicit disclosure whenever AI is used to assist in making a consequential decision. It restricts the use of sensitive or confidential data in AI tools and requires agencies to follow existing state data governance laws, including submitting any AI-enabled software or services to COT for review before use. The policy also mandates user training to ensure staff understand the proper use, limitations, and data-security responsibilities when working with AI.

AI Policy Governance: Kentucky's policy outlines various checks that the COT must perform when employing AI. This includes evaluating fairness and bias, privacy, security, and training. When procuring and implementing AI, the Kentucky Transportation Cabinet should work with the vendor to document a response to all requirements outlined in the policy.

Louisiana

Statewide AI Policy: Louisiana Division of Administration, Office of Technology Services passed the *Artificial Intelligence Acceptable Use Policy*, which became effective September 2025. This enterprise policy sets guidelines for responsible, ethical, and effective use of AI, including generative AI. It aims to ensure that AI use protects privacy and security, maintains public trust, prevents bias and discrimination, and complies with laws. The policy applies to all state agencies under OTS and covers any AI technologies (e.g., machine-learning systems, GenAI models, etc). It reinforces that AI use must align with existing IT processes and that agencies should consult OTS if any conflict arises with other policies [12].

AI Policy Governance: The policy states that agencies must submit all AI-enabled software, applications, tools, and services to OTS for review before procurement or implementation. It also recommends that agencies work with their assigned Agency Relationship Manager to understand the submission process.

Mississippi

Statewide AI Policy: Mississippi Department of Information Technology Services (Mississippi ITS) published the *Acceptable Use Policy for Artificial Intelligence* on November 25, 2025 [13]. The policy applies only to Mississippi ITS staff, not other agencies.

AI Policy Governance: The Mississippi ITS policy is not binding, so it does not restrict Mississippi DOT AI use. Rather, it acts as suggested language that other Mississippi agencies should consider and modify when developing their own policies.

North Carolina

Statewide AI Policy: North Carolina's AI policy is named the *North Carolina State Government Responsible Use of Artificial Intelligence Framework* and was published in August 2024 [14] [15]. The AI Framework provides principles, practices, and guidance to help agencies leverage AI while reducing privacy and data-protection risks, particularly when using certain types of AI and handling sensitive data. The AI Framework applies to all state agencies and all uses, including standalone models and AI within other tools or software.

AI Policy Governance: The policy stipulates that, while it does not impair agencies' overall authority or functions, it requires agencies to adhere to it when making AI-related decisions. Therefore, agencies retain the ability to make decisions as long as the risk of AI is assessed and mitigated. An interview with North Carolina DOT staff revealed that agencies are developing governance committees to help evaluate AI solutions and ensure they are needed and implemented in line with policy. The committees can engage the Enterprise Security and Risk Management Office and the Office of Privacy and Data Protection to seek guidance during evaluation.

South Carolina

Statewide AI Policy: No official statewide South Carolina policy was found as of November 2025. However, South Carolina DOT adopted a brief *Artificial Intelligence Use Policy (Directive Number 58)* on October 14, 2024, that provides general guidelines when using AI [16]. This includes instructions on using judgment and caution when utilizing AI-generated content, not sharing restricted or confidential data, and being aware of biases and inaccuracies in AI-generated content.

AI Policy Governance: No separate review or approvals are defined in the policy for developing or implementing AI solutions.

Tennessee

Statewide AI Policy: The Tennessee Department of Finance and Administration published the *Enterprise Generative AI Policy* in October 2024, informed by the NIST AI RMF. The Enterprise AI Policy requires the disclosure of AI tool usage, prohibits the entry of personal information on platforms not managed on state-controlled servers, and ensures that state data is not used to train non-state generative AI models. The policy states that all AI solutions must undergo review and approval and requires users to review outputs for risks, including bias, accuracy, and intellectual property compliance [4].

AI Policy Governance: The Enterprise AI Policy applies specifically to generative AI. If Tennessee DOT wishes to employ GenAI, the agency must first receive approval through the state-authorized vendor procurement process.

Virginia

Statewide AI Policy: The Virginia Information Technologies Agency published the *Enterprise Architecture Standard (EA-225)* [17] in November 2023 and the *Policy Standards for the Utilization of Artificial Intelligence by the Commonwealth of Virginia* in June 2024 [18]. Together, the standard and the policy standards outline ethical use guidelines, mandatory approval processes for any AI deployment, and requirements for human review of AI decisions. EO 30 forces agencies to get explicit approval and follow strict protocols for AI projects, thereby ensuring accountability [19].

AI Policy Governance: The policy standards require Virginia DOT (VDOT) to undergo a series of approvals. First, VDOT must register the AI system and obtain approval from its IT representative and information security officer (ISO). Once approved, the use case and appropriate documentation is reviewed by VITA and the CIO of the Commonwealth. Finally, the Secretary of the agency shall approve or disapprove, in consultation with the Governor's Chief Counsel, considering the ethical issues involved in the AI systems.

West Virginia

Statewide AI Policy: West Virginia has no official statewide policy published as of November 2025. The state does have the Statewide AI Task Force, created by *House Bill 5690* in 2024 [20]. The Task Force is focused on exploring AI's economic opportunities and impacts and recommending governance structures [5].

AI Policy Governance: No specific AI governance has been identified as of November 2025.

Texas[1]

Statewide AI Policy: The Texas Legislature passed the *Texas Responsible AI Governance Act (TRAIGA, HB 149)* in June 2025 [21]. TRAIGA, effective January 2026, imposes requirements on both private-sector AI and state agencies. Notably, it mandates that state agencies disclose to citizens when an AI system is interacting with them, prohibits agencies from using AI for identifying individuals via biometric data without consent, and bans any AI "social scoring" systems in government. The law also forbids developing or deploying AI intended to cause self-harm, commit crimes, or violate constitutional rights. Separately, TxDOT published the *Artificial Intelligence Strategic Plan 2025–2027* in December 2024 [22]. Texas DOT developed its own AI Strategic Plan to integrate AI into transportation operations. The Texas DOT plan outlines a vision, principles, and a three-year roadmap for adopting AI in ways that improve safety and efficiency, while emphasizing ethical and human-centric use. It stresses protecting systems and users, maintaining human oversight in AI-driven decisions, and aligning with the state's responsible AI framework. This DOT-specific plan dovetails with Texas's statewide policy by operationalizing AI innovation within the agency in a controlled, transparent manner [23].

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[1] While not a STC member state, Texas regularly collaborates with the STC.

AI Policy Governance: TxDOT's autonomy to develop and implement AI is protected in the TRAIGA, which states that agency operations cannot be interfered with or overridden.

Federal Executive Orders

On December 11, 2025, President Donald Trump signed an executive order titled "Ensuring a National Policy Framework for Artificial Intelligence" aimed at curbing and discouraging state-level AI regulation in favor of a "minimally burdensome" national approach. The order grants the U.S. Attorney General the authority to sue states to overturn existing laws restricting AI use or application, or to condition the receipt of federal broadband infrastructure funds on the elimination of such laws. As of the time of writing, the legality and impact of this executive order remain to be determined [24].

AI Use Case Catalog

The research team documented a sampling of specific practices that state DOTs have implemented to leverage AI technologies or solutions. The discussion of practices is organized by the typical DOT office structure and highlights how AI can be integrated into the following different groups within state DOTs.

1. Agencywide Applications
2. Asset Management
3. Engineering, Safety, and Design
4. Planning, Programming, and Procurement
5. Transportation Systems Management and Operations (TSMO)

AI use cases are defined for each of these groups, and real-world examples are provided to document how the AI solution has been or is planned to be implemented. Additionally, contact information for personnel involved with the project example cited is provided when that information was publicly available.

Use Case Index

Agencywide Applications

Agency functions, including research, preparation of public-facing materials, and project management, are performed across several, if not all, DOT departments [25]. In 2025, ICF surveyed 200 federal IT leaders to gauge AI adoption throughout federal agencies. According to their reporting, 41% of agencies were running small-scale pilot projects, and 16% of respondents had begun scaling AI efforts across their agencies [25]. ICF reported several focus areas for AI within federal agencies, including "data analysis for better decision making" and "project management and resource planning [26]." These broad applications aim to streamline workflows, encourage information sharing, and foster consistency in operations, paving the way for advanced solutions like AI-powered chatbots and virtual assistants to support both staff and public interactions.

User Guides and Chatbots

Users seeking information on topics of interest typically browse knowledge bases or websites to find what they need. Individuals may find what they are looking for, but the process of finding the information can be time-consuming or even lead the user to out-of-date or irrelevant information. AI-powered chatbots aim to solve these problems by serving as intermediaries between the user and the knowledge base, efficiently scanning websites or internal documents to find relevant information. These technologies can free up limited staffing resources for more complex cases and provide a more seamless user experience.

Generative AI User Guide Assistant | City of Dallas, TX

Several departments of the City of Dallas, TX, including ITS and Planning and Development, have implemented a Generative AI agent that tracks and summarizes screen and mouse movements to "assist in the creation of user guides, testing, and training documents." The staff can review the guidance and share it with coworkers; the agent, when initiated, can then use on-screen indicators, such as orange boxes or moving mouse graphics, to assist staff in navigating multiple applications to complete tasks [27].

AI Transcriptions | State of Alaska and City of San Jose, CA

The State of Alaska is partnering with Microsoft to implement Microsoft AI features to all State of Alaska employees. Among those features is AI-enabled transcription capable of generating notes and follow-up tasks for meeting attendees [28]. Additionally, the City of San Jose, CA, uses Wordly to transcribe and translate live meetings for constituents. The system can be integrated with various meeting software and can translate between more than 40 languages [29].

Policy and Procedure Consolidation | City of San Francisco, CA

The City of San Francisco's City Attorney's Office (CAO) partnered with Stanford RegLab to develop and deploy an AI tool that "analyzes statutes and flags opportunities for reforms." Within the first year of deployment, the CAO used this Deep Learning tool to introduce an ordinance proposing the "elimination or consolidation" of 36% of reporting requirements across city departments. City Attorney David Chui noted that the tool's ability to sift through the nearly 16 million words of the city's municipal codes and regulations "will free up staff time to focus on core service delivery, particularly during challenging budget times" [30].

Constituent Chatbot Tool | Sullivan County, NY

In 2022, Sullivan County, NY, partnered with Google to develop and implement a Rule-Based virtual agent on their website. The county identified commonly asked questions from its 78,000 residents and used its available resources to create a chatbot capable of answering basic questions from citizens, freeing its limited staff to address more complex constituent concerns. Since its implementation, the county's DMV has noted "a more than 56% reduction in call volume" [31].

Multilingual Virtual Assistant | Minnesota Department of Public Safety (MnDPS)

In 2023, Minnesota's Department of Public Safety partnered with Google to launch a multilingual virtual assistant that can interact with customers who speak English, Hmong, Somali, and Spanish. This Rule-Based assistant can answer basic questions and provide individual records, such as customer driver's license statuses and statuses of customer plates and titles [32]. Customers can also update their insurance through the chat feature. The chat is currently text only, but MnDPS plans to implement a speech version in the future [33].

Chatbots with Agency Knowledge or Policy | Minnesota DOT (MnDOT) and Massachusetts DOT (MassDOT)

MnDOT partnered with Citibot to deploy a chatbot capable of answering questions on both external- and internal-facing agency websites [34]. The agency is also currently piloting a Generative AI-powered chatbot to answer design questions about Manual on Uniform Traffic Control Devices (MUTCD) standards and requirements. Additionally, MassDOT created a chatbot for DOT engineers to "navigate standard operating procedures that govern highway projects." The agency also created a chatbot trained on organizational onboarding procedures and policy manuals to assist new employees [35].

Permitting Chatbot Assistant | City of Portland, OR

In 2025, the City of Portland, OR, launched an AI-driven chatbot capable of providing permitting assistance to customers. The Rule-Learning bot, trained with data from over 2,400 real interactions with the city's permit help desk, was developed to help customers better navigate the permitting system by connecting them with city permitting specialists. The chatbot is currently under pilot [36] [37].

Generative AI for Tasks

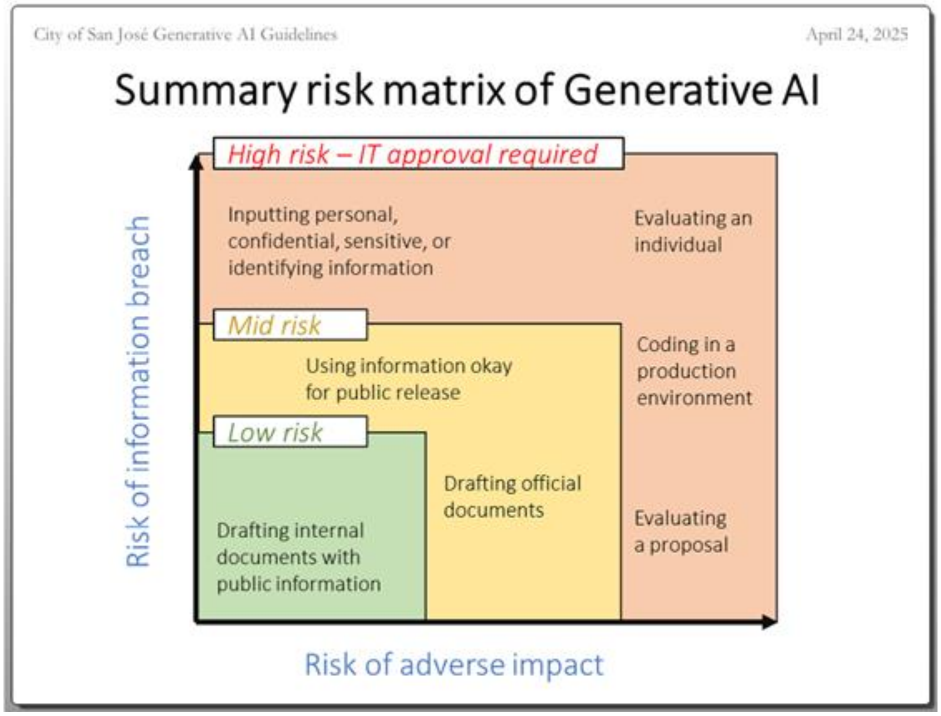
Generative AI is already providing opportunities to assist and augment staff capabilities. Staff may already have access to tools such as ChatGPT and Microsoft Copilot, and agencies across the country are increasingly discovering ways AI can help them become more productive by streamlining repetitive or time-consuming tasks. New and innovative applications for Generative AI are rapidly emerging across the public sector, emphasizing AI's growing potential to reshape how everyday work is accomplished.

Generative AI in Production | City of San Jose, CA

In June 2024, the City of San Jose, CA, established an AI governance structure that allowed city employees to "utilize Artificial Intelligence and AI systems while providing the necessary safeguards for purposeful and responsible use." In the year since the city published this policy, employees have had opportunities to use Generative AI applications in their day-to-day operations, while also being able to propose new uses to the city's Digital Privacy Office (DPO) for review [38].

Staff members can create accounts specifically for city-related work using their city email address or a shared account if they are working within teams or divisions. Staff members are also given freedom to use AI based on the risks of information breach and/or adverse impact of the AI application, which the city has outlined in Figure 3 [29]. The city has not yet released any results on adoption rates across the workforce, but the DPO maintains a list of pre-approved GenAI applications that employees can use.

Figure 3. Summary risk matrix of GenAI (Source: City of San Jose, CA)



Generative AI Pilot with ChatGPT | Commonwealth of Pennsylvania

Between March 2024 and March 2025, Pennsylvania conducted a pilot program encouraging employees to explore Generative AI technology. At the beginning of the pilot, the Commonwealth provided employees with onboarding, OpenAI-led training, and training on fundamental aspects of General AI. Throughout the pilot, Pennsylvania engaged employees with ongoing support opportunities, scoping sessions, and targeted support to employees with use cases of interest. The employees, with ChatGPT Enterprise as a resource, spent the following year using GenAI in their day-to-day work [39] [40].

The pilot included 14 agencies across the state who used ChatGPT to "[tackle] a variety of work tasks." In their breakdown of use cases, Pennsylvania noted the largest number of uses in the following categories:

- Writing assistance, text generation, drafting emails (36% of use cases)
- Research, idea exploration, learning new topics (27% of use cases)
- Summarizing meeting notes or other texts (13% of use cases)

The Commonwealth published a report detailing the pilot's outcomes and insights. The main findings from the pilot were that most employees described their experience using ChatGPT as work as “very positive” and that ChatGPT was not found to be a substitute for the nuance and experience of current employees [40]. The Commonwealth plans to convene its Information Technology heads and other agency leaders to discuss how to adopt AI responsibly [40].

Asset Management

Asset management describes agency activities aimed at maintaining its resources and infrastructure in a state of good repair. Key asset management activities are detailed below.

- **Creating asset inventories.** State DOTs often create and update asset inventories, whether to fill gaps that were previously installed but not inventoried, such as guardrails or striping, or to enhance prior inventories (e.g., replacing a prior centerline roadway inventory with a geometric inventory corresponding to the actual paved area). AI has made creating these inventories far more cost-effective, especially through the application of computer vision to roadway and aerial imagery to identify objects.
- **Monitoring asset condition.** Asset condition is a key attribute of most inventories. Agencies attempt to maintain up-to-date condition information about their assets, such as through the use of profiler vans for pavement, manual inspection for bridges, or reflectometer tests for signs. AI is making it cheaper and easier to capture and update asset condition information, such as using a dash-mounted smartphone to measure pavement distress rather than an extremely specialized, expensive profiler van.
- **Asset management decision support.** Asset management groups typically plan capital investments to improve deteriorating or obsolete assets. For decades, enterprise asset management systems have used machine-learning models to predict asset deterioration and make treatment recommendations. AI can enhance the predictive power and accuracy of these models.
- **Estimating project costs.** Cost estimation may rely on standardized lookup tables or regression models. These conventional approaches are effective for basic budgeting but may struggle to adapt to nuanced variables or unexpected changes in project parameters.

Integrating AI into cost estimation enables the analysis of a broader range of datasets, including real-time construction cost trends, maintenance histories, and site-specific conditions, resulting in more dynamic and accurate predictions. AI's impact on these activities is described in greater detail in the sections below.

Asset Inventories

Creating an inventory of assets is a foundational step for maintaining assets in a state of good repair. Historically, inventories have been established by DOT staff manually entering entries into an asset database via a windshield survey (i.e., physically driving roadways and noting the locations of roadway elements) or via virtual surveys using an agency's roadway video log or aerial imagery. Advances in AI-powered computer vision technology have enabled AI algorithms to quickly and reliably identify objects in imagery and LiDAR data, making it far faster and cheaper to create and maintain inventories of visible roadway elements.

Like all models, computer vision models must be trained using example data. The effort to create example data and the computation required to train computer vision models can be expensive and time-consuming; however, once a model is trained, it can be applied to a virtually limitless quantity of images at a very low cost. As such, the most successful applications of AI in creating asset inventories rely on vendors who have invested the time and effort to train models that can be broadly applied. Many agencies have collaborated with external partners to develop customized AI models for asset inventory tasks. However, these pilot projects often struggle to move beyond the initial testing phase. The primary challenges include the significant upfront investment required to train highly accurate models, as well as the difficulty of successfully implementing and integrating them within a DOT's complex operational environment.

Computer vision can be applied to three primary ways: roadway-level imagery, aerial imagery, and LiDAR. Roadway-level imagery includes dashboard cameras or smartphone images. These models can provide detailed, ground-level views of signs, pavement conditions, and roadside assets, enabling precise asset inventory and condition assessment.

Aerial imagery typically uses high-resolution imagery (e.g., 30 cm or better) captured by satellites or drones. It enables cost-effective data collection over large areas by identifying and tracking features such as pavement markings, signage, and infrastructure conditions across an entire network. For example, considering the data required for the Model Inventory Roadway Elements (MIRE), one vendor can provide a list of roadway elements based on the imagery outlined below.

- Access Control
- Surface Type
- Number of Through Lanes
- Lane Width
- HOV Lanes
- Presence/Type of Bicycle Facility
- Shoulder Width
- Sidewalk Presence
- Curb Presence
- Curb Type
- Median Type and Width
- Intersection Type
- Parking Presence
- Roadway Lighting
- Number of Approach Through Lanes
- Right-Turn Channelization
- Unique Interchange Identifier
- Interchange Type
- Ramp Length and Details
- Ramp Acceleration Lane Length

AI can also be paired with Light Detection and Ranging (LiDAR). LiDAR uses laser light to measure distances by timing how long it takes for the light to reflect off objects, creating a 3D model of the surrounding environment, called a point cloud. AI models can then be trained to detect specific objects, such as signs, curbs, and potholes, in the resulting point cloud environment. This provides a quick and accurate means of developing asset inventories. However, employing LiDAR to inventory transportation networks can be costly, as vehicles must be driven or drones flown to collect the necessary point cloud data.

Crowdsourcing Asset Conditions Using Dashcams | Hawaii DOT

HDOT is partnering with Nextbase Dash Cams to provide 1,000 dashcams to Hawaii residents in an effort to crowdsource roadway conditions. These dashcams capture imagery and geospatial data that is automatically uploaded to the cloud, analyzed using Rule-Learning AI from Blyncsy, and referred to HDOT when attention or repair is recommended. Additionally, participants can use these dashcams to report unsafe driving incidents through an accompanying mobile application.

High-Definition Mapping of Transportation Features | Illinois DOT

IDOT employed Ecopia and its Rule-Learning AI system to build a detailed map and accompanying inventory using high-resolution satellite images collected from its partners. The data includes roads, sidewalks, crosswalks, and other roadway elements, as well as transportation features such as turning lanes, medians, stop lines, and more. This data inventory provides IDOT and partnering Metropolitan Planning Organization (MPOs) with a complete view of the region's land use and pedestrian mobility network and can help inform asset management evaluations [41].

Developing a Statewide Crosswalk Inventory Using Artificial Intelligence and Aerial Images | Florida DOT

The paper "Traffic Data On-the-Fly: Developing a Statewide Crosswalk Inventory Using Artificial Intelligence and Aerial Images (AI2) for Pedestrian Safety Policy Improvements in Florida" presents a framework for public roadways using aerial imagery and Rule-Learning AI. The model was developed to map Florida crosswalks.

While the paper discusses potential improvements to pedestrian safety policies by identifying high-risk locations and implementing appropriate safety measures, the framework also assists transportation agencies in planning and managing crosswalks more effectively, determining where new crosswalks are needed and where existing crosswalks require maintenance or upgrades. The framework developed in the study could be extended to create inventories for other roadway features, such as school zones, intersections, and auxiliary turning lanes, with additional training data [42].

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Guardrail Inventory | Nebraska DOT

When a specific type of guardrail attenuator was recalled due to safety issues, NDOT hired High Street to create an inventory of guardrails classified by attenuator type across its state roadway network. High Street trained a custom You-Only-Look-Once (YOLOv5) Rule-Learning model to identify guardrails in state video log imagery to produce a statewide inventory of guardrails in 10 weeks for approximately $60,000.

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Crosswalk Detection and Inventory | Nebraska DOT

NDOT also worked with High Street to find, locate, and inventory painted-pedestrian-crosswalks on its state highway system. Images taken from NDOT's pavement profiler van were used with out-of-the-box object-detection machine-learning models (e.g., a convolution neural network, or CNN, which is commonly used for computer vision) and Esri's Python API to create an inventory of crosswalks that was stored within a feature layer.

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Median Inventory Using AI | Missouri DOT

As part of a broader initiative evaluating the use and cost-effectiveness of AI, MoDOT hired High Street and Strong to create a GIS inventory of its medians. Their consultant labeled medians in 1,000 aerial images to train a SparseInst model applied across 10,000 statewide images. The Rule-Learning model delineated 48 million square meters of median but generated many false positives, especially gore areas, as well as some false negatives. The resulting inventory was ultimately deemed insufficiently accurate for agency use, primarily because the source imagery had limited resolution.

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Statewide Asset Attribute Inventory | Idaho Transportation Department

In May 2020, ITD selected Cyclomedia Technology to develop a statewide asset inventory by driving a vehicle equipped with LiDAR equipment across the state, analyzing the resulting images using Rule-Learning AI. The resulting document, the Statewide Asset Attribute Inventory (SWAAI), reports on the success of the project, citing 28 GIS asset inventory types that include over 300,000 point and line features and an additional 6,000 polygon features. Examples of asset inventory types included signs, billboards, lights, lanes, sidewalks, utilities, mileposts, and bridges.

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Asset Condition Monitoring

In addition to creating inventories, AI can assess the condition of various transportation assets, a task that is typically subjective, labor-intensive, and prone to inconsistency. For example, machine-learning models can be trained to evaluate pavement conditions based on the presence of cracking, rutting, or potholes, and to identify signs with graffiti, fading, or poor reflectivity. Similar approaches can be applied to guardrails, markings, lighting, and other roadway elements. This type of automated condition assessment not only supports more objective and repeatable evaluations but also helps identify infrastructure needs with greater detail. As a result, agencies can improve cost estimation, prioritize maintenance more effectively, and integrate condition data into long-range asset management and capital planning.

Pavement Marking Condition Assessments Using AI with Aerial Imagery | Cities of Atlanta, GA, and Greensboro, NC

Municipalities in Atlanta, GA, and Greensboro, NC, have utilized Rule-Learning AI in conjunction with aerial imagery to evaluate the condition of urban markings through color-coded mapping of locations. The AI technology evaluates the input data and identifies locations needing improvement. This solution has also been expanded to evaluate accessibility standards compliance for pedestrian facilities [43].

AI-Empowered Computer Vision Tool for Locating and Recognizing Traffic Signs Confirmation | Washington DOT

WSDOT partnered with STARS Lab to build a Rule-Learning AI model to recognize and identify road signage based on dashboard video imagery. The model developed by STARS Lab offers an efficient method for detecting and classifying signs, tracking objects with unique IDs, evaluating their condition, and ultimately building a comprehensive data inventory of roadway signage. WSDOT tested the STARS Lab computer vision model, but has not turned to it for full deployment [44].

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Asset Management Decision Support

Asset management professionals employ the asset inventory to model pavement and bridge deterioration, develop treatment recommendations, and estimate project costs to maximize the infrastructure condition with limited investment. Common software employed includes AASHTOWare Bridge Management (BrM) and Deighton's Total Infrastructure Management System (dTIMS). These programs each utilize machine-learning to forecast various scenarios and project specific features. AI offers significant advancements in deterioration modeling and cost estimation by incorporating real-time data, actual asset conditions, and complex variable relationships that traditional methods often overlook. Early research by state DOTs and universities indicate that AI can produce more accurate, dynamic, and cost-effective recommendations for pavement and bridge management, although adoption remains in the pilot and evaluation stages.

While no states have openly and widely adopted AI in deterioration modeling or treatment recommendations, a number of DOTs have participated in research comparing traditional models to AI.

Pavement Deterioration Modeling Research | Iowa State University

Researchers at Iowa State University's Institute of Transportation and Applied Research Associates compared a Deep-Learning AI model to Iowa DOT's (IDOT) traditional regression deterioration models. The deep learning model provided more accurate, less biased predictions than IDOT's model. However, the authors noted that the regression, although labor-intensive, offers interpretable results. While AI is more accurate, it can be sensitive to unrecorded maintenance events that would seemingly cause an unexplainable change in pavement conditions.

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Estimating Project Costs

Estimating project costs in asset management traditionally relies on standardized lookup tables or regression models that use historical data, material costs, and anticipated labor to forecast expenditures for pavement and bridge work. While effective for baseline budgeting, such methods can be limited by their inability to quickly adapt to nuanced variables or unexpected shifts in project parameters. Incorporating AI into the cost estimation process enables the analysis of additional and varied datasets, including real-time construction cost trends, maintenance histories, and even site-specific conditions, allowing for more dynamic, accurate, and responsive predictions.

AI-driven models can continuously learn from completed projects, refine their accuracy over time, and better account for the complex interplay of factors influencing project costs, ultimately supporting more strategic investment decisions in infrastructure management.

Pavement Preservation Cost Model | Wisconsin DOT

WisDOT partnered with High Street Consulting Group to test machine-learning and AI algorithms in improving project cost predictions using historical data. Although WisDOT chose an interpretable machine-learning model, the project outlines how more advanced modeling, including AI methods, can be implemented in project cost estimation. Compared to WisDOT's previous cost estimation tables, the new model achieved a 30% reduction in mean absolute percent error, equating to an estimated $850 million reduction in error across WisDOT's 10-year program.

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Engineering, Safety, and Design

The engineering division of state DOTs provides the technical foundation for the development and maintenance of transportation systems. Safety engineering, planning, and analysis ensure that these systems protect all users through data-driven, proactive strategies and continuous evaluation [45]. Although the scope of work performed within these offices is expansive, this section will focus on examples of how AI solutions can support the following key tasks.

- Design Reviews
- Crash Prediction and Analysis
- Incident or Risk Detection
- Enforcement Coordination

Design reviews help identify and resolve potential safety and compliance issues in project plans before construction begins, reducing costly changes and future risks. Crash or risk prediction, detection, and analysis involve using data-driven methods to pinpoint high-risk locations and guide the prioritization of safety improvements, ensuring resources are directed where they will have the greatest impact. Enforcement coordination aligns engineering insights with law enforcement strategies, targeting risky driver behaviors and supporting integrated safety campaigns for maximum effectiveness. Collectively, these functions aim to enable proactive, evidence-based approaches to reducing crashes and improving transportation safety outcomes.

Design Reviews

Transportation infrastructure design reviews are a critical quality assurance process for practitioners, ensuring highway and bridge construction projects are ready for construction authorization and compliant with all federal and state requirements. Typically, a plans, specifications, and estimates (PS&E) package includes detailed design plans, contract specifications, and a detailed cost estimate. These documents collectively define the scope, requirements, and expectations for contractors bidding on and executing the project. AI technology can enhance the quality of these otherwise manual reviews and reduce the time required to complete them.

Plans, Specifications, and Estimates (PS&E) Review | Texas DOT

TxDOT intends to implement AI-powered PS&E reviews as part of its AI Strategic Plan, published in 2024. They plan to use Deep-Learning AI tools to optimize the design process, check for accuracy and adherence to complex design documents, and promote data-driven design practices, with the hopes of reducing change orders and enhancing design excellence [22].

Crash Prediction and Analytics

The safety of users on transportation systems is consistently noted as the top priority for practitioners at both the federal and state levels. One of the core principles of FHWA's Safe System Approach, a framework adopted by state DOTs to strengthen safety culture, is that "safety is proactive." This principle emphasizes the importance of utilizing tools to identify and mitigate latent risks in the transportation system, rather than reacting to crashes after they occur [46]. By accurately identifying crash-prone locations, understanding contributing factors such as roadway geometry, traffic volume, and weather conditions, and forecasting the likelihood of future crashes, practitioners can prioritize safety investments, design effective countermeasures, and implement targeted interventions to reduce crashes and their severity.

Statistical methods are usually the primary means of analyzing historical crash frequency, in tandem with GIS tools used to map and visualize crash locations. Data collection, geolocation, and reporting tasks are performed either manually or through semi-automated workflows to accomplish this. AI technologies, such as machine-learning models, can now process high-resolution, real-time data from multiple sources, identify complex crash precursors, and provide dynamic, near-instantaneous risk assessments. In this application, AI can enhance accuracy, reduce false alarms, and enable real-time crash risk prediction, allowing DOTs to deploy active traffic management strategies more effectively and continuously improve safety outcomes through adaptive, data-driven approaches [47].

Safety Analytics Platform | Hawaii DOT

HDOT partnered with Google Cloud and CARTO to implement Deep-Learning AI technology that analyzes crash patterns throughout the state and maps the locations where crashes are likely to occur [48]. Additionally, they developed proposed improvements to mitigate potential future crashes based on AI-enabled data patterns and decision-support systems. This was used to quantify the expected impact of safety improvements, such as implementing raised crosswalks or rumble strips [48].

Incident or Risk Detection

As with crash prediction, identifying conditions that present safety hazards or are crash-conducive is another proactive safety strategy that supports the Safe System Approach. Immediate and reliable roadway incident or risk detection can alert DOT practitioners when there is a need to reroute traffic, disseminate information to drivers, or deploy enforcement. This can directly impact roadway safety, congestion management, and network efficiency. While traditional methods rely on manual observation and basic automation, AI-powered solutions can improve speed, accuracy, and proactivity, thereby enhancing the safety and efficiency of transportation systems.

Crash-Conducive Congestion Detection | Nevada DOT

Nevada DOT partnered with the Nevada Highway Patrol and the Regional Transportation Commission to deploy Deep-Learning AI-based software to recognize traffic patterns associated with crash-related congestion [49]. The system's input data included vehicle data, existing cameras, and roadside sensors, among other elements, to develop predictive analytics that trigger a pattern closely tied to crash-conducive congestion. This enables the strategic positioning of highway troopers and the activation of dynamic messaging signs. The pilot program resulted in an 18% reduction of primary crashes, a 43% reduction in speeding, and an improved first responder response time of 12 minutes. The benefit-cost analysis resulted in over $3 million in economic benefits and savings [50].

Near-Miss Detection | City of Detroit, MI

The City of Detroit, MI, deployed digital intersection safety tools that use continuous monitoring and advanced analytics to proactively identify and address road safety risks. Developed by Miovision, this system employs AI-powered computer vision to detect, track, and classify vehicles, cyclists, and pedestrians at intersections using video feeds. This Deep-Learning AI solution then analyzes the trajectories of users, identifies near-miss events, and assesses the severity and frequency of these interactions [51]. The data can be compiled into detailed risk diagnostic reports, which help agencies pinpoint hazardous conditions, select targeted safety interventions, and measure the effectiveness of changes over time. Research studies have indicated that using this AI-driven approach for near-miss detection and intervention can achieve risk reductions of 63% to 85% at intersections [52].

Railroad Crossing Safety Risk Flagging | Caltrain

Caltrain is deploying advanced safety technology that uses Deep-Learning AI to assess potential hazards and instantly notify railroad operations teams if a dangerous situation is detected. This technology, called RailSentry, leverages LiDAR sensors and cameras, combined with AI-driven software, to continuously observe these crossings, detect vehicles, people, bicycles, and even smaller objects, and analyze their proximity to the tracks in real-time. California officials, in partnership with railroad services company Herzog, have begun implementing RailSentry at high-risk crossings known for frequent trespassing [53].

Enforcement Coordination

The combination of education, engineering, and enforcement strategies is a recipe for success in improving transportation safety culture. Additionally, two components of FHWA's Safe System Approach are "safe road users" and "safe speeds." These facts underscore the importance of collaborating with enforcement agencies to enhance road safety. More specifically, identifying driver non-compliance, whether it be regarding seat belt use or abiding by the speed limit, is critical, as these behaviors are major contributors to roadway fatalities and serious injuries.

Violations have typically been detected through manual enforcement, roadside observation, and spot speed sensors, which are labor-intensive and have a limited scope. AI technologies enable automated, real-time detection of violations using advanced computer vision and data analytics. This allows for broader coverage, higher accuracy, and immediate response, which can more effectively target enforcement and education efforts and prioritize high-risk locations.

Seat Belt Enforcement | North Carolina State Highway Patrol

The North Carolina State Highway Patrol partnered with road safety technology company Acusensus to establish a statewide Commercial Motor Vehicle (CMV) enforcement program. This initiative used Deep-Learning AI to detect real-time seat belt and distracted driving violations for commercial drivers. The AI software reviewed high-resolution images instantly under all weather and lighting conditions to identify potential non-compliance instances, which are automatically transmitted to law enforcement [54] [55]. Within the first two months of the program, seat belt violation detection increased by six times, and there were nine times as many mobile phone distraction violations identified. This program is also deployed in Georgia [56].

Speed Enforcement | Arkansas DOT

Arkansas DOT deployed Deep-Learning AI technology that instantly reviews high-resolution images to detect speeding violations, specifically in work zones. The AI software has the ability to transmit identified violations to law enforcement personnel stationed nearby in real-time, facilitating an immediate response. In Benton, AR, there was a 45% decrease in work zone crashes within seven months of the program's deployment [57].

Planning, Programming, and Procurement

Planning, programming, and procurement cover the entire project lifecycle, from defining and aligning long-term goals to carrying out improvements. Traditionally, these processes rely on human expertise, static data, and time-intensive workflows. However, AI offers transformative opportunities across all three phases. AI tools can assist with project prioritization, travel demand prediction, and forecasting during planning; automate funding allocations and simulate tradeoffs during programming; and support RFP production, bid analysis, collusion detection, and contracting during procurement. Even public engagement can benefit from AI through tools such as real-time translation and sentiment analysis, allowing more inclusive and responsive planning. As agencies face increasing demands with limited resources, integrating AI into these core functions can enhance accuracy and efficiency.

Transportation planning involves identifying future infrastructure needs based on demographic trends, economic activity, freight movements, land use, and community input. Traditionally, planners rely on manual analysis of historical data, periodic surveys, and forecasting models to shape long-range plans. While these methods are foundational, they can be limited by data quality, static assumptions, and the time required to produce and interpret results.

AI can augment planning activities from producing more accurate and dynamic travel demand prediction and forecasting to improving project prioritization by maximizing return on investment. Even incorporating public engagement can be improved with AI-enabled real-time translation tools. The following case studies highlight various planning activities in which state DOTs have implemented AI.

Travel Demand Modeling

Travel demand models (TDM) range from simple, four-step modeling processes (e.g., trip generation, trip distribution, and mode choice) to more advanced parametric models. Yet even the more advanced models still require human-defined relationships. AI can identify complex, non-linear data that is constantly updated in real time to provide more accurate TDMs. Although at the time of this publication, the research team was unable to source examples of DOTs using AI solutions for travel demand modeling, third-party companies are currently promoting how AI applications can improve traditional TDMs [58]. Additionally, research publications also offer an insight into this potential.

Travel Demand Forecasting | University of Florida

Xilei Zhao, Ph.D., and Xiaojian Zhang of the University of Florida's Department of Civil and Coastal Engineering, along with Qian Ke, AI Researcher with Bloomberg, created an AI TDM with a focus on balancing fairness and predictive power. While Deep-Learning AI can improve predictive capabilities, biases in the models can produce results that perform worse for lower-income, minority, and lower-education communities. In their paper, the authors demonstrated how their proposed methodology can effectively enhance demographic fairness while preserving prediction accuracy when tested in Chicago, IL, and Austin, TX [58].

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Programming

Programming moves projects from planning to reality by determining which will be funded, when they will be implemented, and from which sources. These decisions are typically documented in a Statewide Transportation Improvement Program (STIP). The process involves balancing complex trade-offs among goals, such as safety, mobility, and economic development, alongside considerations like project readiness, cost estimates, and funding eligibility. It also includes decisions about how projects are grouped or phased, such as bundling similar or geographically proximate projects to reduce costs, improve delivery efficiency, or minimize disruptions. Many agencies currently rely on spreadsheets, manual scoring systems, and institutional knowledge to guide these choices. While these methods are familiar, they can be time-consuming, inflexible, and difficult to scale.

AI has the potential to streamline and strengthen programming by applying advanced neural networks and optimization models to automate tasks such as funding allocation, project prioritization, and project bundling. These tools can evaluate multiple criteria, including performance metrics, cost-effectiveness, risk, location, and timing, to identify logical groupings of projects that improve efficiency and reduce overall costs. AI can also simulate a wide range of programming scenarios to show how changes in policy, scoring methods, or funding availability might affect the composition and sequencing of the program. By analyzing large volumes of historical project data, AI can support more consistent and replicable decisions, reducing subjectivity and highlighting patterns that may be missed in manual processes.

While AI applications in programming are still being tested across areas such as prioritization, funding allocation, and scenario modeling, project bundling stands out as an example where a pilot has been successfully completed, demonstrating the potential for real world impact.

Bundling Expensive Road Projects | Indiana DOT

INDOT used AI to manually bundle projects based on geography and similar scope to reduce costs and improve efficiency by forming larger contracts, streamlining processes, and minimizing public impact. Although INDOT was recognized for its effective bundling practices, the process was time-consuming and intensive. INDOT partnered with Foro, a software and AI vendor, to produce a Rule-Based AI model to streamline the bundling process. The introduction of AI transformed this process by automating and optimizing project bundling based on historical data. This AI-driven approach cut bundling time from weeks to hours, increased savings by 40%, and enabled more consistent, multi-year statewide bundling decisions, resulting in projected savings of over $100 million across four years [59].

AI-Based Tool to Estimate Contract Time | Montana DOT

In 2023, MDT partnered with FHWA and Texas A&M University to develop a neural network algorithm that estimates the "most likely contract time for a highway project." The tool, embedded in a spreadsheet, prompts users to enter key project characteristics, such as work type, project location, and major controlling work items, and the underlying Deep-Learning AI estimates the most likely duration. MDT has used the tool in its projects over the past two years, fine-tuning the tool with new data while improving work efficiency [60].

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Procurement

Procurement for transportation and infrastructure projects encompasses a range of critical functions, including defining project requirements, estimating timelines and costs, advertising bids, evaluating proposals, and awarding contracts. These processes are traditionally guided by standardized rules, expert judgment, and historical data, but they can be prone to inefficiencies, inconsistencies, and human error. Challenges such as overly conservative contract estimates, cost overruns, or undetected patterns of non-competitive bidding can hinder effective project delivery and lead to inflated public spending.

AI offers new opportunities to strengthen procurement by supporting complex decision-making, improving data interpretation, and surfacing insights that might otherwise go unnoticed. Unlike rule-based systems or basic statistical models, AI can process large volumes of unstructured or dynamic data, such as past contract documents, bid histories, and infrastructure characteristics, to support more informed, timely, and fair decisions. By integrating AI into procurement, transportation agencies can improve accuracy, enhance transparency, and allocate resources more efficiently throughout the project lifecycle.

Identifying Anti-Competitive Bidding | USDOT

The U.S. Department of Transportation's Office of Inspector General (OIG) introduced an AI approach, specifically the unsupervised machine-learning algorithm known as Gaussian Mixture Model (GMM), to detect potential complementary bidding in highway procurement contracts. Complementary bidding occurs when firms collude, designating one company as the winner while the others deliberately submit higher bids. This strategy creates a false appearance of competition, thereby increasing the appeal of the chosen firm. Traditionally, econometric methods have been used to flag such behavior, but they require a larger volume of data and offer limited precision. In contrast, the GMM model was applied across six states (Florida, Georgia, North Carolina, New Jersey, Pennsylvania, and South Carolina) and proved more effective by clustering contracts and firm-pair bidding patterns based on variables linked to complementary bidding. It successfully identified suspect patterns with as few as five joint bids, whereas traditional econometric methods required at least ten. The GMM analysis revealed that contracts with potential complementary bidding cost 5.2% to 10.2% more than competitive ones, translating to an estimated $1.19 billion in excess spending across the analyzed states [61].

Transportation Systems Management and Operations (TSMO)

Transportation Systems Management and Operations (TSMO) is a comprehensive approach that uses operational strategies and technology to optimize the performance of existing transportation infrastructure. TSMO focuses on maximizing the benefits of existing infrastructure by enhancing safety, reliability, and efficiency for all users. AI technologies can enable real-time traffic management strategies that include:

- Traffic Flow Optimization
- Incident Detection and Response
- System Monitoring
- Decision Support

AI solutions can support adaptive traffic control, predictive modeling, and real-time decision support to enhance operational efficiency, safety, and system reliability across transportation networks. These AI applications are further detailed in the following sections.

Traffic Flow Optimization

Traffic flow optimization has traditionally relied on fixed-time signal plans, manual adjustments, and reactive strategies based on historical data. Although adaptive signal control systems have been in use for decades, the implementation of AI technology has greatly improved the efficiency and responsiveness of standard adaptive systems. This is due to its ability to predict upcoming traffic patterns, learn and improve over time, coordinate larger road networks, and adapt to complex scenarios with greater accuracy. AI technology has transformed traffic optimization techniques into a dynamic, predictive process by integrating real-time data and machine-learning to reduce congestion, enhance safety, and decrease emissions from vehicle idling.

Capturing Risky Driving Behavior | Texas DOT

TxDOT partnered with Cambridge Mobile Telematics to deploy StreetVision, which uses Deep-Learning AI and behavioral analytics to analyze cellphone data for indicators of risky driving behaviors, such as hard braking, distraction, and speeding. This technology enables near-real-time risk measurement and was leveraged by TxDOT to identify outdated street signs across 250,000 lane miles that contributed to hard-braking incidents and crashes.

Real-Time Detection and Signal Optimization | Cities of Pittsburgh, PA, and Quincy, MA

Municipalities such as Pittsburgh, PA, and Quincy, MA, have deployed SURTRAC's Deep-Learning AI technology, which detects vehicles and queue lengths in real-time to inform dynamic signal timing adjustments. This technology can aggregate vehicular data into platoons and predict expected queue lengths and allocated green time for each cycle, ultimately helping minimize total delay, reduce travel times, and decrease emissions. New advancements also include increased pedestrian walk times based on improved adaptive signal timing and live network monitoring of operational status and system performance [62] [63].

Real-Time Traffic Flow Analytics | Cities of Boston, MA, and Seattle, WA

In Seattle, WA, and Boston, MA, Google's AI technology Project Green Light has been implemented to improve traffic operations. Project Green Light utilizes deep-learning AI models, built on Google Maps driving trends and real-time traffic data, to analyze how vehicles flow through intersections. This analysis focuses on patterns such as stop-and-go movements, average wait times, and coordination between adjacent traffic signals. A key outcome for this initiative is the opportunity to reduce emissions by decreasing vehicular idling through traffic signal optimization [64] [65] [66].

Incident Detection and Response

Identifying traffic incidents and responding to address them are critical functions for state DOTs, as they directly impact roadway safety, congestion, and the overall efficiency of the transportation network. Prompt and coordinated incident management helps restore normal traffic flow quickly after a crash or vehicular breakdown, reducing the risk of secondary crashes and minimizing delays for motorists and emergency responders. Traditionally, traffic incident detection and response relied on manual reporting by motorists or patrols, constant monitoring of CCTV feeds by operators, and sensor-based systems that flagged incidents using simple threshold algorithms. These methods tend to be slow, labor-intensive, and prone to errors, such as false alarms and missed events, leading to delayed response times and less effective management of traffic disruptions.

With the advent of AI, incident detection and response can be handled more quickly, accurately, and proactively. AI-driven systems utilize machine-learning to analyze real-time and historical data from multiple sources, including sensors, cameras, and connected vehicles. This technology enables complex pattern recognition, incident prediction, and distinction between routine congestion and actual emergencies. These systems can automatically alert operators and first responders, prioritize incidents based on severity, and suggest optimal response strategies, leading to quicker resolutions and safer, more efficient roadways.

Traffic Incident Management | Iowa DOT

IDOT partnered with Iowa State University to develop its Traffic Incident Management Enabled by Large-Data Innovations (TIMELI) system. This Deep-Learning AI system utilizes large-scale data analytics to reduce the frequency of incidents and their resulting impacts by minimizing vehicle exposure time. Open source TensorFlow technology was paired with existing Iowa DOT data streams at TMCs to detect incidents and is currently being trained to eventually predict them as well [44] [67].

TransGuide Advanced Transportation Management System (ATMS) | Texas DOT

TxDOT piloted and is now expanding the use of its AI-powered platforms to integrate its existing ITS video, sensor, and external data, automatically detecting roadway incidents, including crashes, stalled vehicles, and congestion. The goal is to enable faster response times and reduce secondary crashes. This application was first piloted throughout Austin, TX [22] [68].

Pre-Incident Detection | Missouri DOT

Funded through an FHWA innovation grant, MoDOT deployed an ambitious Deep-Learning AI system to intervene and prevent traffic incidents before they occur. The system uses combined inputs from the many data sources available within the St. Louis traffic management center, including HERE probe data, roadway radar data, radar speed and volume data, Advanced Road Weather Information System (ARWIS) weather data, and more to deploy tools such as ramp metering and messages on dynamic message signs to warn motorists of hazardous driving conditions [69] [70].

Speed, Vulnerable User, and Debris Detection | Missouri DOT

MoDOT uses TrafficVision to monitor video feeds from the Closed-Circuit Television (CCTV) cameras installed across the St. Louis region and in the urban areas of the Kansas City District. This technology uses deep learning to identify traffic speeds, pedestrians on restricted-access facilities, and debris. These identified events are sent as alerts to the Traffic Management Center. The true positive rate on incident identification since deployment in January 2022 is greater than 90% [70].

System Monitoring

State DOT practitioners are tasked with collecting and maintaining data that can be used to help support the operations and maintenance of the transportation systems under their jurisdiction. This activity can be summarized as system monitoring and can include Annual Average Daily Traffic (AADT) counts, assessing pavement marking or striping conditions, and inventorying crosswalk locations at intersections. AI can support these efforts by automating the data collection, improving the accuracy of inventories and enabling real-time insights.

Traffic Counts | New York State DOT

NYSDOT conducted an evaluation comparing Leetron AI Counts to traditional tube counts and manual counts. The Leetron AI Counts technology uses computer vision and deep learning to perform real-time, multi-lane vehicle detection and is trained to distinguish vehicles well enough to classify them into the 13 FHWA classification types, covering up to eight travel lanes. By contrast, Miovision can typically distinguish only the six standard classes. The Leetron system also performs well under all weather and lighting conditions, in work zones, and amid heavy congestion. Leetron is currently developing capabilities for the classification and counting of e-bicycles and scooters as well [71].

Decision Support

Practitioners have implemented Intelligent Transportation Systems (ITS) to help manage and optimize transportation networks using sensors, control systems, and communication technologies. Decision support is a component of ITS that is typically executed reactively through rule-based logic, which relies on predefined algorithms and manual inputs. AI technologies can enhance decision support ITS applications by proactively recommending responses to changing conditions. In practice, the AI solution can analyze real-time traffic data and provide recommendations to traffic operations staff. AI-based decision support system augments operations staff by analyzing live data feeds and providing recommendations to decision makers based on pre-designed response plans and measuring the impacts of the decision on resulting traffic conditions for future recommendations.

AI-Based Integrated Corridor Management (ICM) Decision Support System | Tennessee DOT

Tennessee DOT partnered with Southwest Research Institute (SwRI) and Vanderbilt University to deploy an AI-based Integrated Corridor Management (ICM) Decision Support System along I-24 in the Nashville area, known as the I-24 Smart Corridor.

The project integrated data from multiple systems, including freeways, arterials, and transit, to coordinate real-time traffic management tasks, including traffic signal timing adjustments on arterials, ramp metering, dynamic lane control and speed harmonization, diversion routing, incident management, and automatic changes to Dynamic Message Signs (DMS). Preliminary results of the deployment indicated an approximate 9% decline in crashes involving injuries or fatalities and a 6% improvement in vehicular flow [72].

Post-Script on AI Agents

AI agents are “AI systems that can plan and run actions over long time horizons using a variety of tools where the steps are not predetermined” [73]. AI agents are often characterized by: autonomy, or the ability to run unconstrained and suggest and use a variety of tools, such as the ability to write to a database or edit an Excel document; memory, or the ability to learn and improve its ability to perform a task over time; and communication, or the ability to proactively present information or ask questions. Agentic behavior describes both the ability to plan and link together a sequence of actions and take actions with real world results. As a simple example, Google provides an experimental restaurant reservation service that can open and operate a web browser or place a phone call to reserve a table on a user's behalf. At the time of writing, agent functionality from OpenAI, Anthropic, and Google have demonstrated impressive capabilities for actions that can be accomplished by writing and executing computer code, but more limited abilities for tasks that involve browsing the internet. Across the industry, there is a general consensus that agents are "the next big thing," though the research team did not identify any existing AI agents deployed into production within state DOTs at the time of publication.

Implementation Guidance

This chapter outlines several practical strategies state DOTs can use to implement AI solutions within their agencies. The information provided draws on national guidance, agency experiences, and specific project profiles to highlight best practices, effective implementation frameworks, and risk management techniques. A common theme across these sources was the need for clear leadership, sound governance, cross-divisional collaboration, and strong data privacy and security measures. This chapter provides a summary step-by-step AI implementation action plan, synthesizes lessons learned from agencies that have already adopted several AI technologies, and offers real world examples to equip practitioners with the tools and insights needed for successful AI deployment.

Practical Ways to Implement AI Solutions

National Guidance

Intelligent Transportation Society of America (ITS America) released a guidebook detailing practical steps state DOTs can take to support the implementation of AI solutions. This guide provides a synthesis of the insights extracted from extensive discussions with state DOTs and local agencies that have implemented AI technologies. The guide details a "Ten-Point Action Plan for AI Success" [74], which emphasizes that agencies should expect to invest significant time, effort, and resources to achieve success. The ten action items from this plan are included in the table below. Additionally, strategies such as cross-divisional collaboration are considered essential to align funding and staff capabilities. The takeaways from this report echo the findings from the policies examined in this research. Table 1 provides a summary of the Ten-Point Action Plan detailed in the ITS America guidance.

Table 2. ITS America's Ten-Point Action Plan for AI Success [74]

Action Item	Description
1. Establish AI Leadership & Strategy	AI strategy should align with organizational goals and broader transportation priorities, creating leadership roles such as a Chief AI Officer to foster accountability.
2. Foster a Responsible AI Culture	Embed core AI principles, such as transparency, into daily operations and decision-making; help staff develop an understanding of AI ethics through educational opportunities; establish KPIs to measure outcomes.
3. Understand AI Technological Capabilities	Evaluate current and emerging AI tech to determine high-impact opportunities and assess risk; may have to hire AI experts.
4. Build the Right Capabilities for AI	Perform assessments to identify gaps in data and cybersecurity protocols; invest in cybersecurity.
5. Strengthen Governance and Risk Management	Define roles and responsibilities for AI oversight across all functions, ensuring accountability.
6. Monitor AI Strategy Plan with Clear Metrics	Define KPIs to track AI adoption and outcomes; use pilots to refine strategies; ensure metrics are outcome-driven and aligned with organizational goals.
7. Empower People with Human-centric AI	Design AI systems to be transparent and user-friendly; provide training tailored to specific roles for employees at all levels; use SMEs to provide professional oversight of the AI implementation.
8. Deploy AI with Intent	Coordinate different approach preferences among deployment stakeholders; establish processes to monitor AI during pilots; ensure transparency and explainability are detailed in deployment plans.
9. Collaborate for Innovation	Partner with academia or research institutions (e.g., UTCs); participate in peer exchanges and working groups to foster cross-sector collaboration.
10. Ensure Transparency and Trust	Regularly engage with the public and stakeholders to explain AI goals, benefits, and limitations; create user-friendly interfaces to enhance understanding; continuously engage communities throughout development and deployment stages to address concerns.

State Guidance

Takeaways from Texas DOT's presentation on "Harnessing AI's Power at Transportation" [75] and conversations with North Carolina DOT personnel were used to help inform implementation guidance from the state perspective described in this section. The insights gained from these agencies represent on-the-ground knowledge and practical tips on how other DOTs can effectively integrate AI solutions into their processes or tasks.

The path to successful AI integration seems to begin with a comprehensive strategic plan developed collaboratively across the agency. This approach appears to be universally accepted; as noted in the AI Policy Environment chapter, most agencies either have an AI plan or policy or are in the process of developing one. TxDOT's approach involved engaging all districts and divisions, soliciting staff input to identify operational challenges, and aligning proposed AI use cases with organizational goals. This inclusive process ensures that AI solutions address genuine needs and have broad stakeholder buy-in.

After a plan is set, DOTs are encouraged to use deliberate, phased implementation schedules to adopt a measured approach to AI deployment. One strategy is to focus initial projects on low-risk applications, particularly those with minimal security and privacy concerns or those involving internal-facing processes. AI pilots and prototypes can be helpful in building a better understanding of AI tools, including their benefits and risks, while avoiding unnecessary exposure. DOTs should prioritize working closely with their IT partners to safely prototype or deploy solutions and remain flexible to adapt pilot projects as needs change or improvements are identified. As organizational knowledge grows, broader adoption can proceed in a controlled and safe manner.

Agency risk management techniques, such as verifying encryption standards and documenting potential exposure risks, are recommended prior to granting access to sensitive datasets. Robust data governance frameworks should be considered essential to establishing and maintaining data privacy and addressing security concerns. DOTs are advised to continuously evaluate AI tools for compliance and risk mitigation through regular audits and quality assurance checks, ensuring the AI solutions are used safely and responsibly. NCDOT emphasized its commitment to maintaining human oversight in all its AI use cases and does not plan to pursue fully autonomous technology. This is a key component to mitigating their risks and reassuring agency personnel that even amidst their pursuit to expand AI use, they want to always keep a "human in the loop."

Finally, it is necessary to establish clear metrics to evaluate the effectiveness of AI solutions. Agencies should quantify time savings and validate AI outputs through parallel reviews. Practitioners at NCDOT noted that their agency has favored initially implementing AI use cases with predictable outcomes to facilitate ongoing evaluation and concurrent data verification efforts. This practice is currently in place at both NCDOT and TxDOT. Another consistent theme echoed is the need for continued knowledge sharing across DOTs and other agencies to communicate the successes and failures of AI implementation. Participating in national peer exchanges with other agencies is recommended to foster shared learning and accelerate effective AI adoption.

Workforce Readiness

There is often a gap between leadership enthusiasm for AI's potential and the practical readiness of the workforce to use these tools effectively. Preparing the workforce is a crucial step for any DOT seeking to implement AI tools.

Ideally, agencies should start with AI literacy, not AI tools. Before introducing specific applications, staff members need a baseline understanding of what AI is, what it is good at, and crucially, where it fails. This does not mean that everyone needs to understand transformer architectures, but they do need mental models for probabilistic outputs, hallucination risks, and the distinction between pattern-matching, which LLMs and other AI models excel at, and reasoning, which only humans can do to date. Without this foundation, staff may accept erroneous outputs uncritically or refuse to engage at all.

To facilitate learning and adoption, agencies should create low-stakes opportunities for experimentation and learning. People learn by doing, but they will not experiment if they are afraid of breaking something consequential. Running pilots or setting up sandboxed environments in which staff can test AI tools against real, but non-production, problems allows them to build intuition for what AI can do well.

In the long term, agencies should consider which roles will evolve substantially and what new hybrid positions might emerge. For example, a transportation planner who can effectively leverage AI for scenario modeling is more valuable than one who cannot. Agencies should consider how AI will not only adjust job roles but also how AI skills should be factored into hiring, promotion, and professional development.

Agencies should prioritize transparency about AI, both externally and internally. Workforce preparation is not just about training; it also addresses legitimate concerns about job security, workload changes, and professional identity. Agency leadership should be transparent about their intentions and involve staff in identifying where AI can help address pain points, rather than imposing solutions from above.

With a baseline in AI literacy and clearly communicated leadership intentions, a great starting point for building internal AI staff capacity is the implementation of pilots or sandbox applications. Choose a specific, contained workflow that everyone agrees is tedious and low-value and use it as a pilot. Potential examples include initial document review, data entry validation, or report formatting. Success in this environment can build confidence and reveal implementation challenges before the agency attempts to deploy something more ambitious.

Project Examples

The research team engaged practitioners to gather their recommendations for effectively implementing AI solutions in practice. The team used survey results from STC members to identify which use cases were most interesting and to develop a sample of DOT projects to profile in greater depth. The research team contacted eight DOTs that sponsored the highest-ranking AI use cases identified in the survey to inquire about specific project details, including associated costs and risks of implementing the technology. These agencies included Florida, Hawaii, Idaho, Massachusetts, Montana, Missouri, New York State, and Wisconsin DOTs. Tables 3 through 5 summarize the project details provided by the responding states.

Table 3. MoDOT's I-270 Traffic Management and Safety Enhancement Project Profile [76]

Project Sponsor	Missouri DOT
Project Description	Pre-Incident Detection
Budget Breakdown	Total Costs—$2,000,000 Infrastructure Costs—$1,000,000 Technology Costs—$1,000,000 (2/3 went towards predictive analytics, and the remaining 1/3 was split between video and weather analytics).
Cost-Effectiveness Evaluation	Benefit-cost analysis performed using data from enforcement partners resulted in B-C ratios greater than 6.0 (WSP USA, Inc., 2024).
Unexpected Costs	Understanding the technology and reconciling the coding required to customize the software to fit the specific project needs added additional costs.
Key Risks Identified	Data privacy; risk of the proprietary software compromising the security of the input data; false alarms or missed incident detections.
Risk Management Techniques	MoDOT manually redrew detection zones in the program whenever there was an indication that the camera was no longer in the appropriate detection zone. This was noted as a time-consuming aspect of the project.

Table 4. NYSDOT's AI-Based Traffic Counts and Classification Project Profile

Project Sponsor	New York State DOT
Project Description	Traffic Counts
Budget Breakdown	Total Costs—$13,000 (per portable counting unit, includes two supplemental batteries) Minimal costs for maintenance and equipment installation.
Cost-Effectiveness Evaluation	Counters capable of 95% accuracy; 80% accuracy is generally acceptable. Data quality meets agency expectations and is noted as worth the cost.
Unexpected Costs	None
Key Risks Identified	Counters were occasionally unstable, but their results were comparable to those obtained through other methods of data collection.
Risk Management Techniques	NYSDOT ensured counters were placed a minimum of 10 to 12 feet from the travel lane to improve accuracy in urban areas and downtown rural spaces. Data transformation was performed by a third-party vendor to prepare the data for FHWA submittal requirements.

Table 5. Idaho Transportation Department's Statewide Asset Attribute Inventory Project Profile [77]

Project Sponsor	Idaho Transportation Department
Project Description	Statewide Asset Attribute Inventory (SWAAI)
Budget Breakdown	Total Costs—$2,500,000
Cost Effectiveness Evaluation	Calculated return on investment was $3.8 million as of 2021 based on data collection hours saved (Hollinshead, 2021). This AI solution was beneficial from an efficiency and safety perspective, eliminating the need for team members to conduct field work to manually collect the data.
Unexpected Costs	None
Key Risks Identified	There were no significant risks related to the technology. The primary risk was process-based and related to the lack of a defined team to maintain the asset data in the long term.
Risk Management Techniques	A lesson learned for ITD was to designate the personnel responsible for maintaining the asset inventory at the localized district level.

Implementation Risks and Challenges

As with any new technology, there are risks and challenges associated with implementing AI solutions. Business productivity and work quality may actually decline during the adoption and implementation period. Large-scale data collection, required to optimize AI inputs, can raise substantial privacy concerns, as sensitive personal and location-based information must be protected to comply with regulations and maintain public confidence. Additionally, high-quality and relevant data is critical for AI systems to function accurately and effectively. However, state DOTs can face difficulties in collecting sufficient and representative datasets due to sparse infrastructure sensors, funding limitations, and the challenge of integrating diverse data sources. Inadequate or biased data can lead AI systems to produce unreliable or inconsistent results, undermining trust and hindering deployment. These challenges necessitate data governance strategies and privacy safeguards as essential components of AI adoption to maximize benefits while minimizing risks and ethical pitfalls. Several examples of how these issues can manifest are highlighted in the following sections.

The Productivity J Curve

Economists Brynjolfsson, Rock & Syverson have identified what they call a "Productivity J Curve" associated with the adoption of general-purpose technologies (GPTs) such as AI [78]. This describes the fact that companies and agencies may require significant complementary investment upfront to learn how to use, effectively implement, and integrate new technology, leading to lower productivity in the near term before productivity gains are realized in the long run. In this context, agencies should expect that AI may create additional burdens in the short run (e.g., the costs of hiring consultants to advise on AI integration) before yielding productivity gains in the long run.

Reliable and Consistent Data

In ICF's survey of over 200 federal leaders, they found that 32% of respondents cited accessing reliable and consistent data as a challenge hindering their agency's adoption of AI [26]. AI amplifies existing data problems. AI implementations drawing on poorly documented or incomplete data are unlikely to succeed.

Two major data quality obstacles practitioners should be cognizant of are hallucinations in Generative AI and biased output. AI hallucinations occur when generative AI models produce content that is inaccurate, misleading, or entirely fabricated, yet present it with confidence and fluency, making the errors difficult to detect. These hallucinations arise because AI models generate responses by predicting the most likely sequence of words based on patterns in their training data without understanding the underlying truth or context. This can result in AI inventing facts, references, statistics, or articles that appear plausible but have no basis in reality [79].

Generative AI tools are specifically susceptible to producing biased outputs. This issue has been shown to produce images and text that perpetuate gender and racial stereotypes, such as consistently depicting professionals as young, thin, and light-skinned, or associating certain jobs with specific genders. Users tend to assume AI results are objective, which can make users less likely to question biased outputs, further entrenching discrimination in these systems at times [80]. Several examples of these types of challenges are documented below.

Meta's Large Language Model Galactica Hallucinations and Inaccuracies

In 2022, tech giant Meta launched Galactica, a large language model specifically designed to assist students and scientists in generating summaries, literature reviews, and academic content. Three days after its launch, the model was taken down due to reported hallucinations in the output. Academics who used the technology identified frequent instances of invented scientific citations. Additionally, Galactica attributed fictitious research to real authors and produced summaries that misrepresented or completely fabricated content from scientific literature. One incident involved Galactica citing a non-existent paper by a real researcher when asked to generate a literature review on HIV/AIDS. In addition to these hallucinations being factually incorrect at times, the output was offensive or misleading, raising concerns about the reliability and safety of using such a tool in scientific and educational contexts [81].

Midjourney Generative AI Stereotypical Images

Midjourney, a generative image tool, is a well-documented example of AI technology providing biased outputs. Studies have shown that when prompted with non-specialized job titles like "journalist" or "reporter," Midjourney consistently generates images featuring only younger, thin, and conventionally attractive men and women. For specialized roles, the tool includes both younger and older people, but older individuals are almost always men, and women are depicted as younger and wrinkle-free. Additionally, for these prompts, the AI overwhelmingly produces images of light-skinned people, reinforcing both age, gender, and racial biases. These outputs reflect and amplify stereotypes present in the model's training data, suggesting that "attractive" and "youthful" are default traits, and that lighter skin and thinness are the typical characteristics of professionals [82].

Legal Ramifications from an AI-Powered Hiring Tool

A recent collective lawsuit was filed alleging that Workday's AI-based applicant tracking system disproportionately screened out older job applicants, in violation of California's Fair Employment and Housing Act (FEHA). The case against Workday was based on allegations that their algorithm used proxies for age, such as years since graduation and employment gaps, in the screening mechanism, which resulted in a disparate impact on applicants greater than 40 years old. The court's decision to allow the case to proceed signals that neutral criteria in AI tools do not shield organizations from discrimination claims if the tools' outcomes are biased. The lawsuit highlights the increasing expectation that both public agencies and their technology partners must audit AI systems for bias, document decision-making criteria, and ensure ongoing oversight [83].

Data Privacy and Protection

ICF's 2025 survey also reported data privacy and protection as a major challenge for agency AI adoption, with 29% of respondents citing it as an issue. AI solutions are vulnerable to privacy violations due to their reliance on large volumes of data, which often include sensitive or personal information. Risks arise from data breaches, unauthorized data collection, accidental data leaks, and attacks that can extract or manipulate confidential data. Additionally, AI-powered surveillance can lead to overreach and unwarranted monitoring, while the complexity and lack of transparency in many AI systems make it difficult to detect or audit privacy violations. These factors underscore the importance of robust security, transparent data practices, and effective regulatory oversight in protecting individual privacy rights when utilizing AI-powered technologies. Several examples of these challenges are documented below.

Strava Heat Maps Reveal Sensitive Military Locations

The fitness app Strava aggregates users' GPS-tracked fitness data and utilizes AI and machine-learning technology to transform it into a global heat map. In 2018, the company's publication revealed the locations and daily routines of military bases and personnel in remote conflict areas, such as Afghanistan and Syria. The map depicted places where only military or intelligence personnel would be active, which exposed sensitive locations and patrol patterns. Analysis promptly identified this national security breach and initiated immediate review by the Pentagon and other defense agencies [84].

United Kingdom's National Health Service Records Sharing

In the United Kingdom, their National Health Service partnered with Google's DeepMind to develop AI tools for healthcare diagnostics. Issues arose when the project involved sharing the medical records of over one million patients without their consent. The data sharing was ruled unlawful by UK regulatory authorities [85].

Conclusions

As demonstrated by the more than 60 application examples described in this report, AI is already being widely used in a beneficial manner among state Departments of Transportation across the United States. These applications are particularly common in asset management, traffic operations, and maintenance. AI applications for engineering and planning are less common.

The policy environments for AI use vary between states. While no states prohibit the use of AI or AI-based solutions, some states (e.g., Virginia for all AI uses; Georgia, Louisiana, and Tennessee among STC states for AI procurement) require AI-based solutions to be vetted and approved by a centralized statewide authority. In practice, this review requirement can hinder the development of smaller-scale or exploratory uses and applications of AI.

Most state agencies acquire AI through vendors rather than building in-house. This means the real governance questions emerge in RFPs and contracts. For example: What data rights do you retain? Can you audit the model? What happens when the vendor sunsets the product? Many agencies are still using procurement frameworks designed for road construction or photocopiers, not the AI ecosystem.

This report focuses on AI applications that have progressed beyond the pilot phase and into production, while also highlighting many pilots that never made it to production. These pilots have helped build internal capacity for understanding AI applications, while also highlighting the need for workforce development and improved governance of existing data.

Where AI has made it into production, AI is augmenting, rather than replacing, agency staff and efficacy. The cases presented in this study all reflect agencies using AI to help existing employees handle larger workloads, provide better customer service, or tackle previously impossible analyses, rather than as a cost-cutting strategy. Framing AI implementation as staff augmentation and emphasizing its benefits to both the agency and the public is the best way to create buy-in among the workforce and stakeholders.

Proactively explaining what AI is being used for, what it is not being used for, and how humans remain in the loop is much easier than rebuilding trust after a controversy. Several states are starting to require disclosures of AI use; getting ahead of this trend is wise, regardless. This applies both internally, with clear communication to agency staff about how the agency intends to use AI, as well as externally to the public.

Recommendations

Based on the findings of this research, the following recommendations are offered to transportation agencies seeking to advance their adoption and integration of artificial intelligence technologies:

1. Develop a Comprehensive AI Strategic Plan

Agencies should develop a formal AI strategic plan that aligns AI adoption with organizational goals and broad transportation priorities. As demonstrated by the Texas DOT AI Strategic Plan, effective planning involves engaging all districts and divisions, soliciting staff input to identify operational challenges, and aligning proposed AI use cases with the agency's mission. This process ensures that AI solutions address genuine needs and have broad stakeholder buy-in. The strategic plan should articulate a clear vision, guiding principles, and a multi-year roadmap for AI adoption that emphasizes ethical, human-centric use while protecting systems and users.

2. Establish Clear AI Governance and Oversight Structures

Transportation agencies should establish internal governance committees or designate AI leadership roles to evaluate AI solutions, ensure compliance with statewide policies, and maintain accountability. As observed in the North Carolina DOT's approach, governance committees can engage enterprise security and risk management offices to seek guidance during the evaluation of AI projects. Where statewide AI policies exist, agencies should work proactively with state IT authorities to understand approval processes and documentation requirements before initiating AI projects. Agencies should strive to govern AI in a way that minimizes risks while avoiding onerous review requirements that may stifle experimentation and adoption.

3. Adopt a Phased Implementation Approach Beginning with Low-Risk Applications

Agencies are encouraged to focus initial projects on low-risk applications with minimal security and privacy concerns, or on internal-facing processes. AI pilots and prototypes can be effective tools for building organizational understanding of AI tools, including their benefits and risks, while avoiding unnecessary exposure. Following the example of the Pennsylvania ChatGPT pilot, agencies should provide onboarding and training opportunities, then allow staff to experiment with sandboxed or controlled environments before broader deployment. As organizational knowledge grows, adoption can proceed in a controlled and safe manner toward more complex or public-facing applications.

4. Prioritize Workforce Development and AI Literacy

Preparing the workforce is a crucial step for any state DOT seeking to implement AI tools. Agencies should begin with AI literacy before introducing AI tools, ensuring staff understand what AI is, what it excels at, and where it falls short. Training should address concepts such as probabilistic outputs and hallucination risks. Agencies should create low-stakes experimentation opportunities, selecting specific, contained workflows as pilots to build confidence and reveal implementation challenges before more ambitious deployments. Potential examples include document review, data entry validation, or report formatting.

5. Maintain Human-in-the-Loop Requirements for All AI Applications

Nearly all statewide AI policies include human-in-the-loop (HITL) requirements. HITL ensures human involvement and review when using AI systems, prohibiting AI from acting autonomously and making real-world decisions without human approval. As the North Carolina DOT emphasized, agencies should commit to maintaining human oversight in all AI use cases. This approach is a key component to mitigating risks and reassuring agency personnel that AI adoption will keep humans in control of consequential decisions.

6. Establish Clear Metrics to Evaluate AI Effectiveness

Agencies should establish clear metrics to evaluate the effectiveness of AI solutions. This includes quantifying time savings, validating AI outputs through parallel reviews, and defining key performance indicators (KPIs) to track the progress of AI adoption and outcomes. Following the practice employed by both the North Carolina and Texas DOTs, agencies should initially implement AI use cases with predictable outcomes to facilitate ongoing evaluation and concurrent data verification efforts.

7. Modernize Procurement Frameworks for AI Acquisition

Most state agencies will acquire AI through vendors rather than building solutions in-house, meaning critical governance questions emerge in RFPs and contracts. Agencies should review and update procurement frameworks to address AI-specific concerns, including data rights retention, model auditability, and vendor sunset contingencies. Contract provisions should clearly define data ownership, noting whether data may be used in model development or created during system use. Agencies should require AI providers to demonstrate compliance with applicable state policies and the NIST AI Risk Management Framework.

8. Engage in Knowledge Sharing and Peer Collaboration

A consistent theme across successful AI implementations is the need for continued knowledge sharing across DOTs and other agencies to communicate both successes and failures. Agencies should participate in national peer exchanges, working groups, and regional consortia to foster shared learning and accelerate effective AI adoption. This collaborative approach helps agencies avoid duplicating efforts, learn from others' experiences, and identify proven solutions that can be adapted to local needs.

9. Prioritize Transparency with Staff and the Public

Transparency builds trust. Agencies should proactively explain what AI is being used for, what it is not being used for, and how humans remain involved in decision-making processes. This communication should occur both internally, with clear messaging to agency staff about how the agency intends to use AI, and externally to the public. Workforce preparation must also address legitimate anxieties about job security, workload changes, and professional identity. The use cases documented in this research reflect agencies using AI to help existing employees handle larger workloads, provide better customer service, or tackle previously impossible analysis. Framing AI implementation as staff augmentation rather than replacement creates buy-in among the workforce and stakeholders.

Acronyms, Abbreviations, and Symbols

Term	Description
AASHTO	American Association of State Highway and Transportation Officials
cm	centimeter(s)
DOTD	Louisiana Department of Transportation and Development
FHWA	Federal Highway Administration
ft.	foot (feet)
in.	inch(es)
LTRC	Louisiana Transportation Research Center
lb.	pound(s)
m	meter(s)

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Appendix A: State-Level Summary of AI Policies

This section provides an overview of the officially adopted statewide policies governing the use of artificial intelligence (AI), particularly generative AI, in each state. Where policies exist, this section describes the responsible state agency or authority that issued the policy, along with a brief summary of its key elements. Links to the policies are provided in the endnotes. It also notes whether the state's Department of Transportation (DOT) has a separate AI policy, and if so, provides a link and explains how it relates to the statewide policy.

Alaska

Statewide AI Policy: No official statewide AI policy found.

Key Elements: Alaska has not issued a statewide policy on generative AI use in government. AI legislation in Alaska has focused on specific issues like appropriations and sectoral uses [86].

Arizona

Statewide AI Policy: Arizona Strategic Enterprise Technology (ASET), Arizona Department of Administration – Generative AI Policy (P2000 October 2024)

Key Elements: Arizona's ASET office adopted a Generative AI Policy (P2000) for state agencies in 2024, outlining how employees may use GenAI tools. The policy emphasizes reviewing AI-generated outputs for accuracy, privacy, and security, and bans the input of any confidential state data into public GenAI services. This serves as Arizona's primary governing document for AI use by executive agencies [87].

California

Statewide AI Policy: Governor's Office & GovOps – Executive Order N-12-23 (September 2023); Department of Technology – GenAI Guidelines (March 2024)

Key Elements: California's Governor issued EO N-12-23 directing a study of GenAI and the development of guidelines for its use in state government. In March 2024, the CA Government Operations Agency (GovOps) led the release of Statewide GenAI Guidelines via the Department of Technology covering procurement, use, and training. The guidelines require agencies to assess risks and transparency of GenAI tools, designate GenAI project leads, and pilot AI projects responsibly, aligning with state AI risk management frameworks [88].

Colorado

Statewide AI Policy: Governor's Office of IT (OIT) – Statewide GenAI Policy (2024)

Key Elements: Colorado's OIT published a Statewide Generative AI Policy in 2024, establishing strict guidelines for the use of GenAI by state agencies. The policy mandates risk assessments for GenAI projects, requires human oversight for any AI-driven decisions that affect individuals, and ensures adherence to security and ethics standards. Non-compliance can lead to accountability measures. The policy aligns with the NIST AI RMF to ensure responsible use [89].

Connecticut

Statewide AI Policy: Office of Policy & Management (OPM) – Policy AI – 01 AI Responsible Use Framework (February 1, 2024)

Key Elements: Connecticut has implemented an enterprise framework with guiding principles (fairness, privacy, transparency, accountability, security), mandatory AI Impact Assessment before deployment, BITS review for AI procurements, and inventory and annual updates submitted to the AI Board [90].

Delaware

Statewide AI Policy: Delaware Department of Technology & Information - Generative Artificial Intelligence Policy (July 3, 2025)

Key Elements: Encourage responsible GenAI use for state purposes; label AI-generated content and independently verify outputs; prohibit using personal accounts/devices to bypass safeguards; distinguish Public GenAI from Enterprise GenAI; require DTI business case, IAM integration, encryption at rest for Enterprise tools; no Public GenAI with confidential data; allows DTI monitoring/logging and service restriction for violations; training required/strongly encouraged [91].

Hawaii

Statewide AI Policy: No official statewide AI policy found.

Key Elements: Hawaii has not published a generative AI policy for state government. AI discussions in Hawaii have centered on ethics and innovation encouragement, but as of 2025, no binding policy for state employees' AI use exists.

Idaho

Statewide AI Policy: No official statewide AI policy found.

Key Rlements: Idaho has not adopted a statewide policy on AI or GenAI use. AI-related activity in Idaho has been driven by legislation on specific issues such as deepfakes and data privacy, but no general policy for state agencies' AI use is in place. Anecdotally, the research team has been told by Idaho Transportation Department staff that the use of Generative AI is prohibited, pending future policy making.

Illinois

Statewide AI Policy: State of Illinois – Policy on the Acceptable and Responsible Use of Artificial Intelligence (April 2025)

Key Elements: State agencies must designate an AI compliance lead and inventory AI systems. The policy mandates risk mitigation, transparency in algorithms, and human oversight for AI-driven decisions. Illinois DOT has expressed an intention to develop an internal AI policy modeled on the statewide policy [92].

Indiana

Statewide AI Policy: State of Indiana Policy – Artificial Intelligence Version: 1.1 (December 2024)

Key Elements: Enterprise policy adopting NIST AI RMF; approval required for all AI use; agency readiness/maturity assessments conducted at planning and pre-deployment stages, with post-deployment triggers; just-in-time transparency notices provided to users; exceptions allowed with risk documentation and annual re-evaluation each January; enforcement actions, including termination of implementations [93].

Iowa

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Iowa has not adopted a statewide generative AI policy for its agencies. AI in Iowa has been addressed via legislative studies and targeted bills, but there is no comprehensive policy governing state employee use of GenAI tools.

Kansas

Statewide AI Policy: Kansas Office of Information Technology Services – Statewide Generative AI Policy (August 2023)

Key Elements: Kansas implemented a statewide Generative AI Acceptable Use Policy in August 2023. Issued by the state CIO's office, it is the primary governing document for GenAI usage in executive agencies. It requires that AI-generated outputs be reviewed for accuracy, appropriateness, privacy, and security before being used. The policy also forbids entering restricted or confidential state data into GenAI tools, and mandates that any AI-generated software code be security-checked and clearly annotated. Contractors with state agencies must disclose any AI usage and are prohibited from using state confidential data in AI without approval [94] [95].

Maine

Statewide AI Policy: Department of Administrative & Financial Services – GenAI Policy (July 2024; rev. September 2025)

Key Elements: Maine initially issued a six-month moratorium (Cybersecurity Directive) in mid-2023, barring executive agencies from using generative AI tools to allow time to assess risks. Subsequently, Maine's OIT adopted a permanent Generative AI Policy establishing guiding principles for responsible, transparent, and ethical use of GenAI in the Executive Branch. Maine's policy requires human-in-the-loop review and labeling of GenAI content; no non-public data in public GenAI; employee training required (initial and annual); approved tools list (others prohibited); and vendor disclosure and risk assessment [96] [97].

Maryland

Statewide AI Policy: Office of the Governor & Department of IT – Executive Order 01.01.2024.02 (January 2024); Interim GenAI Guidance (DoIT, May 2024)

Key Elements: Governor Wes Moore signed an Executive Order (01.01.2024.02) in January 2024 to "catalyze the responsible and productive use of AI in Maryland state government." This order launched an initiative for state agencies to adopt AI ethically and established an AI governance framework [98]. In May 2024, the Maryland Department of Information Technology issued Interim Generative AI Guidance for agencies [99]. The guidance provides initial guardrails (e.g., requiring agencies to inventory AI use, assess risks, ensure transparency to constituents, and focus on ethical AI adoption that protects privacy and cybersecurity). A comprehensive Maryland AI Strategy and roadmap is under development to further guide implementation.

Massachusetts

Statewide AI Policy: Executive Office of Technology Services & Security – Enterprise GenAI Use Policy (April 2024; rev. January 2025)

Key elements: Massachusetts established an AI Task Force (EO 629) in February 2024 and soon after released an Enterprise Policy on the Use and Development of Generative AI (April 12, 2024). This statewide policy from EOTSS sets minimum requirements for all Commonwealth agencies when developing or using GenAI [100]. It emphasizes ethical, transparent, and secure AI adoption, requiring that AI projects align with privacy laws and NIST-aligned risk management. The policy's guiding principles ensure that agencies use GenAI to innovate while maintaining public trust; for example, by validating AI outputs and avoiding any use that could violate civil rights or data security. This was updated in January 2025 with refined standards [101] .

Michigan

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: In 2025, Michigan unveiled an AI and the Workforce Plan as part of its statewide workforce strategy. While not a restrictive policy, it aligns state agencies and partners to proactively embrace AI's opportunities (e.g., training programs, upskilling) while addressing risks like job displacement and bias, under the mantra of "AI as an augmentation tool, not a replacement" [102].

Minnesota

Statewide AI Policy: Minnesota IT Services - Public Artificial Intelligence Services Security Standard (October 2023)

Key Elements: Minnesota has approached AI governance through specific initiatives, including the Transparent Artificial Intelligence Governance Alliance (TAIGA). The MNIT

Public Artificial Intelligence Services Security Standard guides the responsible use of Artificial Intelligence (AI) technologies and services by State of Minnesota employees. Specifically, the standard provides recommendations on the use of AI to improve personal productivity and efficiency, while providing best practices to prevent the release of private, sensitive, or protected data. The MnDOT "Generative AI Standard" was effective July 14, 2025. MnDOT issued a department-specific GenAI standard aligning with state law and values. It requires responsible, ethical use of GenAI, forbids input of private or confidential data into public AI tools, and mandates that all AI-generated content be treated with human oversight and verified for accuracy. This MnDOT policy operates within Minnesota's broader IT and data governance framework, ensuring the DOT's AI use complements any enterprise security standards [103] [104].

Missouri

Statewide AI Policy: No official statewide GenAI policy, with the state's focus remaining on study efforts.

Key Elements: Missouri does not have a formal generative AI policy for state employees. The state has emphasized studying AI's economic and workforce impacts (e.g., through the Missouri Chamber's AI reports) and is considering targeted legislation; however, no comprehensive usage policy has been adopted yet [105].

Montana

Statewide AI Policy: No official statewide GenAI policy found, but Montana House Bill 178 (May 2025) legislates some aspects of AI use.

Key Elements: Bans AI for behavioral manipulation, discriminatory classification (including disparate impact), malicious purposes, and most public-space surveillance (with limited exceptions); requires AI disclosure for AI outputs published without human review; mandates human review for AI outputs affecting people's rights, duties, privileges, and immunities [106].

Nebraska

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Nebraska has not promulgated a statewide policy on generative AI. Discussions on AI in Nebraska have been at the legislative level, and the state is monitoring federal guidance, but no internal policy exists as of 2025.

Nevada

Statewide AI Policy: OCIO – Policy on the Responsible and Ethical Use of Artificial Intelligence in Nevada State Government (November 2024)

Key Elements: Establishes enterprise minimum standards; bars agency rules from being more lenient; prohibits the use of discriminatory AI content and non-anonymized personal data; emphasizes the responsible, ethical, and transparent use of AI [107].

New Hampshire

Statewide AI Policy: New Hampshire State Government DoIT – Code of Ethics for the Use and Development of Generative Artificial Intelligence and Automated Decision Systems (June 20, 2023)

Key Elements: Identifies principles of human dignity/freedom, democracy/rule of law, equality/fairness, privacy/data governance, and transparency/accountability; requires human oversight of decisions, robustness/safety, and bias mitigation. Informs DoIT's later Use of AI Technologies Policy [108].

New Jersey

Statewide AI Policy: Office of Innovation & Office of Information Technology – State Employee AI Use Policy (November 2023)

Key Elements: New Jersey released a policy guiding state employees' use of generative AI in November 2023. The policy ensures that GenAI tools are used appropriately and transparently, and that outputs are independently fact-checked. It explicitly forbids sharing any confidential or protected information with AI platforms. New Jersey is also investing heavily in training; the Office of Innovation, in partnership with InnovateUS, produced training videos and is rolling out self-paced AI training for public workers [109].

New Mexico

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: New Mexico has not established a statewide generative AI policy as of 2025. The state's focus has been on developing AI tech sector opportunities and ethical guidelines via commissions, but no formal internal use policy for agencies is in place.

New York

Statewide AI Policy: Office of Information Technology Services – Acceptable Use of Artificial Intelligence Technologies (January 2024; rev. March 2025)

Key Elements: Requires human-in-the-loop (i.e., no automated final decisions); disclosure to the public; bias monitoring/remediation; AI Risk Assessment using NIST AI RMF; statewide AI inventory; NYS security/SDLC controls; ITS intake and procurement reviews; agency policies may be stricter but not more lenient than NYS-P24-001 [110].

North Dakota

Statewide AI Policy: NDIT CIO – Artificial Intelligence Policy (February 2024)

Key Elements: NIST-aligned (AI RMF and SP 1270); transparency and labeling (disclose AI to citizens; mark systems/outputs when using medium/high-risk data); no moderate/high-risk data in public AI; risk and privacy assessments; training; approved-tool inventory and intake; exception process; notes on copyright and open-records [111].

Ohio

Statewide AI Policy: Department of Administrative Services – Use of Artificial Intelligence in State of Ohio Solutions (December 2023)

Key Elements: Covers Conventional and GenAI; mandates use-case definition, agency executive approval, and AI Council approval for GenAI; public data only in public GenAI; human review of outputs; statewide procurement checklist, GenAI repository, and governance roles. The Ohio Department of Transportation bans the use of generative AI by its staff or contractors [112].

Oklahoma

Statewide AI Policy: Office of Management & Enterprise Services - Use of AI in Oklahoma State Government Standard (February 2024; rev. March 2025)

Key Elements: CIO must sign all AI acquisitions; review covers strategy, ethics, security; no sensitive data in public AI; CISO ATO/security review required pre-use; Do/Do-Not rules for staff; auditing for compliance/bias/privacy; permitted secure instances with CIO approval for sensitive data [113].

Oregon

Statewide AI Policy: No official statewide GenAI policy, but current guidelines: Enterprise Information Services (State CIO) – Interim Generative AI Use Guidelines (December 2024; rev. April 2025)

Key Elements: Oregon's State CIO (EIS) issued Interim Guidelines for Responsible Use of GenAI in state government. Guidelines encourage agencies to integrate generative AI in a secure, values-driven manner. The guidance underscores Oregon's core values of service, equity, and inclusivity, insisting GenAI adoption must align with those principles. Stresses careful planning and risk mitigation are needed to address new risks introduced by AI. Based on NIST's AI RMF, the guidelines require periodic review as technology evolves. In practice, agencies are advised to conduct security reviews, prevent data leakage, and ensure ethical use of GenAI under these interim rules [114].

Pennsylvania

Statewide AI Policy: Office of the Governor & Office of Administration – Executive Order 2023-19 (September 2023)

Key Elements: Governor Josh Shapiro signed Executive Order 2023-19 in September 2023, establishing a comprehensive governance framework for generative AI. The order created a Generative AI Governing Board and outlined ten core values to guide all Commonwealth agencies' use of GenAI (e.g., accuracy, equity, privacy, transparency). It directs the Office of Administration (OA) to develop training and "GenAI knowledge certifications" for employees, ensuring staff are upskilled to use AI as an "enhancement tool, not a replacement" for workers. Pennsylvania's policy both empowers agencies to use GenAI for efficiency and mandates ethical guardrails and training via the new governance structure [115].

Rhode Island

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Rhode Island has not yet adopted a formal generative AI policy for its state agencies. The state has shown interest in AI for economic development and government innovation, but no explicit internal-use policy is in place as of 2025.

South Dakota

Statewide AI Policy: No official statewide GenAI policy, but current guidelines: Bureau of Information & Telecommunications – Generative AI Guidelines & Acceptable Use (2024)

Key Elements: South Dakota's BIT issued guidelines for Generative AI use in 2024, promoting a balanced, cautious approach. The guidelines acknowledge GenAI's potential to boost efficiency and productivity in state agencies, but equally stress the risks of AI bias, privacy breaches, and cybersecurity issues. BIT instructs employees that AI-generated content should always be proofread, edited, and fact-checked, and used only as a starting point, never the final product, in government work [116].

Utah

Statewide AI Policy: Office of the Governor – Artificial Intelligence Policy Act (UAIPA, March 2024); Office of AI Policy (Commerce) (July 2024); DTS Policy 4000-0008

Key Elements: Utah has been a trailblazer in both legislative and administrative policy regarding AI. In March 2024, Utah enacted the Utah AI Policy Act (SB 149), a first-of-its-kind law that requires transparency when generative AI is used in consumer interactions and clarifies that existing consumer protection laws apply to AI. Concurrently, the state established a dedicated Office of Artificial Intelligence Policy (OAIP) in July 2024 under the Department of Commerce. DTS Policy 4000-0008 provides enterprise GenAI guidance; no state data to train/build public GenAI; use approved tools/accounts; human verification and disclosure [117] [118].

Vermont

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Vermont has not adopted a specific generative AI policy for state government. AI discussions in Vermont have focused on ethics in government use and small-scale pilots, but no formal policy governs AI usage by state employees yet.

Washington

Statewide AI Policy: Office of the Governor - Executive Order 24-01: Artificial Intelligence (January 30, 2024); EA-01-03-G - Interim Guidelines for Purposeful and Responsible Use of Generative Artificial Intelligence (AI) in Washington State Government (August 2023)

Key Elements: Statewide EO directing responsible GenAI adoption; WaTech issued interim use guidelines, high-risk AI risk-assessment guidance, equity-impact analysis guidance, and initial procurement guidance; agencies to identify initiatives, train workforce, and engage stakeholders, including tribal governments [119] [120].

Washington, D.C.

Statewide AI Policy: Executive Office of the Mayor & OCTO – Mayor's Order 2024-028 (February 2024)

Key Elements: The District of Columbia, under Mayor Muriel Bowser, established a comprehensive AI policy via Mayor's Order 2024-028 in February 2024. This order defined DC's AI Values Statement with six core values (e.g., public benefit, safety/equity, accountability, transparency, sustainability, privacy/security) that must guide any AI use in D.C. government. It also launched a District AI Strategic Plan roadmap to integrate generative AI into city operations in a responsible manner. D.C.'s approach is notable for its focus on values and public oversight, ensuring any generative AI adoption by the city is ethical, transparent, and in line with D.C.'s equity goals [121].

Wisconsin

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Wisconsin's Governor Tony Evers signed EO #211 in August 2023 establishing the Governor's Task Force on Workforce and Artificial Intelligence. Wisconsin's focus is on workforce readiness and mitigating disruption. The Task Force will advise on training programs, education curriculum changes, and potential regulations to ensure workers and businesses thrive alongside AI. There is no separate operational policy limiting state employees' use of AI tools yet; the state is first studying AI's effects via this task force [122].

Wyoming

Statewide AI Policy: No official statewide GenAI policy found.

Key Elements: Wyoming has not adopted a statewide generative AI policy for its government. As of 2025, the state's AI engagement has been minimal; any AI use by agencies is handled on a case-by-case basis without a unified policy.