



Generative AI and the Future State DOT Workforce

Requested by

Dara Wheeler, Acting Chief Data and Artificial Intelligence Officer

Author

Mehdi Moeinaddini, Senior Transportation Planner, Office of Planning, Policy, and Program Development, Division of Research, Innovation, and System Information

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Executive Summary

Summary of Key Findings

This review involves selecting relevant studies, news articles, and reports, and synthesizing their key themes and findings to summarize how Generative AI (GenAI) could transform the work of U.S. state Departments of Transportation (DOTs). GenAI can significantly improve operational efficiency, enhance safety through predictive analytics, and streamline public engagement and service delivery. It enables faster data analysis, automates repetitive tasks, and supports more strategic use of staff resources. However, several risks must be carefully managed. Data quality issues could compromise AI accuracy, while overreliance on automated systems may weaken institutional knowledge if not paired with continuous human oversight. Workforce resistance to change, ethical concerns around bias in AI models, and regulatory uncertainty (e.g., the "Big Beautiful Bill") could delay or derail implementation. Without a strong governance framework, AI deployment may inadvertently introduce new inefficiencies or vulnerabilities, particularly related to cybersecurity and privacy.

GenAI technologies are set to significantly transform DOTs, impacting job roles, organizational structures, workflows, and funding priorities across three phases:

- **Near-Term (1–3 Years):** Caltrans and other DOTs will primarily leverage GenAI through pilot projects aimed at enhancing productivity. Initial deployments will focus on augmenting human capabilities, such as using AI for data summarization, report drafting, and preliminary data analysis. Early pilots indicate notable efficiency gains, exemplified by Pennsylvania's success using GenAI for routine tasks, saving significant employee hours weekly. Roles will mostly evolve rather than disappear, with tasks shifting from creation to reviewing AI-generated outputs.
- **Mid-Term (3–7 Years):** GenAI will scale into mainstream applications within DOTs, fundamentally transforming workflows. Positions will increasingly focus on oversight and analytical tasks as routine data entry and processing become automated. New specialized roles will emerge, including AI governance experts, prompt engineers, and dedicated data scientists. Agencies will witness major operational improvements, particularly in asset management, project planning, traffic operations, and procurement.
- **Long-Term (10+ Years):** DOTs will become fully AI-integrated entities, significantly reshaping organizational models. AI will manage many routine decisions, with human roles evolving to oversight, innovation, and complex problem-solving. Workforce size may reduce slightly, offset by an increase in highly skilled roles focused on managing AI technologies. The workforce will feature roles like AI maintenance technicians, transportation AI system architects, and ethics officers. Human-AI collaboration will become standard practice, deeply embedded in all decision-making processes.

Recommendations for Caltrans

1. **AI Strategy and Governance Framework:** Develop a comprehensive roadmap with clearly outlined AI use cases, timelines, and ethical guidelines for governance and risk management.
2. **Workforce Development:** Implement extensive AI literacy and upskilling programs tailored to role-specific needs, ensuring all employees become proficient in utilizing AI tools effectively.
3. **Organizational Adaptation:** Move toward cross-functional teams to support rapid technological changes, fostering flexibility in roles and responsibilities.
4. **AI Champions:** Identify and nurture internal advocates who can mentor colleagues, encourage adoption, and demonstrate the real-world benefits of AI.

5. **Recruitment and Hiring Strategies:** Adapt recruitment practices to attract talent skilled in data analytics and AI, revise job descriptions to include relevant competencies, and establish apprenticeships or internships focused on transportation-specific AI applications.
6. **Modernized IT Infrastructure:** Prioritize modernization efforts including cloud migration, data standardization, and cybersecurity enhancements to ensure robust support for AI systems.
7. **Change Management:** Engage employees actively through transparent communication, involve them in AI deployment decisions, and manage transitions with clear messaging around the anticipated benefits and job impacts.
8. **AI Governance Team:** Form dedicated governance teams responsible for continuously monitoring AI applications to ensure ethical compliance, mitigate biases, and maintain transparency.
9. **Interagency Collaboration:** Foster partnerships with academic institutions, research centers, and peer agencies to leverage shared expertise and resources, advancing AI capabilities collaboratively.
10. **Regulatory Vigilance:** Proactively engage in and influence federal legislative developments, such as the "Big Beautiful Bill," to ensure Caltrans can navigate regulatory environments effectively without losing local innovation opportunities.

Implementation Mechanisms

To operationalize these recommendations, Caltrans should deploy the following mechanisms:

- **Pilot Programs:** Launch targeted GenAI pilots to test high-impact use cases such as traffic safety analytics, congestion mitigation, document automation, and public engagement tools.
- **Cross-Functional Teams:** Establish agile teams composed of planners, IT staff, data scientists, and legal experts to collaboratively develop and scale AI projects.
- **AI Center of Excellence:** Create a centralized hub to support AI strategy, provide technical guidance, manage vendor relationships, and coordinate training efforts.
- **Strategic Partnerships:** Formalize collaborations with universities, research institutions, and peer DOTs to accelerate learning, share tools, and co-develop best practices.
- **Technology Infrastructure Investments:** Modernize IT systems to support cloud-based AI tools, real-time data processing, and secure data sharing across Caltrans divisions.
- **Federal Funding Utilization:** Leverage programs such as USDOT's SMART grants and IJJA innovation funds to finance pilots, training, and long-term AI scaling.
- **Continuous Evaluation:** Integrate performance tracking into AI projects, measuring outcomes such as time savings, user adoption, error reduction, and public satisfaction.

Next Steps for Caltrans

- Launch immediate, focused pilot initiatives to generate early successes and demonstrate value.
- Conduct comprehensive workforce assessments to identify skill gaps, subsequently initiating role-specific training programs.
- Establish an internal AI task force or Center of Excellence to centralize expertise, coordinate pilots, and ensure alignment across departments.
- Begin immediate infrastructure upgrades to prepare for broader AI adoption, emphasizing data quality and system integration.
- Regularly communicate with staff to foster trust and clarity regarding AI's integration into daily operations, highlighting how AI augmentation will enhance—not replace—human capabilities.
- Monitor and participate in policy discussions at state and federal levels to anticipate and adapt to regulatory changes impacting AI initiatives, ensuring Caltrans remains strategically positioned for future innovations.

Detailed Findings

Generative AI (GenAI) is poised to reshape the work of U.S. state Departments of Transportation (DOTs) in profound ways. From automating routine tasks to augmenting decision-making with data-driven insights, GenAI will impact job roles, organizational structures, workflows, and funding priorities. Below is a structured analysis of these impacts across three-time horizons (near-term, mid-term, and long-term) followed by recommendations for workforce readiness.

Near-Term (1–3 Years): Pilots and Augmentation

In the near term, state DOTs are expected to experiment with GenAI through pilot projects and targeted tools that enhance productivity without major structural changes. Early deployments focus on augmenting staff capabilities rather than replacing jobs:

- **Pilot Projects and Use Cases:** Many states are launching GenAI pilots to tackle specific challenges. For example, [Caltrans \(California DOT\) recently awarded contracts to test GenAI solutions for traffic safety and congestion](#)¹. These pilots use AI to analyze “near-miss” incident data and complex traffic patterns, aiming to identify high-risk locations and optimize traffic flow. Such projects illustrate how AI can crunch vast datasets to flag issues that human staff can then address, augmenting analysts and traffic engineers with deeper insights.
- **Productivity Gains and “Co-Pilot” Tools:** Early results suggest GenAI can significantly boost efficiency. [In Pennsylvania’s 2024 pilot](#)², 175 state employees across agencies used OpenAI’s ChatGPT Enterprise for writing, research, and IT support; they reported saving about 95 minutes *per day* (roughly 8 hours per week) on routine tasks. Governor Josh Shapiro noted that AI served as a “*job enhancer*, not a replacer,” freeing staff to focus on complex cases and direct citizen assistance. This reflects a broader trend: chief information officers (CIOs) see GenAI as a “co-pilot” to augment employee abilities, handling first drafts and data queries so workers can perform higher-value activities as highlighted in [a report that explores generative AI use in state governments](#)³, based on input from 49 CIOs.
- **Changes in Job Roles:** In this phase, most roles are augmented, not eliminated. Planners, engineers, and data analysts begin using GenAI tools for tasks like document summarization, report generation, and data querying. For instance, a generative AI system might draft an initial environmental review or summarize public comments on a project, which a human then refines. [Based on a new Capgemini Research Institute report](#)⁴, many roles will evolve from creation to reviewing GenAI outputs. Some new roles may emerge in a limited capacity: [a May 2024 survey](#)⁵ found that 67% of mature organizations are creating new roles for GenAI, with 87% having dedicated AI teams. Additionally, agencies might tap “prompt engineers” or AI system trainers on a pilot basis to fine-tune prompts and models for agency-specific needs, though these may be temporary roles often filled by consultants or upskilled IT staff. [Embracing Generative AI in Local Governments: Prompt Engineering and Upskilling](#)⁶ explores how local governments are addressing the skill gap associated with generative AI by investing in upskilling programs for current employees. Additionally, the article “[Generative AI Consulting Roles Are On the Rise. Here’s Why](#)”⁷ discusses how enterprises, including government agencies, are increasingly

¹ <https://dot.ca.gov/news-releases/news-release-2024-016>

² <https://statescoop.com/chatgpt-pennsylvania-governor-shapiro-pilot-program/>

³ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

⁴ https://www.capgemini.com/gb-en/insights/research-library/generative-ai-in-leadership/?utm_source=pr&utm_medium=referral&utm_content=GenAI_none_none_none_none&utm_campaign=CRI_GenAI_atwork_2024

⁵ <https://www.gartner.com/en/newsroom/press-releases/2024-05-14-artificial-intelligence-is-creating-new-roles-and-skills-in-data-and-analytics>

⁶ <https://patimes.org/embracing-generative-ai-in-local-governments-prompt-engineering-and-upskilling/>

⁷ <https://www.thedailyupside.com/cio/enterprise-ai/generative-ai-consulting-roles-are-on-the-rise-heres-why/>

seeking consultants with expertise in generative AI.

- **Workflow Redesign (Early Stages):** Core transportation workflows remain largely the same in the near term, but with efficiency tweaks. [According to a survey of over 200 executives](#)⁸, while GenAI is being adopted across various functions like asset management, route optimization, and warehouse operations, these implementations are often limited and focused on specific areas.

Project planning teams may start using AI to rapidly draft planning documents or generate alternative design scenarios. According to the National Cooperative Highway Research Program (2025), transportation planning teams may soon integrate generative AI tools to streamline tasks such as drafting planning documents and generating alternative design scenarios. [A forthcoming NCHRP primer](#)⁹ aims to guide state DOTs in adopting GenAI technologies for more efficient and informed decision-making.

Asset management units experiment with AI-driven analytics – for example, using machine learning to predict pavement deterioration or to prioritize bridge inspections. [The FHWA's 2024 report](#)¹⁰, “Exploratory Advanced Research Program: The Role of Artificial Intelligence and Machine Learning in Federally Supported Surface Transportation”, outlines various research initiatives involving AI and machine learning in transportation. It highlights projects focused on leveraging big data, video analytics, and machine learning to improve infrastructure asset conditions, including pavement and bridge management.

In procurement, GenAI can be used to help draft RFP language or to quickly answer vendor questions. [Places like Idaho and Murray, Utah, are finding early success using generative AI to speed up their procurement process](#)¹¹.

Data analytics and performance management see immediate gains: AI can sift through traffic sensor data or crash reports and highlight key trends, which analysts then validate. [Generative AI in Transportation Planning: A Survey](#)¹² emphasizes how AI can enhance data analytics and performance management in transportation systems, directly supporting this point.

Citizen engagement gets a boost from AI- powered chatbots. In the near term, [these bots](#)¹³ handle basic FAQs, freeing call center staff to handle complex or sensitive cases.

- **Organizational Moves and Funding:** Near-term organizational changes are modest. Several states have formed working groups or innovation task forces to coordinate AI efforts^{14 15 16 17 18}. A DOT might create a cross-departmental AI task force including IT, traffic operations, and HR to oversee pilot projects and develop usage policies¹⁹. A few early adopters may stand up a small AI Center of Excellence at the state level to support all agencies (transportation included) in experimenting with AI²⁰.

In terms of funding, most pilots are financed through existing IT or R&D budgets or small innovation grants. Agencies redirect funds to purchase enterprise AI licenses ([as Pennsylvania did for ChatGPT](#)²¹) and to contract with vendors or academia for pilot implementation. Federal support is beginning to trickle in: U.S. DOT’s Exploratory Advanced Research program and Small Business

⁸ https://www2.deloitte.com/content/dam/insights/articles/us187568_cic_gen-ai-in-transportation/Gen-AI-in-transportation.pdf

⁹ <https://rip.trb.org/View/2381701>

¹⁰ <https://rosap.ntl.bts.gov/view/dot/79060>

¹¹ <https://statescoop.com/generative-ai-government-procurement-risk-2024/>

¹² <https://arxiv.org/pdf/2502.05777>

¹³ <https://statescoop.com/government-ai-chatbots-state-local-websites-2024/>

¹⁴ <https://www.govtech.com/artificial-intelligence/virginia-activates-its-artificial-intelligence-task-force>

¹⁵ <https://www.govtech.com/artificial-intelligence/new-arkansas-ai-working-group-will-guide-implementation>

¹⁶ <https://www.atg.wa.gov/aitaskforce>

¹⁷ <https://www.mass.gov/news/governor-healey-signs-executive-order-establishing-artificial-intelligence-ai-strategic-task-force>

¹⁸ <https://www.govtech.com/artificial-intelligence/alabama-governor-creates-task-force-for-responsible-ai-adoption>

¹⁹ <https://www.govtech.com/artificial-intelligence/ai-poised-to-reshape-state-transportation-departments-staff>

²⁰ <https://dir.texas.gov/news/dir-announces-creation-texas-artificial-intelligence-center-excellence>

²¹ <https://statescoop.com/chatgpt-pennsylvania-governor-shapiro-pilot-program/>

Innovation Research (SBIR) grants are offering funding for AI in transportation²². Additionally, federal guidance like [OMB Memorandum M-24-10](#)²³ provides a governance framework for AI use in agencies, emphasizing risk management and responsible innovation—many state DOTs will adopt similar guardrails in this period. Recent federal actions, including a new [Executive Order](#)²⁴ revoking previous AI governance frameworks such as [Executive Order 14110](#)²⁵, further signal a shift in national AI policy with new federal guidance like [M-25-21](#)²⁶. The stated goal is to eliminate perceived ideological bias and clear barriers to innovation, reaffirming America's commitment to global AI leadership. This reorientation may affect how states, including Caltrans, align their AI strategies with evolving federal priorities, especially in balancing innovation, ethics, and local oversight. State DOTs also should monitor developments related to '[Big Beautiful Bill](#)²⁷,' as its enactment might halt state-driven AI regulatory pilots or initiatives, necessitating quick adaptation to federally standardized guidelines and policies.

- **Workforce Development – Initial Steps:** Preparing staff for GenAI begins now. Forward-looking DOTs are introducing AI training and upskilling programs on a pilot basis. [TxDOT's 2025–2027 AI Strategic Plan](#)²⁸, for example, calls for a comprehensive AI literacy program to educate employees on AI fundamentals and applications in transportation. Early training focuses on using AI tools safely and effectively (e.g. how to craft good prompts, interpret AI outputs, and avoid disclosure of sensitive data). Some DOTs establish communities of practice to share AI knowledge internally²⁹. There is an emphasis on building *trust*: leaders communicate that AI is a tool to assist staff, not replace them, and they highlight success stories to reduce skepticism. According to [National Association of State Chief Information Officers \(NASCIO\)](#)³⁰, with proper policy guardrails in place and pilots underway, now is the time for states to move into scaling AI – but doing so requires helping current staff learn new skills and recruiting fresh talent to fill skill gaps. In the near term, this means offering broad-based training and beginning to update job descriptions to include data and AI competencies.

Actionable Insight (Near-Term)

State DOTs should launch small-scale GenAI pilots targeting “quick win” use cases (e.g. an internal chatbot for staff knowledge or an AI tool to summarize project documents). Ensure a governance policy is in place (covering data privacy and ethics), then allow interested employees to experiment with AI in their workflows. Invest in basic AI literacy workshops to familiarize staff with these tools, and publicize pilot successes to build buy-in.

²² <https://www.transportation.gov/ai/funding>

²³ https://www.transportation.gov/sites/dot.gov/files/2024-09/USDOT_Compliance_Plan-for-OMB_Memorandum_M-24-10_%28September_2024%29.pdf

²⁴ <https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/>

²⁵ <https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/>

²⁶ <https://www.whitehouse.gov/wp-content/uploads/2025/02/M-25-21-Accelerating-Federal-Use-of-AI-through-Innovation-Governance-and-Public-Trust.pdf>

²⁷ <https://www.usatoday.com/story/news/politics/2025/05/27/trump-big-beautiful-bill-ai-regulation-ban/83874952007/>

²⁸ <https://www.txdot.gov/content/dam/docs/str/ai-strategic-plan-09-20-2024.pdf>

²⁹ <https://aashtojournal.transportation.org/knowledge-session-examining-role-of-ai-in-transportation/#:~:text=We%20developed%20a%20community%20of%20practice%20for%20our%20workforce%2C%20making%20them%20aware%20of%20where%20we%E2%80%99re%20going%20from%20a%20governance%20perspective%20and%20also%20from%20an%20operational%20perspective>

³⁰ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

Mid-Term (3–7 Years): Scaling and Transformation

Over the mid-term, roughly 3–7 years out, generative AI is expected to scale up from pilots to mainstream use in state DOTs. This period will likely bring more transformative changes to roles, processes, and organizational structures as agencies integrate GenAI into core business functions.

- **Wider Deployment of AI Tools:** What began as pilots will evolve into enterprise-grade AI applications across departments. For example, if a pilot AI system proved useful in drafting environmental impact summaries, by this stage it may be deployed agency-wide for all environmental reviews. DOT maintenance divisions might use computer vision and GenAI to analyze images of road conditions and draft maintenance schedules. Multiple use cases mature simultaneously, from AI-assisted traffic management systems to automated document processing for administrative workflows.

This shift is supported by recent findings. For example, [IBM \(2023\)](#)³¹ reports 64% of CEOs are under pressure to accelerate GenAI adoption across departments. [Menlo Ventures \(2024\)](#)³² found a sixfold increase in enterprise GenAI spending from \$2.3B in 2023 to \$13.8B in 2024, illustrating a market-wide shift from experimentation to enterprise-scale investment and [Boston Consulting Group \(2025\)](#)³³ highlights that over 90% of high-performing Global Capability Centers (GCCs) have established AI Centers of Excellence, indicating that organizations are institutionalizing AI to sustain long-term innovation and scalability.

[A survey of state CIOs](#)³⁴ indicates optimism that GenAI will improve service delivery and analysis across government once scaled. However, scaling up is not trivial— states must overcome data quality issues, budget constraints, and security concerns to move from isolated pilots to enterprise implementation.

- **Job Roles – Augmentation Turns to Evolution:** As GenAI is institutionalized, job roles will significantly evolve. Many positions are “AI-augmented” – the job still exists, but its day-to-day tasks are changed by AI assistance. For instance, a transportation planner in 2028 might spend less time manually compiling data or writing reports; instead, they supervise AI models that generate draft plans or forecasts, and then focus on interpreting results and engaging stakeholders. A highway design engineer might use generative design tools to create multiple design alternatives in hours (something that used to take weeks), then use their expertise to vet and refine the AI-generated designs. This shift elevates the analytical and oversight aspects of jobs and reduces the rote mechanical aspects.

Research by [Clarke and Joffe \(2025\)](#)³⁵ examined how creative professionals in agencies adapt their workflows with GenAI tools. They found that workers assign specific roles to AI tools, modify their outputs, and continuously manage AI-generated content to align with stakeholder expectations. This “reflexive delegation” indicates that professionals are increasingly overseeing AI processes, ensuring outputs meet quality standards and organizational needs.

In the construction industry, firms like Zaha Hadid Architects have integrated AI to enhance design processes. This allows architects to focus more on creative and strategic aspects, such as refining designs and engaging with clients, rather than on manual drafting tasks³⁶. Generative AI is revolutionizing construction by automating tasks like reading and processing invoices, creating construction schedules, and identifying building code violations. These advancements enable

³¹ <https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/enterprise-generative-ai>

³² <https://menlovc.com/2024-the-state-of-generative-ai-in-the-enterprise/>

³³ <https://web-assets.bcg.com/66/c2/16f4539648f0a6a455ce5058f7f2/rewriting-the-global-capability-center-playbook.pdf>

³⁴ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

³⁵ <https://arxiv.org/pdf/2505.18938>

³⁶ <https://www.thetimes.com/business-money/entrepreneurs/article/zaha-hadid-architects-builds-winner-proposals-with-ai-enterprise-network-gs7m7txwz>

professionals to focus on higher-value activities, such as strategic planning and risk management, thereby transforming their roles into more analytical and oversight-oriented positions³⁷.

At the same time, some roles may be partially phased out or reduced as certain tasks become fully automated. For example, positions devoted largely to data entry or routine data processing will dwindle as those functions are handled by AI-powered RPA (robotic process automation) and natural language interfaces^{38 39 40}. We may also see fewer front-line customer service reps needed if AI chatbots handle the bulk of simple inquiries (though humans will still handle complex cases)⁴¹. Importantly, wholesale job losses are not expected mid-term – rather, agencies will likely reassign or retrain staff whose tasks are automated. McKinsey’s analysis suggests that while GenAI could affect up to 30% of work hours by 2030, those hours shift into new activities and higher-value work, provided workers are reskilled^{42 43}. Based on the [Federal Reserve Bank of New York's August 2024 survey on AI](#)⁴⁴ use and workforce impacts, AI's labor market impact remains modest and leans more toward workforce adaptation than disruption. Firms are proactively preparing through retraining, with limited near-term effects on wages or employment levels.

- **Emergence of New Roles:** By this period, new specialized roles are formalized in state DOTs. One key role is the AI Governance or Ethics Lead – a professional responsible for overseeing responsible AI use, monitoring bias or privacy issues, and ensuring compliance with evolving AI regulations. [NASCIO](#)⁴⁵ forecasts that scaling AI in government will require talent beyond traditional IT, including “*experts in ethics, responsible AI practices, privacy, law, and deep domain expertise in areas like ... transport*”. State DOTs may hire or designate AI domain experts who bridge transportation knowledge and AI skills – for example, an experienced traffic engineer with AI training might serve as a “Transportation AI Coordinator” to identify use cases and liaise with the IT department.

Another emerging role is the Prompt or Knowledge Engineer: individuals who curate prompts and fine-tune GenAI models on agency data (e.g. training a generative model on decades of DOT project archives to act as an internal knowledge base). While some of this work might be handled by vendors or central IT, large DOTs could have in-house prompt engineering teams as their repositories of data grow. Additionally, data scientists and machine learning engineers will become integral to DOT staff, either within the IT division or embedded in units like planning and operations, to maintain AI models and analyze outputs. [A survey](#)⁴⁰ in 2024 found that many states plan to expand hiring in data and AI skill areas to support automation efforts.

Concurrently, leadership roles may adapt – for example, the Chief Information Officer or Chief Data Officer of a DOT will take on an expanded portfolio that includes AI strategy, or new “Chief Artificial Intelligence Officer” positions might be created in state government to coordinate AI across agencies^{46 47 48 49 50}.

³⁷ <https://www.oracle.com/cis/construction-engineering/gen-ai-construction/>

³⁸ <https://arxiv.org/pdf/2408.14791>

³⁹ <https://iwconnect.com/casestudies/automating-data-entry-and-reporting-in-banking-application-using-rpa/>

⁴⁰ <https://www.mindfieldsglobal.com/blog/rpa-impact-on-our-labour-markets>

⁴¹ <https://arxiv.org/pdf/2304.11771>

⁴² <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-ai-the-next-productivity-frontier>

⁴³ <https://www.mckinsey.com/mgi/our-research/generative-ai-and-the-future-of-work-in-america>

⁴⁴ <https://libertystreeteconomics.newyorkfed.org/2024/09/ai-and-the-labor-market-will-firms-hire-fire-or-retrain/>

⁴⁵ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

⁴⁶ <https://www.govtech.com/artificial-intelligence/ai-poised-to-reshape-state-transportation-departments-staff>

⁴⁷ <https://statescoop.com/georgia-chief-digital-ai-officer-state-playbook/>

⁴⁸ <https://nj.gov/governor/news/news/562023/approved/20231010b.shtml>

⁴⁹ <https://its.ny.gov/press-release/new-york-state-office-information-technology-services-announces-appointment-shreya-amin-chief>

⁵⁰ <https://apnews.com/us-news/tate-reeves-artificial-intelligence-mississippi-general-news-d43d88dcd34de5f346919fe1f65c6b10>

- **Redesigned Processes and Workflows:** By 3–7 years out, core DOT workflows will be redesigned around AI capabilities, yielding major efficiency and service improvements:

- **Project Planning & Design:** Planners will use GenAI-driven simulation tools to generate and evaluate numerous project scenarios (for a new highway or transit route) in a fraction of the time. AI will quickly produce draft planning documents, environmental analyses, and even public hearing presentations, which humans will then customize⁵¹. Some agencies might adopt generative AI to analyze public comments on draft plans – clustering sentiments and summarizing key concerns to inform decision-makers. The workflow shifts to be more iterative and data-rich: planners spend more time on strategy and community engagement, with AI handling initial analysis and documentation.
- **Asset Management & Maintenance:** Predictive AI models, fed by IoT sensors and inspection data, will optimize maintenance schedules⁵². Rather than relying purely on set cycles, a future asset manager might get an AI-generated weekly list of “top 10 assets at risk of failure” drawn from real-time data. Crews could receive AI-prioritized work orders (e.g. which potholes or signals to fix first based on risk). Some DOTs will employ drones and robots for inspections (a trend already emerging), with AI analyzing imagery to detect cracks or hazards^{53 54}. The result is a proactive maintenance process: issues are identified and addressed before they escalate, improving safety and saving costs. Workers on maintenance teams may transition to roles like drone operator or AI maintenance analyst, overseeing the tech that monitors infrastructure.
- **Traffic Operations & TSMO:** In Traffic Systems Management and Operations (TSMO), AI will play a central role in real-time traffic control. AI systems will synthesize data from connected vehicles, cameras, and sensors to adjust traffic signals dynamically and manage congestion. For example, an AI might detect an incident and immediately suggest an optimal detour plan (drawing on historical incident data). DOTs are already exploring [AI for transportation safety](#)⁵⁵ – using incident data to recommend different traffic management responses accordingly. Iowa State University and Iowa DOT are developing TIMELI, an AI system that uses real-time video and sensor data to detect and predict traffic incidents. It improves response times, reduces congestion, and enhances safety⁵⁰. By the mid-term, such AI-driven decision support could be standard in traffic control centers, with staff shifting from manual timing adjustments to supervising AI recommendations and handling exceptions.
- **Procurement & Back-Office Processes:** Many administrative workflows will be streamlined by GenAI. Procurement teams can deploy AI to rapidly review thousands of pages of bid documents or contracts, flagging inconsistencies or risks⁵⁶. An AI assistant could compare a vendor’s proposal against RFP requirements and produce a summary for the selection committee.

Routine correspondence and report writing (grant applications, progress reports, HR memos) may be drafted by GenAI and then reviewed by staff, cutting document preparation time dramatically. Overall, support staff roles will evolve to process supervisors: rather than typing and filing, they verify AI outputs, handle exceptions, and focus on customer service.

⁵¹<https://www.pnnl.gov/sites/default/files/media/file/PolicyAI%20Comment%20Processing%20White%20Paper%20V1.pdf>

⁵²<https://fantasticit.com/how-iot-and-ai-are-revolutionizing-predictive-maintenance/>

⁵³<https://arxiv.org/pdf/2401.02343>

⁵⁴<https://www.wired.com/story/poop-drones-are-keeping-sewers-running-so-humans-dont-have-to/>

⁵⁵https://www.atssa.com/wp-content/uploads/2024/05/DrivingTransportationWithAI_2024CaseStudy.pdf

⁵⁶<https://www.thehackettgroup.com/insights/embracing-the-future-how-generative-ai-is-revolutionizing-procurement-in-2025/>

- **Public Engagement and Customer Service:** By this time, AI-powered chatbots and digital assistants will handle a large volume of public inquiries for DOT services. Citizens might interact via chat or voice with an AI to get real-time information on road conditions, permit requirements, or DMV services. These systems will be far more advanced than today's phone trees – capable of conversing in multiple languages and providing personalized, context-aware answers. This will require integration of back-end systems with the AI, and oversight by human customer service teams for quality. [The NJ AI Assistant](#)⁵⁷, launched in July 2024, is a secure generative AI platform designed to help New Jersey State employees improve government services responsibly. By March 2025, it gained features like support for multiple file uploads and larger file sizes. Used by over 14,000 employees across state agencies, the tool is aiding in tasks like content drafting and feedback analysis, with over 80% user satisfaction. It has already enhanced services—for example, improving email clarity at the Department of Labor and optimizing call center operations at the Division of Taxation, resulting in faster resident responses and more resolved calls. The benefit is 24/7 responsive service and faster turnaround, but DOTs will need to ensure AI responses are accurate and equitable. Human staff will still step in for unique or high-stakes issues, but their caseload will shift towards those specialized cases.
- **Organizational and Structural Shifts:** As GenAI becomes ingrained in daily operations, state DOTs are likely to implement organizational changes to govern and support AI. We can expect the creation of formal AI governance bodies or offices within the agency. Some states may consolidate expertise by establishing an AI Center of Excellence at the state level, serving all departments with technical guidance, contracts, and standards for AI systems (this was suggested as a way to leverage cross-agency collaboration)^{58 59 60 61}. If [Big Beautiful bill](#)⁶² becomes law, state DOTs could face limitations in their ability to independently scale and evolve AI-related initiatives, including governance and ethical frameworks. This could require DOTs to restructure organizational roles and processes significantly, aligning them more closely with federal mandates rather than state-specific regulatory innovations. With the new [Executive Order prioritizing AI systems free from 'engineered social agendas'](#),⁶³ organizational transformation plans should incorporate the risk that some previously supported ethical or inclusive practices may now be deprioritized or require independent justification and funding.

Within DOTs, IT units and business units will work more closely than ever. It's anticipated that cross-functional "AI project teams" will become common – for example, a team that includes IT developers, traffic engineers, data scientists, and legal advisors might jointly develop a new AI-powered permitting system. Breaking down silos is critical; as [NASCIO](#)⁶⁴ reports, scaling GenAI requires procurement, IT, legal, finance, and line agencies to "collaborate in agile multidisciplinary teams" to deploy solutions faster. This represents a cultural shift for many government agencies used to siloed operations. In terms of hierarchy, some agencies might create new units or positions dedicated to AI⁶⁵. For instance, a DOT might establish an Office of Innovative Technologies or similar, which houses AI, data analytics, and digital strategy, reporting to top leadership. Alternatively, AI responsibilities might be absorbed into existing divisions like Planning or Operations (e.g., a Planning division might have a dedicated AI analytics section). By the mid-term, it wouldn't be

⁵⁷ <https://innovation.nj.gov/projects/ai-assistant/>

⁵⁸ <https://statescoop.com/georgia-chief-digital-ai-officer-state-playbook/>

⁵⁹ <https://nj.gov/governor/news/news/562023/approved/20231010b.shtml>

⁶⁰ <https://its.ny.gov/press-release/new-york-state-office-information-technology-services-announces-appointment-shreya-amin-chief>

⁶¹ <https://apnews.com/us-news/tate-reeves-artificial-intelligence-mississippi-general-news-d43d88dcd34de5f346919fe1f65c6b10>

⁶² [Trump's 'Big Beautiful Bill' could ban states from AI regulation](#)

⁶³ <https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/>

⁶⁴ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

⁶⁵ <https://www.govtech.com/artificial-intelligence/ai-poised-to-reshape-state-transportation-departments-staff>

surprising if a few large DOTs or state governments designate a Chief AI Officer to coordinate AI initiatives across agencies (somewhat akin to Chief Information Officers but focused on AI ethics, standards, and strategy).

- **Funding Implications:** Mid-term budgets will reflect a substantial shift toward technology and training investments. State DOTs will allocate more of their capital and operating budgets to IT infrastructure (cloud services, data platforms, software licenses) to support AI systems. Funding that once might have gone solely to physical infrastructure may be complemented by funds for “digital infrastructure.” Notably, the federal Infrastructure Investment and Jobs Act (IIJA) and related programs like [ADCMS](#)⁶⁶ are encouraging states to adopt advanced digital construction and management systems, which aligns with integrating AI and data into transportation projects. We can expect states to tap federal grant programs for technology deployment: e.g. [USDOT’s SMART Grants](#)⁶⁷ (Strengthening Mobility and Revolutionizing Transportation) can fund pilot deployments of intelligent transportation systems. By leveraging such programs, DOTs defray costs of AI modernization. Internally, agencies will also need to budget for continuing software subscriptions and data services as AI tools move from free trials to enterprise products. Another key funding priority will be workforce development and change management. DOTs will invest in extensive training and potentially in severance or redeployment programs if certain job classes shrink (though ideally much of this is managed via upskilling). In fact, [research](#)⁶⁸ indicates GenAI and other automation could raise U.S. labor productivity growth by an additional 0.5 to 0.9 percentage points annually through 2030. To capture these gains, stakeholders must invest in helping workers master new skills and mitigating risks, meaning budget carve-outs for training, change management, and robust AI oversight (e.g. auditing algorithms for bias) will be necessary parts of mid-term financial plans. Lawmakers and state budget officers may start creating dedicated funding streams for “technology modernization” that include AI, given the clear productivity benefits.
- **Workforce Development – Skill Building at Scale:** By the mid-term, state DOTs should have moved from ad-hoc training to institutionalized workforce development programs for AI. This includes multiple dimensions:
 - **Comprehensive Training Curriculum:** Agencies will roll out tiered training programs to ensure all employees achieve a baseline of AI proficiency (for example, understanding how to use internal AI tools and the basics of data security). [TxDOT’s strategic plan](#)⁶⁹ explicitly calls for an AI Training Plan tailored to different staff roles, ensuring each role (from maintenance technician to executive) gets relevant training on AI applications⁷⁰. This might involve e-learning modules, hands-on workshops, and certification programs. Key topics include how GenAI can assist in one’s specific job, how to interpret AI outputs, and the policies governing AI use.
 - **AI Specialists and Upskilling:** For more technical staff, DOTs will support advanced upskilling – e.g. certifying some engineers or analysts in data science or machine learning. Some existing employees will transition into the new specialist roles mentioned earlier. Programs to identify employees with aptitude for AI and provide them intensive training (perhaps via partnerships with universities or online courses) will gain traction. States might establish an “AI fellows” program where employees spend a few months in a course on AI development or data engineering and then return to lead projects.

⁶⁶ https://www.fhwa.dot.gov/infrastructure-investment-and-jobs-act/adcms_fact_sheet.cfm

⁶⁷ <https://www.transportation.gov/grants/SMART>

⁶⁸ https://www.nascio.org/wp-content/uploads/2024/04/NASCIO_McKinsey_GenAI-and-Impact-on-State-IT-Workforces_2024.pdf

⁶⁹ <https://www.txdot.gov/content/dam/docs/str/ai-strategic-plan-09-20-2024.pdf>

⁷⁰ <https://ourpublicservice.org/blog/launching-the-ai-center-for-government/>

Currently, federal programs like the [GSA’s AI Training Series](#)⁷¹ and the [C3 AI Fellows](#)⁷² Program provide models for equipping government employees with practical AI skills. States are also launching their own initiatives. The [California Department of Technology](#)⁷³ offers technical AI training for state employees.

- **Interagency and Academic Partnerships:** Recognizing that public agencies cannot do it alone, many DOTs will partner with universities, community colleges, and private sector for workforce development. For example, a DOT might collaborate with a university engineering department to create a certificate program in “AI for Transportation” open to its employees. Academic partnerships can also help keep agencies current on rapidly evolving AI tech. [An expert from academia](#)⁷⁴ stressed the importance of state DOT–university partnerships to advance AI and build trust in new tech. By mid-term, such partnerships will be formalized (e.g. research consortiums, joint training centers). Additionally, states can band together (possibly through AASHTO or regional alliances) to share AI training resources – indeed, [TxDOT](#)⁷⁵ has expressed interest in *interstate collaboration for AI training and best practices*.
- **Cultural Change and Change Management:** A critical aspect of mid-term workforce readiness is cultural. Agencies need to foster an environment where employees embrace continuous learning and do not fear AI. Many DOTs will launch change management initiatives – town hall meetings, internal communication campaigns, and recognition programs – to celebrate AI adopters and reassure staff about job security. Leaders will emphasize, as [Pennsylvania](#)⁷⁶ did, that AI is here to handle tedious work so employees can focus on more meaningful tasks. Success stories (like “AI saved me time on X task”) will be shared internally to drive engagement. There will also be an emphasis on trust: both [trust in AI](#)⁷⁷ (workers trusting the tools) and trust of the workforce (leadership trusting employees to use AI responsibly). However, since AI tools are sometimes not fully accurate or reliable, it’s equally important to ensure that outputs are regularly checked and verified by humans. Recently, a variety of studies focused on the [different dimensions of trust](#)⁷⁸ and distrust in AI and its relevant considerations. This period will see agencies actively working to integrate AI into their organizational DNA while keeping staff morale and trust high.

Actionable Insight (Mid-Term)

State DOTs should develop a formal AI strategy and roadmap for the next 5+ years, if they haven’t already. This includes identifying priority AI use cases to scale, budgeting for necessary technology and training, and updating organizational structures to embed AI expertise. Mid-term success requires moving beyond pilots: form dedicated cross-functional teams to implement AI in high-value workflows (e.g. traffic operations), appoint clear owners for AI governance, and invest heavily in upskilling programs so that the average employee can comfortably work alongside AI tools. Collaborate with external partners – other states, universities, federal programs – to share knowledge and secure funding.

⁷¹ <https://coe.gsa.gov/communities/AITraining.html>

⁷² <https://c3.ai/c3-ai-fellows/>

⁷³ <https://cdt.ca.gov/workforce-development/generative-ai-training/>

⁷⁴ <https://aashtojournal.transportation.org/knowledge-session-examining-role-of-ai-in-transportation/#:~:text=So%20trust%20is,we%20move%20forward>

⁷⁵ <https://www.txdot.gov/content/dam/docs/str/ai-strategic-plan-09-20-2024.pdf>

⁷⁶ <https://statescoop.com/chatgpt-pennsylvania-governor-sharpiro-pilot-program/>

⁷⁷ <https://www.mckinsey.com/capabilities/quantumblack/our-insights/building-ai-trust-the-key-role-of-explainability>

⁷⁸ <https://www.nature.com/articles/s41599-024-04044-8.pdf>

Long-Term (10+ Years): A Fully AI-Enabled DOT

Looking a decade or more ahead, generative AI (along with other advanced technologies) could drive transformational changes in how state DOTs operate and the nature of their workforce. While predicting technology beyond 10 years has uncertainty, current trends suggest the following long-term scenario:

- **Ubiquitous AI in Operations:** GenAI and automation tools are fully integrated into all DOT functions by the mid-2030s. AI will be as commonplace as computers and smartphones are today. [According to the rapid adoption of generative AI working paper](#)⁷⁹, genAI adoption is already widespread and mirrors early computer trends, but with faster uptake due to lower barriers. Its impact varies by worker type and usage intensity, and while still early, genAI shows potential to boost productivity meaningfully across the economy.

Many routine decisions and actions are handled by AI in real-time, with humans providing oversight. For example, imagine an AI-driven system monitoring statewide traffic 24/7, automatically detecting incidents, and instantly dispatching response teams or digital message signs with minimal human input⁸⁰.

In planning and design, AI could generate entire project plans (designs, cost estimates, impact analysis) overnight for review the next morning. [Digital twins of transportation networks](#)⁸¹ – virtual models updated in real-time – might be managed by AI to simulate and optimize everything from signal timings to evacuation routes.

The concept of “self-driving bureaucracy” may partially materialize: some administrative processes (permits, licensing, routine approvals) become largely automated workflows between an AI assistant and the citizen, with oversight audits rather than case-by-case processing.

- **Workforce Size and Composition:** The long-term might see a smaller but more skilled DOT workforce, as productivity gains allow agencies to handle growing transportation needs without proportional staff increases. According to a FEDS note about [measuring AI uptake in the workplace](#)⁸², all evidence shows rapid growth in AI uptake, but future research must move beyond binary adoption to assess intensity, novelty, and impact on productivity and work structure. Some jobs that existed in 2020 may no longer exist in 2035. For instance, clerical roles (file clerks, typists, data entry) will be largely obsolete⁸³ – those tasks will be fully automated or self-service for users. Even roles like traffic monitoring staff could decrease if AI systems manage traffic signals and TOC (Traffic Operations Center) functions autonomously. However, rather than abrupt layoffs, this will likely come through gradual attrition and reskilling. [According to the World Economic Forum's 2025 Future of Jobs Report](#)⁸⁴, 77% of employers plan to retrain their workforce to work alongside AI, and 47% aim to transition employees from declining roles to new positions within their organizations.

The workforce that remains – and grows – will be oriented around technology, analysis, and oversight. We will see a higher concentration of data analysts, AI system managers, cybersecurity specialists, and engineers who can work with intelligent machines. The *overall size* of a state DOT workforce might contract somewhat or remain steady even as service demand grows, thanks to AI-driven productivity. One study by [McKinsey Global Institute](#)⁸⁵ projects that combining GenAI with other automations could raise productivity which can translate into doing much more work with

⁷⁹ https://www.nber.org/system/files/working_papers/w32966/w32966.pdf

⁸⁰ <https://highways.today/2025/05/28/ai-blueprint-for-smart-highway/>

⁸¹ <https://itsa.org/wp-content/uploads/2025/01/Digital-Twinning-Decoded.pdf>

⁸² <https://www.federalreserve.gov/econres/notes/feds-notes/measuring-ai-uptake-in-the-workplace-20240205.html>

⁸³ <https://www.wric.com/news/u-s-world/the-10-jobs-expected-to-decline-over-the-next-decade/amp/>

⁸⁴ https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf

⁸⁵ <https://www.mckinsey.com/~media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/the%20economic%20potential%20of%20generative%20ai%20the%20next%20productivity%20frontier/the-economic-potential-of-generative-ai-the-next-productivity-frontier.pdf>

the same number of people. s

- **New Categories of Roles:** Entirely new career paths could emerge. For example, “AI Maintenance Crew” – technicians who specialize in maintaining the AI and robotic systems (drones, sensors, software) that, in turn, maintain the infrastructure. These workers might have hybrid skills, understanding both IT and field operations. Another example is “[Transportation Systems Architect – AI](#)”⁸⁶, a role focused on continually improving the algorithms that run traffic management or logistics in the state. [AI Ethics Officers](#)⁸⁷ may become permanent fixtures, ensuring algorithms comply with laws and public values (especially as automated decisions become more prevalent in areas like enforcement or resource allocation). The notion of a “Prompt Engineer” may evolve into a broader “[Conversational UX Designer](#)”⁸⁸ role, where staff design the conversational interfaces and information sources that the public and employees interact with.

In essence, many roles will revolve around managing AI as the new infrastructure – similar to how today DOTs have electrical engineers for traffic signals or civil engineers for bridges, future DOTs might employ AI engineers to design and maintain intelligent transportation systems⁷⁹.

- **Human-AI Collaboration Norms:** In the long run, every employee is expected to be AI-proficient, much like computer proficiency is expected today. [LinkedIn's 2025 report highlights](#)⁸⁹ that AI literacy is now one of the most in-demand skills across all job roles. The culture will treat AI as an ever-present colleague. Decision-making processes will formally include AI-generated analysis. For example, a project approval might require an AI-generated risk assessment alongside the human project manager’s assessment. Frontline workers (like highway maintenance or construction inspectors) might use augmented reality glasses with AI vision assistance to identify issues on site in real time. The nature of supervision could change: managers might oversee teams that include both human staff *and* AI agents (for instance, a maintenance superintendent might assign work to both human crews and AI-powered robotic equipment). Continuous learning will be critical – workers will routinely update their skills as AI technology evolves (the training programs established in the mid- term will persist indefinitely).
- **Process Automation and Efficiency:** By 10+ years out, processes will be highly optimized and largely automated from end to end. [The integration of GenAI and digital twin models](#)⁹⁰ could significantly revolutionize the existing digital twin applications towards more intelligent, reliable, and autonomous systems. Consider infrastructure planning: A future scenario could involve an AI model analyzing statewide transportation data, identifying areas of need, proposing project ideas, and even drafting grant applications for funding – leaving humans to do the final evaluation and stakeholder coordination. Emergency response might be coordinated by AI systems that predict incidents (using predictive analytics on weather, events, etc.) and pre-deploy resources. Safety enforcement could become more automated (e.g. AI analysis of video feeds to detect hazards or violations and trigger responses). Public engagement could be radically transformed as well, with AI-driven platforms enabling virtual town halls or personalized traffic information services for citizens.

Importantly, AI will enable a level of data-driven decision-making and predictive governance that was previously impossible: long-term policy choices (like where to invest billions in infrastructure) could be informed by AI models projecting various scenarios and their outcomes, giving leaders unprecedented analytical support. Human judgment and leadership remain essential, but they will be supported by a wealth of AI-generated evidence and options.

⁸⁶ <https://aidegreeguide.com/what-type-of-ai-student-are-you/ai-tools-for-professional-fields/transportation-system-design/>

⁸⁷ <https://onlinedegrees.sandiego.edu/ai-ethicist-career/>

⁸⁸ <https://userpilot.com/blog/conversational-ux/>

⁸⁹ <https://www.forbes.com/sites/benjaminlaker/2025/04/29/linkedin-data-shows-executives-upskilling-ai-over-traditional-skills/>

⁹⁰ <https://arxiv.org/pdf/2405.19464>

- **Organizational Structure:** In the long horizon, the organization chart of a state DOT may look quite different:
 - **Integrated AI Functions:** Rather than a separate “AI team”, AI expertise will be embedded in all units. The distinction between “IT” and “the business” sides of the agency will blur—technology becomes core to every division. [A January 2024 Gartner poll](#)⁹¹ revealed that nearly two-thirds of organizations are utilizing generative AI across multiple business units, marking a 19-percentage-point increase since September 2023. Additionally, 40% of respondents indicated deployment in more than three business units. The Chief Information Officer (CIO) role may evolve or split, with one focus on maintaining the technical infrastructure and another on innovation and AI strategy (some states may have a Chief Technology Innovation Officer⁹² by then).
 - **Agile, Flexible Teams:** The pace of technology and transportation change may prompt DOTs to adopt a more agile organizational model⁹³, where cross-functional teams form around projects and then dissolve, rather than rigid department silos. This flexibility helps address the fast iterations of AI tech deployment. An employee might move from a team optimizing AI traffic signals to a team overhauling the DMV chatbot, as their skills are needed, rather than staying in one narrow role long-term.
 - **Workforce Size and Distribution:** With more tasks automated, the field offices might shrink in administrative headcount (since many paper-based processes will be digital), while central offices might grow in tech staff or consolidate certain functions at the state level^{94 95}. Alternatively, if remote work and distributed cloud systems dominate, physical offices could downsize overall. We might also see more shared services across state agencies: for example, a central AI support unit that serves DOT, Department of Motor Vehicles, etc., providing technical expertise and maintenance of AI systems.
 - **External Talent and Contractors:** In the long term, the line between in-house staff and external resources may also blur. DOTs could rely on a network of contractors and AI service providers to operate certain functions (much like some IT is outsourced today). This could mean the “workforce” includes AI bots and vendor staff as part of the extended team. Managing these relationships and ensuring knowledge transfer will be a key organizational challenge⁹⁶.
- **Funding and Budgeting:** By 10+ years, funding priorities will reflect the digital transformation. A sizable portion of budgets will routinely go to software, data acquisition (e.g. buying data feeds from connected vehicles), cloud computing costs, and licensing of AI models, akin to how infrastructure projects are budgeted today. The justification is the high return on investment: for instance, if AI-driven efficiencies save thousands of labor hours or prevent costly accidents, those savings can be quantified and re-channeled. We might also see new federal funding mechanisms supporting state AI use. Just as past federal programs funded IT modernization or cybersecurity improvements, future programs could focus on AI in government. Federal frameworks will likely mature – perhaps an updated NIST [AI Risk Management Framework](#)⁹⁷ and stronger [federal guidelines on AI ethics and transparency](#)⁹⁸ – which states will adopt to remain eligible for certain funds or to align with nationwide standards.

⁹¹ <https://gcom.pdo.aws.gartner.com/en/insights/generative-ai-for-business>

⁹² <https://its.ny.gov/press-release/new-york-state-office-information-technology-services-announces-appointment-shreya-amin-chief>

⁹³ <https://www.agilebusiness.org/resource/using-ai-to-empower-cross-functional-teams.html>

⁹⁴ <https://www.nber.org/papers/w30659>

⁹⁵ <https://www.gao.gov/products/gao-19-257>

⁹⁶ <https://aicenterforgovernment.org/about/about-us/>

⁹⁷ <https://www.nist.gov/itl/ai-risk-management-framework>

⁹⁸ <https://www.cogentinfo.com/resources/federal-ai-mandates-and-corporate-compliance-whats-changing-in-2025>

Additionally, as AI automates tasks, some labor costs could be reduced, potentially freeing up money. However, states will need to invest continuously in workforce reskilling – not just one-time training, but lifelong learning initiatives. There may be budget lines for periodic “AI upskilling sabbaticals” for employees or funding for employees to obtain advanced degrees in relevant fields.

Workforce development funding (through federal workforce agencies or state legislatures) could be directed to ensure public sector workers keep up with AI advancements, preventing skill atrophy. Essentially, the long-term funding model treats expenditures on technology and training as equally important as expenditures on physical assets.

- **Workforce Readiness and Society:** In the big picture, the long-term success of AI in state DOTs will depend on human adaptability and policy frameworks⁹⁹. The workforce of 2035 will include many digital-native “Gen Z” and “Gen Alpha” employees who grew up with AI, potentially making adoption easier. However, continuous effort is needed to avoid disparity – DOTs must ensure older employees in the late stages of their careers are not left behind in training, and that new employees are recruited not only for tech skills but also for creativity, ethics, and public service ethos which AI cannot replace.

Diversity and inclusion remain crucial; as roles shift towards tech, agencies will need to work hard to attract a diverse pool of technologists and avoid biases that could be introduced by homogeneous tech teams (a point underlined by workforce diversity goals in AI integration research¹⁰⁰).

The regulatory and ethical landscape¹⁰¹ will also shape workforce roles – for example, if future laws mandate that every AI decision impacting citizens must be reviewable by a human, that ensures certain oversight roles will always exist. Already, some states are considering legislation to study and regulate AI’s impact on public jobs¹⁰². By proactively reskilling workers and redefining roles, state DOTs can make AI a tool for empowerment rather than replacement.

Actionable Insight (Long-Term)

State DOT leaders should envision what a “fully AI-enabled” agency looks like and start laying groundwork now. This means updating long-range strategic plans to incorporate AI in every facet of operations and building resiliency (e.g., ensuring data infrastructure and cybersecurity are robust for heavy AI reliance). Advocate for and shape state and federal policies that support workforce transition – such as job guarantees, retraining grants, and ethical AI usage laws – to secure a future where employees and AI systems coexist productively. Above all, maintain a people-centric approach: even as AI use grows, invest in the human capital that will guide, supervise, and improve those AI systems.

⁹⁹ <https://www.taylorfrancis.com/chapters/edit/10.1201/9781003509196-1/resilience-thinking-artificial-intelligence-integration-framework-umar-ali-bukar-radhwane-sneesi>

¹⁰⁰ <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5704>

¹⁰¹ <https://truyo.com/the-current-landscape-of-global-ai-regulations/>

¹⁰² <https://www.ncsl.org/technology-and-communication/artificial-intelligence-2025-legislation>

Summary of Findings

Generative AI technologies bring both great promise and significant change to state DOTs. In the near-term, they offer quick wins by handling drudge work and improving analytics, enabling employees to be more productive and focus on higher-value tasks. In the mid-term, they drive deeper workflow transformations and necessitate new skills and organizational models as they raise productivity and service levels. In the long-term, AI has the potential to fundamentally reinvent how transportation agencies function – with predictive, efficient systems and a workforce centered on oversight, innovation, and complex problem-solving. Importantly, human workers remain at the core: their roles will shift, but their importance does not diminish. AI's biggest benefit is turning data into actionable information for better decision-making – but humans must decide how to act on that information. By proactively planning for these changes, investing in their people, and embracing a culture of innovation, state DOTs can ensure that GenAI becomes a powerful tool that augments the workforce and improves transportation outcomes, rather than a disruptive threat. With thoughtful implementation, the DOT workforce of the future will be not only AI-enabled, but also more agile, skilled, and impactful than ever.

Recommendations for Readiness

To navigate these coming changes, state DOTs must act today to prepare their workforce and organization. Below are key recommendations and early lessons learned:

1. **Develop an AI Strategy and Governance Framework:** Every state DOT should craft an AI roadmap that identifies potential use cases, timelines, and desired outcomes across near, mid, and long-term horizons. This strategy must include an AI governance framework – clear policies on data usage, model ethics, and risk management. For instance, establishing guidelines for where GenAI can/cannot be used (e.g. not for final decisions on employee discipline or similar sensitive areas without human review), and forming an AI governance committee to oversee implementation.

Federal guidance like [OMB M-25-21¹⁰³](#) provides a template for governance, emphasizing responsible innovation and risk mitigation. Adopting such frameworks at the state level will build public trust and internally guide employees on proper AI use.

2. **Launch Training and Upskilling Programs Now:** *Workforce development is the linchpin of successful AI adoption.* State DOTs should invest in comprehensive training programs to raise AI literacy for all employees. This might involve tiered training and including AI tools in existing professional development – e.g., basic AI orientation for general staff, advanced data science for specialists. Crucially, training should be role-specific: as TxDOT recommends tailor curricula¹⁰⁴, so that engineers get training focused on AI in design, maintenance crews learn about AI in asset monitoring, planners learn AI for data analysis, etc.

Moreover, leverage AI itself to assist training – e.g., interactive chatbots that can answer employees' questions on new software, or AI-driven simulations for practicing decision-making. This not only builds skills but demonstrates the technology's value. The goal is to make staff comfortable co-working with AI tools by demystifying them. Metrics such as AI tool adoption rates and employee feedback on productivity should be tracked to ensure training effectiveness.

¹⁰³ <https://www.whitehouse.gov/wp-content/uploads/2025/02/M-25-21-Accelerating-Federal-Use-of-AI-through-Innovation-Governance-and-Public-Trust.pdf>

¹⁰⁴ <https://www.txdot.gov/content/dam/docs/str/ai-strategic-plan-09-20-2024.pdf>

3. **Identify and Cultivate AI Champions:** Within the organization, identify employees who are enthusiastic about technology – these can serve as “AI champions” or super-users. Early adopters can mentor their peers and help pilot new tools. For example, Pennsylvania’s pilot found that once employees were trained and saw AI saving them time, 85% had a positive experience¹⁰⁵. Harnessing these positive use cases internally will encourage broader adoption. Agencies might establish a community of practice (as TxDOT did¹⁰⁶) for AI, where staff across departments regularly share tips, use cases, and solutions. Recognize and reward employees who find creative ways to improve work with AI – this signals that AI augmentation is valued. At the leadership level, ensure CIOs, HR directors, and operations chiefs are aligned to promote AI skill development as a core competency for career advancement.

4. **Rethink Recruitment and Hiring Practices:** To meet new skill needs, DOTs should update hiring strategies. This includes recruiting new talent with AI and data expertise – e.g., data analysts, machine learning engineers, software developers with interest in public service. It may be challenging for government to compete with private sector salaries, but agencies can appeal to mission-driven candidates and offer career growth in pioneering government technology.

Job descriptions for many roles should be updated to list AI/data competencies (for instance, requiring familiarity with data analysis tools for planning positions, or experience with automation software for project managers). States might create fellowship or internship programs focused on AI in government, to bring in young talent on rotation.

Also consider retraining internal candidates: someone in a traditional IT role might be upskilled to become an AI specialist rather than hiring externally. In partnership with state workforce boards and universities, launch apprenticeship programs in AI for transportation which can also improve diversity in tech by providing new entry pathways.

5. **Invest in Change Management and Employee Engagement:** Introducing AI can raise employee anxieties about job security or changes in routines. Proactive change management is essential. Communicate clearly and frequently about why the agency is adopting AI, how it will benefit employees (e.g. less drudgery, more interesting work), and what safeguards exist to protect jobs and privacy. Share timelines so staff know changes won’t happen overnight and they have time to adapt. Involve employees in the process – seek volunteers to test new AI tools and incorporate their feedback in implementation.

Employees should be actively involved in identifying high-impact AI use cases, rather than having solutions imposed on them. This bottom-up engagement yields better ideas and fosters ownership of the transformation. Transparency is also key: be open about AI pilot results, challenges, and successes, which builds trust in both the technology and leadership¹⁰⁷.

Agencies could hold periodic “AI town halls” or internal webinars where leadership updates staff on AI initiatives and addresses questions. Building a culture that sees AI as a tool for empowerment – not a threat – will smooth the workforce transition.

6. **Establish an AI Governance and Ethics Team:** As usage grows, create a dedicated team or designate officers for AI governance, ethics, and data privacy. This team should include a mix of IT experts, legal/privacy officers, HR, and operational staff. Their role is to continuously monitor AI deployments for compliance with ethical standards and performance benchmarks. For instance, they might audit the outputs of a GenAI-powered hiring tool to ensure no bias in recommendations, or review citizen-facing chatbots for accuracy and tone. Having such oversight in place not only prevents negative outcomes but also reassures employees (and the

¹⁰⁵ <https://statescoop.com/chatgpt-pennsylvania-governor-sharpiro-pilot-program/>

¹⁰⁶ <https://aashtojournal.transportation.org/knowledge-session-examining-role-of-ai-in-transportation/#:~:text=community%20of%20practice>

¹⁰⁷ <https://www2.deloitte.com/us/en/insights/industry/public-sector/use-of-ai-in-government.html>

public) that AI is being used responsibly.

State DOTs might not hire a full panel of philosophers, but they can train existing compliance officers in AI issues and tap external advisors (from universities or ethics boards) as needed. Ensuring “responsible AI” practices will likely be a condition of future federal funding as well, so this is both a best practice and a compliance step.

7. **Modernize IT Infrastructure and Data Management:** An often-overlooked workforce aspect is that employees can only use AI effectively if the infrastructure supports it. State DOTs should accelerate efforts to modernize legacy IT systems and integrate data across silos, enabling AI tools to access high-quality, up-to-date information. This may involve moving more data to the cloud, adopting common data standards, and improving cybersecurity to guard AI systems.

Frontline staff will be frustrated by AI that gives wrong answers due to bad data; thus, investments in data quality and governance are foundational (for example, using AI to clean and organize large volumes of transportation data). Regardless of method, better data empowers the workforce to leverage AI effectively. Also, ensure your computing environment can handle AI workloads – upgrading network bandwidth, providing cloud computing credits, etc., so employees aren’t hindered by technical limitations when using advanced tools.

8. **Leverage Federal and Peer Support:** Finally, state DOTs should actively leverage federal frameworks and funding programs to support their AI readiness. Specifically, DOTs should proactively engage in federal policy discussions regarding new bills like [‘Big Beautiful Bill’](#)¹⁰⁸, advocating for regulatory frameworks that allow sufficient state flexibility.

The U.S. DOT has signaled commitment to integrating AI safely into transportation and improving internal operations with AI¹⁰⁹. Keep an eye on USDOT initiatives, such as pilot programs or research consortiums, that states can join. For example, participate in TRB and AASHTO research efforts (like the [NCHRP 23-46 project](#)¹¹⁰ studying AI workforce impacts) – these not only yield useful findings but also connect states to share strategies.

Take advantage of federal grants under programs like IJJA, the Advanced Transportation Technology program, or FHWA’s innovation funding to get resources for AI projects. Coordination through organizations like NASCIO, AASHTO, and National Association of State Workforce Agencies (NASWA) can provide forums for sharing lessons learned.

Many states are in the same boat; by collaborating, they can develop common standards (for example, agreeing on ethical use policies or pooled procurement of AI services for better pricing). “Engaging the workforce and building effective governance” are cited as critical to scaling AI– these are areas where states can help each other by exchanging playbooks for workforce training, model policies, and even staff exchange programs to build capacity.

¹⁰⁸ <https://www.usatoday.com/story/news/politics/2025/05/27/trump-big-beautiful-bill-ai-regulation-ban/83874952007/>

¹⁰⁹ <https://www.transportation.gov/AI>

¹¹⁰ <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5704>

Implementation Mechanisms

- **Pilot Initiatives:** Launch focused GenAI pilot projects to target specific efficiency gains, such as traffic safety analysis, near-miss incident identification, and congestion management.
- **Training Programs:** Establish comprehensive AI literacy and upskilling programs, tailored specifically for various roles within Caltrans, ranging from planners and engineers to field operations staff.
- **Cross-Functional Teams:** Adopt an agile organizational model that creates flexible, cross-departmental teams which form around projects and dissolve upon completion to enhance adaptability to rapid technological changes.
- **AI Governance Framework:** Develop clear AI governance policies addressing data privacy, ethical usage, and risk management. Establish a dedicated AI governance committee to oversee compliance and ethical implementation.
- **Infrastructure Modernization:** Invest in modernizing IT infrastructure, such as moving data to cloud services, standardizing data formats, and upgrading cybersecurity to support robust AI operations.
- **Workforce Transition:** Foster internal champions of AI technology who can mentor colleagues, advocate for AI adoption, and serve as early adopters to demonstrate real-world benefits and build organizational trust.
- **Interagency and Academic Partnerships:** Collaborate with universities, research institutions, and other state agencies to share resources, research findings, and to jointly develop educational programs aimed at building AI expertise within Caltrans.
- **Funding Alignment:** Reallocate or obtain funding (including federal grants such as SMART) specifically aimed at AI implementation, training, and associated infrastructure.
- **Change Management and Communication:** Implement structured internal communication and change management strategies to ensure clear messaging around the introduction of GenAI, its benefits, and impacts on jobs to minimize resistance and maximize workforce engagement.
- **Regulatory Awareness:** Actively monitor and influence federal legislative actions, such as the "Big Beautiful Bill," to anticipate and adapt quickly to regulatory requirements that might limit state-specific AI initiatives.

These implementation mechanisms provide a strategic pathway for Caltrans to effectively harness generative AI, ensuring a structured, comprehensive, and adaptive approach to workforce and operational transformation.