Texas Department of Transportation

TxDOT Artificial Intelligence Environment and Platforms

Building a secure, scalable, and business-led enterprise AI capability

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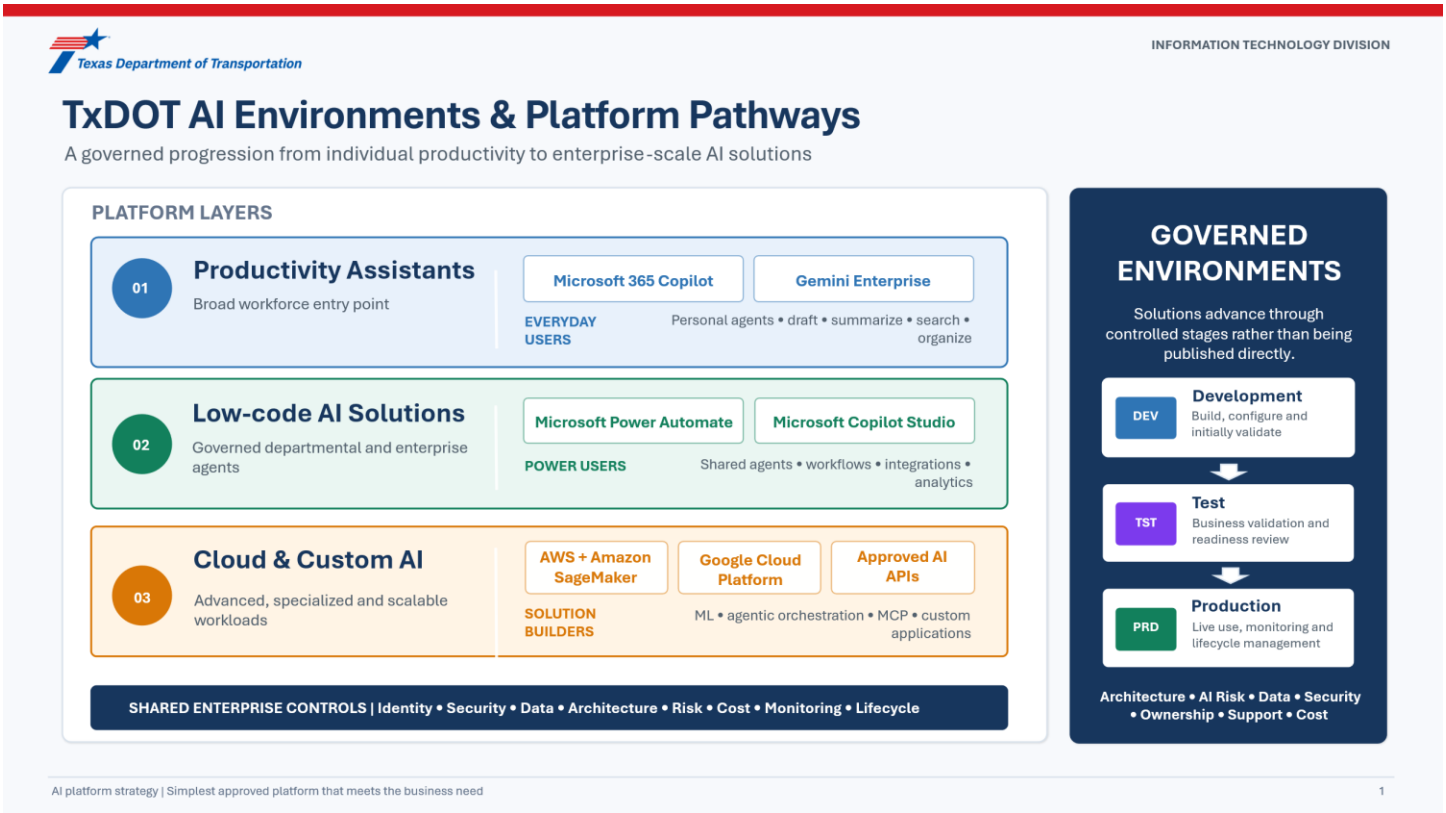
Executive Summary

Artificial Intelligence is evolving from a collection of individual projects into a strategic enterprise capability across the Texas Department of Transportation (TxDOT). The Information Technology Division (ITD) is establishing a governed, reusable, and scalable AI ecosystem designed to support transportation operations, workforce productivity, engineering, customer service, asset management, and decision-making across the agency.

TxDOT's AI environment provides a clear pathway for adopting AI based on business need and solution complexity. Generative AI productivity assistants support employees in their everyday work. Governed low-code platforms enable power users and business teams to develop departmental solutions and AI agents. Enterprise cloud platforms support advanced analytics, machine learning, computer vision, generative AI, and custom application development.

This layered approach enables TxDOT to use the simplest approved platform appropriate for each business need while maintaining common standards for security, data protection, architecture, identity, cost management, monitoring, and lifecycle governance.

The result is an enterprise AI capability designed to accelerate delivery, reduce duplication, broaden responsible participation, improve consistency, and provide greater visibility into risk, performance, and cost.



1. Enterprise AI Environment

TxDOT's AI requirements span a broad spectrum, from everyday employee productivity to complex, specialized enterprise solutions. Productivity assistants help employees work more efficiently. Low-code platforms enable governed business applications, workflow automation, and departmental AI agents. Cloud AI and machine learning platforms provide the scale and technical capabilities required for advanced analytics, computer vision, generative AI, and custom applications.

TxDOT's enterprise AI environment brings these capabilities together under a common approach that connects employee tools, business applications, enterprise data, security, infrastructure, and operations. This framework reduces duplicate investment, makes solutions easier to create and reuse, and provides ITD with greater visibility into cost, risk, performance, and operational support requirements.

The guiding principle is straightforward:

Use the simplest approved platform that meets the business need while appropriately addressing data sensitivity, integration requirements, risk, scale, and operational complexity.

AI Enterprise Benefits

Speed
Reusable environments, services, components, and architectural patterns shorten startup and delivery cycles.

Consistency
Common controls, standards, and architectures reduce unnecessary variation across implementations.

Capacity
Low-code platforms and AI-assisted development expand the agency's ability to deliver solutions without relying exclusively on traditional software development.

Risk Reduction
Approved platforms provide established identity, security, logging, cost-management, and data-protection capabilities.

Scalability
Enterprise cloud platforms provide elastic capacity and managed AI services capable of supporting evolving workloads.

Value Realization
Portfolio governance connects AI initiatives to accountable owners, measurable outcomes, and business value.

2. Generative AI Productivity Tools and Assistants

Generative AI productivity tools provide the broadest and most immediate entry point for employees to benefit from AI. Enterprise assistants such as Microsoft 365 Copilot and Gemini Enterprise can help staff draft and summarize content, find and organize information, prepare for meetings, analyze routine material, and complete administrative work more efficiently.

These tools introduce AI through familiar, everyday work while keeping employees accountable for reviewing AI-generated content and making final decisions. Broad adoption also helps build practical AI experience across the workforce and increases awareness of where AI can create meaningful business value.

Productivity assistants should be managed as an enterprise workforce capability, with defined access, training, support, acceptable-use expectations, and measures of business value. Tracking adoption, time savings, quality, and recurring use cases will help TxDOT identify high-value power users and AI-solution opportunities that may be ready to advance beyond individual productivity to more complex business processes and applications.

Three User Roles

Everyday Users
Use approved AI assistants for activities such as drafting, summarization, information retrieval, organization, and routine productivity.

Power Users
Develop recurring workflows, knowledge assistants, automations, and team-level solutions within governed platforms.

Solution Builders
Develop integrated applications using enterprise platforms, approved AI models, data services, APIs, and engineering controls.

Together, these user segments create a progression from **using AI**, to **configuring AI**, to **building AI-enabled enterprise solutions**.

3. Low-Code and No-Code Enablement

Low-code and no-code platforms, such as Microsoft's Power Platform and Copilot Studio, expand the agency's ability to translate business expertise into working solutions. For appropriate use cases, these platforms reduce the amount of traditional software development required and provide a governed pathway for AI agents, workflow automation, knowledge retrieval, and business-process support.

Low-code, however, does not mean no governance. Environment management, connector controls, data access, ownership, cost controls, testing, security, support, monitoring, and solution retirement remain essential throughout the lifecycle.

Primary value proposition

- Accelerates prototyping and delivery for well-defined business problems. Greater participation by subject-matter experts and power users.
- Expands participation by subject-matter experts and power users.
- Provides reusable identity, connector, workflow, and integration capabilities.
- Offers a governed alternative to unmanaged or ad hoc technology use.
- Creates a practical pathway for departmental solutions to mature into reusable enterprise patterns.

Microsoft Power Platform

Microsoft Power Platform is a low-code suite that enables business and technical teams to create applications, automate workflows, analyze data, and incorporate Copilot Studio agents using governed tools and approved connections to enterprise systems. Power Automate is the workflow automation component of Power Platform; it uses flows to trigger actions, move information between systems, route approvals, send notifications, and streamline repetitive or multi-step business processes. When combined with AI capabilities, Power Automate flows can classify and extract information, generate content, support decisions, and automate work across approved systems and data sources.

AI Assistant – Microsoft Copilot Studio

Microsoft Copilot Studio is TxDOT's governed low-code platform for building AI agents that extend beyond individual productivity assistance.

Agents can use approved knowledge sources to answer questions, guide users through business processes, connect with enterprise systems, initiate workflows, and support multi-step activities. The platform is intended for departmental and enterprise solutions requiring broader distribution, system integration, lifecycle management, analytics, and administrative oversight.

Copilot Studio is licensed and managed as an enterprise platform. Agent consumption may be supported through prepaid Copilot credits or pay-as-you-go usage. Costs may vary based on audience, activity, integrations, and solution complexity.

Agents used by appropriately licensed Microsoft 365 Copilot users in eligible Microsoft 365 scenarios may be included under applicable user licensing, while broader deployments, including users without applicable premium licenses or agents delivered outside Microsoft 365, may generate Copilot Studio consumption charges. Additional Power Platform, Dataverse, connector, or automation licensing may also apply.

TxDOT Agent Environments

Development: Agent-DEV

Authorized builders create and configure agents, prepare knowledge sources, test functionality, and conduct initial validation within a controlled environment with limited permissions.

Test: ITD-Agent-TST

Administrators promote eligible agents into the Test environment for structured validation with an approved audience. Business owners and subject-matter experts evaluate accuracy, functionality, security, user experience, and overall readiness for production.

Production: Agent-PRD

Approved agents are deployed for live use. Direct environment access is restricted to administrators or designated service accounts, with appropriate monitoring, analytics, cost controls, support processes, and lifecycle management in place.

Governed Agent Lifecycle

AI agents progress through a governed **Development** → **Test** → **Production** lifecycle rather than being published directly into production.

In Development, builders establish the business need and demonstrate solution functionality. ITD administrators then promote eligible agents into Test for structured technical and business validation. Solutions advance to Production only after completing applicable reviews for architecture, AI risk, security, change management, ownership, support, cost, and monitoring.

This approach is designed to enable business-led innovation while helping ensure that production AI solutions are accurate, secure, supportable, appropriately governed, and cost-managed.

4. Cloud Platforms

TxDOT operates a secure, enterprise-grade AWS AI Platform designed to support the development and deployment of AI solutions across the agency.

The platform uses six dedicated environments to support innovation, testing, governance, and a structured progression from development to production. Integration with TxDOT's Enterprise Data Platform in Snowflake provides technical teams with controlled access to enterprise data and AI services while maintaining oversight of security, risk, cost, and operational performance.

Cloud Runways

TxDOT leverages cloud runways to provide standardized environments for experimentation, development, testing, and production. This reduces repeated architecture, infrastructure, and security setups. It also allows TxDOT to support a more scalable compute environment that allows for more variable AI workloads. Most importantly, it enables more consistent operational monitoring, access control, and cost management.

Amazon Web Services (AWS)	Cloud infrastructure, data services, machine learning capabilities, generative AI capabilities, and scalable application hosting have been enabled in alignment with TxDOT architecture and governance standards. Amazon AI Services supports the development, training, deployment, and management of machine learning models and AI integrated solutions.
Google Cloud Platform (GCP)	Gemini Large Language Models have been enabled in alignment with TxDOT architecture and governance standards. Available services provide data analytics, machine learning, generative AI, and application services that can support specialized solutions and workloads.
Custom solutions integrating AI	Allows technical teams to integrate approved Large Language models and AI services into TxDOT applications through infrastructure managed access. The issued service

credentials are securely issued, stored, monitored, rotated, and limited according to business need.

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This platform also provides the agency with access to leading third-party and frontier models, along with many open-source providers. Examples include:

- **Anthropic:** Claude Opus, Claude Sonnet, Claude Haiku, Claude Fable
- **OpenAI:** GPT-6 Series, GPT-5.6 Series, GPT-5 Series, GPT-OSS
- **Amazon:** Nova Series, Titan Text Embeddings, Titan Multimodal Embeddings
- **Meta:** Llama 3 Series, Llama 4 Scout, Llama 4 Maverick
- **Mistral AI :** Mistral Series, Mixtral, Pixtral, Devstral, Ministral, Magistral, Voxtral
- **NVIDIA:** Nemotron Nano Series, Nemotron Super

Service	Platform function and Implementation considerations
Amazon SageMaker AI	Supports machine learning development, training, evaluation, model deployment, and MLOps. **Implementation considerations:** Integrate with centrally governed model registries and approved enterprise data-access patterns.
Amazon Bedrock	Provides managed large language model inference and generative AI application capabilities, including access to supported third-party and open-source models, prompt optimization, knowledge bases, and prompt routing.

	Implementation considerations: Govern approved models, invocation privileges, region selection, throughput, and consumption.
Amazon Bedrock Data Automation	Provides intelligent document processing and structured extraction from supported unstructured and multimodal content. **Implementation considerations:** Define extraction schemas, validation requirements, data-handling controls, and cost-management practices.
Amazon Bedrock AgentCore (Under Enablement)	Provides infrastructure capabilities supporting AI-agent execution and operations, including runtime and related agent services. **Implementation considerations:** Establish controls for tool permissions, agent identities, access, and execution traces.
Amazon Textract	Provides optical character recognition and extraction of text, forms, and tables from documents. **Implementation considerations:** Establish accuracy-validation processes, document-sensitivity controls, and appropriate processing workflows.
Amazon Rekognition	Provides managed image and video analysis and computer-vision capabilities. **Implementation considerations:** Evaluate suitability, accuracy, risk, and quality for transportation imagery and individual use cases before production deployment.