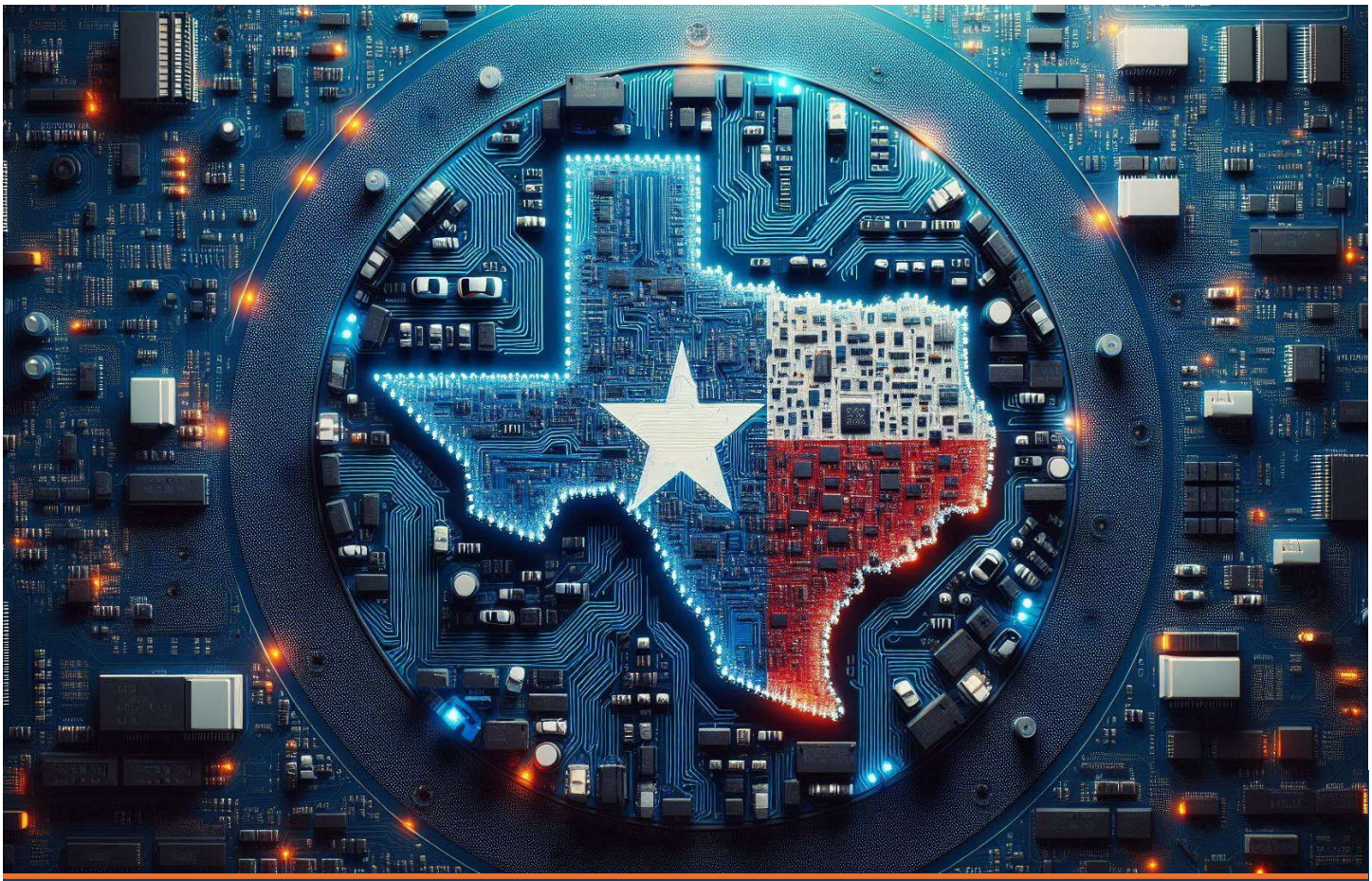

TxDOT's AI Road Trip: Paving the Way for Innovation

Texas Department of Transportation

Award Category: Artificial Intelligence

Project Title: TxDOT's AI Road Trip: Paving the Way for Innovation

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Texas Department of Transportation

Executive Summary

At the Texas Department of Transportation (TxDOT), the journey into Artificial Intelligence (AI) began not with technology for its own sake, but with a vision – one championed by our forward-thinking, innovation-minded Chief Information Officer (CIO). Recognizing the transformative potential of AI, TxDOT laid a strong foundation rooted in policy, guiding principles, and a governance framework to ensure that any adoption of AI would be secure, value-driven, and aligned with TxDOT's mission – "Connecting you with Texas." By integrating AI-driven technologies, TxDOT aims to optimize transportation systems and ensure the efficient movement of people and goods throughout the state.

With this groundwork in place, TxDOT took a measured approach. Starting small, TxDOT launched pilot programs for the use of AI that prioritized business value over novelty. These pilot initiatives were selected not just for their promise, but for their potential to solve real problems. TxDOT deployed these tools and collected data, evaluated outcomes, and used those insights to inform how and where to scale. As a result, the agency is now exploring opportunities to enable a multi-cloud, multi-platform environment, ensuring that our AI solutions remain adaptable and resilient amidst evolving technological landscapes.

This deliberate, data-informed progression has allowed TxDOT to responsibly expand its AI capabilities while maintaining a clear focus on transparency, safety, and trust. TxDOT's AI program reflects our commitment to empowering our workforce and delivering smarter, more responsive transportation solutions for all Texans.

IDEA

With the advent of generative AI and the explosive evolution of various AI technologies, TxDOT faced an uncertain but opportune future riddled with the potential to leverage these technologies to make a positive impact on TxDOT's mission. But how would TxDOT start? No frameworks or resources were available to guide how to safely and responsibly onboard AI technology and ensure compliance with TxDOT policies and alignment with its mission.

TxDOT's CIO, Anh Selissen, recognized that AI had the transformative ability to change how TxDOT operated and offered a wealth of opportunities to enable innovation previously out of reach. Without proactive oversight, however, the agency risked hindering innovation and adopting AI technologies in ways that could prove unsustainable or unsafe.

TxDOT set out to lay a strong foundation upon which the agency could build and utilize AI technologies ensuring alignment with its core mission and values while adhering to legislative guidance. TxDOT's approach is both straightforward and effective:

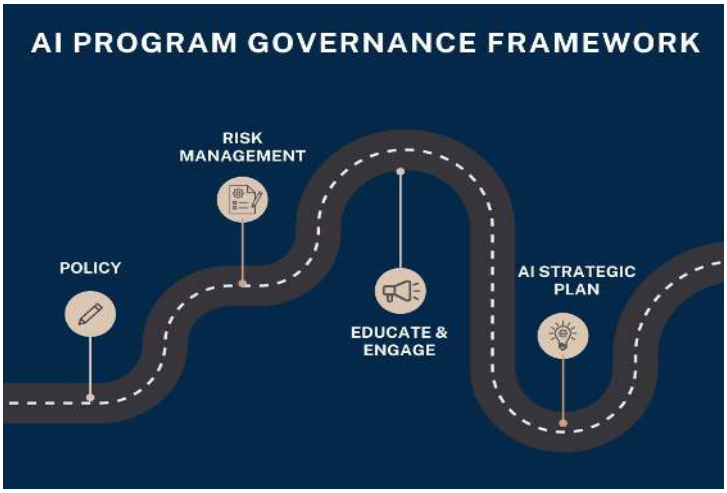
- Implement a governance framework to support onboarding AI technologies.
- Onboard staff to support AI technologies and foster collaboration between ITD and business stakeholders and innovators.

- Develop and build a comprehensive and secure data foundation.
- Pilot use cases with the potential to deliver quick wins, demonstrating the power and potential of AI technology.

With this approach, TxDOT has completed successful pilots and proofs-of-concept and moved into operational programs that leverage AI technologies (i.e., machine learning, robotic process automation (RPA)). TxDOT's emphasis on safe and responsible AI ensures that AI implementations are secure and resilient against threats. Leveraging the power of data, TxDOT can use AI technologies to inform decision-making and strategic planning. TxDOT's approach not only advances TxDOT's AI roadmap but also facilitates upskilling within the organization by promoting continuous learning, ongoing engagement, and sparking innovation.

IMPLEMENT

AI Program Development



In developing an AI Program, TxDOT has taken a proactive and strategic approach to ensure its adoption of AI is ethical, secure, and aligned with the agency's mission. The adoption of AI is not just a technical advancement; it's a universal opportunity to make a meaningful impact on the agency's operations, its employees, and the state of Texas.

Led by the Chief Information Officer and Information Technology Division (ITD), TxDOT's AI governance framework is anchored by an enterprise AI policy, guiding principles, and risk management strategies developed through cross-division collaboration and informed by national standards.

POLICY

TxDOT's AI policy establishes clear expectations for the use of AI tools at TxDOT – whether developed internally, procured from third parties, or publicly available. Before any AI technology can be used at TxDOT or with TxDOT data, it must follow existing TxDOT policies and governance processes and abide by the following guiding principles:

- **Security**: Systems must be resilient to threats and protect the confidentiality, integrity, and availability of TxDOT data.
- **Transparency**: AI systems must clearly communicate how data is used and how decisions are made.
- **Accuracy**: AI output must be verifiable, and uncertainties must be clearly communicated.
- **Accountability:** Oversight mechanisms must ensure AI systems operate as intended and avoid unintended harm.
- **Trustworthy**: AI output must be free from bias and equitably represent all users.

- **Privacy**: AI must respect user privacy and comply with all applicable data protection laws and TxDOT policies.
- **Safety**: AI must enhance public and employee safety, particularly in infrastructure and service delivery contexts.

Core to the policy is the requirement that any AI deployments and operations must be overseen by a human, especially in reviewing and validating outputs or decision-making.

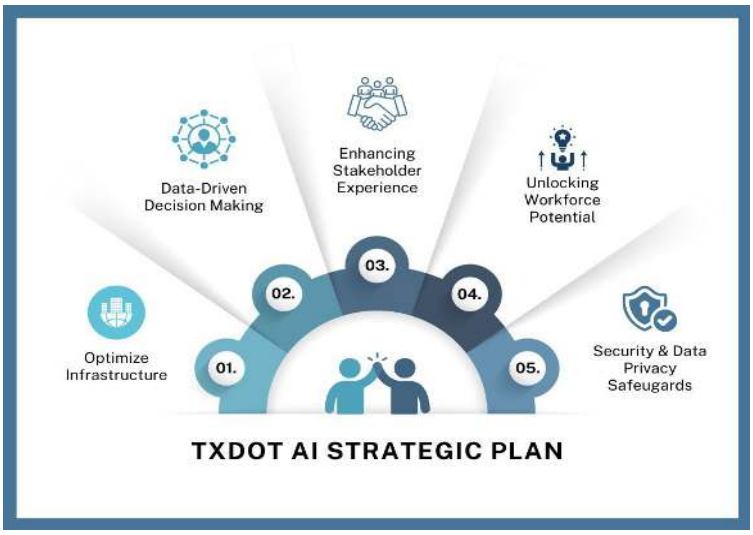
AI Risk Workgroup

Understanding the need for a careful evaluation of AI technologies, TxDOT ITD established an AI Risk Workgoup, a cross-divisional, collaborative body with representation from information technology, information security, human resources, audit and compliance, legal, and risk management. This group evaluates and mitigates potential risks associated with the implementation of AI technologies across the agency, applying a risk framework from the National Institutes of Standards and Technology (NIST) in their assessments.

Education and Engagement

Education and engagement are foundational to TxDOT's AI program. To build agency-wide understanding, TxDOT launched an "AI 101" course designed to establish core literacy around AI. In parallel, the agency has established an AI Community of Practice, a collaborative forum that promotes innovation, strengthens governance, and encourages peer learning. This community fosters a culture of responsible experimentation and continuous improvement.

AI Strategic Plan



In late 2024, in collaboration with internal Divisions and Districts, TxDOT's Strategic Initiatives and Innovation Division (STR) published an AI Strategic Plan, which positions the agency at the forefront of the artificial intelligence revolution. This plan marks a major step forward in leveraging AI to enhance safety, improve traffic management, and streamline agency operations across Texas.

The plan was developed through the combined efforts of ITD and STR. STR led critical discussions with business stakeholders across the agency to identify and document potential AI use cases, serving as a blueprint for exploring opportunities and innovations.

IMPACT

Piloting Innovation

Building upon the foundation of the AI program and the governance framework, TxDOT has made an intentional decision to pilot AI tools to assess value and benefit before deploying on a wider scale. These pilots enable TxDOT to make informed decisions regarding future AI implementations and opportunities. By thoroughly evaluating these pilot programs and capturing insightful metrics, TxDOT ensures that each AI tool meets current needs and aligns with the agency's broader strategic goals.

AI Traffic Incident Detection Pilot (Rekor)

TxDOT's Austin District and ITD have deployed an Artificial Intelligence system (Rekor) aimed at improving TxDOT's awareness and response to traffic incidents in the Austin area. Since implementation, this system has significantly reduced the time it takes for TxDOT to receive notifications about crashes, stalled vehicles, and debris on the road, and has expanded the coverage area for incident notifications. By ingesting multiple real-time data streams, the AI system identifies locations likely to have roadway incidents, allowing operators in the Traffic Management Center (TMC) to more quickly prevent and clear roadway incidents.

On average, the TMC is notified of roadway incidents 5-10 minutes faster; the system also captures up to 34% more incidents, providing TxDOT with greater awareness of all roadway incidents. With faster notifications for roadway incidents, TxDOT can reduce response times and clear the road of crashes, stalled vehicles, or debris more quickly. **This quicker clearance time has reduced the occurrence of secondary crashes by 29%, enhancing overall road safety for the traveling public.**

The performance of the AI detection system is continuously monitored and improved, with plans to implement and enable similar technology in other districts.

> ***"Using the advanced AI technology within Command, we now have a more comprehensive view of our roadways, which enables us to respond to roadway incidents and events more quickly and efficiently. It also provides necessary insights to improve traffic flows and has made our roadways safer, which has always been our top priority."***
>
> **Mike Arellano**
> **TxDOT's Deputy District Engineer**

Microsoft 365 (M365) Copilot Pilot

In 2024, ITD introduced M365 Copilot, an AI-productivity tool integrating with the M365 Office suite, to an initial group of 300 agency users to investigate ways that Copilot could enhance employee productivity and improve operational efficiencies. TxDOT identified a value framework aligning business objectives to four value levers to help understand the impact of Copilot and the business case for expanding its adoption: AI Adoption, Task Management, Employee

Behaviors, Employee Experience. Leveraging both quantitative and qualitative research, our analysis included the following key findings:

- **High Copilot Adoption**: ~97% of enabled users used the tool during the pilot and **68% reported they had made Copilot a daily habit** (with Teams, Chat Outlook, and Word being most used).

> ***"The initial Copilot program at TxDOT was a resounding success, with enthusiastic participation from nearly every district and division. By the end of the pilot, users reported significant productivity gains and time savings. We are thrilled to have offered TxDOT employees the chance to safely explore and utilize this AI technology, and we look forward to discovering further opportunities for AI to support TxDOT's mission."***
>
> **Anh Selissen**
> **TxDOT's Chief Information Officer**

- **Significant Productivity Gains**: Pilot users surveyed reported an average of **up to 12 hours / week in time savings for common tasks like emails, presentations, analysis, and meeting notes.**
- **Numerous Use Cases**: Beyond out of the box Copilot use, users helped uncover 20+ TxDOT specific use cases (e.g., document translation, compliance reviews, public info requests).
- **Improved Employee Experience**: While feedback varied based on level of engagement, most users noted that Copilot had a positive impact on their employee experience.

Moving forward, TxDOT will continue building an operations model to support current pilot users, while identifying opportunities to expand M365 Copilot throughout the agency.

Invoicing Automation

Recognizing the power of automation, TxDOT has embraced Robotic Process Automation to automate key processes that directly impact the efficiency, accuracy, and productivity of our agency. From reducing manual data entry to improving turnaround times, RPA is helping us modernize how TxDOT works, one process at a time. First piloted within ITD, invoicing automation resulted in faster invoice processing, **reduced invoice penalty interest by over 70%, improved accuracy, and saved an estimated 300 hours of annual time savings for staff.**

TxDOT's invoicing automation is driving measurable efficiency gains as it expands across the agency. A recent implementation in the Professional Engineering Procurement Services (PEPS) Division is projected to save 22,000 staff hours annually, **with early results showing over 700 invoices processed in just two weeks at a 90% success rate, cutting average processing time from more than 7 days to under half a day.**

These automation efforts are part of TxDOT's broader digital transformation strategy, underscoring its commitment to operational excellence and the strategic use of AI to better serve Texans.

WHAT'S NEXT

In the near-term, TxDOT is advancing its AI program by building a flexible, multi-platform environment to support scalable, secure, and innovative implementations across the agency. This includes a machine learning cloud platform to empower staff to develop and deploy AI models with built-in governance, potentially enabling several use cases identified in the agency's AI Strategic Plan. By leveraging large-scale data sets with machine learning, TxDOT is transforming fleet maintenance, fraud detection, and other operations, shifting from reactive to proactive approaches and reducing analysis time from months to minutes. Additionally, TxDOT is enabling Copilot Studio within the Microsoft 365 environment, enhancing enterprise-wide access to information through intelligent chatbot functionality. Continuous engagement and education are pivotal, fostering an AI-literate workforce through diverse educational opportunities and engagement forums, ensuring seamless and effective adoption of AI technologies.

TxDOT's AI Program embraces and advocates a commitment to deploying AI in a manner that is transparent, accountable, and grounded in safety and trust. As technology and regulatory landscapes evolve, TxDOT's adaptive governance model ensures the agency remains forward-looking and resilient and provides a comprehensive and strategic approach to leverage AI to achieve the agency's mission and goals. Looking ahead, the next phase of TxDOT's AI program will focus on expanding responsible AI use in areas such as intelligent traffic systems, predictive analytics, and operational excellence. With a strong foundation already laid, and continued emphasis on building technical and cultural infrastructure, TxDOT aims to of empower employees with intelligent tools that streamline workflows, surface insights, and unlock new efficiencies, using AI where it makes sense to deliver smarter, safer, and innovative transportation solutions for all Texans.