4 ways to get ready for AI in transportation

Transportation leaders are tired of sales pitches about the potential of artificial intelligence and machine learning (AI/ML). What they need is practical guidance on what they can do now to realize an AI-driven future for transportation.

Department of transportation leaders shared these thoughts in closed-door meetings convened by Rekor, which develops AI-powered hardware and software for the transportation sector.[1] The meetings concluded that leaders should focus on four areas — data, workforce, cybersecurity and collaboration — to build a solid foundation for AI in transportation.

1. Manage your data

The future of human travel is intelligent transportation systems (ITS) that use AI/ML to improve safety, optimize traffic flow and provide strategic guidance to transportation leaders. ITS depends on reliable, timely data fueling algorithms that analyze patterns and learn how to become more effective.

Challenges

Organization. Data must be structured properly for AI/ML applications. Many agencies have data lake architectures that can prevent AI apps from finding specific information efficiently. David Desharnais, CEO of Rekor, likens the issue to finding a movie to watch on Netflix. "Normally, you search by actor, genre or keyword," he says. "With data lakes, it's like you're searching for a movie based on its physical location on a computer drive. That doesn't work."

Location. Data is often scattered across departments and organizations, making it difficult to glean useful, strategic guidance.

Volume. Transportation agencies are swimming in data. This trend will only accelerate as connected-vehicle data comes online. Finding the most relevant information presents a challenge. "Not all of the data needs to be used for specific AI use cases," says Ryan Reynolds, head of transportation with Amazon Web Services (AWS), one of Rekor's technology partners.

Steps to take

☐ **Clarify operating principles.** Create a data strategy that spells out what you hope to gain from AI, and determine which data yields the most actionable value. Identify storage locations and create sharing policies for breaking down silos and developing data exchanges and interfaces between teams that need to use it.

☐ **Organize data.** Instead of using a data lake, aggregate your data from multiple sources, divide it into specific domains and create connective links between the domains.

☐ **Clean up your data.** Filter out useless or repetitive data that can slow down an AI app. Reynolds recommends using visual data preparation tools, which can reduce the time required for data cleanup and normalization by 80% to 90%.

2. Prepare your workforce

AI applications can help agencies tackle persistent transportation problems. Desharnais recalls a recent customer that had only enough staff to manage 200-300 road incidents a month — a small fraction of the work that needed to get done. After embracing AI automation, "they were managing an average of 2,000 to 3,000 incidents within a month or two," he says.

Challenges

Resistance. Agency staff may be reluctant to adopt AI/ML applications, especially if they think the tech will put them out of work.

Retirements. Millions of Baby Boomer workers are leaving the workforce, taking decades of talent and knowledge with them.

Recruitment. Government agencies frequently have open positions that go unfilled for months. Private sector work often pays better, making it tough for the public sector to find strong candidates.

Steps to take

☐ **Demonstrate value.** AI can automate manual tasks, allowing staff to focus on more important and interesting work. Employees embrace technology quicker if you can show it improves their everyday working lives.

"It's also important for them to understand AI won't replace a job," Desharnais says.

☐ **Modernize.** It's easier to attract young workers if you use modern technologies in areas like traffic management facilities.

☐ **Collaborate.** Join forces with local schools and other organizations to create a talent pipeline.

3. Focus on cybersecurity

A cyberattack took out transportation cameras and highway messaging boards in the Kansas City, Missouri, metro area.[2] That's the kind of real-world threat that AI can help transportation leaders confront.

Challenges

Novelty. Dangerous cyberattacks come from unexpected sources at unpredictable times. Agencies need ways to prepare and respond to these events.

Network growth. Cameras, sensors and connected vehicles critical to ITS are also potentially vulnerable network endpoints that will proliferate more quickly in the years ahead.

Attack quantity. Any device in an ITS network can see massive malicious activity. Desharnais noted an experiment that placed a network device by a road to see how much attention it attracted. "Within one week, this single device had close to 30,000 attacks," he says.

Steps to take

☐ **Conduct penetration tests.** Check for potential attack entry points on new devices added to networks.

☐ **Monitor continuously.** Use AI to interpret if unusual network behavior represents malicious activity. "You need to be able to understand what's real and what's not," Desharnais says.

☐ **Take advantage of cloud security.** Cloud providers like AWS have a strong incentive to lock down their infrastructure. Services built on highly secure cloud platforms tend to be more resilient against cyberattacks.

4. Improve collaboration with transportation leaders

The more reliable your data is, the more valuable AI applications become. Collaborating with your transportation colleagues can drive more productive AI outcomes.

Challenges

Protectionism. Agencies often want to maintain control of what they see as "their" data, even if such information could produce substantial benefits when shared with other jurisdictions. "If data is locked in silos with the inability to share for a common purpose, you will have a problem using AI," Desharnais says.

Priorities. Each agency has specific objectives and audiences to serve. Incentives to maintain the status quo may overwhelm the potential for change.

Duplication. Multiple departments within an agency may buy similar AI services from multiple vendors, spending much more than necessary.

Steps to take

☐ **Standardize data processes.** Develop standard formats, taxonomies and meta guidelines to encourage interoperability frameworks between teams.

☐ **Pursue openness.** Embrace open-data policies to encourage agencies to share data via open-data portals and application programming interfaces (APIs).

☐ **Deploy AI strategically.** Don't innovate for innovation's sake. Use AI to impact your key priorities. Training, organizational culture and collaboration can ensure AI is used for the best reasons.

Conclusion: The value of a partner

When addressing the challenges above, agencies should not think they have to do everything on their own. They should look to partners who have years of experience, trust and outcomes to point to, and let them do the heavy lifting. "Don't do it yourself," Desharnais says. "Work with folks who have done it before across many industries, both public and private."

1. https://www.rekor.ai/industry-insights
2. https://www.kmbc.com/article/kansas-city-kc-scout-cyber-attack-traffic-camera-signs-restoration/60670123

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