

Audax Labs helped drive a transformation in student transportation for Beacon Mobility through an AI-driven, proactive, and safety-first solution for school districts nationwide.

# ***Enhancing student safety at scale: How Audax Labs partnered with Beacon Mobility to build a real-time AI platform transforming operations across 12,000+ buses.***

## **Business Challenge**

Beacon Mobility is one of the largest and most trusted student transportation providers in the United States, operating over 12,000 buses across 30+ states. Serving hundreds of school districts, Beacon's mission, "Compassionate Mobility," centres on safe, reliable, and human-centric transportation.

Despite their strong reputation, Beacon faced significant blind spots in monitoring what happened inside their vehicles in real-time. Traditional camera systems were passive, merely recording events without offering actionable insights or real-time incident detection.

Beacon needed a solution that could:

- Detect student fights, students standing during transit, or students falling asleep and missing drop-offs.
- Empower drivers and operations staff with real-time alerts.
- Reduce manual video review and incident response lag.
- Ensure student privacy and maintain data security compliance.

To solve this, Beacon partnered with Audax Labs, a Microsoft-certified technology consultancy, to co-create a scalable, AI-powered passenger safety monitoring solution—one that not only meets Beacon's current needs but also positions them as a national leader in safe, tech-enabled student transit.

## **Solution**

Audax Labs collaborated with Beacon Mobility to design an advanced smart transportation platform featuring:

**Passenger Tracking System:** An AI-powered solution that automatically detects and tracks students as they board and exit, ensuring complete accountability.

**Real-Time Video Processing:** AI algorithms analyze live camera feeds, delivering accurate passenger count data throughout each trip.

**AR-Assisted Training:** Interactive AR modules help drivers and staff stay prepared and compliant.

**Next-Gen Incident Monitoring:** IoT-enabled vehicle monitoring ensures safer journeys and quicker response times.

**IT Cost Optimization & Data Analytics:** Scalable, cloud-based tools provide actionable insights for safer and more efficient operations.

## Client Need

Beacon Mobility manages one of the largest student transportation fleets in the U.S., operating over 12,000 vehicles across diverse school districts and regions. With such scale came operational challenges, particularly around real-time visibility into student activity during transit. Existing camera systems were primarily passive, often failing to detect critical incidents, such as student fights, standing during motion, or sleeping students until long after they occurred.

Drivers were expected to monitor onboard behaviour while managing routes and ensuring safe driving, placing them under significant stress and increasing the chances of missed incidents. Meanwhile, support staff relied on delayed and manual video reviews, making the incident response process reactive and time-consuming.

What Beacon needed was a proactive solution capable of identifying safety incidents in real time, reducing the burden on drivers, and streamlining operational workflows. This solution also had to scale across a large, geographically distributed fleet, function reliably with variable network conditions, and comply with strict student data privacy regulations. Their goal was to move from basic recording to intelligent, in-the-moment safety management.

## Our Solution

Audax Labs designed and implemented a robust, AI-powered safety and operations platform tailored to meet the scale, complexity, and compliance requirements of Beacon Mobility's nationwide fleet. At the core of the solution is a powerful Edge AI + IoT architecture, where Azure IoT Hub enables real-time communication between onboard cameras, sensors, and the cloud. This setup supports edge computing capabilities directly within the buses, allowing critical safety events to be detected and addressed instantly, even in areas with limited or intermittent internet connectivity.

The system uses advanced computer vision algorithms trained on real-world student transit scenarios. These AI models accurately detect key safety events such as students standing while the bus is moving, aggressive behaviour or altercations, and sleeping students who risk missing their stops. Built using Azure Machine Learning, these models are continuously improved through feedback loops, enhancing their precision over time and adapting to diverse conditions across the fleet.

To enable data-driven decision-making, the solution leverages Azure Synapse Analytics to consolidate both structured and unstructured data from video, sensor, and vehicle systems. Microsoft Fabric helps unify these data streams across safety, logistics, and compliance domains. Dashboards built in Power BI give dispatchers and operational leaders real-time visibility into incidents, safety trends, and route performance, enabling more proactive and efficient fleet management.

Security and compliance were built into the solution from the ground up. Azure Defender secures all endpoints and communication channels, while the entire platform is aligned with FERPA and other student data privacy regulations. Additionally, Audax Labs trained 50

Beacon Mobility staff on interpreting AI-driven insights, and the solution was built with Copilot-readiness in mind, enabling future integration with Microsoft 365 Copilot and Dynamics 365, ensuring the platform evolves with Beacon's growing digital maturity.

## How Beacon Mobility Benefitted

The deployment of Audax Labs' AI-powered safety solution led to a fundamental transformation in Beacon Mobility's day-to-day operations. Most notably, the organization achieved a 90% reduction in undetected sleep incidents, ensuring that students are more closely monitored and protected throughout their journey. In parallel, incident response times improved by 40%, enabling quicker intervention in the event of student altercations, unsafe behaviour, or other onboard issues that could compromise safety.

Operational efficiency also saw significant improvements. The solution led to a 60% reduction in manual video reviews, relieving support staff from hours of reactive monitoring and allowing them to focus on proactive safety strategies. In addition, Beacon reported a 5% year-over-year increase in Azure service usage, signalling a successful digital shift and a strong return on investment in Microsoft's cloud infrastructure.

Drivers experienced tangible benefits as well. With

intelligent alert filtering and accurate event detection, driver focus improved and false alarms were minimized, reducing stress and cognitive load. On a broader scale, the predictive analytics built into the platform provided deep insights into incident trends, enabling Beacon to identify and address recurring safety issues before they escalate. These outcomes align seamlessly with Beacon's core mission of delivering proactive, compassionate mobility, ensuring that student safety is no longer a reactive task, but a real-time operational standard.

## Customer Satisfaction and Testimonial

Beacon's leadership has voiced enthusiastic support:

*"What Audax Labs delivered is beyond a product—it's a cultural shift for us. We now know what's happening in real-time, and we're finally able to act before a small incident becomes a crisis."*

— CTO, Beacon Mobility

The solution's impact was featured in **School Transportation News**, the most widely read publication in the space:

 [Read the article](#)

### Contact Audax Labs

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### About Audax Labs

**Audax Labs** is a US-based digital engineering and AI consultancy, known for its ability to deliver **real-world solutions at enterprise scale**. As a **Microsoft Solutions Partner in Data & AI**, Audax helps organizations accelerate transformation through applied AI, cloud modernization, and connected systems.

From concept to scale, Audax partnered deeply with Beacon Mobility to ensure the solution wasn't just cutting-edge—but also **sustainable, ethical, and impactful**.