



Case Study

AI-Powered Traffic Law Enforcement

Enhancing Traffic Safety with Automated Traffic Enforcement

Traffic law enforcement has benefited from artificial intelligence (AI) developments. The combination of smart cameras, artificial intelligence, and cutting-edge edge computing hardware can automate traffic control and law enforcement. It can help tackle and solve real-time traffic violations such as red-light violations, speeding, wrong-way driving, and illegal parking. AI-powered traffic law enforcement provides an effective way to reduce traffic violations and improve abidance to traffic laws while using fewer police resources.

Challenges

The customer is a system integrator specializing in traffic control equipment engineering, traffic signaling engineering, information software services, traffic management consulting, etc. It was looking for an edge AI system to enhance traffic law enforcement for the Transportation Department of the New Taipei City Government. The customer specifically requested an edge AI system based on NVIDIA® Jetson Orin™ with support for NVIDIA JetPack. One PoE LAN port is crucial for camera deployment. The system must be made in Taiwan to meet strict safety standards for government use.

Main Requirements

- Fanless edge AI system with the latest NVIDIA Jetson module
- Dual LAN with one supporting PoE for camera deployment
- Long-term support and product life cycle exceeds 5 years
- Manufactured in Taiwan to meet government safety requirements
- Supports NVIDIA JetPack 5.11

Edge Computing and AI in Improving Road Safety

Axiomtek has proposed its **AIE100-ONX**, a fanless edge AI system powered by the NVIDIA® Jetson Orin™ NX platform that features a powerful 8-core/6-core ARM® Cortex® A78AE processor delivering up to 100 TOPS of AI performance and integrates an advanced 1,024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores. Equipped with a 15W GbE PoE port, the AIE100-ONX offers a



ready-to-deploy IP camera with both power and video transmission. It also has one M.2 Key M 2280 with PCIe x4 NVMe SSD slot for massive data processing. One full-size PCI Express Mini Card slot and one SIM slot are ready for 3G/4G, GPS, Wi-Fi, and Bluetooth connections.

The AIE100-ONX operates within a wide temperature range of -25°C to $+50^{\circ}\text{C}$, making it suitable for deployment in diverse environmental conditions. Its compact dimensions (148.6 x 129.8 x 34.6 mm) enable deployment in space-constrained field sites. An optional waterproof IP42-rated cover kit is also designed to strengthen the protection of semi-outdoor environments.

Application

AI-Powered Traffic Law Enforcement

The customer applied the AIE100-ONX to enforce traffic violations, including parking in red zones, stopping in yellow zones for more than 3 minutes, failure to yield to pedestrians, illegal U-turns, and vehicles crossing the stop line. The AI-powered enforcement is placed at various road intersections, targeting areas prone to frequent traffic violations. It aims to effectively deter and address traffic infractions, ultimately fostering safer and more orderly roadways for our community.



System Configurations of the AIE100-ONX

- NVIDIA® Jetson Orin™ NX
- M.2 Key M 2280 with PCIe x4 NVMe SSD slot
- One 15W GbE PoE for camera
- Wide operating range -25°C to +50°C
- IP42 rating for semi-outdoor

Why Axiomtek

The integration of AI and edge computing in traffic law enforcement represents a significant advancement in promoting road safety and regulatory compliance. Axiomtek's expertise and tailored solutions exemplify the potential of AI-powered technologies to address complex challenges and create safer, more efficient urban environments.

"We greatly appreciate the Axiomtek team for its attentive listening and provision of a tailored solution based on the NVIDIA Jetson Orin platform and fully supporting NVIDIA JetPack. Including a PoE LAN port is crucial to our camera deployment, ensuring seamless integration and optimal functionality. With the AIE100-ONX solution, we've successfully enhanced traffic law enforcement in our city, contributing to safer roads for everyone," said the technical director of the customer.

About Axiomtek Co., Ltd.

Axiomtek has experienced extraordinary growth in the past 30 years because of our people, our years of learning which resulted in our tremendous industry experience, and our desire to deliver well-rounded, easy-to-integrate solutions to our customers. These factors have influenced us to invest in a growing team of engineers including software, hardware, firmware, and application engineers. For the next few decades, our success will be determined by our ability to lead with unique technologies for AIoT and serve our key markets with innovatively-designed solution packages of hardware and software – coupled with unmatched engineering and value-added services that will help lessen the challenges faced by our systems integrator, OEM and ODM customers and prospects alike. We will continue to enlist more technology partners and increase collaborations with our growing ecosystem

who are leaders in their fields. With such alliances, we will create synergy and better deliver solutions, value, and the expertise our customers need.

As a member of the NVIDIA Preferred Partner, Axiomtek has been in close collaboration with NVIDIA in driving AI innovation at the edge. Combining its strong edge computing expertise with NVIDIA's AI and deep learning technologies, Axiomtek delivers a full portfolio of GPU-optimized hardware platforms and data communication solutions for deploying AI to the edge, helping customers speed up the implementation of deep learning capabilities into their IoT devices and turn Artificial Intelligence of Things (AIoT) into reality.