From Bottlenecks to Breakthroughs: How Edge AI Enabled Smarter Infrastructure on Taiwan's Outlying Islands

Overview

Kinmen, one of Taiwan's outlying islands, faced increasing number of public safety incident reports in its remote area due to constrained resources for security patrol. With limited power and network coverage, real-time monitoring was difficult. The project, led by Yian Electronics, began with EverFocus's edge AI system with NVIDIA® Jetson Xavier™ NX powered by ACROSSER for license plate recognition and basic object detection. As coverage expanded, the system reached its performance limits. In 2025, Yian upgraded to NVIDIA Jetson Orin Nano™ 8G Super Mode to meet higher computing needs for vehicle tracking, object detection, and behavior alerts. Smart streetlights and sensors respond to events and adjust lighting automatically. The system's compact, low-power design allowed deployment without major infrastructure changes. It now serves as a stable, scalable foundation for smart infrastructure in remote environments.

Customer
Yian Electronics

Industry
Smart Security and Monitoring

Location
Kinmen, Taiwan

Challenges

The project faced several practical barriers common to remote environments. Power supply and network coverage were unreliable, and it became harder to deploy real-time systems at scale. Many key intersections and public areas lacked monitoring, which created safety and response blind spots. The existing NVIDIA Jetson Xavier NX platform could not handle additional camera inputs or more advanced detection models as demand grew. At the same time, budget constraints required a solution that was cost-effective, compact, and easy to maintain.

Solutions

Yian Electronics upgraded the system from NVIDIA Jetson Xavier NX to NVIDIA Jetson Orin Nano 8G Super Mode. Each unit was configured to support three full-HD camera streams and run advanced detection models, including YOLOv7. This enabled more precise tracking of vehicles, detection of group behavior, and identification of unusual activity. The system was also integrated with smart streetlights to trigger lighting and send real-time alerts. Environmental sensors were added to detect events across a wider area, further improving situational awareness.

Results

- Delivered over 2.3× higher AI inference throughput, enabling real-time analytics beyond the legacy system's capability.
- Accelerated response times with on-device video processing, eliminating cloud latency for instant insights.
- Increased uptime with lower maintenance needs, even in limited-bandwidth, harsh environments.
- Deployed seamlessly without infrastructure upgrades, ensuring fast, scalable expansion.
- Running reliably across multiple sites, now serving as a proven reference architecture.

Products & Application

Product Used

EAC-30N: Compact Fanless Embedded Edge AI Computer with NVIDIA Jetson Orin Nano Super Mode

A compact, power-efficient edge AI module used for real-time video processing and intelligent infrastructure control.

Application Highlights

- License plate recognition and vehicle detection
- Real-time traffic flow analysis
- Smart lighting with integrated object detection
- Edge AI processing for bandwidth-limited deployments