Driving industrial transformation and smart upgrades with AI for a comprehensive solution

A Leader in AI-Powered Smart Solutions

ABILITY INTELLIGENT

Blending ABICO Group's manufacturing with Ability Enterprise's AI expertise enables delivery of custom technology solutions. Offerings include smart cameras, control platforms, digital twins, and automated parking for a range of industries.

Intelligent Transportation Systems (ITS)

The Smart Traffic Management Solution uses AI vision to collect vehicle data, track movements, recognize vehicle types, and analyze traffic, replacing manual surveys. It turns traffic footage into real-time insights, helping agencies improve monitoring, signal optimization, incident alerts, and overall efficiency.

Different regions prioritize different applications: Europe focuses on smart signals and public transport scheduling for carbon reduction; the U.S. emphasizes highway operations and incident response; Asian cities such as Singapore, Japan, and Korea use the technology for high-density signal control and autonomous-vehicle testing.

In Taiwan, most accidents occur at intersections. With systematic data collection and large-scale diagnostics, governments can identify high-risk locations, adjust signal strategies, and refine road design, thereby building a safer, more efficient, and sustainable urban mobility environment.

Multi-channel all-pass import

Urban Traffic Control / Arterial Roads

- ✓ Per-lane traffic flow detection and statistics vehicle type recognition and pedestrian detection
- ✓ Average speed measurement and analysis
- ✓ Turning-movement detection and statistics
- ✓ Traffic signal (red-green light) recognition
- ✓ Extended applications for smart recognition：
  - illegal U-turn detection
  - Roadside illegal parking/stopping detection
  - Detection of vehicles going straight from designated turning lanes

Interchanges & Expressways

- ✓ Per-lane traffic volume detection and analysis
- ✓ Vehicle type identification across all lanes
- ✓ Congestion/occupancy ratio analysis by lane
- ✓ Queue length measurement
- ✓ Configurable data refresh at one-minute intervals

Highway Tunnels / Major Corridors / Service Areas

- ✓ Detects stoppages, pedestrians, wrong-way driving, smoke, motorcycle entry, congestion, lane-crossing, and debris for faster emergency response and improved road safety.
- ✓ Detects shoulder-lane stoppage, lane encroachment, pedestrian dwell time, debris, and motorcycles for efficient incident resolution.
- ✓ Detects stoppages, wrong-way behavior, and objects on highways to improve safety, prevent incidents, and aid traffic management.
- ✓ Detects roadside smoke, fog, and low visibility.

Highways & High-Speed Roadways

- ✓ Automated detection of vehicle height, integrated with loop coils and license plate recognition to verify compliance with height restrictions
- ✓ Configurable height-trigger thresholds with automated alerting and event notification
- ✓ Dual-side laser-scanning sensors covering the full 30-meter range (X/Y axes) provide comprehensive detection across multiple lanes, improving monitoring accuracy.

System Architecture

Integrating sensing devices, AI analytics, and cloud platforms to form a complete intelligent traffic operations ecosystem.

Distributed / Edge Architecture

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Field Side

Using Cameras, RFID, and Controllers to capture imagery and perform real-time plate recognition, traffic analysis, and congestion detection on-site.
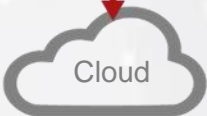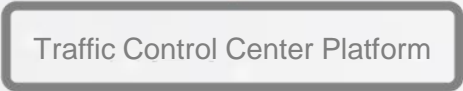
🌐 **NETWORK**

Data Center Side

The data server consolidates site data, and the video broadcasting server manages all recordings.

API NETWORK

Traffic Control Center Platform

Cloud

Centralized Architecture

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Field Side

Cameras capture video and send it directly to the data center.

↕ 🌐 NETWORK

Data Center Side

The central server handles AI tasks such as traffic, event, and plate analysis, while the video server manages storage, playback, and retrieval.

↑
API
NETWORK

Traffic Control Center Platform

Cloud

Automatic Number Plate Recognition

Through advanced AI-powered image recognition, the system accurately captures license plate information across intersections, arterial roads, and angled camera views. It operates at high speeds and adapts to drastic lighting changes and backlight conditions. The system maintains high recognition performance in rain, fog, and nighttime environments. This enables transportation authorities to rapidly interpret and respond to real-world traffic conditions.
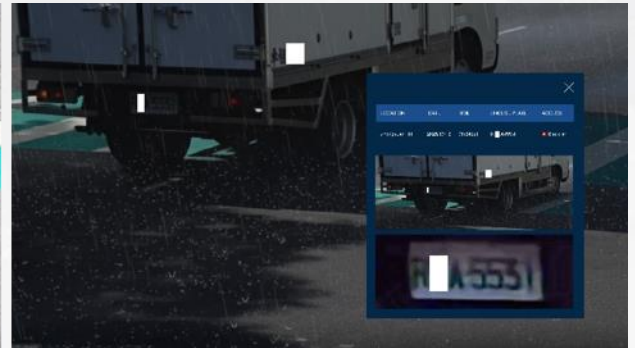
Ability Intelligent's proprietary AI model is trained on over one million real-world traffic images. The dataset covers diverse camera angles, vehicle categories, character styles, and environmental scenarios. This ensures exceptional model stability and reliability, even in complex and dynamic traffic environments.

✅ **Precision Recognition for Angled Plates**
Engineers optimized the AI engine for typical intersection camera placements, enabling it to automatically correct plate tilt and distortion to ensure superior recognition accuracy.

✅ **High Environmental Resilience**
The system delivers stable performance under extreme backlight, low illumination, heavy rain or fog, and high-speed traffic—ensuring consistent results in all conditions.

✅ **Real-Time Event Interpretation**
The system instantly transmits recognition results to the traffic control center for use in flow analysis, plate matching, violation tracking, and other operational scenarios.

✅ **Million-Scale Data Training**
With over **1,000,000** field images, the dataset continues to grow. As the model evolves over time, it becomes increasingly precise and adaptive.

✅ **Flexible Integration Across Platforms**
The system is compatible with traffic management centers, whitelist/blacklist systems, law-enforcement platforms, smart signal controllers, and other mission-critical systems.

Vehicle Detection System

This system uses AI video recognition and data analytics to give agencies real-time traffic monitoring, event detection, and intersection warnings. Instant data processing and dashboards help agencies spot hazards and act quickly to improve safety and efficiency.

✅ **AI Video Recognition & Data Collection**
AI cameras at busy intersections continuously capture traffic data—vehicle activity, movement patterns, and abnormal behavior—for better situational awareness.

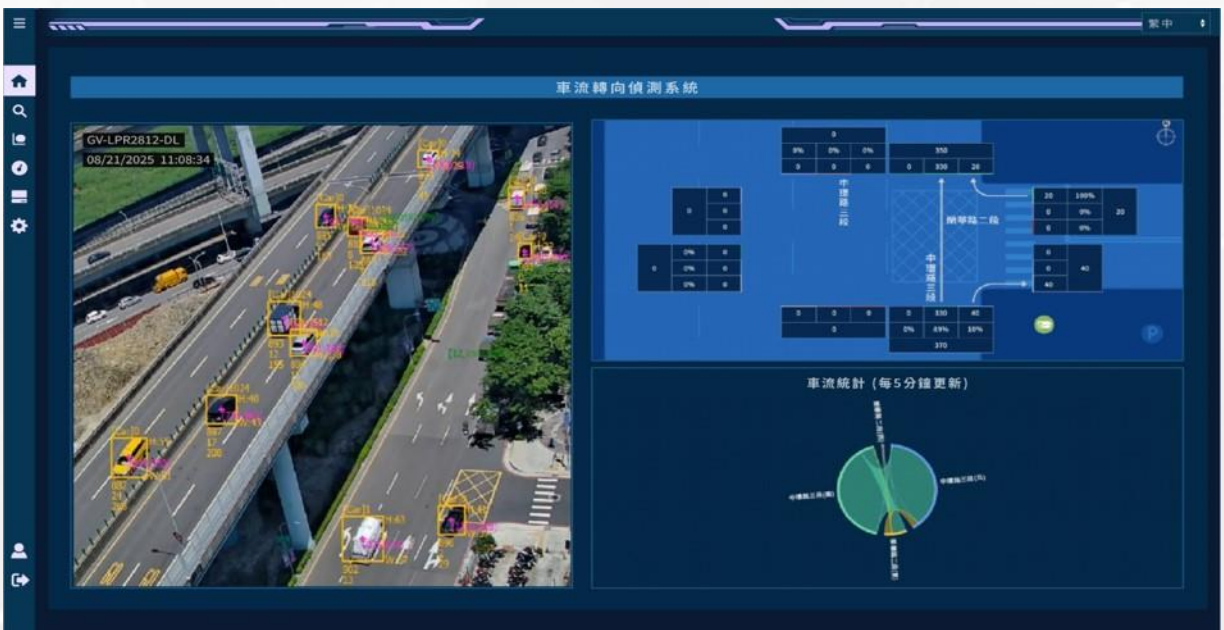✅ **Data Analysis & Transmission**
Traffic data is sent securely over 4G or fiber using UTC 3.0 or API integration. AI analyzers assess conditions and send results to the central platform for better coordination.

✅ **Data Storage & Real-Time Alerts**
AI data is processed and accessed through one interface for visualization, alerts, storage, and queries. Management can monitor traffic, detect anomalies, and identify violations in real time using live charts for better roadway control.

✅ **Data Utilization & Operational Management**
The system precisely analyzes traffic direction, classifies vehicles, and instantly detects issues like illegal stopping, abnormal turning, and lane congestion. It turns insights into predictive alerts and enables remote responses, helping agencies reduce incidents and manage roads efficiently.
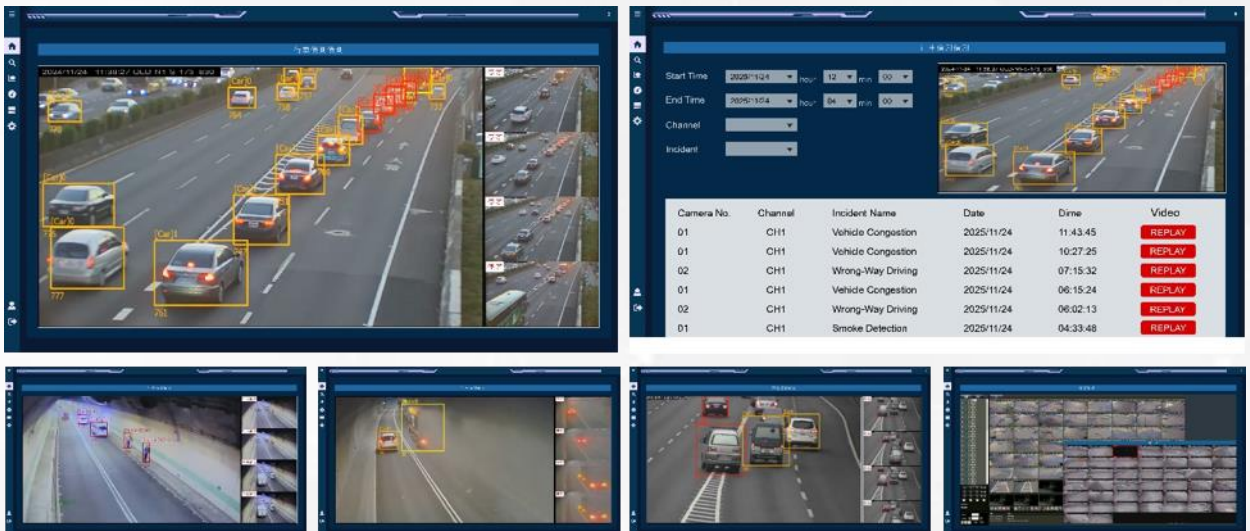
Incident Information Detection System

Ability Intelligent's AI-powered video analytics helps transportation agencies detect abnormal road and intersection conditions, such as pedestrian activity, vehicle dwell time, smoke, wrong-way driving, unauthorized motorcycle entry, lane-crossing, and debris or congestion.

✔ **Behavioral Event Detection & Analysis**
The AI video analytics system rapidly detects road issues—including pedestrian activity, blockages, smoke, wrong-way driving, motorcycle intrusions, lane violations, and debris— so operators can respond faster and keep roads safer.

✔ **Automated Event Tagging & Video Archiving**
The AI system automatically tags detected events and stores the corresponding video footage. This process enables operators to efficiently review events, audit incidents, and retrieve evidence—greatly improving operational workflow and event management efficiency.
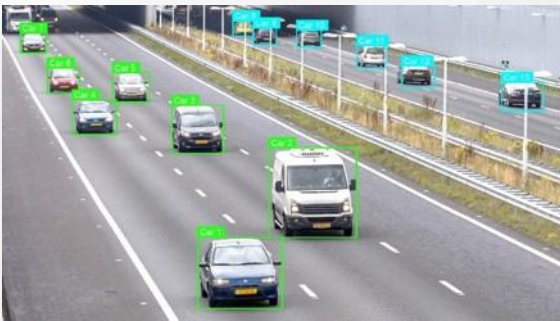

✔ **Remote Real-Time Monitoring**
Integrating with the CMS platform and AI-IID engine, the system provides centralized, real-time monitoring and pop-up event alerts, letting operators oversee multiple sites and respond instantly from one location.

✔ **Statistical Analysis & Visualization**
The system turns raw video into charts and dashboards, giving agencies clear insights to improve decisions, allocate resources, and plan safer, smoother roadways.

Solution Features and Application Scope

✅ **AI-Powered Traffic Video Analytics**
Powered by Ability Intelligent's proprietary AI algorithms, the system delivers highly accurate detection of vehicles, pedestrians, and traffic-related events. It enables real-time intersection monitoring and comprehensive data analysis to support smarter mobility management.

✅ **Comprehensive Multisource Traffic Data Collection**
The platform supports AVI license plate recognition (including UHF readers), QLD congestion detection, and VDS turning movement analysis, forming a comprehensive traffic monitoring and statistical framework for intersections and major road segments.

✅ **Real-Time Congestion and Incident Alerts**
The system detects road issues and sends instant alerts to management, with real-time map visualization and support for multiple communication protocols.

Traffic Flow Monitoring

By identifying vehicles in traffic video streams, the system provides real-time insight into traffic volume, speed, and direction, enabling agencies to assess congestion and overall mobility.

Violation Detection & Enforcement Support

Using AI video recognition, the system detects traffic violations — including illegal stopping or parking, improper lane changes, and red-light running—helping enforcement agencies monitor, record, and manage violations more efficiently.

✅ **Flexible Architecture for Multi-Scenario Deployment**
The client–server system supports multi-region operations on many workstations and can be deployed across highways, intersections, and road sections, providing comprehensive event detection and management for diverse traffic environments.

✅ **Data Management and Customized Integration**
The platform offers historical search, custom features, and third-party integration for seamless data exchange and efficient workflows, adapting to any agency's operational needs.

Intersection Safety Monitoring

The system tracks vehicles and pedestrians in live video, continuously monitoring intersection safety, signal timing, and violations to help agencies improve safety at key junctions.

Regional Roadway Monitoring

By analyzing traffic volume and vehicle paths, the system delivers insights that support urban planning, capacity assessment, signal timing, traffic simulation, and improved mobility management.

The Key to Smart Transformation Starts with Choosing Ability Intelligent

About Ability Intelligent

Ability Intelligent, a subsidiary of Ability Enterprise under the ABICO Group, leverages the Group's manufacturing expertise and advanced AI research to deliver smart technology solutions that drive measurable industrial transformation. Our high-performance smart cameras, command-and-control platforms, digital twins, intelligent warehousing, and smart parking deliver secure, deployment-ready results for large-scale impact.

Our core principles—customer-centricity, innovation, and integrity—guide deep investments in AI, big data, cloud, and information security. Continuous R&D and implementation enable organizations to optimize efficiency and improve decision accuracy.

Together with partners, we enable digital transformation and sustainable growth for smart industries.

- ✅ **Solid Corporate Backing**
- ✅ **Combines different technologies**
- ✅ **Strong AI skills**
- ✅ **Wide range of products**
- ✅ **Strict quality control**
- ✅ **Solutions for different industries**
- ✅ **Cares about the environment**

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