Milesight

Creating a Safer, More Sustainable City with AI-enhanced Video Surveillance and ANPR

Make Sensing Matter for Sustainability

The Modern Urban Challenge: Balancing Growth with Livability

Cities are growing faster than ever. Today, 55% of the world's population lives in urban areas, which is expected to increase to 68% by 2050 (United Nations). With that growth come tough questions about how to stay liveable, sustainable, and safe.

Environmental Pressure: Congestion and Emissions

Traffic congestion imposes massive economic and environmental costs. According to the INRIX 2024 Global Traffic Scorecard, drivers in many cities spend hundreds of hours each year stuck in traffic, wasting fuel and producing emissions.

Vehicle emissions are a major source of air pollution, greenhouse gases, and public health issues. As cities densify, the "last-mile" traffic, idling, and stop-and-go flows exacerbate emissions hotspots and urban heat islands.

Road Safety Risks: The Invisible Toll of Mobility

Globally, road traffic crashes kill around 1.19 million people annually and injure 20–50 million others (WHO). Vehicle speeding, illegal parking, and lack of visibility create acute danger zones, especially for vulnerable road users (pedestrians, cyclists, motorcyclists), which account for more than half of road fatalities.

Road deaths are three times higher in many low- and middle-income countries, despite having far fewer vehicles. Even in developed developed, progress on road safety has stalled, with many countries seeing higher fatalities in 2022 than before COVID.

Public Safety: Complexity in Dense Environments

Crime rates remain higher in dense urban settings. The enforcement challenge is multiplied in fast-growing cities: limited police resources strain responsiveness; incident detection is often delayed by insufficient or outdated surveillance infrastructure; the data available for identifying patterns or emerging threats is lag behind; and situational awareness is constrained by complex urban layouts and the fast pace of activities. These factors collectively create a complex enforcement environment.

Gaps in Coverage: Infrastructure and Connectivity

Many urban outskirts, new growth zones, informal settlements, construction sites, and temporary event spaces suffer from lack of power, network, or physical infrastructure, making conventional camera deployment costly or infeasible. Even in well-instrumented cities, blind spots persist: narrow alleys, remote back streets, pedestrian corridors, and cross-junctions where theft, vandalism, or jaywalking occur.

The lack of AI-enhanced smart analytics and poor integration are common issues of legacy CCTV systems that hinder fast, automated decisions.



Cities demand security systems that not only see, but understand and license plate recognition also becomes mission-critical for traffic surveillance.

Make Sensing Matter for Sustainability

To address the pressing challenges of modern urban environments, Milesight offers AI-driven video surveillance and intelligent traffic ANPR cameras designed to deliver measurable improvements in both environmental sustainability and social safety.

Environmental Sustainability

Cities are under increasing pressure to reduce emissions, improve traffic flow, and optimize urban planning. Milesight's solutions empower authorities to proactively manage transportation and reduce environmental impact:

- Traffic optimization
- Low emission zone enforcement
- E-scooter Management
- Smart parking solutions
- Data-driven urban planning

Social Sustainability & Safety

Protecting citizens is central to a livable city. Milesight solutions strengthen public safety through real-time monitoring, rapid incident detection, and intelligent enforcement:

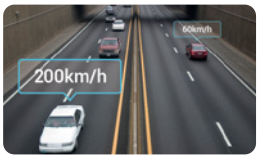
- Improving road safety
- Vulnerable road users protection
- Rapid incident detection and response
- Public order & crime prevention

By combining environmental and social sustainability, Milesight's integrated solutions transform urban monitoring into actionable intelligence, helping cities become safer, greener, and more efficient. Our cameras are flexible, scalable, and easy to deploy, even in challenging environments such as remote or temporary urban zones.

Building Resilient Cities: Key Scenarios for Safety and Sustainability

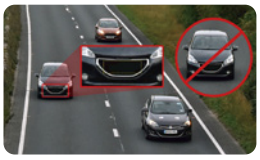
Optimized Urban Mobility for People & the Planet

Low Emission Zone Enforcement

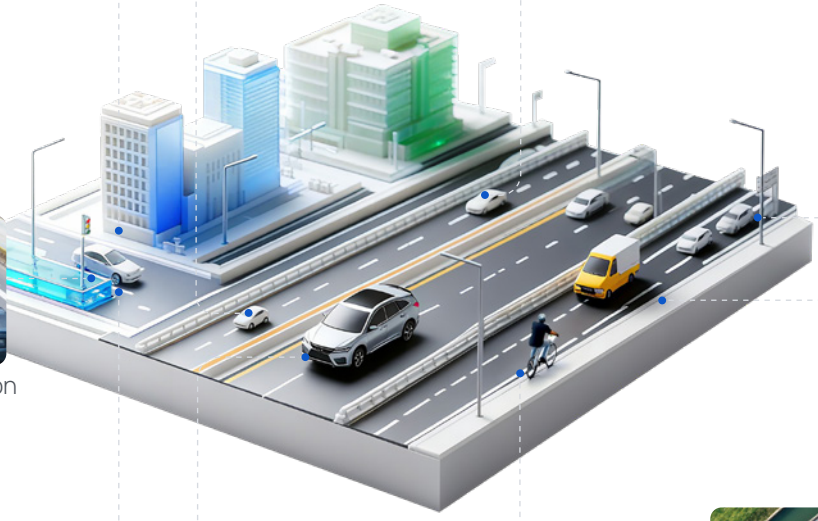


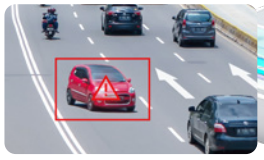
Speeding Detection

Specific Lane Management



No-Plate Detection





Reverse Driving Detection

Traffic Flow Management

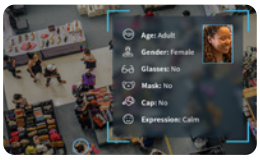
Red Light Violation Detection

On-street Parking Violation Detection

Cyclist Detection

AI-Powered, Proactive Public Protection

Heat Map



Face Detection

Off-grid, Solar-powered Surveillance

People Flow Analysis

License Plate Recognition

Fire & Smoke Detection

Hard Hat Detection

Applications in Focus

Greener City

Traffic Flow Optimization & Sustainable Infrastructure Planning

Milesight ANPR cameras can detect vehicles and license plate numbers, classify them, measure speed, count volumes, etc., allowing city traffic systems to know what's really happening on the road. Using this real - time data, traffic lights can be adjusted dynamically (green times, cycle lengths etc.) to match current traffic flow rather than using fixed timing schedules. The flexibility reduces idle time at red lights and helps avoid stop-and-go traffic.

The vehicle traffic data collected by ANPR cameras can provide valuable insights for urban traffic planning. By analyzing traffic flow, travel patterns, and peak periods across different areas, city planners can optimize the layout of public transportation networks and strategically allocate sustainable mobility facilities, such as bicycle lanes, dedicated bus corridors, and electric vehicle (EV) charging stations.

Traffic Enforcement: Low-Emission Zones, Paperless Operations, etc.

Many cities have adopted Low Emission Zones (LEZs) that restrict access based on vehicle type or emissions category. High-accuracy Milesight ANPR cameras help enforce these zones with reliable detection and documentation. By cross-referencing vehicle data with emissions databases, authorities can quickly identify and flag on-compliant vehicles.

Besides, Milesight's AI-empowered ANPR cameras can monitor traffic violations in real time, such as running red lights, driving the wrong way, or speeding, and enable automatic issue of electronic fines with 3rd-party integration, improving enforcement efficiency and reducing human intervention.

More Intelligent, Sustainable Parking Management & Enforcement

On-street parking management is key to emissions control. Milesight ANPR cameras automate parking enforcement across multiple scenarios, such as detecting overtime violations and illegal parking in restricted areas (fire hydrants, bus lanes, handicapped zones, etc) and verifying permits in residential or commercial zones to prevent unauthorized parking. It reduces misuse of designated parking spaces, reduces congestion, and minimizes unnecessary patrols.

On the other hand, traditional parking lots typically rely on paper tickets for timekeeping and payment. The automatic recognition of vehicle license plates drives the shift toward a ticketless system, significantly reducing paper consumption and waste, while greatly decreasing queuing and idling time at entry and exit points. Such systems also enable smarter, more accurate billing and enforcement processes, supporting real-time data transmission, system integration, and remote management.

Moreover, Milesight offers indoor parking guidance cameras to detect whether parking spots are occupied or free. These devices enable dynamic space guidance, directing drivers to available spots via indicator lights, thereby reducing unnecessary driving inside parking facilities and lowering emissions and fuel consumption.

Low Power & Off-Grid Operation

Milesight offers solar-powered series cameras that enable 24/7 surveillance even in remote or infrastructure-poor areas, such as construction sites and farms, without relying on grid electricity. By removing the need for wired infrastructure, cellular networks (4G/5G) enable fast and flexible deployment with minimal environmental footprint — anytime, anywhere.

In off-grid or remote areas, video surveillance devices need to operate efficiently on minimal power to make the most of limited energy sources like solar. Our low power consumption technology extends battery life and reduces dependence on infrastructure, which is ideal for challenging environments.

- Runs on as little as 0.19W
- Up to 962Wh battery & 100W*2 solar panel
- 17-day battery life with continuous

Keeping Power Use Low at Night with IR Technology

Milesight's IR technology effectively addresses power waste associated with infrared night vision, offering a more eco-friendly and low-power option for outdoor surveillance. The intelligent IR control significantly extends operation time in low-light or nighttime conditions.

- **IR Strobe Mode:** The IR in the SP111 model employs a strobe mode, activating IR lights in short, periodic bursts only in night. This design reduces IR power consumption by more than 60% compared to a continuous IR mode.
- **Smart IR Activation:** The SC211 model conserves power by activating IR illumination when a moving object is detected and needs to be captured at night. By minimizing continuous IR usage, it is particularly useful in off-grid and remote areas where battery preservation is critical.

Besides, our TrueColor camera series achieves full-color imaging with an ultra-low 0.0005Lux sensitivity, capturing vibrant details even in low-light conditions, reducing the need for additional artificial lighting.

Safer City

Traffic Flow Optimization & Sustainable Infrastructure Planning

Traditional security systems have a massive false alarm problem that wastes resources. The average cost per incident ranges from tens to hundreds of dollars, including fines, staff response, and operational disruptions. By accurately distinguishing between genuine threats (loitering, intrusion, unauthorized access) and false triggers (animals, weather, leafs, etc.), Milesight AI-powered analytics significantly reduce unnecessary emergency responses and their associated costs.

Besides, the AI-powered analytics helps automate physical security and move from simple detection to proactive threat protection. Instead of passively recording, the system sends alerts to enable early intervention before situations escalate. The shift allows for a more immediate and effective response to potential incidents.

Beyond general security, Milesight cameras are also equipped with features like face, hard hat, safety clothing, violence, and fall detection, further enhancing safety in public and commercial spaces. Besides, the cameras support integration with VoIP systems for secure audio communications and alarm notifications.

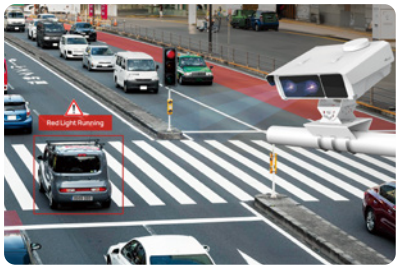
From traffic heatmaps to visitor analytics, Milesight provides valuable data for public safety, city planning, and business decision-making. The system extracts key attributes of people and vehicles, such as clothing color, gender, vehicle type, and license plate number, and converts them into metadata. These visual elements are then structured as "who, what, when, where," enabling smart search, analysis, and decision-making.

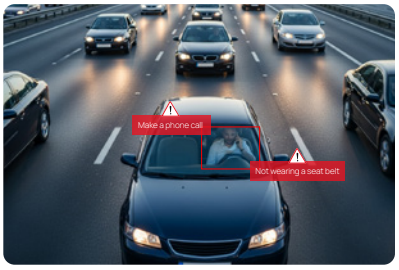
Traffic Violation Detection & Vulnerable Road Users Protection

Milesight's edge AI traffic cameras are equipped with a rich set of intelligent video analytics that enable real-time detection of a wide range of traffic-related events, such as speeding, illegal U-turns, wrong-way driving, illegal parking in restricted areas, running red lights, mobile phone use while driving, seatbelt violations, and other abnormal behaviors that may indicate a safety risk or ongoing incident. Once an event is detected, the system can immediately push detailed alerts, including snapshots, short video clips, and metadata, via HTTP, MQTT, or standard APIs to centralized platforms or emergency systems.

Speed enforcement stands out as a key application. Milesight uses AI-based ANPR, radar-video fusion, dual lenses, and IR light for all-weather, real-time, precise speed and license plate detection. These cameras act as a deterrent, and the images and metadata captured provide stronger evidence for traffic authorities. They are designed to cover various scenarios such as highways, urban streets, school zones, residential areas, private communities, and restricted zones.

Specifically, our cameras enhance the safety of vulnerable road users such as pedestrians and cyclists by detecting their presence and triggering real-time warnings to drivers. It helps prevent accidents and facilitates safer urban mobility.





Building Trust Through Cybersecurity and Data Protection

As cities grow smarter, data becomes a key asset and its protection a shared responsibility. Ensuring cybersecurity and privacy is a foundation for trust, inclusiveness, and long-term urban resilience.

Milesight takes a multi-layered approach to cybersecurity. We adhere to a number of international standards and regulations, such as PSTI, NDAA, TPM 2.0, ISO 27001, NIS2, and GDPR.

With robust encryption like HTTPS, SSL, and TLS 1.2 to protect data during both transmission and storage, we ensure that video feeds and other sensitive information can't be easily intercepted. We also proactively identify, mitigate, and report vulnerabilities with transparency, reducing risks across our product portfolio.

PSTI NDAA TPM 2.0 ISO 27001 NIS2 GDPR

Technology Behind

Low-Power Product Design

By integrating both sensing (radar, PIR) and AI/analytics in the camera hardware/software, Milesight devices avoid the overhead of running a separate AI box continuously (which would mean always-on high power mode, communication to box, etc.). The edge AI approach allows “wake-on-event” type behaviour, rather than “always-on full-rate” behaviour. This can yield ~60 % lower power consumption compared to older "AI box + camera" setups.

Besides, Milesight emoloyes several hardware and firmware strategies to reduce consumption, such as dynamic frame rate, flexible sleep mode, smart IR activation, advanced System on Chip (SoC) technology, off-grid / solar readiness, and OpenVision Server with consumption of 6-18W.

Milesight AI Analytics: AI at the Edge

Milesight’s self-developed edge AI technology empowers all our network camera with real-time intelligence, combining VCA 2.0 for precision detection and MSense for vertical-specific metadata generation and management.

Core Capabilities:

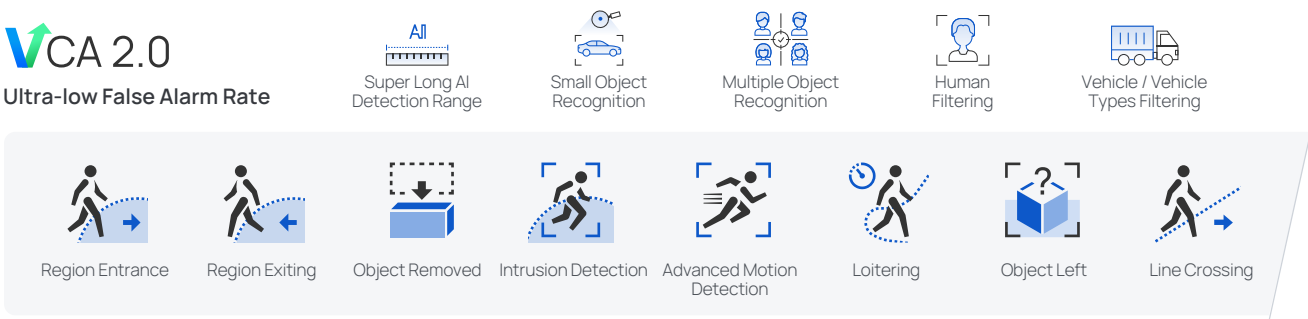
Built-in Edge Intelligence

- AI processing directly at the edge for faster response and reduced bandwidth
- Real-time detection, classification, and event response

Dual AI Engines

VCA 2.0: Optimized for core security accuracy
Milesight’s upgraded Video Content Analysis algorithm ensures highly accurate detection and fewer false alarms, even in complex environments.

- 8 built-in AI VCA features for instant threat detection
- Accurate recognition of small and multiple targets
- Up to 75m AI detection range (fix-lens)



Msense: Tailored for vertical-specific analytics and rich metadata generation
MSense transforms live footage into rich metadata, powering smarter, industry-specific operations.

- A wide range of advanced, self-developed algorithms
- Built for diverse vertical applications (retail, construction, eldercare, etc.)
- Generates metadata to support smart search, reporting, and alert linkage

Human & Vehicle Classification Foundation

All AI functionalities are built upon accurate human and vehicle classification, enabling precise filtering and targeted detection.

Robust Data Security

Equipped with TPM 2.0 chip and compliant with leading standards such as PSTI, NDAA, TPM 2.0, ISO 27001, NIS2, and GDPR, Milesight AI guarantees the highest level of data protection.

Seamless Integration

With plug-and-play interoperability, full ONVIF support, and seamless integration with leading VMS platforms, Milesight AI effortlessly fits into your existing security ecosystem.

Low-Power Product Design

Milesight PlateXpert technology is the core of Milesight's Intelligent Traffic Series cameras. It's an advanced deep learning-based License Plate Recognition (LPR) technology designed to evolve continuously, learning from diverse real-world data to deliver up to 98% recognition accuracy across global environments and plate types.

Core Capabilities:

Recognize Smarter & Faster

- Deep Learning AI: Ensures 98%+ accuracy and continuously learns and improves in diverse environments.
- Ultra-Fast Recognition: Identify license plates in as little as 100ms.

Recognize Better Under Challenging

- Challenging Lighting: Frame Parity Flashing and dual 740/850nm IR options guarantee clear captures, day or night.
- Long-Distance Capture: Reliably reads plates from up to 630 feet away.

Recognize Broader

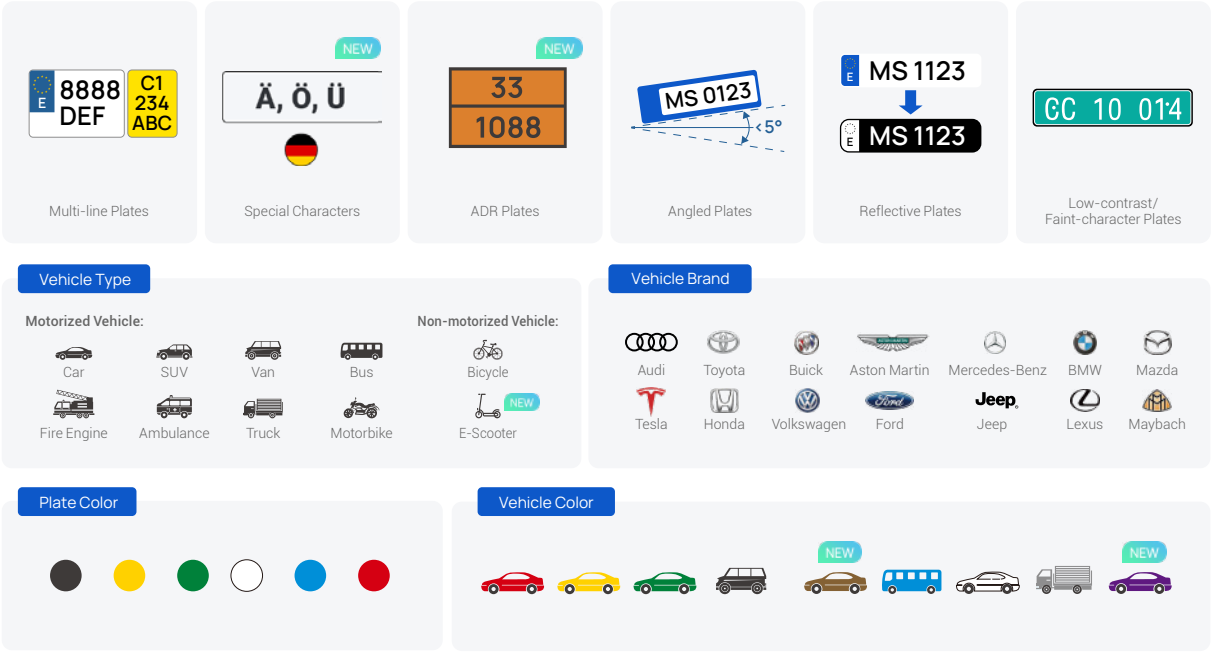
- Worldwide Support: Covers over 50 countries, 50+ U.S. states, and features the EU Fusion algorithm for recognizing license plates from any EU member state.
- Special Character Recognition: Effectively identifies non-English characters, state emblems and space.

Recognize with High Accuracy

- Configurable Serial Format: Define plate formats to prevent misidentification.
- Continuous Recognition: Automatically selects the most accurate result.
- Small Plate Filtering: Avoids premature detection when vehicles are distant.
- Scenario-Tailored Algorithms: Optimized for road traffic and entrance/exit.
- Line-Cross Triggering: Reduces false recognition with an additional trigger line.
- Confidence Level: Displays recognition reliability for informed actions.

Recognize More Than Just the Plate

- Vehicle Attributes: License plate color, vehicle type, color, and brand
- Plate Types: Angled, reflective, multi-line plates, and ADR plates
- Multi-Lane & Bidirectional Recognition
- Rich Traffic Metadata: For surveillance, forensic searches, and pattern analysis, fully compliant with ONVIF Profile M.



Success Stories

Smart Traffic Congestion Warning System in Barcelona

Location: Barcelona, Spain **Application:** Traffic Management
Products: Milesight AI Road Traffic Radar Pro Bullet Plus Cameras

Barcelona, one of Spain's busiest transport hubs, faces heavy traffic, especially during rush hours. To improve the flow, the Spanish Ministry of Transport turned to a smart warning system powered by Milesight traffic cameras. It detects congestion in real time and, through LoRa communication, trigger electronic signs a kilometer away to alert drivers. Each camera are paired with a solar panel to enable it work off-grid and cut down on energy use.

Elevating Phuket City Safety with Hundreds of Milesight Cameras

Location: Phuket, Thailand **Application:** Smart City
Products: Milesight 8MP AI Motorized Pro Bullet Plus Camera

To protect its booming tourism industry, Phuket deployed hundreds of Milesight cameras across parks, heritage streets, and residential areas to eliminate the blind spots and low-quality footage of the old CCTV network. With advanced features like ANPR and helmet detection, the system enhances traffic flow, supports fast evidence collection, and improves coordination among agencies.

- Unified Management with E-map
- End-to-end Intelligence (On-edge VCA 2.0)
- Traffic Enforcement Built for Busy Roads
- Citywide 4K Where It Matters

Enhancing Rural Road Surveillance and Incident Response in Mongolia

Location: Gipuzkoa, Spain **Application:** Road Traffic Safety, Cyclist Protection

Products:
- AI Road Traffic Radar Pro Bullet Plus
- AI Road Traffic Pro Bullet Plus
- IoT Controller - UC300

Gipuzkoa, known for its high cycling activity, faced frequent accidents in areas with limited driver awareness. To address the challenge, an intelligent traffic surveillance system was deployed, combining AI cameras with IoT controllers to detect cyclists, trigger alerts to drivers and real-time roadside warnings, and provide actionable traffic data to authorities. The solution not only reduced accident risks but also delivered continuous insights for improving road safety across vulnerable zones.

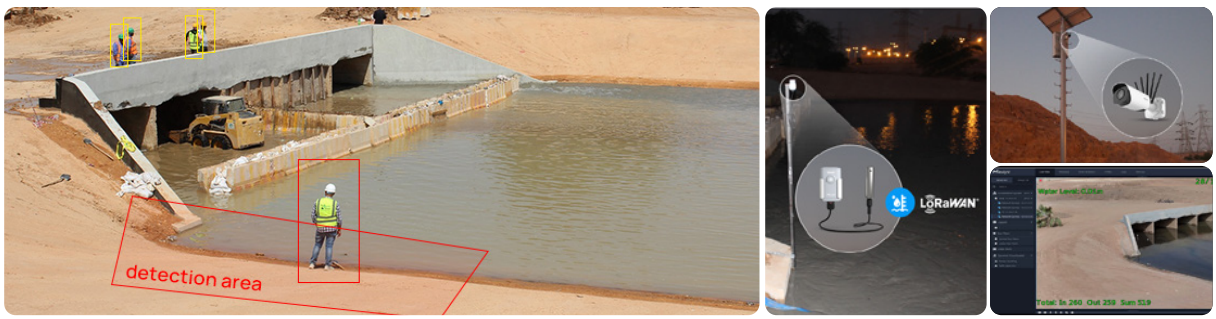
Smart Flood Prevention in Saudi Arabia with 5G AIoT Solution

Location: Saudi Arabia **Application:** Smart City, Flood Prevention

Products:
- Milesight 5G AIoT 4X/12X Pro Bullet Plus Network Camera
- Milesight Submersible Water Level Sensor (EM500-SWL)

To combat destructive flash floods in remote, off-grid areas of Saudi Arabia, an intelligent solution was deployed using a solar-powered Milesight 5G AIoT camera integrated with an IoT water level sensor.

The camera's built-in AI analytics detect illegal dumping to prevent channel blockages, while the sensor transmits real-time water level data via LoRaWAN® to the camera. When a preset threshold is exceeded, the camera automatically triggers an HTTP notification to the Milesight Enterprise NVR 1U Series, allowing operators to remotely visualize live video, water levels, and AI-driven alerts on a single platform for centralized management and proactive response.



Product Showcase

Intelligent Traffic

TrafficX Series

DualVision TrafficX Camera
TS5510-GH

DualVision TrafficX Enforcement Camera
TS5511-GH

DualVision TrafficX Radar Camera
TS5510-GVH

- 2*5MP Dual-lens for Overview and ANPR Image
- 99% Capture Rate & 98% Plate Recognition Rate
- 50m ANPR Distance & 2-3 Lanes Covering
- Up to 320km/h Speed Detection and ANPR

4G Solar Power ANPR Camera Kit

- Specialized 6mm/16mm Lens
- 850nm/740nm IR Wave Length
- License Plate Recognition, Vehicle Type Identification, and No-plate Event
- List Management / List Event

4G Solar-powered Traffic Sensing Camera

- Radar Triggered Vehicle Capture
- Low-power Working Mode & Solar-powered for Sustainable Use
- 4G LTE for Wireless Data Transmission
- MQTT & HTTP Protocol for Seamless Integration

Indoor Parking Guidance Camera

- AI Parking Space Occupancy Detection (≥99.9% High Accuracy)
- Dual Lens Covering up to 6 Spaces
- Multi-color Customizable Indicator

AI Parking Management Pro Bullet Plus Camera

- Occupancy Detection (Up to 100 Parking Spaces)
- Parking Detection with LPR (Up to 6 Parking Spaces)
- Parking Violation Detection (Identify and Record Illegal Parking Behaviors)

AI Road Traffic Pro Bullet Plus Camera

AI Road Traffic Supplement Light Pro Bullet Plus Camera

AI Road Traffic PTZ Bullet Plus Camera

AI Road Traffic PTZ Bullet Plus Camera

AI Road Traffic 5G Pro Bullet Plus Camera

Video Surveillance

4G Solar Power Security Camera Kit

- Specialized 2.8mm/6mm Lens
- Identification for Human & Vehicle (Bicycle/Car/Motorcycle/Bus/Truck)
- Intrusion Detection / Line Crossing / Object Left / Advanced Motion Detection

Q Series

Offering exceptional performance in low-light conditions

Panoramic Series

Delivering stitched, vivid images for wide-area monitoring

PTZ Series

Providing PTZ feature for wide area coverage and all-around monitoring

Pro Series

Designed for project-grade surveillance deployments with a full suite of AI analytics

Mini Series

Featuring ultra-mini size, stylish design and easy installation

5G Series

Equipped with 5G, IoT, and AI deep learning, catering to outdoor remote monitoring

About Milesight

Milesight offers multi-potential sensing products to capture the most meaningful data, and makes it accessible across diverse applications. It innovatively applies emerging technologies such as AI, 5G, and IoT to distinct use scenarios. With a commitment to making sensing matter, Milesight quickly responds to customer-specific challenges and collaborates with an expanding network of partners to deliver unique data value. It is determined to make real, positive impacts in smart buildings, intelligent traffic, intelligent security, smart cities, and beyond.

Contact Us

Website: www.milesight.com
Email: sales@milesight.com