

# ROAD SAFETY ENFORCEMENT

-Travel Safety  
-Man-power Saving  
-Sustainable



#### Vehicle Proceeding Through Red Light

- Advanced LPR camera
- Evidence archive



#### Speeding Detection

- Point speed enforcement
- Section speed enforcement



#### Bus Lane Enforcement

- ANPR
- Fully-automated



#### Parking Violations

- Detect illegal parking

# ROAD SAFETY ENFORCEMENT SOLUTIONS

As a system that has been proven to save lives, the Intelligent Traffic System (ITS) is widely deployed in cities worldwide. The traffic enforcement system is an important component of ITS, not only helping drivers to strengthen their awareness when driving, but also generating additional revenue from fines to help finance a sustainable, growing, and well-maintained enforcement system. The Dahua Road Safety Enforcement Solution is a unique and comprehensive suite of tools which can detect multiple traffic violations in order to improve road efficiency and safety.

## 4 Typical Uses:



Vehicle Proceeding Through Red Light



Speeding Detection



Bus Lane Enforcement



Parking Violations

## CHALLENGES

**Security**

- Traffic accidents have increased with the rapid growth in drivers and cars
- Number of serious injuries and fatalities from accidents grows annually
- Lack of evidence to enforce traffic violations

**Efficiency**

- Traffic congestion causes lost time and money
- Enforcement systems technologically backward
- High-cost, complex, and customized systems are difficult to maintain and create.

## SOLUTIONS

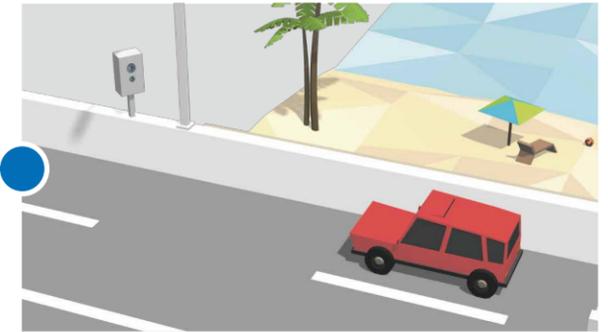


# OVERVIEW

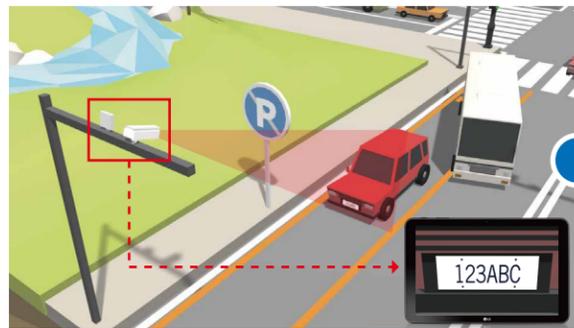
• Vehicle Proceeding Through Red Light



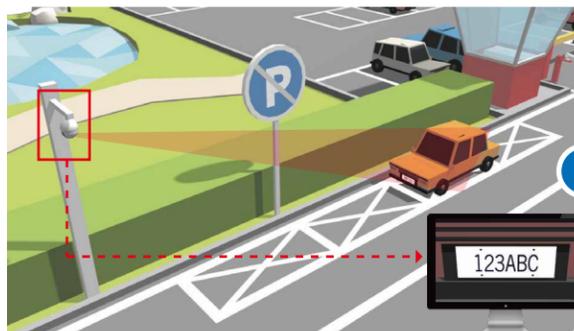
• Point Speed Enforcement



• Bus Lane Enforcement



• Parking Violations



• Section Speed Enforcement

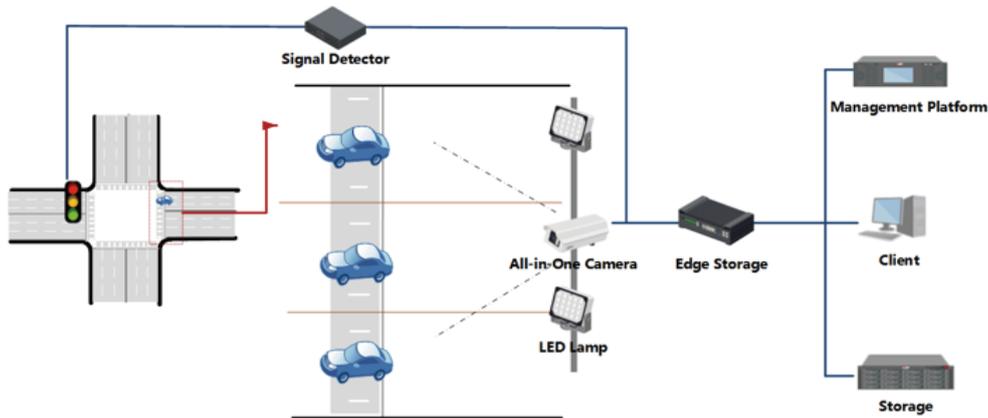


# VEHICLE PROCEEDING THROUGH RED LIGHT

## Background

Safe public transportation is a global concern, especially in how to respond quickly to traffic accidents. In a modern society with increased mobility, red light violations are a major factor in traffic tragedies. Every year, 21.5% of all traffic accidents are caused by running red lights. The Dahua Red Light Enforcement Solution reduces accidents to create a safer and more secure life for citizens.

## System Overview



### • Solution Details

At the core of the Red Light Enforcement Solution is a system that synchronizes the status of red light signals with the triggering signal to cameras. When a violation occurs, the Dahua all-in-one capture camera takes three images of the violation to be used as evidence. These images include the vehicle license plate, status of traffic signal, and an overview of the scene. Afterwards, the DSS management and storage platform collects the data from each camera and distributes it to client operators for further processing. Edge storage devices ensure data from the cameras is saved, even in the event of transmission failure.

### • Features and Value

#### >> Embedded LPR

Enriched recognition features: up to 95% license plate recognition rate.

The license plate color, vehicle color, vehicle brand recognition can be customized.

The screenshot shows a software interface for license plate recognition. It features two main video feeds showing traffic on a road. Below the feeds, there are sections for 'Obtain Plate Info' and 'Real Plate Info'. The 'Obtain Plate Info' section displays 'RLM60'. The 'Real Plate Info' section displays a large image of the license plate 'RLM-60'. At the bottom, there is a table with the following data:

Index	Event Type	Capture Time	Lane	Plate	Plate Color	Vehicle Color	Speed(km/h)	Vehicle Sign	Vehicle Type
83	ANPR	2015-09-09 10:51:05	2	RLM507	White	Black	No Speed	Unknown	Unknown
82	ANPR	2015-09-09 10:51:04	1	BY9626	White	White	No Speed	Unknown	Unknown
81	ANPR	2015-09-09 10:51:03	2	S'AR468	White	Green	No Speed	Unknown	Unknown
80	ANPR	2015-09-09 10:51:02	1	BWQ264	White	White	No Speed	Unknown	Unknown
79	ANPR	2015-09-09 10:51:01	1	ZHW721	White	Black	No Speed	Unknown	Unknown

**>> Automatic Day / Night Mode**

Automatically distinguishes day/night without setting any parameters.

**>> Advanced LPR Camera**

6.8MP high definition LPR camera captures more details.

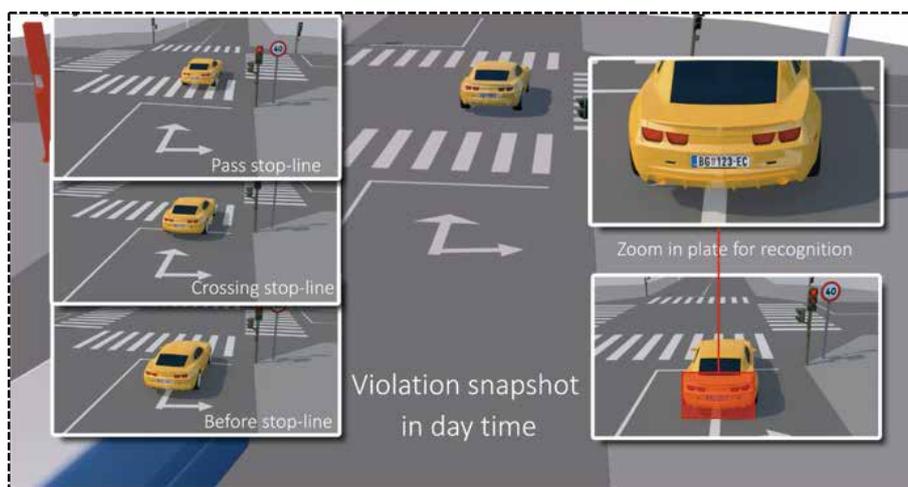
Cover 3 lanes just with one camera.

One box solution with built-in fan/heater/lightning protection/lamp module, make the installation easier and more convenient.



**>> More Convincing**

Take 4 snapshots with the violation in progress, status of traffic signal, and plate number to be used as evidence.



**• Traffic Management Server Support**

- Search and fuzzy search by plate/time/type of violations.
- Show plate/record time/processing pictures/linkage video.
- Supports real time monitor.
- Supports block car alarm.

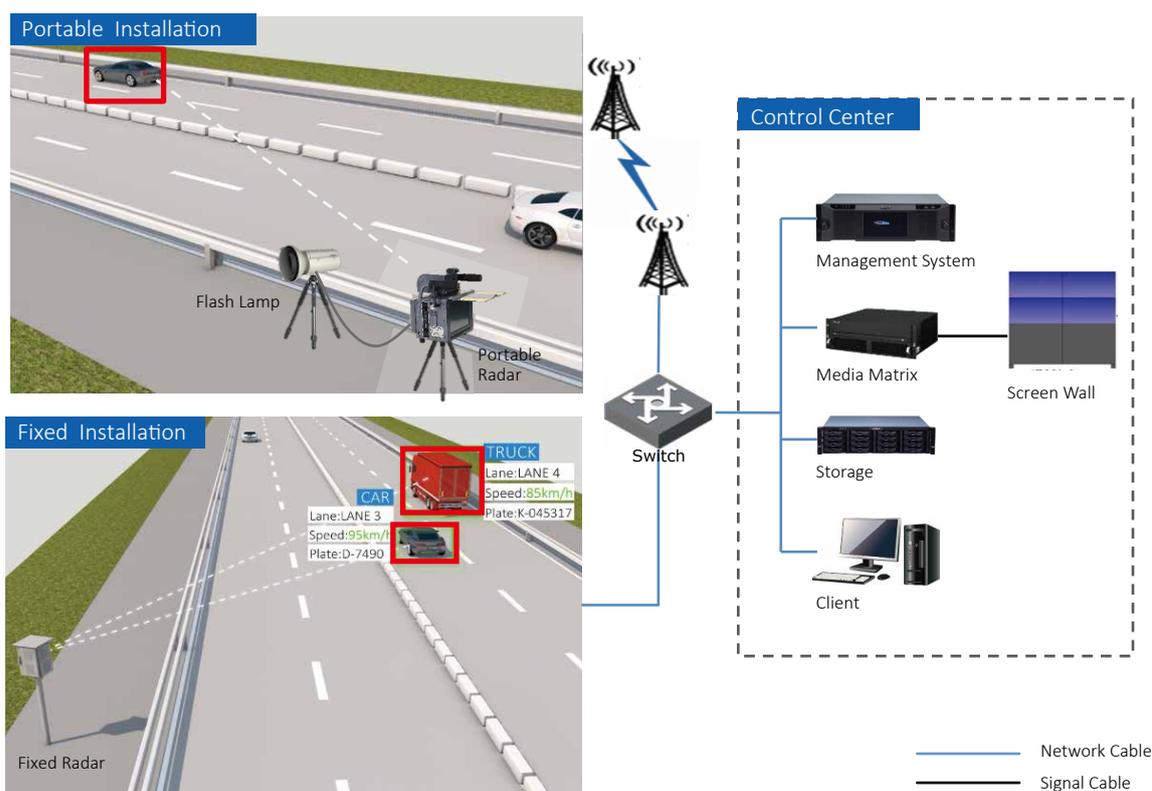
# SPEEDING DETECTION

## Background

Most governments all over the world prioritise the improvement of road safety. One of the available tools for influencing the behaviour of road-users is traffic enforcement – and in particular speed measurement.

There are currently several ways to measure speed- section speed enforcement and point speed enforcement. Section speed enforcement, in contrast to point speed enforcement (for example, radar boxes) , has the advantage of measuring speed on a longer road stretch, preventing abrupt speed reduction at certain points. Point speed enforcement has the advantage of increased mobility so that traffic police can move to different points whenever necessary.

## Point Speed Enforcement System



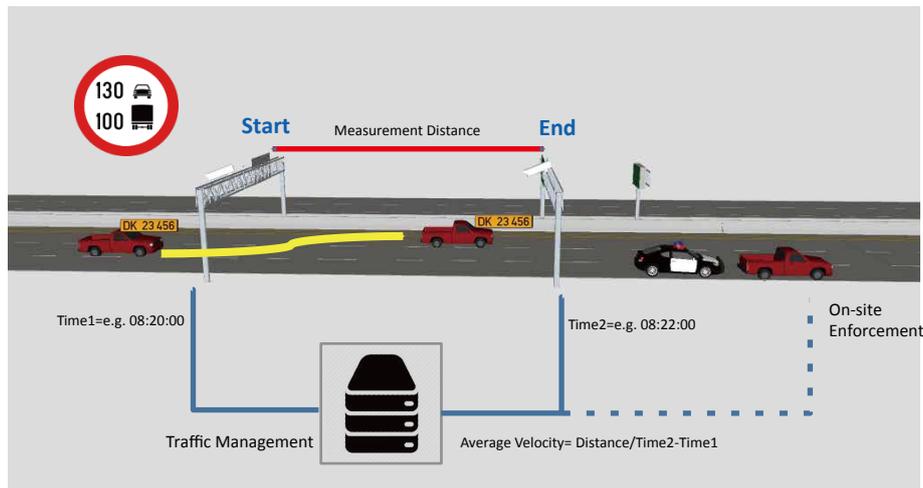
### • Solution Details

The Dahua Point Speed Enforcement solution can effectively help transportation authorities detect vehicles which break the speed limit in all types of weather conditions. The system features an all-in-one design which makes it easy to use and install. It consists of an 8MP CCD camera and multi-target tracking radar which provide an accurate instant speed measurement of each passing vehicle with high definition images. What's more, the IR flash lamp ensures excellent imaging capabilities even at night.

### • Features and Values

- Supports measurement of multiple vehicles in different lanes with high-precision 3D radar.
- In addition to speed, cameras can also capture details such as plate number, vehicle type, and lane number.
- High definition cameras can operate around-the-clock.
- Long battery life, touch panel, and compact design provide better on-site enforcement.
- Easy setup, instant deployment.
- Use wired / wireless(Wi-Fi, 3G, 4G) network to forward data back to control center.

## Section Speed Enforcement System



### • Solution Details

The Dahua ANPR camera captures the plate number and time at both the section start and end, and forwards this information to the DSS. The DSS then evaluates the average velocity of each passing vehicle. The margin of error of velocity detection diminishes as section length increases. The recommended distance of sections is 2-5km, of which accuracy reaches up to 99.8%. Multiple velocity limits can also be set for different types of vehicles.



### • Traffic Management Server Support

- Search and fuzzy search by plate/time/type of violations.
- Display plate/record time/processing pictures/linkage video.
- Average speed measurement/setting according to different vehicle type.

### • Features and Values

- 99.8% high accuracy of vehicle velocity.
- One camera covers 3 lanes , cost-effective.
- Avoid abrupt slowdown to escape from speed measurement.
- Reduces accident rates throughout entire section.

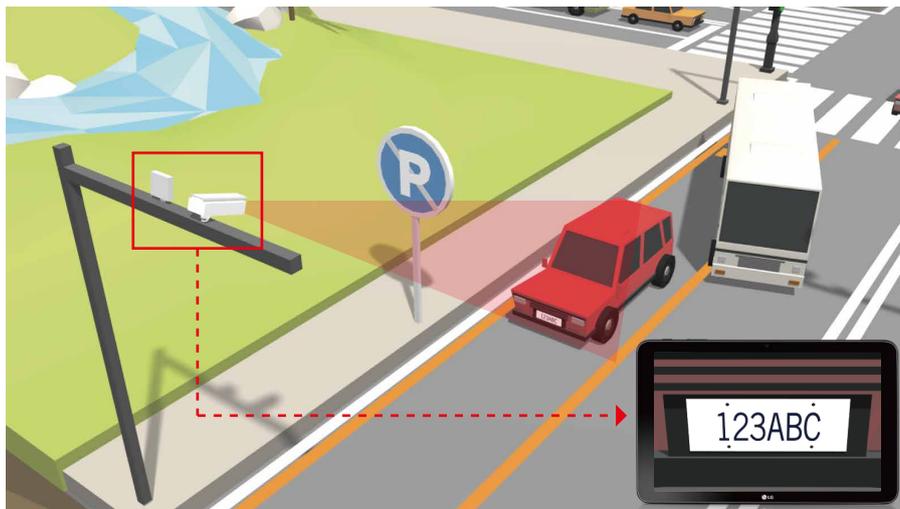


## BUS LANE ENFORCEMENT

### Background

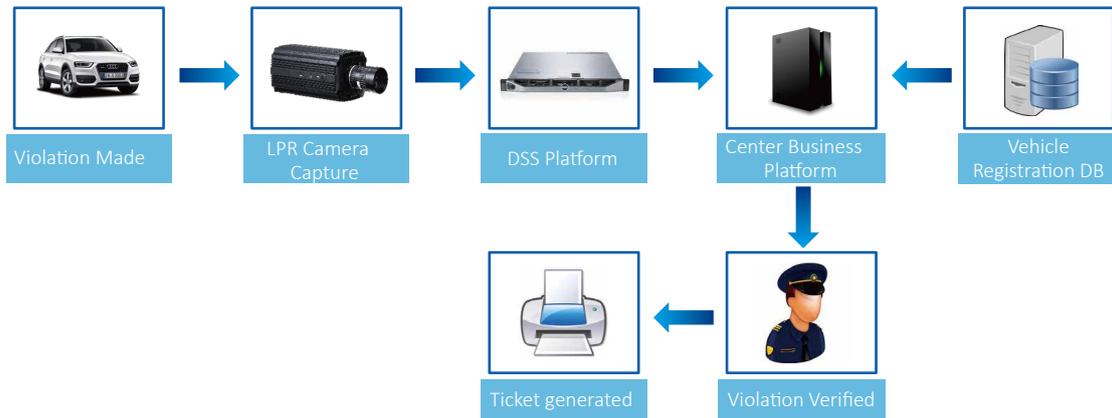
Millions of commuters, students, parents, and the elderly rely on bus transportation every day to get to where they need to be. Buses help to reduce traffic congestion and air pollution because they provide a more efficient way of moving people from one point to another. However, cars and trucks travelling and parking in bus lanes can reduce the efficiency of buses and create unnecessary congestion.

### System Overview



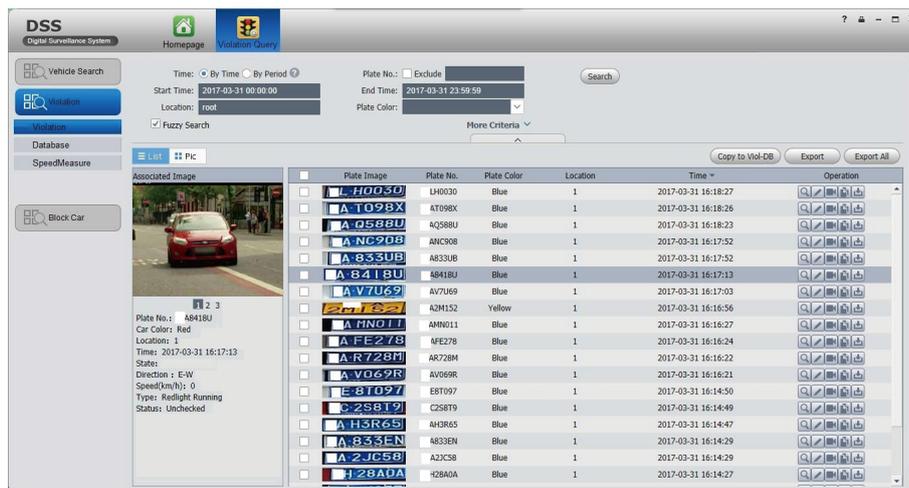
#### • Solution Details

This figure shows a camera with License Plate Recognition (LPR) enabled, capturing both the license plate number and a color snapshot of the vehicle crossing into the bus lane. The system then uploads the images to the DSS platform along with the vehicle plate number. The business platform then collects the vehicle list from the DSS and checks to see if they are on the list of permitted vehicles provided by the vehicle registration database (DB server). These records can then be verified and traffic tickets can be issued after verification and approval. The DSS can also sort vehicles by custom rules or plate color, if provided.



**Traffic Management Server Support:**

- Search and fuzzy search by plate/time/type of Vehicle.
- Show plate/record time/processing pictures/linkage video.
- Supports live monitoring.



**The Features and Values**

- Fully automated.
- Reduce traffic enforcement overhead costs.
- Speed up bus transit times.
- Video-based vehicle classification to monitor different vehicles. No Additional sensor is needed.
- Improve carbon emissions.

## PARKING VIOLATIONS

### Background

Illegal parking is the act of drivers parking their vehicles in an illegal or restricted area such as a fire zone, in crosswalks, on sidewalks, blocking a fire hydrant, and in some restricted zones.



Illegal parking hinders pedestrian

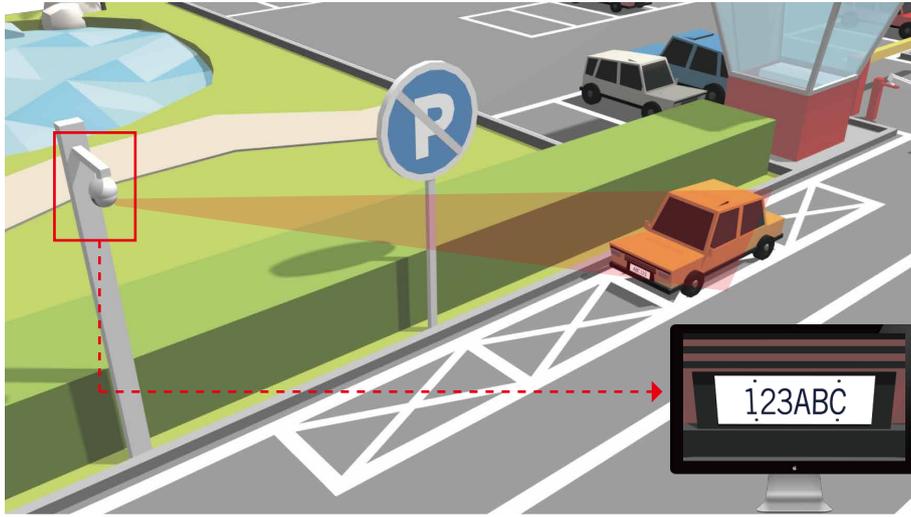


Traffic chaos caused by illegal parking



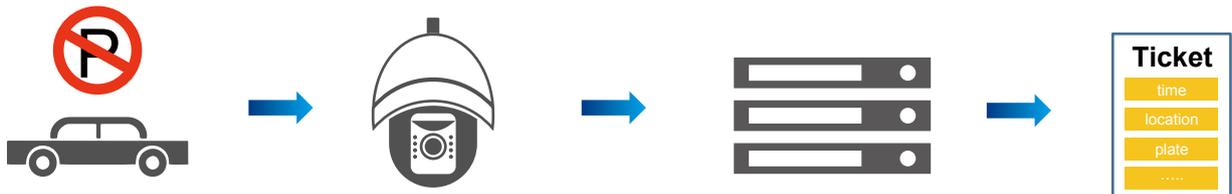
Illegally parked vehicle occupies bike lane

## System Overview



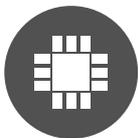
### • Solution Details

The Dahua Parking Enforcement solution is a system for detecting parking violations. It is used for simple and effective monitoring of parked cars in selected, precisely defined zones. It can effectively monitor areas where stopping or parking is prohibited, or areas with a limited parking time. Dahua devotes itself to safeguarding pedestrians, easing the burden on public transportation, and helping the disabled community.



The system can patrol streets and pre-defined areas to detect parking offenses. As soon as a vehicle is detected being stopped in or parking in a restricted area, a ticket is issued. The parking citation includes a set of proof materials, including pictures of the offending vehicle and those of the license plate automatically taken after the LPR has detected the number.

### • Features and Values



Embedded algorithms support ANPR. Automatically captures illegally parked vehicles.



Protects the right of way for pedestrians and bicyclists.



Lessens burden on police force, maximizing resources and reducing costs.



Video surveillance evidence ensures violators will be fairly fined.



Decreases traffic congestion. Keeps roads safe and efficient.

## PRODUCTS

### All-in-One LPR Camera



- All-in-One camera, built-in HD camera, heater, lamp, easy to install
- High performance CCD image sensor, high color reduction degree, high sensitivity
- Embedded integrated component design. Variety of built-in algorithms
- Rich variety of signal, data and communication interface

### Speed Measuring System



- 8M CCD image sensor and 3D wide beam radar
- Supports lane recognition and distance measurement
- Multi-target tracking up to 60 objects simultaneously
- Supports violation detection and LPR
- Supports GPS and 3G/4G wireless transmission

### Parking Detection Dome



- Innovative computer algorithms provide auto positioning and tracking of illegally parked vehicles, adjusting focal length to preserve a clear image
- Starlight technology, powerful 30x optical zoom
- Supports Hi-PoE, built-in infrared lamp ,IR distance up to 200m, IP67, IK10

### Signal Detector



- Connects up to 16 red light signal channels
- Supports red light detection mode and green light detection mode switch
- Live upload of signal status data

### Edge Storage



- 12 channel HD IP camera input, 4 channel analog camera input
- Supports image combining
- Supports video and snapshot synchronization
- Heat dissipation without mechanical fan, working environment: -30°C~+70°C

### Strobe Lamp



- Features imported high brightness LED
- Strobe generates a flash when vehicle passes in normal conditions
- Suitable for capturing both non-reflective and reflective license plates

## PRODUCTS

### Flash lamp



- High performance Xenon flash lamp
- Light Spot Range: 12m
- 80ms recharging time, support 2 continuous snapshots

### Management Platform



- Integrated design, lower combined cost
- Simple deployment, one-touch upgrade
- Safe and stable, highly reliable. Highly open, good compatibility
- High scalability, grouped applications, easy expansion
- Abundant applications, high starting point of creation
- Firm performance, high value

### Radar Detector



- Adopts flat micro beam array antenna design
- Speed measuring accuracy: -2km/h to +2km/h
- Quick response time guarantees high capture rate and real-time features
- Advanced real-time radar signal processing technology

### Loop Detector



- Capture rate:  $\geq 99.9\%$
- Vehicle detector supports auto-tuning
- Response time: 20ms
- Supports 6 coil simultaneous detection

## PRODUCT OVERVIEW

Product	Vehicle Proceeding Through Red Light	Speeding Detection	Bus Lane Enforcement	Parking Violations
ITC206-RU1A-(IR)HL ITC302-RU1A-(IR)HL(F) ITC602-RU1A-(IR)HL(F) 	●	●	●	
HWS800A 		●		
SD6AE830V-HNI SD6AE240V-HNI SD6AE530U-HNI 				●
ITASD-016RA 	●			
ITSE0400-GN5A-B ITSE0804-GN5B-D 	●	●	●	●
ITALE-060AA-P ITALE-080BA-IR7-P ITALE-080BA-IR8-P 	●	●	●	
ITALF-300AC-(IR) 		●	●	
DSS4004 DSS7016DR 	●	●	●	●

# SUCCESS STORIES



## Mongolia ITS system

### Background

- The capital of Mongolia, Political Center
- 3 million inhabitants, ≥400,000 vehicles

### Dahua Achievements

Completed project in 3 months:

- Solution design→Product selection→Delivery
- 28 traffic roads for ANPR system, 8 junction for E-police system, 2 mobile speed measurement systems, 15 high spot PTZ surveillance sites



## Poland Tristar Project

### Background

Tristar is a traffic management project which was implemented 3 cities: Gdansk, Gdynia, and Sopot. Dahua provided systems for each city, including traffic cameras, IR lamps, signal detectors, vehicle detectors, and a management center.

### Dahua Achievements

- 2 integrated management centers
- 350 sets red light enforcement system
- 230 sets speed enforcement system
- 610 CCTV cameras.



## Serbia ITS Project

### Background

The Serbia red-light enforcement project overcame various challenges which arose from advanced requirements such as having color images without white light pollution. Dahua successfully constructed the first stage of the project, in which the end-user was highly satisfied.

### Dahua Achievements

- Up to 95% vehicles license plate recognition rate, tickets automatically generated
- Color images with no white light pollution
- High spot monitoring with speed domes
- Live alert system integrated with emergency phone tower



## Laos ITS Project

### Background

On September 6th, 28th, and 29th, 2016, the ASEAN Summit was held in Vientiane, Laos, attracting the attention of global media outlets.

On September 5th, the leaders of ASEAN countries arrived in Laos. News outlets commented on the presence of Dahua cameras, stating "There has been a familiar figure- Dahua ITS capture cameras fixed above important areas around the airport, adding security for leaders as they are escorted."

### Dahua Achievements

- Replace old solution
- Two weeks to acceptance
- Recognize suspicious license plates
- 5 sets of ANPR and 1 central E-police system

\* Design and specifications are subject to change without notice.

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