

INTELLIGENT TRAFFIC SYSTEM SOLUTION

- Safety Enhancing
- Reduces Labor Costs
- Efficient



Traffic Enforcement

- ANPR
- Fully-automated



Traffic Status Display

- Estimated travel time
- Diversified



Traffic Signal Control

- Video traffic data analysis
- Adaptive control

INTELLIGENT TRAFFIC SYSTEM SOLUTION

Intelligent Traffic Systems (ITS) is the application of computer, electronics, and communication technologies and management strategies in an integrated manner to provide traveler information to increase the safety and efficiency of transportation systems. The system consists of traffic violation enforcement, road traffic flow monitoring, and traffic signal control systems.

The Typical ITS Solution Includes:



Red Light Enforcement



Speeding Detection



Bus Lane Enforcement



Parking Violations



Real-Time Traffic Status Display



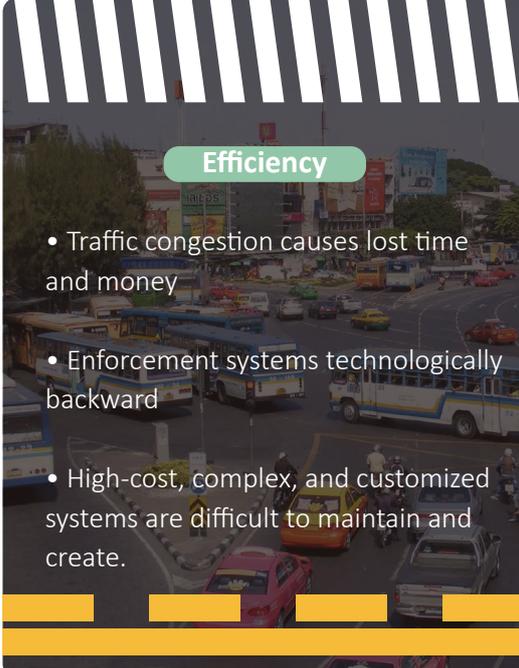
Traffic Signal Control

CHALLENGES



Security

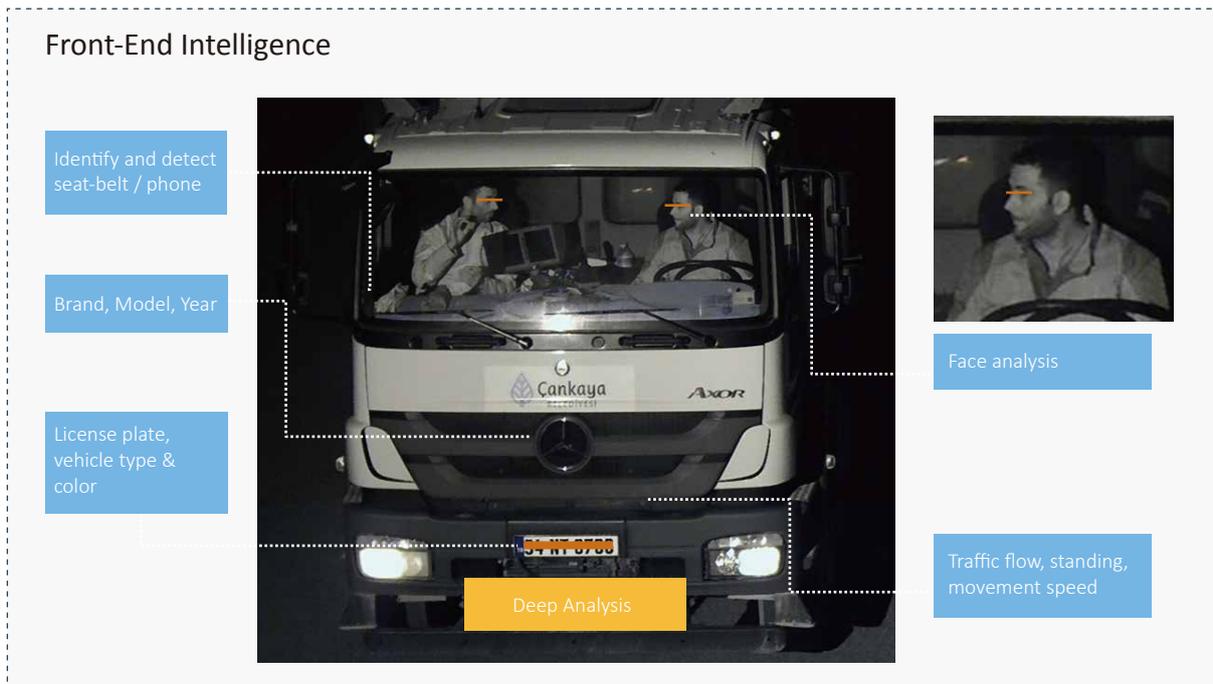
- Traffic accidents have increased with the rapid growth in drivers and cars
- Number of serious injuries and fatalities from accidents grows annually
- Lack of evidence to enforce traffic violations



Efficiency

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

KEY TECHNOLOGY



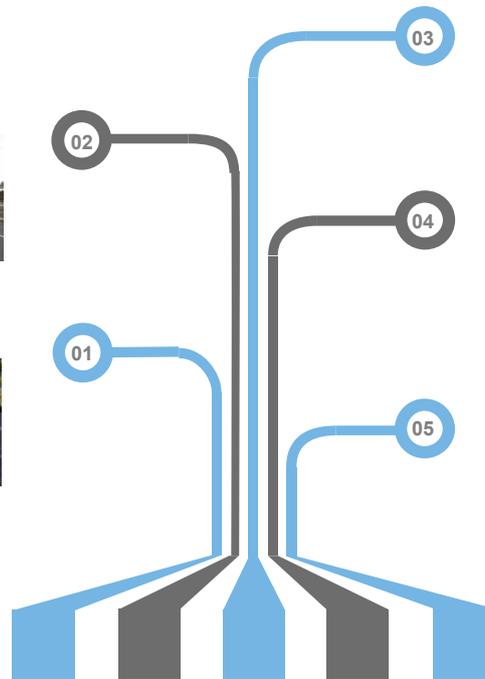
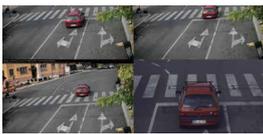
Each Dahua ITS camera acts as a state-of-the-art brain, continuously collecting traffic data and transforming it into structured data to be stored in the back-end management platform. This data can then be analyzed to paint a detailed data picture of city traffic trends.

Based on advanced intelligent algorithms, Dahua ITS cameras can identify and process a variety of driving behaviors and record driving data.

Speeding



Running Red Lights



Driving in Bus Lanes



Parking Violations



Traffic Status Monitoring



SOLUTIONS



Safety Enhancing

Reduce traffic accidents by building up driver awareness of traffic regulations through efficient violation detection and enforcement.

Reduces Labor Costs

Advanced technologies such as LPR and fuzzy search reduce manpower demands on the police force while increasing enforcement efficiency.

Efficient

Significantly improves traveler safety and comfort, delivering substantial social and economic benefits through saving energy and protecting the environment.

OVERVIEW

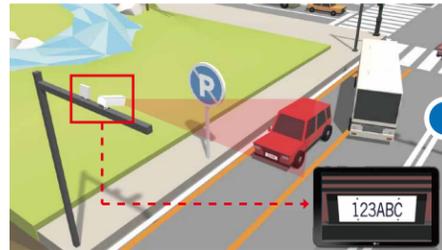
• Red Light Enforcement



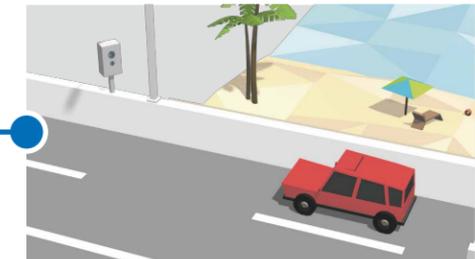
• Traffic Signal Control



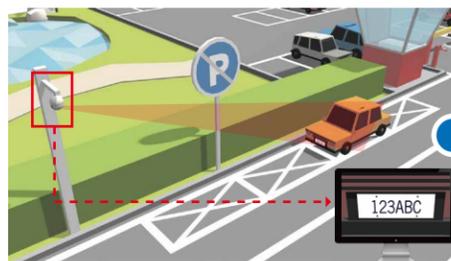
• Bus Lane Enforcement



• Point Speed Enforcement



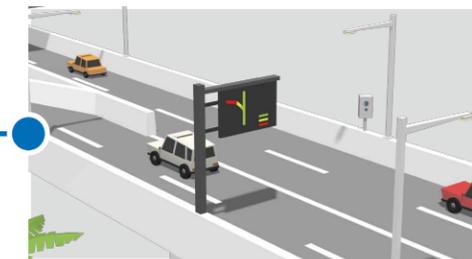
• Parking Violations



• Section Speed Enforcement



• Real Time Traffic Status Display

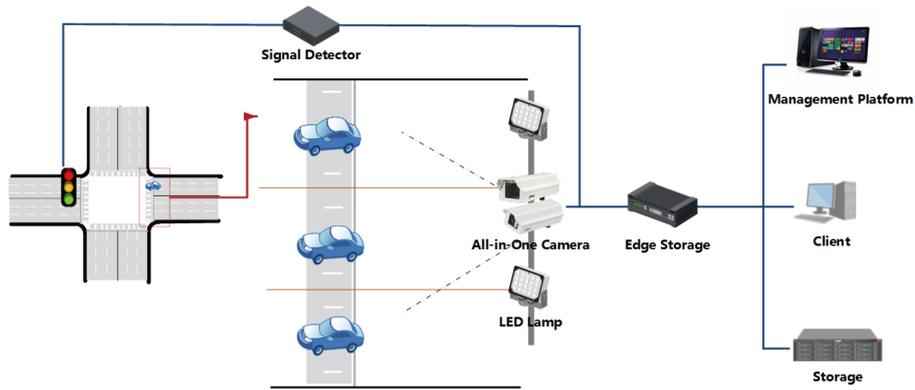


RED LIGHT ENFORCEMENT

Background

Safe public transportation is a global concern, especially in responding 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 safer and more secure roads 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 Benefits

>> 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 the software interface for the red light enforcement system. It features a main video stream on the left and a detailed view of a violation on the right. The detailed view includes a license plate recognition box showing 'RLM60' and a table of captured events.

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	RLM607	White	Black	No Speed	Unknown	Unknown
82	ANPR	2015-09-09 10:51:04	1	BYE626	White	White	No Speed	Unknown	Unknown
81	ANPR	2015-09-09 10:51:03	2	SAR468	White	Green	No Speed	Unknown	Unknown
80	ANPR	2015-09-09 10:51:02	1	BWG264	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.

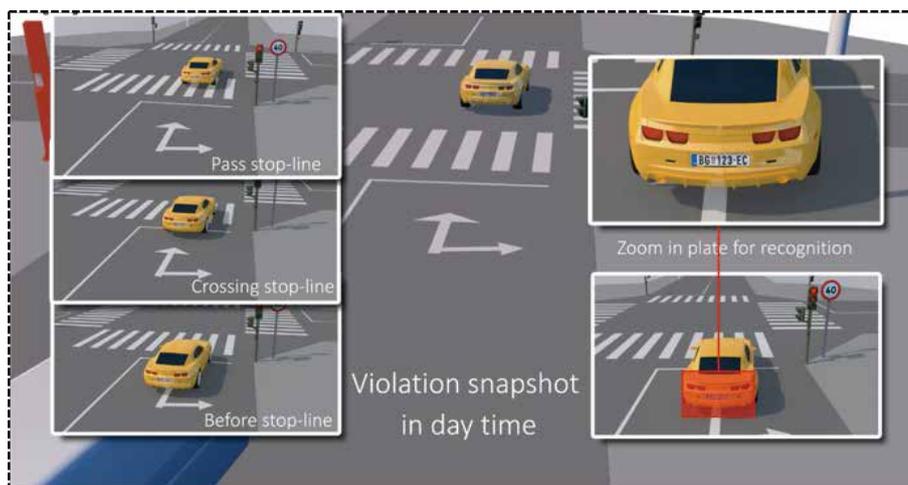
>> **Advanced LPR Camera**

6.8MP high definition LPR camera captures more details.

Cover 3 lanes with only one camera.

>> **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/image thumbnails/linked video.
- Supports real time monitoring.
- Supports block car alarm.

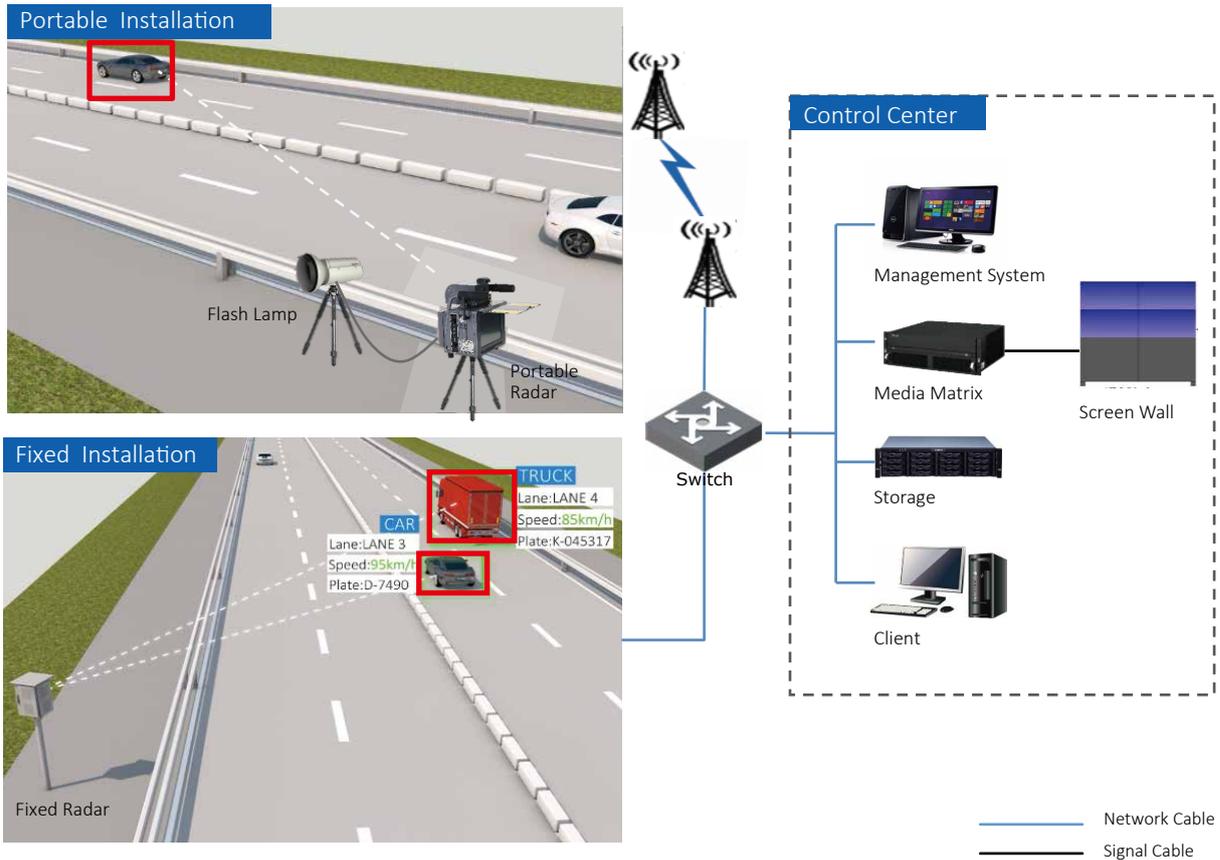
SPEEDING DETECTION

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



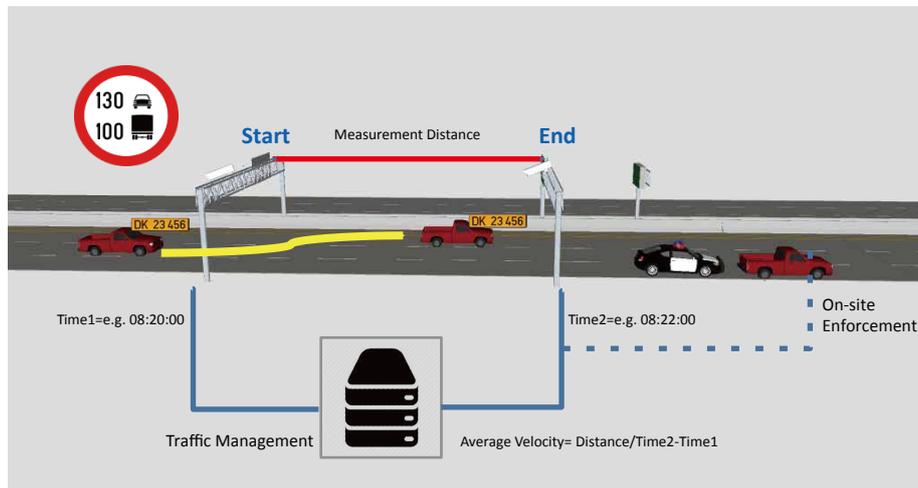
• Solution Details

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 Benefits

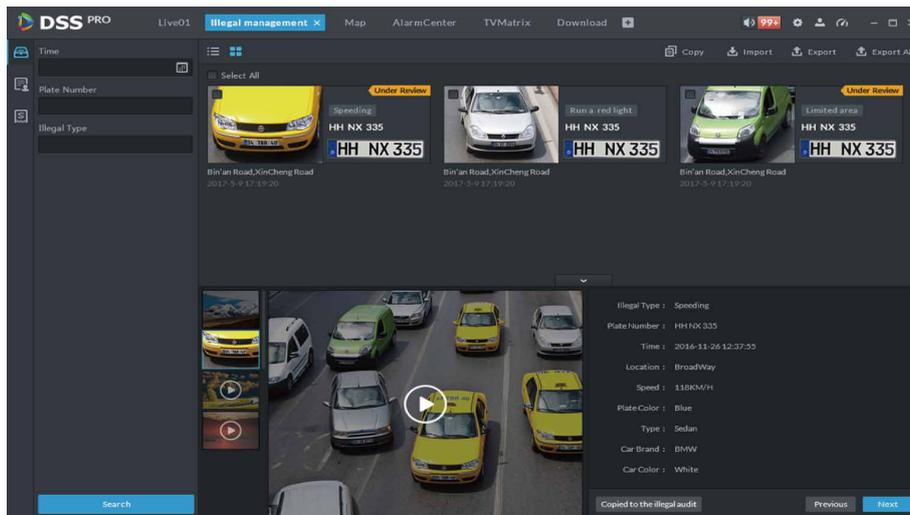
- Supports measurement of multiple vehicles in different lanes with high-precision 3D radar.
- In addition to speed, cameras can also capture details such as plate number, vehicle type, and lane number.
- High definition cameras can operate around-the-clock.
- Long battery life, touch panel, and compact design provide better on-site enforcement.
- Easy setup, instant deployment.
- Uses 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/image thumbnails/linked video.
- Average speed measurement/setting according to different vehicle type.

• Features and Benefits

- 99.8% velocity measurement accuracy.
- One camera covers 3 lanes, cost-effective.
- Avoids abrupt braking to evade speed measurement.
- Reduces accident rates throughout entire section.

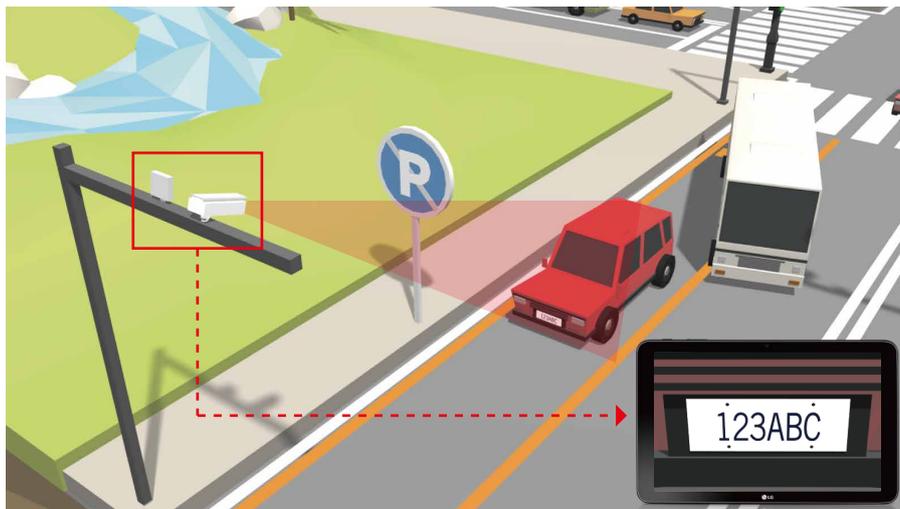


BUS LANE ENFORCEMENT

Background

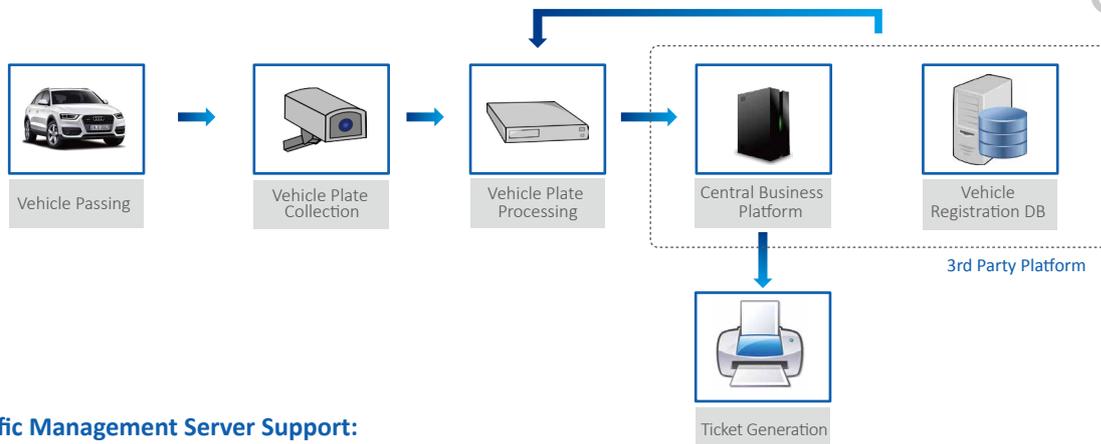
Millions of commuters, students, parents, and the elderly rely on bus transportation every day to get to where they need to be. Buses help reduce traffic congestion and air pollution because they provide a more efficient way of moving people from one point to another. However, cars and trucks travelling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

System Overview



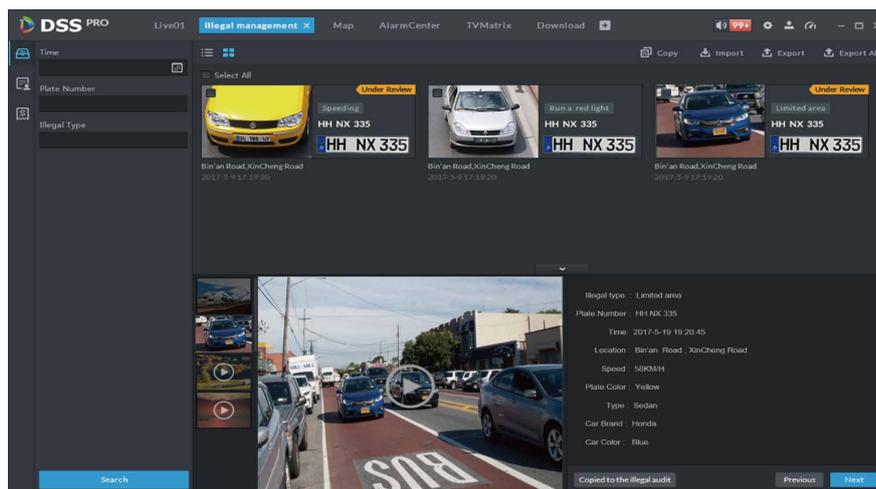
• Solution Details

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.



Features and Benefits

- Fully automated.
- Reduces traffic enforcement overhead costs.
- Speeds up bus transit times.
- Video-based vehicle classification to monitor different vehicles. No Additional sensor is needed.
- Improves 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

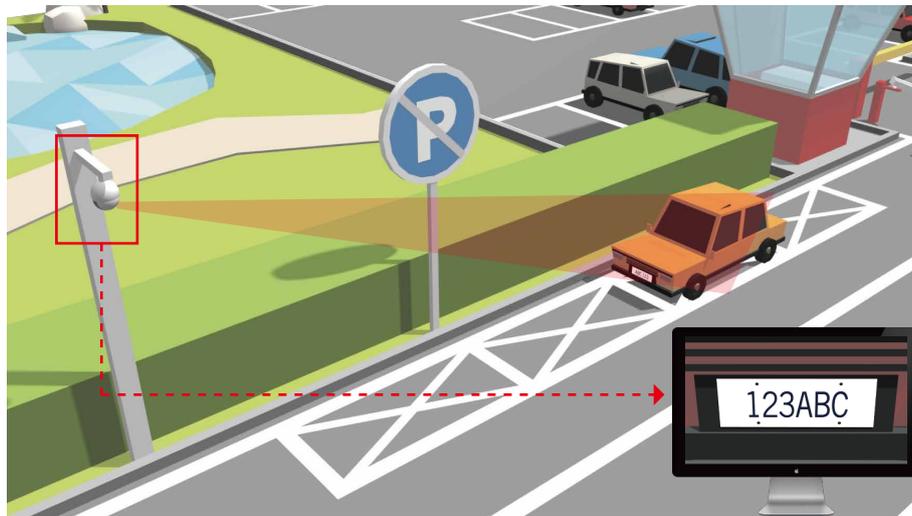


Traffic chaos caused by illegal parking



Illegally parked vehicle occupies bike lane

System Overview



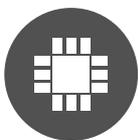
• Solution Details

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 Benefits



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.

REAL TIME TRAFFIC STATUS DISPLAY

Background

Millions of people deal with traffic congestion on a daily basis. The roadways leading into and out of most major cities can become gridlocked due to accidents, road construction, or simply a high number of cars on the road.

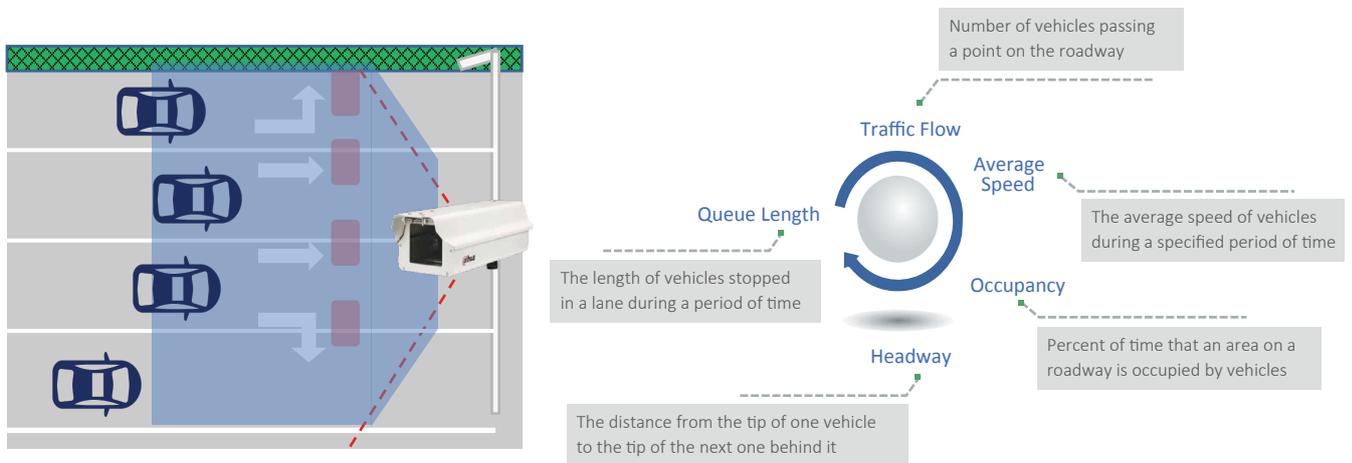
System Overview



• Solution Details

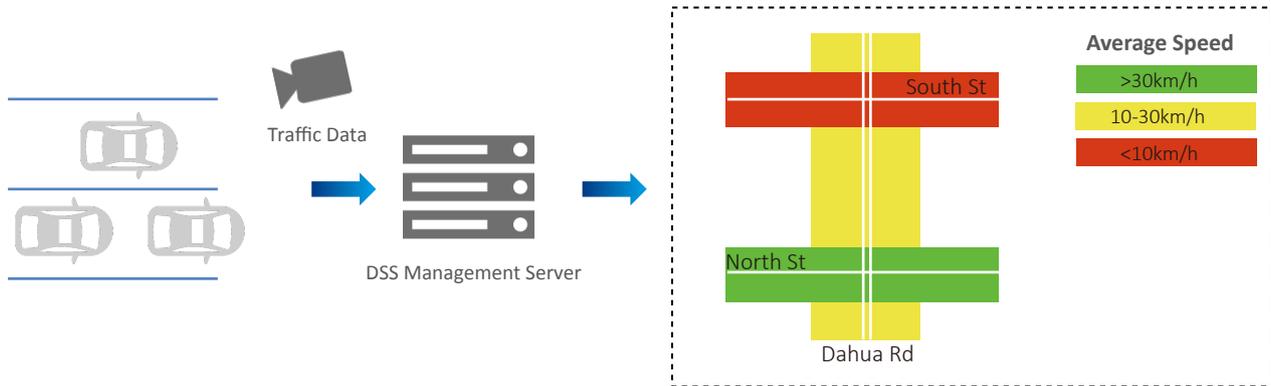
>> Traffic Data Collection

Traffic data is collected by traffic flow cameras using non-intrusive virtual loops where detection is done through advanced computer algorithms and does not involve any road work as in the case of an inductive loop. It can cover 1-4 lanes at a time, and has a 99% detection accuracy at speeds below 80km/h.



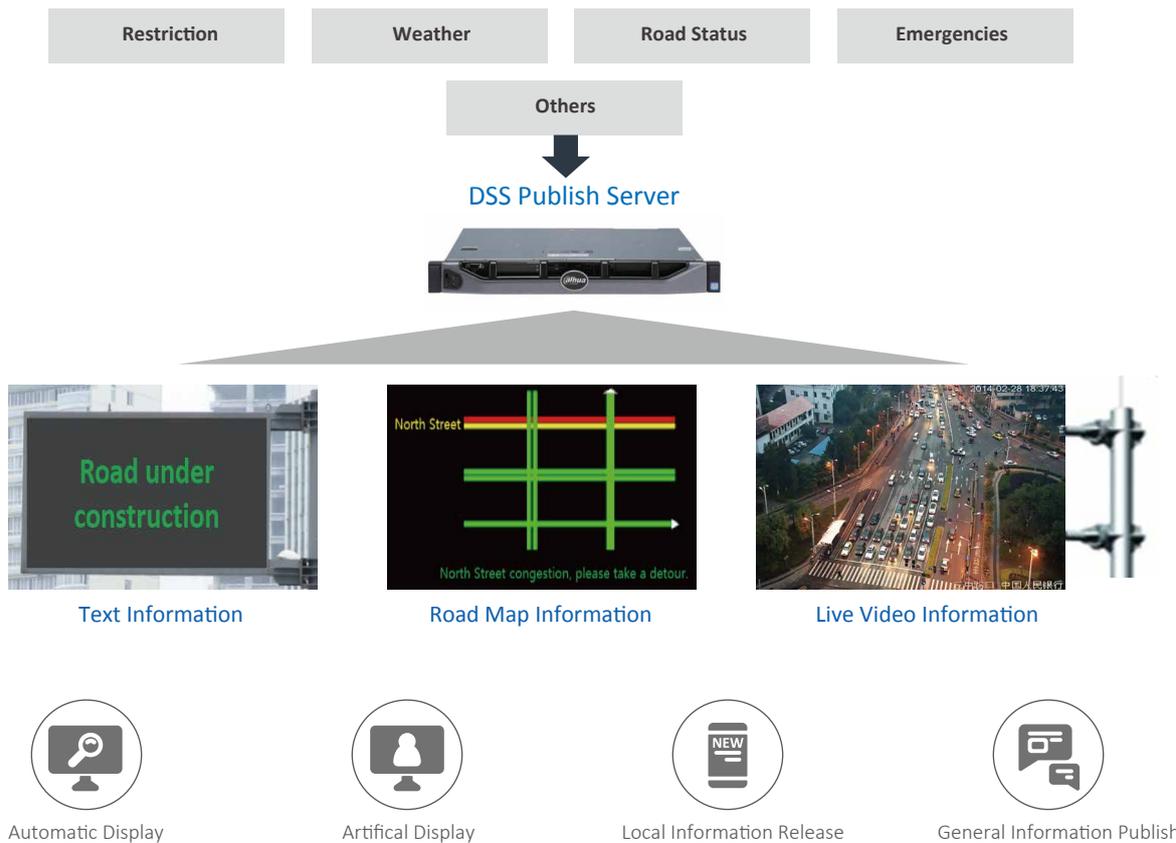
>> Traffic Data Processing

An advanced traffic flow information analysis algorithm gets and analyzes a city's traffic conditions in real time and displays results on special road signs in colors of red, yellow, and green to represent the speed of traffic flow. It serves as a guide to help drivers select the best travel route, easing overall traffic congestion.



>> Information Dissemination

Another core system function is information dissemination, which can also help guide traffic with these additional information types:



• Feature and Benefits

- Works for both highways and surface streets.
- Cameras provide accurate data in real-time.
- Collects data for transit authorities.
- Improves road safety by avoiding incidents and reducing accidents on the road.

TRAFFIC SIGNAL CONTROL

Background

Many signal controllers are unable to automatically adjust signal timing based on real-time traffic flows, which could lead to long traffic queues during rush hour, requiring more police resources to direct traffic.

System Overview



The Dahua VACS Solution is a system that can extend traffic light intervals according to the detected vehicle queue length of road intersections. It adopts a traffic flow camera to detect information such as traffic flow, headway, average speed, occupancy, and queue length. It effectively improves traffic conditions by adjusting to make traffic clear faster. In addition, the system works independently and does not require a central software platform.

• Solution Details

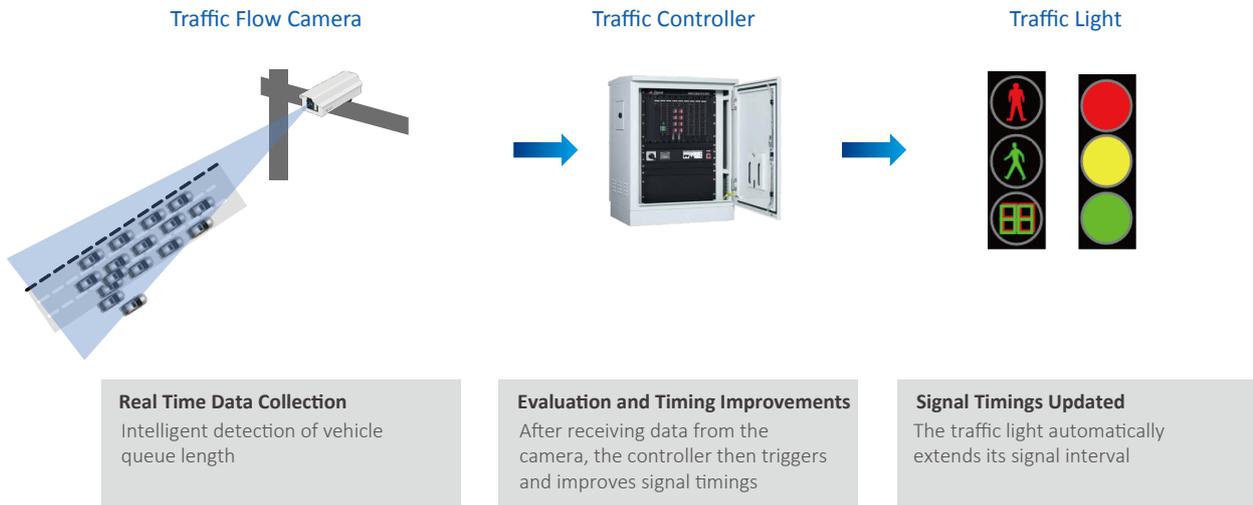
>> Traffic Data Collection

The collection of traffic data helps better manage traffic signals and provide for more efficient signal adjustments based on real traffic data. Traffic authorities can use real-time data to better understand current road conditions and enhance dynamic green light management, which can greatly reduce vehicle idle times. In the morning and evening rush hours, signal times can be adjusted according to actual conditions to provide more time for vehicles on busier roads.



>> Adaptive Signal Control

The traffic flow camera detects vehicles in pre-defined lanes and sends the length of vehicle queues to the controller through an Ethernet connection. The controller then triggers and automatically improves signal timings.



• Features and Benefits

Interconnecting previously uncoordinated or pre-timed signals and providing newly optimized timing plans and a central master control system can result in travel time reductions of 10-20 percent.

- Reduces number of stops.
- Reduces travel times.
- Lowers fuel consumption.
- Lowers costs.

PRODUCT SHOWCASE

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

Flash lamp



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

PRODUCT SHOWCASE

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

Management Platform



- Supported on Windows
- Safe and stable, highly reliable. Highly open, good compatibility
- High expansibility, grouped application, easy expansion
- Stable performance, high value

Traffic Controller



- Supports max 16 vehicle and pedestrian presets
- Controls 44 traffic signals
- Supports 32 vehicle detection presets
- Emergency manual control

Traffic Flow Camera



- Supported on Windows
- All-in-One design, including housing and power supply
- 230MP, HD resolution: 1920(H) x 1200(V)
- P-Iris automatic control
- Embedded modular design includes a variety of traffic counting algorithms such as vehicle type recognition, traffic flow, headway, occupancy, and road status.

Traffic Guidance LED



- The display module can be customized to fit any size and display any color.
- Double housing structure ensures even airflow to normalize temperatures.
- Module casing uses advanced soft silica gel which ensures reliable long-term use.
- Wide operating temperature range guarantees reliable functionality in high or low temperature environments.

PRODUCT OVERVIEW

Product	Red Light Enforcement	Speeding Detection	Bus Lane Enforcement	Parking Violations	Real Time Traffic Status Display	Traffic Signal Control
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) 		●	●			
DSS-Pro 	●	●	●	●	●	
DH-ITSC-044A 						●
ITC235-TU1A 					●	●
PHTA10 					●	

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 in 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% vehicle 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

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



QUALITY BY DESIGN

* Design and specifications are subject to change without notice.

Intelligent Traffic System Solution - 02, Aug 2017



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