

## THE EYES HAVE IT

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*More cost effective, accurate and reliable than ever before, video detection is outperforming in-ground inductive loops and other above-ground technologies in a whole host of applications and environmental conditions*

The forte of video detection systems is in their capability to see wide areas and process those views for a variety of applications, such as urban traffic monitoring, highway management, bridge and tunnel safety, incident detection, and long-term roadway planning. As well as improving the efficiency of traffic flows, they are also being used for safety and security reasons. A beneficial side-effect of this is reduced pollution and reduced waste of fuel.

### Urban Traffic Control

The acceptance and growth in the use of video vehicle detection for urban traffic control applications in North America has continued for over a decade. Similarly, in recent years acceptance and deployment continue to grow in Europe, Asia and the Middle East. Vehicle detection systems are being used not only for demand actuation at signalized intersections, but also increasingly to provide traffic data for travel time display and for road planning.

In Greece, as part of a large-scale effort to upgrade roads and traffic management, the Ministry of Public Works in Athens first installed a state-of-the-art system in 2004 to coordinate traffic signals to lessen congestion during and since the summer Olympics. The central software of the traffic management system is called SITRAFFIC CONCERT. Feeding this system is traffic information from 75 Autoscope cameras installed around the city, supplied by ATS Traffic Systems. As shown in Figure 1, the cameras relay critical data on vehicle speeds, counts, and classifications, as well as detecting stopped and wrong-way vehicles, incidents and queues.



Figure 1: Autoscope camera installation in Athens, Greece

In the USA, video detection systems are playing a key role in the rebuilding of urban areas of the Gulf Coast region devastated by hurricanes in 2005. Econolite Control Products, Inc – the North American partner of

Image Sensing Systems (ISS) and supplier of traffic control and video detection systems - worked with its customers to replace destroyed systems and install new ones to manage urban traffic flows. Moving traffic efficiently is an essential part of restoring the economic vitality of cities that were severely damaged.

The City of Baton Rouge and the Parish of East Baton Rouge reached a milestone in May 2006 with their traffic system and the installation of their 500th video detection device in the wake of Hurricanes Katrina and Rita. These Autoscope Solo® Pro systems are being used to sense traffic waiting to pass each intersection and simultaneously collect traffic volume, occupancy and speed data per lane to respond effectively to the increased traffic demand at over 163 intersections. The systems continue to be deployed at all new and existing signals as and when the in-ground vehicle detection loops malfunction.

According to Ingolf Partenheimer, chief traffic engineer, city of Baton Rouge—parish of East Baton Rouge, “by installing a reliable detection system, we have seen a tremendous drop in detector-related complaints and we have received quite a few positive responses from the motoring public.

“As a bonus,” Partenheimer adds, “we quickly collect traffic data to help our engineers change timing plans for the increased traffic we are experiencing since Katrina and Rita. In response to the hurricanes and the additional traffic generated, we conducted 278 timing changes throughout the city parish in two weeks. We plan to add more cameras in the next two years and automate the data collection process into a real-time system, viewable to the public. Given the increased traffic 52 percent in some areas and 42 percent in others, it was truly a dramatic, virtually overnight event.”

## Highways Monitoring

In 2005, video detection systems played a key role in monitoring hurricane evacuations in Louisiana as well. Illustrated in Figure 2 is a Louisiana DOTD traffic data collection and management web site showing westbound traffic evacuating on I-10 prior to the arrival of Katrina. Operations personnel were able to monitor evacuation video and traffic flow data directly via the internet in real time from anywhere, not just regional TMCs.

The screenshot shows a web interface for the New Orleans Regional Planning Commission (RPC) Traffic Data Collection and Management Program. The header includes the RPC logo and the Louisiana Department of Transportation and Development (DOTD) logo. The main navigation bar contains links for 'Admin', 'Live Video', 'Live Data', and 'Reports'. The central content area displays two side-by-side traffic video images from I-10 at Loyola, labeled 'Looking East' and 'Looking West'. The left sidebar contains a 'Log off' button and the site's name: 'New Orleans Regional Planning Commission Traffic Data Collection and Management Program in conjunction with the LA DOTD.'

Figure 2: Hurricane Katrina evacuation traffic

When new highways are built and intersect with older roads, traffic congestion often results. The A75, connecting Paris and Barcelona, for instance, makes for a good case. The last section to be completed - between the Massif Central and the Mediterranean - passes through rugged terrain, marked by steep, narrow valleys. During construction, long queues formed when traffic from older roads backed up on newly opened sections of the highway. The absence of telephone and power lines along the highway further complicated matters.



Figure 3: Wireless queue detection France.

The solution was wireless video queue detection, installed by Autoscope distributor Magsys SA. The installation included CCTV cameras, a battery-powered Autoscope RackVision™ processor, and a generator to recharge the battery (as shown in Figure 3). The Autoscope system detects queues as they are forming and relays that information to a traffic information center, which can then inform motorists by VMS of the congestion many kilometers ahead.

South Korea has become a world leader in the deployment of video detection on highways. Following a series of ITS long-range plans, authorities have steadily deployed systems on the highways and ring roads in the municipality of Seoul, as well as on the rural highways and

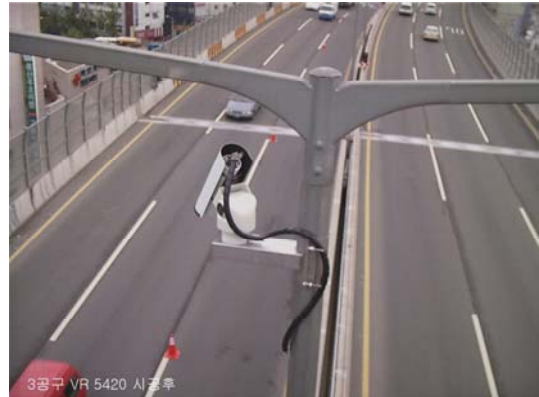


Figure 4: South Korean highway installation.

tollways. Through its Korean distributor, Flow Traffic Ltd, over 400 systems have been installed year-to-date. Continued video detection deployment, similar to that shown in Figure 4, demonstrates South Korea's commitment to ITS for moving traffic efficiently.

## Tunnel Incident Management

Video detection has arguably become the *de facto* standard for traffic monitoring and detection of incidents for safety in tunnels. Incidents can be detected within seconds of their occurrence, with tunnel operators automatically informed and able to respond quickly and work to prevent secondary incidents. Incidents such as stopped, slow or vehicles facing the wrong way, pedestrians and debris, must be detected and video recorded automatically for later review. Advance products, such as the Autoscope system are also able to detect the onset of smoke as a result of fires.

Autoscope systems are now deployed in over 50 tunnels worldwide. These systems regularly detect serious incidents. For example, in Scotland's Clyde Tunnel, the Autoscope detected and recorded a car colliding with a bus. The incident detection system automatically recorded video of the accident and notified the tunnel control staff, who promptly dispatched emergency personnel. The tunnel incident management system was provided by Techmiracle, who supplied 18 Autoscope Solo Pro cameras, nine in each tube. The video and data are linked to a SCADA (Supervisory Control and Data Acquisition) system for incident management, as well as to a digital video recorder system.

## Bridge Applications

The longest bridge in the Middle East spans the Suez Canal and connects the Sinai Peninsula with the rest of Egypt, as shown in Figure 5. Security and efficient movement of vehicles across the four-lane structure were top priorities for the government authorities, who saw the bridge's potential for increasing economic activity in the area.

The project's Egyptian systems integrator selected the Autoscope video vehicle detection system: 14 camera systems were installed on the bridge, which automatically detect stopped vehicles, queues and measure traffic speed. So, when entering traffic forms a long queue, for example, the Autoscope systems transmit an alarm to the bridge control staff, who can then close the entrance



Figure 5: Suez Canal bridge deployment

temporarily, and also send the information to motorists by VMS to alert them about the delay.

In addition to enabling real-time traffic management, the Autoscope systems also provide surveillance capabilities and collect traffic data for long-term planning. The data available comprise traffic volumes and speeds, time occupancy, vehicle time headways, vehicle classifications, and incident or event statistics.

## Safety and Security

The world can be a dangerous place in small and large ways, as the news headlines constantly remind us. So it is no surprise that traffic management systems have been recruited to help ensure safety and security, which is why Autoscope systems are increasingly being used in applications focused on these particular fields. These include identifying pedestrians and stopped vehicles in prohibited areas, oversized vehicles exceeding safe speeds, vehicles going the wrong way, and debris or suspicious objects on the roadway.

If you are looking for the an above-ground vehicle detection system for your traffic management system that provides the advantages described, then video detection could be the perfect solution. In fact, it is the *only* detection technology that can provide all of these functions and benefits. Moreover, video detection is now more cost effective, accurate and reliable than ever before, outperforming in-ground detection technologies in all manner of weather and light conditions.

### The Advantages of Video Vehicle Detection

There are many advantages of employing above-ground video detection systems:

- Non-intrusive, above ground detection that eliminates saw-cuts in the roadway and minimizes road closures
- Offers the widest array of traffic data, alarms, and video images for a wide range of applications
- Interfaces with a wide variety of roadside traffic equipment and communications systems
- Easy installation and maintenance possible during all 12 months of the year in all locations.
- Choice of integrated processors/cameras for optimal processing, road-side cabinet processing or central system processing,
- Proven high detection accuracy and low false alarm rates with fail-safe detector outputs
- Open architecture for easy integration into new or existing traffic management systems.

### Table 2: Product Description

The Autoscope range is wide and varied and includes:

- **Autoscope Solo® Pro** - Integrated robust colour camera with powerful video image processor in a compact, weather-proof enclosure;
- **Autoscope® RackVision™** - Single-camera processor system in two formats: a 3U by 160mm card and a card for detector card racks;
- **Autoscope® RackVision™ System—4** - Multi-camera processor system with up to four RackVision cards;
- **Autoscope® RackVision™ System—16** - Multi-camera detection solution with up to 16 RackVision cards;
- **Autoscope® RackVision™ System 1** - Compact, standalone, shelf-mount, single-camera processor system;
- **Autoscope® Atlas™** - A 3U x 160mm processor card for stopline vehicle presence detection at junctions;
- **Autoscope® 2020™** - A four-camera processor for North America.