# A Better Watchman for Trucking: IP Video Surveillance

A guide for freight companies, distribution centers, and container lots on the advantages of IP video surveillance.

milestone

# Table Of Contents

# Introduction

The trucking and freight distribution industry face some of the hardest security challenges. As distribution centers and container parks grow and the number of incoming and outgoing trucks increases, so do the opportunities for theft, fraud, injury, and costly inefficiencies. Modern container parks are a good example of the security nightmare that comes from acres of containers and drivers coming and going at all hours of the day and night.

Video surveillance systems play a vital role in container park, distribution center and warehouse security programs. Cameras help deter crime by signaling to perpetrators that they're being watched and evidence is being collected against them.

Today, older analog (CCTV) video surveillance systems are being replaced by IP (networked) video surveillance systems. These combine IP video surveillance management software and IP network cameras to deliver astonishing new benefits and capabilities to video surveillance — everything from centralized management and superior scalability to higher image quality and greater automation.

Through IP networking, IP video surveillance also opens up new ways integrate with other security systems and devices, as well as leverage video surveillance for other applications, such as monitoring to improve operational efficiency. Best of all, IP video surveillance provides a proven way to simultaneously improve security and reduce security costs.

This paper discusses the advantages of IP video surveillance and its benefits for use in warehouses, distribution centers and container parks. We also include two case studies of companies involved in various aspects of trucking, distribution and warehousing that use IP video surveillance to improve their security and operational efficiency.

**Author:**

Eric Fullerton, Chief Sales and Marketing Officer, Milestone Systems, the world's leading innovator and thought leader of open platform IP video management software.

Kent Sumida, Pre-Sales Support Manager, Milestone Systems.

## The advantages of IP video surveillance management software

Analog video surveillance is a closed circuit system that requires monitoring a particular location's surveillance cameras from that same location. Cameras are connected by coaxial cable to some type of a guard station with monitors, or the cameras simply record to tape or a DVR all the time to provide evidence after the fact, offering no immediate warning of an incident.

Based on the TCP/IP network protocol, IP video surveillance systems free collection of the video transmission from the premises and make it available through the Internet. Now one centralized control room can monitor how ever many warehouses, distribution centers or container parks you want. And security and other authorized staff can view live or stored video from any Internet device (desktop computer, laptop, PDA, even cell phone) wherever they are — around the corner, at the opposite end of a site, or on the other side of the country.

At the core of such a solution is IP video management software. This software provides a foundation for highly efficient video monitoring, analysis, and automation of thousands of cameras. (A good example is Milestone Systems XProtect Enterprise.) Such software also enables a wide spectrum of opportunities for integrating IP video surveillance with other applications in an IT environment. These can include access control systems, gate barriers, license plate recognition solutions, and sprinklers.

Today's best IP video management software solutions enable:

- **Monitoring from any Internet device** — Security staff with appropriate authorization can log on via the Web any time with a networked PC, laptop, or even a cell phone, and check what a camera is recording.
- **Video analytics** — Software algorithms can evaluate incoming video to determine specific information about the content of that video. Examples of video analytics applications include door entry; determining location, speed and direction of travel; identifying suspicious movement of people or packages; license plate identification; facial recognition; and much more. This intelligence can provide early alerts to incidents needing attention from security or other personnel and relieves security staff from having to watch monitors for hours on end.
- **Automated alerts** — Specified events, such as the failure to totally unload a trailer, can be automatically directed to specific people or Internet devices.
- **Easy search and export** — Video can be saved to a database, enabling fast searches and easy export of video evidence to Internet-connected devices and the authorities.
- **Rules-based management** — A hierarchy of authorization levels based on user accounts and profiles allow easy control of access privileges to stored video and cameras.
- **Time-synchronization** — This feature is particularly important for enabling simultaneous, time-synchronized playback of

multiple cameras (all cameras playing back on the same time line) for analysis of an incident involving a large area.

- **Distributed server architecture** — IP network cameras can create a lot of data traffic. It's important to choose a solution that can optimize bandwidth usage, keeping video data traffic between cameras, servers and users to a minimum.
- **Staged transitions** — If you already have an analog (CCTV) surveillance system and want to maximize your investment, you need a solution that lets you run a hybrid system of IP network cameras and your existing analog cameras. (Analog cameras will require IP video encoders or DVRs to connect with the system.)

## More flexible and less expensive installation

A great disadvantage of analog video surveillance systems has always been the need to wire each camera with its own coaxial cable. IP network cameras, on the other hand, can be placed almost anywhere on a network using cost-efficient standard Ethernet cable or wireless technologies such as standard IEEE 802.11b. They don't even necessarily need their own dedicated power outlet. Wireless cameras in outdoor locations can be solar-powered and wired IP network cameras can be connected and powered by Power over Ethernet (PoE). PoE enables power to be provided to a network camera using the same cable as that used for network connection. Use of PoE also enables easier application of uninterruptible power supplies (UPS) to ensure 24 hours a day, 7 days a week operation.

IP network camera installation is easy and flexible.

- Multiple cameras can use the same cable, attaching to the network just like you would any other network device.
- Changing camera placement is simple – just remove and plug into another network jack somewhere else. Wireless cameras can be moved within the range of any access point.
- IP video surveillance systems scale easily from one to thousands of cameras in increments of a single camera (no mandatory 16-channel jumps like in the DVR world).
- Installation can be done in stages, integrating your analog CCTV system with your network video solution.

DHL Exel Supply Chain in Sweden found that an analog video surveillance system would be "around 30% more expensive than an IP solution," says Tommy Nielsen, DHL Sweden Security and Safety Manager. For a 2,400 square meter warehouse, he says the amount of cabling required for an analog installation "would have been enormous." He also notes that the "camera's PoE functionality saved installation costs and effort."

Have an IT department? Then your company already has the much of the necessary expertise for installing, maintaining and managing an IP video surveillance system. Cameras have IP addresses just like any other network device and can be controlled centrally via software. This means you to leverage existing infrastructure such as servers, switches and cabling.

## Open platform for future proofing and seizing other IP networking advantages

IP video surveillance solutions enable you to escape from "proprietary jail"— being locked into using one vendor. Unlike analog DVR-based video surveillance solutions which lock you into "black boxes" that require proprietary upgrade components, IP video surveillance solutions are based on open standards that guarantee a wide choice of products from a large number of manufacturers for years to come. You're not locked into a particular system or platform.

The most versatile IP video surveillance solutions are "open platform." Open platform solutions use published external programming interfaces, such as the Application Program Interface (API), to enable third-party applications that can expand the functionality of your system and "future proof" your system.

Advantages of open platform components include:

- **Freedom of choice in hardware, software, and other components.** You're assured of always getting the best products and pricing by being able to select equipment from different suppliers based on your needs.
- **The ability to integrate with other security equipment like lighting, gates and doors for a truly powerful solution.** IP network cameras have digital inputs/outputs (I/O) that enable cameras to, upon alarm or other cue, activate switches to close or open doors, turn lights on or off, or other actions.
- **Greater archiving capabilities and storage reliability through easy network transfer to off-site storage and the ability to inexpensively set up redundant systems.** With IP video surveillance systems, you can take advantage of the most cost-effective network storage solutions now. Then, when something better comes along, you can switch to that, no matter who you bought your earlier storage system from.

## Better video quality and other value-added features of IP network cameras

IP network cameras are digital and provide up to 16 times the resolution of traditional analog cameras. Because analog images are made of lines and each image is formed from two interfaced fields, images that contain lots of movement become blurry. With digital pixel image sampling, on the other hand, an entire image is captured at one time. This ensures sharp images even with a high degree of motion. Consequently, IP network cameras can provide rich detail on everything from facial features to the numbers on a license plate.

Multi-megapixel IP network cameras that deliver full-motion digital video are already available at analog camera prices. More expensive high-performance multi-sensor cameras (such as eight megapixel quad-sensor 180° and 360° panoramic cameras) drastically reduce user cost per unit area under surveillance by covering much more ground per camera. To reduce video storage requirements, IP network cameras can be equipped with image buffers to save and send only the images collected before an alarm occurred and after an alarm.

### *Specialized Cameras*

For superior digital zoom capabilities, IP network cameras with pan/tilt/zoom controls (PTZ network cameras) are available. These cameras enable staff to remotely take control of individual cameras and zoom in on an activity. Some cameras' zoom capabilities enable reading a cigarette pack from as far as 1,000 feet from the camera.

Small wired and wireless IP surveillance cameras are available for covert surveillance. This enables you to monitor a suspected situation, such as internal theft, without employees knowing. A great advantage of these cameras is they can be deployed in one area, and then easily moved to another. Multi-channel two-way audio can be incorporated as well.

In general, you'll find much more innovation in IP network cameras. Just as the public is losing interest in film cameras, so is interest in the security field waning for analog surveillance cameras. They're a sunset technology and most of the industry's energy is turning to the much more promising possibilities of IP network cameras.

## Prevent loss

Effective loss prevention means catching thieves in the act. Today IP video surveillance is enabling freight and warehousing companies to track warehouse deliveries and loading, ensure trailers are fully unloaded, document fraudulent worker compensation claims for accidents that never happened, and make better decisions on how to improve security around distribution centers.

Houston-based Mattress Firm, a company with more than 300 stores, used to have difficulties pinpointing specific activities. With its old CCTV system, someone might have to sift through two weeks worth of videotapes before finding out what happened. Their new IP-based system makes search and retrieval much faster. For instance, when a trailer loaded with $30,000 of merchandise was stolen, they were able to find and export the surveillance data quickly to the authorities. As a result, Mattress Firm was able to recover the trailer and prosecute the thieves within a mere two weeks.

Another company, Coastal Sunbelt Produce, used their IP video surveillance system to gather evidence in a case of internal fraud. A manager was coming in after hours to steal products to sell to another supplier. Losses totaled over $100,000 until IP video surveillance caught the manager in the act.

ITbutikken, a Scandinavian retail web business that carries approximately 2,000 IT products was having problems with customers complaining about missing products in their deliveries and improper packaging. Stock counts matched deliveries, suggesting customers were making fraudulent claims. ITbutikken installed IP network cameras and IP surveillance management software to record images of the packaging and packing process. These images are now used in the event of claims — and have virtually put an end to them. “All customer fraud has been totally eliminated for us now,” says Peter Sunesen, CEO and ITbutikken founder. Their IP video surveillance solution has also caught various stock person mistakes and one instance of internal theft so far.

## Improve operations

By centralizing video surveillance, IP video surveillance systems provide an excellent tool for management to use in improving operations. The system can be used to monitor the movement of cargo in freight terminals for later reviewing in looking for ways to improve the efficiency and safety of personnel, truck traffic, loading procedures, and other activities. It can even help facilities that handle hazardous substances meet tough security conformance standards and avoid non-compliance citations, fines, and negative publicity.

Global logistic specialist Kühne+Nagel uses an IP video solution to monitor its operations. As a truck arrives at a distribution center, an operator tracks its movement with a PTZ dome camera, which records the unloading process together with the truck license plate, the driver's identity and the truck's arrival time. This video record provides an important element in their packet tracking system and provides visual evidence in the event of a shipping problem. The system also provides traditional security surveillance to protect against intruders and possible theft both inside and outside of the warehouse.

IP network cameras are excellent for recording loading and, when the wrong merchandise ends up on a truck, can be used to identify which workers make the mistake and spark additional training. Coastal Sunbelt Produce uses IP video surveillance to catch employee errors on video and then use the video as a coaching tool and for re-training. "We ship about 17,000 cases each night, so if we make a mistake on one box, it costs us to correct that mistake — and that can add up, says Phil Murth, President, Coastal Sunbelt Produce. "Cutting down on these mistakes saves us money."

Johannes Olofsson, Operations Manager for DHL Rosersberg (Sweden), notes that the PTZ functionality of their digital cameras allows them to "check the numbers on the boxes in the warehouse and even the small print, without having to physically go there." With IP network cameras, each camera can be chosen and programmed for a specific requirement.

Video of product, such as perishable produce, going into and out of trucks can be used to substantiate quality. Suppliers will be more careful about their shipments to you if they know you are recording incoming shipments on video. Mallory Alexander International Logistics uses IP video surveillance for security and quality assurance at its 400,000 square-foot. 62-dock distribution center (the largest fulfillment center for 1-800-FLOWERS outside New York). Mallory's IP video surveillance system provides proof of their quality control and support of 1-800-FLOWERS's 7-day money-back guarantee.

## Improve freight records with RFID integration

Through IP networking, IP video surveillance can be integrated with RFID tags. Tags can signal the IP video surveillance system to record every instance of goods being moved. This makes it both easier to monitor loading and unloading and the accuracy of shipments.

Pfefferkorn Spedition, a freight forwarding company headquartered in Germany, is using a system in which every time a bar code is scanned on freight to record a move, system software calculates the tag location and directs the appropriate camera to record the activity. (The RFID is in the bar code reader, not on the package — this saves having to purchase and apply thousands of RFID tags for packages.) Shipment information from the bar code scan is then recorded with the transaction location. A data marker enables easy retrieval of the video record. To reduce video storage needs, just four to five seconds of video is recorded.

Video and RFID integration is especially popular in Europe where companies are increasingly required to keep video records of goods. Sony Europe, for instance, uses a combination of RFID and video surveillance to improve efficiency and reduce shrinkage at its Tilburg distribution center in the Netherlands. An automated vide system monitors the packages, burns RFID data onto the video image, and indexes the video stream according to the RFID information. The tag-read data and video images are used to verify shipment and provide electronic proof of delivery. If an item is claimed lost or damaged in transit, Sony has a visual record of the condition of the goods when they left the warehouse.

## Tighten security

While many companies acknowledge the need for greater security, the focus on the bottom line leaves few with the financial or human resources to implement it. IP video surveillance provides the perfect, cost-effective way to patrol the perimeter and embed security throughout your facilities.

Loading docks, for instance, are often overlooked or downplayed in the larger security picture. Yet every loading dock is a portal and a perfect place to make off with goods or shortchange a shipment. Security risks include dock doors left open for air flow, employees reluctant to challenge unknown or unauthorized personnel, inattention or deliberately not following operational procedures, and facilities with poor lighting and numerous hiding places.

### *Integration with Access Control and Other Systems*

A common rule in networking is that the more CPU-based devices (such as IP networked cameras) on a network, the greater its value. Putting video surveillance on a network enables the information to be routed, processed, analyzed, compared, cross-correlated and stored for decision making and additional uses in everything from training and HR to operations. It also enables integration with other devices to tighten security in ways no single device can do alone.

The best warehouse systems have comprehensive operational policies that are backed by appropriate security. The ideal is having IP video surveillance integrated with access control and asset/inventory management systems. A door opens, a camera starts recording. Integrating card access systems with video surveillance provides a comprehensive picture of who is coming in and leaving. Cameras can even perform tasks for you. Digital relay outputs on IP network cameras can be used to automatically open or close doors, turn lights on or off, or perform other tasks.

### *Improve Security Through Video Analytics*

Video analytics can also dramatically improve security. Human observers have trouble dealing with an increasing number of video channels. Reliable image analysis through IP networked cameras and IP video surveillance management software is now available that can be integrated with alerts, alarms and automatic incident flagging to free security personnel to perform other duties and be in position to better respond to security incidents upon alert. Automatic close-ups of moving targets and synchronized handoffs from one camera to the next enable robot-like tracking of a situation or threat without anyone at the controls.

Today’s video analytics use pattern recognition to identify object characteristics such as license plates, employee numbers, dangerous goods signs, bar codes, and container inscriptions. For instance, XProtect Analytics - LPR (License Plate Recognition) is a video analytics solution that reads, detects, alerts and stores license plate information from a video stream. License plate information can be checked against

pre-defined lists which determine if any action should be taken, such opening a gate.

Video analytics can also be used to spot objects being removed, placed, or left unattended. For instance, an employee tossing a box over a fence for later retrieval could set off an alert to security and the video stored for evidence. Video analytics can even provide ancillary detection of such things as smoke, fire, visible gas leaks, and leaking containers. Incident flagging, coupled with high quality image analysis, makes for fast search, retrieval and identification of incidents.

### *Ensure Security Staff and Responder Safety*

IP networked cameras with their video analytics and wider range are ideal for watching over areas too dangerous for security guards to patrol — such as areas of hazardous chemicals or waste. Guards only need to view and respond to alarm events.

IP video surveillance also increases scene safety for responders by providing better, clearer video, PTZ tracking (on certain cameras) and remote analysis capabilities. This enables scoping out a scene before responding and constant visual monitoring of intruders and those who respond to the incident.

# Case study: Transus Intermodal reduces freight security costs

### 1. The Challenge

Transus Intermodal manages 325 trucks, of which 90% are contracted and the other 10% company-owned. They are responsible for storing and moving around 9,200 containers monthly. Transus Intermodal has to protect all shipments in transit against theft. Their 12 trucking container yards, located throughout the Southeast USA, tend to be in isolated areas that are dark at night. Guard services were very expensive and proved to be inadequate for their needs. Walking around a site doesn't give the kind of total and simultaneous overview that IP video surveillance can.

### 2. The Solution

The company has installed a mix of IP network cameras, including PTZ cameras and stationery color cameras with good night-time visibility, in each location. Milestone XProtect IP video surveillance software is used to schedule the cameras, to record on motion detection, and to view or manage the images archived in its database.

### 3. The Advantages

Transus Intermodal has saved $500,000 annually on security guards at all locations and improved control over their security issues significantly. The video surveillance with its remote access capabilities and better overview of the yards is a new management tool assisting with the dispatch of trucks, and ensuring higher customer satisfaction. Mike Malikowski, Vice President of Transportation and Logistics, says, "We started out using the surveillance just for the theft issues, but there are all these extra benefits like scanning the yards, fixing vehicles, checking if drivers have arrived. We don't have many security issues anymore, so now we use it for all these extra things that help us run our business better. It helps us plan our overall operation more optimally."

# Case study: DSV safeguards customer goods

### 1. The Challenge

DSV's headquarters cover 150,000 square meters in a suburb of Copenhagen where 11,000 to 12,000 shipments are made daily. Customers demand the highest security for their goods, but DSV's old analog CCTV system could not archive recordings long enough, and sometimes crashed and lost data. Hundreds of drivers traffic the area round the clock, which makes the surveillance even more critical should any lost or stolen goods need to be investigated. Proof of handling is also necessary for resolving supplier disputes.

### 2. The Solution

The company's analog DVR security system has been replaced with an IP network-based solution using Milestone XProtect Enterprise software that is designed for operating unlimited numbers of cameras. They use a mix of the old analog cameras with new IP network cameras. As of 2007, more than 560 IP network cameras have been installed in several locations in Denmark.

### 3. The Advantages

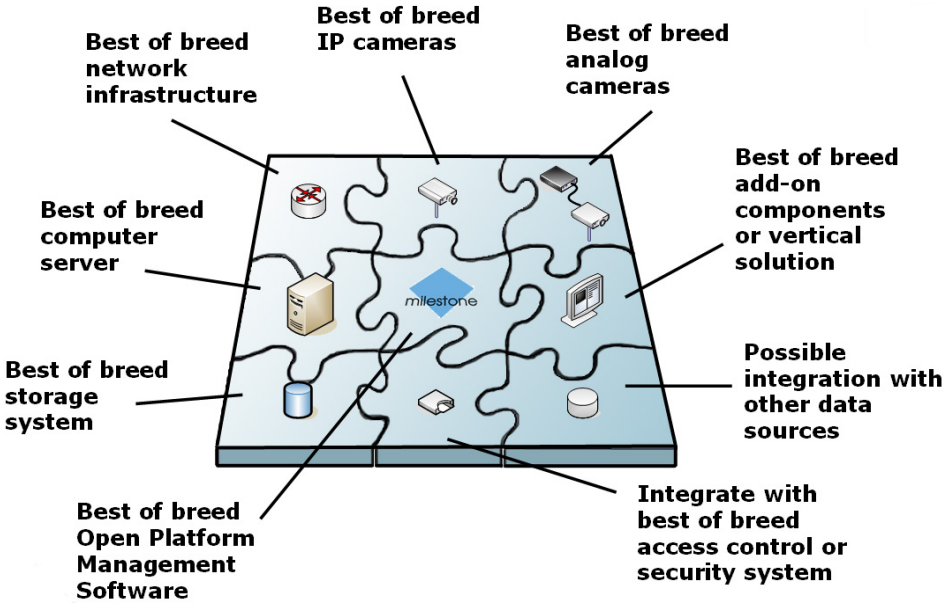
DSV now has a flexible, user-friendly IP video surveillance system that provides many days of archived recordings and uses disk mirroring for increased security – an important parameter that no other system could offer. The frame rates are increased — the analog recordings were only one to two frames/second per camera, and now there are six frames/second for all the cameras. This ensures higher quality of evidence, and the system can easily and quickly give operators the overview to monitor all activities in every area. Technical Manager Finn Nelson comments that at first "users were a little irritated at having to switch to new technology, but when they saw what video-over-IP could offer, they were really delighted. One gets such better quality for the same price."

## Milestone Systems

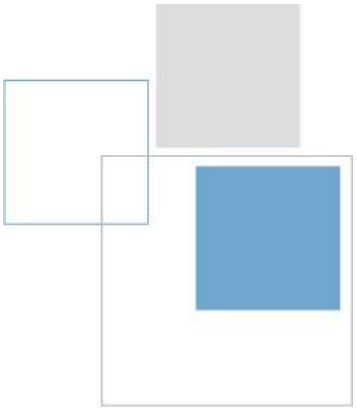
**Innovator.** Milestone Systems is internationally recognized as an innovator and thought leader in open platform IP video management software. Milestone's XProtect products operate as the core of surveillance systems: connecting, sharing and managing all devices through a single interface that is easy to learn and operate.

**Easy to use.** The XProtect platform is easy to use, proven in operation and scales to support unlimited devices. XProtect products support the widest choice of network video hardware and are designed with an Application Programming Interface (API) that integrates seamlessly with other manufacturers' systems.

**Best-of-breed.** Using XProtect, you can build scalable, "best of breed" solutions to reduce cost, optimize processes, protect assets and ultimately increase value in a company's products and services.




Copyright Milestone Systems 2008



Milestone Systems is the industry leader in developing true open platform IP video management software. The XProtect™ platform gives users a powerful surveillance solution that is easy to manage, reliable and proven in more than 35,000 customer installations worldwide.

With support for the industry's widest choice in network hardware and integration with other systems, XProtect provides best-of-breed solutions to "video enable" organizations – reducing costs, optimizing processes, and protecting assets.

Milestone software is sold through authorized partners in approximately 90 countries.

*Office Locations:*

**Milestone Systems Inc.**
8905 SW Nimbus Avenue, Beaverton, OR 97008, United States
Tel: +1 (503) 350 1100

**Milestone Systems A/S (Headquarters)**
Banemarksvej 50, 2605 Brøndby, Denmark
Tel: +45 88 300 300

**Milestone Systems DE**
Am Kleefeld 6a, D-83527 Haag i.OB., Germany
Tel: +49 (0) 8072 442173

**Milestone Systems Italy**
Via Paisiello,110, 20092 Cinisello Balsamo, Milano, Italy
Tel: +39 02 6179 508

**Milestone Systems UK, Ltd.**
118 Codnor Gate, Ripley, Derbyshire DE5 9QW, Great Britain
Tel: +44 (0) 1773 570 709

**Milestone Systems France**
121 rue d'Aguesseau, 92100 Boulogne-Billancourt, France
Tel: +33 141 03 14 82

**Milestone Systems Japan**
c/o Royal Danish Embassy, 29-6, Sarugaku-cho, Shibuya-ku, Tokyo 150-0033, Japan
Tel: +81 (0)3 3780 8749

**Milestone Systems Pte. Ltd.**
30 Robinson Road, 13-03 Robinson towers, Singapore 048456
Tel: +65 6225 2686

**Milestone Systems Middle East**
P.O, Box 500809, DIC, Building 5 IEB, 6th floor Office 606, Dubai, United Arab Emirates
Tel: +971 50 8827093

**Corporate web site: www.milestonesys.com**

**Milestone User Group & Discussion Forum www.milestonesys.com/usersgroup**