



MOTOROLA OPTIMIZED VIDEO SECURITY

VIDEO SURVEILLANCE SOLUTIONS



Deploying video is an effective way to bring cost-effective security to a neighborhood – or a city. A well-executed video solution can help you spot problems before they turn into incidents, make the most effective use of your staff, provide compelling evidence at trial and protect personnel from spurious misconduct accusations. Its visibility can reassure the public, deter crime and even change behavior.

In contrast, a poorly executed video solution quickly becomes a burden, its very visibility serving to underscore its uselessness. A street camera is a promise: it says that someone is watching its video at all times, ready to help. Yet few departments have the manpower to constantly watch video feeds from all of their cameras. Without well-designed procedures to capture, monitor and react to these feeds, the video project can turn into a high-profile failure and a visible target for public frustration.



1:26 AM CAMPUS INCIDENT

A break-in alarm goes off at a university laboratory filled with sensitive research and expensive equipment. Campus security informs the local police and monitors the incident on their private CCTV system.

Police operators access video from the college’s private video surveillance system and see several suspects removing equipment. Nearby units are dispatched to campus.

En route, officers can view the suspects “at work” on their mobile workstations. Once they arrive, the officers cover the exits and enter the building, continuing to monitor the suspects on handheld computers. The thieves are quickly apprehended.

Video of the break-in, equipment theft, arrest, and suspect transport is stored and tagged on police data systems, ready to be made available for prosecution and training.

THE OLD WAY	THE MOTOROLA WAY
Video from the college’s private security surveillance system is unavailable to the police force. Local law enforcement must depend on campus security officers to describe what’s happening or send someone to the campus security office to monitor the incident. Either way, no video is available to responding officers at the scene. Security camera footage must be manually retrieved and stored in the evidence room. Retrieval, authentication and correlation can be difficult.	The college’s security camera footage is acquired by the police department’s video systems, with proper timestamping and chain-of-custody support. Supervisors, dispatchers and officers in the field have direct access to live video streams, even as they are entering the building to apprehend suspects. Video is easily located and shared to be used later for training or as evidence. Footage of the suspect’s actions can be correlated with phone and radio calls, showing the entire incident from the first 9-1-1 call to the arrest.

CAPTURE	TRANSPORT	RESPOND	POST-INCIDENT
• Fixed Cameras • In-Car Video • Third-Party Video • ALPR	• Fixed Wireless • LTE • Wireline	• Analytics • CAD Integration • PSIM	• Correlation • Tagging and Search • Authentication • Chain of Custody • Data Storage

CAMERAS ARE ONLY THE BEGINNING

At Motorola, we view video security not as a stand-alone system, but as an integral part of an organization's day-to-day workflow. We work to integrate our solutions into your operations and help you make the most effective use of video.

This approach yields dividends even if the number of cameras you hang is relatively small. Continuous monitoring of a handful of cameras is difficult even for the most dedicated operator, yet many departments choose to deploy 20 or more cameras without assigning adequate personnel to watch them – implicitly making false promises about security that can undermine their credibility with the public. Many departments would be better served by deploying fewer cameras with an advanced video analytics system, which could handle most of the mundane monitoring tasks. We can help you evaluate and choose from multiple options.

Organizations considering deploying video often have other sensor networks in place: emergency door alarms, open/close sensors, card readers, motion detectors, temperature

sensors – even legacy cameras. We will work with you to help link these sensors with video, leveraging prior investments to create a truly intelligent video system. We'll also ensure that the system's future expandability is addressed so you can later expand video coverage to a larger area, add vehicle cameras or include audio and correlation capabilities.

A technology leader serving the public safety market for more than 75 years, Motorola knows firsthand how quickly technology advances. We work with our customers to implement a solution that meets their immediate needs today, but we also look to the future, ensuring that you can expand and add on to our solutions as your needs change and new technology becomes available.



WHAT IS INCLUDED IN MOTOROLA OPTIMIZED VIDEO SECURITY?

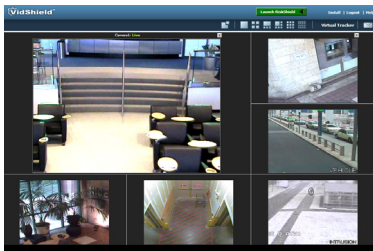
CAMERAS

Selection and placement of cameras is crucial for the success of any video system. Many decisions need to be made: do you want a fixed camera, or one with pan-tilt-zoom (PTZ) capabilities? A high-definition camera can help see things more clearly, distinguish faces and read license plates, but it will cost more and require substantial bandwidth and storage space. Thermal cameras can make it easier to monitor dark locations and discern intruders. You should also consider if the cameras need to be enclosed or ruggedized to protect them from cold, heat, humidity or vandalism.

VIDEO MANAGEMENT SYSTEM

A Video Management System (VMS) controls all aspects of video once it leaves the camera, including acquisition from external sources, authentication, storage, retrieval and retention policies. The VMS can include network video recorders, network equipment, management servers, storage hardware, backup systems and data recovery plans. The system is developed and operated in close cooperation with a customer's IT staff.

PHYSICAL SECURITY INFORMATION MANAGER (PSIM)



A PSIM connects an organization's physical security infrastructure, sensor networks and legacy equipment

into a computer-controlled video solution. With proper customization, virtually any device that creates an electrical signal can be read with a PSIM, including keycard readers, door alarms, motion detectors, heat sensors — even old cameras. A PSIM allows the system to activate a recording when a motion detector is tripped, prevents Halon release into an occupied equipment room or permits an operator to control legacy cameras installed in 1993 alongside those put in last month. Most customers will require some amount of customization to make PSIM work with their unique mix of equipment.

NETWORK VIDEO RECORDER

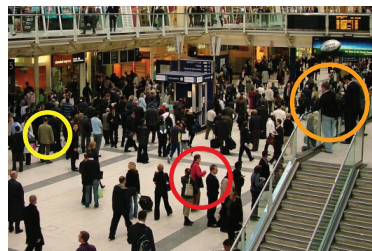
A Network Video Recorder (NVR) is the first stop for video captured by cameras, recording directly from the camera

output. The NVR can reside at the edge with the camera, or miles away, in a centralized server room. NVRs can be used in combination, such as when an edge NVR captures high-quality video and stores it for a period of time while the central NVR is sent a lower-quality stream to reduce bandwidth costs. If higher-quality video is needed to investigate an incident, that video can be retrieved from the edge NVR. Motorola has worked with some customers to set up NVRs that automatically send back high-quality video at off-peak hours, when bandwidth isn't at a premium.

BACKHAUL

Getting video from incident location to the command center is one of the most difficult challenges of real-world video surveillance. Fiber and wire networks can provide high bandwidth and a clear signal, but they are expensive, hard to scale and require massive infrastructure investments. Wireless networks are more cost effective and scale easily, but require careful planning and design in order to work in challenging weather conditions, through trees and foliage, over water and around hills and buildings. With proven public safety and wireless industry experience, Motorola has the knowledge to ensure your video gets through when it matters most.

VIDEO ANALYTICS



Video Analytics software looks for certain anomalies in video streams captured by cameras, mostly by making

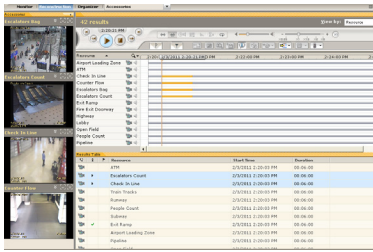
comparisons against a baseline image. For example, the baseline image can be an empty room, and if someone enters the room, the software would register it as a change. Analytics software can track the number of objects and people in the room, their motion, length of time spent in the room and nearly any other criteria. Analytics can be used to spot unattended packages at bus terminals, stalled cars on an expressway, a person loitering on a street corner, a blocked fire exit in a concert hall or to count the number of people entering a building. The software's ability to monitor and respond to video feeds makes it a powerful tool for video surveillance and security, particularly when combined with a PSIM.

SOLUTION BRIEF

OPTIMIZED VIDEO SECURITY

Video Analytics can continuously watch dozens, even hundreds of simultaneous video streams, without getting tired or needing a break. When something unusual occurs, it can respond by alerting a human operator and, if desired, by sounding an alarm, locking a door or taking any other action permitted by the PSIM. Analytics is one of the most powerful – and overlooked – technologies that should be considered by anyone thinking of deploying a video system.

CORRELATION AND INCIDENT RECONSTRUCTION

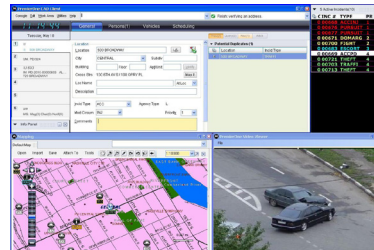


The modern command center is receiving an ever-increasing number of data streams: not only video from cameras,

but also radio, phone calls, mobile video, motion and other sensors, location information and more. Correlation software allows command center personnel to put these information streams together in a coherent way, giving multiple synchronized viewpoints or allowing an incident to be reconstructed; starting with the first 9-1-1 call, it adds nearby fixed cameras and then adds radio calls, mobile

camera video from arriving vehicles and other data. This reconstruction can take place minutes after an incident, allowing a commander to quickly get up to speed – or months later, turning jury members into witnesses.

INTEGRATION WITH PREMIERONE™ COMPUTER AIDED DISPATCH (CAD)



When dealing with an incident, location data is vital: incident location, location of nearby cameras, location of

closest responders and the best routes for access or evacuation must all be available to dispatchers and commanders. By integrating video with our PremierOne CAD software, Motorola allows all of this information to be available on one screen. A dispatcher can note the location of the incident, find the nearest cameras and view their video, then dispatch available units and track their response. CAD integration is another way Motorola helps customers maximize and protect their technology investment.

CASE STUDY: LARGE PUBLIC UNIVERSITY ON THE EAST COAST

Ensuring the safety and security of a campus population of more than 20,000 students and 3,500 staff is a key challenge for the university. Motorola proposed an open-architecture security framework to enable current and new technologies to communicate with one another, while integrating disparate technologies into a single situation-management platform. Leveraging Motorola's high-speed, point-to-multipoint wireless broadband network to extend the reach and expand the capabilities of the university's existing fiber network, the platform incorporates content from business partners for physical security information management (PSIM) and situation management, asset management and tracking, and security products and service integration.

At the core of the solution is a powerful, standards-based, command-and-control application that correlates activities from sensors, cameras and existing infrastructure components to bring enhanced response and analytic capabilities for increased visibility across campus. The platform enables the integration of existing and new video, radio frequency identification (RFID) access control and asset-management solutions to create a single approach to manage different systems. This approach minimizes the need to manually monitor individual components and increases operational efficiency. The result is an easy-to-use system that correlates location, incident type and responding personnel to provide relevant and real-time information to first responders for better situational awareness and optimized command and control response.

The system offers video surveillance in high-traffic campus areas, as well as expands coverage to student housing located on the fringes of university's campus where it is often difficult to provide a continuous security presence and crime deterrence. Working collaboratively with the university to optimize its existing security and communications infrastructure, the Motorola solution also provides a platform to integrate future advances in technology.

THE VIDEO LIFECYCLE

LIFECYCLE STAGE	WHAT HAPPENS	SUCCESS FACTORS	MOTOROLA'S EDGE
Capture	Camera gets a clear view of an incident	• Camera at the right location • Camera active at the right time • Camera positioned and zoomed in towards the incident • Camera designed for present environmental conditions (temperature, vandalism, etc.)	• Our engineers and partners ensure proper coverage • We partner with top-end camera vendors to ensure performance to spec • Motorola works with customers to select the right cameras for their environment • We provide PSIM software solutions to enable automatic camera activation and control in response to sensor input
Transport	Video is delivered from the camera to the command center	• Adequate bandwidth to deliver one or more relevant video streams • Security to prevent unauthorized access or tampering • Ability to deal with conflict between video quality and limited bandwidth	• Motorola supports multiple wired and wireless backhaul and transport technologies • Our wireless broadband technologies provide cost-effective backhaul where wired transport is impractical • Wireless communications are encrypted • Authentication prevents video tampering
Response	Video is seen by an operator, who is able to assess the situation and act accordingly	• Operator needs to be looking at video stream • Video needs to be clear enough for operator to discern what's happening • Operator needs incident location • Operator needs to know how to respond • Dispatch needs to know location of resources to deploy to incident • Input from other sources must be considered in incident analysis	• Our advanced solutions maximize video quality • Motorola and our partners provide training and support to customer personnel • Analytics can help recognize an incident and alert the operator • Integration with Motorola PremierOne™ CAD helps locate cameras on a map and dispatch nearby units • Correlation capabilities enhance video and analytics with input from other sources – from motion sensors to radio calls
Post-Incident	Recorded video is stored for later retrieval and use	• Adequate storage capacity • Well-developed policies to resolve conflict between limited storage and an ever-growing collection of video • Robust video search and retrieval capabilities • Authentication and chain-of-custody support • Post-incident correlation of multiple video, audio and data streams • Easy export of data for later use • Robust data security and loss prevention	• Motorola works with top-notch storage partners to deliver redundant systems with online offsite storage capabilities • We offer video software and storage that provides tagging and other search and retrieval features • Software from Motorola partners allows the integration of fixed and mobile video, phone and radio calls, and other inputs – all correlated into a single incident • Video and related data are easily exported to DVD or other media for use in court • We work with customers to develop well-designed data retention policies that ensure retention of critical data while limiting resource use

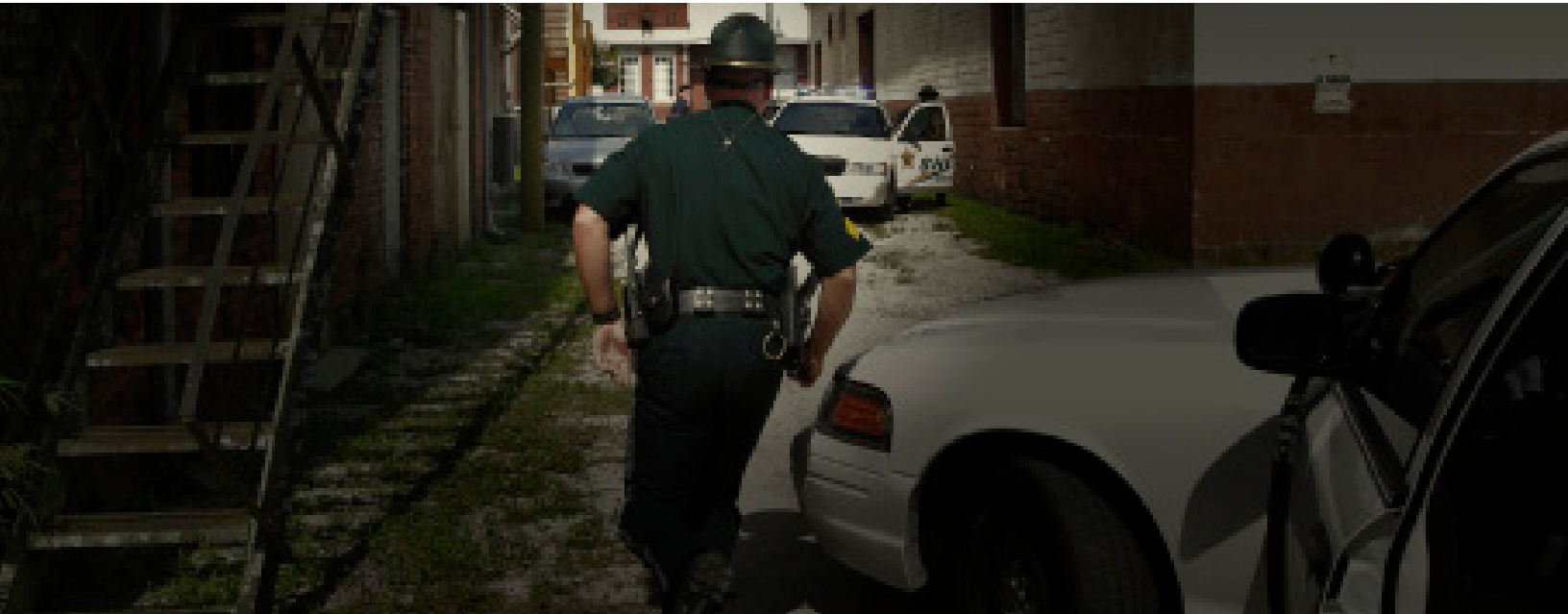
7:52 PM STREET FIGHT

A call reporting a fistfight outside a local bar comes into dispatch. A dispatcher locates nearby fixed video cameras, sees a two-man brawl and dispatches the closest unit.

Before officers arrive, one of the suspects flees the scene in his car. Zooming in on the car, the camera operator reads a license plate. A BOLO (Be On The Lookout) alert is sent to all units and a hotlist update is uploaded to vehicles equipped with ALPR (Automatic License Plate Recognition) systems. Within minutes, the suspect is located and apprehended.

THE OLD WAY	THE MOTOROLA WAY
Without a nearby camera, the dispatcher must rely on witnesses to provide information about the incident If the caller hangs up, the dispatcher has no way of knowing whether the fight involves two people or has turned into a large riot. If a suspect leaves the scene before officers arrive, the probability of capture is low.	Cameras allow dispatchers to confirm, size up and monitor the incident as it happens, enabling the right amount of police resources to be used. Suspects are tracked on scene even before officers arrive. Relevant information like appearance, clothing, and getaway vehicle are captured and recorded. Automatic License Plate Recognition (ALPR) provides crucial information of likely vehicle location. And Mobile ALPR can quickly pick out the identified vehicle from thousands encountered by a patrol car in a typical shift.

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Video technology is rapidly evolving and improving. For more than 75 years, Motorola has been recognized as the leading provider of advanced technology for government and public safety. To learn how we can help you develop and deploy optimized video security solutions that will both provide immediate benefits and allow you to take advantage of future innovation, contact your Motorola representative or [visit **www.motorola.com/videosecurity**](http://www.motorola.com/videosecurity)

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