milestone

Understanding AI-powered video analytics

Discover how intelligent video analytics software is redefining what you can do with video technology.

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Welcome to the future of AI-powered video analytics

Video technology has been an integral part of our daily lives for decades. Some estimates put the number of surveillance cameras alone at more than one billion worldwide. But a lot has changed recently. Intelligent video analytics is now exponentially transforming what video technology can do, along with what we can achieve with it.

These advances have also levelled the playing field. Once the domain of enterprises, intelligent video analytics is now accessible to organizations of any size. Whether you're in a corner store or a critical infrastructure facility, wherever there is video, there is data — and new, exciting opportunities.

Who is this guide for?

This guide is designed for anyone interested in exploring the possibilities of AI and video analytics — both in surveillance and beyond. Whether you're just beginning your video analytics journey or looking to unlock more value from your existing system, this guide is here to help.

Inside, you'll find:

- A basic description of intelligent video analytics and how it works.

- Inspiration for reimagining how video can serve your business beyond security.

- Real-world examples from industries such as retail, schools, critical infrastructure, and public safety.

- What to consider when starting your journey with video analytics.

What is intelligent video analytics software?

Intelligent video analytics uses artificial intelligence (AI), including machine learning and computer vision, to analyze video footage. It extracts metadata about objects, activities, and events, making video searchable, actionable and quantifiable.

From surveillance to intelligence

Unlike traditional systems that only review footage after an incident, intelligent video analytics software transforms passive surveillance into real-time intelligence — helping security teams prevent threats and predict patterns, not just react. It turns video into a strategic business asset.

Omdia
by informa techtarget

85%

of end users stated they achieved an ROI on their video analytics solutions within one year.

Based on the Whitepaper "The ROI of Video Analytics" commissioned by BriefCam that surveyed 140 end users of video analytics solutions across North America and Europe.

Shift from reactive to proactive

Incidents are too often only uncovered after the damage is done. Video analytics transform your surveillance system into a proactive tool, detecting threats, anomalies, and patterns in real time, so you can prevent or mitigate them.

Get straight to the evidence

With conventional video, reviewing hours or days of footage has always been a laborious, time-consuming process. Video analytics can accelerate investigations by instantly pinpointing people, vehicles, behaviors, and events. Whether you're tracing a suspect, verifying a timeline, or uncovering key details, investigations become faster, easier, and more effective.

Turn insights into business impact

Intelligent video analytics expands the value of video systems beyond security. They let operators spot patterns and behaviors such as how people move through a specific area or where bottlenecks occur. Insights like these drive informed decisions that help to improve daily operations, and enhance the customer, employee and visitor experience.
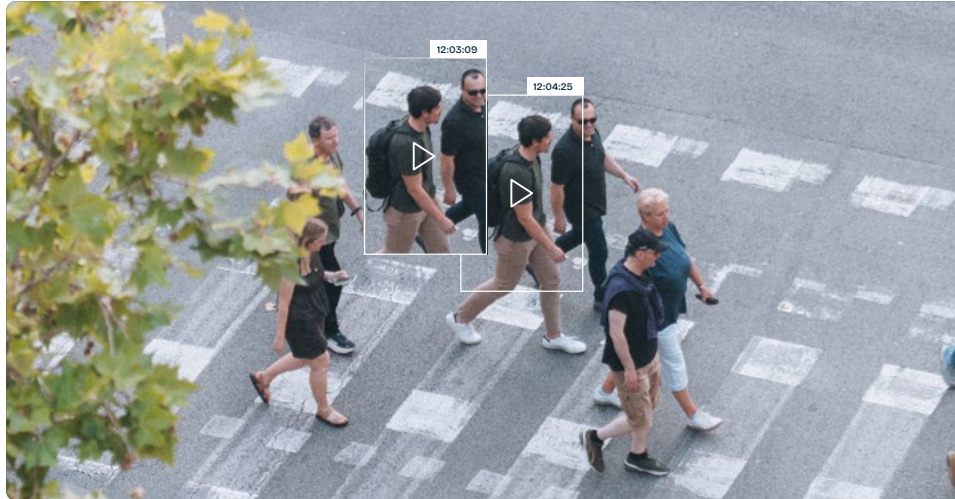
Adopting analytics responsibly

The use of AI in video surveillance naturally raises important ethical questions, with regulatory bodies moving fast to address them. For organizations the challenge is clear: how can you take advantage of the latest video analytics while remaining confident that you're doing it compliantly?

Responsible Technology as a foundation
At Milestone, our Responsible Technology framework guides how we develop and deploy our products, and choose our partners. Our approach is built on five core principles:

Accountability
We ensure human control and oversight of our technologies.

Transparency
We openly and clearly communicate how our systems work and are intended to be used.

Fairness & Inclusion
We actively work to eliminate unwanted bias in our products.

Privacy
We respect the privacy rights of individuals and communities to remain in control of their data.

Security
We protect the data integrity, availability, and confidentiality.

Helping lead the way with ethical AI

We were one of the first companies to adopt the G7 Code of Conduct on AI. We train models using anonymized real-world data and synthetic data to preserve privacy and reduce unwanted bias. This provides high-quality results now and a foundation for responsible use as standards evolve.

Keeping pace with regulations

We are actively preparing for the EU AI Act in August 2026 to ensure model transparency, individual privacy, and cybersecurity. Our XProtect video management software already supports GDPR and FIPS 140-2 compliance through robust data handling and security practices. Our goal is to ensure all the products in our portfolio help users to fulfil current and future privacy standards, sparing them reputation loss and costly retrofitting.

How raw video footage becomes valuable business insight

Video analytics examine every frame of footage and generate detailed metadata about the objects, activities, and events in it.

This metadata makes it easier to search, categorize, and understand video content. It enables features such as automatic object tracking or unusual behavior detection.

Every bit of data can contribute to insight extraction — until recently this last step required human intervention, but modern video analytics can now generate insights automatically.

How the process works:

- **Video capture:** Cameras record video in various locations, such as streets, retail stores, or office buildings.
- **Data transmission:** The video is sent to a central system via wired or wireless networks.
- **Processing:** Specialized software uses algorithms and AI to process the footage.
- **Analysis:** The system identifies patterns and events such as movement, facial recognition, object detection, or crowd counting.

Key components of an intelligent video system:

- **Cameras:** Capture the video footage.
- **Network:** Transmits video to the analysis system.
- **Software:** Analyzes and interprets the video data.
- **Storage:** Saves footage for future review.
- **User interface:** Allows users to view footage, receive alerts, see patterns over time and manage the system.

Key benefits of video analytics

Adding AI-powered video analytics to security and operational video systems amplifies what operators can see and do, while saving time, footwork, and operational costs.

Here is a basic breakdown of the benefits:

⊕

Enhanced awareness and response

Detect and respond to threats before they develop into security events.

⊕

Accelerated investigations

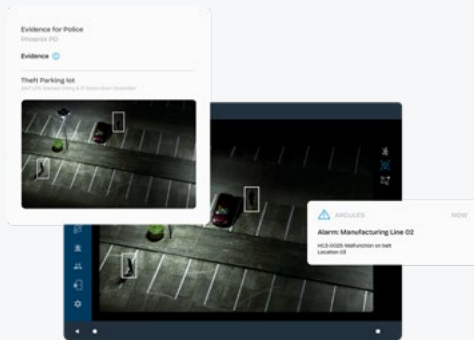Take the manual labor out of investigations.

⊕

Operational efficiency and data-driven planning

Go beyond security. Analytics also help businesses streamline processes, enhance customer experiences and improve overall efficiency.

Enhanced awareness and response

Detect and respond to threats before they develop into security events.
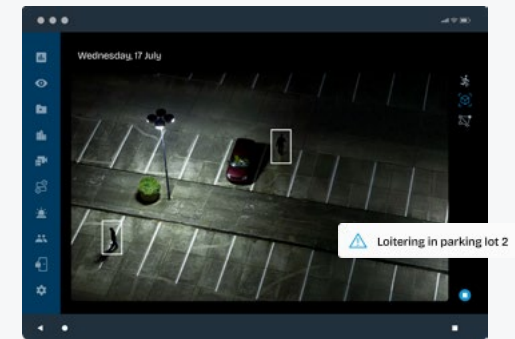

Automated real-time alerts

- Instant detection of unusual activity (e.g., unauthorized entry, loitering, perimeter breaches) allows operators to act immediately.

- Custom rules can be set for specific zones, timeframes, or behaviors so alerts are always relevant and timely.
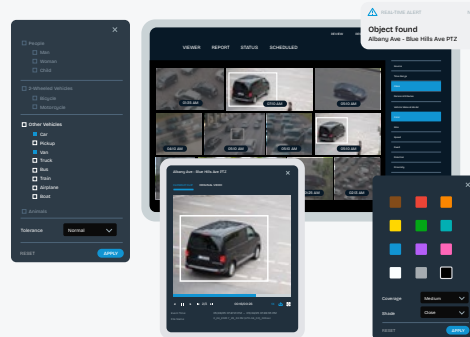
Object and behavior recognition

- Identifies people, vehicles, or objects that match suspicious criteria (e.g., a person leaving a bag unattended).

- Tracks movement and behavior patterns, flagging anomalies like someone walking against traffic flow or entering restricted areas.


Integrated response workflows

- Real-time analytics can be integrated with alarm systems, access control, or public address systems to trigger automatic lockdowns or alerts.

- Operators can accelerate decision-making by viewing live feeds with contextual metadata such as heatmaps, object classifications, or movement trails.

Accelerated investigations

Take the manual labor out of investigations.
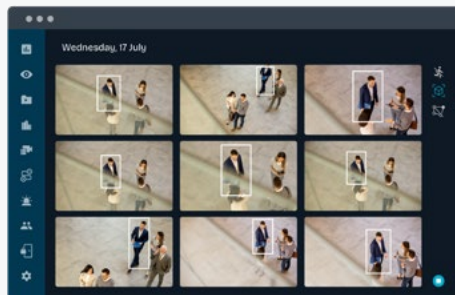
Rapid search and filtering

- Object and person detection: AI instantly identifies and labels people, vehicles, license plates, colors, clothing, or bags, making it easy to jump directly to the moments that matter.

- Event detection: Instead of scanning hours of video, the system pinpoints specific actions such as movement in restricted areas, loitering, or object removal so you only review the most relevant clips.

- Face recognition: Quickly finds individuals across multiple cameras or time periods.
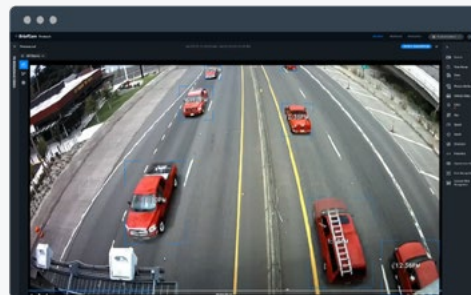
Enhanced accuracy

- AI reduces human errors or oversights by consistently analyzing every frame.

- Cross-referencing metadata (e.g. time stamps, GPS, access control logs) helps confirm the sequence of events.
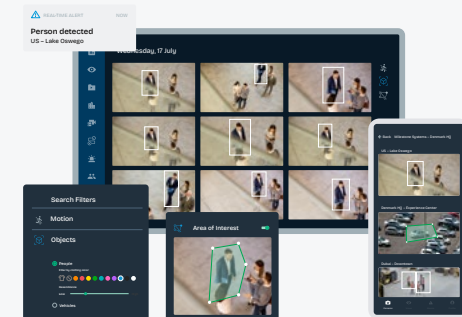
Time and cost efficiency

- Manual video footage review is slow and labor-intensive. Video analytics can cut review times from days to minutes.

Operational efficiency and data-driven planning

Go beyond security. Analytics also help businesses streamline processes, enhance customer experiences and improve overall efficiency.


Understand customer behavior

- Foot traffic analysis reveals where, when, and how customers move through a space.

- Heatmaps show high-traffic zones, helping optimize store layouts, product placements, or service counters.

- Dwell time tracking helps identify bottlenecks, confusion points, or popular areas.
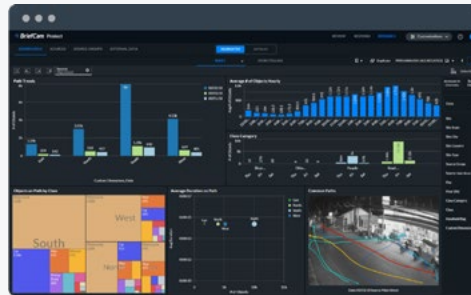
Optimize staffing and resource allocation

- Analytics can reveal peak hours or understaffed zones, helping managers adjust schedules accordingly.

- Queue monitoring notifies staff when wait times get too long, improving service and customer satisfaction.

- Supports compliance with occupancy limits, hygiene practices, or operational protocols — especially in regulated industries.
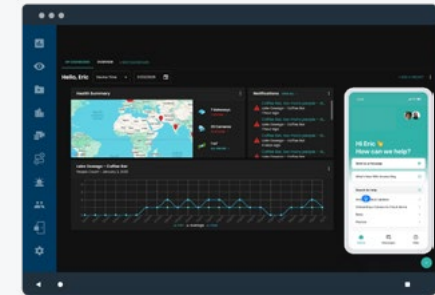

Enhance facility management

- Identifies underused or overcrowded spaces, allowing better space use.

- Tracks cleaning cycles based on actual usage instead of fixed schedules.

- Drive strategic decisions; long-term trend data can inform decisions on store layout design, instore marketing, or the need for expansions or relocation.

The Milestone intelligent analytics toolbox

Milestone's AI-powered video analytics turns video footage into actionable intelligence, enabling organizations to see more, act faster, and work smarter. Whether built-in or integrated, our open-platform portfolio's analytics support everything from everyday monitoring to advanced business insights. With the ability to start small, adapt quickly and scale without limits, we turn video into a strategic advantage — free from vendor lock-in.

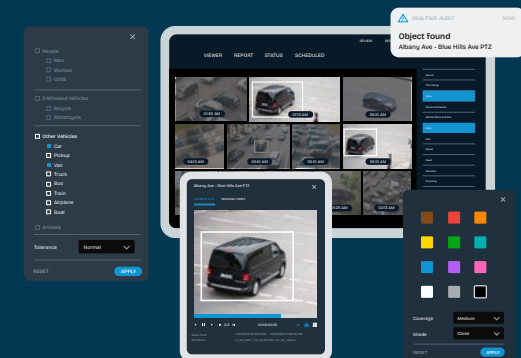The Milestone portfolio comprises three core products:
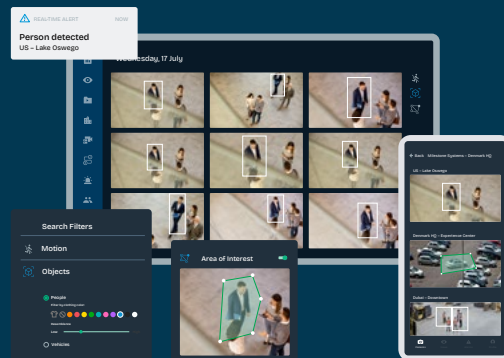
Arcules
Video surveillance as a service (VSaaS)
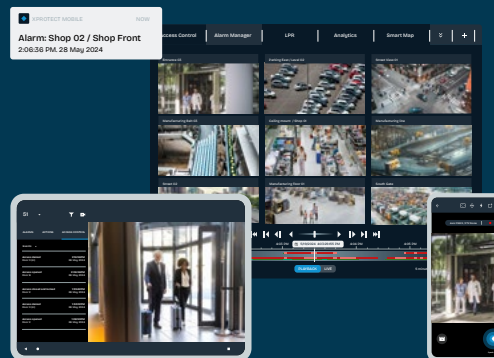
XProtect®
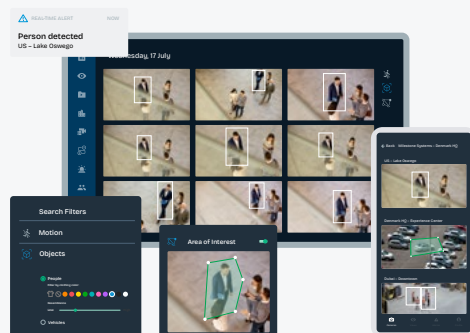Video management software (VMS)

BriefCam®
Advanced video analytics

Collectively these provide three types of intelligent video analytics, each designed to support different levels of operational maturity, use cases to be solved, and business goals. Here's a quick overview of how they differ:


Essential
intelligent video analytics

Designed for easy deployment and everyday needs, Milestone's essential video analytics include features such as motion detection and object tracking. These are ideal for companies with straightforward video intelligence needs such as simple motion monitoring, object detection, event rules and alarms; and who are looking to get started fast. Essential intelligent video analytics systems are often either edge based or cloud based, each offering their own advantages.

Arcules – Cloud VMS (VSaaS)
Cloud VMS with built-in video analytics such as people detection and line crossing. It also offers the option to embed edge and camera-to-cloud analytics.

→ **Learn more about Arcules**
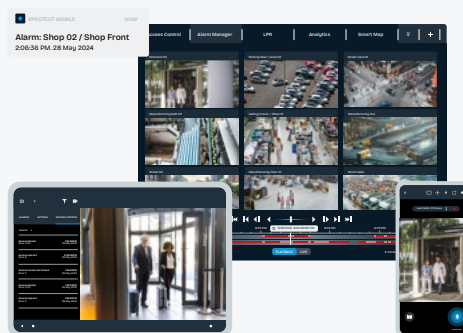
Core
intelligent video analytics

Offer more sophisticated capabilities through built-in features and support for third-party integrations. The features include line crossing detection, facial recognition, people counting, and much more. This selection is suited for businesses with more specific or granular video analytics requirements.
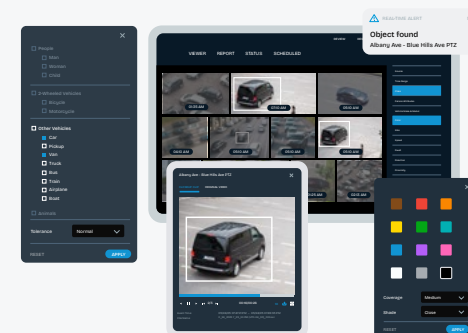
XProtect – VMS
VMS with built-in video analytics features such as motion detection and license plate recognition.

XProtect – VMS with analytic integrations
VMS with specific video analytics integrations such as people counting object detection or line crossing.

→ **Learn more about XProtect**

Advanced
intelligent video analytics

These include predictive analytics, video synopsis, appearance similarity, and more. It's an ideal fit for industries like law enforcement, critical infrastructure and retail where every camera feed can be a valuable source of insights, helping organizations make advanced proactive, data-driven decisions.

BriefCam – Video analytics software
Full business intelligence suite providing capabilities such as VIDEO SYNOPSIS, Custom ClassifID, face recognition, appearance similarities and much more.
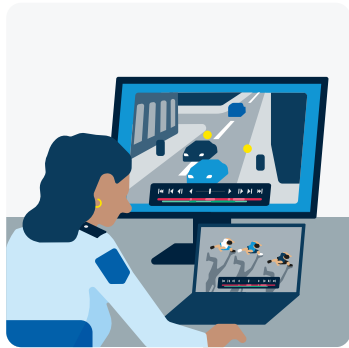
→ **Learn more about BriefCam**

How video analytics software is used in different industries

A variety of public and private organizations employ video analytics for a rapidly growing number of use cases.

The following pages highlight how.

Schools

Critical infrastructure

Public safety

Retail

Public safety

Accelerate Investigations with centralized video search

Investigating incidents across thousands of hours of footage can be overwhelming. With centralized video search and advanced analytics, investigators can quickly find relevant video clips by filtering for people, vehicles, motion, or specific behaviors. Tools like BriefCam VIDEO SYNOPSIS® condense hours of footage into minutes, making it easier to identify key evidence based on appearance, movement, or object type.
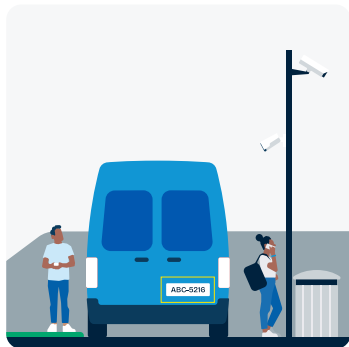

Track and identify vehicles of interest

Public safety agencies often need to locate vehicles involved in crimes or suspicious activity. License plate recognition (LPR), available with XProtect extensions and BriefCam enables officers to search by vehicle attributes such as make, model, color, speed, and direction. Watchlists are created using full or partial license plates that will trigger real-time alerts when a match is detected.
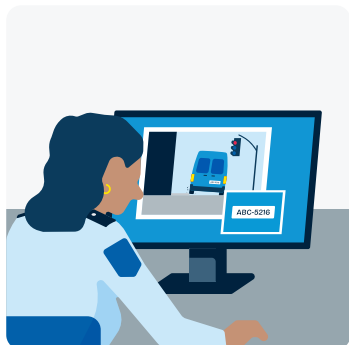
### Analyze and address traffic violations

Manual traffic enforcement is resource-intensive and typically reactive. Using tools such as BriefCam video analytics authorities can detect violation patterns — such as illegal turns, jaywalking, or sidewalk cycling — by analyzing directional paths and behavior trends. This data supports proactive enforcement and helps improve road safety over time.
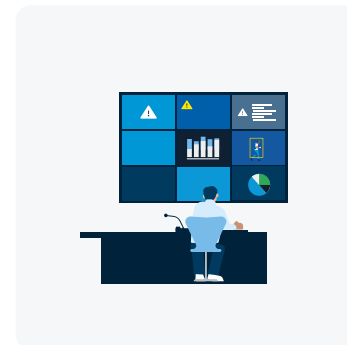
Schools
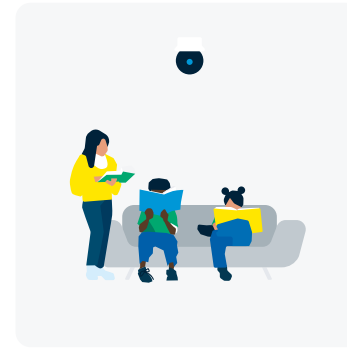
Monitor building occupancy

Schools are required to ensure that occupancy limits are respected in areas such as gyms, theaters, and auditoriums. Arcules analytics can track building occupancy in real time and alert staff when thresholds are exceeded. Video analytics can also identify peak usage times for better crowd management and safety compliance.
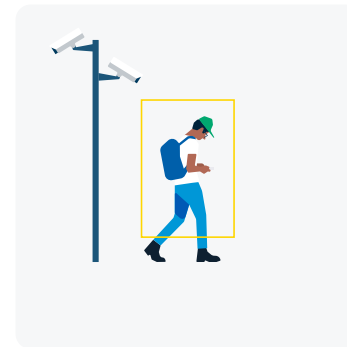
Enhance intrusion protection

Unauthorized access to school grounds can pose serious safety risks. Video analytics can detect motion or line crossings in restricted areas and trigger real-time alerts. This enables security teams to respond quickly to potential intrusions and maintain a secure environment for students and staff.
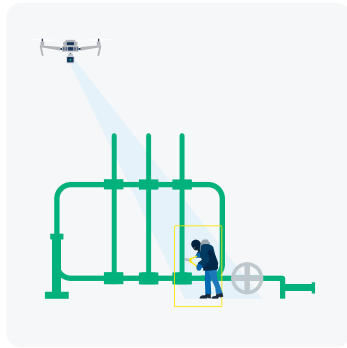

Keep events running smoothly

Large school events require the careful coordination of people and traffic flow. This is where the BriefCam Research module provides insights into crowd density, movement patterns, and bottlenecks, and helps staff to adjust layouts, allocate resources, and improve safety and efficiency.

Critical infrastructure

Prevent copper and equipment theft

Critical infrastructure sites are frequent theft targets due to the high value of specialized equipment and materials like copper. BriefCam analytics detect unauthorized access by recognizing line crossings and loitering near restricted zones. Fully integrated into XProtect, automated alerts and deterrents like alarms or warning messages help security teams respond quickly and prevent loss.
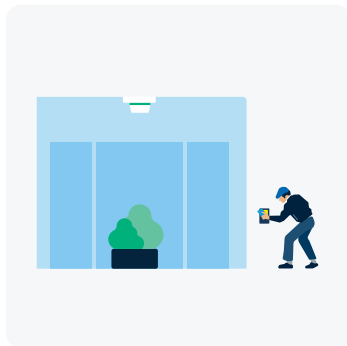

Enhance intrusion protection

Intrusions disrupt operations and pose safety risks. Tools like BriefCam video analytics monitor restricted areas and trigger alerts when unauthorized individuals or vehicles enter predefined zones. This enables immediate response to potential threats such as sabotage or vandalism, helping maintain operational continuity and safety.


Ensure worker safety and compliance

High-risk environments demand strict adherence to safety protocols. BriefCam video analytics detect if workers are not wearing the required personal protective equipment (PPE) such as helmets, vests and safety glasses, and alert supervisors to violations. This proactive approach supports compliance, reduces liability, and protects personnel in hazardous conditions.

Retail
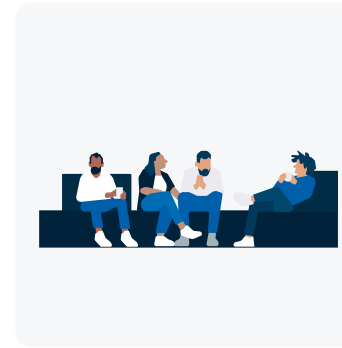
Discourage loitering

Loitering may be harmless, or a prelude to a security event such as theft or vandalism, or the cause of customer discomfort. You can combine XProtect with third-party video analytics or use Arcules cloud-based analytics to track and detect individuals lingering in specific areas for extended periods and trigger alerts for security staff. This helps retailers monitor low-traffic zones, entrances, and semi-public areas more effectively, especially after hours.
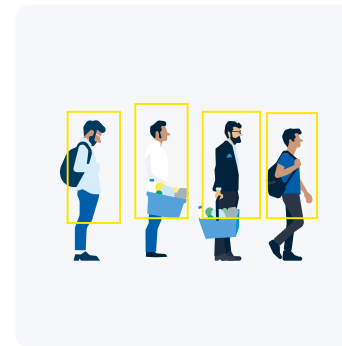
Identify long check-out lines

Long queues can take a heavy toll on customer satisfaction and store efficiency. Integrate XProtect with video analytics to monitor foot traffic and queue lengths in real time, alerting staff when thresholds are exceeded. This enables timely interventions such as opening additional checkouts to reduce wait times and improve service during peak hours.
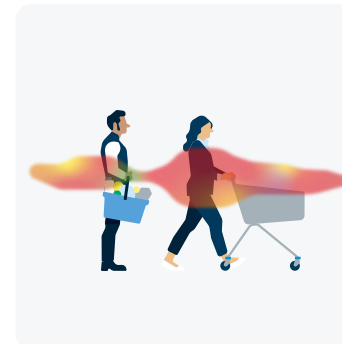
Optimize store layout

Understanding how customers move through a store is key to improving layout and product placement. Heat maps and movement tracking in BriefCam Research reveal which zones experience high traffic and engagement — and when — along with potential bottlenecks. These insights help retailers reconfigure displays and aisles to enhance flow, encourage exploration, and increase sales opportunities.

Customer stories

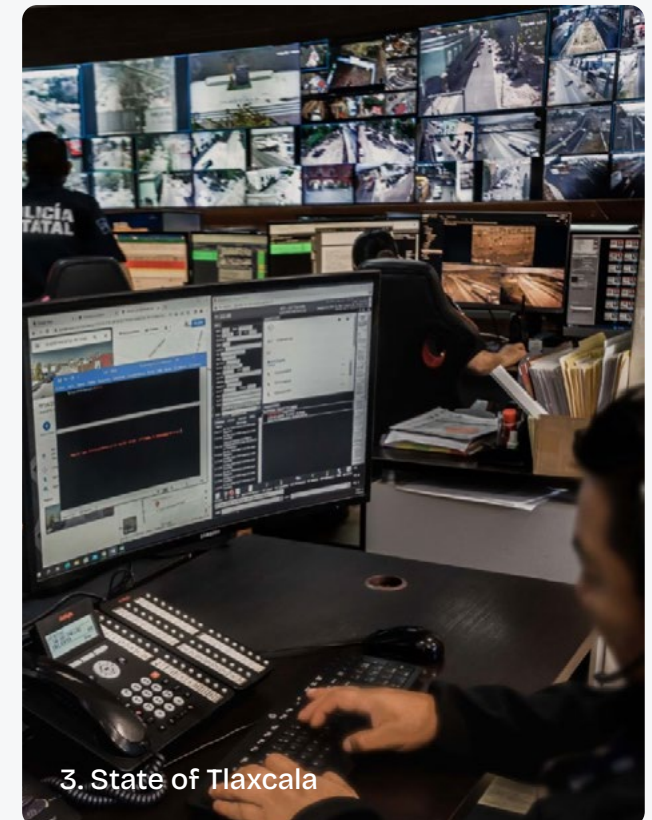# Video analytics in real-world applications

Milestone video technology supplemented by analytics can be found in a variety of industries worldwide. Here is just a sample of our customer success stories.

1. City of Hartford

2. Federal District of Brasilia

3. State of Tlaxcala

Customer story > City of Hartford

Police force increases case solvability by 442%

Using a mixture of Milestone XProtect, BriefCam and third-party analytics, the Hartford Police Department were able to turn the tide on shooting incidents.

The City of Hartford in Connecticut, USA, faced increasing levels of gun violence, making it critical for the police to find more effective ways to solve crimes. While surveillance cameras were already deployed throughout the city, there was no clear data on how much these cameras contributed to crime resolution. Additionally, the Hartford Police Department needed to ensure that any future investments in surveillance infrastructure would provide measurable, long-term results.

An integrated approach to crime fighting

The Hartford Police established the Capital City Command Center, better known as C4. With XProtect video management software as its foundation, this real-time anti-crime center also integrated BriefCam video analytics for accelerated decision-making and investigations, along with a third-party License Plate Reader and SoundThinking gunshot detection. The results were dramatic: a 442% increase in the solvability of shooting cases — and a 20-year low in shooting crime.

"The open platform approach has been crucial to our success. With Milestone's VMS as our backbone, we can leverage a wide range of tools and data sources to create a comprehensive picture of each incident. This flexibility, combined with our focus on rapid information sharing and analysis, has been the key to dramatically improving our solvability rates and making Hartford safer."

Chris Mastroianni
Sergeant, supervisor of C4 real-time crime center, City of Hartford

Customer story > Federal District of Brasilia

Water treatment company boosts operational efficiency

A major Brazilian public water treatment company in the city of Brasilia has dramatically improved its incident response capabilities, reducing response time to just 15 minutes through Milestone video technology.

The organization, which serves over two million people through its extensive network of treatment plants and facilities, faced significant challenges in monitoring hundreds of remote operational units with outdated surveillance systems.

Working with integration partner Brasília Segurança, the company deployed a centralized security solution using Milestone's open-platform XProtect VMS. The system integrates 670 cameras across multiple locations, managed through a Global Monitoring Center featuring a four-meter LED video wall and dedicated operator workstations. The Milestone Federated Architecture ensures efficient data management with local recording servers at each site.

Just the beginning

The modernized infrastructure has significantly improved operational efficiency through simultaneous monitoring across multiple locations. When alarms trigger, operators instantly access video recordings and review the previous two minutes to assess situations. Confirmed incidents prompt immediate security team notification with ongoing remote support through the VMS.

"What began as a cost-reduction strategy has become a comprehensive solution that improves both security and operational efficiency. With each new expansion, we continue discovering new ways to leverage the open platform architecture to strengthen our operations."

Renan Humberto de Souza Cavalcante
Technical Manager, Brasília Segurança

Customer story > State of Tlaxcala

Integrated high-tech approach slashes crime

The Executive Commission of the State Public Security System (CESESP) in the Mexican State of Tlaxcala is dedicated to enhancing public security through technological advancements, with a special focus on video surveillance. Using open-platform, analytics-driven video technology, they achieved a 22.5% decrease in vehicle thefts and 93% reduction in cargo thefts.

Faced with increased crime and slowing emergency response, the commission expanded and upgraded its existing security infrastructure with a comprehensive video system centered on Milestone's XProtect Corporate. It handles video streams from a variety of camera brands — fully integrated with BriefCam video analytics.

Smarter policing, better results

BriefCam detects, identifies and classifies video metadata for more efficient investigations and decisions, such as finding missing persons, investigating vandalism, theft, assaults, accidents, injuries, or acts of violence — extracting and analyzing through heat maps, dashboards, and visualizations.

The upshot of the CESEP's analytics-driven efforts? A massive reduction in theft, and the lowest crime rate in Mexico.

"Milestone's VMS integration and the detailed analytics give operators a single data feed where the entire surveillance system can be accessed as needed. We don't miss a thing, which is priority number one when dealing with safety."

Isaac Sánchez Morales
Engineer, Digital Information Systems (SDI)
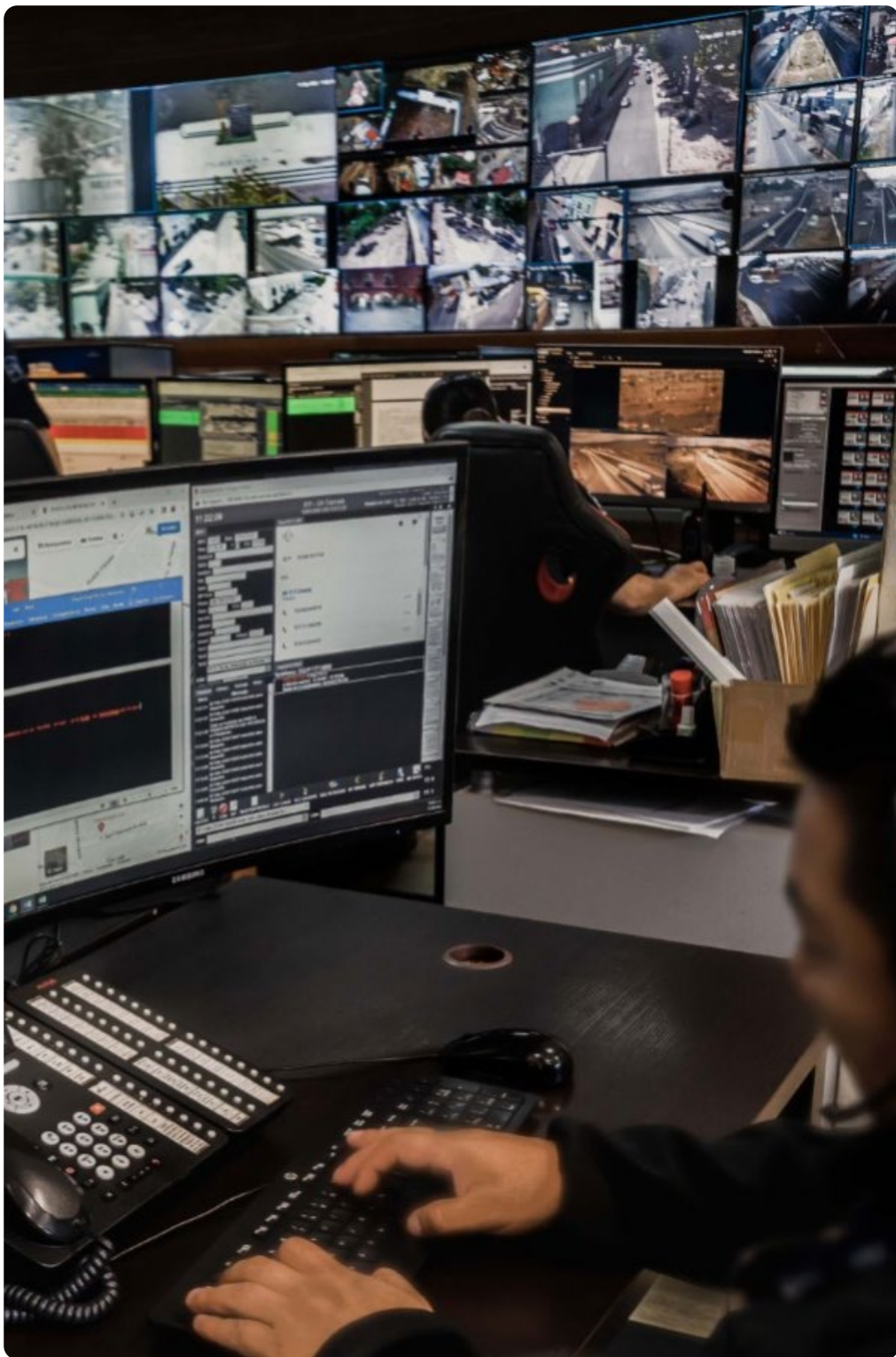
Ready for the next step? Here's what to consider

Before choosing a video analytics solution, it's important to evaluate your business goals and technical capabilities to ensure that your choice meets current needs and scales with future goals. Here's a checklist of some of the key considerations:

Business considerations for video analytics

It's essential to define the problems you're trying to solve. Clarifying your goals will help guide technology choices, deployment strategies, and success metrics.

1. Define the problem you are solving

Start by identifying the core challenges your organization faces. Some examples could include:

- **Incident investigation:** Do you need faster access to footage to resolve security or safety incidents?

- **Queue management:** Are long wait times affecting customer satisfaction or throughput?

- **Occupancy tracking:** Do you need to monitor how many people are in a space for safety, compliance, or efficiency?

- **Intrusion detection:** Are you trying to prevent unauthorized access to restricted areas?

Each of these use cases requires different types of analytics, camera placements, and processing capabilities.

2. Align use cases with business goals

Once you've identified the problems, map them to broader business objectives such as:

Improving security
- **Goal:** Reduce investigative time and improve incident resolution.
- **Use case:** Use AI-powered search and metadata tagging to quickly locate relevant footage.
- **Success metric:** Reduction in time spent reviewing footage or resolving incidents.

Increasing workplace safety
- **Goal:** Reduce injuries and improve compliance with safety protocols.
- **Use case:** Monitor high-risk areas like warehouses or loading docks, detect PPE compliance, and analyze near-miss events.
- **Success metric:** Fewer injury reports or safety violations.

Boosting operational efficiency.
- **Goal:** Improve productivity and optimize space usage.
- **Use case:** Analyze how people move through and use physical spaces, identify bottlenecks, and verify process adherence.
- **Success metric:** Increased throughput, reduced downtime, or better space utilization.

Reducing retail theft
- **Goal:** Minimize theft and reduce shrinkage
- **Use case:** Monitor high-risk zones, detect suspicious behavior, and integrate with POS systems.
- **Success metric:** Decrease in theft-related incidents or improved recovery rates.

Improving customer experience

- **Goal:** Increase satisfaction and revenue through behavioral insights

- **Use case:** Track customer journeys, dwell times, and engagement zones to optimize layout and staffing

- **Success metric:** Higher conversion rates, improved satisfaction scores, or increased average spend.

By tying video analytics to measurable outcomes, you can demonstrate ROI and make informed decisions about scaling or refining your deployment.

3. Choose the right cameras

The success of video analytics starts with selecting the right hardware. Not all cameras are created equal, and your use case will dictate your needs.

- **Match camera to use case:** Standard security cameras may suffice for general surveillance, but specialized devices — like bodycams for field staff or drones for large-area monitoring — require tailored solutions.

- **Camera compatibility:** Does the use case allow you to use your current IP cameras, or would it require upgrades?

- **Resolution matters:** What resolution level is appropriate for your use case? While 4K cameras offer high detail, they also increase GPU load and network strain. In those cases, you might want to consider dual-stream setups (e.g., one high-res for analytics, one low-res for monitoring) to balance performance and reliability.

- **Lighting considerations:** AI models often rely on color and contrast. Poor lighting can degrade AI performance, so consider supplemental lighting in low-light areas for optimal AI and analytics performance.

4. Find the right mix

The video analytics market continues to grow with an ever-increasing number of options available. Some video management platforms come with built-in analytics, while others rely on third-party systems that integrate with your existing infrastructure.

- **Built-in analytics** offer simplicity and faster deployment, making them ideal for common use cases like motion detection or basic object tracking.

- **Third-party analytics** often provide more advanced capabilities tailored to specific needs — such as facial recognition, behavior analysis, or license plate recognition.

To make the right choice, evaluate your current system and future needs. Ideally, your platform should support both: embedded analytics for everyday tasks and the flexibility to connect with third-party tools for specialized use cases.

5. Keep deployment options open

Your choice of deployment model can impact costs, performance and scalability. Each option — server-based, edge-based, cloud-based and hybrid — has its advantages governed by location, bandwidth, privacy requirements and other variables. That is why VMS vendors that support all four set you up for the best ROI.

- **Server-based analytics** allow you to scale by adding processing power centrally, without needing to replace your entire camera network.

- **Edge-based systems** analyze the data directly on the camera, which can offer more speed and bandwidth savings.

- **Cloud-based** offers more flexibility relative to edge-based options. You can add more cameras without infrastructure upgrades.

- **Hybrid** offers the most flexibility, notably the ability to move workloads between deployments as required.

Whether analytics run on the camera, on servers, or in the cloud, the key is having the freedom to balance performance, cost, and complexity as your needs evolve.

6. Consider the processing and storage requirements

Video analytics generate large volumes of data and metadata, which require robust infrastructure.

- **Processing power:** AI workloads demand more of your GPU processing. Your infrastructure must be able to scale with the number of cameras and the complexity of analytics (e.g., real-time facial recognition vs. post-event analysis).

- **Storage needs:** Metadata from analytics such as object detection, timestamps, and behavioral patterns need to be stored for investigations and insights. While not exceptionally large, it tends to accumulate and will need to be accounted for in your storage needs.

Some broader considerations

Is it future proof?

Return on investment is a key performance metric for any software investment. Obsolescence will derail that very quickly. That's why a non-proprietary, open platform VMS is so beneficial.

- **Open platform:** Customize, scale and adapt as needs evolve.
- **No lock-in:** Avoid being limited to a single vendor's proprietary ecosystem.

How user-friendly is it?

Even the most advanced analytics are ineffective if users can't access or interpret the data. And if the team feels it's too complex to use, uptake will suffer.

- **Intuitive software:** Interfaces should be designed for non-technical users, with clear dashboards, search functions, and alert systems.
- **Training and support:** Provide onboarding and ongoing training to ensure adoption and maximize ROI.

Which other departments will benefit?

Video systems are no longer confined to security teams. With the rise of APIs and metadata sharing, other departments can leverage video insights for diverse use cases.

- **API access:** Enable teams like marketing, operations, or customer experience to tap into video data for footfall analysis, queue management, or behavioral insights.
- **Governance and permissions:** Establish clear policies for cross-functional access to ensure data is used responsibly and securely.

Start your journey or take the next step with video analytics

Whether you are just starting to explore smarter video technology or are ready to expand, Milestone Systems can be your guide.

We've helped organizations across every industry successfully deploy video intelligence solutions.

Our team can help you:

Assess your current infrastructure and identify the most impactful analytics.

Develop a realistic roadmap that aligns with your budget and timeline.

Navigate technical decisions around cameras, processing, storage, and integration.

Address compliance and privacy considerations specific to your industry and location.

Ready to explore your possibilities and our portfolio?
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