



5 steps to improving security with portable, self-powered surveillance

Security is a critical and growing concern for business, government, schools, and the public in general. Yet all of them still face complications in deploying security throughout the entire area of concern – a shortcoming that leaves blind spots and results in ineffective safety.

In addition, global security concerns have spiked due to terrorism, mass shootings, and crime, as well as natural disasters. In 2015 there was a 120% increase in the number of countries that suffered more than 500 deaths, compared to 5 countries in 2013 and 11 countries in 2014. The increasing frequency of attacks on soft targets and critical infrastructure has only made the need for improved, rapidly deployable security more critical.

In the United States alone, there have been more mass shootings, defined as four or more people shot in a public area, than there are days in a calendar year. Of the 12 deadliest shootings in the United States, 6 have happened since 2007.

The role of the Industrial IoT

Police forces, which are often cash-strapped, will increasingly turn to data analytics and Industrial IoT technologies to protect citizens more cost effectively. For example, if someone is defacing a public space with graffiti, IIoT technology enables law enforcement to catch the perpetrator in the act by sending real-time alerts, so the cost to the city of remediation plummets. As a result, IIoT devices and platforms will be deployed in an ever-greater number of public safety programs.

Facing budget cuts, law enforcement will increase the use of web intelligence and big-data analytics to maintain service levels. As law enforcement seeks security solutions that show a clear return on investment for operation and protection, the tight police budgets will put pressure on security providers to offer better value. When legacy systems are replaced with newer analytics-based technologies, the boom in infrastructure security will only accelerate.

Current Security and Gunshot Detection Shortcomings

Costs and Savings. Traditionally, video surveillance and gunshot detection must be implemented as separate solutions. (See Figure 1 for cost comparisons and savings) Even after all the time and effort, cumbersome fixed solution create sunk-in costs, because they're not re-deployable, even though there may be no more use for them after the event for which they were deployed. For instance, the cost of current gunshot detection averages \$65,000 per year per mile, and the expense doesn't include trenching and deployment costs. Compare this expensive process with the rapid deployment and savings enabled by wireless, portable, self-powered devices that integrate both video surveillance and gunshot detection.

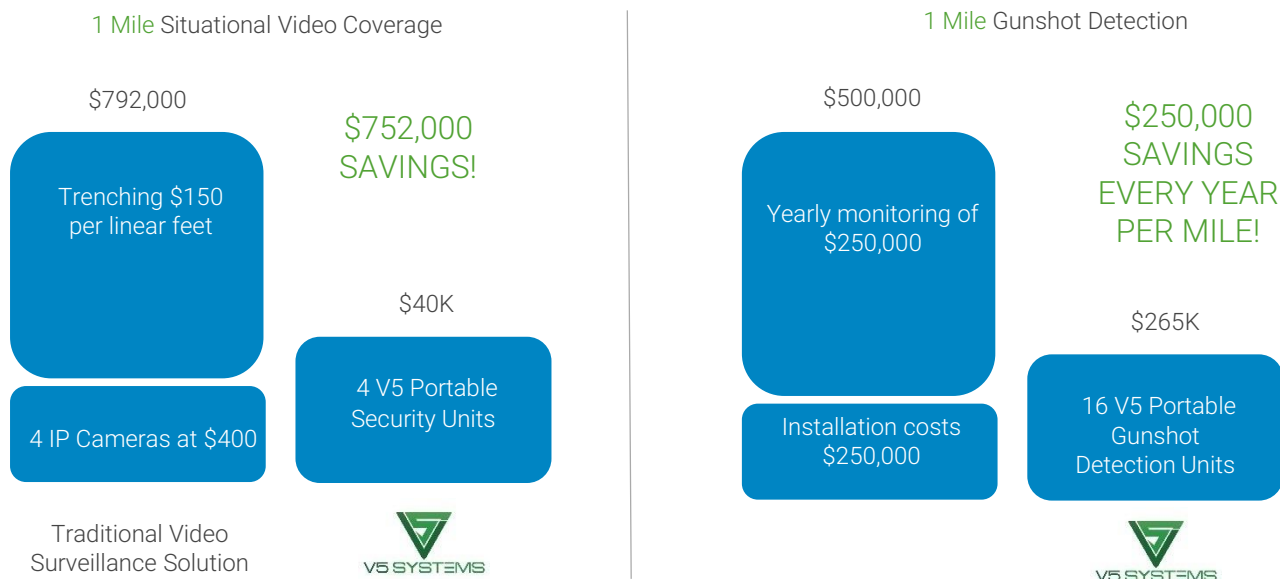


Figure 1: Traditional costs vs. V5 Systems costs



For both video and gunshot detection systems, months of delays can occur due to the need to acquire permits before trenching for the power and data lines can be implemented to connect to the remote data center. IT also faces the challenge of having to connect the separate functions to the data center and the steps required for traditional surveillance and gunshot detection. Most critically, once traditional systems are in place, they lack actual real-time alerts, because the information is sent to the server and then to the data center, etc., creating latency. As you can see by the diagram, this shortcoming delays response times.

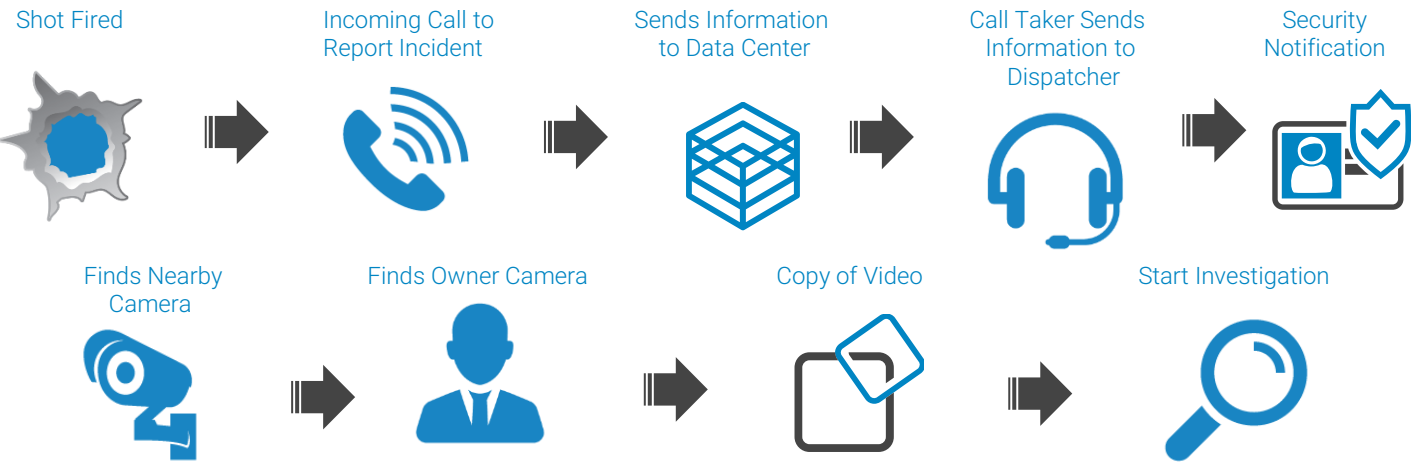


Figure 1: Traditional surveillance response timeline

The Next Generation of Security Is Here

Thankfully, security systems have improved and can now address critical shortcomings. The next generation enables cloud-based security systems that are truly portable, self-powered, intelligent solutions. They address the drawbacks of traditional security. Since this new digital security is wireless, permitting times and trenching costs are eliminated. Digital technology also means that analog video has become IP video.

A V5 Systems Self-Power Remote Security Unit that integrates the Dell Edge Gateway 5000

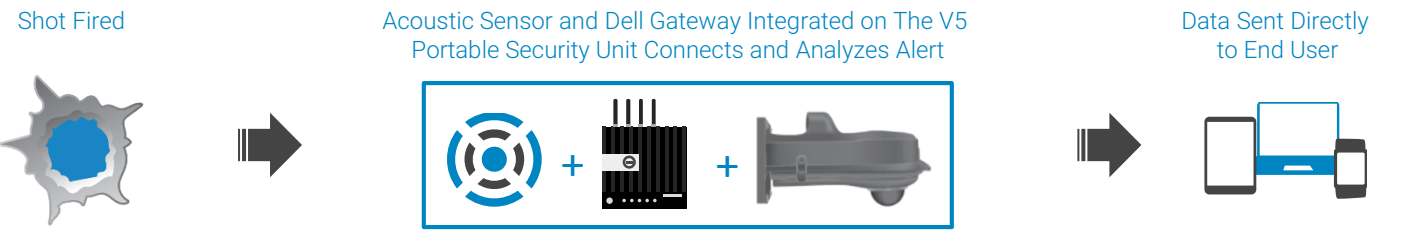


Figure 3: Solar Powered, Wireless Security With Integrated Sensors and edge computing alerts the end user faster than traditional gunshot detection.

Follow these 5 best practice steps to plan your security implementation

1 | Assess potential security risks in outdoor spaces and the surveillance business case

When an assessment is made for outdoor security, different environments have their own requirements. There are transient events, such as fairs, festivals, and marathons, which draw large crowds. In these instances, the rapid deployment and easy re-deployment of next generation security is especially relevant. In fixed locations, the speed of deployment and the cost efficiencies are also compelling. Such environments include securing college campuses, sporting venues, parks, downtowns and business campuses. Mass transit systems and critical infrastructure, such as office towers, must also be assessed for their unique security risks.

Now that the security risks have been assessed, companies should consider newer security measures, specifically, state-of-the-art security systems utilizing IoT technologies. The assessment should be conducted as early as possible, so all factors can be taken into consideration, including the need for video, gunshot, and chemical detection. During the assessment, planning must occur so that if something happens, the response can be proactive, not reactive. This speed advantage makes it easier for law enforcement or the other end users to look into the event. It also means the perpetrator can be caught, instead of being allowed to escape. Part of the assessment must take into account how much data the customer should archive and where the customer wants to interact with the data. Finally a business case should be developed based on and how much the customer/entity stands to lose if proper security measures are not in place. This can include losses such as cost of litigation, the impact on the community including support for local law enforcement/government, and the effect of a location losing desirability as an area to visit or conduct business.



2 | Assess the deployment location and identify implementation challenges

There must be a detailed assessment of the strengths and weaknesses of video and audio sensors, along with ideal deployment locations. The number of devices required to solve the security concerns/risks must be determined. Camera angles, fields of view, lighting conditions, and bandwidth usage must be evaluated. A decision must also be made about whether to deploy streaming video only vs video analytics for object detection in a zone. This aspect of the assessment includes determining if a complete solution can be implemented with current power and connectivity constraints.

3 | Plan for IT and OT collaboration

A successful surveillance deployment requires the collaboration of both Information Technology (IT) and Operational Technology (OT). IT must assess networking options, storage requirements, determine the optimal configuration and also support the integration of insights from the surveillance solution into existing IT systems where appropriate. OT will likely own the assessment of how to facilitate power and connectivity to the outdoor locations. Finally Video Management System (VMS) ownership between OT and IT must be decided on.

4 | Identify video and data storage requirements

Identify the storage requirements of the customer/entity and whether data should be stored on the cloud or on the edge. A determination should be made as to whether additional on-board storage of HD quality video should be provided to enable redundancy. There should also be a decision about whether real-time alerts should be sent through the UI of V5 Systems and via an Android/iOS app.

When determining if storage should be deployed in the cloud or on the edge consider the following details. Cloud storage requires a longer time to transmit data, and while cloud storage is usually not expensive, retrieving the data can be costly. There are also other issues, such as whether sufficient bandwidth is available, how reliable the uptime of the host is, and the speed of access to the cloud during peak usage. With that said, if your surveillance use case requires storing video data for more than 30 days it would be a challenge to deploy enough storage at the edge so you would need to store it in the cloud.

Edge storage has many advantages. It provides immediate access to the data because it's stored locally on the unit which reduces latency. It's also easier to access and cheaper. Data can be stored and retrieved through any smart device at no cost. It allows for up to 1TB of video storage for up to 30 days.

5 | Automate alerts to gain the greatest ROI

End users should be given hands-on training to ensure that they are capable of operating the system and maximizing its benefits. The training should include user-interface training and, if the solution allows, for mobile access and mobile app training.

Automatic functions, including real-time alerts, can be integrated into the system. Gunshot and chemical detection are automatically configured onto the platform and requires no setup. Video alerts can be set up in an easy 3-step process in the user interface:

Step 1. Draw a surveillance zone within the camera field of view.

Step 2. Set the parameters

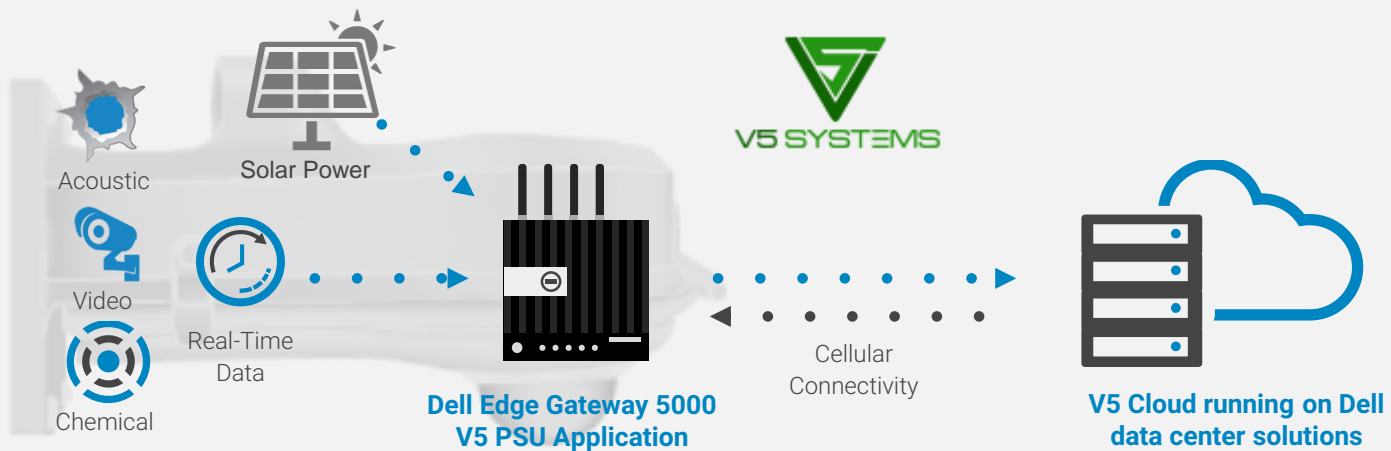
1. Person and/or Vehicle
2. Entering, Leaving or Staying in the zone

Step 3. Set the days and times you would like the zone to be active and to send an alert if the parameters are triggered.

Once set, these alerts will automatically be sent to any smart device via email or text to enable proactive responses. The email addresses and/or phone numbers where the alerts are to be sent must be provided.

Surveillance and gunshot detection solution example

V5 Systems Portable Security Units (V5 PSU's) are specifically designed to provide situational awareness video streaming and gunshot detection/location in any outdoor environment. V5 Systems features multiple on board processors, local storage, wireless communications, and V5 Sensors as well as an intelligent power system to make it portable and self-powered. The power management system includes built in logic to provide features such as power sensing to identify the source of highest current and voltage, power switching between multiple battery packs, power storage of up to 1000w per device, and auxiliary power packs for additional storage and extension of run times. This enables them to operate for 3-7 days without requiring a charge from input power sources. For local intelligence, the V5 Systems have an integrated the Dell Edge Gateway 5000 to collect, analyze and relay real-time video and acoustic data on the edge. Computing at the edge allows for edge-based analytics and greatly reduces false alerts by allowing end users to make real-time security assessments and respond to potential threats proactively, rather than reactively. By leveraging the on-edge computing provided by the Dell Edge Gateway 5000, V5 Acoustic Sensor Technology applies deep learning techniques (classifiers) to identify specific acoustic signatures (electronic ear). V5 Systems is able to identify the specific sound signature of a gunshot and triangulate the location from which it came. This triangulation is accomplished by deploying V5 GSL devices in minimum lots of 3. Additionally, intelligence at the edge enables the video sensors in V5 Portable Security Units to set/manage zones, recognize people and/or vehicles, track them and, when applied rules are broken, trigger alarms. Zone violation alerts are emailed or texted directly to the list of first responders designated by the system's admin. V5 Systems proprietary power management system enables V5 PSU's to operate in any outdoor environment with no need for external power or wired connectivity reducing deployment cost and time. As a result, they can be deployed in any outdoor environment in under 60 minutes.



Data Aggregation

Edge Storage

Edge Analytics

Connectivity

Big Data Analytics

Reporting

Cloud Storage



Along with our IoT Solutions Partners, we provide technology you can trust to help you get started quickly and efficiently.

Dell takes a pragmatic approach to the Internet of Things (IoT) by building on the equipment and data you already have, and leveraging your current technology investments, to quickly and securely enable analytics-driven action.

The Dell IoT Solutions Partner Program is a multi-tiered partner ecosystem of technology providers and domain experts to complement Dell's broad portfolio of IoT-enabling technologies.

To learn more visit us online at: www.delliotpartners.com

Contact Dell Sales to learn more about the Dell Edge Gateway 5000, our ecosystem of qualified partners, and to deploy this flexible surveillance and gunshot detection solution today.



**IoT Solutions
Partner Program**

Dell IoT Solutions
One Dell Way
Round Rock, TX 78664
www.dell.com/iot
1-800-438-9973