Photo: Lance Murphey / Source: Memphis Daily News

CASE STUDY

MEMPHIS HITS THE RIGHT NOTES WITH SURVEILLANCE

The Memphis Police Department finds that a combination of traditional and unconventional surveillance works best to keep the city safe.

INTRODUCTION

By virtually any account, Memphis is a storied city with a fascinating history. Situated along the Mississippi River, it is a major port area for the United States and home to the fifth-largest inland port in the country. It is home to iconic American sites such as Beale Street, the hub of the Memphis' blues scene and where artists like Louis Armstrong and B.B. King helped to develop and define the Memphis Blues sound. It is home to Graceland, Elvis Presley's mansion-turned-museum and final resting place. Aretha Franklin was born in Memphis. Martin Luther King Jr. was assassinated there. Racial and social tensions, along with the ebbs and flows of immigration, politics, and urbanization, have helped to shape Memphis into the city it is today.

The Memphis Police Department (MPD) has a vision to create and maintain an environment of public safety "with focused attention on preventing and reducing crime." Video surveillance has played a key role in having this vision come to fruition. It started in 2007, when MPD began considering ways to further protect the city's critical infrastructure assets, including the port area and other commercial hubs, which could be potential targets if the city were to come under attack.

REQUIREMENT: Surveillance High and Low

Kenneth Shackleford, former technology manager at MPD who has subsequently retired from the force, was tasked with developing a surveillance program to monitor these assets. The police force wanted to explore a variety of surveillance configurations to meet the safety needs of its citizens and critical infrastructure. They thought surveillance cameras would be most useful on public utility poles, the elevated height of which would give the police a wide field of view with the capability of zooming in on critical details.

"I started looking at ways that we could start installing cameras throughout the city," Shackleford said. He is now vice president of sales at SkyCop, a trusted local integrator that specializes in law enforcement, military, and private industry installations. "I started looking into ways to stream video and came across H.264 compression. That's how I found Hikvision — they were offering the technology."

In addition to the pole cameras, Shackleford and his team wanted to explore the idea of having cameras affixed to buildings to provide eyes on the ground and a more detailed look at certain areas within Memphis. They also wanted to find a mobile solution that would help MPD efficiently monitor special events that were not covered by existing surveillance.

SOLUTION: A Mix of Mobile and Stationary Monitoring

MPD eventually decided on a mix of all three configurations; pole cameras, cameras attached to buildings, and mobile trailers are all employed at designated spots. So far, the police department has established a network of about 600 of Hikvision's analog and IP bullet and dome PTZ cameras throughout the city. Building

Source: Memphis Daily News

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exteriors, for example, are often outfitted with the DS-2CD2032-I, a 3 MP outdoor bullet camera with a body type that allows for easy mounting to building exteriors. Aside from wide dynamic range that extends the light range that the camera can capture, this camera also offers line crossing and intrusion detection features to make surveillance more effective. These features can send alerts to the police when someone enters or leaves a designated area.

The footage from these cameras, which are placed at strategic points around Memphis,

One of the most fascinating solutions that MPD has put in place is a gunshot detection feature that works in tandem with the PTZ cameras. A circuit board is programmed to listen for gunshots and essentially filters out all other noise. Microphones atop the enclosure pick up any possible gunshot sounds, and if those sounds are heard, the detector triangulates the location of the shot. It then guides the camera to pan, tilt, and zoom in the direction of the gunshot within seconds.

MPD is pleased with the novel ways that the cameras are being used to fight crime, and

as a finishing touch. These units are peppered throughout the city, from Beale Street to the ports and many areas in between. To further protect police force and sensitive operations, a local wifi system is employed that enables officers to pull up to an enclosure, connect to the network, and discreetly pull data without even exiting the car.

RESULTS: Additional Eyes and Evidence to Fight Crime

MPD has experienced noticeable benefits from their citywide surveillance program.

"Two years ago, we had a local store that had multiple break-ins," Sergeant Patty said. "We put a SkyCop trailer on the property to monitor the area and we had zero incidents the next year. I'm a firm believer that these cameras work."

> ❝ **The DarkFighter is a great camera and the quality is unbelievable. The analytics are impressive as well.** ❞

Sergeant Joseph Patty, video surveillance manager for MPD

flows back to the MPD Real Time Crime Center (RTCC). The RTCC is used to enhance security for city assets and infrastructure and has become a sophisticated way for the city to fight crime. It features a large video wall that can pull up live streams from surveillance cameras that have been deployed throughout the city, as well as unique software that provides instant information on recent criminal activity in a radius around a crime, existing crime patterns in the surrounding area, and a history of people with arrest records who may frequent the neighborhood.

"We have a video wall with dozens of monitors and we can pull up any police camera feed in the city," said Sergeant Joseph Patty, who has succeeded Shackleford as the video surveillance manager for MPD. He and Director of Police Services Toney Armstrong have driven MPD's technology program as it continues to evolve. "We have about 30 workstations out on the floor that can view the video wall or pull up any camera feed."

Additionally, MPD has invested in mobile trailers that are powered by generators or solar energy. These trailers, equipped with two cameras, are used for parking lots, malls, and special events. Officers in the RTCC can monitor events live and respond as needed.

"We also have long-term deployments that are basically skids — a 4x4 footprint with two solar panels and a retractable 30-ft tower," Sergeant Patty said, also noting that they have about two dozen of these trailers.

Sergeant Patty and his team were particularly impressed with Hikvision's DarkFighter PTZ camera (DS-2DF8223I-AEL). In addition to smart features such as detection of line crossing, intrusion, region entrance/exit, and audio loss, the DarkFighter thrives in challenging low-light environments and features 120 dB wide dynamic range as well as a sharp 23x optical zoom lens with autofocus. These elements help to provide crystal-clear color images day and night — making the DarkFighter ideal for 24-hour surveillance applications.

"The DarkFighter is a great camera and the quality is unbelievable. The analytics are impressive as well," Sergeant Patty of MPD said.

Each pole camera unit actually contains anywhere from one to three cameras, one of which is typically the DS-2DF1-717-B, a network PTZ camera that boasts an 80-meter infrared range and 128 dB wide dynamic range for true day-and-night coverage. These units also use Hikvision's DS-2DF7286-AEL, a 2 MP outdoor network speed dome camera. Aside from the smart features also found in the DarkFighter, this PTZ offers 30x zoom to hone in on crucial details.

SkyCop was also able to assist MPD with a unique deployment for the pole cameras by developing and patenting an enclosure to house the cameras and all of their related equipment: a DVR or NVR, an encoder, a power supply, and a router. A flashing blue light — a nod to a police car's light bar on the roof — is placed on the enclosure

He also said that the department receives a lot of positive feedback on the cameras and that they have become an instrumental tool in catching criminals.

"We have numerous cases prosecuted thanks to these incidents being captured on video," he said. "Plus, we're able to dispatch calls from the RTCC and view live video before the officer even arrives on the scene."

CONCLUSION

Memphis, a city with a rich history of creative and trailblazing American icons, has found a way to capture the city's creative spirit in surveillance applications as well. Hikvision's surveillance solutions have helped the police department turn an idea about protecting citizens and critical infrastructure assets into a full-scale operation that has already proven effective in battling crime.

MPD is not resting just yet, though. The police are continually tweaking Memphis' surveillance setup and looking for better ways to deploy the existing cameras. They are also looking to expand the network and upgrade the older analog cameras to those of the IP variety. But from the novel gunshot detection to the sophisticated operations at the RTCC, it's clear that both the city and police department are focused on hitting all the right notes for safety.

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