Charleston Int'l Blankets Pre-Security Areas With Gunshot Detection Sensors

BY RONNIE L. WENDT

FACTS&FIGURES

Project: Gunshot Detection System

Location: Charleston (SC) Int'l Airport

Operating Entity: The Charleston County Aviation Authority

Cost: Less than $100,000

System: Guardian Indoor Active Shooter Detection & Reporting System, from Shooter Detection Systems

Security Systems Partner: Johnson Controls Security Solutions

Project Timeline: Aug. 2018-early 2019

Key Benefits: Shot detection in public side of terminal speeds response to verified threats; system integrates with access control, video management & critical communications systems

There's a poignant art exhibit at Charleston International Airport (CHS) about the church shooting that rocked the South Carolina city in 2015. The memorial includes a Bible open to the passage that victims were studying the night of the tragedy. For most, the multimedia display is a tribute to the nine people killed and five wounded in the racially charged incident. For Paul Campbell, executive director and chief executive officer of the Charleston County Aviation Authority, it is

PAUL CAMPBELL

also a somber reminder of CHS' commitment to the safety of its passengers and community.

"The airport continually seeks advanced solutions to provide better protection for passengers against all measures of threats. But the 2015 Emanuel African Methodist Episcopal Church shooting, and other mass shootings that followed, sparked the airport's search for active shooter technology," he commented in a press release.

That quest led to the recent installation of an approximately $100,000 gunshot detection system that covers baggage claim, ticketing and other areas of the terminal before the TSA checkpoint. "It is

my understanding that we are the first airport in the country to utilize this technology in a public setting," says Tedd Steele, senior network architect at CHS.

TEDD STEELE

The Guardian Indoor Active Shooter Detection and Reporting System, by Shooter Detection Systems (SDS), provides the airport with location information and associated video within 1½ seconds after a shot is fired to help speed response to verified shooting incidents. Campbell calls it "life-saving technology that adds a vital layer of security against the active shooter threat."

Minimizing Chaos

Multiple airport shootings here and abroad have inspired a growing interest in shot detection technology. As of mid-April, Abilene Regional in Texas is the latest U.S. airport to install a system like the one at CHS, and other Category X airports are also using the technology. Los Angeles

International recently announced plans to install the Guardian System in its new automated people mover facility.
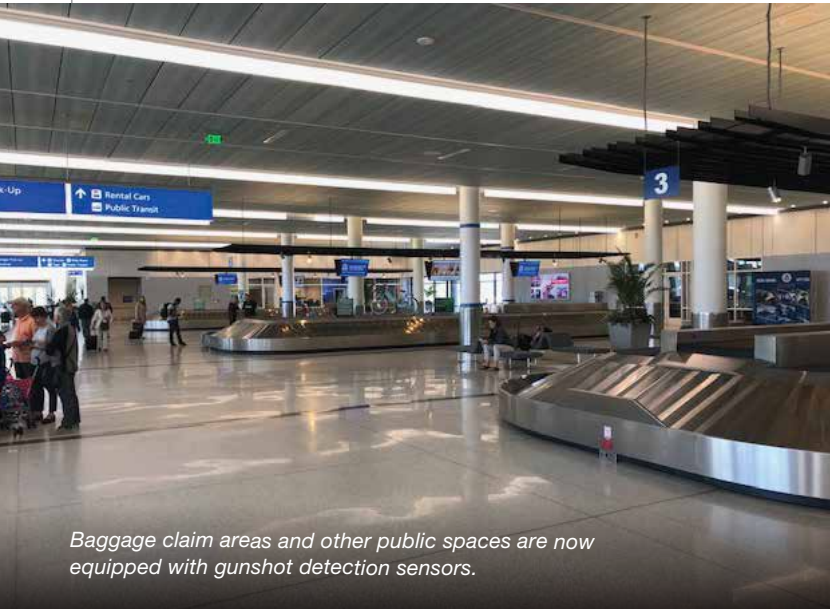
Christian Connors, chief executive officer of SDS, notes that many terminal operators are interested in preventing the mass confusion that occurs during actual or suspected incidents. "Airport personnel don't always know there is a shooting right away, and sometimes there is a lot of misinformation that goes out once they do," Connors explains. "Look at what happened at JFK International when people were cheering about the Olympics, and others thought it was an active shooter situation. The post-analysis of that incident found there were reports of 40 shooters, when in fact there was no shooter at all. Even at Fort Lauderdale, when there was an active shooter, the airport received reports of multiple shooters in other terminals when, in fact, there was only one. Our system takes confusion and human panic out of the loop by digitizing everything and quickly getting information out to security personnel and police, as well as passengers."

The installation at CHS came after an exhaustive review of various gunshot detection systems, says Steele. Ultimately, the airport selected the Guardian System for its technology, performance and third-party credentials, including SAFETY Act Certification by the U.S. Department of Homeland Security. Officials also liked that the airport's security systems provider, Johnson Controls Security Solutions, had previously partnered with SDS on other projects.

"We wanted a system that was very reliable and compatible with what we already had," summarizes Airport Security Manager Nick Haynes.

The project team found it attractive that the SDS system already had certified integrations with the other technologies used in the airport's security system. Johnson Controls installed the new shot detection technology and will help maintain it.

"The airport wanted a complete package that could simply plug into their current system, and our system fit the bill," says Connors.

Baggage claim areas and other public spaces are now equipped with gunshot detection sensors.

System Specs

Originally developed for the battlefield, the Guardian System utilizes sensors placed every 80 feet within a given space. The sensors use a combination of acoustic and infrared technology to "hear" the sound and "see" the flash of a gunshot. The system processes audio and visual information from the sensors to determine if a gunshot occurred. According to company personnel, the system can pinpoint a shooter's location to within 40 feet.

"There are no false positives," adds Steele. "The system can determine gunshots with a high degree of accuracy thanks to the dual-mode sensors. It knows the difference between firecrackers or loud bangs and a gunshot."

Moreover, the system at CHS is configured to trigger multiple reactions if a shot is detected. Alarms are automatically triggered, specific doors are locked or unlocked, information is sent to first responders and alerts are broadcast through the public address system. Because the shot detection system is integrated with the airport's video management system, security cameras can track a shooter's movement through the facility, which helps police find the perpetrator and neutralize the threat more quickly.

For all this to happen seamlessly, the sensors must be placed correctly. Johnson Controls and SDS performed a walkthrough of the terminal with a software tool that ensures coverage overlaps to eliminate dead zones. Crews then installed sensors along the ceiling of pre-security areas.

"The system requires a cabled infrastructure," states Greg Livesay, a business development specialist with the Advanced Technologies Group, Government Technologies of Johnson Controls Security Solutions. "To do this, we figured out what the most appropriate design would be, and then ran the cable and installed the devices."

Few other changes were required at CHS because the airport already had a robust infrastructure in place, notes Connors.

Sensors have anti-tamper technology to prevent physical sabotage. In addition, each contains a firewall and uses military-grade encryption to prevent hacking. "If someone were to manipulate them, a maintenance alarm is sent immediately to the gateway, and any connected systems are also notified," Livesay says. Standard maintenance needs are communicated via text alerts.

The sensors are plug-and-play technology and do not require calibration, adds Connors. They are also programmed to perform a built-in test to analyze their components and output. Such records are logged; so if there is an issue with a sensor, an alert is sent automatically to the airport and integrator.

"In other words, if someone hangs a neon sign next to a sensor after it is installed, the sensor will know its environment has changed, and it will let you know," explains Connors. "In addition, we use a patented gunshot tester during installation to ensure each sensor is online and working; and then we run a simulation and training tools tests to ensure all integrations are configured correctly."

According to military-style reliability tests, SDS sensors and components have a minimum lifecycle of approximately 10 years.

Deep Integration

After sensors were installed at CHS, Johnson Controls integrated the new Guardian system with the airport's access control system and other systems. The multifaceted integration is what enables the system to generate gunshot detection alarms, activate facility doors, cue cameras to record a shooter's location and stream live video and maps to significantly reduce

Gunshot sensors are integrated with other airport systems to speed notifications and evacuations.

response time during an active shooter incident.

"The integration was quite simple," reports Connors. "It's a software integration that has been certified on both sides."

If a shooting would occur at baggage claim, security cameras tied to the sensors installed there will automatically pull up views of the area. "We have numerous cameras that are tied to each sensor," explains Steele. "As each sensor is triggered, it will automatically initiate an alarm call within the Genetec Security Desk system that [airport] police monitor 24/7. They will get an alarm along with video of the area and a map of where the sensors are. Even though this is not a large airport, we still want responding officers to know where to go."

Integrating the gunshot detection system into the facility's video management system was key, Connors emphasizes. "1½ seconds after the shot goes off, responders have video. Some of our customers have up to 2,000 cameras, and it's impossible to search that many cameras quickly. By integrating with the video management system, we bring up the exact area where the shot occurred so officials can see what is happening in that area, how many people are injured, and how many shooters there are. All of this happens without anyone having to make a panicked 911 call."

The airport may also integrate the system with flight information boards located throughout the terminal. This would allow it to use the digital displays to alert passengers who have passed through the TSA checkpoint about an active shooter situation on the pre-security side.

The extent of integration at CHS is what makes its system truly unique—and more effective, notes Livesay. A standalone gunshot detection system not integrated with other airport systems would connect to a computer in the security operations center and send text messages to first responders.

"When you move to what Charleston's done with integration, users don't interact with the gateway anymore; they interact with their usual systems. Shot detection becomes another sensor on their workstations," he explains. "A video management system has a graphical user interface of camera locations; so when a gunshot goes off, video from that area will be pulled to the front. Operators will see it and turn to their standard operating procedure, which is an all-call on the radio with a description of the suspect and location. There will also be some predictive knowledge going out, such as where the shooter is headed. They are no longer just responding to a threat but responding in an intelligent way."

Integration and response improvements notwithstanding, Campbell hopes CHS will never need to use its new gunshot detection system.

Haynes agrees wholeheartedly, noting that it's gratifying to help make CHS more secure and potentially encourage other airports to do the same. "We keep having issues across the country, but it seems like no one ever does anything to correct them," he reflects. "We hope others will see what we've done and follow our lead to try and reduce some of these problems."

Editor's Note: To help maximize security and safety at Charleston International, we omitted certain details about its new gunshot detection system. However, airport personnel will gladly answer questions directly from industry peers. Contact Nicholas Haynes at 843.767.7261 for more specific details.