



**LOUROE
ELECTRONICS®**

World Leader in Audio Monitoring Technology Since 1979

A SOUND SOLUTION FOR SAFE CITIES



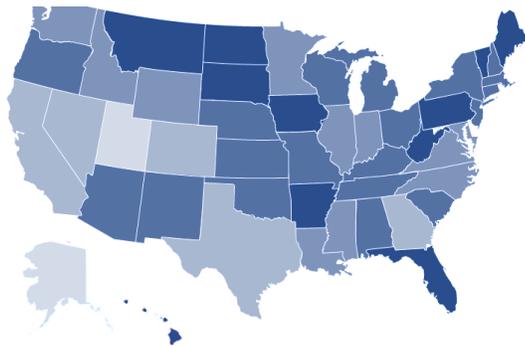
white paper

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COMBATING CRIME AND THE DEMAND FOR THREAT DETECTION

A violent crime occurs once every 26.3 seconds in the United States. As such, reducing crime in metropolitan and suburban areas is arguably the highest priority for municipalities and law enforcement. Nevertheless, there has been significant progress in recent years. When considering trends over the last decade, the 2015 estimated violent crime rate was about eight percent below the 2010 level and about 25 percent below the 2005 level, according to Crime in the United States, a 2015 report by the Federal Bureau Investigation (FBI). However, combating lawless behaviors continues to present steep challenges.



**Crime Costs:
\$3,257 per
U.S. Taxpayer**



In addition to the emotional and physical damage that occurs when an offense is committed, every act of violence carries with it a monetary cost. The fees for investigators, lawyers, medical procedures and other services add up quickly. The Institute for Economics & Peace’s 2012 United States Peace Index report estimates that the average cost of violence “related only to paying for police, justice, corrections and the productivity effect of violent crime, homicide and robbery is \$3,257 for each U.S. taxpayer or \$460 billion for the United States economy.”

Fortunately, steps can be taken to effectively reduce or deter crime, increasing safety, and saving time, money and resources for everyone involved. According to statistics reported by the nonprofit organization, The Peace Alliance, “investing early to prevent conflicts from escalating into violent crises is, on average, 60 times more cost effective than intervening after violence erupts.” In other words, immediately identifying a potential danger gives personnel more time to assess and react, which can make all the difference when trying to diffuse a situation and minimize the damage.

**Prevention is
60x
More cost
Effective**

Today, threat detection technologies and data analytics such as motion sensors, thermal imaging and license plate capture, have become essential components of security solutions for the safe cities sector. However, these elements only focus on the visual factors. A truly comprehensive city security solution must include sound detection, as audio analytics provides additional situational awareness, proactive evaluation and early warnings.

IMPORTANCE OF AUDIO AND AUDIO ANALYTICS

When it comes to protecting cities and enhancing public safety, acoustic solutions are essential. This is particularly true when it comes to delivering critical information to first responders. Sound is often one of the earliest indicators to a first responder that something is wrong. Knowing that sound plays such an important role in early risk identification and emergency response, it seems only logical that security personnel deploy video surveillance systems that integrate audio. The context provided by knowing a gunshot was detected or an individual was yelling for help is invaluable, and in some cases, could be the determining factor in effectively responding to and handling a life or death situation.

Adding audio to a surveillance solution is the first step in deploying smart city security. One and two-way audio solutions allow for proactive and real-time monitoring. Security staff can remotely interact with suspicious persons in real-time, rather than needing to physically dispatch a guard or law enforcement official to the area. Instead, officials can monitor multiple zones, restricted areas, or commercial locations, to better identify threats in progress and quickly respond with verbal warnings and directions. Utilizing audio also helps combat false alarms and provides secondary alarm verification in the case of an emergency, robbery, security threat or other event by allowing companies to both see and hear what is going on. However, it is not enough for a system to just listen. The monitoring solution must listen intelligently. In other words, a city surveillance system should also be capable of running audio analytics.

Audio analytics help security and law enforcement personnel define which acoustic events are of interest and which are irrelevant. The technology works similarly to the way in which the human ear processes sound. When an audio signal comes in, the sound detection software analyzes the noise based on advanced algorithms and determines whether it is a match for other sound patterns from pre-classified sources. Once a sound is identified as a positive detection, the software sends an immediate alert to security staff through the video management system (VMS). Ultimately, audio analytics are useful to municipalities because they identify the acoustic events commonly associated with crimes, alerting first responders prior to a precarious situation reaching its full potential.

The benefit of audio analytics in cities may be best showcased through duress or aggression detection. According to the FBI, the estimated rate of aggravated assaults in 2015 was 237.8 per 100,000 inhabitants. Today, there is research that indicates that 90 percent of physical aggression is preceded by verbal aggression. The value of an aggression detection solution is that it allows security officers to identify stressed voices and other sounds associated with anger, fear and verbal aggression. Upon receiving an alert from an aggression detector, guards can engage antagonistic individuals immediately, resolving the conflict before it turns into physical violence. This technology is an indispensable tool when it comes to prevention and cities would do well to adopt it.



Another key advantage of aggression detection and other audio analytics solutions is that the technology upholds privacy. Sound detectors do not record speech. Instead, the software analyzes sound frequencies, volume level, time duration and other sound patterns. When a sound detector is deployed with a surveillance camera at a street intersection, the system does not listen for keywords or language, but strictly listens for acoustic events that indicate a threat.

DEPLOYING AUDIO AND AUDIO ANALYTICS

By providing key crime information and threat indicators, audio monitoring and audio analytics prove themselves as a worthwhile investment. Below, are three solutions every city could benefit from using.

1. OUTDOOR MICROPHONE.

When deploying an audio monitoring solution for street surveillance, an external microphone mounted on to structures such as utility poles or light poles is ideal. For this reason, external microphones, such as Louroe Electronics' Verifact® E, are recommended for deployment over built-in microphones inside cameras for improved audio quality.

2. TWO-WAY AUDIO SOLUTIONS.

In addition to capturing sound, a safe cities audio monitoring solution should also have talkback capability. This can be achieved with a two-way horn speaker that has a built-in microphone like Louroe Electronics' TLO. This kind of solution is most effective in situations where law enforcement need to quickly broadcast a mass safety message to a crowd.

3. AUDIO ANALYTICS SYSTEM.

Security and law enforcement teams can sometimes focus on integrating just one sound analytic into their security solution. However, this approach is an incomplete one. In order to be prepared for all public safety hazards, a system should utilize multiple analytics that listen for different dangers and run simultaneously such as Louroe Electronics' LE-802 Intelligent Audio Analytics System.

Here are the two most essential analytics for a safe city sound detection solution:

- **AGGRESSION** – To detect verbal abuse and hostile interactions likely to develop into assaults or altercations.
- **GUNSHOT** – For immediate notification to first responders that a firearm has been discharged.

CONCLUSION

Rising safety concerns and notable crime rates have made threat detection a top priority. According to the 2016 Threat Detection Effectiveness Survey conducted by RSA, “only 24 percent of organizations are satisfied with their current ability to detect and investigate threats using their current data and tools.” That same survey also notes that these organizations are devoting 47 percent of their security investment in staff and technologies for prevention over the next 12 months. Technologies that prevent incidents or provide immediate notification of emergencies can make cities safer and reduce security costs.

If your current security solution does not incorporate audio technology, ask your integration partner to assess the system. Together, review your solution’s strengths and discuss where audio can improve its performance. Ask your integrator to recommend audio products for your consideration and demonstrate the technology. These simple steps will lead to an improved security system and ultimately a safer city.

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ADDITIONAL RESOURCES AND LINKS

Louroe Electronics' solutions for the safe cities market.

- **Verifact® E:**

<http://www.louroe.com/product/verifact-e/>

- **TLO:**

<http://www.louroe.com/product/tlo-nm/>

- **LE-802 Intelligent Audio Analytics System:**

<http://www.louroe.com/product/intelligentaudioanalyticssystem/>

ABOUT LOUROE ELECTRONICS

Located in Van Nuys, California, Louroe Electronics® has been the world leader in audio monitoring technology since its inception in 1979. Recognized globally, Louroe Electronics' products are used in over 50 countries and are utilized by both the private sector and government.

The company's Verifact® line of microphones, complementing base stations, and communication accessories, provide line level output to interface with various digital electronics. For over three decades, Louroe Electronics has maintained rigorous standards to ensure their products provide reliability, durability, and excellent performance for their customers' needs.

For more information about Louroe's audio solutions, visit www.louroe.com or call 800-927-6498.

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