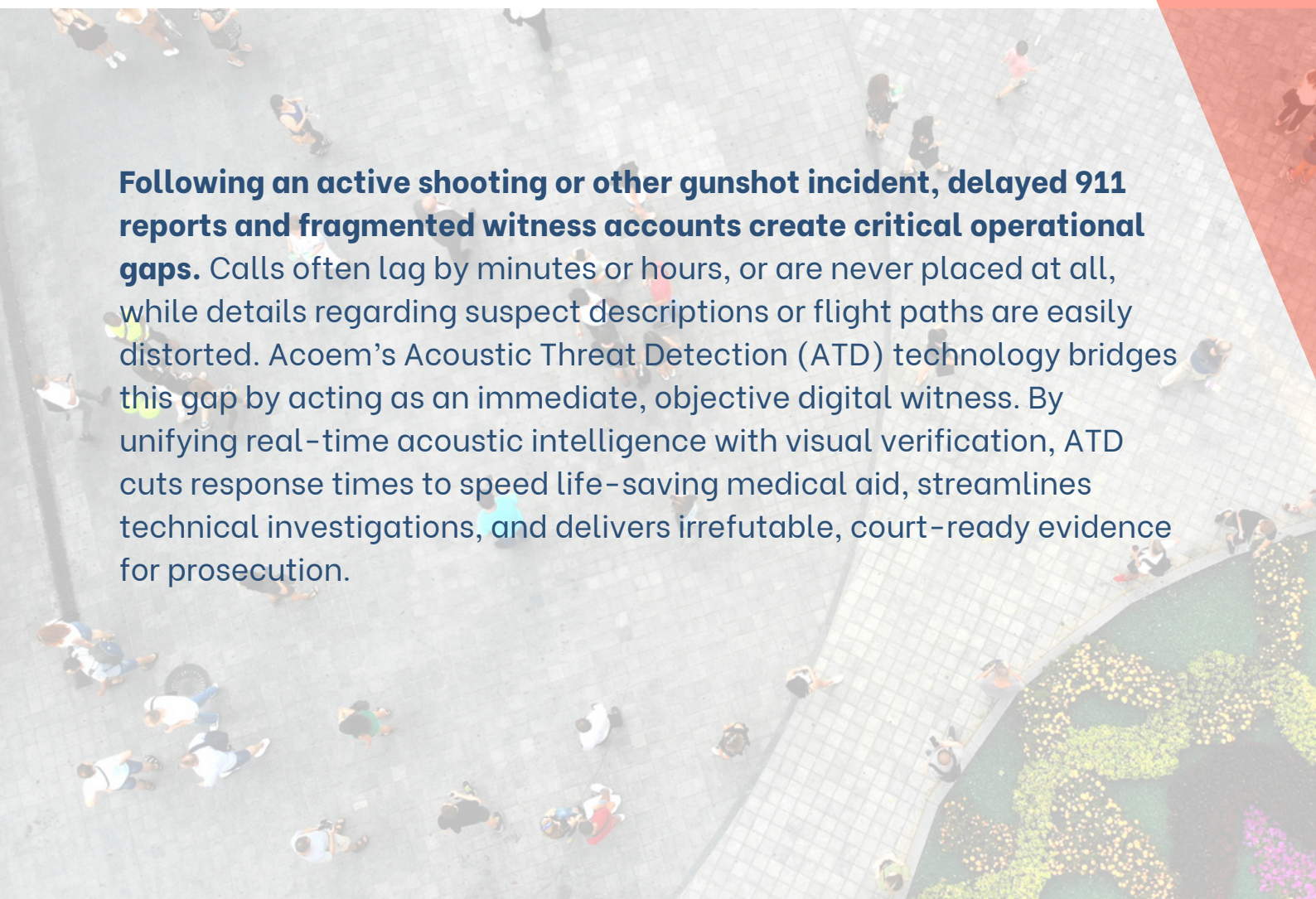
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The Silent Witness: Building Compelling Cases with Acoustic Threat Detection (ATD) Technology

A strategic brief on revolutionizing investigations through integrated acoustic and visual intelligence



Following an active shooting or other gunshot incident, delayed 911 reports and fragmented witness accounts create critical operational gaps. Calls often lag by minutes or hours, or are never placed at all, while details regarding suspect descriptions or flight paths are easily distorted. Acoem's Acoustic Threat Detection (ATD) technology bridges this gap by acting as an immediate, objective digital witness. By unifying real-time acoustic intelligence with visual verification, ATD cuts response times to speed life-saving medical aid, streamlines technical investigations, and delivers irrefutable, court-ready evidence for prosecution.



From Acoustic Alert to Irrefutable Evidence

More than a simple alert mechanism, Acoem ATD introduces true acoustic intelligence to physical security, delivering immediate, objective intelligence when seconds count.

Powered by an edge-based AI engine and backed by 30 years of acoustic expertise, a single sensor can:

- **Detect & Classify in Real Time:** Analyzes 96 acoustic attributes to confirm gunshot signatures and shot count without continuous audio streaming, fully preserving citizen privacy.
- **Significantly Minimize False Positives:** Uses a Dual-Detection Standard to mathematically cross-verify muzzle blasts and ballistic shockwaves, filtering out fireworks, backfires, and urban noise to protect operational resources.
- **Automate Visual Verification:** Instantly commands PTZ cameras via ONVIF-S to slew to exact coordinates, turning raw acoustic triggers into live video evidence.

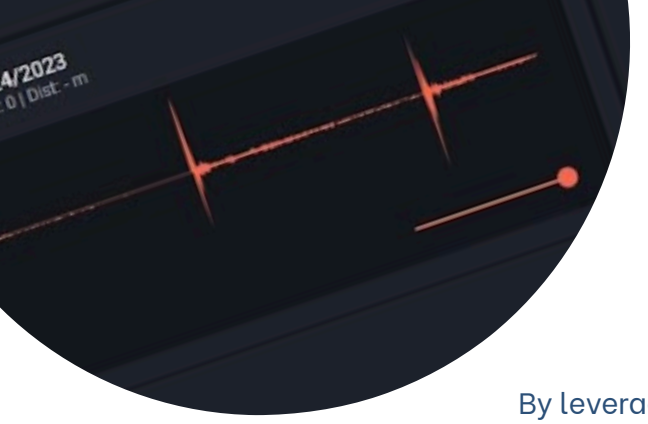
This multi-layered intelligence provides an unassailable foundation for investigations. Directing patrol units to precise coordinates enhances officer safety, accelerates life-saving medical aid, and preserves pristine physical evidence at the scene. Fusing verified acoustic timestamps with synchronized video equips law enforcement with definitive, court-ready evidence built for prosecution.

The Power of Integrated Audio-Visual Forensics

ATD provides the immediate “what“ and “where,“ while automated video integration delivers the critical “who“ and “how“.

Unlike always-on surveillance networks, ATD relies on event-driven activation. Microphones do not record ambient audio, and visual cueing is triggered strictly when a valid acoustic threat signature is confirmed at the edge. Automating PTZ camera alignment to exact coordinates provides first responders with immediate, multi-angle visual context, suspect tracking, and vehicle identification. This creates an objective, timestamped forensic record built for prosecution.





For technical investigators, the precision synchronization of acoustic timestamps with corresponding video frames is paramount. This integration creates a powerful, undisputed timeline of events, often accurate down to the millisecond.

By leveraging your existing cameras and infrastructure, the ATD system delivers integrated data that includes:

- **Verified Video Evidence:** Automatically slews connected PTZ cameras via ONVIF-S to the incident origin. The event video is instantly bookmarked in your VMS with precise millisecond timestamps, capturing critical moments during and immediately after the event.

- **Corroborating Audio Data:** Captures an event-specific audio clip tied directly to the acoustic signature, linking the sound file to the exact video frame without recording continuous background audio.

By establishing a verified, objective starting point, this integrated data streamlines the investigative process. Technical investigators can immediately validate timeline details, verify witness statements, and preserve crucial evidence before scene integrity is degraded. This localized, event-driven approach enables agencies to build strong, transparent cases backed by indisputable scientific data to deliver court-ready evidence while maintaining full public trust and privacy compliance.

Real-World Impact: The Town of Edenton, North Carolina

TThe field effectiveness of this integrated approach is demonstrated in the Town of Edenton, North Carolina. Partnering with Acoem, the Edenton Police Department deployed an ATD sensor network to deliver high-precision acoustic intelligence without complex server infrastructure or prohibitive costs.

A prime example of the system in action occurred on October 31, 2022, when an ATD sensor detected multiple shots fired. The system immediately alerted department personnel and commanded connected cameras to capture the scene. The paired, timestamped video evidence enabled investigators to identify two shooters, leading to their arrest within 24 hours. By seamlessly integrating with Edenton's existing camera infrastructure, Acoem ATD provided the real-time visibility and conclusive data needed for swift action.



According to Chief Henry King Jr., "Having technology like this in our tool belt keeps us one step ahead of criminals."

Building Compelling Cases for Conviction

Fusing edge-verified acoustic data with automated video evidence provides an unassailable baseline of proof, streamlining technical investigations and accelerating the path to conviction.

- **Objective Digital Evidence:** Unlike fallible eyewitness accounts or delayed reports, event-triggered data delivers an unbiased, scientifically validated record that corroborates human testimony.
- **Irrefutable Chronological Timelines:** Synchronizing millisecond-accurate acoustic timestamps with corresponding video frames establishes a precise, undisputed narrative of events
- **Direct Forensic Link:** Targeted visual confirmation captures crucial suspect details and vehicle involvement, directly connecting perpetrators to the crime scene without continuous public surveillance.

This objective evidence equips prosecutors with a clear, undeniable picture of the event, significantly strengthening indictments while maintaining full public trust and privacy compliance.

From Chaos to Conviction.

Schedule a demo today

or visit us at acoemATD.com



