# Ending the Delayed-Awareness Problem in School Gunfire Response

Smartphone-based gunshot detection for faster awareness and lower risk.

## 1. Executive Summary

Schools are expected to prevent and respond to high-impact threats while balancing limited budgets, aging facilities, and staff who already carry the daily load of teaching, supervision, and student well-being. When a loud bang occurs on or near campus, the most crucial moments are often the earliest ones: when people are unsure what they heard, where it came from, or whether to act.

This paper describes a common failure point in gunfire incidents: delayed awareness driven by uncertainty and fragmented information. It also outlines how privacy-first, smartphone-based gunshot detection can complement existing safety plans by providing a shared alert signal that helps staff escalate faster and act more consistently.

## 2. The Problem: Seconds of Confusion

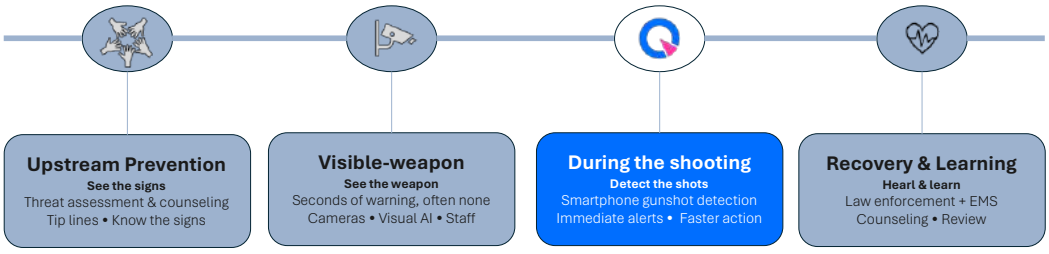
In real incidents, the first moments after gunfire are often defined by uncertainty. A sharp sound may be heard by some staff but not others. People try to interpret it. Was it a gunshot, fireworks, construction, or a locker slam?

During this window, response becomes uneven: some rooms lock down while others continue instruction, and students in hallways or common areas may remain exposed. Only after additional shots, a call from another location, or radio confirmation do actions become coordinated.

Reviews of past incidents indicate that initial recognition and the first 911 call can be delayed by minutes. Even when schools have radios, cameras, and emergency plans, the opening moments can still lack a clear, shared signal.

Traditional safety technology can help, but it is often expensive, building-bound, and difficult to extend to buses, fields, parking lots, and off-campus activities. Many districts cannot fund or maintain a full sensor grid, and even when they can, coverage gaps remain.

**Where SplitSec fits in the life of an incident**




SplitSec turns the first shots into a shared, actionable alert.

*Figure. Where smartphone-based gunshot detection fits in an end-to-end violence prevention and response timeline (illustrative).*

## 3. How SplitSec.AI's Technology Works

SplitSec AI is designed to support school safety without introducing intrusive monitoring or complex infrastructure. At a high level, the technology works as follows:

### 3.1 Trained detection models

SplitSec AI uses machine-learning models trained on tens of thousands of labeled sound samples, including gunfire and common non-gunfire events. The goal is reliable detection in real environments while keeping false alerts infrequent.

### 3.2 On-device analysis

All sound processing and detection runs on the device. SplitSec AI does not record conversations or upload raw audio. Connectivity is required to deliver alerts to other users.

### 3.3 Administrative visibility (optional)

Authorized administrators can view alerts and timelines through a configurable dashboard, supporting coordination and review without constant monitoring.

### 3.4 Location awareness (where supported)

In environments with sufficient device coverage, SplitSec AI can provide approximate information about where a detected sound may have occurred. Accuracy varies based on layout and conditions.

These capabilities are designed to complement existing safety plans and procedures, supporting faster awareness while keeping people, not technology, at the center of decision-making.

## 4. SplitSec.AI: A Software-First Early Warning Layer

SplitSec AI takes a software-first approach: rather than installing new microphones, it leverages smartphones that staff already carry. The app runs an on-device model designed to detect acoustic signatures consistent with gunfire.

When a possible gunshot is detected, SplitSec can:

- Issue a site-wide alert to enrolled staff and designated safety roles (e.g., principal, safety team, SRO).
- Provide a one-tap option to call 911 (aligned to district policy).
- Record minimal event metadata (time, approximate location where supported, device type, confidence score) to support internal review.

SplitSec is designed as a privacy-first platform: detection occurs on the device, and raw audio is not stored or streamed to the cloud. This reduces privacy risk and avoids creating a long-term archive of classroom audio.

## 5. How SplitSec Adds Value to Schools

### 5.1 Faster, More Consistent Staff Response

When a gunshot-like sound occurs, a clear “possible gunshot detected nearby” alert can reduce hesitation and speed escalation into existing procedures: lockdown, shelter, evacuation, and calling 911, without waiting for multiple shots or secondary confirmation.

Earlier awareness does not replace training or judgment, but it can help staff act more consistently during the most uncertain moments.

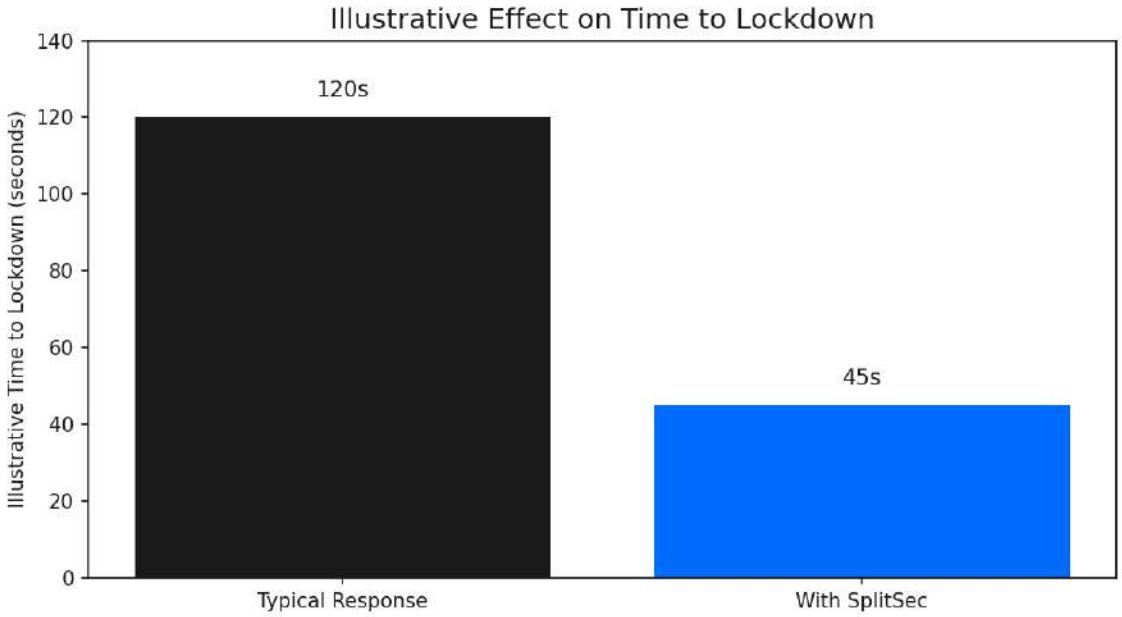



Figure 1. Illustrative scenario showing how earlier awareness could reduce time to protective action. Actual performance will vary by incident and environment.

### 5.2 Coverage Without New Hardware Projects

Because SplitSec runs on smartphones, it can extend awareness into areas that hardware systems often miss: buses and parking lots, fields and outdoor events, temporary classrooms, and staff moving between buildings during arrival/dismissal. Pilots can start with a focused group: administrators, deans, campus safety, or a single school, before expanding. There is no need to open ceilings, run cables, or integrate with a PA system to gain value from an initial deployment. Setup and role-based training can typically be completed quickly.

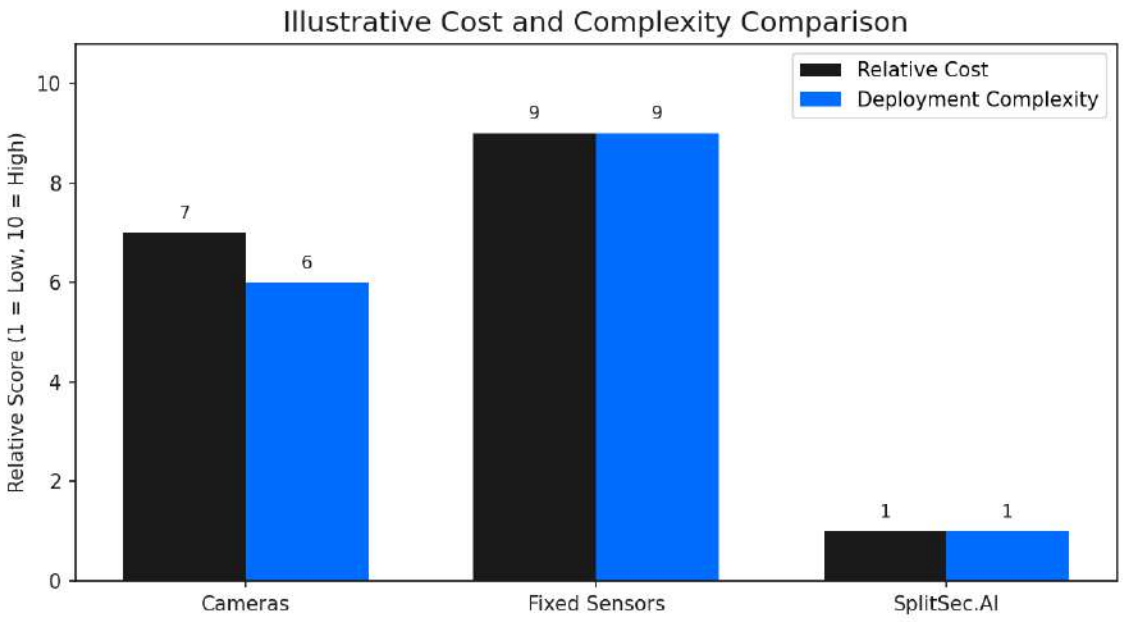



Figure 2. Illustrative comparison of relative cost and deployment complexity for common safety technologies (1 = lowest, 10 = highest). Actual costs and complexity will vary by district.

### 5.3 Privacy and Community Trust

Parents, students, and staff are understandably wary of "always listening" technologies in classrooms. SplitSec is intentionally designed to minimize data exposure: detection happens on the device; raw audio is not stored or uploaded; and only limited, configurable event metadata is used for review and improvement by agreement. This enables districts to add a meaningful safety capability without creating a new, open-ended surveillance archive.

## 6. Why Now and What Comes Next

School leaders are being asked to improve safety while balancing budgets, staffing, and community trust. Large, building-bound hardware projects can be expensive and slow to deploy. Meanwhile, the smartphones many staff already carry contain capable microphones and processors that can contribute to safety today.

SplitSec AI offers a practical way to evaluate an additional layer of protection: privacy-respecting, early awareness of gunshot-like sounds, without committing to new infrastructure. Through a carefully designed pilot, districts can assess how the technology performs in their environment and how it fits alongside existing training, radios, and emergency plans.

We welcome the opportunity to collaborate with district safety, technology, and leadership teams to design an evaluation that is practical, respectful of your community, and focused on one outcome: helping staff move from uncertainty to coordinated action sooner.

## 7. Implementation considerations

- Policy and governance: Define who receives alerts, how alerts are verified, and how alerts map to existing SOPs.
- Training: Short, role-based training focused on actions, not the technology.
- Privacy: On-device processing reduces exposure; districts should document privacy posture and data-minimization practices.
- Testing: Use permitted, policy-compliant methods (tabletop exercises, drills, and controlled tests where allowed).

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