



Justice Insights Series: Research Briefs for Policy and Practice

More Alerts, More Work: What Police Departments Should Expect When They Adopt Gunshot Detection Technology

Key Takeaways

- Gunshot detection technology (GDT) roughly doubled shooting notifications across the three cities studied, leading to a two- to threefold increase in total officer staff time spent responding to those incidents.
- Officers arrived at shooting scenes faster when alerted by GDT as opposed to 911 calls, although more of the time savings came from faster dispatch rather than from faster travel to the scene.
- GDT is the most effective when integrated with other investigative tools, supported by a program supervisor, and paired with community outreach—agencies that treat it as a stand-alone system are most likely to see it underperform.

Why This Matters

Police agencies rely on 911 calls to identify shooting incidents, but community members in areas with high levels of gun violence often do not call, whether from distrust, fear of retaliation, or the belief that police are already aware of the incident. GDT fills that gap by automatically detecting gunfire. As GDT has spread to more than 100 agencies, basic operational questions have remained unanswered: How much additional work does it create? Does it speed up police response? What are the best approaches to implementing this technology?

Prior research has produced inconsistent results. Some studies found modest improvements in response time, ranging from 32 seconds to several minutes, and one study in Chicago found that officers were dispatched one minute slower and arrived nearly two minutes later after GDT was introduced. Research in St. Louis estimated that GDT generated roughly 1,200 additional officer hours per year. This study fills a gap by analyzing detailed administrative data from three cities to measure GDT's effects on shooting notifications, workload, and response times and by drawing on 46 stakeholder interviews to identify the operational practices that produce the best results.

How the Study Worked

The researchers analyzed calls-for-service records from Denver, Colorado; Milwaukee, Wisconsin; and Richmond, California, covering eight GDT coverage areas. Each department provided timestamps indicating when a shooting notification was received, when an officer was assigned, and when the officer arrived. The analysis excluded calls involving a confirmed gunshot victim to ensure fair comparisons between GDT alerts and 911 calls for shots heard. It also removed duplicate notifications from the same incident that occurred within five minutes and one-quarter mile of one another.

To measure changes in notification volume, the researchers compared the 365 days before each GDT deployment with the 365 days after using interrupted time series analysis, a method that estimates whether a policy change produced a meaningful shift at the moment it launched while accounting for preexisting trends, making it more reliable than a before-and-after comparison. Median and average response times were compared for GDT alerts and 911 calls. The findings were supplemented by 46 in-person interviews with patrol officers, detectives, crime analysts, prosecutors, and federal agents.

What Was Learned

- **GDT immediately and substantially increased shooting notifications.** Across all eight coverage areas, shooting notifications increased by a factor of 1.7 to 2.4 in the year after GDT was deployed, with statistically significant increases in most areas within the first month of implementation.
- **Officer workload grew proportionally.** Total staff hours spent responding to shooting events increased by a factor of 1.8 to 3.4. In Milwaukee, GDT added 286.9 staff hours in the first year across its four coverage areas, amounting to 22.6 additional hours per square mile.
- **Response time gains resulted almost entirely from faster dispatch rather than from faster driving.** Across all coverage areas, officers arrived an average of 52 seconds faster for GDT alerts than for 911 calls. Of this difference, 49 seconds resulted from faster officer assignment, and travel time from assignment to arrival was only 7 seconds quicker on average.
- **The most effective GDT programs integrate the technology into a broader investigative process.** Stakeholders described three tiers of implementation: a minimal approach in which officers check the scene and leave if no victim or evidence is found; a more thorough approach adding canvassing and witness engagement; and a full approach that links GDT with resources from the Bureau of Alcohol, Tobacco, Firearms and Explosives, such as its ballistic evidence network, firearm-tracing system, public surveillance cameras, and license plate readers. Stakeholders consistently identified the highest tier as the most effective.

What This Means in Practice

Agencies considering GDT should plan for an immediate and substantial increase in officer workload once the system goes live. The cost of the technology extends well beyond the subscription fee: without adjustments to staffing and response policies, officers will face competing demands between GDT alerts and other high-priority calls. The authors note that agencies should deploy GDT strategically in areas most affected by gun violence rather than expanding coverage broadly since response time advantages appear to erode as coverage grows into areas not experiencing severe gun violence.

The authors identify two elements as essential at every level of GDT implementation: a dedicated program supervisor who actively manages the technology, coordinates between vendors and detectives, and ensures officer accountability and a community outreach strategy that clearly explains what the system does and does not do. In focus groups conducted as part of the broader research, community members in GDT areas mistakenly believed that police were automatically notified of all gunfire citywide and that sensors continuously recorded audio. The authors note that correcting these misconceptions is critical for maintaining public trust and ensuring residents continue to call 911, particularly given that GDT coverage is never citywide.

Source article

Lawrence, D. S., & Novak, K. J. (2025). Firearm shootings and the police response: Examining the impact of gunshot detection technology. *Police Practice and Research*, 26(6), 726–745. <https://doi.org/10.1080/15614263.2024.2384879>

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