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Gunshot Detection Systems

Considerations for Prosecutors



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Introduction

Have you ever brought a shooting case to trial and witnesses did not agree on how many shots were fired? Have you faced a defense witness who claimed at trial that the victim shot first? Maybe you had an uncooperative victim at the hospital, but no one reported the shooting and thus no scene could be established. In these situations, the existence of a gunshot detection system (hereafter referred to as “GDS”) can help make your case.

GDS evidence can be crucial circumstantial evidence that helps establish where and when a shooting occurred, confirm whether more than one shot was fired, provide evidence about the type of gun used, and show whether there was more than one shooter. Combined with officer and lay witness testimony, 911 call recordings, video from the scene, cell site data, or location monitoring, GDS evidence can also link a person to a shooting at a particular place in time. GDS evidence has been used in probable cause affidavits that justify search and arrest warrants. As demonstrative evidence, GDS evidence allows jurors to hear the shots that took a life or were fired toward a home or gathering.

This article provides a basic understanding of GDS technology, its investigative and evidentiary value, and issues prosecutors may encounter when trying to admit GDS evidence at trial.¹

Executive Summary

Overview of Gunshot Detection Systems

GDS systems work by recording sounds on a network of audio sensors clustered around a designated location. The sensors transmit sound recordings, timestamps, and Global Positioning System (GPS) data to computers with proprietary algorithms that compare the input to known waveforms (graphic representations of sound) associated with the sound of gunfire. The mathematical calculations used to establish the location of gunfire are based on the same scientific principles that are used to locate the epicenter of an earthquake. Environmental factors may affect the accuracy of captured information, but modern GDS systems can detect 80% of gunfire in uncontrolled environments and pinpoint where shots were fired within as little as a 10-foot radius.²

Reliable GDS evidence has been admitted in nearly 200 cases and has established innocence, as well as guilt. GDS notifications can save lives through quicker response

¹ It is important to note that this technology is only deployed in regions that have contracted with GDS providers.

Prosecutors should consult with their local law enforcement agency to learn if GDS technology is deployed in the area.

² See <https://law.justia.com/cases/nebraska/supreme-court/2014/s-13-698.html>, testimony of Paul Greene for ShotSpotter. See also, <https://www.ojp.gov/sites/g/files/xyckuh241/files/archives/ncjrs/fs000201.pdf>.

times and can help the police find suspects, victims, witnesses, and other evidence. Prosecutors seeking admission of GDS evidence must understand the scientific foundation of the technology, determine that it is accurate, and be prepared for legal objections. This is an evolving area where preparation by prosecutors is essential, as their work will impact the future admissibility of GDS.

Information Captured in GDS Reports

GDS reports generally contain information which can be used to further an investigation or as evidence in trial. This may include the date and time of the sound event, location of the sound, number of shots, and pattern of shots. An audio recording of the shots and plotting the shots on a map is usually also available.

Gunshot Detection Systems as Evidence

GDS recordings of live gunfire have been used as demonstrative evidence, usually through an expert witness in various ways including:

- Connecting shooting events.
- Proving the time, location, and number of shots.
- Displaying characteristics of shots that provide relevant information about a firearm or use of more than one firearm.
- Establishing the location of a crime scene, and, in some cases, a suspect.

Considerations for Prosecutors

Prosecutors should educate themselves about the many issues surrounding this evolving topic including:

- How the specific technology used in their jurisdiction works.
- How to preserve the data from GDS.
- The standards for admissibility in the prosecutor's jurisdiction and relevant case law, including these cases:
 - [*State v. Hill*, 288 Neb. 788 \(2014\)](#)
 - [*United States v. Rickmon*, 952 F.3d 876, \(7th Cir. 2020\)](#)
 - [*US v. Godinez*, No. 19-3425, \(7th Cir. 2021\)](#)
 - [*People v. Hardy*, 275 Cal. Rptr. 3d 566 \(Cal. Ct. App. 2021\)](#)
 - [*Wisconsin v. Nimmer*, 2022 WI 47 \(CASE No. 2020AP878-CR 2022\)](#)
- The proprietary nature of algorithms used to interpret the data and existence of other trade secret concerns, that could affect discovery and admissibility.
- The type of expert is needed to interpret the evidence at trial.
- Why expert testimony may be inconsistent with automated interpretations of the data.
- Criticisms of GDS technology and defense tactics to exclude GDS evidence or juror concerns about GDS evidence.

Overview of Gunshot Detection Systems

Gunshot Detection Systems (GDS) combine information received from sensors to determine where and when guns were fired. In some instances, the GDS can determine if more than one gun was used and if the gun was an automatic weapon.

Sensors

Most gunshot detection systems utilized for purposes of domestic law enforcement record sounds using a network of audio sensors installed in predetermined locations.³ These sensors transmit sound recordings and corresponding timestamp data to proprietary servers that can interpret the sounds as being consistent with the muzzle blast produced after a firearm is discharged. The sensors are also equipped with GPS location devices that provide precision location information that is simultaneously transmitted to the servers. However, muzzle blast detection can be affected by environmental factors including ambient noise, especially fireworks or loud construction noises, weather, and physical obstructions between the location of the blast and the sensor. These factors may increase the size of the area identified as the epicenter of a firearm discharge captured by the network sensors.

Sensor Locations

GDS network technology does not require a line of sight between audio sensors and the location where the firearm was discharged, but sensors are usually installed on rooftops or light poles with the least interference from other obstructions around the target area. Sensors are often positioned with the goal of them being virtually invisible to actors who may try to disable the GDS system.



If prosecutors have information on crime trends, current investigations, or recently released high-risk individuals, criminal justice stakeholder collaboration may help

³ Some gunshot detection systems operate on a smaller scale and can even be worn on a person and consist of a single audio sensor device. See <https://www.eagltechnology.com/index.php/bluefly-2/>. These devices are generally intended to detect the origin of gunfire for moving targets such as a police officer, military personnel, or transport vehicle. These systems may operate utilizing a different sound measurement system and consequently capture sounds within a much smaller area with increased precision. See <https://www.shotspotter.com/system/content/uploads/mediakit/Gunshot-detection-WP.pdf>.

agencies effectively select deployment areas resulting in a more effective use of the system.

Video and Gunshot Detection Systems

While GDS providers cannot independently identify a shooter, some departments have set up GDS sensors alongside video equipment which can capture footage of the shooting, the suspect, victims, or witnesses, so long as they are within the line of sight of the video camera. This strategy, though effective when a crime occurs in the camera's line of sight, may raise privacy concerns from the community.

Expert Reivew

In some instances, the GDS assessment of gunfire is reviewed by an expert acoustic technician and may be peer reviewed by another technician. Prosecutors should ascertain whether such reviews were conducted and obtain any related paperwork.

Alerts

Depending on the type of GDS deployed by a law enforcement agency, alerts can be sent to an agency point of contact, through 911, and directly to officers using mobile application notifications that can provide a map interface with a radius overlaying the likely area of gunfire. While GDSs are usually implemented through the local police departments, some prosecution agencies have set up secondary alert systems to obtain information contained in the gunshot detection reports.⁴ This is especially useful for prosecutors who track all gunshots in their jurisdiction or those who participate in multi-disciplinary gun violence teams.



Accuracy

Modern GDSs can detect gunfire in 97% of cases in controlled studies and 80% of detectible gunfire in uncontrolled environments. Some GDSs have proven to be much less

⁴ Gunshot detection systems are increasingly used in cities across the United States as part of a Crime Gun Intelligence Center (CGIC). A CGIC is a dedicated unit comprised of ATF, state and federal prosecutors, police, analysts, forensic laboratories, and other partners that identifies, analyzes, and investigates gun crime. The goal is to produce actionable intelligence to assist in identifying, arresting, and prosecuting offenders who most frequently perpetrate gun crime in each community. A CGIC also seeks to identify illegal sources of crime guns. In many cities with a CGIC, gunshot detection systems serve as the entry point of the intelligence process.

effective at detecting small caliber gunfire.⁵ Some GDS experts will attest to the accuracy of gunshot epicenter data within a 150-foot radius for 80% of detectible outdoor gunfire.⁶ However, it is not uncommon to see more precise results with as little as a 10-foot radius.

Limitations

The GDSs typically utilized by law enforcement agencies are not able to determine the caliber of a weapon fired. However, in some instances and for some systems, experts, using audio sensor recordings, can differentiate between one or more firearms being used. If sufficient evidence is captured, experts may also opine about characteristics of a firearm based on the number of shots recorded and sound patterns.⁷ These experts can also utilize data in conjunction with other evidence to determine if there were multiple shooters or multiple shooting locations.

Gunshot Detection System Reports

GDS providers can generate reports that may include some of the following information:

- Date and time of sound event
- Epicenter radius information
- Street coordinates for epicenter radius information
- Epicenter movement in cases of multiple shots fired at different locations
- Number of shots detected
- Pattern of shots fired and time between shots fired
- Possible use of an automatic weapon
- Possible use of multiple firearms
- Possible presence of multiple shooters
- Graphic representations from the event depicting multiangulation and multilateration
- Audio recordings of detectible gunfire
- Location of shots plotted in a map interface

⁵ See <https://www.unomaha.edu/college-of-public-affairs-and-community-service/nebraska-center-for-justice-research/documents/addendum-2016-psn-final-eval-report.pdf> and <https://www.forensicmag.com/578128-Evidence-Accuracy-of-ShotSpotter-Gunshot-Detection-System-Called-into-Question/>

⁶ See <https://law.justia.com/cases/nebraska/supreme-court/2014/s-13-698.html>, testimony of Paul Greene for ShotSpotter

⁷ ShotSpotter's contractual guarantee only pertains to firearms 25-caliber or greater.

Using Gunshot Detection System Evidence in Court

GDS evidence has been introduced in court to establish probable cause for an officer's conduct or further investigation. It has also been used as substantive evidence at trial to show how a scene, suspect, or witness was identified, to prove certain characteristics of a firearm used in a shooting, and as direct evidence of the sound of the gunshots that are at issue in the case. This section highlights how prosecutors might use GDS evidence in court.

Locating Scenes, Suspects, and Witnesses

Gunfire often goes unreported but remains a persistent threat to communities traumatized by frequent gunfire. Lack of reporting can be due to many factors including a lack of trust in law enforcement or fear of retaliation. GDS technology alerts law enforcement even when victims, witnesses, and the community do not. Those alerts can provide additional evidence that can lead to solving the crime and prosecution even when there is no 911 call.

Time and Place

Another common use of GDS evidence is to locate the scene of a shooting when a shooting victim is afraid to report crimes to law enforcement. In those cases, police are often notified by hospital staff of the shooting but are not told where the crime occurred. GDS evidence has been admitted in court to establish the location of a shooting despite the lack of information from a shooting victim. It can also be helpful when witnesses have a distorted perception of the location of the shots fired due to the way in which sound travels. Once the crime scene is identified, investigators can work to find witnesses, recover physical evidence such as cartridge cases, discover damage indicative of gunfire, and recover video footage that may capture cars, people, or the event itself.

Example:

Milwaukee, Wisconsin police were on patrol when they were alerted to gunfire by GDS technology. They arrived at the GPS coordinates specified in the data when Avan Nimmer noticed them and started walking away at an accelerated pace. Nimmer was stopped, searched, and discovered to be in possession of a firearm he was unauthorized to carry. Nimmer contested the search, but Wisconsin's Supreme Court found that GDS evidence pinpointing the time and location of gunfire provided sufficient probable cause of the stop when coupled with officer testimony about Nimmer's response to their arrival on scene.⁸ Without the GDS evidence, the scene, suspect, and crime would have gone undetected.

⁸ <https://www.wicourts.gov/sc/opinion/DisplayDocument.pdf?content=pdf&seqNo=536634>

Electronic Monitoring Devices

GDS evidence can be used in court hearings to establish that a witness, victim, or suspect was present at a scene when shots were fired. An electronic monitoring system generally retains the timestamped GPS coordinates for the individual who is wearing it, which can be compared to the timestamped GPS coordinates captured by GDSs. This has been effectively used in hearings by pairing evidence of the date, time, and location of gunfire detected by GDSs with data captured through electronic monitoring of individuals on bail, probation, or parole.

Defining the Event

GDSs can be used, in some instances, to establish that more than one gun was fired, which gun was fired first, and whether a gun had certain characteristics. GDS experts can be called to testify to interpret system recordings based on their own extensive experience with firearms.

Example:

During the investigation of a suspected gang-murder, police discovered a GDS alert in the same location just hours before the victim was killed. That alert led to the recovery of earlier video footage which captured the vehicle used in a drive-by shooting earlier in the day. Using traditional investigative techniques and GDS hits, police tied five related shootings to the original alert. GDS data combined with other evidence helped prove the identity and intent of those responsible.⁹

Shots Fired

While GDS technology has some limitations with lower caliber gunfire and may not be able to differentiate between shots fired at exactly the same time in close proximity, prosecutors can introduce recordings as demonstrative evidence of how many shots were fired in a particular event. This evidence can be used with other corroborative evidence, such as cartridge casings found at the scene.

Example:

If GDS data shows only three shots were fired and three cartridge casings tied to the suspect's gun are recovered at the scene, it can be used as circumstantial evidence that the victim did not fire a gun.

⁹ Interview with San Diego County prosecutor Ted Fiorito by the Prosecutors' Center for Excellence on 12/28/2021.

Movement

GDS experts can also use sound recordings from several microphones to show movement. This may be relevant to show that a suspect fired on foot or by car from different locations depending on the amount of time between shots fired.

Example:

Analysis based on the detection of gunshots by multiple sensors can be used to show how a suspect advanced by foot on a victim versus driving away in a vehicle.

Multiple Weapons

Sometimes experienced GDS experts can establish the use of more than one weapon through sound comparisons. Recorded gunshots can be compared and contrasted to determine if they have similar qualities or if there are sufficient differences to opine that more than one type of gun was used. This evidence can be admitted at trial as circumstantial evidence of more than one shooter or to establish an exchange of gunfire between parties.

Weapon Characteristics

GDS evidence and expert testimony can be used in cases of multiple gunshots to establish whether or not the firearm had special characteristics which may be required to prove an element in a case. In many states, there are additional penalties for using an automatic or semiautomatic weapon in a crime. Due to the speed in which these types of weapons discharge bullets, GDS recordings can be analyzed by experts who can testify that the timing of shots is consistent with automatic or semiautomatic gunfire. However, it should be noted that GDS is not able to determine the caliber of the gun used.

Demonstrative Evidence

Perhaps the most common and dramatic use of GDS evidence is the introduction of a live recording that resulted in injury or death. These recordings capture critical moments and bring a case to life in front of a jury.

Example:

Two officers in plain clothes and an unmarked car were surveiling a residence when the suspect emerged. The recognized him, identified themselves, and ordered him to stop. The suspect fled and fired on police, shooting one officer, and leaving him fatally injured. At trial the suspect claimed he did not know they were law enforcement. GDS technology in the area captured the gunfire and the three words that preceded it, “police, police, police.” This conclusive and dramatic evidence from GDS disproved the defense.¹⁰

¹⁰ Interview with Alameda County prosecutor John Brouhard by the Prosecutors’ Center for Excellence on 11/09/22.

Considerations for Prosecutors

Using GDS evidence provides many advantages and challenges. Prosecutors should familiarize themselves with the issues surrounding this evolving topic and understand the limitations and requirements for admission of GDS evidence.

Proof required to substantiate admission of GDS evidence varies according to the type of GDS evidence to be admitted. For instance, introduction of an audio recording from a sensor may be relatively straightforward. More complex testimony, such as a GDS expert who states that multiple weapons were used or contradicts the result of the initial computer algorithm raise various questions about admissibility.



The admission of GDS evidence may also vary by local jurisdictional requirements for admission of scientific evidence. In some instances, a hearing may be required to establish the reliability of the evidence or the general acceptance by the scientific community of the technology. See also section on Court Challenges to GDS Evidence.

Preservation

Police and prosecutors must act promptly to preserve the recorded GDS data. While some GDS providers may retain detected gunshot sounds for a longer period, those sound recordings may be limited and failure to preserve could result in the loss of helpful information or even exculpatory data. It is important to remind investigators to actively preserve such data. In the case of multiple shootings that may be related, it is also important to capture the additional recordings for future review once the investigation has progressed and more is known about the circumstances leading to the primary sound event.

Proprietary Gunshot Detection System Information

Prosecutors should be aware that GDS providers may use agency contracts which bind them to non-disclosure agreements regarding the location of the audio sensors as well as proprietary information about their system. Most GDS providers will resist the release of proprietary or trade secret data. This can have an impact on discovery and the admissibility of GDS network evidence if a court requires disclosure of this information.

Whether or not such materials must be produced remains unresolved. In one unpublished New Jersey opinion on the discovery of proprietary data, the court held:

“Hiding the source code is not the answer. The solution is producing it under a protective order. Doing so safeguards the company’s intellectual property rights and defendant’s constitutional liberty interest alike. Intellectual property law aims to prevent business competitors from stealing confidential commercial information in the marketplace; it was never meant to justify concealing relevant information from parties to a criminal prosecution in the context of a Frye hearing.”¹¹

The prosecutor should be prepared to address these complex issues in writing and provide alternatives to unprotected disclosure of proprietary information when warranted. It should be underscored that prosecutors’ interests may differ significantly from that of the GDS provider in these hearings.

Expert Testimony

When using GDS evidence, prosecutors should communicate with experts early, learn the details of the technology, and understand the types of objections that are raised to exclude the testimony. Prosecutors who use GDS evidence without preparation may find convictions met with subsequent reversals, while those who cautiously and thoroughly examine the issues will eventually pave the way for “general acceptance” of this important evidence.



Once a case requires expert testimony, all the GDS files should be reviewed by the testifying expert as a form of peer review and a forensic report should be prepared. In the report most experts will review the initial audio recording, explain the presence of sounds that are inconsistent with gunfire, and detail their findings with written and graphic representations.

It should be noted that the most significant evidentiary issues associated with GDS technology have involved sound events that were initially either undetected or inconsistent with initial GDS reports, but were later re-interpreted by acoustic experts to have evidentiary value.¹² In some instances this happens after an agency requests a review

¹¹ State of New Jersey v. Pickett, A-4207-19T4 (NJ Court of Appeal, 2021).
<https://www.njcourts.gov/attorneys/assets/opinions/appellate/published/a4207-19.pdf>

¹² See <https://apnews.com/article/artificial-intelligence-algorithm-technology-police-crime-7e3345485aa668c97606d4b54f9b6220> and <https://www.forensicmag.com/578128-Evidence-Accuracy-of-ShotSpotter-Gunshot-Detection-System-Called-into-Question/>

of the recorded data, thus laying the foundation for a defense objection that the new findings were influenced by human bias.

Most GDS providers have experts on staff who can testify about the scientific methods used in processing GDS data. The prosecutor should have early contact with that expert to assist with preparing for an evidentiary hearing. The expert's testimony should establish the witness's expertise in the technology used to capture, send, and process sound data, as well as the scientific principles behind the algorithms that interpret the data. The expert's own experience with firearms, recognition of muzzle blasts associated with different types of firearms, and understanding the import of certain firing patterns should also be elicited. When laying a foundation for the introduction of GDS evidence, expert witnesses should testify that GDS is based on commonly used technologies. For instance, GDS audio sensors are merely microphones and the GPS technology in GDS is universally used by cell phones and mapping devices. Also, the science behind multilateration, multiangulation, and waveforms are well studied, peer reviewed, and deployed in other technologies.¹³

Court Challenges to Gunshot Detection System Evidence

While GDS technology has aided law enforcement for over 20 years, there are remarkably few published cases on the subject and only one that examined the technology in depth. Litigation on the admissibility of GDS evidence is an evolving area of law and depending on the jurisdiction will require a hearing under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) or *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).



Thus, while GDS science may in fact be reliable and ultimately pass scrutiny under *Daubert* and *Frye*, until such time as published cases affirm its various uses, the most prudent approach for prosecutors is to request an *in limine* hearing regarding the admissibility of the evidence so an adequate record can be reviewed on appeal.

When conducting a hearing on the admissibility of GDS evidence, providing corroboration for the evidence is critical. The list of possible factors that could corroborate a GDS alert is dependent on the facts of each case, but prosecutors should endeavor to enumerate every factor relevant to an officer's determination of probable cause or reasonable suspicion, even when compelling GDS evidence is presented. For example, had the prosecutor in the *Rickmon* case, described below, not introduced corroborating

¹³See <https://www.sciencedirect.com/topics/engineering/multilateration> and <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/triangulation>

facts to support the officer's actions, the court may have found GDS alert evidence, by itself, inadequate for the defendant's detention and arrest.

The following list includes decisions of note through 2022.

Nebraska v. Hill, 288 Neb. 788 (2014):

Using a *Daubert* analysis, the court found that the GDS provider's testing, positioning, and maintenance of audio sensors, its process of classifying sounds, and its training of employees was sufficient to allow the introduction of GDS testimony. The testimony could be used to support detention, search, and direct evidence of shots fired. *Hill* did not address the underlying mathematical and physics principles of triangulation utilized in GDS technology.

United States v. Rickmon, 952 F.3d 876, (7th Cir. 2020):

Using a *Daubert* analysis and Federal Rule 702¹⁴, the court held that the GDS technology could be used as probable cause in evidentiary hearings and in warrant applications, though only when corroborated. In *Rickmon*, corroboration was established by concurrent 911 calls of shots fired in the general location and an officer's observation of muzzle flash in the area.

United States v. Godinez, No. 19-3425, (7th Cir. 2021):

A trial court erred in allowing expert testimony about the number of shots and the epicenter of a shooting without a full hearing under *Daubert*. Though the error was deemed harmless in that case, the reviewing court found the trial court overly relied on *Hill* in denying a full *Daubert* hearing, and that *Hill* did not address the reliability of programming or the use of algorithms underpinning GDS technology. This was particularly significant here because the GDS notification system initially reported two shots, while the expert's re-analysis of the recording resulted in testimony regarding five shots.

California v. Hardy, 275 Cal. Rptr. 3d 566 (Cal. Ct. App. 2021):

In *Hardy*, GDS evidence was introduced to show why officers responded to the scene and that the weapon was a semiautomatic firearm. Using a *Frye* analysis, the conviction was reversed for failure to conduct a full evidentiary hearing on the acceptance of GDS technology in the scientific community. The court conducted a thorough review of published cases addressing GDS technology and found the science was novel and that it had been inadequately examined by the courts. *Hardy* plead guilty on remand without a hearing, but prosecutors in the jurisdiction have subsequently requested at least two such

¹⁴ The Federal Rules of Evidence supply a rule for admitting scientific evidence in section 702 which allows for expert testimony if: "(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case."

hearings and successfully admitted GDS evidence at trial after laying a sufficient foundation.¹⁵

Wisconsin v. Nimmer, 2022 WI 47 (CASE No. 2020AP878-CR 2022):

In *Nimmer*, GDS evidence was introduced during a motion to suppress evidence as the basis for the officer's stop of Nimmer. Nimmer claimed that the stop was unjustified and that a GDS alert was insufficient to justify his detention. Relying in part on *Rickmon*, the court disagreed and found that the GDS alert, in conjunction with officer observations, justified Nimmer's detention. While the reliability of GDS technology was not contested, the opinion indicates prosecutors provided sufficient foundation for admission.

Other Criticisms of the Technology Potentially Impacting Admissibility

In July 2021, *Vice* published an article making several claims about the reliability of ShotSpotter GDS testimony.¹⁶ ShotSpotter filed a complaint against *Vice* seeking monetary damages for misrepresentation.¹⁷ While the suit was dismissed for failure to prove intentional falsehood, the *Vice* article now includes an editorial update retracting certain key allegations made against ShotSpotter in the original text.¹⁸ Prosecutors should read the *Vice* article and the ShotSpotter complaint to be prepared for defense arguments based on the *Vice* article.



Another attack on GDSs came from the City of Chicago's Office of the Inspector General who released a report calling into question the benefits of the technology considering its cost.¹⁹ The article did not contest ShotSpotter's accuracy but questioned whether the technology had a discernable impact on reducing or solving gun crimes where they were deployed. However, ShotSpotter continues to be part of the jurisdiction's policing strategy which, in part, attributes recent reduction in gun violence and increased clearance rates to their use of GDS technology.²⁰

¹⁵ Interview with Alameda County prosecutor Tim Wagstaffe by the Prosecutors' Center for Excellence on 11/10/2022.

¹⁶ <https://www.vice.com/en/article/qj8xbq/police-are-telling-shotspotter-to-alter-evidence-from-gunshot-detecting-ai>

¹⁷ <https://shotspottercomplaint.com/gallery/20211011%20ShotSpotter%20v.%20Vice%20Complaint%20and%20Exhibits.med.pdf>

¹⁸ <https://www.vice.com/en/article/qj8xbq/police-are-telling-shotspotter-to-alter-evidence-from-gunshot-detecting-ai> (see editors note at the end of the article).

¹⁹ <https://igchicago.org/2021/08/24/oig-finds-that-shotspotter-alerts-rarely-lead-to-evidence-of-a-gun-related-crime-and-that-presence-of-the-technology-changes-police-behavior/>

²⁰ <https://abcnews.go.com/Politics/gun-violence-dropping-chicago-police-credit-tactics-community/story?id=91211750>

Critics also have decried the deployment of the technology in communities of color and expressed concerns that false alerts increase the risk of harm to people in those communities during police response.²¹ More recently, a federal lawsuit has been filed in Illinois alleging that law enforcement misused GDS technology, leading to wrongful convictions and racially discriminatory practices in policing.²² “The suit seeks class-action status for any Chicago resident who was stopped on the basis of the alerts. It also seeks a court order barring the technology’s use in the nation’s third-largest city.”²³ Notably, the suit does not name the GDS technology provider, which may be an indication that government misuse, rather than technology, is the primary concern of watchdog groups.

Jury Selection



As jurors may have been exposed to information that could bias their view of GDS technology, prosecutors should prepare targeted questions for jurors to determine if they have any preconceived views of GDS technology at trial. This is particularly important in jurisdictions where GDS technology has been the subject of negative media coverage or where lawsuits have been filed.

Conclusion

Reliable GDS evidence can be an important part of a criminal case. It has been admitted in nearly 200 hearings and has both inculpated and exonerated people accused of crime.²⁴ When GDS technology alerts police to a crime in progress, it may be the only notice police receive that a shooting has occurred.²⁵ GDS notifications can save lives through quicker response times and can help the police to find suspects, victims, witnesses, and other evidence.

However, prosecutors seeking admission of GDS evidence must understand the scientific foundation of the technology, determine that it is accurate, and be prepared for legal objections. This is an evolving area where preparation by prosecutors is essential, as their work will impact the future admissibility of GDS evidence.

²¹ <https://www.ncja.org/crimeandjusticeneeds/increased-use-of-shotspotter-raises-accuracy-race-concerns>

²² <https://www.macarthurjustice.org/wp-content/uploads/2022/07/Complaint-file-stamped.pdf>

²³ <https://apnews.com/article/gun-violence-technology-crime-chicago-lawsuits-3e6145f63c96593866cf89ac01ce7498>

²⁴ See <https://www.shotspotter.com/wp-content/uploads/2021/12/Smith-New-Trial-Order.pdf>

²⁵ See <https://www.brookings.edu/blog/up-front/2016/04/27/gun-violence-in-major-u-s-cities-is-massively-underreported/>