Law Enforcement Tools to **Detect, Document, and Communicate Use of Service Weapons**

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Criminal Justice Technology Testing and Evaluation Center
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The Criminal Justice Technology Testing and Evaluation Center (CJTTEC) is a program funded by the National Institute of Justice (NIJ) and operated by RTI International. CJTTEC works along the innovation continuum to help NIJ, the criminal justice community, and product developers gain awareness about emerging technologies and solutions and understand the realities associated with criminal justice applications. The CJTTEC team uses research methodologies to enhance the capabilities of law enforcement, courts, and corrections agencies and acts as an honest broker for the nation's criminal justice practitioners by providing objective and rigorous understanding, testing, and evaluation of existing and emerging technologies, policies, and practices.

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This brief is meant to be high-level, good faith overview of products but is not an exhaustive list of commercially available products and research products approaching market readiness. Inclusion of a product in this report does not represent a recommendation, endorsement, or validation of product claims by the Department of Justice, NIJ, RTI, or CJTTEC. While this document summarizes product claims and offerings based on information provided by secondary sources and product representatives, it does not evaluate or comment on the effectiveness of these tools, or their ability to support product claims. Product and technology information is current as of June 2024.

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EXECUTIVE SUMMARY

Context

Service weapon activity, including instances where an officer's firearm is drawn, pointed, or discharged, plays an important role in understanding events transpiring during a police–public encounter. Detection, documentation, and communication of these events in a way that is accurate, timely, and dependable is vital for enhancing transparency and accountability of law enforcement service weapon use.

About this Report

The National Institute of Justice (NIJ) requested the Criminal Justice Technology Testing and Evaluation Center (CJTTEC) to investigate the landscape of commercially available and emerging technologies that could meet this need. CJTTEC conducted a review of technologies capable of detecting when a service weapon has been unholstered, pointed, or discharged; documenting when a law enforcement officer discharges their service weapon (or initiating documentation such as body-worn camera (BWC) recordings in such incidents); and communicating the information to dispatchers. CJTTEC's methodology to understand this technology landscape included secondary research (e.g., reviewing patents, trade literature, press releases, news articles, and publications) and primary research with technology experts, product representatives, and researchers. This brief provides a high-level summary of technology systems capable of documenting, detecting, and communicating service weapon activity, focusing specifically on technology integrated into or onto the weapon, in a holster, in a BWC, in a wearable device, or in environmental sensing tools.

Conclusion

Although no single commercially available tool is capable of detecting, documenting, and communicating service weapon activity, law enforcement agencies may be able to rely on a suite of products to help them address these needs.

Key Takeaways

- **Agencies are facing increased pressure to document service weapon activity.** From 2015 through 2020, on average, an estimated 1,769 people were injured annually—979 fatally and 790 nonfatally—from shootings by police in the United States.[1] Because of the impact that officer-involved shootings (OISs) have on the community, law enforcement agencies are facing increased public pressure and policy mandates to document service weapon activity.
- **There is a need for tools or technologies that can objectively detect, document, and communicate service weapon activity.** OISs are stressful incidents that can occur quickly and under poor visual circumstances, which can impact accurate documentation of events. Further, obtaining reliable service weapon activity data can be challenging because of noncompliance with body-worn camera (BWC) policies, lack of BWCs, or inaccurate witness and officer accounts.
- **There is no single commercially available product that meets service weapon activity needs.** No single product can currently (1) detect service weapon activity, such as recording actual shots fired in an incident involving law enforcement weapons; (2) document the activity, such as initiating BWC recordings; and (3) communicate information about service weapon activity to police dispatchers.
- **Agencies can rely on a suite of products to address these needs or choose specific products, each with strengths and limitations.** Available technologies may be integrated into or onto the weapon, in a holster, in a BWC, in a wearable device, or in environmental sensing tools.

Weapon-integrated tools offer the most functionality to detect and document multiple types of service weapon activity during a use-of-force incident, but many of these products, such as those developed by Armaments Research Company and Yardarm, are not commercially available. These products often lack the capability to communicate updates in real-time with dispatch.

Holster-integrated tools can sense officer unholstering activity, activate BWC, and communicate with dispatch, but they cannot detect activity related to pointing or firing a weapon.

BWCs, activated by multiple types of triggers, can document audio and video of the incident and communicate with dispatch, but they cannot specifically detect officer firearm activities (e.g., weapon unholstering, pointing, gunshot detection).

Wearable devices can detect officer firearm activities, document metadata, and communicate with dispatch, but most products are still in a development phase for law enforcement applications.

Environmental sensing tools may detect and document activities transpiring within a certain area, including shots fired in an incident, and communicate information to dispatch, but they cannot detect or attribute gunshot activities specifically to an officer's service weapon.

- **Technology advancements and independent testing, evaluation, and implementation research are needed to accelerate adoption.** Technology developers are currently working through several technical hurdles and are leveraging insights from BWC to improve technology uptake. Some commercially available products have been evaluated for performance, but more studies are needed as technologies are further developed and released into the market.

1. Ward, J. A., Cepeda, J., Jackson, D. B., Johnson, O. Jr., Webster, D. W., & Crifasi, C. K. (2024). National burden of injury and deaths from shootings by police in the United States, 2015–2020. *American Journal of Public Health, 114*, 387–397. https://doi.org/10.2105/AJPH.2023.307560

INTRODUCTION

From 2015 through 2020, on average, an estimated 1,769 people were injured annually—979 fatally and 790 nonfatally—from shootings by police.[2] Because of the impact that officer-involved shootings (OISs) have on the community, law enforcement agencies are facing increased pressure and policies to document service weapon activity. This report provides information related to commercially available or emerging tools capable of detecting when a service weapon has been unholstered, pointed, or discharged; recording when a law enforcement officer discharges their service weapon; communicating the information to dispatchers; and initiating documentation such as body-worn camera (BWC) recordings in such incidents. CJTTEC identified emerging and on-market technologies that can perform one or more of the following tasks:

Activity Detection: Detect that a firearm has been unholstered, pointed, and discharged.

Firearm Identification: Identify whose firearm was fired or what types of weapons were fired.

Documentation: Initiate audio/video/sensor to document the situation where a firearm was used.

Communication: Communicate to dispatch or other officers in real time.

Report Development: Develop incident report for investigations.

For the purposes of this report, these technologies will be collectively referred to as "tools" for understanding service weapon activity.

2. Ward, J. A., Cepeda, J., Jackson, D. B., Johnson, O. Jr., Webster, D. W., & Crifasi, C. K. (2024). National burden of injury and deaths from shootings by police in the United States, 2015–2020. *American Journal of Public Health, 114*, 387–397. https://doi.org/10.2105/AJPH.2023.307560

Law enforcement agencies are looking to enhance transparency, accountability, and objectivity of events transpiring during a use-of-force incident.

Agencies face pressure and mandates to document instances when law enforcement officers draw, point, or discharge their firearms. For example, the Phoenix[3] and Dallas[4] Police Departments recently mandated that officers self-report instances where they draw a weapon on an individual. This information helps promote agency transparency and accountability in these circumstances. The Phoenix Police Department publishes these data in publicly available dashboards that highlight instances of officers pointing weapons at individuals, officer use of force, and OISs (as shown in **Figure 1**).

BWC technology, implemented to improve officer accountability and transparency, is widely deployed but may be limited by officer compliance. A 2021 case review of Los Angeles Police Department use-of-force cases by the department's inspector general office noted that 22% of officers, nearly 1 in 4 cases, failed to promptly activate BWCs as required by agency policies. Intentional or accidental noncompliance limits the ability of these tools to capture relevant data.[5] Further, only 62% of law enforcement agencies use BWCs.[6]

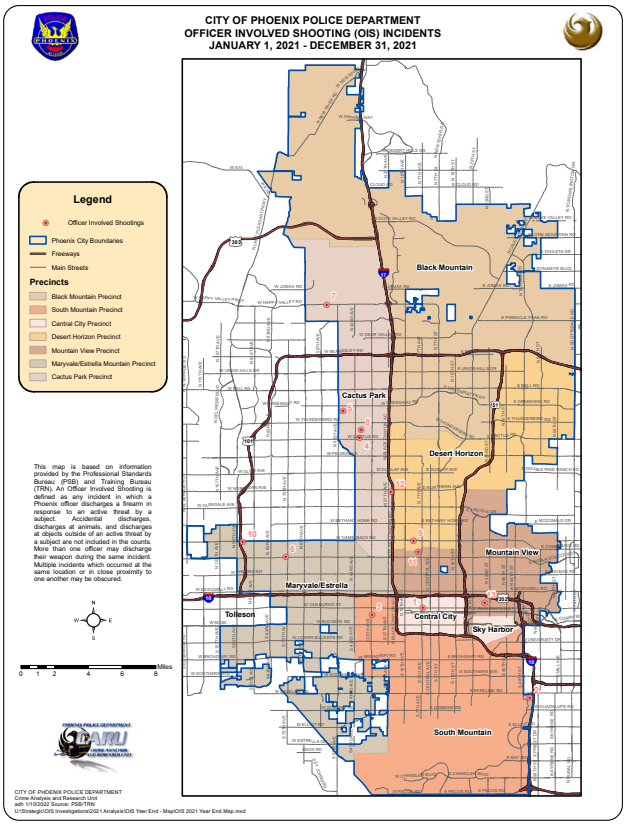

Figure 1: The City of Phoenix Police Department offers publicly available OIS datasets, developed from officer self-reporting policies. Captured from https://www.phoenixopendata.com/dataset/ois.

Service weapon unholstering and firing events often take place in high-risk, dynamic situations that may occur in poor visual situations (e.g., in small, enclosed areas; in low light); as a result, officers may fail to accurately report service firearm activities. Detection and documentation of events transpiring during a use-of-force incident may be especially helpful in providing an objective account of firearm unholstering, pointing, and firing. Real- or near-real-time communication of these events can help dispatch provide the appropriate support for the officer and improved situational awareness for officers providing backup. **Technology represents an opportunity to improve accurate, objective, and comprehensive documentation of officer use of service weapons.**

3. Hanna, J. (2019, August 20). Phoenix police must now document each time they point their gun at a suspect. *CNN*. https://www.cnn.com/2019/08/20/us/phoenix-police-policies-guns/index.html
4. Shjarback, J.A., White, M.D., & Bishopp, S.A. (2021). Can police shootings be reduced by requiring officers to document when they point firearms at citizens? *Injury Prevention, 27*(6), 508–510. https://injuryprevention.bmj.com/content/27/6/508
5. Rector, K. (2021, July 20). 22% of LAPD officers failed to promptly activate body cameras in force incidents. *Los Angeles Times*. https://www.latimes.com/california/story/2021-07-20/22-of-lapd-officers-failed-to-promptly-activate-body-cameras-in-force-incidents
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TECHNOLOGY LANDSCAPE

CJTTEC researchers conducted secondary research (reviewing patents, trade literature, press releases, news articles, publications) and primary research with technology/product representatives from a sample of commercially available products and emerging research to identify products that address the stated need. This brief is meant to be high-level, good faith overview of products but is not an exhaustive list of commercially available products and research products approaching market readiness. Inclusion of a product in this report does not represent a recommendation, endorsement, or validation of product claims by the Department of Justice, NIJ, RTI, or CJTTEC.

Systems capable of detecting and documenting officer firearm activity share sensing, interpreting, and communication elements.

Many types of detection systems for service weapon activity use the same enabling technologies to detect a potential use-of-force incident, act upon it, and convey that it is happening. These technologies include sensing elements, software to interpret the signal, and communication mechanisms.

- **Sensing Element:** Systems may use one or more sensors to indicate whether an officer raised, pointed, or fired their weapon. Accelerometers, gyroscopes, and magnetometers can detect the position and orientation of a weapon and detect when a weapon has been fired. Acoustic, infrared, and air pressure sensors can detect a muzzle blast and energy changes that may indicate that a gun has been fired. Global positioning system (GPS) sensors and other tools can provide location data to dispatch or determine proximity of an officer to other officers.

- **Interpretation Software:** Once the sensor detects activity, an embedded software in the device determines whether the input is a signal (e.g., a weapon firing event has been detected; the weapon has changed orientation congruent with pointing) or "noise" (e.g., the noise is a balloon popping; the officer sat down, which changed firearm orientation, but did not unholster weapon). Many tools employ machine learning techniques to better distinguish this signal from noise. Software embedded in the system can capture important metadata such as timestamps, geospatial data, and positioning. Some devices may integrate software tools that aggregate and analyze relevant data for reporting and investigative purposes.

- **Communication Mechanism:** Once the software has detected a relevant signal, the product may trigger actions or tasks such as activating a BWC or communicating this information to computer-aided-dispatch (CAD) systems for situational awareness. This mechanism requires communication platforms such as Bluetooth or 5G/LTE technology.

Technology designed to capture service weapon activity is often located on or around the officer's firearm, but environmental sensors may also capture relevant activity.

Technologies that can detect, document, and communicate service weapon activity are integrated into a variety of devices that fit into the connected-officer ecosystem.[7] As shown in **Figure 2**, this technology can be integrated into the BWC system, into or onto the service weapon, into the holster, or onto a wearable, or it can be built into the environment around the officer.

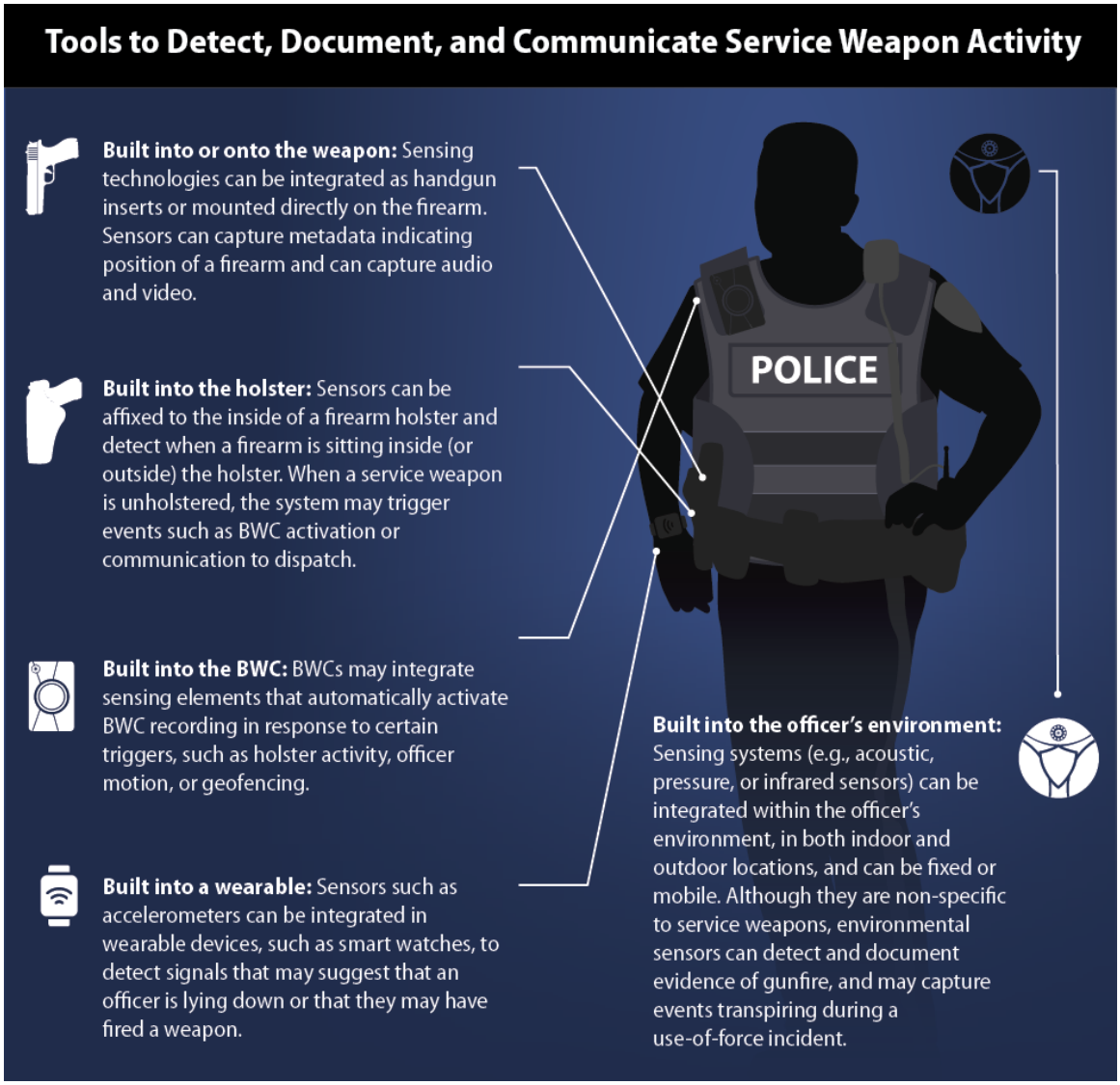

Figure 2: Law enforcement can choose from multiple emerging and commercially available technologies to detect, document, and communicate service weapon activity.

7. By connected-officer ecosystem, CJTTEC refers to a suite of Internet of Things tools that connect officer to multiple devices, to dispatch, and to other officers.

No single product can comprehensively address needs for detecting, documenting, and communicating service weapon use, but agencies may leverage a system of products.

As of publication, no commercially available product can fulfill all three requests: (1) recording actual shots fired in an incident involving law enforcement weapons, (2) communicating information about firearm activities to police dispatchers, and (3) initiating BWC recording, as shown in **Figure 3**. However, agencies may leverage more than one technology to create a system that addresses their needs.

Technology Type	Technology Maturation	Detection Capabilities	Documentation Capabilities	Communication Capabilities
 Systems Built Into or Onto the Weapon	Medium	In-weapon systems contain sensing elements to detect service weapon unholstering, pointing and firing, and location.	In-weapon systems may document sensing metadata and may offer platforms to integrate data into an incident report. On-weapon cameras may document video footage at the scene.	No known systems can transmit this information in real-time to dispatch or other officers.
 Holster-Based Systems	High	Holster-based systems contain sensing elements to detect service weapon unholstering but often cannot detect pointing or firing.	Holster-based systems often trigger BWC recording and record metadata from the unholstering event (e.g., time, location). These tools may integrate platforms to document incidents.	Holster-based systems may communicate with BWCs to activate recording. Some BWCs can communicate in real time with dispatch.
 Body-Worn Camera Systems	High	BWCs do not have widely available capabilities for gunshot detection. Although BWCs may automatically activate in response to specific triggers, such as a holster-based sensor detecting an unholstering event, the BWCs do not detect service weapon activity.	BWCs can capture video recording and relevant metadata, and they often offer video management platforms to organize these data.	Some BWCs can communicate in real time with dispatch.
 Wearable Systems	Low	Wearables, although not yet mature, may be able to detect recoil indicative of gunshots. They can detect position, movement, or orientation of an officer indicative of incidents that may involve service weapons.	Wearables can document relevant metadata, and some may be able to capture audio of any gunshots fired. These will likely be used in conjunction with a BWC, so these tools may not capture video.	Previously on-market officer-down sensors communicated signals to dispatch for backup support.
 Environmental Gunshot Detection Systems	High	Environmental gunshot detection sensors detect audio or energy patterns from gunshots; some companies are working on discerning the type of weapon fired. However, this does not detect weapon pointing or firing, or specifically capture service weapon activity.	Environmental gunshot detection systems document these metadata and may offer a visualization platform to view and manage gunshot incidents.	Environmental gunshot detection systems typically notify dispatch when a gunshot is detected.

Figure 3: Several subtypes of tools can help detect, document, and communicate activity of service weapons.

Systems Built Into or Onto the Weapon

Products that integrate sensors into the weapon can provide the most-comprehensive picture of service weapon activity transpiring during a use-of-force incident. Several companies have patented or commercialized technology integrating sensing elements into an insert for the handle of a handgun. These systems may integrate sensors such as accelerometers, gyroscopes, magnetometers, and GPS, which capture information on the orientation and location of the firearm and on the gunshots fired. Armaments Research Company (ARC) has patented and developed an insert capable of integrating into multiple types of handguns (**Figure 4**).

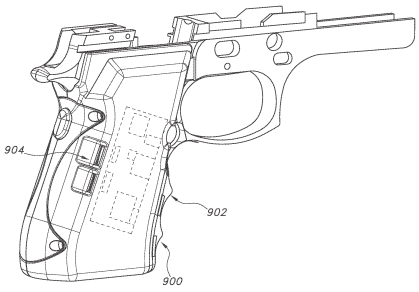

Figure 4: ARC patented a technology capable of integrating into the handgun. Captured from: Deng, W., & Canty, M. (2019). *Firearm usage monitoring system* (U.S. Patent No. US20200003511A1). U.S. Patent and Trademark Office.

ARC has also concepted a connected-officer system that not only senses weapon unholstering, pointing, and firing, but also captures this information in a dashboard for analysis and incident reporting. Although these offerings may detect and document the most-comprehensive data available (weapon unholstering, pointing, firing, and location) and integrate into a diverse array of handguns, ARC does not currently offer this in-weapon sensor commercially (**Figure 5**).[8] Kord ShotDot offers a commercially available integrated sensor element for gunshot detection, but it is limited to certain types of Glock pistols. ShotDot records the number and timing of gunshots, but it does not track weapon positioning, location, or orientation.

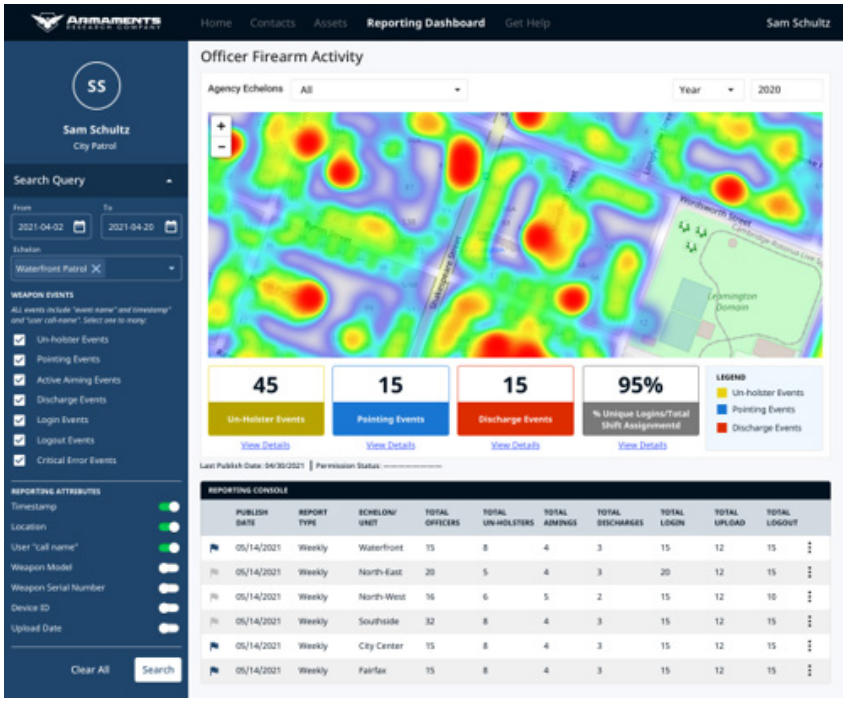

Figure 5: ARC has concepted a platform that offers a customizable dashboard of incident reports. Image provided by ARC.

8. ARC has cited funding limitations as the main barrier to its rollout of the in-weapon sensor system and anticipates a focused rollout in 2024 or 2025. Yardarm fully developed an integrated weapon sensor, which entered the market a few years ago, but indicated that this sensor is no longer commercially available.

Viridian Weapon Technologies offers FactDuty, a high-definition camera that can be mounted directly onto the firearm, creating what the company considers a less-obstructed view to complement BWC footage (**Figure 6**). Viridian offers FactDuty models with a laser sight to improve accuracy and aiming. Viridian's technology captures video evidence, unlike the systems inserted into the weapon grip; however, these tools do not automatically activate in response to stimuli and cannot sense shots fired or weapon position changes. Adoption of both in- and on-weapon technologies may be limited by performance challenges introduced by adding extra weight to the service weapon. No known tools can communicate information related to service weapon aiming or firing to dispatch in real time.

Figure 6: Viridian Weapon Technologies' FactDuty is a weapon-mounted camera. Captured from https://gun-camera.com/.

Holster-Based Systems

Holster-based systems are the most widely known and deployed tools for detecting use (by means of unholstering) of service weapons. These systems sense when a weapon has been removed from its holster and uses Bluetooth technology to trigger events such as BWC activation and communication with dispatch for additional support and situational awareness. Two products dominate the market: the Yardarm HolsterAware (**Figure 7**), which accommodates many BWC and CAD systems, and the Axon Signal Sidearm, which can only be used in the Axon BWC/CAD ecosystem. Both products can fit a wide range of holsters and less-lethal weapons. Yardarm is currently developing Weapon Alert, which will communicate data and metadata about the service weapon (e.g., when HolsterAlert senses weapon unholstering) in real time to dispatch.

Figure 7: Yardarm's HolsterAware technology is integrated on a firearm holster (provided by Yardarm).

Holster-based sensors introduce a layer of redundancy, providing a backup for BWC activation when officers cannot or will not follow agency policy requirements or when auto-activation fails. No known publications or evidence-based sources reliably document usage statistics of BWC activation primarily through holster sensors.

Body-Worn Camera Systems

Traditional BWC activation stems from manual initiation or signals such as light bar/siren activation, cruiser door opening, speed of a police cruiser, and signals from holster sensors, but emerging technologies can activate BWCs in response to triggers such as the following:

- **Audio Signals:** Kustom Signals, developer of Argus BWCs, claims to initiate recording once "common first-responder phrases" are detected.

- **Location Signals:** Utility has developed technology that enables the BWC to activate once it has entered a temporary geofence, usually a radius around the dispatch location.
- **Activation Signals from Other Officers:** When the Axon Signal Sidearm holster activation is triggered, it can automatically activate other officers' BWCs within a certain radius.

Several BWCs enable communication with dispatch. For example, Utility offers a BWC built from commercially available smartphone technology. These cameras contain a built-in accelerometer that notifies dispatch when the officer appears to be running or laying prone for a certain period of time. The Axon Body 4 system enables bidirectional communication and real-time video streaming, allowing users to communicate with support groups and enhancing situational awareness. BWC platforms offer video evidence management and reporting functions that could be used to organize evidence for incident reporting. Utility groups related BWC videos together with an autoclassifying function to save time and help ensure an accurate view of events transpiring during an incident.

No BWCs can specifically detect officer firearm use. Several vendors noted that gunshot detection is not yet mature or technically sound for BWCs. Utility holds multiple patents for indoor and outdoor gunshot detection and is using machine learning to identify energy patterns representative of gunshots.[9] However, all BWC products record audio in addition to video and could capture evidence of gunshots.

Wearable Systems

Wearable technology, such as wrist- or body-worn sensors, represent an opportunity for easily deployable and accurate detection of weapons fired. Like weapon-mounted sensors, wearable sensors can detect signals that may suggest that an officer fired a weapon, is moving quickly, or is lying flat using sensors like accelerometers. Although they are an additional accessory for the officer, wearables can be lightweight and eliminate the need to configure or replace weapons or BWCs with sensing technology. Although promising, wearable technology to document use of service weapons is mostly in a research phase or has been developed for alternative applications. Officer-down sensors like EAGL Technology's now-defunct BlueFly sensor can detect the position of an officer and capture audio of gunshots; however, this technology could not distinguish shots fired from service weapons from other similar sounds. Suunto offers an automatic shot-detection feature in its smartwatch, Traverse Alpha, which uses an algorithm that accounts for motion patterns in wrist and gun recoil movement for rifles and shotguns; however, it is intended for hunting applications. Dr. Charles Loeffler, a researcher at University of Pennsylvania, has demonstrated technical feasibility for a wearable gunshot detection system. Based on accelerometer technology that recognizes signals corresponding to firearm usage, the system is available for licensing, and the research team is currently working on validating the technology and understanding reliability.[10,11]

9. Davis, T. M., Bedell, E. H., & McKeeman, R. S. (2022). *Minimizing gunshot detection false positives* (U.S. Patent No. US11676624B2). U.S. Patent and Trademark Office.
10. Loeffler, C. (2015). *Wearable system for accelerometer-based detection and classification of firearm use* (U.S. Patent No. US10401380B2). U.S. Patent and Trademark Office.
11. Loeffler, C. (2014). Detecting gunshots using wearable accelerometers. *PLOS ONE, 9*. https://doi.org/10.1371/journal.pone.0106664

Environmental Gunshot Detection Systems

Although not specific to documentation of service weapon activity, environmental sensors may help document the events transpiring during a use-of-force incident. Environmental gunshot detection systems use a combination of acoustic sensors, air pressure sensors, and infrared sensors to detect gunshots in an indoor or outdoor radius. Agencies and organizations can choose from a variety of commercially available options, such as SoundThinking's ShotSpotter. Some gunshot detection systems have integrated camera systems. Gabriel's Smart Shield technology, for example, is a fixed sensor that automatically activates in response to gunfire and can connect directly with law enforcement dispatch. Most environmental gunshot detection products require fixed or temporarily fixed sensors and cannot distinguish types of weapon fired. Triangula is an artificial intelligence software program (**Figure 8**) that relies on a combination of fixed and mobile phone-based sensors to triangulate gunfires.

Researchers are actively working to improve gunshot detection and characterization of weapons fired. Dr. Robert Maher of Montana State University has leveraged NIJ funding (2014-DN-BX-K034, 2017-DN-BX-0179) to better characterize acoustical properties of gunshots, and Triangula claims to use machine learning to determine types of guns fired in its Scout mobile application.

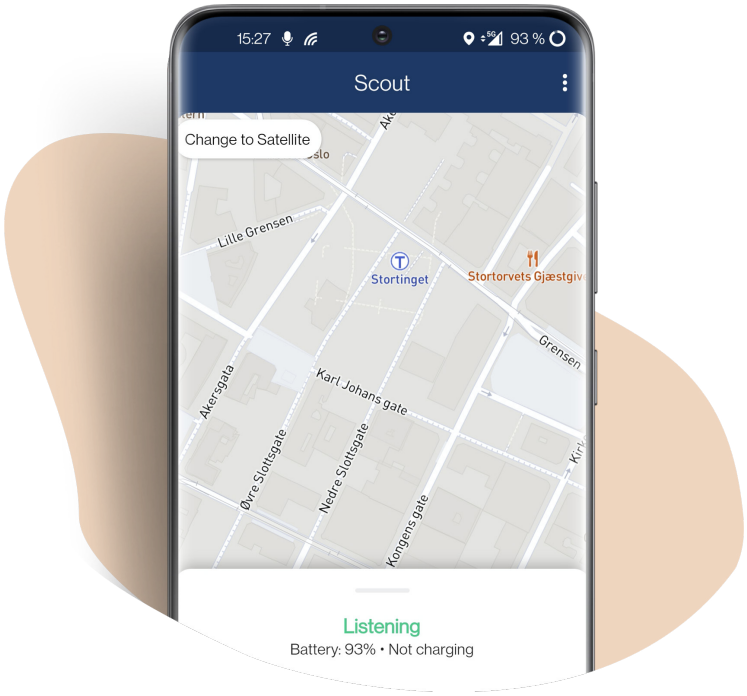

Figure 8: Triangula's Scout app triangulates gunshot locations from smartphone sensors. Captured from https://triangula.no/.

FUTURE OF SERVICE WEAPON ACTIVITY TOOLS

Although the sensor technology behind documenting service weapon activity has advanced significantly, technology developers face challenges to overcome the next hurdles of product development:

- **Distinguishing signal from noise:** Software embedded into service weapon activity detection must reliably distinguish a relevant event, such as a gunshot or positional change, from similar innocuous sounds or movements (i.e., noise). Many companies are employing machine learning techniques to address this challenge.
- **Expanding detection capabilities:** Companies are evaluating the ability of machine learning techniques to distinguish how many weapons were fired in an incident and what types of weapons were fired.
- **Communicating within a connected-officer system:** Previous challenges in connected-officer systems included the bandwidth to communicate (in near-real time) with dispatch and other officers. Although the advent of the cellular phone as a law enforcement tool and networks such as LTE/5G have made this challenge easier, technology developers noted challenges in managing the signatures emitted by the devices and reliable connection via Bluetooth.

Similar to BWC adoption, uptake of these technologies may depend heavily on leadership buy-in, ease of use, and impact to workflows. Experts noted that a main driver of BWC uptake and compliance, beyond increased accountability, was realization of the time savings and benefits that the footage could provide beyond its initial purpose. Officers, for example, can refer to footage to help build an accurate report. Technology implemented to detect service weapon activity may streamline workflows and increase objectivity of reporting and may lead to time savings and other benefits to the law enforcement officer. For many agencies, updating BWCs or weapons with new technology requires significant financial and training investments. Tools that integrate into existing technology (e.g., holster-based sensors or handgun inserts) or separate sensors like wrist-wearable devices may offer a lower barrier to adoption.

CONCLUSION

Technologies that document service weapon activity provide objective data and important lifelines that promote transparency, continuous improvement, and safety. Currently, no one technology or company can currently provide comprehensive documentation of service weapon unholstering, pointing, and firing; communication with dispatch in real time; and initiation of BWC recording. However, a suite of products integrated in or on the service weapon, BWC, or holster; on the officer's body; and within the environment can provide a significantly helpful picture of events transpiring during critical incidents. Technology advances are driving development of lighter, lower-profile sensors and enhancing abilities to gather more-sophisticated data from officers' service weapon use.

Independent testing and validation of these technologies is critical for helping law enforcement decisionmakers understand how effectively these products operate as advertised. For example, in 2023 the Department of Homeland Security Science and Technology Directorate's System Assessment and Validation for Emergency Responders Program, managed by the National Urban Security Technology Laboratory, conducted an assessment of BWC with automatic activation, including BWCs activated by holster sensors.[12] This assessment concluded that three different holster sensors generally met expectations, noting general satisfaction with size, mounting options, and durability, but resulted in mixed feedback on the ability to easily pair the sensors to the BWC. Continued assessments on a wider range of service weapon activity technology, especially as on- and in-weapon and wearable technologies develop, could help agencies make informed decisions when pursuing a suite of tools that truly support their needs. Independent testing, evaluation, and implementation research will drive continued adoption within law enforcement, leading to a future of improved transparency and objectivity.

12. National Urban Security Technology Laboratory (2023, July). *Body Worn Cameras with Automatic Activation: Assessment Report*. https://www.dhs.gov/sites/default/files/2023-10/23_1019_st_bodywordcamerasactivation.pdf