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THE CHICAGO POLICE DEPARTMENT'S USE OF SHOTSPOTTER TECHNOLOGY

CITY OF CHICAGO
OFFICE OF INSPECTOR GENERAL



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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY.....	2
II. BACKGROUND.....	4
A. SHOTSPOTTER ACOUSTIC GUNSHOT DETECTION TECHNOLOGY.....	4
B. SHOTSPOTTER NETWORK IN CHICAGO.....	6
III. METHODOLOGY.....	10
A. SHOTSPOTTER ALERT DATA.....	10
B. JOINING SHOTSPOTTER ALERT DATA TO INVESTIGATORY STOP REPORT DATA.....	11
IV. DATA ANALYSIS.....	13
A. SHOTSPOTTER ALERTS: VOLUME AND DISTRIBUTION.....	13
B. SHOTSPOTTER ALERTS: INCIDENT DISPOSITIONS.....	14
C. INVESTIGATORY STOP REPORTS ASSOCIATED WITH SHOTSPOTTER ALERT EVENT NUMBERS.....	16
D. INVESTIGATORY STOP REPORTS WITH "SPOTTER" AND/OR "SST" IN WRITTEN NARRATIVE.....	18
V. CONCLUSION.....	22
APPENDIX A: SHOTSPOTTER ALERT INCIDENT DISPOSITIONS.....	23

TABLE OF FIGURES

FIGURE 1: SHOTSPOTTER GUNSHOT DETECTION TECHNOLOGY.....	5
FIGURE 2: TYPICAL PROCESS FROM SHOTSPOTTER ALERT TO CHICAGO POLICE ARRIVAL ON SCENE.....	8
FIGURE 3: SHOTSPOTTER ALERTS BY CPD DISTRICT AND BEAT.....	13
FIGURE 4: SHOTSPOTTER ALERTS AND LIKELY GUN-RELATED CRIMINAL INCIDENT DISPOSITIONS	15
FIGURE 5: LAW ENFORCEMENT OUTCOMES DOCUMENTED ON INVESTIGATORY STOP REPORTS MATCHED TO CONFIRMED SHOTSPOTTER ALERTS.....	16

ACRONYMS

CPD	Chicago Police Department
MCC	Municipal Code of Chicago
MJC	MacArthur Justice Center
OEMC	Office of Emergency Management and Communications
OIG	Office of Inspector General
SDSC	Strategic Decision Support Center
SST	ShotSpotter Technology

I. EXECUTIVE SUMMARY

Pursuant to the Municipal Code of Chicago (MCC) §§ 2-56-030 and -230, the Public Safety section of the Office of Inspector General (OIG) initiated an inquiry into the Chicago Police Department's (CPD) use of ShotSpotter acoustic gunshot detection technology and CPD's response to ShotSpotter alert notifications. As part of this ongoing inquiry, OIG has analyzed data collected by CPD and the City of Chicago Office of Emergency Management and Communications (OEMC) regarding all ShotSpotter alert notifications that occurred between January 1, 2020 and May 31, 2021, and investigatory stops confirmed to be associated with CPD's response to a ShotSpotter alert.

In this report, OIG details ShotSpotter's functionality and descriptive statistics regarding law enforcement activity related to CPD's response to ShotSpotter alerts. OIG does not issue recommendations associated with this descriptive data. OIG is issuing this analysis of the outcomes of ShotSpotter alerts to provide the public and City government officials—to the extent feasible given the quality of OEMC and CPD's data—with clear and accurate information regarding CPD's use of ShotSpotter technology.

The City's three-year contract with ShotSpotter began on August 20, 2018, through August 19, 2021, at a cost of \$33 million.¹ In November 2020, well before the end of the contract term, CPD requested an extension of the contract and in December 2020, the City exercised an option to extend it, setting a new expiration date for August 19, 2023.² In March 2021, CPD requested approval for an annual 5% increase in the cost per square mile of the contract.

OIG's descriptive analysis of OEMC data and investigatory stop report (ISR) data collected for ShotSpotter alert incidents that occurred between January 1, 2020 and May 31, 2021, revealed the following:

1. A total of 50,176 ShotSpotter alerts were confirmed as probable gunshots by ShotSpotter, issued an event number—a unique record identification number assigned to

¹ The initial contract was neither competitively bid nor a non-competitive sole source contract, but a reference contract entered pursuant to MCC §2-92-649. Article 1 of the contract states "The City, pursuant to Chapter 2-92-649 ("Reference Contract Ordinance") of the Municipal Code of Chicago ("MCC"), desires to enter into an agreement with the Contractor for the purchase of ShotSpotter Flex gunfire detection, alert and analytic subscription services by using an existing contract ("Reference Contract") of another unit of government. There exists a contract by and between the City of Louisville, Kentucky, and Contractor, these two parties entered into a contract on January 31, 2017 for the provision by the Contractor of a subscription for gunshot detection software and services. The City of Louisville awarded the Contract pursuant to a publicly advertised Request for Proposals. The Reference Contract Ordinance grants the Chief Procurement Officer ("CPO") of the City the authority to enter into a new contract (a "City Contract") based on a Reference Contract " City of Chicago, "Contract Number 71366," August 22, 2018, accessed July 21, 2021, <https://webapps1.chicago.gov/vcsearch/city/contracts/71366>.

² City of Chicago, "Contract Number 71366: Modifications/Amendments," December 22, 2020, accessed July 21, 2021, <https://webapps1.chicago.gov/vcsearch/city/contracts/71366> Section 5.5 of the original contract allows for a 24-month extension

distinct “events” of police activity—and dispatched by OEMC; each of these resulted in a CPD response to the location reported by the ShotSpotter application.

2. Of the 50,176 confirmed and dispatched ShotSpotter alerts, 41,830 report a disposition—the outcome of the police response to an incident. A total of 4,556 of those 41,830 dispositions indicate that evidence of a gun-related criminal offense was found, representing 9.1% of CPD responses to ShotSpotter alerts.
3. Among the 50,176 confirmed and dispatched ShotSpotter alerts, a total of 1,056 share their event number with at least one ISR, indicating that a documented investigatory stop was a direct result of a particular ShotSpotter alert. That is, at least one investigatory stop is documented under a matching event number in 2.1% of all CPD responses to ShotSpotter alerts. Some of those events are also among those with dispositions indicating that evidence of a gun-related criminal offense was found, where an investigatory stop might have been among the steps which developed evidence of a gun-related criminal offense.
4. Through a separate keyword search analysis of all ISR narratives within the analysis period, OIG identified an additional 1,366 investigatory stops as potentially associated with ShotSpotter alerts whose event number did not match any of the 50,176 confirmed and dispatched ShotSpotter alerts. OIG’s review of a sample of these ISRs indicated that many of these keyword search “hits” were in narratives referring to the general volume of ShotSpotter alerts in a given area rather than a response to a specific ShotSpotter alert.

OIG concluded from its analysis that CPD responses to ShotSpotter alerts rarely produce documented evidence of a gun-related crime, investigatory stop, or recovery of a firearm. Additionally, OIG identified evidence that the introduction of ShotSpotter technology in Chicago has changed the way some CPD members perceive and interact with individuals present in areas where ShotSpotter alerts are frequent.

II. BACKGROUND

There are a number of possible ways to measure law enforcement activity and outcomes arising from ShotSpotter alerts. In light of limitations in data quality and reporting, OIG focuses on two such metrics. First, OIG examines instances in which CPD's immediate response to ShotSpotter produces evidence sufficient for the incident to be coded as a crime, and specifically, a gun-related crime. Second, OIG reports on the frequency with which CPD reports an investigatory stop in a way which allows it to be associated with a ShotSpotter alert, and whether those investigatory stops produce gun crime-related outcomes.

The information in this report relating to the technical operations of the ShotSpotter system and the process for confirming ShotSpotter alerts and dispatching police to respond to those alerts is sourced primarily from publicly available records. Where the publicly available records are silent or ambiguous on these topics, OIG has identified issues for possible future study.

A. SHOTSPOTTER ACOUSTIC GUNSHOT DETECTION TECHNOLOGY

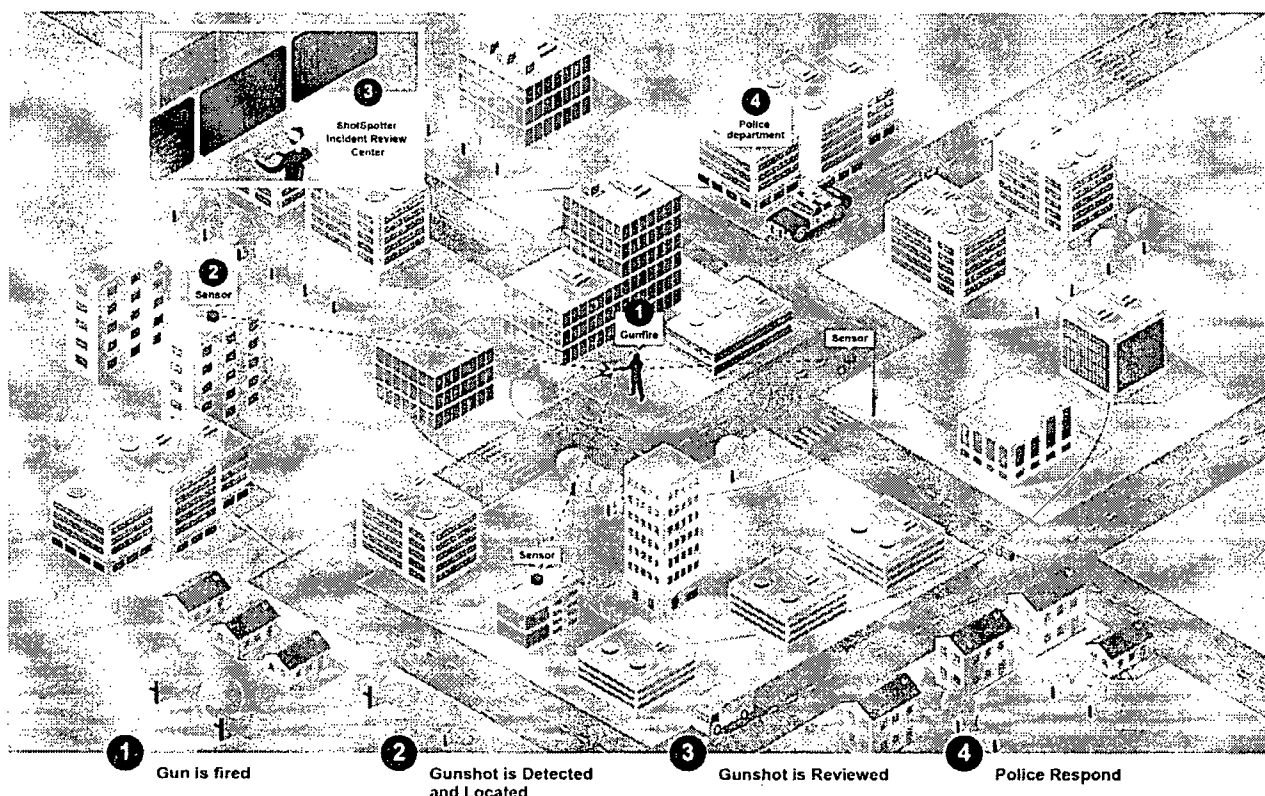
ShotSpotter is a gunshot detection system that uses a network of acoustic sensors to identify and locate suspected gunshots. ShotSpotter sensors rely on an algorithm to flag noises suggestive of gunshots, and the ShotSpotter system approximates the location of the possible gunshots via triangulation and multilateration—two techniques for computing the source location of a sound based on the time of arrival and angle of arrival of sound waves at multiple surrounding sensors.³ Then, a human “acoustic expert” at ShotSpotter’s Incident Review Center, located at a ShotSpotter corporate office, reviews these readings. The acoustic expert listens to the audio flagged by the algorithm to determine whether to classify the detected noise as a gunshot or gunshots and alert local police. Sounds that are not gunshots may activate ShotSpotter sensors. ShotSpotter’s public-facing description of its system acknowledges the potential for fireworks to produce false positive alerts, due to the similarities in the impulsive nature of the sound and the distance the impulsive sound produced by either gunshots or fireworks can travel.⁴ ShotSpotter acoustic experts are responsible for filtering out these false positive alerts from the confirmed alerts that are forwarded to local police. ShotSpotter currently operates in more than 100 U.S. cities.⁵

³ Triangulation identifies the location of a noise based on angle of arrival (AoA) and multilateration identifies the location of a noise based on time difference of arrival (TDoA). ShotSpotter’s patented technology uses both AoA and TDoA to identify the location where a noise suggestive of gunshots originated. ShotSpotter, “Gunshot Detection Technology,” September 2, 2014, accessed June 14, 2021, <https://www.shotspotter.com/system/content/uploads/mediakit/Gunshot-detection-WP.pdf>.

⁴ In 2014, ShotSpotter produced a white paper that explains, in detail, the technical science behind the acoustic gunshot detection technology, including a discussion of false positive alerts. ShotSpotter, “Gunshot Detection Technology,” September 2, 2014, accessed June 14, 2021, <https://www.shotspotter.com/system/content/uploads/mediakit/Gunshot-detection-WP.pdf>.

⁵ “ShotSpotter Respond FAQ,” *ShotSpotter*, December 2020, accessed June 14, 2021, <https://www.shotspotter.com/wp-content/uploads/2020/12/ShotSpotter-Respond-FAQ-Dec-2020.pdf>.

FIGURE 1: SHOTSPOTTER GUNSHOT DETECTION TECHNOLOGY



Source: ShotSpotter.⁶

Research published by the Brookings Institution—a nonprofit research organization—in 2016 found that only 12.4% of incidents of shots fired in Washington, DC, resulted in a resident calling 911 to report that they heard noise suggestive of gunshots.⁷ A 2020 study of ShotSpotter in St. Louis, MO, found, following installation of ShotSpotter sensors, a *decrease* of approximately 30% in the volume of 911 calls reporting shots fired, an 80% overall *increase* in volume of police responses to incidents of reported gunshots, and no significant reduction in crime attributable to the installation of ShotSpotter sensors.⁸

In 2021, the Journal of Urban Health published a ShotSpotter study conducted by several researchers, including individuals affiliated with the Center for Gun Policy and Research at the Johns Hopkins Bloomberg School of Public Health and several hospitals in Hartford, CT. The

⁶ ShotSpotter, "Gunshot Detection," accessed June 14, 2021, <https://www.shotspotter.com/law-enforcement/gunshot-detection/>.

⁷ Jillian B. Carr and Jennifer L. Doleac, "The Geography, Incidence, and Underreporting of Gun Violence. New Evidence Using ShotSpotter Data," Brookings Institution, April 2016, accessed June 14, 2021, <https://www.brookings.edu/research/the-geography-incidence-and-underreporting-of-gun-violence-new-evidence-using-shotspotter-data/>.

⁸ Dennis Mares and Emily Blackburn, "Acoustic Gunshot Detection Systems: a Quasi-Experimental Evaluation in St. Louis, MO," *Journal of Experimental Criminology* 17, no. 2 (2020) 193–215, <https://doi.org/10.1007/s11292-019-09405-x>.

analysis concerned the impact of ShotSpotter technology on homicides and arrests for murder and weapons across 68 large metropolitan counties between 1999 and 2016. This study found that implementing ShotSpotter technology had no significant impact on firearm-related homicides or arrest outcomes.⁹

B. SHOTSPOTTER NETWORK IN CHICAGO

Gunshot detection technology was deployed in Chicago as a feature of the second generation of police observation device cameras installed between September and December of 2003.¹⁰ According to a CBS2 News story in 2012, the City later determined the gunshot detection systems of the early 2000s were “too expensive and ineffective.”¹¹ In 2012, under CPD’s then-Superintendent Garry McCarthy, ShotSpotter sensors were installed in sections of CPD’s 3rd, 7th, 8th, and 11th Districts, with McCarthy stating that the technology had improved “dramatically.”¹² In 2018, the City of Chicago entered into a three-year, \$33 million dollar contract with ShotSpotter to provide network coverage in 12 police Districts over 100 square miles, making Chicago ShotSpotter’s largest customer.¹³ On December 22, 2020, the City exercised an option to extend the current contract with ShotSpotter through August 19, 2023.¹⁴ The City’s Violence Reduction Dashboard reports that, as of May 2021, ShotSpotter sensors have been installed in CPD’s 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 15th, and 25th Districts.¹⁵

Currently, ShotSpotter is one of the tools used by analysts in CPD’s Strategic Decision Support Centers (SDSCs), CPD District-based centers that are “equipped with crime-reduction tools and technology to assist [CPD] members with district-crime forecasting and achieving the primary

⁹ Mitchell L. Doucette, Christa Green, Jennifer Necci Dineen, David Shapiro, and Kerri M. Raissian, “Impact of ShotSpotter Technology on Firearm Homicides and Arrests Among Large Metropolitan Counties: a Longitudinal Analysis, 1999–2016,” *Journal of Urban Health*, April 30, 2021, accessed June 14, 2021, <https://doi.org/10.1007/s11524-021-00515-4>.

¹⁰ Chicago Police Department, “Police Observation Device (POD) Cameras,” accessed June 14, 2021, <https://home.chicagopolice.org/information/police-observation-device-pod-cameras/>.

¹¹ “Chicago Police Testing New Gunshot-Detection Technology,” *CBS News*, October 25, 2012, accessed May 19, 2021, <https://chicago.cbslocal.com/2012/10/25/chicago-police-testing-new-gunshot-detection-technology/>.

¹² “Chicago Police Testing New Gunshot-Detection Technology,” *CBS News*, October 25, 2012, accessed May 19, 2021, <https://chicago.cbslocal.com/2012/10/25/chicago-police-testing-new-gunshot-detection-technology/>.

¹³ City of Chicago, “Contract Number 71366,” August 22, 2018, accessed June 14, 2021, <https://webapps1.chicago.gov/vcsearch/city/contracts/71366>. The contract itself specifies a dollar amount of \$33 million. A press release from ShotSpotter Inc. stated that the value of the contract was \$23 million. ShotSpotter, “Chicago Signs \$23 Million Multi-Year Agreement with ShotSpotter to Extend Gunshot Detection Coverage into Next Decade,” September 5, 2018, accessed June 14, 2021, <https://www.shotspotter.com/press-releases/chicago-signs-23-million-multi-year-agreement-with-shotspotter-to-extend-gunshot-detection-coverage-into-next-decade/>.

¹⁴ City of Chicago, “Contract Number 71366: Modifications/Amendments,” December 22, 2020, accessed July 21, 2021, <https://webapps1.chicago.gov/vcsearch/city/contracts/71366>.

¹⁵ City of Chicago, “Violence Reduction Dashboard Glossary,” accessed June 14, 2021, <https://www.chicago.gov/city/en/sites/vrd/home.html>. OEMC data identifies some ShotSpotter alerts occurring in CPD Districts not reported to house ShotSpotter sensors.

mission of district crime-reduction.”¹⁶ The first SDSCs were established in 2017 in partnership with the University of Chicago Crime Lab.¹⁷ After a shots fired incident is detected and confirmed by a ShotSpotter-employed “acoustic expert” at a ShotSpotter office, the alert is displayed on the ShotSpotter application, which is accessible by the CPD members assigned to the SDSC (“SDSC analysts”), OEMC, and CPD members who are equipped with the ShotSpotter mobile application on CPD-issued smartphones. SDSC analysts monitor the ShotSpotter application for these incoming alerts. When alerts come through, pursuant to CPD directives, SDSC analysts are responsible for initiating the dispatch process by contacting OEMC to report the ShotSpotter alert.¹⁸ OEMC personnel will then issue an event number—a unique identification number assigned to every distinct incident of police activity—for a ShotSpotter alert and dispatch CPD units to respond.¹⁹

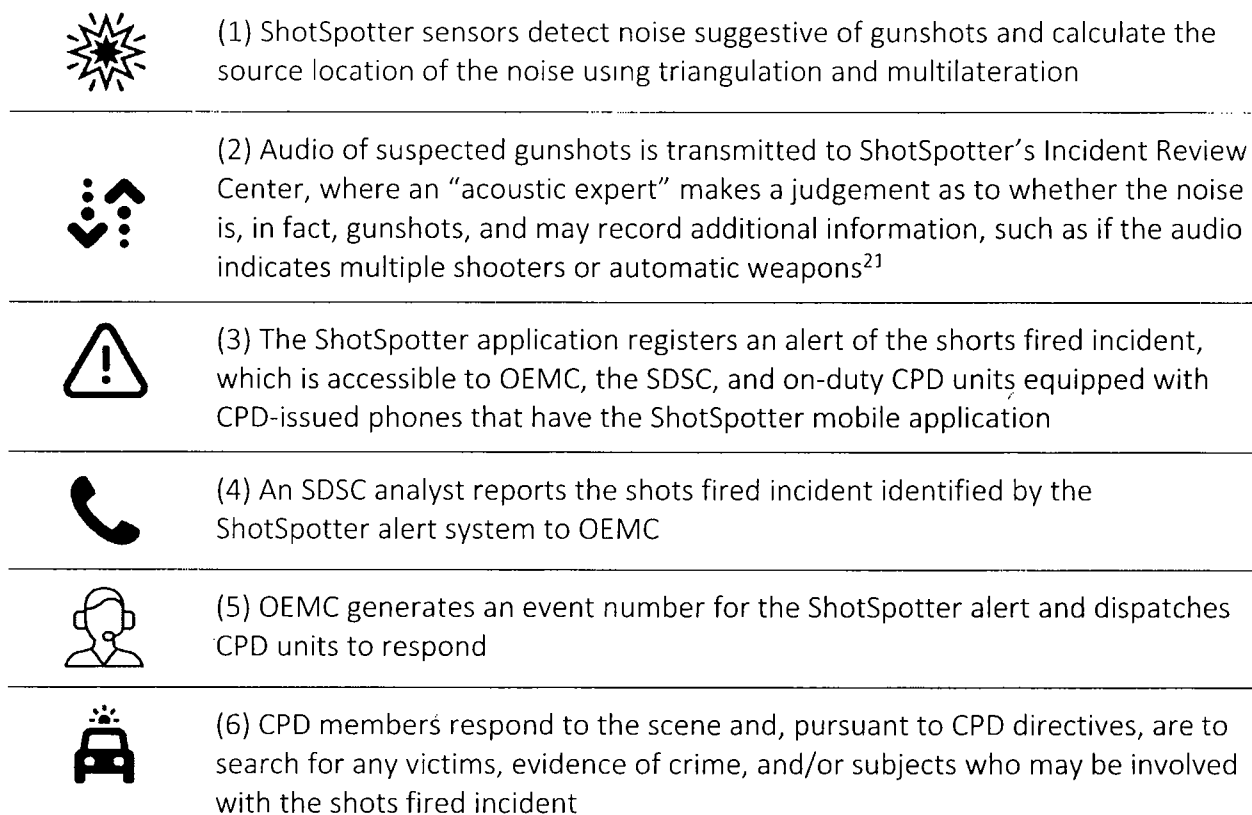
¹⁶ Chicago Police Department, “Special Order S03-02-01: Strategic Decision Support Centers: Operations and Accountability,” IV.A., July 26, 2019, accessed July 19, 2021, <http://directives.chicagopolice.org/directives/data/a7a57b85-16c2efbe-c2416-c2fa-edbba6051837c01c.pdf?hl=true>.

¹⁷ Chicago Tribune Editorial Board, “A high-tech ray of hope in the fight against gun violence in Englewood,” *Chicago Tribune*, December 15, 2017, accessed May 19, 2021, <https://www.chicagotribune.com/opinion/editorials/ct-edit-englewood-20171215-story.html>, and University of Chicago, “A \$10 million grant will support Crime Lab collaboration for police innovation,” April 12, 2018, accessed June 25, 2021, <https://news.uchicago.edu/story/10-million-grant-will-support-crime-lab-collaboration-police-innovation>.

¹⁸ SDSCs were initially staffed by analysts who were employed by the University of Chicago Crime Lab. In January 2020, after a transitional phase during which CPD hired analysts and the University of Chicago Crime Lab trained them, the University of Chicago Crime Lab analysts moved out of the CPD District SDSCs. University of Chicago Crime Lab, “Strategic Decision Support Centers (SDSCs),” accessed June 14, 2021, <https://urbanlabs.uchicago.edu/programs/strategic-decision-support-centers-sdscs>, and Chicago Police Department, “Strategic Decision Support Center. A User Manual,” 2019. While OEMC receives alerts from ShotSpotter’s “acoustic experts” concurrent with the SDSCs, CPD’s directive provides that “ShotSpotter incidents will be dispatched from the District’s Strategic Decision Support Center (SDSC) to field units through the Office of Emergency Management and Communications (OEMC).” Chicago Police Department, “Special Order S03-19. ShotSpotter Flex Program,” IV.B, July 5, 2017, accessed June 25, 2021, directives.chicagopolice.org/directives/data/a7a57b85-15d1331c-51715-d133-2e1831b972745907.pdf?hl=true

¹⁹ Chicago Police Department, “Strategic Decision Support Center. A User Manual,” 2019

FIGURE 2: TYPICAL PROCESS FROM SHOTSPOTTER ALERT TO CHICAGO POLICE ARRIVAL ON SCENE²⁰



Source: OIG analysis.

CPD established its first special order concerning ShotSpotter on July 5, 2017, replacing a department notice issued in 2012.²² CPD Special Order S03-19: ShotSpotter Flex Program states that ShotSpotter will be used as part of CPD's Gang Violence Reduction Strategy.²³ S03-19 establishes that ShotSpotter alerts will prompt "an immediate dispatch with the priority of in

²⁰ This figure is demonstrative of major steps in the typical sequence of events from a ShotSpotter noise detection to alert to arrival of CPD units on scene. The information in this figure is gathered from multiple sources, and it does not purport to be exhaustive of every aspect of this sequence of events, nor is this typical sequence the only possible way for CPD members to arrive on scene of a ShotSpotter alert. CPD units are equipped with the ShotSpotter mobile application and may respond directly to any alerts that originate from the application rather than an assigned dispatch from OEMC.

²¹ ShotSpotter, "See how ShotSpotter Gunshot detection works," accessed June 14, 2021, video, <https://www.shotspotter.com/law-enforcement/gunshot-detection/>.

²² Chicago Police Department, "Special Order S03-19: ShotSpotter Flex Program," July 5, 2017, accessed June 25, 2021, directives.chicagopolice.org/directives/data/a7a57b85-15d1331c-51715-d133-2e1831b972745907.pdf?hl=true.

²³ Chicago Police Department, "Special Order S03-19: ShotSpotter Flex Program," July 5, 2017, accessed June 25, 2021, directives.chicagopolice.org/directives/data/a7a57b85-15d1331c-51715-d133-2e1831b972745907.pdf?hl=true, and Chicago Police Department, "General Order G10-01: Gang Violence Reduction Strategy," February 8, 2019, accessed June 25, 2021, [http://directives.chicagopolice.org/directives/data/a7a57bf0-136d1d31-16513-6d1d-382b311ddf65fd3a.pdf?hl=true](https://directives.chicagopolice.org/directives/data/a7a57bf0-136d1d31-16513-6d1d-382b311ddf65fd3a.pdf?hl=true)

progress crimes involving the use of a firearm.”²⁴ Responding CPD members are cautioned to “take a safe and strategic approach while responding to the incident, being aware that an offender or multiple offenders may be on scene.”²⁵ SDSC analysts are responsible for analyzing and reporting notable observations and/or trends in ShotSpotter alerts and assisting command staff in developing a strategic response.²⁶

At the conclusion of any law enforcement activity, the primary responding CPD unit is to report a disposition—the outcome of the incident—to OEMC. OEMC will then record the corresponding disposition code in the record for the event number. Criminal incidents are assigned an Illinois Uniform Crime Reporting code.²⁷ Incidents that are not criminal in nature but require the completion of a case report, such as a traffic crash, are assigned a non-criminal incident code.²⁸ For incidents that do not require the completion of a case report, CPD also defines a set of “miscellaneous incident” disposition codes.²⁹ When a CPD member responds to a ShotSpotter alert, they are to take investigative steps which may include interviewing witnesses, conducting investigatory stops, running license plates, searching for shell casings, etc. If these activities produce evidence of a shooting or any other criminal activity, a corresponding criminal incident code will be assigned. If there is no such evidence, then the event will receive a miscellaneous incident disposition code.

²⁴ Chicago Police Department, “Special Order S03-19: ShotSpotter Flex Program,” IV.B., July 5, 2017. Whether criminal activity that prompts a ShotSpotter alerts is, in fact, still “in progress” when OEMC sends the dispatch would depend in part on how long the process depicted in Figure 2 took.

²⁵ Chicago Police Department, “Special Order S03-19: ShotSpotter Flex Program,” VII.C.2., July 5, 2017.

²⁶ Chicago Police Department, “Special Order S03-19: ShotSpotter Flex Program,” VII.E., July 5, 2017.

²⁷ Chicago Police Department, “Illinois Uniform Crime Reporting (IUCR) Codes,” accessed July 13, 2021, <https://data.cityofchicago.org/Public-Safety/Chicago-Police-Department-Illinois-Uniform-Crime-R/c7ck-438e>. According to the City of Chicago Office of Public Safety Administration, crime classification codes are “derived from the Federal Bureau of Investigation’s (FBI) National Incident-Based Reporting System (NIBRS) Uniform Crime Reporting (UCR) Program.” NIBRS codes report the crime type and UCR codes report the specific criminal offense. City of Chicago Office of Public Safety Administration, “Definition & Description of Crime Types,” accessed July 20, 2021, https://gis.chicagopolice.org/pages/crime_details

²⁸ Chicago Police Department, “Incident Reporting Table (CPD 63.451),” accessed July 13, 2021, http://directives.chicagopolice.org/forms/CPD-63.451_Table.pdf

²⁹ Chicago Police Department, “Miscellaneous Incident Reporting Table (CPD 11.484),” accessed June 25, 2021, <http://directives.chicagopolice.org/forms/CPD-11.484.pdf>

III. METHODOLOGY

A. SHOTSPOTTER ALERT DATA

OIG analyzed OEMC data for confirmed dispatched ShotSpotter alerts between January 1, 2020 and May 31, 2021.³⁰ ShotSpotter alerts reported to OEMC are stored in the same database in which OEMC documents other event records related to police service, including 911 calls for service that OEMC receives from the public and notifications of police-initiated events such as investigatory stops received from police officers.³¹ Each of the events recorded in this database is assigned an event number, which is a unique identification number assigned to every distinct incident of police activity.³² Multiple records associated with a single incident of police activity (a single “event”) should, in principle, be assigned the same event number. Accompanying information about events recorded in the OEMC database includes location information, a “final” designation of the type of event, and the “disposition” of the incident.³³

OIG identified for analysis 50,176 ShotSpotter alerts in OEMC’s data between January 1, 2020 and May 31, 2021. This represents the number of instances in which ShotSpotter sensors registered an alert that, after review by ShotSpotter’s “acoustic experts” and personnel in CPD’s SDSCs, was sent on to OEMC, dispatched by OEMC, and recorded as an event of final type “SST” by OEMC, short for ShotSpotter Technology. This means that CPD members responded to 50,176

³⁰ A dispatched event is any event marked as “dispatched” in OEMC’s database or supplied with a dispatch date and time.

³¹ Chicago Police Department, “General Order G03-01: Communications Systems and Devices,” III.B-E, May 30, 2014, accessed July 21, 2021, <http://directives.chicagopolice.org/directives/data/a7a57be2-1287e496-14312-87e6-e46a12b808498f0d.pdf?ownapi=1>.

³² Chicago Police Department, “General Order G03-01: Communications Systems and Devices,” III.C-D, May 30, 2014.

³³ The event type designations that OEMC applies to 911 calls for service can be seen on OIG’s dashboards, along with the volume of calls received that are designated to each event type. City of Chicago Office of Inspector General, “911 Calls,” accessed June 21, 2021, <https://informationportal.igchicago.org/911-calls-for-cpd-service/>. The OEMC database includes many other data fields as well, and OIG made two methodological decisions on how to treat these data fields that had a marginal impact on the total population of ShotSpotter alerts identified in the period of analysis. First, the OEMC database designates both an “initial type” and a “final type” for each event. In the period of analysis, OIG identified 171 records for which the “initial type” was “SST” (ShotSpotter) and the “final type” was recorded as something else. OEMC personnel have reported to OIG that discrepancies between “initial type” and “final type” occur for two main reasons: (1) an officer responding to the event updates the type to align with the situation; or (2) the OEMC operator receives added details during the call and updates the type. Accordingly, these 171 records were excluded from OIG’s analysis. Secondly, OEMC’s database has a field to indicate if events are “duplicate.” In the period of analysis, there are 8,379 events with an “initial type” and/or “final type” of “SST” that are also tagged as “duplicate” events. Upon examination of these records, OIG determined that elimination of events tagged as “duplicate” would result in the loss of valuable information, such as event numbers tagged as “duplicate” that matched to event numbers recorded on investigatory stop reports. Additionally, in this review of ShotSpotter alert data, OIG is concerned with law enforcement outcomes of each individual ShotSpotter alert that receives a dispatch, regardless of whether multiple alerts are associated with what may be considered one incident; that is, for these purposes, the relevant unit of analysis is a distinct ShotSpotter alert event number. Therefore, events tagged as “duplicate” with a “final type” of “SST” were included in the analysis.

individual reports of probable gunshots identified by ShotSpotter between January 1, 2020 and May 31, 2021.

OIG used OEMC's "Location" field information and geocoding technology to map ShotSpotter alerts by CPD Beat. In the OEMC data available to OIG, 90.4% of the 50,176 events with a "final type" of a ShotSpotter alert in the analysis period listed locations that included datapoints for the corresponding CPD District and Beat. For the remaining 4,825 alerts, OIG cleaned all available location data and successfully geocoded 3,896 records to capture geographic datapoints for a cumulative total of 98.1% of the ShotSpotter alerts in the analysis period.

While the ShotSpotter application is notionally communicating geographic coordinates to OEMC and SDSCs with every alert, it is nevertheless true that, for a small percentage of those alerts, the location data that is ultimately stored in OEMC's database is incomplete or in a format that is incompatible with geocoding software. Information transfers from ShotSpotter to CPD to OEMC may introduce alterations or errors in the location information associated with the initial ShotSpotter alerts by the time OEMC personnel make a database entry (See Figure 2 for an overview of the multiple steps and actors that are part of this process). OIG did not exclude event numbers for ShotSpotter alerts that occurred outside the boundaries of CPD Districts confirmed to have ShotSpotter sensors or the immediately adjacent beats, and instead relied on OEMC's reporting of ShotSpotter alerts regardless of their location.³⁴

B. JOINING SHOTSPOTTER ALERT DATA TO INVESTIGATORY STOP REPORT DATA

OIG joined data from CPD's ISR database to OEMC's ShotSpotter event data to identify investigatory stops initiated after and related to ShotSpotter alerts using recorded event numbers. As described in the previous section, OEMC issues event numbers to ShotSpotter alerts, and CPD directives require that CPD members record the relevant event number when completing ISRs.³⁵ These event numbers should, in principle, allow for cross referencing of multiple reports and data records that are created in relation to a single "event."

OIG queried ISR records and matched event numbers to the set of 50,176 confirmed ShotSpotter alerts, returning 1,056 event numbers shared by both a ShotSpotter alert and one or more approved ISRs.³⁶ CPD members documenting an investigatory stop are required to complete a

³⁴ ShotSpotter sensors are currently installed in the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 15th, and 25th CPD Districts. City of Chicago, "Violence Reduction Dashboard Glossary," accessed June 14, 2021, <https://www.chicago.gov/city/en/sites/vrd/home.html>. Among the 49,247 ShotSpotter alerts that were successfully geocoded, 294 (0.6%) were located in a CPD District outside the 12 with confirmed ShotSpotter sensors, and 226 of those were located in a CPD Beat immediately adjacent to a CPD District with confirmed ShotSpotter sensors.

³⁵ Chicago Police Department, "Special Order S04-13-09: Investigatory Stop System," VIII A.3, July 10, 2017, accessed July 20, 2021, <http://directives.chicagopolice.org/directives/data/a7a57b99-151b6927-49f15-1b69-2c32e99868b316b0.pdf?ownapi=1>

³⁶ Additional records reflecting investigatory stop reports in a status other than "approved" were excluded from analysis. Where duplicate ISR records by event number and subject reported disagreement as to whether (1) a gun

narrative account of the stop; OIG searched for additional ISRs which may be associated with ShotSpotter alerts by conducting keyword searches of the narrative field. By searching for the keywords "SPOTTER" and "SST," OIG identified an additional 1,366 ISRs that contained one of these keywords but for which the ISR event number did not match any of the 50,176 ShotSpotter alert event numbers in the analysis period.³⁷ These 1,366 ISRs were associated with 917 distinct event numbers. Review of a sample of 72 of these reports—one randomly sampled report from each CPD District with confirmed ShotSpotter sensors (12) for each quarter (6) in the analysis period—revealed important results relating to both the quality of CPD's record keeping and the outcomes of ShotSpotter events, described further below in section IV.D.

The keyword search analysis provides an estimate of the volume of investigatory stops associated with ShotSpotter alerts that cannot be matched by event number, but it does not provide conclusive results as to the true number of investigatory stops conducted as part of the law enforcement response to a ShotSpotter alert.³⁸ For this reason, OIG restricted quantitative and geographic analysis to the set of 1,740 ISRs associated with 1,056 ShotSpotter alert event numbers through an exact event number match.

was recovered, (2) an arrest was made, (3) a search was performed, and/or (4) a pat down was performed, OIG preserved the ISR record which indicated the observation did occur, using a hierarchical scheme indicated by the order as listed. CPD members frequently record only the last five digits of the ten-digit event number, and this occurred in 843 (79.8%) of the matched ISRs. OIG performed data management transformations on these ISR event numbers to recreate the complete ten-digit event number to facilitate event number matching.

³⁷ This set of 1,366 ISRs corresponded to 917 distinct event numbers.

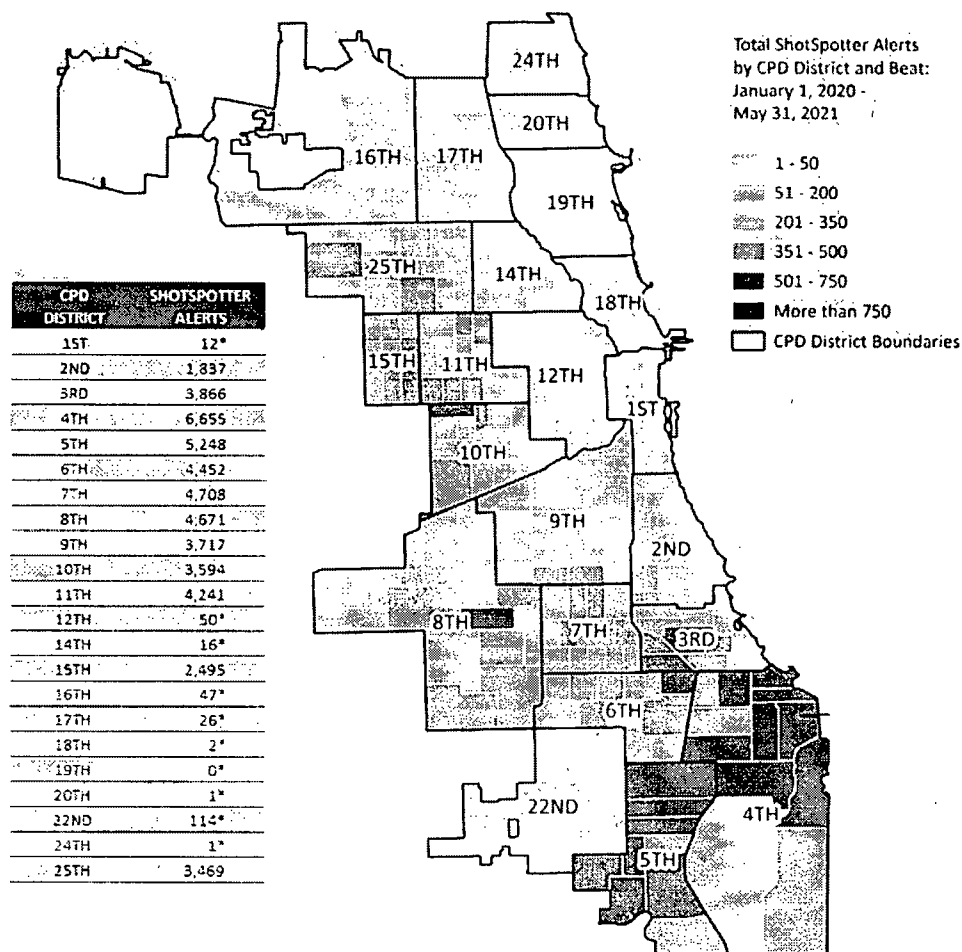
³⁸ OIG relied upon CPD documentation of investigatory stops; where CPD did not document an investigatory stop, OIG was unable to identify and analyze such law enforcement activity. Additionally, OIG's review of the random sample of 72 narratives revealed that many references to ShotSpotter in ISR narratives did not concern *specific ShotSpotter alerts*, but rather reflected mention of the *overall volume of ShotSpotter alerts in a given area*, meaning these keyword search "hits" would not be appropriately classified as a CPD response to a unique ShotSpotter alert.

IV. DATA ANALYSIS

A. SHOTSPOTTER ALERTS: VOLUME AND DISTRIBUTION

Between January 1, 2020 and May 31, 2021, a total of 50,176 ShotSpotter alerts were confirmed by ShotSpotter acoustic experts and dispatched as an event of final type "SST" by OEMC. This means that CPD members responded to 50,176 individual reports of probable gunshots identified by ShotSpotter between January 1, 2020 and May 31, 2021. Nearly a quarter of ShotSpotter events during the analysis period are concentrated in CPD's 4th (South Chicago) and 5th (Calumet) Districts, totaling 11,903 (23.7%) confirmed ShotSpotter alerts.

FIGURE 3: SHOTSPOTTER ALERTS BY CPD DISTRICT AND BEAT³⁹



Source: OIG analysis

³⁹ OIG did not exclude event numbers for ShotSpotter alerts that occurred outside the boundaries of CPD Districts confirmed to have ShotSpotter sensors or the immediately adjacent CPD Beats, and instead relied on OEMC's reporting of ShotSpotter alerts regardless of their location. Among the 49,247 ShotSpotter alerts that were successfully geocoded, 294 (0.6%) were located in a CPD District outside the 12 with confirmed ShotSpotter sensors. The ShotSpotter alert totals reported in Districts which are not confirmed to have ShotSpotter sensors are marked with an asterisk (*) in the Figure 3 table.

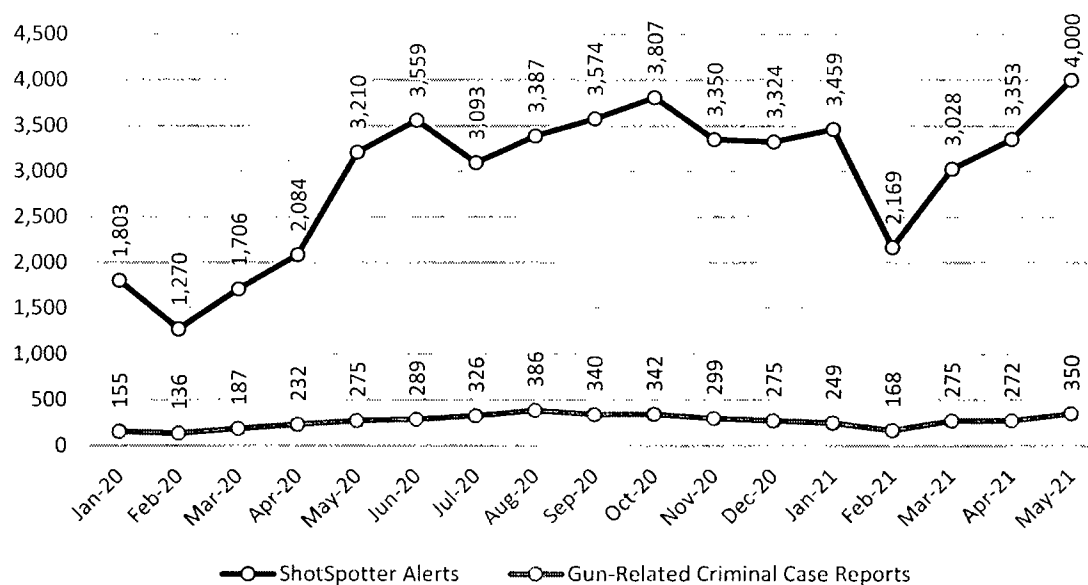
In light of limitations in data quality and reporting, OIG focuses on two metrics for law enforcement activity and outcomes arising from ShotSpotter alerts. First, OIG examines instances in which CPD's immediate response to ShotSpotter produces evidence sufficient for the incident to be coded as a crime, and specifically, a gun-related crime. Second, OIG reports on the frequency with which CPD reports an investigatory stop in a way which allows it to be associated with a ShotSpotter alert, and whether those investigatory stops produce gun crime-related outcomes.

B. SHOTSPOTTER ALERTS: INCIDENT DISPOSITIONS

In 8,346 of the 50,176 confirmed ShotSpotter alerts (16.6%), no disposition code indicating the final outcome of the event was recorded in the OEMC event record. The remaining 41,830 ShotSpotter alerts reported either a criminal incident disposition, a non-criminal incident disposition, or a miscellaneous incident disposition. Criminal incident dispositions account for 13.2% of OEMC records that include disposition data, representing 5,504 criminal case reports completed following a CPD response to a ShotSpotter alert. Of that total, 4,556 criminal case reports—82.8% of criminal incident dispositions and 10.9% of all records reporting a disposition—listed charges which are likely related to gun violence or illegal gun possession.⁴⁰ Figure 4 below displays the monthly total of ShotSpotter alerts alongside the monthly total of ShotSpotter alerts which recorded likely-gun-related crime disposition.

⁴⁰ Of the incident dispositions recorded in relation to ShotSpotter alerts during the analysis period, OIG determined the following primary charge types to be likely indicative of gun-related crime: homicide, aggravated vehicular hijacking, armed robbery with a handgun/firearm, aggravated battery with a handgun/firearm, aggravated domestic battery with a handgun/firearm, aggravated assault with a handgun/firearm, reckless firearm discharge, unlawful use of a handgun/firearm, and use of metal piercing bullets. Not all statutes in the Illinois Criminal Code designate whether or not a violent crime was committed with a gun, and in others, the use of a gun is an aggravating factor, but other factors such as the age of the victim may cause the charge to be aggravated. OIG elected to categorize some dispositions as related to gun violence, notwithstanding that some percentage may not have involved a gun. For example, homicides may be committed with a weapon other than a gun, or without a weapon, but OIG cannot ascertain which did not involve a gun from the available OEMC data on ShotSpotter alert dispositions and therefore opted to include all homicides. In 2020, 692 of the 770 homicides (89.9%) that occurred in Chicago were fatal shootings. City of Chicago, "Violence Reduction Dashboard," accessed July 9, 2021, <https://www.chicago.gov/city/en/sites/vrd/home.html>. See also Appendix A

FIGURE 4: SHOTSPOTTER ALERTS AND LIKELY GUN-RELATED CRIMINAL INCIDENT DISPOSITIONS



Source: OIG analysis.

A miscellaneous incident disposition was recorded for 36,039 of the ShotSpotter alert events occurring during the analysis period. The most common type of miscellaneous incident disposition recorded was “19-P,” listed in CPD’s Miscellaneous Incident Reporting Table as “Other Miscellaneous Incident-Other Police Service.”⁴¹ The “19-P” disposition code was applied to 29,480 ShotSpotter alert events, representing 70.5% of all events with a recorded disposition. Among the 36,039 events with a miscellaneous incident disposition, OIG identified a total of 468 investigatory stops that shared an event number with a ShotSpotter alert, including 407 investigatory stops under ShotSpotter alert events closed with a “19-P” disposition.

A recent analysis of disposition codes associated with ShotSpotter alerts in Chicago by the MacArthur Justice Center (MJC) reaches a conclusion consistent with what is reported here: a large percentage of ShotSpotter alerts cannot be connected to any verifiable shooting incident. In May 2021, attorneys for MJC published findings from their analysis in an amicus brief filed on behalf of their clients—several local nonprofit organizations—in Cook County Circuit Court in support of a criminal defendant seeking a hearing on the reliability of ShotSpotter alerts. MJC analyzed OEMC data for ShotSpotter alert notifications between July 1, 2019 and April 14, 2021, and found that 85.6% of incidents in which CPD members respond to ShotSpotter alerts did not result in the completion of a criminal case report.⁴²

⁴¹ Chicago Police Department, “Miscellaneous Incident Reporting Table (CPD 11.484),” accessed June 25, 2021, <http://directives.chicagopolice.org/forms/CPD-11.484.pdf>.

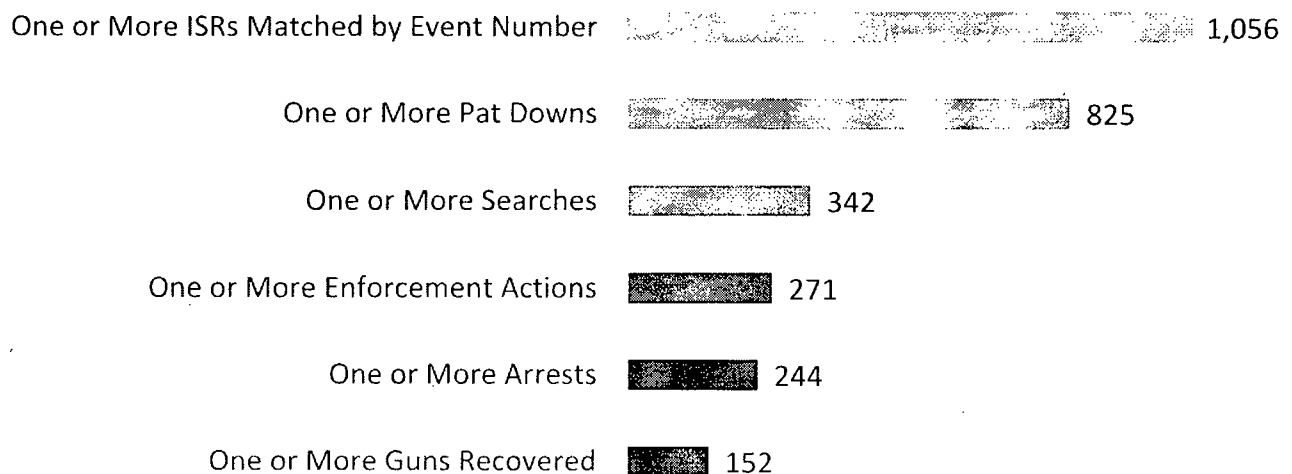
⁴² MacArthur Justice Center, “ShotSpotter Generated Over 40,000 Dead-End Police Deployments in Chicago in 21 Months, According to New Study,” May 3, 2021, accessed June 25, 2021, <https://www.macarthurjustice.org/shotspotter-generated-over-40000-dead-end-police-deployments-in-chicago-in-21-months-according-to-new-study/>. The fullest description of MJC’s methodology for its analysis is provided in its amicus brief filed in the Circuit

C. INVESTIGATORY STOP REPORTS ASSOCIATED WITH SHOTSPOTTER ALERT EVENT NUMBERS

Among the 50,176 ShotSpotter alerts between January 1, 2020 and May 31, 2021, a total of 1,056 were matched to one or more investigatory stop reports (ISRs) through a shared event number, representing 2.1% of all ShotSpotter alert event numbers. Because multiple people might be stopped at or near the scene of a ShotSpotter alert, the total number of people stopped is higher than the total number of event number matches. The total number of people stopped in these events is 1,740, and 422 ShotSpotter alert events match event numbers to multiple ISRs. This means that for 40% of ShotSpotter alerts that have event numbers that match ISRs, multiple people were stopped (422 out of 1,056 alerts). In this set, the maximum number of people stopped following a single ShotSpotter alert is seven.

Figure 5 displays law enforcement outcomes for the ShotSpotter alerts matched to ISRs via event number. The 1,056 matched event numbers indicate that investigatory stops are documented as associated with a specific ShotSpotter alert in only 2.1% of the 50,176 CPD dispatches to ShotSpotter alerts.⁴³ "Enforcement actions" include issuance of citations and ordinance violations in addition to arrests. According to the data collected in the associated ISRs, fewer than 2 in 10 investigatory stops following ShotSpotter alerts resulted in the recovery of a gun, with a high rate of 17.2% in the 11th District and a low of 4.7% in the 9th District.

FIGURE 5: LAW ENFORCEMENT OUTCOMES DOCUMENTED ON INVESTIGATORY STOP REPORTS MATCHED TO CONFIRMED SHOTSPOTTER ALERTS



Source: OIG analysis.

Court of Cook County Motion for Leave to File Brief as Amici Curiae in Support of Defendant's Motion for a Frye Hearing, *State of Illinois v. Michael Williams*, at 15, (May 3, 2021) (20CR0988601)

⁴³ OIG identified an additional 1,366 ISRs under event numbers that did not match a confirmed ShotSpotter alert event number yet the narrative section of the ISR included a reference to ShotSpotter. OIG's review of these ISRs is detailed in Section IV-D.

Figure 5 only includes arrests and gun recoveries reported on ISRs with an event number matched to a ShotSpotter alert and therefore does not include any arrests or gun recoveries that were not associated with a documented investigatory stop recorded under a ShotSpotter alert event number. The outcomes reported in Figure 5 represent all law enforcement outcomes reported in ISRs bearing an event number that can be matched to a ShotSpotter alert.⁴⁴

The following case studies present instances in which investigatory stops matched to specific ShotSpotter alerts by a shared event number resulted in arrests. In Case 1, the subject was arrested for a gun-related offense. In Case 2, the ShotSpotter alert provided the articulated reasonable suspicion for the investigatory stop, yet the subject was arrested for narcotics possession, not any gun-related charges.

CASE 1: GUN-RELATED ARREST FOLLOWING RESPONSE TO SHOTSPOTTER ALERT

ISR #005187115

IN SUMMARY R\O'S⁴⁵ WERE DISPATCHED TO A SHOT SPOTTER AT [location]. WHILE ENROUTE TO [location] R\O'S OBSERVED A WHITE CHEVROLET TRAVELING AT A HIGH RATE OF SPEED. TURN WEST BOUND ONTO [street] FROM [street]. R\O'S KNOWING A SHOT SPOTTER HAD JUST BEEN TRIGGERED IN THE AREA INITIATED A STOP ON THE VEHICLE. R\O'S MET WITH THE [subject]. R\O'S ASKED THE DRIVER WHERE HE WAS COMING FROM TO WHICH HE RELATED THE HOUSE, R\O'S ASKED HIM HIS THE ADDRESS OF WHERE HE WAS COMING FROM AND HE RELATED [address]. [Address] IS A MULTI UNIT BUILDING WHICH IS ALSO CONNECTED TO [location] MEANING THE DRIVER WAS IN THE AREA OF THE SHOT SPOTTER. UPON LEARNING HIS NAME R\O'S RAN HIS NAME VIA LEADS⁴⁶ WHICH RETURNED HIM REVOKED IN IL. AT THIS TIME R\O'S ASKED THE DRIVER AND PASSENGER TO STEP OUT AND A SEARCH OF THE VEHICLE WAS CONDUCTED BY R\O [officer]. UPON SEARCHING THE VEHICLE R\O'S RECOVERED FROM THE DRIVERS SIDE FLOOR BOARD UNDER THE DRIVERS SEAT A LOADED BLUE STEEL 9MM SEMI-AUTOMATIC GLOCK 17 4.48IN BARREL SERIAL#[number]. THE BUTT OF THE GUN WAS PROTRUDING IN PLAIN VIEW FROM UNDER THE DRIVER SEAT WHICH INITIATED R\O'S SEARCH OF THE VEHICLE. AT THIS TIME R\O'S DETAINED THE DRIVER AND PLACED HIM IN THE BACK OF THE MARKED SQUAD CAR. MIRANDA WAS READ AT 0301HRS AND THE DRIVER CONSENTED TO QUESTIONS. THE DRIVER WAS ASKED IF HE HAD A VALID CONCEAL CARRY, WHICH HE RELATED HE DID NOT. THE DRIVER WAS ASKED IF HE HAD A FOID⁴⁷ CARD WHICH HE RELATED HE DID NOT. THE DRIVER WAS THEN ASKED IF HE WAS A CONVICTED FELON TO WHICH HE RELATED HE WAS. AT THIS TIME R\O'S INFORMED HIM HE WAS IN CUSTODY. THE OFFENDER WAS TRANSPORTED TO THE 006TH DISTRICT FOR FURTHER PROCESSING, THE VEHICLE WAS SUBJECT TO IMPOUNDMENT AS THE DRIVER WAS REVOKED. WHILE ENROUTE TO THE 006TH

⁴⁴ Investigatory stops that are related to ShotSpotter alerts may be documented under a separate event number without identification of the related ShotSpotter alert (or an investigatory stop might not be documented at all), guns might be recovered when no people are present at the scene, and arrests might be made (on gun-related charges or something else) without an investigatory stop taking place first.

⁴⁵ Reporting officers (R/Os)

⁴⁶ Law Enforcement Agencies Data System (LEADS)

⁴⁷ Firearm Owner's Identification (FOID)

DISTRICT STATION THE OFFENDER RELATED MULTIPLE TIMES HE WAS SORRY, AND THAT NO ONE GOT HURT. WHEN ASKED WHAT HE MEANT BY THAT THE OFFENDER GOT QUIET. FELONY REVIEW CONTACTED AND FELONY APPROVAL WAS GIVEN AT 0534HRS FOR UUW⁴⁸ BY A FELON.

CASE 2: NARCOTICS ARREST FOLLOWING RESPONSE TO SHOTSPOTTER ALERT

ISR #004941914

EVENT#14451. BWC RECORDED INCIDENT. IN SUMMARY, A/O'S WERE RESPONDING TO A SHOT SPOTTER OF ONE ROUND ON THE SIDE OF THE BUILDING OF [address] A/O'S⁴⁹ OBSERVED [subject] (OFFENDER) WALK OUT FROM THE SIDE OF THE BUILDING AT [address]. A/O'S CONDUCTED AN INVESTIGATORY STOP OF THE OFFENDER AT ABOVE LOCATION. A/O OBSERVED A LARGE BULGE IN THE OFFENDER'S BACK POCKET AND FRONT POCKET. A/O'S THEN PERFORMED A PROTECTIVE PAT DOWN OF SUBJECT AND FOUND AN OPEN 24OZ CAN OF "STEEL RESERVE" ALCOHOL IN THE OFFENDER'S BACK POCKET (INV#[number]). A/O FOUND A SMALL GLASS BOTTLE THAT APPEARED TO HAVE BEEN FASHIONED INTO DRUG PARAPHERNALIA (INV#[number]) IN OFFENDERS FRONT POCKET. OFFENDER RELATED HE USES THIS OBJECT AS A PIPE TO SMOKE CRACK-COCAINE. A/O'S PLACED OFFENDER INTO CUSTODY AND PERFORMED A NARCOTICS SEARCH OF THE OFFENDER. A/O RECOVERED A SMALL FOLDED PIECE OF WHITE PAPER CONTAINING WHITE POWDER ROCK-LIKE SUBSTANCE SUSPECT CRACK COCAINE (INV#[number]). OFFENDER RELATED TO A/O'S THAT THE SUBSTANCE WAS A SMALL AMOUNT OF CRACK-COCAINE. OFFENDER TRANSPORTED TO 004TH DISTRICT BY [unit] FOR PROCESSING.

D. INVESTIGATORY STOP REPORTS WITH "SPOTTER" AND/OR "SST" IN WRITTEN NARRATIVE

As described above in the methodology section, keyword searching in ISR narratives identified a substantial number of ISRs that are likely associated with ShotSpotter events, but keyword searching also captures ISRs that only include discussion of the general volume of ShotSpotter alerts in a given area and do not refer to specific alerts.

A total of 1,366 investigatory stop reports (ISRs) completed between January 1, 2020 and May 31, 2021, include the keywords "SPOTTER" or "SST" but did not have an event number match to a confirmed ShotSpotter alert.⁵⁰ OIG examined in detail the narratives from a random sample of 72 of these ISRs—one report randomly selected from each CPD District confirmed to have

⁴⁸ Unlawful Use of a Weapon (UUW)

⁴⁹ Arresting officers (A/Os).

⁵⁰ OIG included the keyword "SST" in its search methodology to increase the chances of capturing any ISR that could be definitively linked to a ShotSpotter alert, although it made little difference to the number of search results returned. In the analysis period, only 32 ISR narratives contained the text string "SST." In most cases, "SST" was actually used as an abbreviation for "ShotSpotter" or "ShotSpotter Technology." A few of the results were false positives. "asisst" [sic] appeared in four ISR narratives, "arresstee" [sic] and "asst" each appeared in three narratives, and "invesstigation" [sic] appeared in two narratives.

ShotSpotter sensors for each quarter during the analysis period—and found that many stops recorded under a different event number did reference the ShotSpotter alert event number in their ISR narrative. Among the 72 ISR narratives OIG reviewed, 13 ISRs (18.1%) identified a ShotSpotter alert by its correct event number as the prompt for the investigatory stop recorded under a separate event number.

In reviewing ISR narratives for mentions of ShotSpotter alerts, OIG also identified 10 ISRs (13.9%) in which reporting officers referred to the *aggregate results of the ShotSpotter system* as informing their decision to initiate a stop or their course of action during the stop, even when they were not responding to a specific ShotSpotter alert. For example, some officers during the reporting period identified the fact of being in an area known to have frequent ShotSpotter alerts as an element of the reasonable suspicion required to justify the stop.⁵¹ Other officers reported conducting “protective pat downs” following a stop because they knew themselves to be in areas where ShotSpotter alerts were frequent.

These cases suggest that the exercise of matching individual ShotSpotter alerts to subsequent associated investigatory stops alone may underrepresent the extent to which the introduction of ShotSpotter technology in Chicago has changed the way CPD members perceive and interact with individuals present in areas where ShotSpotter alerts are frequent. At least some officers, at least some of the time, are relying on ShotSpotter results in the aggregate to provide an additional rationale to initiate stop or to conduct a pat down once a stop has been initiated.

Below, OIG reproduces in full the narratives from three ISRs that cite the frequency of ShotSpotter alerts in a given area as an element of the reasonable suspicion upon which an investigatory stop is predicated. Of the ten stops partially predicated on the high volume of ShotSpotter alerts in the area, OIG was able to identify in its sample only one instance in which the stop led to an arrest, described below as Case 3. In Cases 4 and 5, the investigatory stops predicated, in part, on reasonable suspicion due to the frequency of ShotSpotter alerts in the area did not produce any evidence of the subject's involvement in gun-related crime. While

⁵¹ In *Terry v. Ohio*, 392 U.S. 1 (1968), the United States Supreme Court established that police may temporarily stop and detain a person if the police have “reasonable, articulable suspicion that criminal activity is afoot.” *Illinois v. Wardlow*, 528 U.S. 119, 124 (2000). As the Supreme Court has described, “[a]n individual’s presence in an area of expected criminal activity, standing alone, is not enough to support a reasonable . . . suspicion that a person is committing a crime.” *Id.* However, “officers are not required to ignore the relevant characteristics of a location in determining whether the circumstances are sufficiently suspicious to warrant further investigation” and, thus, “the fact that the stop occurred in a ‘high crime area’ [is] among the relevant contextual consideration in a *Terry* analysis.” *Id.* (quoting *Adams v. Williams*, 407 U.S. 143, 144, 147-48 (1972)). The Illinois Compiled Statutes codify the holding in *Terry* at 725 ILCS 5/107-14 and 725 ILCS 5/108-1.01 CPD’s directives state, “Reasonable Articulable Suspicion is an objective legal standard that is less than probable cause but more substantial than a hunch or general suspicion. Reasonable Articulable Suspicion depends on the totality of the circumstances which the sworn member observes and the reasonable inferences that are drawn based on the sworn member’s training and experience. Reasonable Articulable Suspicion can result from a combination of particular facts, which may appear innocuous in and of themselves, but taken together amount to reasonable suspicion.” Chicago Police Department, “Special Order S04-13-09: Investigatory Stop System,” July 10, 2017, accessed June 14, 2021, <http://directives.chicagopolice.org/directives/data/a7a57b99-151b6927-49f15-1b69-2c32e99868b316b0.pdf?hl=true>

these cases alone do not support inferences or generalizations about the likelihood of any particular outcome, they do demonstrate in concrete detail how perceptions of ShotSpotter alert frequency may impact policing behavior.

In Case 3, the reporting officer cites "multiple bonafide Shot Spotter events in the area" where they observed the subject and initiated the stop. In Case 4, the reporting officer describes being "on patrol in an area known for its high volume of Shot Spotter notifications" and describes "perform[ing] a protective pat down based on the known violent area and [the subject's] suspicious behavior." In Case 5, the reporting officer states that "due to many Shot Spotter alerts and gang activity in the proximity to this location, [reporting officers] reasonably believed [a large weighted object in the subject's front hoodie pocket] to possibly be a firearm."

CASE 3: OFFICER CITING FREQUENCY OF SHOTSPOTTER ALERTS AS AN ELEMENT OF REASONABLE SUSPICION FOR A STOP LEADING TO AN ARREST

ISR #008994781

EVENT#08135 BWC IN USE. R/O'S WERE ON PATROL IN A HIGH CRIME AREA WITH MULTIPLE ONGOING GANG AND NARCOTIC CONFLICTS, SPECIFICALLY AN ONGOING GANG WAR BETWEEN [gang] AND [gang]/ ALSO, MULTIPLE BONAFIDE SHOT SPOTTER EVENTS IN THE AREA. THIS AREA IS PRIORITY ZONE #2 IN THE 007TH DISTRICT. R/O'S TURNED S/B ON [street] FROM [street]. R/O'S OBSERVED WHO THE R/O'S NOW KNOW AS [subject] LOOK IN R/O'S DIRECTION, GRAB HIS WAISTBAND, AND BEGAN TO SKIP TOWARDS THE FRONT DOOR OF THE RESIDENCE [address], BEFORE FULL SPRINTING INTO THE RESIDENCE. [subject] THEN ENTERED SAID RESIDENCE. R/O'S THEN BEGAN TO TOUR THE AREA IN THE WEST ALLEY ON THE [location] AND [subject] (OFFENDER) THEN EMERGED FROM THE GANGWAY AT [address]. R/O [officer] THEN GAVE CHASE AND [subject] (OFFENDER) CONTINUED TO FLEE. R/O [officer] CONTINUED CHASING OFFENDER, AT WHICH TIME [subject] (OFFENDER) JUMPED A FENCE AND A BLACK FIREARM FELL FROM HIS PERSON. [subject] (OFFENDER) THEN PICKED SAID FIREARM BACK UP AND CONTINUED TO RUN. P.O [officer] GAVE A DIRECTION OF FLIGHT VIA OEMC RADIO AND R/O [officer] WAS ABLE TO CUT OFF AND OBSERVE [subject] (OFFENDER) THROW A BLACK FIREARM ONTO THE ROOF AT [address]. R/O [officer] WAS ABLE TO PLACE [subject] (OFFENDER) INTO CUSTODY WITHOUT INCIDENT. R/O'S REQUESTED CFD TRUCK 41 TO RETRIEVE THE FIREARM FROM THE ROOF. FIREARM RECOVERY DOCUMENTED ON BWC. R/O'S RECOVERED 1 LOADED BLUE STEEL MASTERPIECE ARMS MPA DEFENDER 9MM WITH A 4.5 INCH BARRELL YIELDING SERIAL #[number], ATTACHED WAS A BLACK HIGH CAPACITY MAGAZINE WITH MULTIPLE LIVE ROUNDS (INV#[number]). R/O'S THEN TRANSPORTED ARRESTEE TO THE 007TH DISTRICT FOR FURTHER PROCESSING. A SUBSEQUENT NAME CHECK REVEALED THE ARRESTEE DOES NOT POSSESS A CCL⁵² NOR FOID. NAME CHECK CLEAR. ARRESTEE IS A SELF-ADMITTED [gang]. NOT A FELON. NO WANTS/WARRANTS/IA'S. GUN DESK NOTIFIED WEAPON IS CLEAR NOT REGISTERED PER [officer].

⁵² Concealed Carry License (CCL)

CASE 4: OFFICER CITING FREQUENCY OF SHOTSPOTTER ALERTS AS AN ELEMENT OF REASONABLE SUSPICION FOR A STOP**ISR #010151171**

EVENT # 13516. BWC INCIDENT. R/O'S ON PATROL IN AN AREA KNOWN FOR ITS HIGH VOLUME OF SHOT SPOTTER NOTIFICATIONS AND PERSON WITH A GUN CALL. IN THAT, WHILE ON PATROL R/O'S OBSERVED THE ABOVE STATED VEHICLE PARKED AT THE ABOVE STATED ADDRESS MORE THAN 12 INCHES FROM THE CURB WHICH IS A VIOLATION CODE OF MCC 9-64-020(A). R/O UTILIZED HIS UNMARKED POLICE VEHICLE SPOT LIGHT AND SHINNED [sic] IT TOWARDS THE WINDSHIELD OF THE ABOVE STATED VEHICLE. IT WAS AT THIS TIME, R/O OBSERVED A M/1 NKA ABOVE SUBJECT SEATED IN THE FRONT PASSENGER SEAT. R/O THEN NOTICED THE ABOVE SUBJECT REACH TOWARDS THE CENTER OF HIS WAIST LINE AND BEGAN TO ADJUST THE TOP PART OF HIS PANTS. IN ADDITION, R/O THEN OBSERVED THE ABOVE SUBJECT BEND HIS UPPER BODY FORWARD CAUSING BOTH OF HIS ARMS TO BE NON VISIBLE. R/O EXITED HIS POLICE VEHICLE AND APPROACHED THE PARKED VEHICLE FROM THE PASSENGER SIDE AND BEGAN TO COMMUNICATE WITH THE ABOVE SUBJECT. R/O REQUESTED FROM THE ABOVE SUBJECT TO PROVIDE PROOF OF IDENTIFICATION AT WHICH TIME HE FAILED TO PROVIDE ONE. WHILE COMMUNICATION WITH THE ABOVE SUBJECT, R/O SMELLED AN ODOR OF ALCOHOLIC BEVERAGE EMITTING FROM THE VEHICLE AND NOTICED THE ABOVE SUBJECTS HANDS TO TREMBLE. BASED ON R/O'S EXPERIENCE IN NUMEROUS WEAPONS VIOLATION ARRESTS, R/O REASONABLY BELIEVED THE ABOVE SUBJECT WAS IN POSSESSION OF A FIREARM. R/O REQUESTED THE ABOVE SUBJECT TO EXIT THE VEHICLE FOR FURTHER INVESTIGATION. UPON DOING SO, R/O PERFORMED A PROTECTIVE PAT DOWN BASED ON THE KNOWN VIOLENT AREA AND ABOVE SUBJECTS SUSPICIOUS BEHAVIOR [ADJUSTING WAIST LINE, BENDING UPPER BODY FORWARD, AND TREMBLING HANDS]. NEGATIVE RESULTS OF ANY WEAPONS. THE ABOVE SUBJECT THEN RELATED TO R/O THAT THERE WAS A BOTTLE OF ALCOHOL IN THE VEHICLE AND THAT HE HAD BEEN DRINKING. R/O'S PERFORMED A SEARCH OF THE VEHICLE FOR THE POSSIBILITY OF ANY OPEN CONTAINERS OF ALCOHOL IN THE VEHICLE. R/O'S DISCOVERED A BOTTLE OF COURVOISIER ALCOHOLIC BEVERAGE WITH A BROKEN SEAL LOCATED ON THE FLOOR BOARD IN FRONT OF THE REAR PASSENGER SEAT. NAME CHECK OF ABOVE SUBJECT CLEAR. ABOVE SUBJECT WAS GIVEN A VERBAL WARNING AND WAS RELEASED WITHOUT INCIDENT. ABOVE SUBJECT REFUSED AN ISR RECEIPT.

CASE 5: OFFICER CITING FREQUENCY OF SHOTSPOTTER ALERTS AS AN ELEMENT OF REASONABLE SUSPICION FOR A PAT DOWN**ISR #011102767**

EVENT 02301. BWC ACTIVE. IN SUMMARY, R/OS WERE ON ROUTINE PATROL DRIVING NORTHBOUND ON [street] APPROACHING [street] WHEN R/OS SAW LISTED SUBJECT CROSSING STREET WALKING SOUTHBOUND ON [street]. AT THIS TIME, LISTED SUBJECT GAVE THE MIDDLE FINGER TO R/OS AND YELLING OBSCENITIES AT R/OS. R/OS THEN NOTICED A LARGE WEIGHTED OBJECT IN HIS FRONT HOODIE POCKET. DUE TO MANY SHOT SPOTTER ALERTS AND GANG ACTIVITY IN THE PROXIMITY TO THIS LOCATION, R/OS REASONABLY BELIEVED THIS WEIGHT OBJECT TO POSSIBLY BE A FIREARM. R/OS THEN CONDUCTED A STREET STOP AT THE LISTED LOCATION. R/OS THEN CONDUCTED A PAT DOWN WITH

NEGATIVE FINDINGS OF WEAPONS. SUBJECT [sic] HAD A BAG AROUND HIS SHOULDER, AND R/OS ASKED IF THEY COULD LOOK INSIDE TO WHICH SUBJECT GAVE PERMISSION. R/OS SEARCHED THE BAG AND FOUND A SMALL SEALED, ODORLESS, CHILDPROOF CONTAINER WITH SUSPECT CANABIS INSIDE IT. SUBJECT GAVE R/OS HIS IL ID CARD AND R/OS RAN NAME THROUGH [sic] LEADS AND CLEAR,⁵³ WITH A FINDING OF NO WANTS OR WARRANTS AT THIS TIME. THROUGHOUT THIS EVENT, SUBJECT WAS VERY VERBALLY AGGRESSIVE BY CONTINUOUSLY YELLING AT R/OS AND CALLING R/OS OBSCENITIES. SUBJECT REFUSED AN ISR RECEIPT AND THE STOP WAS CONCLUDED WITHOUT INCIDENT.

V. CONCLUSION

Through this descriptive report, OIG aims to provide the public and City government officials with clear and accurate information regarding CPD's use of ShotSpotter technology.

From quantitative analysis of ShotSpotter data and other records, OIG concludes that CPD responses to ShotSpotter alerts rarely produce evidence of a gun-related crime, rarely give rise to investigatory stops, and even less frequently lead to the recovery of gun crime-related evidence during an investigatory stop. If this result is attributable in part to missing or non-matched records of investigatory stops that *did* take place as a direct consequence of a ShotSpotter alert, CPD's record-keeping practices are obstructing a meaningful analysis of the effectiveness of the technology. Additionally, from qualitative review of ISR narratives, OIG found evidence that CPD members' generalized perceptions of the frequency of ShotSpotter alerts in a given area may be substantively changing policing behavior.

The operational value of ShotSpotter is ultimately a question of relative costs and benefits. There may be a law enforcement benefit in the use of ShotSpotter alert information to dispatch CPD members quickly to scenes where there is some evidence available that shots may have been fired. On the other hand, there are real and potential costs associated with use of the system, including financial resources, the time and attention of CPD members, and the risk that CPD members dispatched as a result of a ShotSpotter alert may respond to incidents with little contextual information about what they will find there—raising the specter of poorly informed decision-making by responding members. For this weighing of costs and benefits to accrue in favor of the continued use of ShotSpotter technology, CPD and the City would be well-served by being able to clearly demonstrate its law enforcement value. Such a value is not clearly demonstrated by presently available data.

Because the ability to match ShotSpotter events to other police records, including ISRs, is so limited, it may not be possible at present to reach a well-informed determination as to whether ShotSpotter is a worthwhile operational investment as an effective law enforcement tool for the City and CPD. Better data on law enforcement outcomes from ShotSpotter alerts would be valuable to support the City's future assessments of whether to further extend, amend, or discontinue its contractual relationship with ShotSpotter.

⁵³ Citizen Law Enforcement Analysis and Reporting (CLEAR)

APPENDIX A: SHOTSPOTTER ALERT INCIDENT DISPOSITIONS

The following table lists the disposition code and abbreviated description for 41,830 ShotSpotter alert event numbers dispatched between January 1, 2020 and May 31, 2021, for which a disposition was recorded in the OEMC database.

For the full extent of available incident dispositions and corresponding full descriptions, see the Chicago Police Department's Incident Reporting Guide ([CPD 63.451](#)) and the Chicago Police Department's Miscellaneous Incident Reporting Table ([CPD 11.484](#)).

DISPOSITION CODE AND DESCRIPTION	#	%
CRIMINAL INCIDENT DISPOSITIONS	5,504	13.2%
GUN-RELATED CRIMINAL DISPOSITIONS⁵⁴	4,556	10.9%
1477 - WEAPONS VIOLATION - RECKLESS FIREARM DISCHARGE	1,622	3.9%
041A - BATTERY - AGGRAVATED: HANDGUN	1,131	2.7%
051A - ASSAULT - AGGRAVATED: HANDGUN	434	1.0%
141A - WEAPONS VIOLATION - UNLAWFUL USE HANDGUN	416	1.0%
141B - WEAPONS VIOLATION - UNLAWFUL USE OTHER FIREARM	380	0.9%
110 - HOMICIDE - FIRST DEGREE MURDER	242	0.6%
143A - WEAPONS VIOLATION - UNLAWFUL POSS OF HANDGUN	239	0.6%
031A - ROBBERY - ARMED: HANDGUN	23	0.1%
051B - ASSAULT - AGGRAVATED: OTHER FIREARM	11	0.0%
033A - ROBBERY - ATTEMPT: ARMED - HANDGUN	10	0.0%
143B - WEAPONS VIOLATION - UNLAWFUL POSS OTHER FIREARM	9	0.0%
550 - ASSAULT - AGGRAVATED PO: HANDGUN	7	0.0%
041B - BATTERY - AGGRAVATED: OTHER FIREARM	7	0.0%
488 - BATTERY - AGGRAVATED DOMESTIC BATTERY: HANDGUN	6	0.0%
326 - ROBBERY - AGGRAVATED VEHICULAR HIJACKING	6	0.0%
555 - ASSAULT - AGG PRO.EMP: HANDGUN	4	0.0%
1460 - WEAPONS VIOLATION - POSS FIREARM/AMMO:NO FOID CARD	3	0.0%
650 - BURGLARY - HOME INVASION	2	0.0%
031B - ROBBERY - ARMED: OTHER FIREARM	1	0.0%
1476 - WEAPONS VIOLATION - USE OF METAL PIERCING BULLETS	1	0.0%
143C - WEAPONS VIOLATION - UNLAWFUL POSS AMMUNITION	1	0.0%
450 - BATTERY - AGGRAVATED PO: HANDGUN	1	0.0%

⁵⁴ OIG determined these primary charge types to be likely indicative of gun violence or other gun-related crime, acknowledging that there is not a perfect correspondence between all of these specific charge types and use of a gun (for example, as noted above in Section IV B, many but not all homicides in Chicago are perpetrated with guns)

OTHER CRIMINAL DISPOSITIONS ⁵⁵	948	2.3%
1320 - CRIMINAL DAMAGE - TO VEHICLE	403	1.0%
1310 - CRIMINAL DAMAGE - TO PROPERTY	363	0.9%
1365 - CRIMINAL TRESPASS - TO RESIDENCE	17	0.0%
2093 - NARCOTICS - FOUND SUSPECT NARCOTICS	11	0.0%
486 - BATTERY - DOMESTIC BATTERY SIMPLE	9	0.0%
560 - ASSAULT - SIMPLE	8	0.0%
454 - BATTERY - AGG PO HANDS NO/MIN INJURY	7	0.0%
460 - BATTERY - SIMPLE	7	0.0%
554 - ASSAULT - AGG PO HANDS NO/MIN INJURY	6	0.0%
530 - ASSAULT - AGGRAVATED: OTHER DANG WEAPON	6	0.0%
1330 - CRIMINAL TRESPASS - TO LAND	6	0.0%
610 - BURGLARY - FORCIBLE ENTRY	6	0.0%
470 - PUBLIC PEACE VIOLATION - RECKLESS CONDUCT	5	0.0%
2027 - NARCOTICS - POSS: CRACK	5	0.0%
1812 - NARCOTICS - POSS: CANNABIS MORE THAN 30GMS	4	0.0%
141C - WEAPONS VIOLATION - UNLAWFUL USE OTHER DANG WEAPON	4	0.0%
430 - BATTERY - AGGRAVATED: OTHER DANG WEAPON	4	0.0%
2022 - NARCOTICS - POSS: COCAINE	4	0.0%
3710 - INTERFERENCE WITH PUBLIC OFFICER - RESIST/OBSTRUCT/DISARM	4	0.0%
2024 - NARCOTICS - POSS: HEROIN(WHITE)	3	0.0%
5007 - OTHER OFFENSE - OTHER WEAPONS VIOLATION	3	0.0%
320 - ROBBERY - STRONGARM - NO WEAPON	3	0.0%
630 - BURGLARY - ATTEMPT FORCIBLE ENTRY	2	0.0%
920 - MOTOR VEHICLE THEFT - ATT: AUTOMOBILE	2	0.0%
910 - MOTOR VEHICLE THEFT - AUTOMOBILE	2	0.0%
2028 - NARCOTICS - POSS: SYNTHETIC DRUGS	2	0.0%
5111 - OTHER OFFENSE - GUN OFFENDER: ANNUAL REGISTRATION*	2	0.0%
502P - OTHER OFFENSE - FALSE/STOLEN/ALTERED TRP	2	0.0%

⁵⁵ OIG's classification of "gun-related criminal disposition" intends to identify criminal offenses likely to indicate the use or unlawful possession of a handgun or other firearm and does not extend to offenses based on offender registry status or violations of concealed carry regulations. Additionally, OIG excluded officer-involved shooting dispositions, as the determination regarding whether such incidents are justified, not justified and/or criminal is not immediately determined at the time of occurrence. Dispositions marked with an asterisk (*) are identified as gun-related but not within OIG's classification of "gun-related criminal disposition" for the purposes of this report. The full list of offenses involving guns excluded from OIG's classification as a "gun-related criminal disposition" are: 1479 - CONCEALED CARRY LICENSE VIOLATION - ARMED UNDER THE INFLUENCE, 1480 - CONCEALED CARRY LICENSE VIOLATION - OTHER, 5072 - WEAPON / FIREARM TURN IN, 5110 - OTHER OFFENSE - GUN OFFENDER. DUTY TO REGISTER, 5111 - OTHER OFFENSE - GUN OFFENDER. ANNUAL REGISTRATION, 5140 - OFFICER-INVOLVED SHOOTING - GUNSHOT INJURY / NOT FATAL, 5141 - OFFICER-INVOLVED SHOOTING - NO INJURY

325 - ROBBERY - VEHICULAR HIJACKING	2	0.0%
620 - BURGLARY - UNLAWFUL ENTRY	2	0.0%
1020 - ARSON - BY FIRE	2	0.0%
820 - THEFT - \$500 AND UNDER	2	0.0%
1360 - CRIMINAL TRESPASS - TO VEHICLE	2	0.0%
1090 - ARSON - ATTEMPT ARSON	2	0.0%
461 - BATTERY - AGG PO HANDS ETC SERIOUS INJ	2	0.0%
3730 - INTERFERENCE WITH PUBLIC OFFICER - OBSTRUCTING JUSTICE	1	0.0%
1822 - NARCOTICS - MANU/DEL: CANNABIS OVER 10 GMS	1	0.0%
1710 - OFFENSE INVOLVING CHILDREN - ENDANGERING LIFE/HEALTH CHILD	1	0.0%
1340 - CRIMINAL DAMAGE - TO STATE SUP PROP	1	0.0%
2025 - NARCOTICS - POSS: HALLUCINOGENS	1	0.0%
4386 - OTHER OFFENSE - VIOLATION OF CIVIL NO CONTACT ORDER	1	0.0%
312 - ROBBERY - ARMED: KNIFE/CUTTING INSTRUMENT	1	0.0%
4387 - OTHER OFFENSE - VIOLATE ORDER OF PROTECTION	1	0.0%
1305 - CRIMINAL DAMAGE - CRIMINAL DEFACEMENT	1	0.0%
453 - BATTERY - AGGRAVATED PO: OTHER DANG WEAP	1	0.0%
581 - STALKING - AGGRAVATED	1	0.0%
1025 - ARSON - AGGRAVATED	1	0.0%
810 - THEFT - OVER \$500	1	0.0%
2092 - NARCOTICS - SOLICIT NARCOTICS ON PUBLICWAY	1	0.0%
5110 - OTHER OFFENSE - GUN OFFENDER: DUTY TO REGISTER*	1	0.0%
1350 - CRIMINAL TRESPASS - TO STATE SUP LAND	1	0.0%
520 - ASSAULT - AGGRAVATED: KNIFE/CUTTING INSTR	1	0.0%
2021 - NARCOTICS - POSS: BARBITUATES	1	0.0%
545 - ASSAULT - PRO EMP HANDS NO/MIN INJURY	1	0.0%
1480 - CONCEALED CARRY LICENSE VIOLATION - OTHER*	1	0.0%
558 - ASSAULT - AGG PRO.EMP: OTHER DANG WEAPON	1	0.0%
497 - BATTERY - AGGRAVATED DOMESTIC BATTERY: OTHER DANG WEAPON	1	0.0%
580 - STALKING - SIMPLE	1	0.0%
5001 - OTHER OFFENSE - OTHER CRIME INVOLVING PROPERTY	1	0.0%
2012 - NARCOTICS - MANU/DELIVER: COCAINE	1	0.0%
2820 - OTHER OFFENSE - TELEPHONE THREAT	1	0.0%
2026 - NARCOTICS - POSS: PCP	1	0.0%
5011 - OTHER OFFENSE - LICENSE VIOLATION	1	0.0%
330 - ROBBERY - AGGRAVATED	1	0.0%
1345 - CRIMINAL DAMAGE - TO CITY OF CHICAGO PROPERTY	1	0.0%

501A - OTHER OFFENSE - ANIMAL ABUSE/NEGLECT	1	0.0%
420 - BATTERY - AGGRAVATED: KNIFE/CUTTING INSTR	1	0.0%
2826 - OTHER OFFENSE - HARASSMENT BY ELECTRONIC MEANS	1	0.0%
1479 - CONCEALED CARRY LICENSE VIOLATION - ARMED WHILE UNDER THE INFLUENCE*	1	0.0%
NON-CRIMINAL INCIDENTS	287	0.7%
NON-CRIMINAL GUN-RELATED DISPOSITIONS	1	0.0%
151 - HOMICIDE - JUSTIFIABLE HOMICIDE	1	0.0%
OTHER NON-CRIMINAL DISPOSITIONS	286	0.7%
99B - TRAFFIC CRASH - INJURY/DEATH	111	0.3%
5071 - FOUND PROPERTY	71	0.2%
99A - TRAFFIC CRASH - NO INJURY/DRIVE AWAY	54	0.1%
940 - STOLEN VEHICLE RECOVERED - AUTO STOLEN OUTSIDE CHICAGO	13	0.0%
5081 - NON-CRIMINAL INCIDENT - PROPERTY	6	0.0%
5080 - NON-CRIMINAL INCIDENT - PERSONS	6	0.0%
5091 - FIRE DAMAGE - DAMAGE TO REAL PROPERTY/NON-CRIMINAL	4	0.0%
9999 - CANCELLATION OF RD NUMBER - RD NUMBER OBTAINED IN ERROR	4	0.0%
5082 - ORDER OF PROTECTION NOTIFICATION - NOT PREVIOUSLY SERVED/NO OTHER CRIMINAL ACT	4	0.0%
5090 - FIRE DAMAGE - DAMAGE TO PERSON PROPERTY/NON-CRIMINAL	3	0.0%
6055 - FOUND PERSON - INCAPACITATED PERSON FOUND	2	0.0%
5072 - WEAPON/FIREARM TURN IN*	2	0.0%
5088 - INJURY TO CITY EMPLOYEE - NON-CRIMINAL/NON-TRAFFIC	1	0.0%
5086Z - ATTEMPT SUICIDE - NOT IN POLICE CUSTODY	1	0.0%
5085Z - SUICIDE - NOT IN POLICE CUSTODY	1	0.0%
5141 - OFFICER-INVOLVED SHOOTING - NO INJURY*	1	0.0%
5079Z - MENTAL HEALTH TRANSPORT	1	0.0%
5140 - OFFICER-INVOLVED SHOOTING - GUNSHOT INJURY/NON-FATAL*	1	0.0%
MISCELLANEOUS INCIDENT DISPOSITIONS	36,039	86.2%
19P - OTHER MISC INC - OTHER POLICE SERVICE	29,480	70.5%
19B - OTHER MISC INC - NO PERSON CAN BE FOUND	4,987	11.9%
19A - OTHER MISC INC - NOT BONA FIDE INCIDENT	585	1.4%
5P - DISTURBANCE - OTHER - OTHER POLICE SERVICE	216	0.5%
5B - DISTURBANCE - OTHER - NO PERSON CAN BE FOUND	189	0.5%
4P - DISTURBANCE - NOISE - OTHER POLICE SERVICE	136	0.3%
19E - OTHER MISC INC - PERPETRATOR GONE ON POLICE ARRIVAL	61	0.1%
4B - DISTURBANCE - NOISE - NO PERSON CAN BE FOUND	39	0.1%
11P - SUSPICIOUS AUTO/PERSONS - OTHER POLICE SERVICE	38	0.1%

1P - DISTURBANCE - DOMESTIC - OTHER POLICE SERVICE	37	0.1%
19D - OTHER MISC INC - NO POLICE SERVICE NECESSARY	32	0.1%
11B - SUSPICIOUS AUTO/PERSONS - NO PERSON CAN BE FOUND	30	0.1%
14P - AUTO/BURGLAR/HOLDUP ALARM - OTHER POLICE SERVICE	21	0.1%
1B - DISTURBANCE - DOMESTIC - NO PERSON CAN BE FOUND	15	0.0%
18B - TRAFFIC ACCIDENT - NO PERSON CAN BE FOUND	13	0.0%
5E - DISTURBANCE - OTHER - PERPETRATOR GONE ON POLICE ARRIVAL	11	0.0%
18P - TRAFFIC ACCIDENT - OTHER POLICE SERVICE	9	0.0%
5A - DISTURBANCE - OTHER - NOT BONA FIDE INCIDENT	9	0.0%
19C - OTHER MISC INC - NO SUCH ADDRESS	9	0.0%
19PZ - OTHER MISC INC - OTHER POLICE SERVICE	9	0.0%
5D - DISTURBANCE - OTHER - NO POLICE SERVICE NECESSARY	8	0.0%
10P - ANIMAL BITE - OTHER POLICE SERVICE	8	0.0%
9P - PERSON DOWN - OTHER POLICE SERVICE	8	0.0%
19O - OTHER MISC INC - ADVISED LEGAL HELP	8	0.0%
19L - OTHER MISC INC - INFORMATION REPORT SUBMITTED	7	0.0%
19H - OTHER MISC INC - ADVISED TO RECONTACT POLICE IF REPEATED/RETURNED	7	0.0%
19K - OTHER MISC INC - TAKEN TO DISTRICT STATION	7	0.0%
19F - OTHER MISC INC - PEACE RESTORED	5	0.0%
19R - OTHER MISC INC - ARREST MADE	5	0.0%
5F - DISTURBANCE - OTHER - PEACE RESTORED	4	0.0%
1A - DISTURBANCE - DOMESTIC - NOT BONA FIDE INCIDENT	4	0.0%
11E - SUSPICIOUS AUTO/PERSONS - PERPETRATOR GONE ON POLICE ARRIVAL	3	0.0%
4A - DISTURBANCE - NOISE - NOT BONA FIDE INCIDENT	3	0.0%
5L - DISTURBANCE - OTHER - INFORMATION REPORT SUBMITTED	2	0.0%
19M - OTHER MISC INC - ISSUED TRAFFIC CITATION	2	0.0%
6B - ILLEGAL PARKING - NO PERSON CAN BE FOUND	2	0.0%
1F - DISTURBANCE - DOMESTIC - PEACE RESTORED	2	0.0%
19N - OTHER MISC INC - ISSUED ORDINANCE COMPLAINT	2	0.0%
2P - DISTURBANCE - TEENS - OTHER POLICE SERVICE	2	0.0%
16P - FIRE - OTHER POLICE SERVICE	2	0.0%
4D - DISTURBANCE - NOISE - NO POLICE SERVICE NECESSARY	2	0.0%
11A - SUSPICIOUS AUTO/PERSONS - NOT BONA FIDE INCIDENT	2	0.0%
4E - DISTURBANCE - NOISE - PERPETRATOR GONE ON POLICE ARRIVAL	2	0.0%
19BZ - OTHER MISC INC - NO PERSON CAN BE FOUND	2	0.0%
5N - DISTURBANCE - OTHER - ISSUED ORDINANCE COMPLAINT	1	0.0%

7I - SICK REMOVAL - REMOVED TO HOSPITAL OR DETOXIFICATION FACILITY	1	0.0%
3P - DISTURBANCE - DRUNK - OTHER POLICE SERVICE	1	0.0%
1E - DISTURBANCE - DOMESTIC - PERPETRATOR GONE ON POLICE ARRIVAL	1	0.0%
1E - DISTURBANCE - DOMESTIC - PERPETRATOR GONE ON POLICE ARRIVAL	1	0.0%
19AZ - OTHER MISC INC - NOT BONA FIDE INCIDENT	1	0.0%
17P - ESCORT - OTHER POLICE SERVICE	1	0.0%
5O - DISTURBANCE - OTHER - ADVISED LEGAL HELP	1	0.0%
15B - INHALATOR - NO PERSON CAN BE FOUND	1	0.0%
4M - DISTURBANCE - NOISE - ISSUED TRAFFIC CITATION	1	0.0%
13P - LOST PERSON FOUND - OTHER POLICE SERVICE	1	0.0%
9B - PERSON DOWN - NO PERSON CAN BE FOUND	1	0.0%
12E - CITIZEN CALL FOR HELP - PERPETRATOR GONE ON POLICE ARRIVAL	1	0.0%
11F - SUSPICIOUS AUTO / PERSONS - PEACE RESTORED	1	0.0%

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