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OFFICE OF THE CITY CLERK  
OAKLAND

2019 OCT 31 PM 1:06

# AGENDA REPORT

**TO:** Sabrina B. Landreth  
City Administrator

**FROM:** Anne Kirkpatrick  
Chief of Police

**SUBJECT:** ShotSpotter Privacy Policy

**DATE:** October 10, 2019

City Administrator Approval

Date:

10/31/19

## RECOMMENDATION

**Staff Recommends That The City Council Adopt A Resolution Approving The Oakland Police Department (OPD) Gunshot Location Detection System (ShotSpotter) Use Policy And Surveillance Impact Report.**

## EXECUTIVE SUMMARY

Adoption of this resolution will approve OPD's Gunshot Location Detection (GLD) Use Policy And Surveillance Impact Report, as required by Oakland's Surveillance Technology Ordinance. OPD and ShotSpotter (the company that makes the GLD system) have collaborated with the City's Privacy Advisory Commission (PAC) to develop privacy policies required by the City's Surveillance Ordinance. The PAC voted unanimously to recommend that the City Council approve OPD's GLD System Policy and GLD Impact Report at their October 3, 2019.

The ShotSpotter System is composed of outdoor acoustic sensors which identify and time-stamp impulsive acoustical noises characteristic of gunshots; the system triangulates these sounds to provide OPD with the likely location of gunshots - typically within 30-45 seconds of the trigger pull. OPD and ShotSpotter has developed numerous protocols designed to mitigate against unintentional recordings of human voices;

## BACKGROUND / LEGISLATIVE HISTORY

Gun-related crimes that occur in Oakland are vastly underreported - fewer than one in five shooting incidents are reported to 9-1-1. Additionally, the information reported when the public calls 9-1-1 is often inaccurate. Furthermore, OPD dispatch data proves that the communities most affected by gunfire are least likely to call 9-1-1. OPD officers historically would have to spend many hours driving block by block looking for evidence without knowing exactly where to respond. Criminals often have ample time to leave the shooting scene in such scenarios. Dispatching officers to an active shooting without sufficient available intelligence is also a serious threat to officer safety and needlessly places the public at risk.

Item: \_\_\_\_\_  
Public Safety Committee  
November 12, 2019

OPD relies upon a gunshot location detection (GLD) system known as ShotSpotter, from ShotSpotter, Inc. to remedy the need for better real-time gunshot information. The ShotSpotter System is composed of outdoor acoustic sensors which identify and time-stamp impulsive acoustical noises; the system triangulates the location of the sound source to within 25 meters and runs features of the sound through machine classification. ShotSpotter's Incident Review Center (IRC) human experts confirm the machine classification and publish an alert - typically within 30-45 seconds of the trigger pull.

The ShotSpotter system provides a valuable tool for OPD by increasing the likeliness of apprehending subject(s) involved in gun-related violent crime. OPD posts ShotSpotter data monthly on its website<sup>1</sup> to enhance transparency and accountability.

OPD entered into the original contract with SST, Inc. (former legal name) in 2006, authorized by City Council Resolution No. 80075 C.M.S. on July 18, 2006. The initial ShotSpotter system (Phase I) covered 6.2 square miles of the City – page 3 of the Surveillance Impact Report for the Gunshot Location Detection System (**Attachment C**) provides a map of the three phases. The system was repaired and reactivated in 2011, authorized by Resolution No. 83580 C.M.S., on October 4, 2011. The system was expanded in 2012 (Resolution No. 84058 C.M.S., approved on October 2, 2012) to cover an additional 6.4 square miles (Phase II). The Oakland Housing Authority contributed \$225,000 toward the Phase II expansion.

Phase III of OPD's ShotSpotter System consists of 2.78 square miles of coverage area and began detections on September 28, 2015, after the approval of Resolution No. 85254 C.M.S. on November 5, 2014. The total coverage area for the current ShotSpotter system now comprises 15.38 square miles, or approximately 25% of the City. The City approved a new contract with SST, Inc. on April 5, 2016 via Resolution No. 86083 C.M.S. The City further approved another new contract with ShotSpotter, Inc. on May 1, 2018 via Resolution No. 87165 C.M.S.

## **ANALYSIS AND POLICY ALTERNATIVES**

Beyond being a crime fighting tool, ShotSpotter is used as a community awareness and relationship building resource for OPD. ShotSpotter has two major components:

### *Gunshot Notifications (ShotSpotter Flex™ Alert)*

ShotSpotter Flex instantly notifies officers of gunshot crimes in progress with real-time data delivered to OPD Communications Section and patrol vehicles. This service enhances officer safety and effectiveness through:

- Real-time access to maps of shooting locations and gunshot audio;
- Actionable intelligence detailing the number of shooters and the number of shots fired;
- Pinpoints precise locations for first responders aiding victims, searching for evidence and interviewing witnesses; and

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<sup>1</sup> <http://www.oaklandpolice.com>, on the left side of the page, under "About Us," click on "Public Reports"

- Simultaneous email notification of detected activations with shooting location maps and associated audio.

*Investigative Component (ShotSpotter Flex™ Investigator Portal)*

ShotSpotter gunfire data enables intelligent analysis which would allow command staff to position resources at the appropriate time while reducing violence and to transform OPD from a reactive to proactive policing strategy. It provides critical information for better and timely resource allocation. For example, directed patrols can focus in areas where gun fire is habitually detected.

**ShotSpotter and Oakland's Surveillance Ordinance**

Oakland's Surveillance Ordinance No.13489 C.M.S. adopted by the City Council on May 15, 2018 adds Chapter 9.64 to the Oakland Municipal Code (OMC) covering policy areas related to surveillance technology. OMC 9.64.030.1.C requires City Council approval for new and existing surveillance technology. Additionally, OMC Section 9.64.020.1 requires that, "Prior to seeking City Council approval for existing city surveillance technology under Section 9.64.030 city staff shall submit a surveillance impact report and surveillance use policy to the Privacy Advisory Commission (PAC) for its review at a regularly noticed meeting. The surveillance impact report and surveillance use policy must address the specific subject matter specified for such reports as defined under 9.64.010."

OPD staff presented a draft GLD Policy and Impact Use Report to the PAC on August 1, 2019. The Policy covers several relevant areas required by OPD as well as the Surveillance Ordinance, including the following area:

- Technology Description;
- Authorized Use;
- Use Restrictions;
- Data Access, Data Collection and Retention, and Security;
- Monitoring and Reporting; and
- System training.

The Impact Use Report covers the following areas as required by the Surveillance Ordinance:

- Information describing the system and how it works;
- Purpose of the technology;
- Locations where, and Situations in which the technology may be used (along with area crime data);
- Privacy Impact of the technology;
- Mitigations to prevent privacy impacts;
- Data Types and Sources;
- Data Security;
- Costs;
- Third Party Dependence;
- Alternatives Considered; and
- Track Record of Other Entities

ShotSpotter staff also made a presentation to the PAC covering system benefits and privacy mitigations (see ***ShotSpotter Technology Presentation Attachment A***). OPD staff and PAC commissioners, after the first PAC meeting, visited ShotSpotter's Newark, CA headquarters in September 2019 to review the company's incident command system (where notifications are received, reviewed and processed), speak with operations and technology staff, and review technology and privacy issues. These robust discussions intersect with efforts already undertaken by ShotSpotter to improve and refine its privacy practices. The following key privacy mitigations, which are detailed in OPD ***Department General Order (DGO) I-20: Gunshot Location Detection System, Attachment B*** and ***Surveillance Impact Report for the Gunshot Location Detection System, Attachment C***, are as follows:

- Human voices and street noise will never trigger a sensor because they do not produce an instantaneous sharp sound and they are not loud enough to be picked up by three or more sensors.
- All sensor audio is permanently deleted after 30 hours (was 72 hours before July 2019) and never heard by a human unless it was accompanied by a loud, impulse sound thought to be a gunshot.
- Sensors are placed high above the ground typically on top of buildings or sometimes lampposts. At this height, there is more limited ability to pick up street level sounds clearly.
- The sensors are not capable of audio streaming – neither ShotSpotter nor OPD can listen in on street level sounds in real-time.
- Since 2012, only authorized ShotSpotter employees have access to audio from sensors, they can only access it under a strict set of conditions and can only provide police a short audio snippet.
- In 2019 ShotSpotter commissioned an independent privacy audit by the Policing Project at NYU Law School<sup>2</sup>. This end-to-end assessment conducted by objective privacy professionals concluded that the ShotSpotter presents an “extremely low risk of audio surveillance”. The Policing Project based this finding upon the short amount of audio that is temporarily stored on sensors, the short length of audio snippets that are permanently stored as evidence and the internal controls the company uses to restrict access to audio for authorized employees only.

OPD staff presented a revised GLD Use Policy and Impact Report to the PAC on October 3, 2019. At this meeting, after another robust discussion between PAC commissioners and OPD staff, the PAC voted unanimously to recommend that the City Council approve OPD's GLD System Policy (***Attachment B***, with the changes noted below *in italics*) as well as the GLD Impact Report (***Attachment C***).

**Change #1:**

DGO) I-20: Gunshot Location Detection System, (***Attachment B***):

C – 3. Releasing or Sharing GLD System Data

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<sup>2</sup> <https://www.policingproject.org/ShotSpotter>

GLD system data may be shared only with other law enforcement or prosecutorial agencies *based on a need to know and a right to know, or as otherwise required by law*, using the following procedures:

1. The agency makes a written request for the ShotSpotter data that includes:
  - a. The name of the requesting agency.
  - b. The name of the individual making the request.
  - c. The intended purpose of obtaining the information.
2. The request is reviewed by the Bureau of Services Deputy Chief/ Deputy Director or designee and approved before the request is fulfilled.
3. The approved request is retained on file, *and shall be included in the annual report.*

**Change #2:**

DGO I-20: Gunshot Location Detection System, (**Attachment B**):

D – 3. Monitoring and Reporting

The Oakland Police Department will monitor its use of the GLD system to ensure the accuracy of the information collected and compliance with all applicable laws, including laws providing for process, and time period system audits.

*Department members shall document each interaction with the GLD System, when in the field, and when uploading reports to the CAD system, by indicating in their report that such technology was used, and noting what benefit from use of the technology was received if any. Such benefits could include recovery of weapons, shell casings, identification of suspects, victims or witnesses, situational awareness, and faster transport to or received of medical care including first aid.*

The ShotSpotter Coordinator shall provide the Chief of Police, Privacy Advisory Commission, and Public Safety Committee with an annual report for the previous 12-month period. These reporting procedures will assist in evaluating the efficacy of this policy and equipment.

**FISCAL IMPACT**

This is an informational report and has no fiscal impact.

**PUBLIC OUTREACH / INTEREST**

No Public Outreach was conducted in the preparation of this report.

**COORDINATION**

The Office of the City Attorney reviewed this report.

**SUSTAINABLE OPPORTUNITIES**

***Economic:*** There are no economic opportunities associated with this report.

***Environmental:*** There are no environmental opportunities associated with this report.

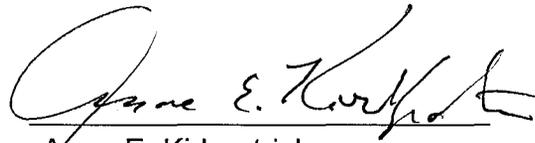
***Race and Equity:*** All Oakland residents and visitors have a right and an expectation of privacy. Additionally, OPD strives to ensure the public safety of all Oakland residents and visitors. OPD has developed its GLD System Policy with the goals of utilizing technology to mitigate the harm of gun violence while simultaneously mitigating privacy impacts.

**ACTION REQUESTED OF THE CITY COUNCIL**

Staff Recommends That The City Council Adopt A Resolution Approving The Oakland Police Department (OPD) Gunshot Location Detection System Use Policy And Surveillance Impact Report.

For questions regarding this report, please contact Bruce Stoffmacher, Management Assistant at 510-238-6976.

Respectfully submitted,



Anne E. Kirkpatrick  
Chief of Police  
Oakland Police Department

Reviewed by:  
Nishant Joshi, Captain  
OPD, Training Division

Phillip Best, Police Services Manager  
OPD, Training Division, Research and Planning

Prepared by:  
Bruce Stoffmacher, Acting Police Services Manager  
OPD, Training Division, Research and Planning

Attachments (3):

**A: ShotSpotter Technology Presentation Attachment**

**B: Department General Order (DGO) I-20: Gunshot Location Detection System**

**C: Surveillance Impact Report for the Gunshot Location Detection System**

**Making Communities Safer**  
Oakland Privacy Advisory Commission  
June 6, 2019



ShotSpotter

**Gun violence is an epidemic in the US**

ON AVERAGE  
THERE ARE NEARLY

GUN HOMICIDES A YEAR  
IN THE UNITED STATES

FOR EVERY PERSON  
KILLED WITH GUNS  
MORE ARE INJURED

Source: CDC,  
Everytown.org

**80% of gunshot incidents are NEVER reported to 911**



**Why Don't More People Call?**

- Recognition
- Redundancy
- Retaliation
- Resignation

WHEN THEY DO CALL, THE DATA IS LATE, INACCURATE, AND INCOMPLETE

Source: Brookings Institute

**What's the cost of a 20% response rate with a delayed response and imprecise location data?**

- Shooting Victims Die**
- Evidence Not Collected**
- Criminals Get Away**
- Community Thinks Police Don't Care**

PERSISTENT GUNFIRE BECOMES "NORMAL"



## ShotSpotter

The leader in gunfire detection,  
location & forensic analysis

### ShotSpotter Overview

**100**

Cities deployed in

**670**

Square miles under contract

**23**

Years in business



**>12M**

Incidents Reviewed

**94%**

Customer Satisfaction

ShotSpotter (NASDAQ: SSTI) is the leading provider of gunfire detection solutions helping law enforcement identify, locate, and deter gun violence.

### Our Purpose

*"Earn the trust of law enforcement to help them provide equal protection to all and strengthen the police-community relationship, ultimately reducing gun violence"*



### DETECT gunfire for rapid and precise response



DETECT



PROTECT

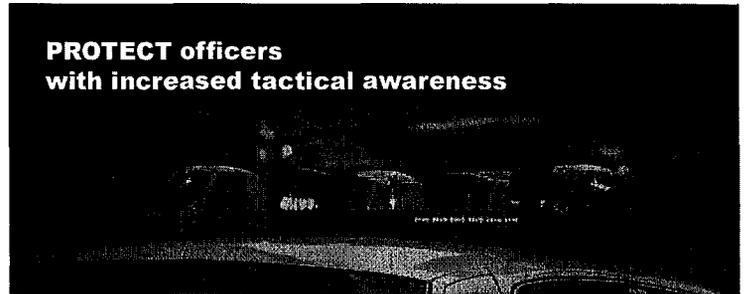


CONNECT

**Dot on Map Gunshot Location in <60 seconds**



**PROTECT officers with increased tactical awareness**



DETECT



PROTECT



CONNECT

**CONNECT police to evidence and the community**



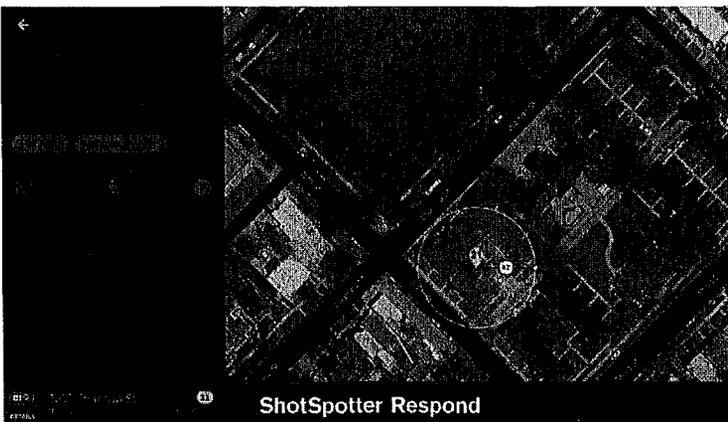
DETECT



PROTECT



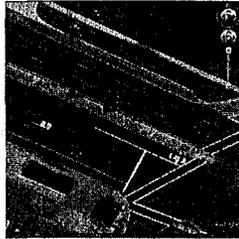
CONNECT



## Crime Scene Investigation Tool

### Investigative Lead Summary (ILS):

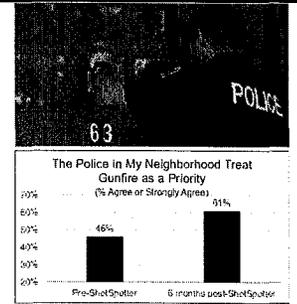
Provides approximate location, sequence and timing of each shot fired for better evidence collection and interviewing of witnesses/suspects on scene; available on demand from Respond app. For investigative purposes only.



Investigative Lead Summary

## Enhanced Police-Community Relations

Consistent response to gunfire incidents helps police connect with communities they serve



## Sample of Positive Outcomes as Part of Comprehensive Gun Crime Response Strategy

<b>Oakland, CA</b> <b>66%</b> reduction in vehicle crime calls <small>(vs. 2015)</small>	<b>Cincinnati, OH</b> <b>48%</b> reduction in shooting victims <small>(vs. 2015)</small>	<b>Chicago, IL</b> <b>40%</b> reduction in targeted shootings <small>(vs. 2015)</small>
<b>Denver, CO</b> <b>102</b> quality of life calls <small>(vs. 2015)</small>	<b>Sacramento, CA</b> <b>3,635</b> positive contacts with the community <small>(vs. 2015)</small>	<b>Las Vegas, NV</b> <b>342</b> quality of life calls received by the community <small>(vs. 2015)</small>
<b>Camden County, NJ</b> <b>46%</b> decrease in homicides by shooting <small>(vs. 2015)</small>	<b>Bakersfield, CA</b> <b>22</b> officers in first 8 months of deployment <small>(vs. 2015)</small>	<b>Rochester, NY</b> <b>40%</b> decrease in gun-shot incidents <small>(vs. 2015)</small>

## ShotSpotter Impact on Patient Outcomes

**4 min.**

Time saved transporting GSW victims to hospital from ShotSpotter coverage area

**35%**

Reduction in field interventions for GSW victims in ShotSpotter coverage areas

*"ShotSpotter has developed technology that allows the trauma patient who has been shot to get to me faster, so I have a greater chance of saving their lives."*

John Porter, M.D. Chief of Surgery  
Cooper Health

**Cooper**  
University Health Care

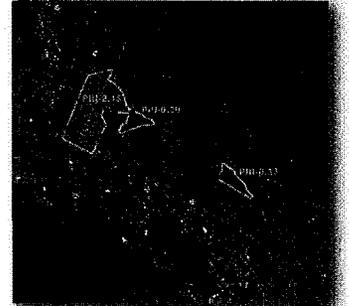
Source: Cooper University HealthCare Study, Sept. 2018

## Oakland and ShotSpotter

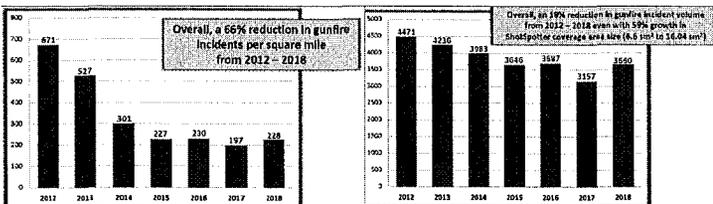
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## ShotSpotter Coverage Area in Oakland

- 16 square miles
- Phase I Go Live: October 12, 2011
- Phase II Go Live: April 19, 2013
- Phase III Go Live: September 26, 2016



## Oakland Gun Violence Results



## ShotSpotter Community Privacy Protections

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## Community Privacy Protections

- ShotSpotter has developed its technology and policies to enhance public safety while respecting individual privacy. The company is able to limit the risk of audio surveillance through technology along with strict controls and policies that have evolved over the years.
- Commissioned independent firm to conduct a privacy audit assessment and learn what we can do to better protect and communicate privacy
- Increasing our transparency about how the system works

COMPANY CONFIDENTIAL

## Community Privacy Protections: Prior to System Activation

- When ShotSpotter comes to a new city, we strongly encourage our police agency customers to engage with their communities about the decisions to acquire and use our technology.
- Using a data-driven approach, ShotSpotter works with our clients to determine the geographic area they want covered by ShotSpotter (i.e. the most gun violent areas)
- When the coverage area is set, ShotSpotter engineers determine where to place sensors so as to allow even gunshot detection throughout the area. Police do not determine where to place sensors and do not have access to a database of sensor locations.
- ShotSpotter acoustic sensors are not positioned, tuned or specialized to pick up human voices. The sensors use ordinary microphones that are similar to ones found in cellphones and are placed high above the street.

## Community Privacy Protections: Before and During an Incident

- Sensors "listen" for gunshot-like sounds and trigger only when detecting an impulsive sound (instantaneous and sharp). When at least three different sensors detect a gunshot-like sound at the same time and determine a location, they send a short audio snippet to ShotSpotter headquarters.
- Human voices will never trigger a sensor because they do not produce an instantaneous sharp sound and they are not loud enough to be picked up by three or more sensors.
- Live streaming of sensor audio is not possible by company employees, police or third parties.

## Community Privacy Protections: Before and During an Incident

- Upon detecting a likely gunshot, trained ShotSpotter personnel listen to a short computer-generated audio snippet of the gunfire to double check that it is actually gunfire.
- It is highly unusual for a human voice to be included in a snippet. For this to occur, the voice must be concurrent with the gunfire. There is no personally identifiable information in any ShotSpotter audio snippet.
- If a snippet is determined to be gunfire, police are notified and provided with an audio snippet of the gunfire from the closest sensor to better help them understand # of shooters, caliber and type of weapon.

## Community Privacy Protections: After an Incident

- The company made changes to the system in the early 2010s to prevent police and employee access to extended audio.
- If ShotSpotter receives a request (including a subpoena) for additional audio beyond the gunshot snippet, the company has and will continue to fight the request.
- Sensors store 72 hours of audio and automatically delete audio older than 72 hours. Neither police nor third parties ever have direct access to this audio. The company is reducing this to 30 hours in July 2019.

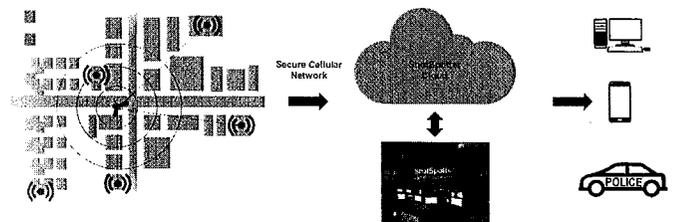
## Community Privacy Protections: After an Incident

- Occasionally, police contact ShotSpotter because a gunshot incident was not picked up by our sensors. Authorized ShotSpotter personnel can access the audio database ONLY if presented with hard evidence of a gunshot incident. The search begins with a look for visual cues of an incident. If found, a short audio snippet is downloaded from the sensor and provided to police.
- ShotSpotter never modifies audio in any way.

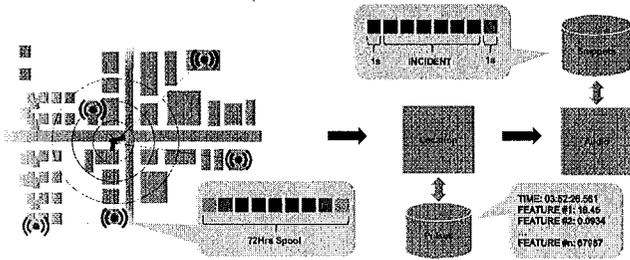
## Technical Details of ShotSpotter Community Privacy Protections

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## Technology: Real-Time Operating Model



## Technology: Data We Store

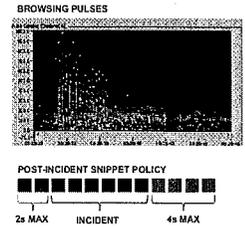


## Technology: Post-Incident Operating Model

Post incident, we may receive evidence from the PD that we missed or mis-located an incident; using authorized forensic analyst, we may be able to improve on the real-time results

### Analyst Techniques:

- Search the pulse database and look for visual evidence that impulsive events were missed
- An audio snippet can be retrieved from the sensors that heard the impulsive event if it is still within the spool file
- Calculate a more accurate location by selecting pulses from sensors further from the incident
- Resolve fine timing errors by examining the waveform and looking for the start of the gunshot



## Technology: Detailed Forensic Report Example

ALERT – July 24, 2016

Real-time



DFR – November 9, 2016

Post-Incident

After analysis, the shot count was corrected to 10 rounds.

Shot	Time
1	01:13:46.637
2	01:13:49.139
3	01:13:49.427
4	01:13:49.689
5	01:13:49.612
6	01:13:49.935
7	01:13:50.103
8	01:13:50.183
9	01:13:50.308
10	01:13:50.575

Table 1 – Shot timeline, Flex ID #250163

## Independent Privacy Audit

- Policing Project at NYU Law School ([www.PolicingProject.org](http://www.PolicingProject.org)) conducted independent review of privacy policies and procedures
- Found low risk of primary privacy issue: audio surveillance
  - “SST’s strict control of the technology and data minimizes the chance it will be used for voice surveillance.”
- SST adopting Policing Project’s detailed recommendations to further minimize any risk:
  - Reduce audio spool from 72 hours to less than 48 hours;
  - Minimize length of audio snippets;
  - Strengthen internal access procedures; and more....
- Policing Project’s full report available Summer 2019



**ACLU Opinion**

**ACLU**

"...gunshot detection in a city does not implicate any significant privacy interests... I am not losing sleep over this technology at this time."

Jay Stanley, Senior Policy Analyst,  
ACLU Speech, Privacy, and  
Technology Project, May 5, 2015,  
[www.aclu.org](http://www.aclu.org)

DETECT    PROTECT    CONNECT

**Thank you!**

 **ShotSpotter**  
[www.shotspotter.com](http://www.shotspotter.com)



## DEPARTMENTAL GENERAL ORDER

### I-20: GUNSHOT LOCATION DETECTION SYSTEM

Effective Date: ~~XX~~ Apr 19

Coordinator: Ceasefire Division

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The Oakland Police Department (OPD) strives to use technology that promotes accountability and transparency. This policy provides guidance and procedure for response, immediate actions, follow up, documentation, and auditing of OPD's Gunshot Location Detection (GLD) System incidents that occur within the City of Oakland.

All data, whether sound or image, generated by OPD's GLD System are for the official use of this department. Because such data may contain confidential information, such data is not open to public review.

#### A. Description of the Technology

OPD uses a GLD System (currently the ShotSpotter® Flex™ system, provided by ShotSpotter, Inc. "Shotspotter") to record gunshot sounds and use sensors to locate the origin of the gunshots. The GLD system enables OPD to be aware of gunshots in the absence of witnesses and/or reports of gunshots to OPD's Communications Division (Communications). The GLD system notifies Communications of verified gunshot events, which allows OPD to quickly respond to gunshots and related violent criminal activity.

##### A – 1. How Shotspotter Works

OPD's GLD system employs acoustic sensors strategically placed in specified areas (commonly referred to as a "coverage area.") When a gun is fired, the sensors detect the firing of the weapon. The audio triangulation of multiple installed sensors then pinpoints a gunfire location and sends the audio file and triangulation information to Shotspotter Headquarters (HQ) for gunshot verification. Verified gunshots and related information are then sent to Communications in real-time so that Communications may notify responding officers where guns were fired.

##### A – 2. The GLD System

There are three components to GLD system:

1. GLD Sensors: Sensors are installed in different coverage areas in Oakland. Oakland currently has five coverage areas (or phases) where sensors are installed to triangulate gunshots.

2. ShotSpotter Headquarters (HQ): Sensors send acoustic information to HQ where computer-based machine-learning algorithms are used to analyze the sound. If the sound and visual audio signature match gunfire, the incident file is then passed along to the Incident Review Center (IRC). Acoustic experts at the IRC review incidents within seconds and provide additional information (e.g. number of gunshots, number of guns, types of guns). Confirmed gunshots are pushed out to Communications (dispatch) as well as to the OPD Shotspotter software system within seconds.
3. The OPD Shotspotter Software System: This system is cloud-based and desktop-based; OPD authorized personnel can use internet browsers to connect to the Shotspotter system via OPD computers. Certain authorized personnel use desktop applications that connect to the Shotspotter system for more in-depth gunshot analysis.

## **B. General Guidelines**

### **B – 1. Authorized Use**

The Chief of Police or designee shall provide necessary training and/or technical assistance for GLD usage. Only OPD personnel shall be granted access to OPD's GLD System. The GLD system shall only be used for locating gunshots. The system shall never be used to record human conversations except where such conversations are unintentionally recorded in connection with gunshot recordings.

### **B – 1. Restrictions on Use**

Department members shall not use or allow others to use the GLDS acoustical recording equipment, software or data for any unauthorized purpose.

### **B – 2. Use Priority**

All GLD activations shall be treated as priority one calls.

### **B-3. Data Access**

1. Authorized personnel may access the GLD system via vehicle computers and receive notifications of verified GLD activations. OPD Communications may also notify authorized personnel of GLD activations. Authorized personnel may respond to such notifications based upon priorities as mandated by their supervisors.
2. The GLD system shall only be used for official law enforcement purposes.
3. Only specifically authorized personnel authorized by the Chief or Chief-designee (e.g. personnel with OPD's Ceasefire Unit and CID crime

analysts) will have access to historical GLD system data via desktop GLD system applications.

The GLD system may be used for authorized patrol and investigation purposes. Contacting individuals at locations where GLD activations occur shall be conducted in accordance with applicable law and policy.

4. Accessing data collected by the GLD system (currently Shotspotter) requires a right to know and a need to know. A right to know is the legal authority to receive information pursuant to a court order, statutory law, or case law. A need to know is a compelling reason to request information such as direct involvement in an investigation or assignment to a unit which responds to gunshot calls (e.g. Patrol Division).
5. Members approved to access GLD system data may only use data for legitimate law enforcement purposes only, such as when the data relate to gunshots, a specific criminal investigation or department-related civil or administrative action.
6. All verified GLD system activations are entered into OPD's computer-aided dispatch (CAD) record management system (RMS) with GLD system-specific ID numbers. Authorized personnel can then query the CAD/RMS system for any and all GLD system activations.

## **C. Shotspotter Data**

### **C – 1. Data Collection and Retention**

1. GLD acoustic data is recorded when three sensors all record sounds that match the acoustic signatures of gunshots. The sensors are constantly recording a total of 30 hours into acoustical digital .wav format files, and then deleting the data unless triggered to send the data to Shotspotter for analysis; the buffer allows OPD to request data within 24 hours.
2. The sensors delete all acoustic data after 30 hours unless the gunshot-like impulsive acoustic event sends the data to Shotspotter for analysis. Only verified gunshot data is maintained in perpetuity, both by Shotspotter HQ as well as on OPD desktop applications.

### **C – 2. Data Security**

All data will be closely safeguarded and protected by both procedural and technological means:

1. Authorized personnel may access the browser-based GLD system via vehicle computers to only access the cloud-based system. Authorized personnel must always gain access through a login/password-protected system which records all login access.
2. OPD has no direct access to actual GLD (Shotspotter) sensors. Only Shotspotter-specified support engineers can use a technology to access the data in the sensors prior to the 30-hour deletion period, if CID investigators need to search for previous gunshots.

### **C – 3. Releasing or Sharing GLD System Data**

GLD system data may be shared only with other law enforcement or prosecutorial agencies based on a need to know and a right to know, or as otherwise required by law, using the following procedures:

1. The agency makes a written request for the Shotspotter data that includes:
  - a. The name of the requesting agency.
  - b. The name of the individual making the request.
  - c. The need for obtaining the information.
2. The request is reviewed by the Bureau of Services Deputy Chief/ Deputy Director or designee and approved before the request is fulfilled.
3. The approved request is retained on file, and shall be included in the annual report

Requests for Shotspotter data by non-law enforcement or non-prosecutorial agencies will be processed as provided in Departmental General Order M-09.1, Public Records Access (Civil Code § 1798.90.55) and per any interagency agreements.

### **D. GLD System Administration**

OPD's GLD System is installed and maintained by Shotspotter in collaboration with OPD. Oversight of the system as well as data retention and access, shall be managed by OPD's Ceasefire Division. The sensors as well as the system are maintained by Shotspotter.

**D – 1. GLD System Coordinator**

The title of the official custodian of the GLD System (Shotspotter Coordinator) is the Captain of the OPD Ceasefire Division, or designee.

**D – 2. GLD System Administrator**

The Ceasefire Captain shall administer the GLD system, implementation and use, in collaboration with OPD's Criminal Investigations Division (CID). The Ceasefire Captain, or designee, shall be responsible for developing guideline, procedures, and processes for the proper collection, accuracy and retention of GLD System data.

**D – 3. Monitoring and Reporting**

The Oakland Police Department will monitor its use of the GLD system to ensure the accuracy of the information collected and compliance with all applicable laws, including laws providing for process, and time period system audits.

Department members shall document each interaction with the GLD System, when in the field, and when uploading reports to the CAD system, by indicating in their report that such technology was used, and noting what benefit from use of the technology was received if any. Such benefits could include recovery of weapons, shell casings, identification of suspects, victims or witnesses, situational awareness, and faster transport to or received of medical care including first aid.

The Shotspotter Coordinator shall provide the Chief of Police, Privacy Advisory Commission, and Public Safety Committee with an annual report for the previous 12-month period. These reporting procedures will assist in evaluating the efficacy of this policy and equipment.

**D – 4. Training**

The Training Section shall ensure that members receive department-approved training for those authorized to use or access the Shotspotter system.

Trainings for Communications personnel (dispatchers and operators) may include training on how to acknowledge the GLD system activations and how to use the system software to identify activation locations so as to provide information to responding officers.

By Order of

DEPARTMENTAL GENERAL ORDER  
OAKLAND POLICE DEPARTMENT

I-20

Effective Date

Anne E. Kirkpatrick  
Chief of Police

Date Signed:

# OAKLAND POLICE DEPARTMENT

## Surveillance Impact Report for the Gunshot Location Detection System

### 1. Information Describing the Gunshot Location Detection (GLD) System and How It Works

The Oakland Police Department (OPD)'s GLD system employs a network of acoustic sensors which are placed in historically high gun crime areas to provide to OPD alerts containing the location of gunshots as they occur. Currently, OPD contracts with ShotSpotter, Inc., the creator of the ShotSpotter® Flex™ system "ShotSpotter." ShotSpotter is the most widely used outdoor gunshot system in the United States with over 100 installations.

The GLD system sensors are designed to detect gunshots based on their acoustic signature (e.g. broad-frequency, impulsiveness and loudness). The utilization of multiple sensors at different distances from a gunshot sound allows the system not only to capture the sound but assign a probability that it is a gunshot and triangulate its precise location based on time difference of arrival. If the machine classifier in the "ShotSpotter Cloud" determines it is likely a gunshot based on computer-learning algorithms, the system will pull a short audio snippet from the sensors that detected it and send it to human analysts at the ShotSpotter Incident Review Center at its headquarters in Newark, CA. The analysts perform an auditory and visual assessment of the audio waveform to make a final determination as part of a two-phased classification process. If confirmed as a gunshot, an alert is published containing information such as street address, number of rounds fired, and a short audio snippet of the gunfire event— all within 60 seconds of the trigger pull (29 seconds on average).

OPD Communications Division and police vehicle terminals receive the alerts so that Communications may notify responding personnel (and personnel can use vehicle computers) of where gunshots were recently fired to generate a fast police response. The GLD System also consists of a cloud-based portal accessible to patrol vehicles, OPD computers and authorized phones via a secure mobile application.

Officers or other authorized personnel can receive real-time gunshot notification when logged into the system in addition to receiving notification from OPD Communications. Authorized personnel such as crime analysts and investigators use a desktop application that connects to the ShotSpotter system for more in-depth gunshot pattern analysis.

The ShotSpotter service also includes the option to receive Detailed Forensic Reports (DFR) which are court-admissible documents that show the exact timing, location and sequence of shots fired. This service is primarily used by the county District Attorney office as evidence in prosecution of gun crime defendants. The company provides expert witness testimonial to support the DFR in court upon request. DFR reports have been utilized by Oakland PD and Alameda County DA more than 100 times since 2012.

**2. Proposed Purpose**

Hundreds of gunshots occur each month in Oakland; in September 2018 alone the system logged 395 total incidents (275 multiple gunshots, 92 single gunshots, and 28 possible gunshots). Police rely on the community to report gunshot incidents via 911. However, on average 80% of gunshot incidents in the United States go unreported resulting in police being unaware of most gun violence. In Oakland, only 5% of gunshot incidents were reported via 911<sup>1</sup> based on May 2019 analysis of verified gunshot notifications and 911 calls.

The purpose of GLD is to enable OPD to provide a higher level of the service to the community related to shootings. The system detects, locates and alerts officers of virtually all gunshots in a coverage area in less than 60 seconds enabling officers to respond to and investigate gunshot incidents they would not have known about and to respond to them much more rapidly than waiting for a 911 call. Personnel can better respond to gunshot activity and respond to possible armed individuals as well as to possible gunshot victims through this important real-time data.

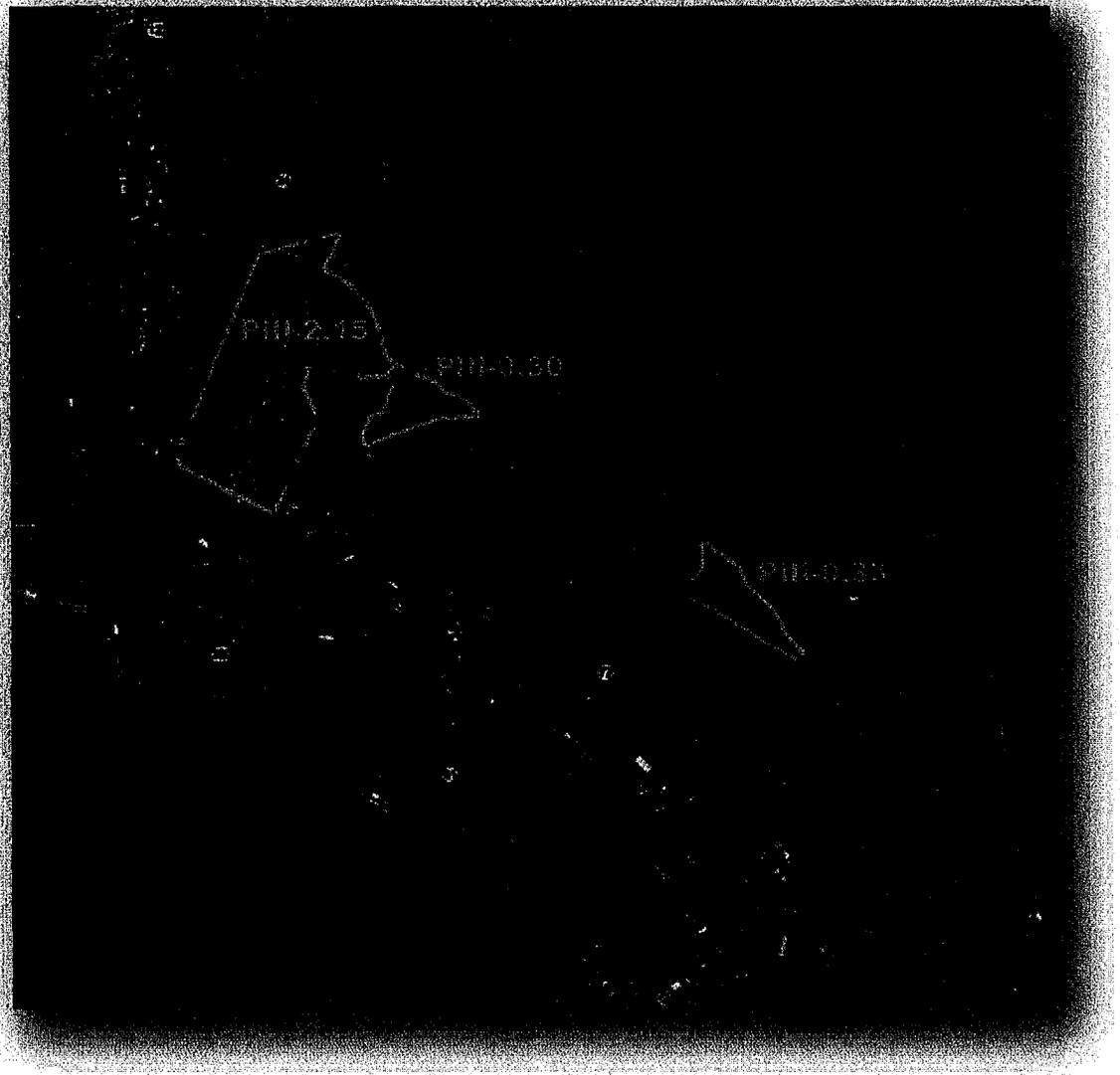
**3. Locations Where, and Situations in which GLD System may be deployed or utilized.**

OPD has contracted with ShotSpotter to install GLD sensors in different areas in several parts of the City. The total coverage area for the current ShotSpotter system comprises over 16 square miles or approximately 27 percent of the City. OPD has chosen to install the sensors in areas most prone to gunshots based upon historical crime data. Many areas in East and West Oakland now benefit from the GLD system – the map below outlines the three phases or areas of ShotSpotter coverage in Oakland.

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<sup>1</sup> based on May 2019 analysis of verified gunshot notifications and 911 calls.

**Figure 1: Map of Oakland Shotspotter Areas**



After receiving OPD training authorized personnel are able to access the GLD system. The following table presents Part 1 Crime Data for January 1-May 31 Year to Date (YTD).

**Table I: Oakland Part 1 Crime Data for January 1-May 31 Year to Date (YTD)**

Part 1 Crimes	YTD 2015	YTD 2016	YTD 2017	YTD 2018	YTD 2019	YTD % Change 2018 vs. 2019	5-Year YTD Average	YTD 2019 vs. 5-Year Average
All YTD								
Homicide 187(a)PC	35	19	25	22	31	41%	26	17%
Aggravated Assault	157	106	100	106	107	0%	115	-6%
Rape	80	93	96	88	71	-19%	86	-17%
Robbery	1,387	1,051	1,054	1,091	1,105	0%	1,115	-3%
Burglary	5,330	3,979	5,363	3,749	4,616	23%	4,607	0%
Vehicle Theft	1,000	1,359	1,744	2,537	2,551	0%	2,077	19%
Larceny	2,618	2,424	2,466	2,622	2,438	-7%	2,514	-3%
Arson	266	184	30	71	48	-32%	75	-36%

**4. Impact**

*Public Privacy Impact*

GLD has provided significant benefit to the OPD and the community around gun violence. This enhanced public safety value must be weighed, however, against its potential to violate the privacy rights of Oakland residents. The specific risk that must be assessed is the possibility that the system could be used for persistent or targeted audio surveillance – listening or recording voice conversations - given the system’s sensors contain microphones that are used outdoors.

ShotSpotter acoustic sensors use ordinary microphones that are similar to ones found in cellphones. They are placed high above the street and are not positioned, tuned or specialized to pick up human voices. The sensors “listen” for gunshot-like sounds and trigger only when detecting an impulsive sound that is instantaneous and sharp. When at least three different sensors detect a gunshot-like sound at the same time and determine a location, they send a short audio snippet to ShotSpotter headquarters that includes 1 second of sound prior to the incident (to establish a baseline of ambient noise), the incident itself and 1 second after. Upon detecting a likely gunshot, trained ShotSpotter personnel listen to a short computer-generated audio snippet of the gunfire to double check that it is actually gunfire. It is highly unusual for a human voice to be included in a snippet. For this to occur, the voice must be loud enough to be heard over the gunfire. In addition, there is no personally identifiable information in any audio snippet.

ShotSpotter made significant changes in its audio access and privacy practices starting in 2012. Prior to this time, police had unlimited access to sensor audio. Since 2012, only authorized ShotSpotter employees have access to audio from sensors, they can only access it under a strict set of conditions and can only provide police a short audio snippet.

In 2019 ShotSpotter commissioned an independent privacy audit by the Policing Project at NYU Law School<sup>2</sup>. This end-to-end assessment conducted by objective privacy professionals concluded that the ShotSpotter presents an “extremely low risk of audio surveillance”. The Policing Project based this finding upon the short amount of audio that is temporarily stored on sensors, the short length of audio snippets that are permanently stored as evidence and the internal controls the company uses to restrict access to audio for authorized employees only.

As the audit concludes: “While it is surely possible that ShotSpotter sensors will, on occasion, capture some intelligible voice audio related to a gunfire incident, we have little concern that the system will be used for anything approaching voice surveillance.”

Human voices and street noise will never trigger a sensor because they do not produce an instantaneous sharp sound and they are not loud enough to be picked up by three or more sensors. That being said, street noise that can include human voices could be captured by a sensor temporarily. All sensor audio, however, is permanently deleted after 30 hours and never heard by a human unless it was accompanied by a loud, impulse sound thought to be a gunshot. Live streaming of audio is not possible.

#### *Public Safety Impact*

As described earlier, without ShotSpotter, OPD would be aware of only a

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<sup>2</sup> <https://www.policingproject.org/shotspotter>

small fraction of shootings in Oakland because most are not called in via 911. This phenomenon is not limited to Oakland with an average of less than 20% of gunshot incidents being called in.<sup>3</sup> In addition, even when incidents are called in, many minutes can pass before the first 911 call comes in and the information about shots fired location is often inaccurate. GLD System technology notifies OPD of gunshot incidents in less than 60 seconds with an accurate location. This helps OPD personnel to leverage their street presence and vehicle mobility to respond more quickly to gunshots and no longer be dependent on the public to call 911 and report them.

In summary, the benefits that OPD can directly attribute to using GLD include:

- Awareness of gunshot incidents that the department would not have known about
- Significant time savings in learning about a gunshot incident along with a precise location
- Ability to get to crime scene faster to provide or call in treatment for gunshot wound victims
- Ability to find and collect more ballistic evidence
- Ability to identify and interview more witnesses
- Better crime scene intelligence available in the form of data on timing, sequence and location of each shot fired in the incident
- Tactical intelligence provided for responding patrol officers to help them approach the crime scene safely (e.g. multiple shooters, automatic weapons)

Some critics of the system say that it does not enable OPD to consistently catch criminals at the scene and therefore the system doesn't help with gun violence. OPD cannot always respond immediately to gunshot activations. However, gunshot location information is very helpful even when OPD cannot respond immediately. The consistent collection of ballistic evidence (e.g. shell casings, found firearms) can be used to connect gun crimes. Also, responding to gunshot locations allows for a greater likelihood of finding witnesses who often disappear if police response is delayed and doesn't happen. Therefore, the use of ShotSpotter results in more suspects being identified, arrested and prosecuted for gun crimes, and ultimately contributing to a reduction in shootings.

OPD is aware of an ongoing lawsuit stemming from the City of Rochester, New York's use of ShotSpotter<sup>4</sup>. The lawsuit relates to Rochester's use of

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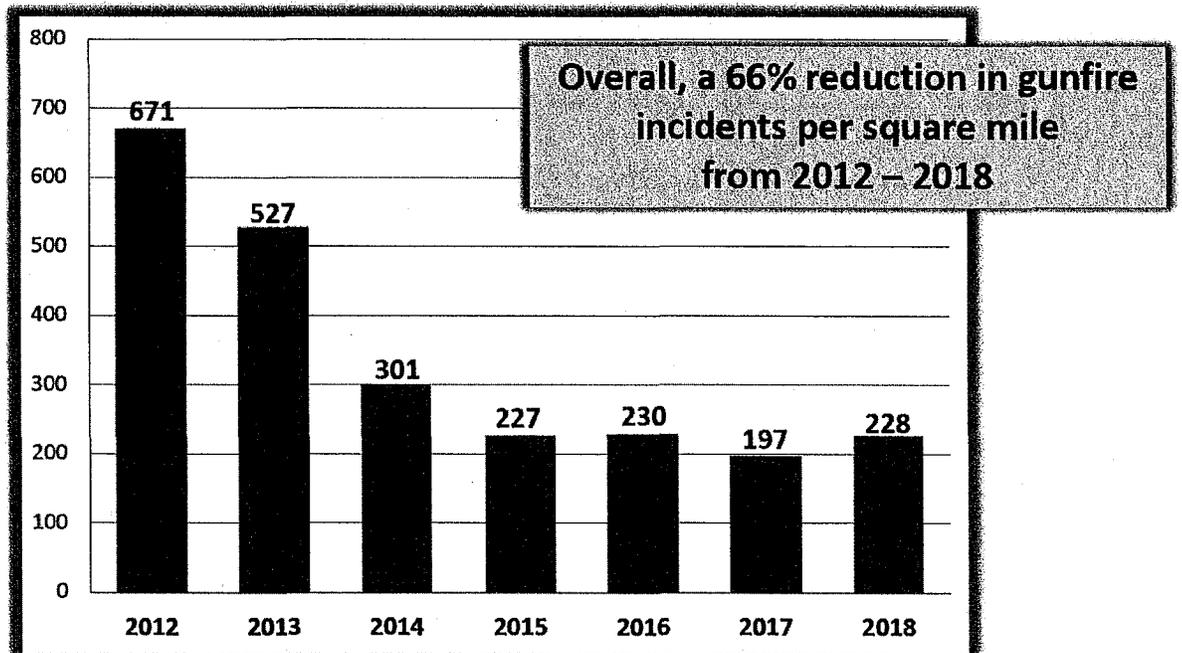
<sup>3</sup> The geography, incidence, and underreporting of gun violence: <https://www.brookings.edu/research/the-geography-incidence-and-underreporting-of-gun-violence-new-evidence-using-shotspotter-data/>

<sup>4</sup> *Silvon S. Simmons vs. Joseph M. Ferrigno, II, Samuel Giancursio, Mark Wiater, Christopher Muscato, Robert*

ShotSpotter for evidentiary support for prosecutions. The "Purpose" section above speaks to use of DFR Reports by OPD and the County of Alameda. In this case, the New York City-based Innocence Project, has filed a legal brief in a Rochester criminal case, challenging the reliability of ShotSpotter when it is used for more than a gunfire alert system. OPD will assess the eventual results of these legal proceedings. Current ShotSpotter use in Oakland continues to show that ShotSpotter provides a reliable tool for precise gunshot location detection.

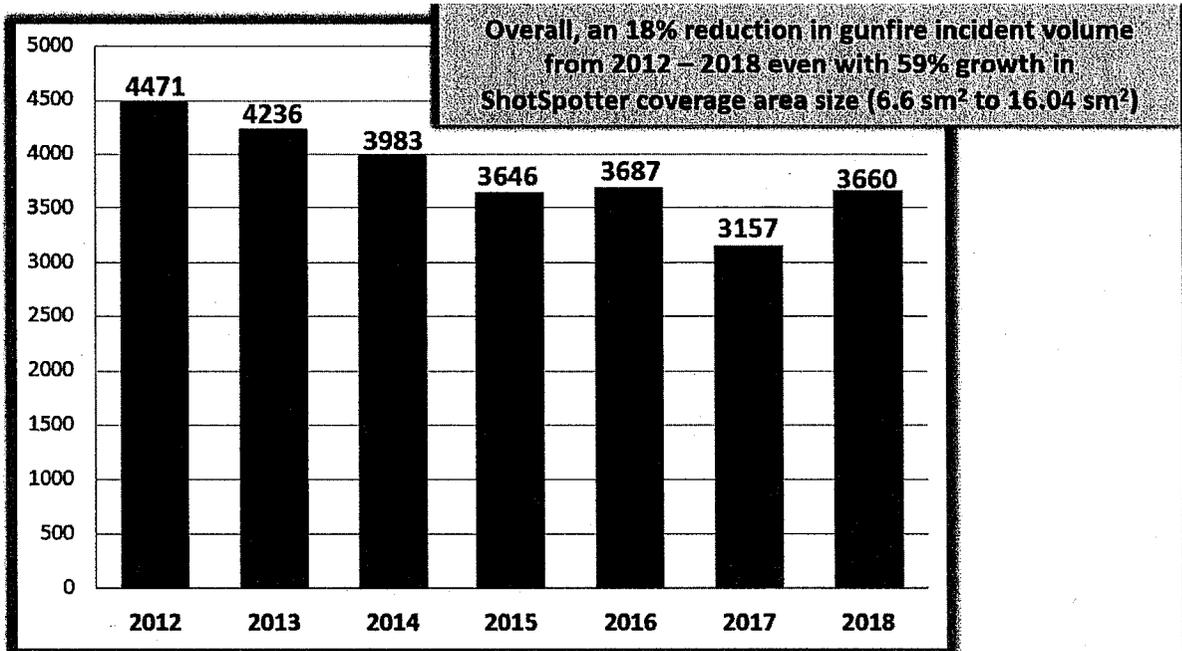
In Oakland since 2012 there has been a 66% reduction in shooting incidents per square mile of ShotSpotter coverage (see charts below). OPD cannot directly attribute this significant gun crime reduction trend to ShotSpotter. However, OPD does believe that ShotSpotter plays a vital role in OPD's large gun crime reduction strategies.

**Figure 2: Oakland Gunfire Incidents by Year: 2012-2018**



Wetzel, Michael Ciminelli, John Does 1-20, City of Rochester, ShotSpotter, Inc., SST, Inc., John Does 21-30 and Paul C. Greene

**Figure 3: Oakland Gunfire Volume by Year: 2012-2018**



OPD cannot draw direct causal relationships between the GLD system and gun crime activity. However, OPD's Ceasefire Unit (focused on diminishing the prevalence of gunshot activity) sees correlations between the use of the GLD system and gunshot activity; in 2014 there were 420 incidents of Assault with a firearm (criminal code 245(a)(2)PC)); 2015 saw 342 incidents; 2016 saw 331 incidents; 2017 saw 281 incidents and 2018 saw 277 incidents – a consistent five year decrease.

OPD views GLD as a community partnership building resource as well. GLD system data pinpoints exactly where to attempt to engage neighbors in areas where shots are being fired. Officers can use this information to introduce themselves to community members, ensure they are safe, and understand what they know related to shots being fired. These initial meetings related to gunfire serve as starting points for greater constructive contact between residents and OPD officers. In particular, OPD has been able to achieve a significant decrease in the incidence of celebratory gunfire around the July 4th and New Year's holidays using GLD to proactively engage with the community prior to these holidays about the dangers of celebratory gunfire.

As OPD offers a consistent, positive response to gunshot incidents, there is a greater opportunity to improve trust with the community as they see police engaging.

## 5. Mitigations

OPD, in partnership with ShotSpotter has developed protocols to ensure that the GLD system does not overly burden the public's right to privacy.

OPD DEPARTMENTAL GENERAL ORDER (DGO) "I-20 Gunshot Location Detection System" Section B "General Guidelines" explains that:

- Only authorized users may access the GLD system;
- No one may access the system without training;
- Only specifically authorized personnel authorized by the Chief or Chief-designee (e.g. personnel with OPD's Ceasefire Unit and CID crime analysts and investigators) will have access to historical GLD system data via desktop GLD system applications.

DGO I-20 Section D "Training" explains that: Training requirements for employees authorized to use the GLD system include completion of training by the GLD System Coordinator or appropriate subject matter experts as designated by OPD. Trainings shall be implemented through OPD's digital policy and training platform.

Such training shall include:

- Applicable federal and state law
- Applicable policy
- Functionality of equipment
- Accessing data
- Safeguarding password information and data
- Sharing of data

### Technology and operational mitigations by ShotSpotter:

Sensors are placed high above the ground typically on top of buildings or sometimes lampposts. At this height, there is more limited ability to pick up street level sounds clearly.

The sensors are not capable of audio streaming – neither ShotSpotter nor OPD can listen in on street level sounds in real-time.

The system permanently deletes all audio that is temporarily stored on the sensor after 30 hours.

The system only triggers an incident to send downstream when 3 or more sensors hear a loud, impulsive sound. Sensors cannot be triggered by human voices because voices are not impulsive enough or loud enough to be heard by 3 sensors which may be 800 meters or more apart. Thus, the audio of a human voice that may be captured by 1 sensor would be permanently deleted after 30 hours and no police or ShotSpotter employee will have heard

that sound.

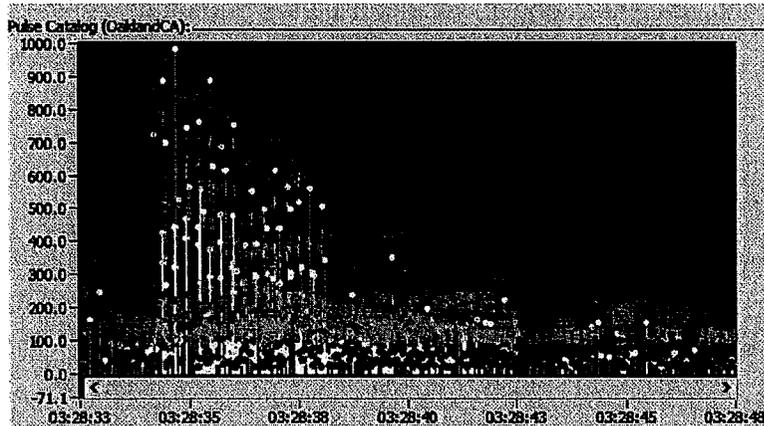
If a sound is loud enough and sharp enough to possibly be a gunshot and is detected by 3 or more sensors and a location is able to be determined, the system pulls a short audio snippet of the sound plus 1 second of ambient noise prior to the incident and 1 second after. This is typically 10 seconds or less in total - not enough to transmit a conversation. This audio is interpreted by a machine at first and then reviewed by an acoustic analyst at ShotSpotter Headquarters who is only presented with the audio snippet and is under significant time pressure to process the incident as either a gunshot or to dismiss as a non-gunshot and get on to the next incident. All incidents, whether determined to be a gunshot or non-gunshot, are permanently and securely stored in the cloud to serve as both evidence and to train the machine classifier in the future.

ShotSpotter security protocols also mitigate gunshot detection data access. ShotSpotter, as mentioned above under "*Impact / Public Privacy Impact,*" does not provide extended audio to OPD or any police agency; they will not provide this access even if requested. Additionally, ShotSpotter does not provide actual precise locations of the sensors to OPD.

As previously mentioned, the sensors are constantly listening for gunshot-like sounds and storing what is captured for 30 hours (was 72 hours before July 2019), and then deleting the data unless triggered to send the data to the ShotSpotter Cloud for analysis. The 30 hour buffer allows OPD to request data within 24 hours in cases where gunshots have been identified by police but not picked up by the system or if there is a need to verify if there were other gunshots prior to the authenticated event. ShotSpotter policy stipulates that only a limited number of authorized forensic engineers can access the storage buffer of a sensor to retrieve prior recorded data within that 30 hour window and search for other gunshot impulsive sound events. To avoid listening to recorded data on a sensor in a haphazard way, the search for a missing gunshot is first done visually through a secure interface looking for the prevalence of electrical "pulses" strong enough to be a gunshot that occurred around the time of the incident in question. See the screenshot below.

**Figure 4: Visual Representation of Gunshot Acoustic Signature**

**BROWSING PULSES**



The system will download an audio snippet of one second before to one second after the gunshot sound incident and provide to OPD.

It is possible, but highly unusual, for a human voice to be heard within an audio snippet given the loud nature of the gunshot or gunshot-like sound that is occurring is the primary audio event of the snippet. Upon receiving a gunshot alert OPD authorized personnel may find that a voice has been recorded along with gunshot sound, but such voice data is only associated with the actual gunshot data and has no personally identifiable information built in. There is no way to tag any voice audio that is unintentionally recorded when connected to a gunshot.

**6. Data Types and Sources**

The GLD system uses acoustical digital data file recordings (.wav files) to send to the ShotSpotter Cloud for gunshot verification. Verified gunshot recordings stored on HQ servers can be reviewed by OPD personnel on desktop or mobile applications.

**7. Data Security**

OPD takes data security seriously and safeguards GLD System data by both procedural and technological means. The mitigation section above explains that only authorized and trained personnel will be permitted access to the GLD system. The system always requires user and password ID for login. Furthermore, as explained in the Mitigation Section above, only personnel specifically designated by the Chief or Chief-designee have access to the GLD system desktop applications which provide access to any historical downloadable data.

The GLD technology itself provides many layers of data security. The sensors detect loud, impulsive sounds; only when such sounds are recorded are audio files captured and sent to ShotSpotter HQ and then to OPD; other street sound recordings such as human conversations are thus constantly deleted.

## 8. **Costs**

OPD has been a ShotSpotter customer for majority of the last 13 years, ShotSpotter's delivery and pricing model has evolved from a traditional premise-based hardware/software capital cost + maintenance fees to a modern Software-as-a-Service (SAAS) subscription model without an upfront capital investment. Over the years, the company has occasionally raised its subscription fees based on increases in the cost of doing business, as summarized below:

### **Phase I:**

OPD entered into the original contract (Resolution No. 80075 C.M.S.) with ShotSpotter in 2006 for the purposes of piloting the gunshot detection system in 6.2 square miles of the city. This initial contract authorized installation of the ShotSpotter GLD system in two areas of Oakland for approximately \$70,000 per year. In October 2011, the City entered into a new contract with SST, Inc (ShotSpotter) for approximately \$84,000 per year for Phase I to convert the coverage from the premise-based hardware/software model to the current SAAS model.

### **Phase II:**

In November 2012, Oakland expanded the ShotSpotter coverage areas to include another 6.6 square miles, creating a total coverage area of 12.8 square miles. The Phase II expansion was priced at the then-current rate of \$40,000 per square mile, bringing that expansion cost to \$264,000.

### **Phase III:**

In September 2015, Oakland further expanded ShotSpotter coverage by 2.78 square miles. This expansion was priced at slightly less than the then-current rate of \$55,000 per square mile, for an expansion cost of \$146,600.

Note that until 2017, there were no increases applied to the subscription renewals despite the fact that the City's rates were well below ShotSpotter's market rate, and the City continues to enjoy rates that are significantly below ShotSpotter's current annual market rate of \$65,000 per square mile of coverage. Table A below outlines Oakland's current price per square mile:

**Table 2: Shotspotter Annual Costs per Area or Phase**

Contract Phase	Coverage Area Size (mi <sup>2</sup> )	Current Annual Price	Subscription Renewal Date	Current Price Per mi <sup>2</sup>
Phase I	6.2	\$92,610	April 18, 2020	\$14,937
Phase II	6.6	\$291,060	June 30, 2020	\$44,100
Phase III	2.78	\$161,627	June 30, 2020	\$58,139
<b>CURRENT TOTAL ANNUAL FEE:</b>		<b>\$545,297</b>		<b>Average Price Per mi<sup>2</sup> \$34,999</b>

**Current Contract for 2018-2021:**

In April 2018, the City adopted a resolution that continued the ShotSpotter service for all three phases of ShotSpotter for a year and also allowed extension for all phases for an additional two years with a nominal 5% increase per year. That resolution resulted in a contract for an amount not to exceed \$1,637,188 for a three-year period (2018-2021) for all three ShotSpotter contract phases of 15.58 square miles. This represents an average annual subscription fee of \$35,028 per square mile.

**9. Third Party Dependence**

OPD, as mentioned in Section 1 above, Currently, OPD contracts with ShotSpotter, Inc., the creator of the ShotSpotter® Flex™ system “ShotSpotter.” ShotSpotter is the most widely used outdoor gunshot system in the United States with over 100 installations.

**10. Alternatives Considered**

OPD officers and investigators rely primarily on traditional members of the public to report gunshot crimes whether or not there are associated gunshot victims. Members of the public, when they witness or hear gunshots (and if they choose to report incidents) often report inaccurate locations due to limitations of the human ear as sound echoes off buildings, trees and other objects. GLD systems have revolutionized real-time intelligence for police. OPD believes that there is no alternative to a modern GLD system other than having exponentially greater numbers of sworn personnel covering many areas throughout the City and/or using more intrusive forms of recording equipment.

ShotSpotter is the leading GLD provider with over 100 cities installed. There are several other gunshot detection systems available such as Shooter Detection Systems (SDS), AmberBox and Boomerang. Many of these systems, like AmberBox and SDS, are for indoor purposes only and would not address most shootings that occur in Oakland. The non-ShotSpotter

outdoor systems suffer from serious deficiencies that make them poor fits for Oakland. They do not have the ability to locate gunshots accurately; they do not provide a second phase of gunshot verification with human review and suffer from high false positives; they do not have proven citywide deployments; and they do not provide the post incident reporting to help locate shell casings and/or court admissible reporting for timing, sequence and number of rounds fired.

OPD does not consider any of these systems to offer a reasonable solution – OPD needs an outdoor GLD that provides coverage to multiple areas where gunshot activity regularly occurs.

Other alternatives would be to continue to rely on less frequent and accurate information provided by the public and to have less information about real-time gunshots. These alternatives are not considered useful given the volume of gunshot incidents which occur in Oakland.

## 11. Track Record of Other Entities

ShotSpotter states that its system is now used in over 100 cities across the United States, and in parts of the Caribbean and South Africa. Nearly half of the top 50 metros use ShotSpotter including Baltimore, Washington D.C., Chicago, New York, Denver and San Francisco<sup>5</sup>. There are 14 cities in California using the system.

Sample results reported from other cities:

- Chicago cites a drop of over 40% in shootings in the Englewood District in the first year after installation<sup>6</sup>
- Cincinnati cites a 48% reduction in shootings in first year<sup>7</sup>
- Camden County, NJ - 46% reduction in homicides by shooting<sup>8</sup>
- Rochester, NY - 40% reduction in shooting incidents<sup>9</sup>
- Denver - 103 arrests and 84-gun recoveries over the course of 3 years<sup>10</sup>

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<sup>5</sup> OPD understands that some police agencies have chosen not to renew their contacts with ShotSpotter. OPD believes that for some law enforcement agencies the decision is based on value and budget issues rather than efficacy or privacy issues. Many cities do not have the same level of gun crime density as OPD so for some cities the need for a GLD system may not justify the cost.

<sup>6</sup> <https://www.chicagotribune.com/news/breaking/ct-met-superintendent-eddie-johnson-chicago-violence-20171116-story.html>

<sup>7</sup> <https://www.wcpo.com/news/crime/shootings-down-nearly-50-percent-in-cincinnati-this-year-police-say>

<sup>8</sup> <https://www.phillymag.com/news/2015/04/02/camden-reduces-gunfire-by-48-percent/>

<sup>9</sup> <https://www.democratandchronicle.com/story/news/2016/09/06/shotspotter-technology-gun-violence/89764672/>

<sup>10</sup> <https://www.thedenverchannel.com/news/crime/denver-police-to-test-shotspotter-system-in-4-different->

- Bakersfield - 22 arrests in first 9 months<sup>11</sup>
- Pittsburgh – 48 arrests and 83 victims found with help of ShotSpotter in 3 years<sup>12</sup>
- 2018 Las Vegas Metro Police pilot report indicates 342 gunshot incidents were identified by ShotSpotter in first 9 months of use that the PD would not have known about. Recommends continuing ShotSpotter in current coverage area and expanding coverage to all known hotspots.<sup>13</sup>
- NYC 2018 Police Commissioner's Report – "ShotSpotter alerts officers to the scene to suppress further violence; to gather ballistic evidence; to locate relevant surveillance video; and to canvas the neighborhood for people who may have seen or heard something. Any of this evidence might provide decisive when investigators are trying to build a case against gang members or other violent criminals in the area."<sup>14</sup>Peoria, IL Police Department in 2016 increased their ShotSpotter coverage area to from three to six miles. They cite the systems usefulness in terms of having better information about where to find shell casings related to gunshot activity. The Chief of Police has stated that the system has improved the department's public image as the public sees the department enhancing its ability to respond to crime through use of the system. The system helps with gun tracing – shell casings are entered into the ATF's National Integrated Ballistic Information Network (NIBN) for tracing; when guns are also recovered based on ShotSpotter location data, the guns can then be matched through NIBIN to other gun casings, ultimately helping to connect different shootings to a single.

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neighborhoods-with-live-gunfire

<sup>11</sup> <https://bakersfieldnow.com/news/local/is-shotspotter-working-in-bakersfield>

<sup>12</sup> <https://www.post-gazette.com/local/city/2018/03/14/Pittsburgh-City-Council-ShotSpotter-expansion-Wendell-Hissrich-North-Side-Jason-Lando-Darlene-Harris-Deborah-Gross/stories/201803140183>

<sup>13</sup> <https://www.shotspotter.com/wp-content/uploads/2019/08/LVMPD-ShotSpotter-Assessment-V102418.pdf>

<sup>14</sup> <https://www.shotspotter.com/wp-content/uploads/2018/09/2018-Police-Commissioners-Report-SST-Section.pdf>



2019 OCT 2 11:04 AM  
**OAKLAND CITY COUNCIL**

**RESOLUTION NO. \_\_\_\_\_ C.M.S.**

**Introduced by Councilmember \_\_\_\_\_**

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**RESOLUTION APPROVING THE OAKLAND POLICE DEPARTMENT  
(OPD) GUNSHOT LOCATION DETECTION (GLD) USE POLICY AND  
SURVEILLANCE IMPACT REPORT**

**WHEREAS**, Oakland's Surveillance Ordinance No. 13489 C.M.S., adopted by the City Council on May 15, 2018, adds Chapter 9.64 to the Oakland Municipal Code (OMC) covering policy areas related to surveillance technology; and

**WHEREAS**, OMC 9.64.030.1.C requires City Council approval for new and existing surveillance technology. Additionally, OMC Section 9.64.020.1 requires that, "Prior to seeking City Council approval for existing city surveillance technology under Section 9.64.030 city staff shall submit a surveillance impact report and surveillance use policy to the Privacy Advisory Commission (PAC) for its review at a regularly noticed meeting. The surveillance impact report and surveillance use policy must address the specific subject matter specified for such reports as defined under 9.64.010,"; and

**WHEREAS**, OPD staff presented a draft GLD Use Policy and Surveillance Impact Report to the PAC at their August 1, 2019 meeting; the policy covers several relevant areas required by OPD as well as the Surveillance Ordinance, including the following area:

- Technology Description;
- Authorized Use;
- Use Restrictions;
- Data Access, Data Collection and Retention, and Security;
- Monitoring and Reporting; and
- System Training; and

**WHEREAS**, the Surveillance Impact Report covers the following areas as required by the Surveillance Ordinance:

- Information describing the system and how it works;
- Purpose of the technology;

- Locations where, and Situations in which the technology may be used (along with area crime data);
- Privacy Impact of the technology;
- Mitigations to prevent privacy impacts;
- Data Types and Sources;
- Data Security;
- Costs;
- Third Party Dependence;
- Alternatives Considered; and
- Track Record of Other Entities; and

**WHEREAS**, through robust discussion and collaboration, OPD has developed substantial privacy mitigations outlined in the report accompanying this resolution; and

**WHEREAS**, OPD staff again presented a revised GLD Use Policy and Surveillance Impact Report to the PAC on October 3, 2019, and at this meeting, after another robust discussion between PAC commissioners and OPD staff, the PAC voted unanimously to recommend that the City Council approve OPD's GLD System Use Policy and GLD Surveillance Impact Report, with agreed upon changes to releasing to Sharing GLD System Data and Monitoring and Reporting procedures; therefore be it

**RESOLVED**: that City Council does hereby approve the OPD Gunshot Location Detection System Use Policy and Surveillance Impact Report for the Gunshot Location Detection System; and be it

**FURTHER RESOLVED:** That the MOU authorized by this resolution shall be approved as to form and legality before execution, and a copy of the fully executed agreement shall be placed on file with the Office of the City Clerk.

IN COUNCIL, OAKLAND, CALIFORNIA, \_\_\_\_\_

PASSED BY THE FOLLOWING VOTE:

AYES - FORTUNATO BAS, GALLO, GIBSON MCELHANEY, KALB, REID, TAYLOR, THAO AND PRESIDENT KAPLAN

NOES -

ABSENT -

ABSTENTION -

ATTEST: \_\_\_\_\_

LATONDA SIMMONS  
City Clerk and Clerk of the Council  
of the City of Oakland, California