



# Surveillance Impact Report

San Francisco International Airport  
Gunshot Detection Solution

---

As required by San Francisco Administrative Code Chapter 19B, departments must submit a Surveillance Impact Report for each surveillance technology to the Committee on Information Technology ("COIT") and the Board of Supervisors.

This Surveillance Impact Report details the benefits, costs, and potential impacts associated with the Airport's use of a gunshot detection solution (from AmberBox, Inc.) integrated with the Department's Closed Circuit Security Camera System .

## DESCRIPTION OF THE TECHNOLOGY

The Airport's mission is to provide an exceptional airport in service to our communities. In line with its mission, the Airport will use a gunshot detection system in the terminals and employee buildings throughout the Airport. The system will enable the San Francisco Police Department – Airport Bureau (SFPD-AB), the Airport Communication Center and Security Operations Center (SOC) to be aware of gunshots, aggressive voices, glass breaking, and unusual disturbances in the buildings on the Airport campus. The system will notify the respective department of verified gunshot events, which allows SFPD-AB to quickly respond to gunshots, aggression, glass breaking and incidents involving unusual disturbances.

It shall be the policy of the Airport to properly utilize the gunshot detection system to enhance law enforcement's ability to respond to and investigate incidents involving gunfire, aggressive voices, glass breaking, and unusual disturbances. The location information provided by the gunshot detection solution will expedite police and ambulance response to incidents involving gunfire, aggressive voices, glass breaking, and unusual disturbances which will accelerate the identification of the location of victims, witnesses and suspects.

In line with its mission, the Airport shall implement the gunshot detection system, only for the following authorized purposes:

*Authorized Use(s):*

1. Detect the sound of gun shots, aggressive voices, glass breaking, and unusual disturbances (based upon decibel level) and use of device sensors to locate the origin of the sounds.
2. Trigger the Airport's security camera system to display the video and images of the specific geographic location where the sounds are occurring.
3. Review of video recordings triggered by the sound of a gunshot, aggressive voices, glass breaking, and unusual disturbance incidents.
4. Provide the date and time stamp, the type of gun used or sound detected and the geographical location (i.e., which sensor detected the sound) to law enforcement or other authorized persons in connection with the investigation of an incident, or to members of the

---

## Surveillance Oversight Review Dates

COIT Review: TBD

Board of Supervisors Review: TBD

public when the information is subject to disclosure pursuant to a Public Records Act request.

Prohibited use cases include any uses not stated in the Authorized Use Case section.

Further, processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, gender, gender identity, disability status, or an individual person's sex life or sexual orientation, and the processing of genetic data and/or biometric data for the purpose of uniquely identifying an individual person shall be prohibited.

Airport technology may be deployed in the following locations, based on Use Case:

The gunshot detection system will use existing Wi-Fi access points owned and deployed by the Airport.

As part of Phase I of this project to implement the gunshot detection solution, the Airport plans to conduct a Proof of Concept (POC) inside the Consolidated Airport Campus Building 674 (Commission Business office). If successful, Phase II (approximately two months effort) will include the deployment of the system throughout the Airport buildings, including the pre- and post-security at all terminals.

## **Technology Details**

The following is a product description:

AmberBox is a detection and response system designed to protect lives in an indoor active shooter incident, aggression, glass break, and unusual disturbances (based upon artificial intelligence employing machine learned decibel level). Specifically, the GDS listens for the ambient (normal) noise within the Airport terminals (i.e., passenger/worker and restaurant/bar decibel levels) and sets a baseline decibel level for the Terminals to eliminate false alarms by only detecting and notifying when the baseline decibel level is exceeded and detected by multiple device sensors.

By automating the emergency notification process, first responders arrive on scene faster, equipped with the vital information needed to contain threats and mitigate casualties. AmberBox provides for immediate and accurate response from internal security and law enforcement teams.

AmberBox offers the most advanced sensing system available, ensuring maximum protection from an active shooter threat, aggressive voices, glass breaking, and unusual disturbances. Specific sounds are detected through percussion and infrared sensors, that analyze the bi-nodal signature, especially those of a gunshot. Combined with AmberBox's sound learning algorithm, false alarm sources are virtually eradicated. All analysis is conducted at the sensor (detector), with no real-time audio transmitted or recorded, guaranteeing privacy.

How AmberBox works:

1. AmberBox utilizes a patented gunshot detection algorithm to provide immediate notifications and alerts to allow immediate response following a firearm discharge, aggressive voices, glass breaking, and unusual disturbances.
2. AmberBox detectors use acoustic and infrared data to determine the firearm signature instantly with a near-zero false alarm rate.
3. AmberBox detectors send an alert signal through a wireless MESH network to the building gateway.
4. An automatic call is made to 911 and to the Airport's 24/7 Security Operations Center (SOC) who connect via the CAD (Computer Aided Dispatch) System to share real-time incident information with first responders.
5. AmberBox can immediately activate building security systems, such as access control, and alert personnel with SMS, email, and other notification methods. Real-time shooter or suspect location and data tracking can be viewed through the web or mobile platform.

The system consists of a number of distinct elements:

- Gunshot Detectors
- Gateway – network devices that connect to the AmberBox Response Platform servers via a VPN and HTTPS connection.
- AmberBox Cloud Server

The detectors sense for the presence of a gunshot, aggressive voices, glass breaking, and unusual disturbances, conducting full analysis on the device (no real-time audio is sent back or recorded). In the event of an activation, the alert message is sent over the Airport's proprietary wireless mesh (potentially hopping over multiple detectors) back to the gateway. The gateway connects to the AmberBox Response Platform servers via a VPN and HTTPS connection. The AmberBox Response Platform servers are hosted by their cloud provider, Google Cloud.

## **SYSTEM INTEGRATION**

The Gunshot Detection System (GDS) is expected to integrate with the following Airport systems:

- Closed-Circuit Cameras/TV
- Mass Notification System

## **IMPACT ASSESSMENT**

The impact assessment addresses the conditions for surveillance technology approval, as outlined by the Standards of Approval in San Francisco Administrative Code, Section 19B:

1. The benefits of the surveillance technology outweigh the costs.
2. The Airport's Policy safeguards civil liberties and civil rights.
3. The uses and deployments of the surveillance technology are not based upon discriminatory or viewpoint-based factors and do not have a disparate impact on any community or Protected Class.

The Airport's use of the surveillance technology is intended to support and benefit the residents of San Francisco and the traveling public, while minimizing and mitigating all costs and potential civil rights and liberties impacts on members of the public.

#### A. Benefits

The Airport's use of the AmberBox solution with the Closed-Circuit Television (CCTV) has the following benefits for residents:

- Education
- Community Development

X	Health	Protect safety of staff, patrons, and facilities while promoting an open and welcoming environment.
---	--------	---

- Environment

X	Criminal Justice	SFPD-AB can be quickly alerted and respond, when needed, to the sound of gunshots, aggressive voices, glass shattering, or other high decibel level sound disturbances such as blasts, with improved geographic precision. In conjunction with the video images from the Airport's CCTV system, triggered by the detection of these sounds, which can be provided to law enforcement to assist in its investigation of an incident.
---	------------------	---

- Jobs
- Housing

- Other – Public Safety  
Improved protection of the public and city assets by leveraging remote condition assessment technology, which improves the overall situational awareness. The technology helps ensure the safety of the 49,000+ people who work at the Airport and the 58 million people who fly to and from SFO every year.

#### B. Civil Rights Impacts and Safeguards

The Airport has considered the potential impacts and has identified the technical, administrative, and physical protections as mitigating measures:

The Airport's use of the AmberBox solution with the CCTV is restricted to those identified Authorized Use Cases. The Airport retains CCTV footage for one year, consistent with state

law. Video files are only released if required by a public records act request, or to assist law enforcement or Airport personnel in connection with an investigation.

NOTE: Airport Rules & Regulations and policies restrict use of CCTV. Airport personnel who monitor CCTV must maintain a current Airport badge and be trained in the proper use of cameras and footage. Contractors that handle and access video footage are required to execute a Corporate and Individual NDA.

Data is housed in servers located in secured areas that are only accessible by approved and badged employees. Cloud access to data is administered by Airport badged employees with access to cloud services that enables continuous monitoring of the Airport account activity.

C. Fiscal Analysis of Costs and Benefits

The Airport’s use of the AmberBox solution with the surveillance cameras yields the following business and operations benefits:

<b>Benefit</b>	<b>Description</b>
X Financial Savings	The AmberBox solution with the Airport CCTV cameras saves on salary costs for additional Airport staff and additional SFPD-AB patrol officers.
X Time Savings	The gunshot detection solution’s automated notification removes the human element of notification which allows first responders to arrive more promptly to the scene to de-escalate any potentially violent situations. The integration with Airport CCTV cameras provides real-time feeds that run 24/7, thus eliminating lengthy physical surveillance of Airport facilities. Video shall be used to verify the accuracy of written reports regarding the incident.
X Staff Safety	The AmberBox solution integrated with the Security cameras provide an immediate view of an incident as it is occurring to better prepare those responding to the incident.
X Data Quality	The AmberBox solution integrated with the Security cameras run 24/7/365 which maximizes the Airport’s ability to capture video of incidents. The CCTV cameras data resolution can be set by level and is currently set to high resolution.

Number of FTE (new & existing)	\$579,168	
Classification	<i>1070, IS Project Director</i>	5%
	<i>1042, System Engineer - Journey</i>	25%
	<i>1043, System Engineer - Senior</i>	10%
	<i>1044, System Engineer - Principal</i>	25%

	1041, Network Engineer - Asst.	20%
	1042, Network Engineer - Journey	20%
	1043, Network Engineer - Senior	20%
	1044, Network Engineer - Principal	15%
	1044, Network Engineer - Principal	20%
	7308, Cable Splicer	20%
	7318, Electronic Maint Tech	100%
	7318, Electronic Maint Tech	15%
	<b>Annual Cost</b>	<b>One-Time Cost</b>
Software		Combined in the hardware cost
Hardware/Equipment		\$5,753,387
Professional Services	Verint Maint./Support \$213,333 BART CCTV VIDSYS Lic/Support \$24,177	Combined in the hardware cost
Training		
Other		
Total Cost	<b>\$816,678</b>	<b>\$5,753,387</b>

The Airport funds its use and maintenance of the surveillance technology through Airport Operating Funds, Capital Funds, and Federal Grants.

### **COMPARISON TO OTHER JURISDICTIONS**

Gunshot detection solutions are used by other governmental entities, including Airports, for similar purposes.

### **APPENDIX A: Mapped Crime Statistics**

The general location(s) it may be deployed and crime statistics for any location(s):

Gunshot detection solution sensors are deployed in ceilings and walls inside terminal buildings.