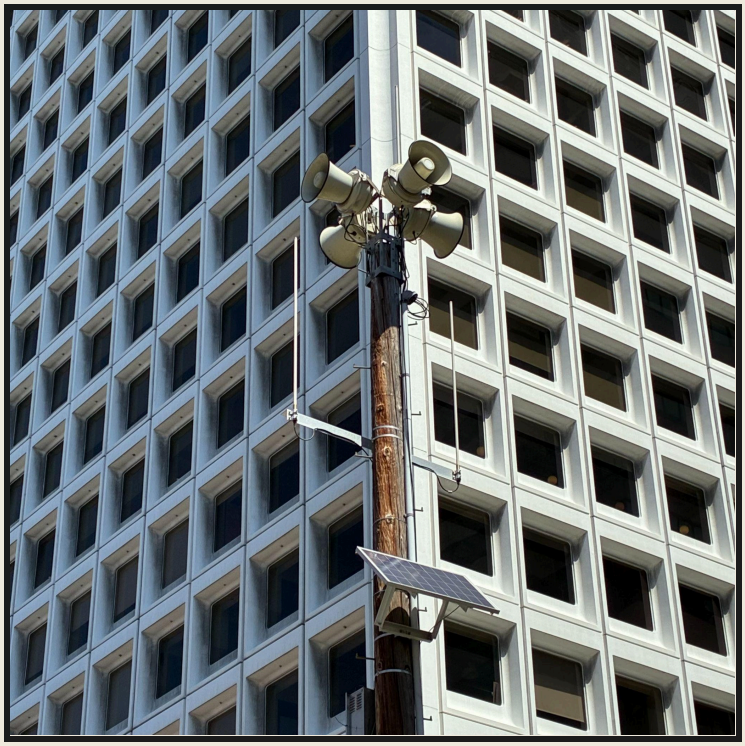

THE SOUNDS OF SILENCE

San Francisco's Outdoor Public Warning System and the Cost of Not Deciding

June 16, 2026
City and County of San Francisco
2025–2026 Civil Grand Jury

ABOUT THE SF CIVIL GRAND JURY

The San Francisco Civil Grand Jury (the "Jury") is a government oversight panel of nineteen San Francisco citizens who volunteer for one year. Each Jury determines which local government entities within San Francisco it will investigate. The Jury cannot investigate disputes between private parties, criminal activity, or activities outside its jurisdiction, which is the government of the City and County of San Francisco ("City") and any other local governments within San Francisco city limits.

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This report is issued by the Grand Jury with the exception of one juror who was recused because of a current or recent connection with an entity whose actions might be relevant to this report. This juror was excluded from all parts of the investigation, discussion, and deliberations related to this report, and from the writing and approval of the report.

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SUMMARY

> "It's time we stop! Hey, what's that sound?
> Everybody look what's going down."
>
> – Buffalo Springfield

San Francisco's outdoor warning sirens have been silent since December 2019. Six years later, no one has decided whether to bring them back. That non-decision has a cost, and the Department of Emergency Management is paying for it.

The Outdoor Public Warning System (hereafter OPWS or sirens) has been inoperable since December 2019. Should the system be restored? Since the OPWS was decommissioned, there have been a few initiatives to reactivate the system, but those initiatives have so far failed to achieve coordinated commitment from the Mayor's Office, the Board of Supervisors (BoS) and implementing departments, principally the Department of Emergency Management (DEM). Here the Civil Grand Jury reviews the history of the sirens, and their applicability to San Francisco's overall strategy to deliver urgent information to residents and visitors.

The siren system originated during World War II as an air-raid warning for a civilian population that was smaller, predominately English-speaking, and more likely to be outdoors. In addition, the number of daily visitors and commuters was smaller than in recent years. Today San Francisco has a different set of threats, serves a different population, and operates in a different built environment. Even when the modernized OPWS was operational from 2005 to 2019, it was activated only once for an actual emergency to warn of unsafe drinking water on Treasure Island.

The system has been offline since 2019 because of documented security vulnerabilities and aging hardware. Several installations have been removed because dilapidated hardware was in danger of falling and causing injury. Proposals to restore the system were formally solicited in 2020. A full restoration of the system at that time was estimated to cost about 20 million dollars, although there were opportunities to save money by limiting the extent of the restoration. While the Mayor and the Board of Supervisors have made requests and resolutions to

restore some or all of the OPWS, there has been no commitment of necessary resources to the project.

This ambivalence, in itself, is a problem that has consequences for emergency preparedness. DEM fields recurring media inquiries, responds to Board resolutions, and manages procurement processes for a system that remains unfunded. That effort competes directly with operational priorities that DEM's own leadership identifies as more urgent, including expanded Watch Center coverage, improved message quality, and growth of the City's digital alerting audience.

The Jury recommends that DEM formally advise the Mayor and Board of Supervisors on whether to restore or permanently retire the OPWS, so that elected leadership can make an informed policy decision along with a public commitment. The DEM should make available a clear, up-to-date explanation of San Francisco's emergency alerting strategy. Remnant siren hardware that presents a physical hazard should be removed, and one installation should be preserved as a public safety monument. DEM does difficult work with limited resources. Closing the siren question frees the department to focus its full attention on the systems and practices that directly protect residents and visitors every day.

BACKGROUND

The People and Hazards of San Francisco

San Francisco has approximately 828,000 residents, but the number of people in the city on any given day is considerably larger.[1] It is residents, commuters, and visitors, layered on top of one another and turning over constantly. More than 200,000 commuters arrive on a typical workday, and more than 23 million visitors pass through annually.[2][3] Recent examples of events drawing large numbers of visitors to the city include Super Bowl LX (2026), NBA All-Star Weekend (2025), APEC (2023), Dreamforce, Fleet Week, and Pride. Many of the people in the city at any given moment may not know its geography, its emergency systems, or the agencies responsible for public safety. An alert that works for a lifelong resident does not automatically work for the person standing next to them.

About 18% of San Francisco's residents do not speak English well.[4] The city's Language Access Ordinance designates threshold languages for which city agencies

must provide translation and interpretation: Chinese, Spanish, and Filipino, with Vietnamese newly added in 2026.[5] An emergency message in English, using local shorthand or referencing locally familiar landmarks, may be unintelligible to a substantial portion of residents and visitors.

The hazards the city faces are varied and can compound. Earthquake, tsunami, wildfire smoke, flooding, severe weather, infrastructure failure, and hazardous materials incidents are all present in the city's risk profile; a single event can trigger several simultaneously. An earthquake may produce a tsunami. A storm may cause flooding and power outages in the same hour. Among major global cities, few approach this level of complexity. Japan's national J-Alert system broadcasts emergency warnings in five languages for a comparable mix of risks.[6] Los Angeles shares the wildfire and multilingual dimensions. New York matches the density and visitor volume. What distinguishes San Francisco is the overlap of coastal, hillside, wildland, and urban-core risks across 47 square miles.

How the City Alerts the Public

Three terms recur throughout this report. An **alert** is a notification to be distributed. A **message** is the content of that notification: the words on a phone screen, or a television or radio broadcast. A **channel** is the delivery method: the technology that carries a message from sender to recipient's email, phone alerts or broadcast program interruptions.

THE WATCH CENTER

The Department of Emergency Management operates the Watch Center at 1011 Turk Street.[7] The Watch Center is the operations hub where decisions are made about when to alert the public, what to say, and which channels to use. It is the nerve center that dispatches alerts on appropriate channels and coordinates the city's emergency communications with other departments and agencies.

The Watch Center is staffed daily from 6:00 AM to 10:00 PM, with an on-call Duty Officer available overnight. Watch Center specialists monitor public safety conditions across the city and coordinate with police, fire, public health, transit, and other city departments. The Watch Center maintains protocols for 38 distinct incident types, from structure fires and hazardous materials releases to tsunami

warnings and citywide power outages. These protocols specify notification chains, agency contacts, and escalation sequences for each type.

The Watch Center communicates with the San Francisco Police Department (SFPD), the San Francisco Fire Department (SFFD), and other city agencies through dedicated radio infrastructure. In a catastrophic scenario where power fails, phone networks fail, and internet service drops, the Watch Center can still reach responders in the field via two-way radio. During a prolonged power outage, when cellular devices lose battery charge and digital alerts can no longer reach the public, the Watch Center's ability to coordinate field-based notification through police and fire services provides communications that do not depend on anyone having a charged phone. This capability provides resilience independent of the digital channels the public sees. Most residents are unaware it exists.

ALERTING CHANNELS

The city's alerting channels fall into three categories: broadcast systems that reach people without requiring any prior action, an opt-in system that requires registration, and supplemental channels that amplify or extend the reach of the first two.

Broadcast systems. Wireless Emergency Alerts (WEA) is the most powerful channel available to the city. WEA messages are sent to all compatible cell phones within a defined geographic area; no registration or opt-in is required. Messages can be geographically targeted to specific zones and are limited to 360 characters. WEA is reserved for imminent threats and is not built to carry sustained, detailed information across the duration of an extended incident. DEM sends WEAs through Federal Emergency Management Agency's Integrated Public Alert and Warning System (IPAWS) and adheres to FEMA guidance in addition to its own internal protocols.[8] Also available to DEM, the Emergency Alert System (EAS) interrupts television and radio broadcasts with emergency information and is reserved for the most severe events.

Opt-in system. AlertSF is the city's primary opt-in alerting system. Residents and visitors who register receive alerts via text message, email, or phone call, targeted by ZIP code. Because AlertSF requires registration, it can only reach people who have signed up. The implementation of AlertSF is the commercial software platform Everbridge Nixle, which is also DEM's connection to IPAWS for sending WEA alerts.

AlertSF is one of several notification systems operated by city agencies; residents may also receive alerts from SFMTA, BART, 311, and other services through separate platforms with different triggering criteria.

Supplemental channels. DEM's External Affairs team maintains social media accounts (including @SF_emergency on X and Instagram), posts to Nextdoor and Facebook, and publishes information on sf.gov/ReadySF. Social media platforms surface content to users based on past engagement patterns, which means emergency messages from official accounts may not appear prominently to users who have not previously followed or interacted with those accounts. Critical messages compete with other content for visibility, and misleading or inaccurate information can spread alongside official updates or outpace them entirely. DEM's own internal after action review of the December 2024 tsunami event documented that inaccurate information was shared across social media and from neighboring jurisdictions during the event.

In urgent situations, DEM coordinates with SFPD and SFFD to notify the public through emergency vehicles, loudspeakers, and door-to-door contact. In San Francisco emergency services terminology, Code 3 designates an emergency response that activates lights and sirens. SFFD deployed Code 3 during the December 2024 tsunami warning to supplement digital alerts in coastal zones. SFPD and SFFD do not have direct access to the AlertSF platform; they amplify alerts through their own agency channels and field operations.

Why Sirens Were Built

The OPWS was a broadcast system like WEA and EAS in that no advance action was required from the public. San Francisco's system was a network of 119 loudspeakers, typically mounted on utility poles and building rooftops, designed to produce an audible alert across a geographic area. When activated, selected installations produced a tone alert and, following a 2005 modernization funded by a federal Department of Homeland Security grant referenced below, spoken voice messages through public address capability.[9] [10]

Sirens are limited in the information they can convey. A tone cannot specify what the hazard is, where it applies, what to do, or how the hazard has been resolved. Voice-capable sirens can deliver spoken instructions, but only to people who are

outdoors, within audible range, able to hear the broadcast, and able to understand the spoken language message.

The first air-raid sirens were installed in San Francisco during World War II to warn the civilian population of incoming aerial attack.[11] The design was built around a single threat with a single protective action: hear the siren, take shelter.

The mechanical systems deteriorated over the following decades. In 2004, the City used a federal Department of Homeland Security grant to contract Acoustic Technology, Inc. (ATI) to design a digital replacement.[9][10] The new system, activated in 2005, combined electronic sirens with voice-capable public address, allowing spoken emergency instructions alongside the traditional tone alert.[9]

Today San Francisco faces threats beyond an incoming aerial attack. The city prepares for earthquakes, tsunamis, wildfires and wildfire smoke, hazardous material releases, infrastructure failures, extreme weather, and active threats. Each hazard requires different protective actions, affects different geographic areas, and lasts for different durations. There is no single universal instruction that applies to each hazard.

Since the siren system was first established, the population of San Francisco has changed. The city is now primarily indoor, multilingual, and host to a large daily commuter and visitor population that has no history with the siren system and no training in what the sound means or what response is necessary.

Academic research in alert communication confirms that tone-only sirens cannot convey a complete message indicating source, hazard, location, protective action, time frame, and closure. The research indicates that, at best, a siren prompts people to seek information from other sources. That information-seeking behavior, which researchers call "milling," is the delay between hearing an alert and taking protective action. Lacking the components of a complete message, sirens tend to increase milling.[12] Art Botterell, a former emergency management expert with FEMA and the California Office of Emergency Services (COES), has described sirens as “essentially a one-bit message” that gives no insight into what to do next.[13]

Even the voice-capable version of the OPWS depends on the listener being outdoors, being within audible range of a siren installation, being able to hear the broadcast, and understanding the language of the message. Advances in window

and insulation technology in recent decades have further reduced the ability of outdoor sound to penetrate modern buildings.[13] The population the system can effectively reach is narrowed in a city where most people are indoors during the day, where about 18% of residents do not speak English well, and where hundreds of thousands of daily visitors may not have familiarity with local warning signals.

When Sirens Were Operational

Before December 2019, every Tuesday at noon, the sirens sounded a 15-second test tone and message across the city.[14] Long-time residents grew fond of the weekly test. Some called it the "Taco Tuesday Alarm."[15] But familiarity with the test tone is not the same as preparedness. The weekly test may have caught San Franciscans attention without necessarily teaching them what to do in case an alert was real.

The only time the siren system was activated for an emergency alert took place on Treasure Island in 2012.[16][17] A water main break caused potential contamination of the drinking water supply. The sirens alerted residents to boil their water. The activation required voice instructions to explain the hazard and the protective action. The population required follow-up through other channels to confirm when the water was safe again to drink, which was information not available through the siren system.

The sirens were not activated during the 2011 tsunami triggered by the Tohoku earthquake off Japan. The sirens would not have been activated during the January 2022 tsunami warning even if the system had been operational.[15]

For tsunamis, the threat San Franciscans most commonly associate with the need for sirens, the warning window can range from minutes to hours depending on the earthquake source location. The December 2024 tsunami warning provided more than an hour of lead time before the estimated wave arrival.[18] During that time, DEM used WEA, AlertSF, social media, and mobile public address systems to reach the affected population.

A recent Board of Supervisors resolution specifically proposes restoring coastal sirens for tsunami evacuation zones.[18] The proposal is supported by the expectation that a siren message would be available to everyone without any pre-arrangement. Further support comes from the intuition that if sirens were once important in the

past, their absence now must be a deficiency. Operational coastal sirens would not obviate the need for additional messaging systems to provide specific instructions: which evacuation phase, which areas, what to do, and when it is safe to return. A siren tone cannot carry that information, and a spoken message is likely to be insufficient.

For earthquakes, the other hazard most commonly cited as a reason for sirens, the warning window is far shorter. The time between a local fault rupture and the arrival of shaking in San Francisco is measured in seconds.[19] That is not enough time to compose, authorize, and transmit a siren-based message. Earthquake early warning systems like ShakeAlert deliver automated alerts to mobile devices precisely because the speed requirement exceeds what any human-operated system can achieve.

ANALYSIS

Demise of the OPWS

The OPWS was shut down in December 2019 following a series of security events in San Francisco and elsewhere that demonstrated the vulnerability of outdoor warning siren systems to unauthorized or unintended activation.

- In 2014, several San Francisco sirens triggered unintentionally late at night because of device failure.[17]
- In 2017, a hacker used a basic radio transmission to activate all 156 of Dallas's outdoor warning sirens.[16]
- In 2018, security researchers at Bastille Networks demonstrated a method to mimic the OPWS activation signal, potentially allowing an attacker to commandeer San Francisco's sirens. The vulnerability was named "SirenJack."[20]

The security vulnerability was the immediate impetus for the shutdown. In addition, the physical infrastructure of the OPWS was also aging and in need of significant maintenance. The system's hardware had not been substantially updated since the 2005 modernization. In the six years since the shutdown, the hardware

has continued to sit on rooftops and utility poles across the city, exposed to weather and without active maintenance. Several siren installations have been removed in recent months to reduce the risk that a falling component might cause injury.

At the time of the shutdown, DEM Executive Director Mary Ellen Carroll described the action as temporary: "As we temporarily relieve the antiquated sirens from their watch for much needed upgrades, San Franciscans can be confident that the city will continue to provide timely alerts and warnings."[16] That was in December 2019. The system remains offline in spring 2026. Reactivation of the OPWS would require years for procurement and installation.

The Cost of Indecision

Deactivating the OPWS was necessary because of a demonstrated security vulnerability. There might have been a time when the system could be reactivated after mitigating the security issue. However, this mitigation was more complex than a software update, requiring physical replacement of devices at each siren location, plus the accumulated cost of deferred maintenance on outdoor infrastructure exposed to weather since 2005.

In 2019, DEM estimated that upgrading the system would cost $2 to $2.5 million.[13] [16] [17] By August 2023, the estimate had risen to approximately $3 million. A formal Request for Information process considered both a full restoration, and a limited implementation of sirens in the tsunami inundation zones of the city. After consideration of the proposals, DEM estimated in December 2024 that a full restoration would cost about $20.8 million and the limited implementation would cost about $8.5 million. Project time would be three to six years from the time funds were budgeted and available.

Three separate capital funding requests have been submitted for OPWS restoration. In January 2022, the Department of Technology submitted a $3 million request. In January 2023, DEM submitted a $2 million request based on preliminary cost estimates. In January 2024, DEM submitted a $7.5 million request for a partial 35-siren system (Capital Funding Database ID #1049). None were approved. The Capital Planning Committee denied the most recent request for both Fiscal Year 2025 and Fiscal Year 2026.[21]

In August 2023, Mayor London Breed and Board of Supervisors President Aaron Peskin jointly announced plans to "prioritize upgrading" and "fully restore" the OPWS.[22] The announcement followed renewed public attention to sirens after the August 2023 Maui wildfires. DEM Executive Director Carroll was quoted in support, "bringing back the outdoor public warning sirens adds an additional layer of redundancy to our overall alert and warning system in San Francisco." Mayor Breed stated: "Although we historically have had minimal need to use the sirens in San Francisco, we must be ready when the time comes." Board President Peskin stated, “I am delighted that we were able to collaborate and find funds to finally get the Warning System back up and running.” Those funds were never allocated.[22]

Board President Peskin sought to fast-track the project with a $5 million funding proposal. Mayor Breed did not include the funding in her budget.[13]

The restoration announced in August 2023 did not occur. In the 2024 budget cycle, during a period of citywide fiscal contraction, siren replacement funding was dropped.[21] DEM lost four filled management positions and eight vacant positions — including four dispatcher roles and two emergency services coordinator roles — in the same cycle. The administration that publicly committed to restoration did not secure the funding to carry it out.

In January 2026, Supervisor Alan Wong introduced Board of Supervisors Resolution #260142 urging funding and restoration of the OPWS, prioritizing coastal and tsunami evacuation zones.[18] The resolution exists in a context where prior administrations have not followed through on their own stated commitments to the siren system, and where clear public explanations have not been offered for why those commitments were not met.

Current Mayor Daniel Lurie has not indicated plans to fund the siren system. His proposed budget seeks to close an $800 million deficit with funding and staffing cuts. When asked about the sirens by the San Francisco Chronicle in 2025, his office redirected inquiries to DEM.[13]

The cumulative result is six years without a formal decision. One administration announced restoration and did not fund it. A Board member has introduced a resolution urging restoration. DEM leadership has publicly supported restoration while simultaneously identifying other operational priorities as more urgent. No

institutional actor has stated definitively and publicly that the system is being restored, or that it is not.

The cost of this extended indecision is consequential. DEM operates under resource constraints. Expanding the Watch Center to 24/7 staffed operations is the department's top recommendation for improving emergency infrastructure, and the department reports that it is a prerequisite before adding more alerting tools. Every recurring media cycle about sirens, every Board resolution urging siren restoration, and every procurement process related to a system that remains unfunded draws staff time, leadership attention, and political energy away from these priorities. Meanwhile the financial cost of reviving the system has grown over time.

DEM is not neglecting its responsibilities. A department already stretched thin is being asked to carry a question that elected leadership has not resolved, and the weight of that unresolved question falls on the people doing the operational work.

What Does the Public Know About OPWS?

The August 2023 press release from Mayor Breed announcing OPWS restoration remains live on sf.gov.[22] There is no update, correction, or addendum indicating that the restoration was not funded and did not occur. No public-facing document exists, on any City website or in any official publication, that clearly states the current status of the OPWS or explains what the City provides instead.

Local media coverage questions the prudence of not restoring the sirens when disasters are reported elsewhere. Coverage following the Maui fires (2023), Texas flooding (2025), and Los Angeles fires (2025) generated renewed public attention to San Francisco's silent sirens.[13][17][23] This reporting often frames the absence of sirens as a failure or a gap rather than a considered operational position, because no considered operational position has been articulated.

The 2026 Wong Resolution (BOS File #260142) proposes a specific answer to the siren question: fund and restore the system, starting with coastal zones.[18] No operational assessment of whether sirens should be an investment priority has been shared with the public or with the Board of Supervisors. Restoring sirens

would not reduce the City's need for WEA, AlertSF, social media, and Watch Center operations.

FINDINGS AND RECOMMENDATIONS

FINDINGS

F1: The OPWS was originally designed for an aerial attack that is not a threat to San Francisco today.

F2: Each type of emergency facing San Francisco, including earthquakes, tsunamis and extreme weather, requires its own emergency instructions, affects different areas of the city, and has different durations.

F3: The OPWS was not designed for San Francisco's current population, which is larger, multilingual, often indoors, and includes a substantial visitor population with little siren training or familiarity.

F4: A modernized version of the OPWS would still depend on listeners being outdoors, in range, and able to hear and understand the language of the broadcast.

F5: Sirens cannot deliver the information people need to take protective action during an emergency.

F6: Any siren-based approach to emergency warnings still requires San Francisco to maintain and use its existing digital messaging systems for emergencies including WEA, AlertSF, and social media.

F7: Restoring OPWS would add a layer of infrastructure and operational complexity to emergency warnings without providing the specific, actionable instructions that discourage milling behavior.

F8: The siren system has been inoperable since 2019 due to security vulnerabilities and deteriorating physical infrastructure without a firm commitment of resources for its restoration.

F9: The status quo, in which OPWS is inoperable and no institutional actor has committed to either restoring or retiring the OPWS, produces ongoing cost without progress to restore OPWS or to confirm its retirement.

F10: The unresolved question of whether to restore or retire the OPWS consumes DEM capacity, including staff time and leadership attention, that could be spent improving the city's emergency warning systems.

F11: The public has not been given a clear explanation of OPWS's historical importance or its current status, and the public information that does exist is outdated and contradictory.

F12: The absence of a clear explanation of OPWS's status has negative implications, including negative media coverage, and public uncertainty.

RECOMMENDATIONS

R1: By **1 July 2027**, the Department of Emergency Management should formally advise the Mayor and the Board of Supervisors whether to restore or permanently retire the OPWS.

R2: By **1 January 2028**, the Department of Public Works, in coordination with property owners where applicable, should remove or secure remnant siren hardware identified as a physical safety hazard.

R3: By **1 January 2028**, the DEM should preserve one siren installation, restored and distinctively marked, as a permanent public safety monument with interpretive signage. The signage should explain the history of the siren system, its World War II origins, its role in San Francisco's public safety infrastructure, and the City's evolution toward modern emergency alerting. The monument should be visibly distinct, consistent with San Francisco's tradition of commemorative infrastructure such as the gold fire hydrant at Church and 20th Streets.[26]

R4: By **1 April 2027**, the DEM should make available to the public a clear explanation of the City's emergency alerting strategy: what channels exist, how the public can access them, and the rationale for the City's approach. DEM should also correct or remove public-facing content that inaccurately describes the siren system. This explanation should be written for a general audience, available in the City's threshold languages, and maintained as a living resource. It should be accessible to anyone searching for "San Francisco emergency sirens" or "San Francisco emergency alerts."

REQUIRED AND INVITED RESPONSES

The following responses are required pursuant to California Penal Code Sections 933 and 933.05.

Required Respondent	Findings	Recommendations
Mayor of San Francisco	F6, F7, F9–F12	R1, R2, R4
Board of Supervisors	F6, F7, F9–F12	R1, R2

Invited Respondent	Findings	Recommendations
SF Department of Emergency Management	F1–F12	R1, R2, R3, R4
SF Department of Public Works	F8, F9	R2

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25 Siren Cover image (Title): 2025–2026 San Francisco Civil Grand Jury.

26 Gold fire hydrant at Church and 20th Streets image (Recommendations). Wikimedia Commons, licensed under Creative Commons Attribution-Share Alike 4.0.

27 Bat Phone image (Glossary): 2025–2026 San Francisco Civil Grand Jury.

METHODOLOGY

The Jury investigated San Francisco's public alert and warning systems from October 2025 through April 2026. In conducting this investigation, the Jury:

- Interviewed individuals in the San Francisco government whose work touches on the city's public alert and warning systems. Also consulted an academic researcher who has worked on emergency warning communication, and a practitioner with operational expertise in public safety information systems.
- Reviewed DEM operational documents, including Watch Center protocols covering 38 incident types, a post-incident after action report, and correspondence regarding the Outdoor Public Warning System and regional coordination. Also reviewed Board of Supervisors resolutions, vendor documentation, federal IPAWS guidance, Congressional testimony, and media reporting from local and national outlets.
- Reviewed published academic research on emergency warning communication, including longitudinal studies of Wireless Emergency Alert content, experimental research on message completeness, and post-alert communication. This research informed the analytical framework applied in the investigation and provided a national baseline for comparison.
- Conducted a systematic review of every emergency message publicly accessible through the AlertSF events page on the Everbridge platform at the time of review, scoring each against a five-element completeness framework derived from the Warning Response Model. The complete scoring criteria, per-message results, and underlying dataset are published at AlertSF.Health for independent verification.

- Used commercially available AI tools to assist with locating publicly available documents, reviewing published academic literature, and analyzing publicly accessible AlertSF message data. All findings, scoring judgments, and recommendations reflect the Jury's own assessment.

The Jury was not able to review every internal document DEM maintains; additional standards or training materials may exist beyond what was provided. The message analysis covers what was publicly displayed on the Everbridge events page during the evaluation period and may not capture every message sent through the system.

GLOSSARY

311 — San Francisco's non-emergency customer service line for city information and service requests.

Access and functional needs — People who need specific accommodations during an emergency: those with disabilities, limited mobility, medical equipment dependence, cognitive or sensory impairments, or language barriers.

AlertSF — The city's opt-in emergency alerting system, run by DEM on the Everbridge platform. Subscribers get notifications by text, email, or phone call, targeted by ZIP code. To sign up, text your ZIP code to 888-777 or visit alertsf.org.

All-clear — The follow-up communication that tells people the danger has passed and they can stop sheltering, evacuating, or avoiding an area. This report uses "closure" for the broader concept; "all-clear" is what most people would call it.

BART — Bay Area Rapid Transit. Regional rail system serving San Francisco and the East and South Bay. BART operates its own notification system separate from AlertSF.

Bat Phone — A private wired telephone exchange that enables communications among the emergency command center and select department offices.[27]

CAP — Common Alerting Protocol. The data format that lets a single alert flow through IPAWS to WEA, EAS, and other channels at once.

Cell broadcast — How WEAs actually get to your phone. Unlike a text message, a cell broadcast goes to every compatible device in a geographic area simultaneously — no phone number, no registration. This is why your phone can scream at you even though you never signed up for anything.

Code 3 — Standard San Francisco emergency services terminology for an emergency response with lights and sirens activated. SFFD used Code 3 as a field notification method during the December 2024 tsunami, driving through coastal neighborhoods with lights and sirens to supplement digital alerts.

DEM — San Francisco Department of Emergency Management.

DPW — San Francisco Department of Public Works. Responsible for maintenance and removal of physical infrastructure including remnant siren hardware.

Duty Officer — The DEM staff member on call overnight (10 PM to 6 AM) when the Watch Center is closed.

EAS — Emergency Alert System. Interrupts TV and radio with emergency information. Reserved for the most severe events.

Everbridge — Commercial mass notification platform on which AlertSF runs. Acquired Nixle, the community notification system many agencies previously used. The public-facing AlertSF events page is hosted on Everbridge.

FEMA — Federal Emergency Management Agency. Runs IPAWS.

IPAWS — Integrated Public Alert and Warning System. FEMA's federal platform for distributing alerts — the pipeline that connects local agencies like DEM to channels like WEA and EAS.

Milling — The gap between getting a warning and actually doing something about it. People mill when a message doesn't give them enough information — they call 911, check X (formerly Twitter), text friends, or look out the window. Complete messages shorten this delay. Incomplete messages make it worse.

NWS — National Weather Service. Issues weather alerts and warnings. When an AlertSF message says "The National Weather Service has issued a Flash Flood Warning," the NWS is the originating authority.

OPWS — Outdoor Public Warning System. San Francisco's siren network — the Tuesday noon test that ran for decades. Taken offline December 2019 over cybersecurity vulnerabilities. Still offline.

Opt-in / Opt-out — Opt-in means you signed up (AlertSF). If you don't register, you don't get the messages. Opt-out means you receive messages by default (WEA). You can disable some WEA categories in your phone settings, but not all of them.

SFFD — San Francisco Fire Department.

SFMTA — San Francisco Municipal Transportation Agency; operates Muni.

SFPD — San Francisco Police Department.

SFPUC — San Francisco Public Utilities Commission. Responsible for the city's water, power and sewer.

ShakeAlert — The USGS earthquake early warning system that delivers automated alerts to mobile devices when shaking is detected. The speed requirement for earthquake alerts exceeds what any human-operated system can achieve; ShakeAlert is referenced in the context of sirens' inability to serve this function.

Threshold languages — Languages in which San Francisco's Language Access Ordinance requires city agencies to offer services. Currently five: English, Chinese, Spanish, Filipino, Vietnamese.

UASI — Urban Areas Security Initiative. Federal grant program for regional emergency preparedness; DEM coordinates with other Bay Area jurisdictions through UASI.

Warning Response Model — Five things a warning message should contain: who's sending it (source), what the danger is (hazard), where it applies (location), what to do (guidance), and how long (time). The framework goes back to Mileti and Sorensen in 1990, and has since been validated across earthquakes, tsunamis, tornadoes, wildfires, and other hazards.

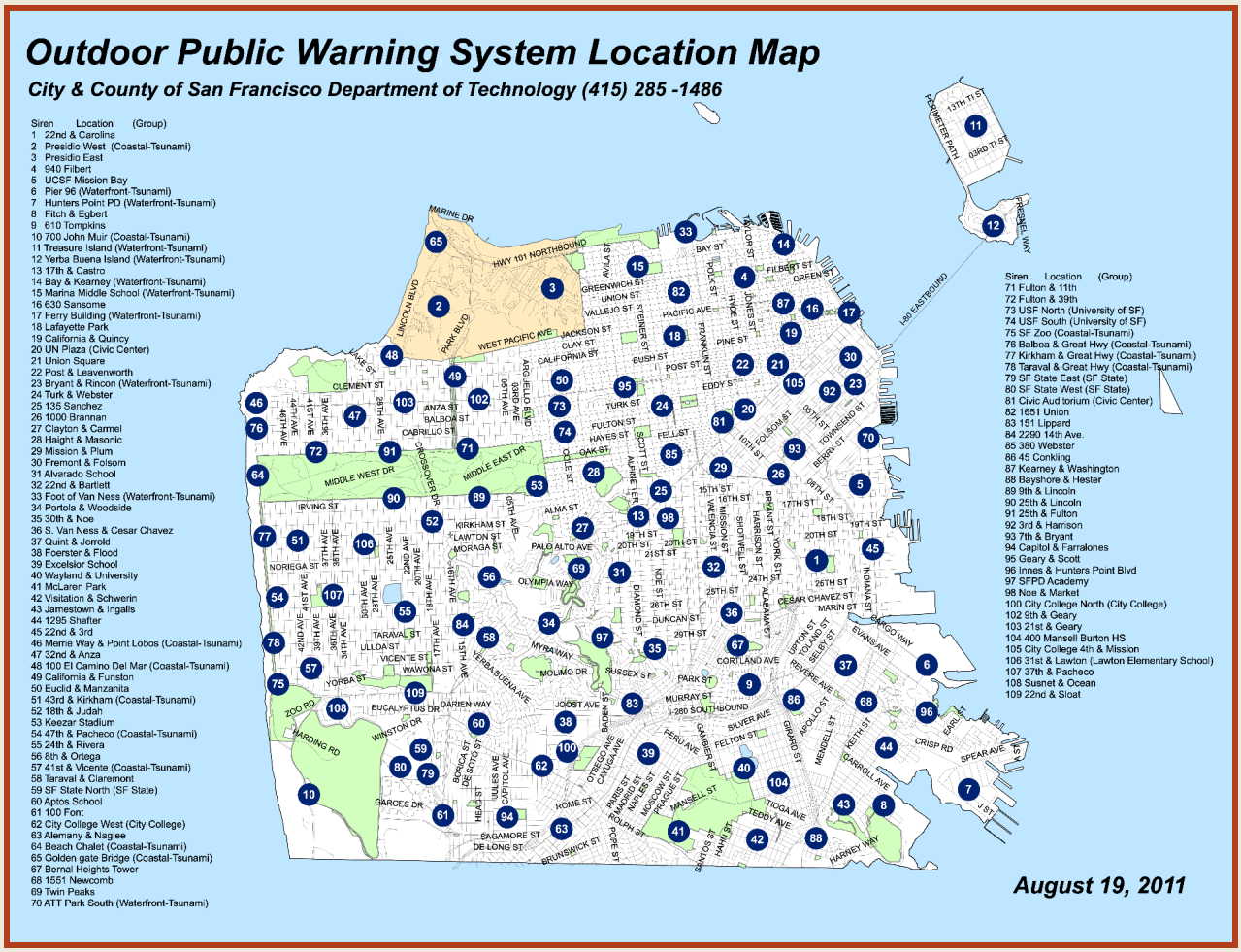
Watch Center — DEM's nerve center at 1011 Turk Street. Staffed 6 AM to 10 PM, seven days a week. Monitors conditions, coordinates with SFFD, SFMTA, SFPD, and the city's Department of Public Health, and decides when and how to alert the public. Overnight, a Duty Officer covers from home.

WEA — Wireless Emergency Alert. Short messages pushed directly to cell phones in a defined geographic area — no signup needed. Limited to 360 characters.

APPENDICES

Appendix 1: Map of Siren Locations

Figure: SF DEM map of Outdoor Public Warning System siren locations (Oct. 2011). The system was taken offline in December 2019 and remains inactive.[24]



Appendix 2: Timeline of Siren-Related Announcements

1942 The first 50 outdoor air-raid sirens installed in San Francisco during World War II to warn civilians of aerial attack.[11]

2005 Modernized Outdoor Public Warning System activated. Designed by Acoustic Technology, Inc. (ATI) under a federal Department of Homeland Security grant. 119 electronic sirens with voice-capable public address.[9] [10]

2012 The only emergency activation of the OPWS in its operational history: Treasure Island water main break. Sirens alerted residents to boil their water. Voice instructions and follow-up messaging through other channels were required.[16] [17]

2018 Security researchers at Bastille Networks publicly disclosed "SirenJack," a vulnerability in the ATI radio protocol that could allow unauthorized remote activation of San Francisco's OPWS.[20]

2019 DEM took the OPWS offline for security upgrades. Estimated cost $2 to $2.5 million; estimated timeline two years.[13] [16] [17]

2023 Mayor London Breed and Board of Supervisors President Aaron Peskin jointly announced plans to fully restore the OPWS, following the Maui wildfires. The announced funding was not allocated.[22]

2024 Tsunami warning from a magnitude 7.0 earthquake off Humboldt County. OPWS remained offline. DEM used digital channels and mobile public address to reach the affected population. DEM revised restoration estimate: $20.8 million full system; three to six years from the time funds are budgeted.[18]

2026 Supervisor Alan Wong's Resolution #260142 urging OPWS restoration adopted by the Board. Became effective without Mayor Lurie's signature pursuant to Charter §3.103. Mayor's office redirects siren inquiries to DEM.[13] [18]