



Surveillance Impact Report

Drones
Department of Public Works

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

The Surveillance Impact Report details the benefits, costs, and potential impacts associated with the Department's use of Drones.

DESCRIPTION OF THE TECHNOLOGY

The Department's mission is to enhance the quality of life in San Francisco as responsible stewards of the public's physical assets by providing outstanding service in partnership with the community. We design, build, manage, maintain, green, protect and improve the City's public spaces (infrastructure, public right of way and facilities) with skill, pride, innovation and responsiveness.

In line with its mission, the Department of Public Works shall use Drones only for the following authorized purposes:

1. *Disaster Preparedness and Response*: In times of disaster preparedness or post-disaster mitigation, drones will provide critical emergency response functions such as logistical support for emergency routing, life safety, and cleanup efforts, not only assisting in protecting physical assets and public spaces but human life as well;
2. *Environmental Monitoring and Documentation*: Drones will support the maintenance efforts of City-owned street trees pursuant to our mission of greening and improving City public spaces;
3. *Inspect/Survey Properties & Assets*: Drones will support the objective of maintaining city owned properties and landscapes by safely providing detailed photographic data and documentation to assist in the planning of corrective or new construction work by roofers, engineers, [architects](#), electricians, PMs, CMs and other personnel.
4. *Project Inspection and Documentation*: [Drones will support the maintenance efforts of City-owned structures by identifying potential maintenance issues at locations unsafe for inspection staff.](#)
5. *Survey/mapping Data Collection*: [Public Asset management for all topographic mapping projects, provision of base imagery for topographic data collection, creation of supplemental Digital Elevation Models, support of field work, review of as-built plans, and inspection of inaccessible or hazardous locations.](#)

The following use cases are expressly prohibited.

1. Use of drone technology to intentionally capture images of a personal nature

Surveillance Oversight Review Dates

COIT Review: TBD

Board of Supervisors Review: TBD

Department technology is located in the following areas:

- For city trees data collection: neighborhoods, parks, and other areas within San Francisco where City-owned street trees are located.
- For property/asset/building/-data collection: City owned land, hilltops and seawalls, Islais Creek & Lefty O'Doul bridges, [infrastructure such as retaining walls, stairs, bridges and other City owned or maintained infrastructure](#), rooftops of City properties where solar panels or other equipment such as HVAC are located, or exterior walls of buildings, including schools, Police and Fire stations, public libraries, and other City owned buildings and facilities.
- For Public Works project education/marketing/promotions: various locations involving Public Works right-of-way or facility construction or repairs
- For surveying/mapping activity: survey site locations along streetscapes, landscape areas, steep hillsides and cliffs, at bridges and fixed structures such as piers, etc.

During disaster/emergency response operations: disaster areas, emergency evacuation routes, and other areas within San Francisco requiring Public Works safety response operations.

Technology Details

The following is a product description of Drones:

Intel Falcon 8+ is designed to provide consistent, stable flights with weak GPS signals, high winds as well as resistance to magnetic field. Falcon 8+ drone can provide detailed data for orthography and 3D reconstruction, with millimeter accuracy for ground sample distance. Unique, patented "V-shaped design enables a greater than 180-degree view from top to bottom. Falcon 8+ system can be configured as a closed system with isolated, on-board data storage that does not transmit data over the public internet.

[The Leica Aibot AX20 is built on a DJI UAV platform which can accommodate various sensor payloads for surveying, mapping and construction aerial data capture solutions.](#)

[DJI Mavic 2 Enterprise Dual is an aerial survey drone that combines navigation and positioning with a high-performance imaging system for use during surveying, mapping or inspection operations.](#)

A. How It Works

To function, Drone technology incorporates unmanned, remotely-operated aircraft with onboard visual recording equipment, for the purpose of capturing images from an aerial perspective.

Data collected or processed by the Department of Public Works will not be handled or stored by an outside provider or third-party vendor on an ongoing basis. The Department will remain the sole Custodian of Record.

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 Department'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 Department's use of the surveillance technology is intended to support and benefit the residents of San Francisco while minimizing and mitigating all costs and potential civil rights and liberties impacts of residents.

A. Benefits

The Department's use of Drones has the following benefits for the residents of the City and County of San Francisco:

Education: Drone imagery to promote Public Works projects and demonstrate use of tax dollars on projects.

Environment: Drone imagery to collect data on street-trees for maintenance and safety reasons.

Public Safety: To inspect tree canopies for damaged limbs (fall risks), to perform safety inspections at locations or structures that are difficult/unsafe to access, to provide support when determining safety routes during emergencies, to collect data and information during emergencies (particularly in the event of loss of cellular communications) and during post-disaster cleanup operations

B. Civil Rights Impacts and Safeguards

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

Administrative Safeguards: Policies & procedures, such as documentation processes, roles and responsibilities, training requirements, data maintenance policies, and more.

Departmental policy stipulates that drone operators/pilots are not authorized to intentionally capture data that can identify individuals ("PII") such as facial images. Auto license plate information shall also not be deliberately captured.

Technical Safeguards: Technical measures (i.e. encryption, pseudonymization, etc.) to properly secure data and systems from unauthorized access, whether at rest or in transit.

Policy requires PII will be blurred during post processing using Adobe After Effects or other similar editing software, and only processed data will be stored.

Physical Safeguards: Measures to ensure data and data systems are physically protected, such as security systems, video surveillance, door and window locks, secured server and computer locations, and policies about mobile devices and removing hardware/software from certain locations.

Processed data will be maintained on secure, department-owned servers.

C. Fiscal Analysis of Costs and Benefits

The Department’s use of Drones yields the following business and operations benefits:

Financial savings: Drones can be far more time efficient and cost effective when conducting asset inspections, by mitigating the need for traffic control, expensive scaffolding/swing stage or other equipment, and can provide more detailed photographs/videos of the assets or areas in need of maintenance or repairs than can be done manually, minimizing labor costs.

Time savings: Deploying a drone can provide time savings over setting up and employing equipment such as scaffolds/swing stages/scissor-lift vehicles, etc.

Staff safety: Drones can be deployed to dangerous locations instead of personnel, such as rooftops, at the sides of building/bridges, along cliff areas or areas prone to erosion.

Improved data quality: Some locations which are difficult to access by personnel may be more easily photographed using drone technology, thereby achieving better data.

The total fiscal cost, including initial purchase, personnel and other ongoing costs is

Number of FTE (new & existing)	Estimate 4 existing employees: Mapping staff: 10 hrs/wk Structural Section staff: 2 hrs/wk Yard staff: 3 hrs/wk <u>Architectural staff: 4 hrs/wk</u>
Classification	Surveyors (5310-14) Engineers (5201-18) Stationary Engineers (7333-35) & BUF Inspectors (3435) <u>Architectural Administrator (5120)</u> <u>Architects (5260-74).</u>
Total Salary & Fringe	<u>76</u> hrs x 12 months x \$160 /hr = \$ <u>145,920</u> /yr
Software (editing)	\$15,000/yr
Hardware/Equipment	Purchase one drone: \$35,000/yr
Professional Services	Lease one drone: \$30,000/yr;
Training	Pilot training: \$5,000/yr;

Other	
Total Cost [Auto-calculate]	\$ <u>230,920</u> per year

The Department funds its use and maintenance of the surveillance technology through:

Personnel: Staff time devoted to use of drone for Inter-departmental work such as inspecting another agency's building can be charged to that agency as a line item cost. Time used to inspect Public Works assets will be charged as any other labor costs, to overhead or General Fund.

Equipment: Funding to pay for cost of equipment purchase/lease and license for software to remove PII will be proposed through typical budget initiative process.

COMPARISON TO OTHER JURISDICTIONS

Drones are currently utilized by other governmental entities for similar purposes.

Some governmental entities use drones to gather intelligence during evolving public safety situations. Others use them to fly above fires to get better information on how to put said fires out. Still others have sent defibrillators to people having heart attacks.

APPENDIX A: Surveillance Impact Report Requirements

The following section shows all Surveillance Impact Report requirements in order as defined by the San Francisco Administrative Code, Section 19B.

<p>1. Information describing the Surveillance Technology and how it works, including product descriptions from manufacturers.</p>
<p>Drone technology incorporates unmanned, remotely-operated aircraft with onboard visual recording equipment, for the purpose of capturing images from an aerial perspective.</p> <p>Intel Falcon 8+ drone is designed to provide consistent, stable flights with weak GPS signals, high winds as well as resistance to magnetic field. Falcon 8+ drone can provide detailed data for orthography and 3D reconstruction, with millimeter accuracy for ground sample distance. Unique, patented "V-shaped design enables a greater than 180-degree view from top to bottom. Falcon 8+ system can be configured as a closed system with isolated, on-board data storage that does not transmit data over the public internet.</p> <p><u><i>The Leica Aibot AX20 is built on a DJI UAV platform which can accommodate various sensor payloads for surveying, mapping and construction aerial data capture solutions.</i></u></p> <p><u><i>DJI Mavic 2 Enterprise Dual is an aerial survey drone that combines navigation and positioning with a high-performance imaging system for use during surveying, mapping or inspection operations.</i></u></p>
<p>2. Information on the proposed purpose(s) for the Surveillance Technology.</p>
<p>Drone technology will support our mission through the following:</p> <ol style="list-style-type: none">1. In times of disaster preparedness or post-disaster mitigation, drones will provide critical emergency response functions such as logistical support for emergency routing, life safety, and cleanup efforts, not only assisting in protecting physical assets and public spaces but human life as well;2. Drones will support the maintenance efforts of City owned structures by identifying potential maintenance issues at locations that are currently unsafe for an inspection staff;3. Drones will support the objective of maintaining City owned properties and landscapes by safely providing detailed photographic data and documentation to assist in the planning of corrective or new construction work by roofers, engineers, <u>architects</u>, electricians, PMs, CMs and other personnel.4. Drones will support the maintenance efforts of City-owned structures by identifying potential maintenances issues at locations unsafe for inspection staff. <p>Drones are used for:</p> <ol style="list-style-type: none">a. Disaster preparedness and responseb. Environmental monitoring and documentationc. Inspect/survey properties & assetsd. Project inspection and documentation

e. Surveying/mapping data collection

Education: drone imagery to promote Public Works projects and demonstrate use of tax dollars on projects.

Environment: drone imagery to collect data on street-trees for maintenance and safety reasons.

Public Safety: to inspect tree canopies for damaged limbs (fall risks), to perform safety inspections at locations or structures that are difficult/unsafe to access, to provide support when determining safety routes during emergencies, to collect data and information during emergencies (particularly in the event of loss of cellular communications), and during post-disaster cleanup operations.

Financial savings: drones can be far more time efficient and cost effective when conducting asset inspections, by mitigating the need for traffic control, expensive scaffolding/swing stage or other equipment, and can provide more detailed photographs/videos of the assets or areas in need of maintenance or repairs than can be done manually, minimizing labor costs.

Time savings: deploying a drone can provide time savings over setting up and employing equipment such as scaffolds/swing stages/scissor-lift vehicles, etc.

Staff safety: drones can be deployed to dangerous locations instead of personnel, such as rooftops, at the sides of building/bridges, along cliff areas or areas prone to erosion.

Improved data quality: some locations which are difficult to access by personnel may be more easily photographed using drone technology, thereby achieving better data.

Cost of operations:

- a. Number of FTE (new & existing): 2-4 existing employees. Total expected staff hours (all): 76 hrs/mo
- b. Classification: Surveyors (5310-14), Engineers (5201-18), Stationary Engineers (7333-35) & BUF Inspectors (3435), Architectural Administrator (5120) & Architects (5260-74)
- c. Total Salary & Fringe: 76 hrs x 12 months x \$160/hr: **\$145,920 / yr**
- d. Software (editing): **\$15,000/yr**
- e. Hardware/Equipment: Purchase one drone: **\$35,000/yr**
- f. Professional Services: Lease one drone: **\$30,000/yr**
- g. Training: Pilot training: **\$5,000/yr**
- h. Total Cost: **\$230,920 per year**

3. If applicable, the general location(s) it may be deployed and crime statistics for any location(s).

For inspection of city trees: Neighborhoods, parks, and other areas within San Francisco where City-owned street trees are located.

For inspection of properties , assets, and buildings: roadway structures, including bridges and tunnels, rooftops of City properties where solar panels or other equipment such as HVAC

<p>are located, or exterior walls of buildings, including schools, City-owned buildings such as police and fire stations, public libraries, and bus maintenance facilities, and inspection of other City owned land or sites with limited access, such as, cliffs, hillsides, and seawalls.</p> <p>For Public Works project education/marketing/promotions: various locations involving Public Works right-of-way or facility construction or repairs</p> <p>For surveying/mapping activity: survey site locations along streetscapes, landscape areas, steep hillsides and cliffs, at bridges and fixed structures such as piers, etc.</p> <p>During disaster/emergency response operations: Roadway structures, emergency evacuation routes, buildings, and other areas within San Francisco requiring Public Works safety response operations.</p>
<p>4. An assessment identifying any potential impact on civil liberties and civil rights and discussing any plans to safeguard the rights of the public.</p>
<p>Personnel: Staff time devoted to use of drone for Inter-departmental work such as inspecting another agency’s building can be charged to that agency as a line item cost. Time used to inspect Public Works assets will be charged as any other labor costs, to overhead or General Fund.</p> <p>Equipment: Funding to pay for cost of equipment purchase/lease and license for software to remove PII will be proposed through typical budget initiative process.</p>
<p>5. The fiscal costs for the Surveillance Technology, including initial purchase, personnel and other ongoing costs, and any current or potential sources of funding.</p>
<p>Personnel: Staff time devoted to use of drone for Inter-departmental work such as inspecting another agency’s building can be charged to that agency as a line item cost. Time used to inspect Public Works assets will be charged as any other labor costs, to overhead or General Fund.</p> <p>Equipment: Funding to pay for cost of equipment purchase/lease and license for software to remove PII will be proposed through typical budget initiative process.</p>
<p>6. Whether use or maintenance of the technology will require data gathered by the technology to be handled or stored by a third-party vendor on an ongoing basis.</p>
<p>Typically, data shall only be handled and processed by Public Works personnel.</p>

APPENDIX B: Mapped Crime Statistics

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

For inspection of city trees: Neighborhoods, parks, and other areas within San Francisco where City-owned street trees are located.

For inspection of assets, buildings, and properties: City-owned roadway structures, including bridges and tunnels, rooftops of City properties where solar panels or other equipment such as HVAC are located, or exterior walls of buildings, including schools, City-owned buildings such as police and

fire stations, public libraries, and bus maintenance facilities, and inspection of other sites with limited access, such as, cliffs, hillsides, and seawalls.

For Public Works project education/marketing/promotions: various locations involving Public Works right-of-way or facility construction or repairs

For surveying/mapping activity: survey site locations along streetscapes, landscape areas, steep hillsides and cliffs, at bridges and fixed structures such as piers, etc.

During disaster/emergency response operations: Roadway structures, emergency evacuation routes, buildings, and other areas within San Francisco requiring Public Works safety response operations.