Surveillance Impact Report

Unmanned Aircraft Systems – All SDFD Types/Models
San Diego Fire-Rescue Department

DESCRIPTION

An Unmanned Aircraft Systems (UAS) is defined by Public Law 112-95, Section 331(8) as an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft. The Federal Aviation Administration (FAA) classifies all UAS that weigh under 55 lbs. as "Small UAS." All of the UAS used by the San Diego Fire-Rescue Department fall under this FAA classification of "Small UAS." Most UAS have a digital camera attached or designed as part of the aircraft.

A UAS is, in essence, a manually controlled video/photography camera that is attached to a small remote-controlled aircraft. The majority of the data collected by UAS is similar to a handheld "point-and-shoot" camera.

The San Diego Fire-Rescue Department currently uses or intends to use the following UAS makes and models:

DJI Phantom 4 Pro
FLIR SkyRanger R60
FLIR SkyRanger R70
FLIR Siras
Teal 2
Fotokite Sigma

All of SDFD's UAS have the below common features:

1. They all range from zero to 15 lbs. in weight, including all batteries and payload.
2. They all have a quad-copter design and use 4 electrically motorized propellors to provide lift.
3. They are all equipped with digital cameras capable of taking photographs and videos in the visual spectrum, and the majority of them have some zoom capability.
4. All models are commercially available aircraft used by civilians, law enforcement, and fire service agencies.

The following UAS have an additional camera sensor that can take photographs and video in the Forward Looking Infrared (FLIR) spectrum, commonly known as "thermal imagery":

FLIR SkyRanger R60
FLIR SkyRanger R70
FLIR Siras
Teal 2
Fotokite Sigma

MANUFACTURER'S PRODUCT DESCRIPTIONS:

1. **DJI Phantom 4 Pro**
    i. Manufacturer: DJI
    ii. Manufacturer Description: An uprated camera equipped with a 1-inch 20-megapixel sensor capable of shooting 4K/60fps video and Burst Mode stills at 14

fps. The adoption of titanium alloy and magnesium alloy construction increases the rigidity of the airframe and reduces weight, making the Phantom 4 Pro similar in weight to the Phantom 4. The Flight Autonomy system adds dual rear vision sensors and infrared sensing systems for a total of 5-direction obstacle sensing and 4-direction obstacle avoidance.

iii. (Description source: https://www.dji.com/phantom-4-pro)

2. **FLIR SkyRanger R60 (discontinued by manufacturer but still in use by SDFD)**
   i. Manufacturer: FLIR
   ii. Manufacturer Description: IP53 rated airframe and payloads ensure safe operations in inclement weather including snow and rain. With its industry-leading high wind tolerance, the R60 delivers stable operations in sustained 40 mph (65 kph) winds and gusts up to 55 mph (90 kph). Infrared and zoom imaging payloads deliver electro-optical and infrared imagery and video for versatility in day or night missions.
   iii. (Description source: https://flir.netx.net/file/asset/19042/original)

3. **FLIR SkyRanger R70**
   i. Manufacturer: FLIR
   ii. Manufacturer Description: The SkyRanger R70 is an adaptable and resilient sUAS platform, delivering a wide range of payload capabilities with the agility and single-operator deployment footprint of a proven small UAS. SkyRanger executes the most complex and demanding missions up to 15,000' MSL, in winds gusting to 90 kph (56mph), in rain and snow, and at temperatures from -20°C to 50°C (-4° F to +122° F). The EO/IR Mk-II delivers high fidelity daylight and thermal imagery in a weather-resistant, 3-axis stabilized gimbal. The HD40-XV EO payload's 33x optical zoom visible camera provides long distance ISR while providing sharp, clear, actionable imagery in support of the mission.
   iii. (Description source: https://flir.netx.net/file/asset/19050/original)

4. **FLIR Siras**
   i. Manufacturer: FLIR
   ii. Manufacturer Description: SIRAS is an affordable, easy-to-fly, IP54-rated professional drone with an interchangeable payload system for industrial and utilities inspection, firefighting, law enforcement, and search and rescue missions. With front collision avoidance, hot swappable batteries, a 31-minute flight time, and no restrictive geofencing, professional UAV pilots can fly safely when and where the mission demands. The quick-connect Vue® TV128 payload features patented MSX® technology, adding visible-light outlines to thermal imagery to provide critical information in real time. The 16MP visible camera delivers clear, pinpoint details with a 128x zoom. A 640x512-pixel, radiometric

FLIR Boson® provides sharp thermal imagery, 5x digital zoom, and accurate temperature-measurement. Designed for data security, SIRAS stores imagery on an onboard microSD card and does not include cloud connection capability. To further protect data chain of custody, pilots are not required to create an online profile, increasing ease of use and reducing potential unintended online data access.

iii. (Description source: https://www.flir.com/products/siras/)

5. **Teal 2**
   i. Manufacturer: Teal
   ii. Manufacturer Description: Teal 2 is an American-made sUAS developed under strict design guidelines that has earned it a Blue UAS Certification by the U.S. Department of Defense. The Teal 2's primary application is short-range reconnaissance missions. Combat soldiers, police officers, firefighters, wildlife managers, and industrial inspectors rely on the Teal 2 to achieve mission success. Integrated FLIR imaging lets you see what is hidden to the naked eye. Equipped with the FLIR Hadron 640R EO/IR payload, optimized for nighttime operations.
   iii. (Description source: https://tealdrones.com/solutions/aircraft/)

6. **Fotokite Sigma**

   i. Manufacturer: Fotokite
   ii. Manufacturer Description: The Fotokite Sigma. A Situational Awareness System for first responders. Focus on your mission. Drastically improve your team's situational awareness. The Fotokite Sigma allows you to gain an impressive, unobstructed overview of any incident in an instant. Live stream and document mission-critical aerial views with total operational freedom. The Fotokite Sigma consists of the Ground Station and Kite. A tablet or computer runs the Fotokite Live App which shows the real-time thermal and low-light video streams, giving teams actionable information throughout their mission safely and reliably; no piloting necessary.
   iii. (Description source: (https://fotokite.com/situational-awareness-system/)

PURPOSE

Authorized uses of Unmanned Aircraft Systems (UAS):

1. Incident Command and Control

a. UAS can be used to give Incident Commanders (IC) an aerial perspective of the event being managed to get a more complete understanding of its nature and scope and to facilitate response planning.

b. Such events may include any evolving incident scene, including bomb incidents, fires, hazmat incidents, search and rescue incidents, lifeguard incidents and to provide hazard identification and overall situational awareness.

c. Such events may include post-incident disaster control/assessment, structural damage assessment, and origin investigation.

d. All requests for UAS support shall be routed through the Incident Commander and must conform to SDFD policies and procedures.

2. Aerial Photography

a. A UAS may also be used to collect video/photographs or other sensor data to document natural disasters and emergency incidents and for training purposes. SDFD only uses UAS for a defined purpose as set forth in the SDFD Operations Manual.

SDFD will use UAS to support the following types of incidents/operations:

1. Bomb Squad incidents
2. Fire/HazMat incidents
3. Search and rescue operations, including Lifeguard incidents
4. Situational awareness on incidents
5. Post incident documentation flights
6. Requests to support other government agencies

LOCATION

SDFD UAS are primarily deployed within the City. SDFD UAS may also be deployed outside San Diego city limits if requested by an outside agency or if requested by an authorized SDFD unit that is responsible for an emergency operation beyond San Diego city limits. An example of this is when the UAS is requested to support the SDFD HazMat Team, which is responsible for providing services countywide under a Joint Powers Authority agreement.

In all cases, the UAS can only be requested and used to support the authorized types of operations listed in the SDFD Operations Manual, Standard Instruction 02, Section 46, Unmanned Aircraft System.

All requests for UAS support must be initiated by an Incident Commander or authorized agency representative to support a specific incident or event with a limited objective. UAS deployment is based on the equipment and capabilities needed for each specific mission.

IMPACT

All UAS deployments are intentional and must follow strict authorization rules and processes. There is no indication that the technology will be used in a manner that may disproportionately affect marginalized communities.

UAS support requests are subject to the following process:

1. Requests for planned events should be forwarded to the UAS program manager as far in advance as possible.
2. Requests for immediate assistance shall be made to on-duty bomb technicians or referred to an on-call crew member(s) if such personnel are designated.
3. All requests for UAS deployment must be for a legitimate public safety mission described above and be authorized by a supervisor.

UAS are deployed to specific incidents or locations with a specific objective. The UAS Pilot manually controls the UAS camera system and selects either video or photos to be captured based on the objectives and goals of the UAS mission.

When a UAS is deployed, there is a specific address, building, object, or area that is the intended point of interest in which the pilot is in charge of observing and potentially collecting photographs or video. During this specifically targeted operation, there may be some unintentional observation or imagery collection of adjacent private property in the background, similar to what may be captured from a news media camera covering the emergency, except from an aerial vantage point.

Regarding data collection, the SDFD has implemented the following policy:

1. The San Diego Fire Rescue Department is committed to the continued protection of civil liberties, rights, and privacies of individuals.
2. UAS missions must comply with all local, state, and federal laws and regulations, and make reasonable effort to avoid collection, use, or sharing of sensitive data, particularly as it relates to PII, unless authorized by law.
3. UAS may not be used to violate an individual's reasonable expectation of privacy, unless authorized by law.
   UAS may only be used in a geographically-confined, time-limited emergency situation in which lives are at risk, such as, but not limited to, a fire, hostage crisis, or a search and rescue mission

MITIGATIONS

SDFD has not identified any impact to civil rights and liberties or use that disproportionately affects marginalized communities.

To the extent UAS inadvertently collects PII, all digitally recorded imagery (video or still photography), or other data, not required as evidence or for use in an on-going investigation shall be managed and disposed of in accordance with federal and state laws, San Diego Municipal Code, and City Administrative Regulation 85.10, Records Management, Retention and Disposition.

DATA TYPES AND SOURCES

A UAS is, in essence, a manually controlled video/photography camera that is attached to a small remote-controlled aircraft. The majority of the data collected by UAS is similar to a handheld "point-and-shoot" camera. The data collected by the UAS is digital photographs and video in either the Visual, Infrared, or Thermal spectrum.

None of the SDFD UAS analyze the collected imagery, produce reports based on imagery, or use any algorithms associated with collected data. The UAS solely captures and stores digital photographs and videos collected by its camera sensors.

DATA SECURITY

The SDFD Operations Manual, special instruction 02, section 46, addresses the use of UAS. Section 46, part 3 – Data Collection, VIII states the following:

A. Digital Media Evidence (DME) Retention and Management
   a. The manner in which the DME is stored by the UAS as it is being captured will dictate how the evidence will be secured. If the evidence is stored on a removable device, that device shall be secured at the completion of each mission by the UAS Pilot or flight crewmember, as defined in the Operations Manual, that obtained the evidence. The crewmember will document the date, time, location, and incident numbers or other mission identifiers and the crewmembers involved in mission. This evidence shall be handled in accordance with City policy and procedures.
   b. If the DME is stored on the system hard drive, it shall be handled in accordance with accepted forensic standards for DME without the need to remove the actual storage device.
   c. As with all evidence, unauthorized personnel shall not edit, alter, erase, duplicate, copy, share, or otherwise distribute DME.
   d. All access to DME must be specifically authorized by agency policy and in accordance with proper evidence handling procedures. The chain of custody documentation for the DME allows for necessary auditing to ensure that only authorized users are accessing the data for legitimate purposes.
   e. SDFD routinely provides DME to outside agencies, i.e., the District Attorney's Office and United States Attorney's Office. SDFD is only responsible for the retention and management of DME in its possession and cannot control the use, retention and management of DME lawfully in the possession of a third party.

B. Digitally Recorded Imagery Not Considered DME
   a. All digitally recorded imagery (video or still photography), or other data, not required as evidence or for use in an on-going investigation shall be managed and disposed of in accordance with federal and state laws, San Diego Municipal Code, and City Administrative Regulation 85.10, Records Management, Retention and Disposition.

b. SDFD personnel shall not edit, alter, erase, duplicate, copy, share, or otherwise distribute UAS imagery in any manner without their supervisor's approval and in accordance with agency policies.

C. Personally Identifiable Information (PII)
   a. It is unlikely that UAS will inadvertently collect Personally Identifiable Information (PII) because of the high altitudes the UAS operate. If imagery is inadvertently collected containing PII, it shall be retained in accordance with SDFD policy, but for no longer than 180 days unless retention of the information is determined to be necessary to an authorized mission or investigation.

FISCAL COST

Over the past five and half years, SDFD has purchased UAS equipment totaling approximately $159,300.00.

Of this $159,300 that has been spent thus far, the current funding sources have been:

(All amounts are approximate)

1. $3,000.00 – SDFD General fund
2. $156,298.00 – Grant funds

Below is a fiscal Breakdown of the individual cost of each of the SDFD's UAS, and the specific funding source(s) used to procure them. Funding sources and estimated costs for future procurements are also listed below.

DJI Phantom 4 Pro - $1500.00 each. Two (2) Purchased with general SDFD fund.
FLIR R60 - $156,298.00 total. Purchased with Urban Areas Security Initiative (UASI) grant funds.
FLIR R70 - $297,947.00 Future procurement for two aircraft to be purchased with grant funds.
FLIR Siras - $24,040.00 Future procurement for two aircraft to be purchased with grant funds.
Fotokite Sigma – $30,000.00 Future Procurement – Unknown Special funding source.

The SDFD UAS Program is staffed by the Bomb Squad and one Program Manager. The Bomb Squad is located at Fire Station 1 and is staffed by two bomb technician/UAS pilots 24/7.

THIRD PARTY DEPENDENCE

The SDFD UAS Program does not share UAS-collected DME with third-party vendors.

ALTERNATIVES

The SDFD UAS Program has three primary operations capabilities:

1. Aerial observation from an elevated vantage point.

2. Forward deployed observation into low altitude emergency environments.
3. Sustained aerial observation using a Tethered UAS that provides a constant power supply from a ground station.

For item No. 1, the only alternative method is to use one of the department's standard helicopters. This alternative is much more expensive than using a UAS and requires more staffing, including a contracted maintenance staff.

For item No. 2, there is no viable alternative method to accomplish this capability with anything other than a UAS.

For item No. 3, the only alternative method would be to deploy multiple standard helicopter aircraft that would take turns observing an emergency for an extended duration switching off to refuel. This solution would be extremely costly and require additional specialized staffing.

TRACK RECORD

Currently, more than 5,000 public safety agencies have implemented drone programs. The use of UAS in the fire service is becoming widely recognized as an effective tool to assist with firefighting operations and to ensure the safety of personnel.

FIRESCOPE is a statewide organization comprised of members of the fire service that represent all geographic areas of the state. FIRESCOPE has created a UAS subcommittee that issues recommendations for the implementation and management of fire service UAS programs. SDFD has designed its program to be consistent with FIRESCOPE recommendations.

Additional fire service agencies that use UAS include the Cal Fire, United States Forest Service, Los Angeles City Fire Department, Los Angeles County Fire Department, Orange County Fire Authority, Santa Barbara County Fire Department, Sacramento Metro Fire Department, Menlo Park Fire Department. In addition to public safety agencies, San Diego Gas & Electric also regularly operates UAS in the San Diego area.

PUBLIC ENGAGEMENT AND COMMENTS

SDFD has made efforts to engage with the public and allow for comments. Use policies have been posted to the SDFD website for citizen review with the ability for citizens to submit comments or ask questions. SDFD will provide a prompt response to any questions that are posed by citizens or other interested parties.

Website: https://www.sandiego.gov/fire/about/technology

On November 2, 2023, SDFD and SDPD issued a joint press release announcing nine community meetings, one in each council district, to be held on November 8, 2023 at 6:00 PM. The locations and summaries of each location are listed below.

- District 1 - La Jolla Recreation Center – 615 Prospect St.
    - Number of citizens in attendance – 5
    - Questions/comments relating to this technology:

    - Comment #1 – Citizen expressed support for all SDFD and SDPD technologies presented. Citizen was not in support of the personnel utilized to attend the nine community meetings, they felt it was an inefficient use of resources.
- District 2 - Point Loma/Hervey Library – 3701 Voltaire St.
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None
- District 3 - Central Library (Mary Hollis Room) – 330 Park Blvd
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None
- District 4 - Anchor Church (Host Location) – 1765 Pentecost Way
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None
- District 5 - Scripps Ranch Community Center – 11885 Cypress Canyon Rd.
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None
- District 6 - Hourglass Park (Room J223) – 10440 Black Mountain Rd.
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None
- District 7 - Police Plaza (Auditorium) – 4020 Murphy Canyon Rd.
    - Number of citizens in attendance – 2
    - Questions/comments relating to this technology: None
- District 8 - San Ysidro Library – 4235 Beyer Blvd.
    - Number of citizens in attendance – 2
    - Questions/comments relating to this technology:
        - Question #1 – Citizen asked a three-part question and did not specify a specific technology. The question was in regards to technology vendor lobbying, data analytics and what comes next. Captain Jordan, SDPD, explained relevant policies and practices that are utilized by city departments to address these topics.
- District 9 - Clark Middle School – 4388 Thorn St.
    - Number of citizens in attendance – 0
    - Questions/comments relating to this technology: None

SDFD offered multiple methods for citizens to provide input regarding this technology. As listed above, very little feedback was received. There were no questions or comments that were considered to be negative or unsupportive. Based on the input received, SDFD will implement the use of this technology in accordance with all relevant policies, procedures, and the published surveillance use policy.