



Blue Unmanned Aircraft Systems for First Responders

Market Survey Report

February 2025



Science and
Technology



The “Blue UAS SAVER Market Survey Report Market Survey Report” was prepared by the National Urban Security Technology Laboratory – in conjunction with DAGER Technology – for the U.S. Department of Homeland Security, Science and Technology Directorate pursuant to 7ORSAT18CB0000049/P00006.

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FOREWORD

The National Urban Security Technology Laboratory (NUSTL) is a federal laboratory within the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T). Located in New York City, NUSTL is the only national laboratory focused exclusively on supporting the capabilities of federal, state, local, tribal, and territorial responders to address the homeland security mission. The laboratory assists responders with the use of technology to prevent, protect against, mitigate, respond to, and recover from homeland security threats and incidents. NUSTL provides expertise on a wide range of subject areas, including chemical, biological, radiological, nuclear, and explosive detection, personal protective equipment, and tools for emergency response and recovery.

NUSTL manages the System Assessment and Validation for Emergency Responders (SAVER®) program, which provides information on commercially available equipment to assist response organizations in equipment selection and procurement. SAVER publications provide information on equipment that falls under the categories listed in the DHS Authorized Equipment List (AEL), focusing primarily on two main questions for the responder community: “What equipment is available?” and “How does it perform?” The SAVER program works with responders to conduct objective, practitioner-relevant, operationally-oriented assessments and validations of commercially available emergency response equipment. Having the right tools provides a safer work environment for responders and a safer community for those they serve.

NUSTL is responsible for all SAVER activities, including selecting and prioritizing program topics, developing SAVER knowledge products, and coordinating with other organizations to leverage appropriate subject matter expertise. In conjunction with DAGER Technology, NUSTL conducted a market survey of commercially available Unmanned Aerial Systems on the Department of Defense’s Blue List. This equipment falls under the AEL reference number 030E-07-SUAS titled “System, Small Unmanned Aircraft.”

SAVER reports are available at www.dhs.gov/science-and-technology/SAVER.

Visit the NUSTL website at www.dhs.gov/science-and-technology/national-urban-security-technology-laboratory or contact the lab at NUSTL@hq.dhs.gov.

U.S. Department of Homeland Security



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EXECUTIVE SUMMARY

Over the past decade, first responders have begun integrating small unmanned aircraft systems (UAS) as a resource for a variety of operational applications. UAS, often referred to as drones, provide first responders with an aerial view of their environment and can be outfitted with various sensors tailored to different applications. UAS are used by first responders in support of public safety activities such as search and rescue, firefighting, and post incident reconstruction. The publication of the Blue Unmanned Aerial System Cleared List, or “Blue List,” by the Department of Defense (DoD), may aid responder agencies with their acquisition processes. UAS on the Blue List, or “Blue UAS,” have been vetted to be compliant with DoD policy.

Between July 2023 and July 2024, the Systems Assessment and Validation for Emergency Responders (SAVER) program conducted a market survey of commercially available UAS on the Department of Defense’s Blue List. This market survey report is based on information gathered from manufacturer and vendor websites, and internet research. NUSTL identified 17 products ranging in price from \$12,995 to \$120,000; note pricing of two products was not available.

The purpose of this market survey is to provide emergency responders with information that will guide emergency response agencies in making operational and procurement decisions. Emergency responder agencies should consider overall capabilities, technical specifications, limitations of, and policies related to UAS in relation to their agency’s operational needs when making equipment selections. Performance of these products and information included in this report has not been independently verified by the SAVER program.

Agencies should also consider impacts associated with integrating equipment into their information technology infrastructure, data management, concept of operations, and required maintenance.

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1.0 INTRODUCTION

Over the past decade, first responders have begun integrating small, unmanned aircraft systems (UAS) as a resource for a variety of operational applications. UAS, often referred to as “drones,” provide first responders with an aerial view of their environment and can be outfitted with various sensors tailored to different applications. UAS are used by first responders in support of public safety activities such as search and rescue, firefighting, and post-incident reconstruction. The publication of the [“Blue Unmanned Aerial System Cleared List,”](#) or “Blue List,” by the Department of Defense’s (DoD’s) Defense Innovation Unit (DIU), may aid responder agencies with their acquisition processes. [1] UAS on the Blue List, or “Blue UAS,” have been vetted to be compliant with DoD policy.

Between July 2023 and July 2024, the Systems Assessment and Validation for Emergency Responders (SAVER) program conducted a market survey of commercially available UAS on the DIU’s Blue List. This market survey report is based on information gathered from manufacturer and vendor websites, and internet research. Seventeen products were identified ranging in price from \$12,995 to \$120,000 – note pricing of two products was not available.

All products included in this report meet the following criteria:

- Active on the Blue List
- Available for purchase by state, local, tribal and territorial (SLTT) agencies

Due diligence was performed to develop a report that is representative of products on the Blue List as of July 2024.

2.0 BLUE UAS TECHNOLOGY OVERVIEW

The Blue UAS Cleared List is a list of United States- and ally-manufactured UAS vetted by the Defense Innovation Unit (DIU) to be policy approved by the DoD. Section 848 of the National Defense Authorization Act (NDAA) for Fiscal Year 2020, Endnote 2 prohibits the use of UAS or any related services or equipment from certain foreign entities. All UAS on the Blue List are NDAA-compliant and have undergone cybersecurity testing by DIU or their contractors. Each device on the Blue UAS Cleared List has obtained an authority to operate (ATO) from DIU.

DHS and other agencies have adopted the Blue List as the de facto standard for selection of UAS until they develop their own evaluation programs, as they must follow similar cybersecurity requirements as DoD. First responder agencies often have state- or locality-based regulations on what equipment they can use in the field. State regulators and first responders may choose to use or require the use of Blue List UAS to help ensure operationalized UAS are secure and NDAA-compliant.

While size is not listed as a requirement, all the UAS currently on the Blue List are considered small, unmanned aircraft systems (sUAS). sUAS are classified by the Federal Aviation Administration (FAA) as vehicles that are operated remotely or autonomously in the air and weigh less than 55 pounds.

2.1 Current Technologies

2.1.1 Airframes

Four primary UAS airframe configurations exist: multirotor, fixed-wing, hybrid, and rotary. For the purposes of this document's descriptions, consider rotors as used primarily for vertical thrust in horizontal flight, and propellers as used primarily for horizontal thrust in forward flight.

2.1.1.1 Multirotor

A multirotor platform, as shown in Figure 2-1, operates like a helicopter with multiple rotor blades, allowing the UAS to lift off vertically, hover, and maneuver in any axis by accelerating and decelerating each motor individually. These platforms typically have between two and eight rotors. Commercial multirotor platforms often have flight controllers with inertial measurement units fused with other sensors to stabilize the aircraft without manual inputs by the pilot. This allows these systems to hover in, regardless of winds or air currents, so long as they are within limits defined by their wind resistance level. Some systems have shrouded rotors or can be outfitted with rotor guards to prevent impact between the rotors and objects or people. This allows them to be more safely operated indoors. The ability to take off and land vertically allows the multirotor UAS to be deployed and recovered in restrictive spaces when compared to fixed wing UAS. Multirotor airframes do not generate lift on their own, instead they rely on their rotors' thrust to provide both lift and directional control. As a result, multirotor systems are often louder and generate noise at a higher frequency and amplitude than fixed wing propeller airframes of an equivalent size.



Figure 2-1 Easy Aerial Osprey
Image Credit: Easy Aerial

2.1.1.2 Fixed Wing

A fixed wing platform, as shown in Figure 2-2, may look similar to a typical airplane, with rigid wings and one or more propellers. These airframes generally require more space to take off and land than multirotor or hybrid platforms. However, since their wings generate lift, they are more aerodynamically efficient while cruising than multirotor or hybrid platforms, which results in greater operational time for a given battery capacity. Fixed-wing drones can fly up to 10 times longer than multi-rotor drones. [2] Fixed wing UAS cannot hover, so use cases like surveillance of a stationary object would require flying in orbital patterns around the object. Some systems have a feature which allows the pilot to designate a target and the aircraft will automatically orbit that location while keeping a gimbaled camera focused on the target. Fixed wing UAS require sufficient horizontal space for takeoff and landing, therefore they generally require more skilled pilots to ensure safe deployment and recovery.



Figure 2-2 AgEagle eBee TAC

Image Credit: AgEagle

2.1.1.3 Hybrid

A hybrid platform, as shown in Figure 2-3, uses vertical propulsion to take off and land, while incorporating a fixed-wing design for efficient flight while cruising. Different configurations of propellers and rotors may be used to achieve this capability, including fixed propellers; moveable, tilting wings; or tilting propellers. Hybrid platforms are designed to capitalize on the operational times of fixed wing systems and the ease of deployment of multirotor systems. Achieving these improvements often adds to the complexity of the system, especially as it relates to transitioning between vertical and horizontal flight. Pilots may have to learn new techniques to safely transition between these flight modes. This airframe complexity can also result in additional weight, cost, and reduced reliability for a hybrid UAS when compared to similar fixed wing or multirotor systems.



Figure 2-3 Flightwave Edge 130

Image Credit: Flightwave

2.1.1.4 Rotary

A rotary platform, as shown in Figure 2-4, typically utilizes a single rotor parallel to the ground to provide thrust during flight. To control pitch, roll, and yaw, rotary UAS utilize different strategies than a typical multirotor. The rotor itself will utilize a swash plate, which changes the pitch of the rotor in flight at various locations of the arc, allowing for thrust to be increased in the quadrant necessary to modify the system's pitch and roll. To control yaw, rotary UAS utilize a smaller rotor perpendicular to the earth. The yaw rotor is positioned on a moment arm that allows for positive and negative yaw control. Rotary UAS are typically more efficient than multirotor UAS and less efficient than fixed wing UAS with their noise profiles also falling in between these two categories.



Figure 2-4 Anduril Ghost
Image Credit: Anduril

2.1.2 Power Sources

All Blue UAS use electric motors for propulsion. Various energy sources can be used to provide the electrical energy to power UAS motors, including batteries, liquid fuel generators, fuel cells, or a combination of the three. All platforms in this report are powered via batteries, which are typically more dependable than fuel-based technologies.

2.1.2.1 Batteries

The majority of Blue UAS use batteries as their primary power source. Batteries are dependable, compact, easy to store and transport, and are often designed to be quickly swapped with a fresh battery when depleted, lessening flight downtime. The Blue UAS that use batteries, either as their primary power source or as a backup, use one of two rechargeable battery chemistries: lithium-ion polymer (Li-Po) or lithium-ion (Li-ion).

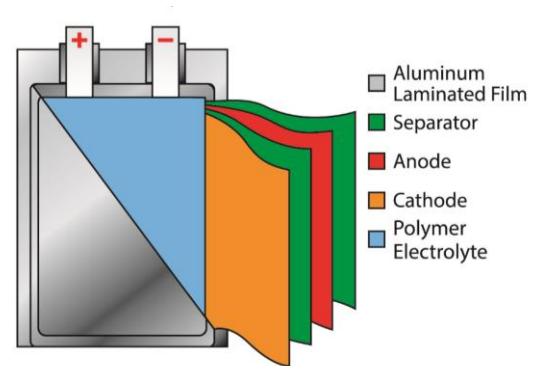


Figure 2-5 Li-Po Battery Construction
Image Credit: DAGER Technology, LLC

Li-Po and Li-ion cells vary slightly in chemistry and construction. Li-Po cells use a gelled polymer electrolyte and usually have flexible, foil/plastic outer casings (see Figure 2-5). Li-ion cells use a liquid electrolyte and typically have a rigid metal outer casing for each cell (see Figure 2-6). With either chemistry, multiple cells in a battery pack can be contained in a rigid plastic outer shell, however, Li-Po batteries are sometimes constructed with a flexible vinyl outer shrink-wrap. Both types of cells have a nominal voltage of around 3.7 volts per cell. UAS battery packs often have multiple cells wired in series to achieve the total voltage needed by the aircraft.

Li-Po batteries trend towards higher power densities than Li-Ion, thus allowing higher charge and discharge capabilities—desirable traits for UAS with high power requirements over short durations. However, Li-Ion cells offer higher energy density, thus allowing longer flight times provided the power draw from the UAS is not too high.

Both Li-Po and Li-Ion batteries can swell, overheat, rupture, and even catch fire if overcharged and require careful monitoring during charging, use, and storage. Both Li-Ion and Li-Po batteries are susceptible to risk of a fire or explosion if damaged, overcharged, exposed to high temperatures, or short circuited. Regardless of the battery chemistry, users should strictly follow the UAS manufacturer’s instructions regarding battery charging, use, storage, and replacement.

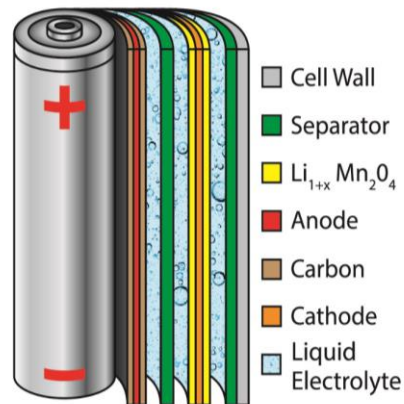


Figure 2-6 Li-ion Battery Construction

Image Credit: DAGER Technology, LLC

2.2 Key Components

Unmanned aircraft considered in this report often contain similar key components necessary for their operation. The quality of integration provided by the manufacturer, even with the same components, may result in drastically different aircraft performance.

2.2.1 Ground Control Station

The ground control station is used to command, monitor, and configure the UAS. Two common types of ground control stations are handheld controllers and computer-based controllers. Handheld controllers may look like controllers used for video games with a screen added to them to monitor the UAS status and video feed. Some handheld controllers use a smart phone or tablet that plugs into the handheld controller. Computer-based controllers may use a desktop or laptop computer that connects to a device that communicates with the UAS. The information is then displayed on the computer’s screen for the user to interact with the UAS.

2.2.2 Flight Controllers

All sUAS on the Blue List contain some level of automation that relies on the onboard “brain” of the sUAS, a computer with integrated sensors called a “flight controller.” These flight controllers often contain microcontrollers from the same architecture known as “STM32,” paired with various sensors that output position, orientation, and location information. These sensors are often embedded in a package called an inertial measurement unit (IMU). The microcontroller fuses the sensor outputs from the IMU, often combined with information from the onboard global navigation satellite system (GNSS), and then utilizes onboard input/output streams to command the propulsion and data collection systems on board the sUAS.

2.2.3 Motors and Electronic Speed Controllers

All sUAS on the Blue List are propelled by electric motors driven by electronic speed controllers (ESCs). The motors are typically three-phase brushless alternating current (AC) motors with no smart components, allowing them to be produced in foreign countries who may or may not be allies with the United States. ESCs are the primary components that convert the direct current (DC) from the battery or onboard generator into three-phase power for the motors. The ESC may or may not contain smart components that require cybersecurity vetting or production in an allied nation.

2.2.4 Onboard Sensors

A variety of sensors may be used by the UAS for flight, data collection or obstacle avoidance. The sensor consistently used across all Blue UAS is a GNSS antenna for receiving positioning information from the GPS constellation. Position information obtained from the GNSS may be used to geotag pictures or videos, or to log the flight path of the UAS. A handful of Blue UAS have obstacle avoidance capabilities. Obstacle avoidance sensor systems use onboard cameras, range finders and sometimes small lidar modules that employ light detection and ranging assist the operator with collision avoidance during flight.

2.2.5 Payloads

UAS payloads may be grouped into two categories: fixed and swappable. Fixed payloads are built into the UAS from the factory and are not designed to be modified by the end user. These payloads are often found in sUAS where size, weight and power (SWaP) considerations are particularly important. Swappable payloads on the other hand can be removed and attached to the UAS by the end user via a mounting port or adapter. A mounting port can be proprietary or open source; one example is the “Smart Dovetail,” for which maker Freefly Systems has published its open-source information.

UAS on the Blue List with swappable payload capabilities are only compliant with the Blue List if the payload itself has also been vetted by the DIU.

2.2.6 Data Links

Three distinct data links may exist between the ground controller and the aircraft: command-and-control, video, and telemetry. UAS may contain all, some or even none of these links. Some UAS fuse all these links into a single radio frequency (RF) stream, while others use discrete frequencies for each of the links. All UAS on the Blue List have, at minimum, a control and telemetry link, although the vast majority contain video as well.

The command-and-control link is used to command the UAS to perform an action, such as to execute a flight plan or to take off. The video link contains the live camera feed from the UAS and downlinks it to the ground controller. Video links are typically very high bandwidth and require significant RF resources as compared to the command and control or telemetry links. The telemetry link contains metadata about the UAS such as position, battery charge and propulsion information.

2.3 Applications

Public safety professionals continually discover new uses for UAS. The National Fire Protection Association bulletin *NFPA 2400, Standards for Small Unmanned Aircraft Systems (sUAS) Used for Public Safety Operations, 2019* identified multiple applications for UAS within several emergency response fields, including firefighting, search and rescue, emergency medical services, hazardous materials response, law enforcement, and ancillary public safety services. These uses are listed and expanded upon below.

2.3.1 Firefighting

UAS are increasingly used in urban, rural and wildland firefighting. Visual camera systems allow firefighters and command staff to increase situational awareness on a fire scene by providing a bird's-eye view not available from ground level. Depending upon the sensors fitted to the aircraft, UAS may be used by fire services for the variety of use cases in Figure 2-7:

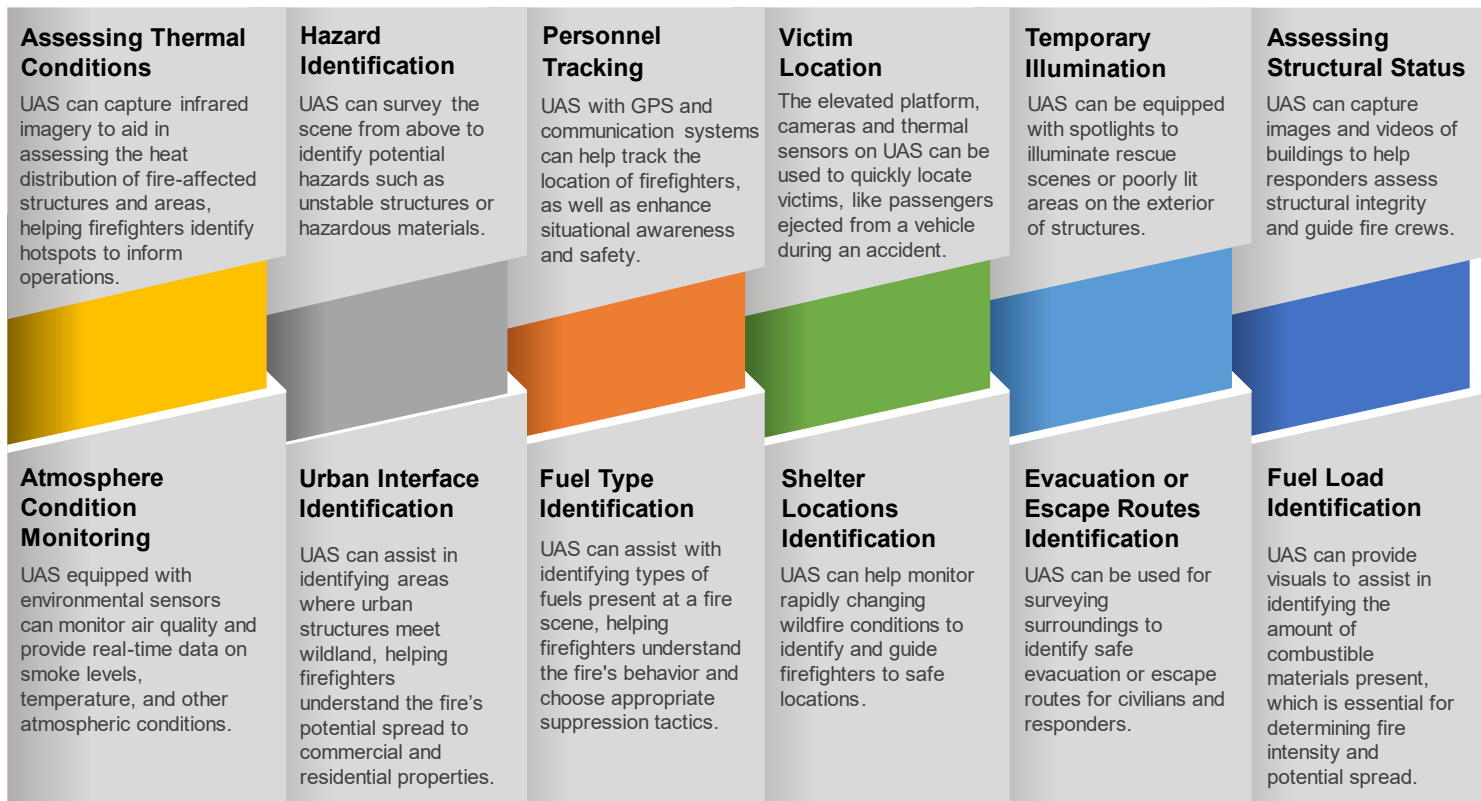


Figure 2-7 Firefighting UAS Use Cases

2.3.2 Search and Rescue

Search and rescue operations often occur in areas that are difficult or dangerous for ground teams to access. UAS can overcome terrain restrictions and operate in confined areas like urban canyons, gorges, and sinkholes that larger aircraft like airplanes and helicopters may be unable to navigate. Responders may find UAS helpful in a variety of search and rescue several applications, including:

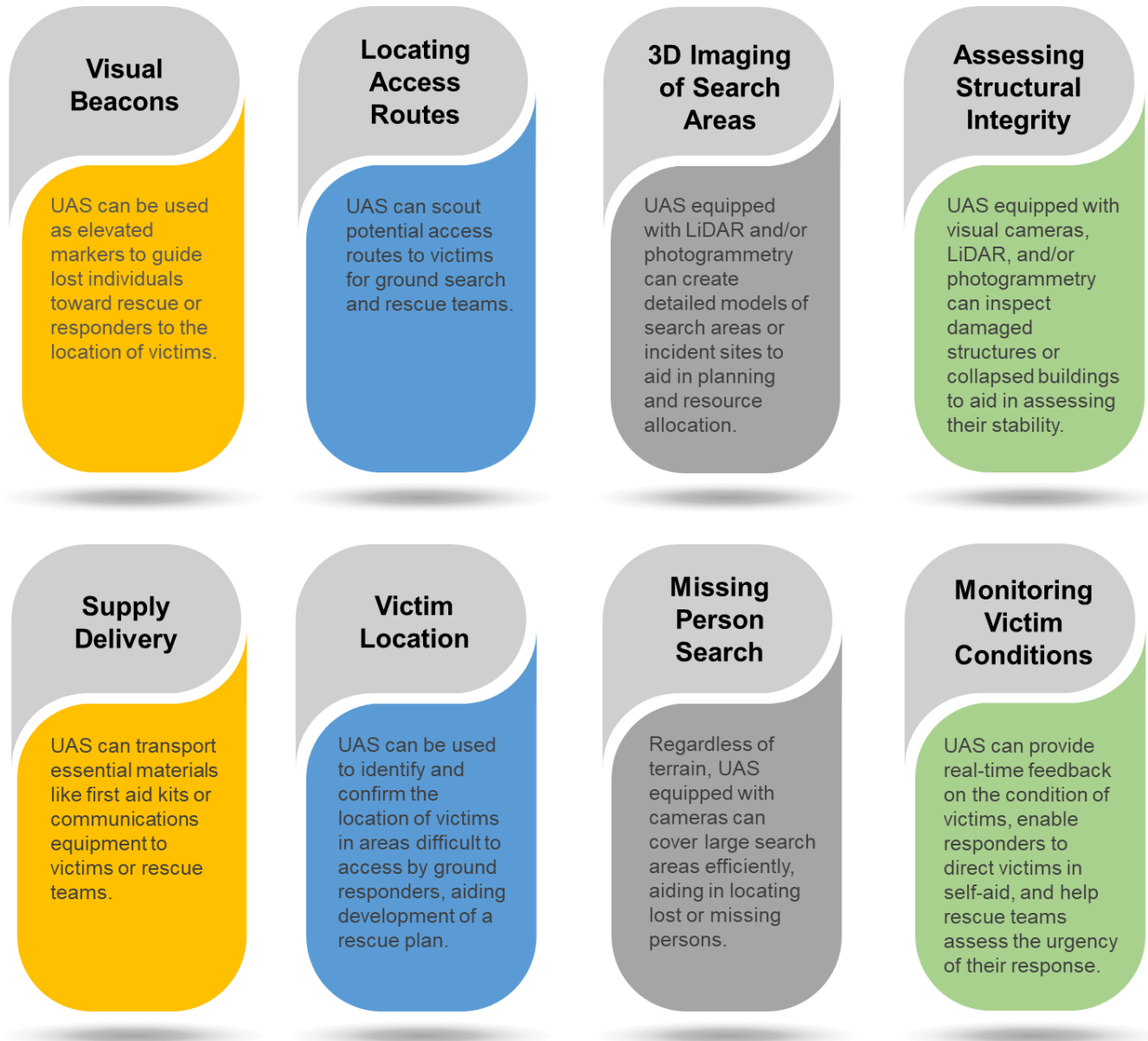


Figure 2-8 Search and Rescue UAS Use Cases

2.3.3 Hazardous Materials Response

Because concern for the safety of an onboard crew is not necessary, UAS can be used in environments with toxicity levels that would likely preclude the use of crewed aircraft. UAS operators, however, must still be cognizant of contamination issues and other concerns like intrinsic safety or the lack thereof when piloting UAS in flammable atmospheres. Responders may need to select UAS with high ingress protection (IP) ratings if wet decontamination procedures are anticipated. Keeping such issues in mind, UAS systems may be helpful for the hazmat use cases in Figure 2-9:

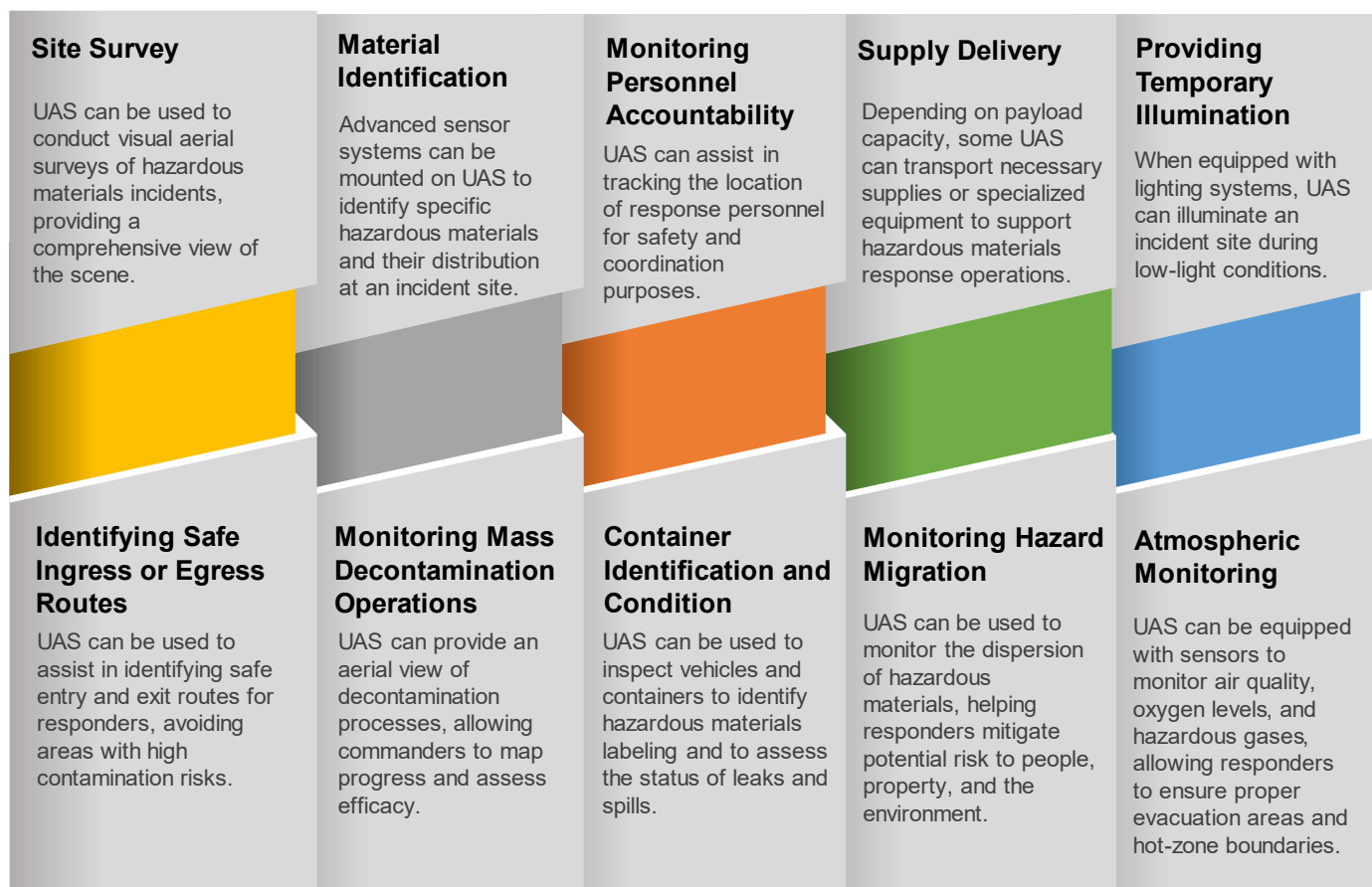


Figure 2-9 Hazardous Materials Response UAS Use Cases

2.3.4 Emergency Medical Services

In hard-to-access, remote, and disaster areas, drones can facilitate treating the injured or support isolated responders. Relevant applications of UAS for medical support include:

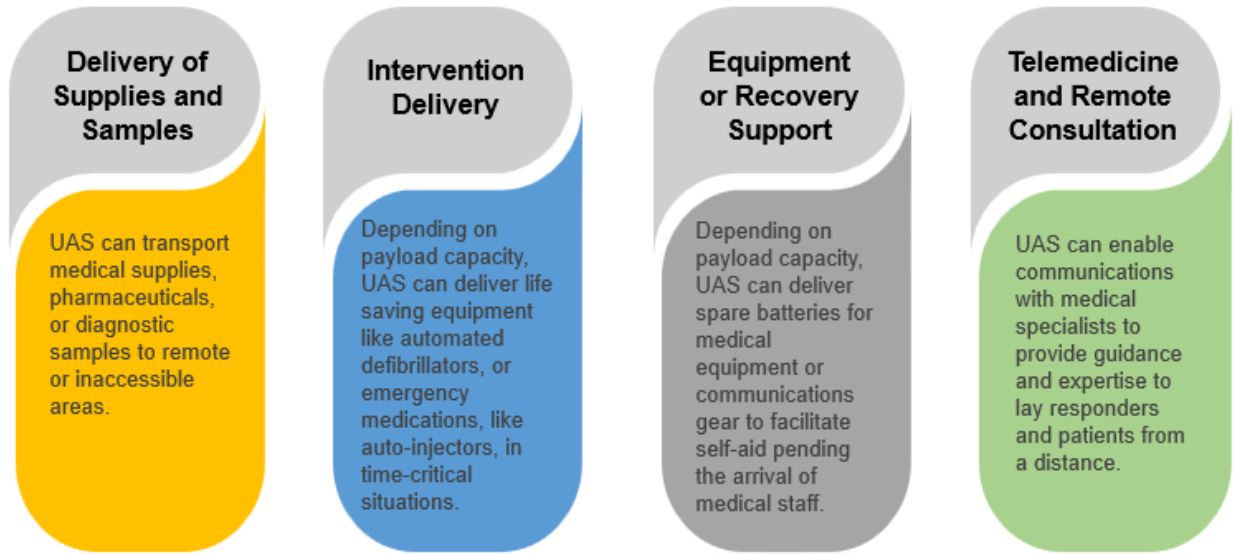


Figure 2-10 Emergency Medical Services UAS Use Cases

2.3.5 Law Enforcement

Well-funded law enforcement agencies have long relied on aviation assets, like helicopters and fixed-wing aircraft, to aid them in multiple facets of their work. UAS are now providing agencies with smaller budgets access to similar resources. Larger agencies are using them as both force multipliers and for rapid, as-needed deployment when traditional aircraft are not available. Some UAS are also finding applications in tactical situations, such as conducting reconnaissance indoors for SWAT Teams or giving bomb technicians an initial look at suspicious packages and suspected improvised explosive devices.

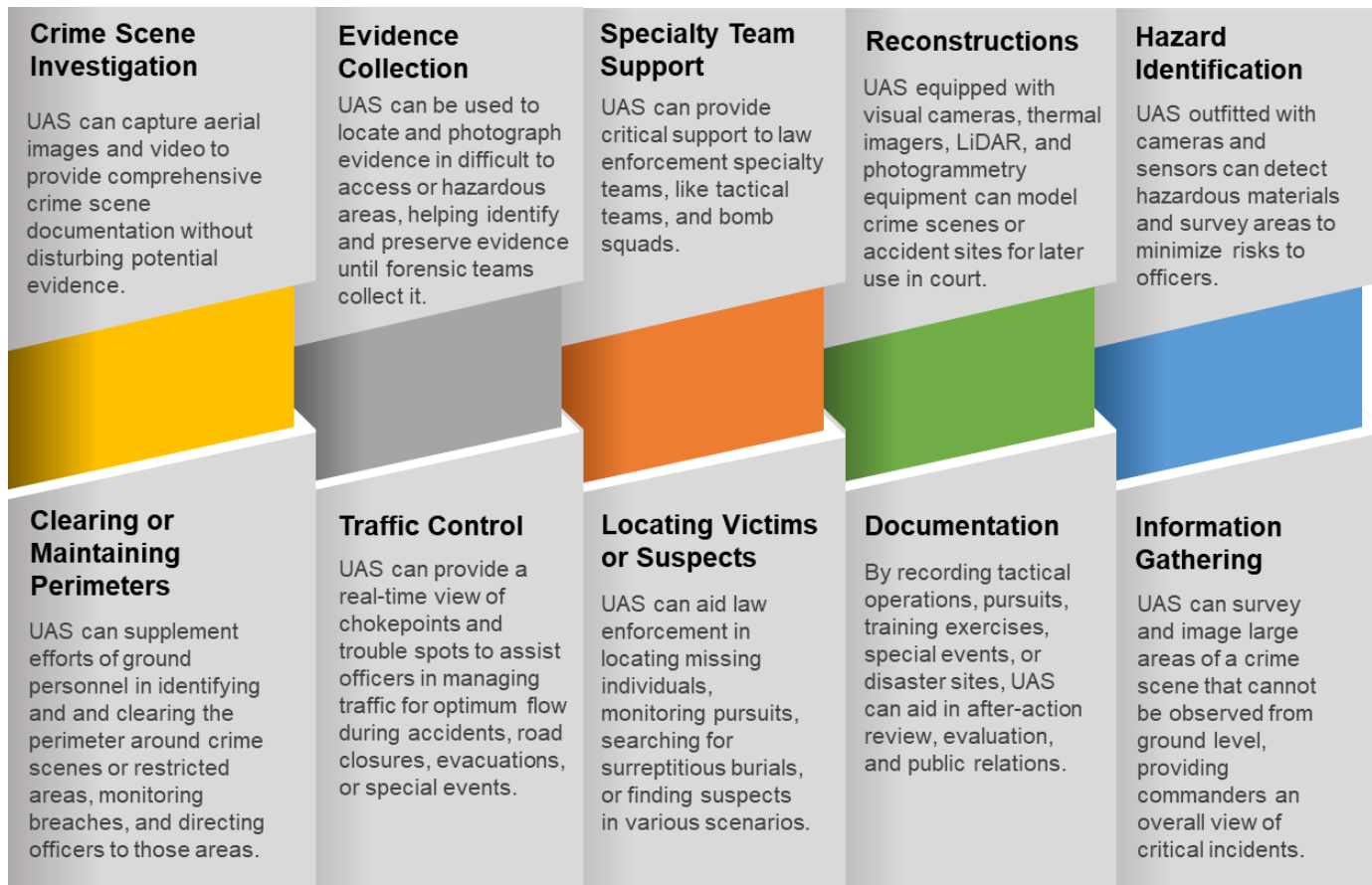


Figure 2-11 Law Enforcement UAS Use Cases

2.4 Use of Grant Funds for Certain Telecommunications and Video Surveillance Equipment or Services

The John S. McCain National Defense Authorization Act for Fiscal Year 2019 (NDAA), Pub. L. 115-232, Section 889 (NDAA) prohibits the use of federal funds, including loan and grant¹ funds, to obtain or acquire certain telecommunications technologies manufactured by certain entities or to enter into contracts with entities that use those technologies. The Office of Management and Budget (OMB) published regulations at 2 C.F.R. § 200.216 to clarify the application of the NDAA to the use of federal grant funds to procure or obtain certain telecommunications equipment or services.

Effective August 13, 2020, federal grant recipients and subrecipients (i.e., **non-federal entities**) are prohibited from obligating or expending loan or grant funds to procure or obtain² the following “covered telecommunications equipment or services”:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities)

For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by:

- Hytera Communications Corporation
- Hangzhou Hikvision Digital Technology Company
- Dahua Technology Company
- or any subsidiary or affiliate of such entities
- Other entities identified by the Secretary of Defense

The restriction also applies to systems that use the covered equipment or services as a substantial or essential component, and to subsidiaries or affiliates of those listed above³. See www.federalregister.gov/d/2020-17468/p-877<https://www.federalregister.gov/d/2020-17468/p-877>.

Costs associated with covered equipment and services are “unallowable” for grant funding. Grant recipients are responsible for ensuring funds are used only for allowable costs, and would be obligated to refund the government for unallowable costs. The Federal Emergency Management Agency (FEMA) issued [FEMA Policy #405-143-1](#), Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim) for further guidance on the Section 889 prohibitions. Additionally, OMB issued [frequently asked questions \(FAQs\)](#) on the topic.

For **federal** entities, FEMA published interim rules amending the Federal Acquisition Regulation⁴.

¹ This also includes cooperative agreement funds.

² Nor may they extend or renew a contract to procure or obtain or enter into a contract to procure or obtain the covered equipment or services.

³ As well as telecommunications or video surveillance services provided by entities or using equipment described above.

⁴ www.federalregister.gov/documents/2019/12/13/2019-26579/federal-acquisition-regulation-prohibition-on-contracting-for-certain-telecommunications-and-video and www.federalregister.gov/documents/2019/08/13/2019-17201/federal-acquisition-regulation-prohibition-on-contracting-for-certain-telecommunications-and-video.

2.5 Cybersecurity Considerations

All UAS on the Blue List undergo evaluation to ensure the software and firmware meet DoD cybersecurity requirements. This evaluation includes elements like static program analysis of software and firmware, as well as evaluation of software and hardware bills of material for potential threat vectors. DIU also conducts continuous evaluations and reviews with manufacturers to ensure products remain compliant while on the Blue List.

2.6 Regulations and Standards

There are regulations applicable to UAS used by public safety agencies in the United States, and compliance with those regulations is mandatory. There are also numerous consensus standards available; compliance with standards is voluntary unless the standard is incorporated by reference into regulations.

2.6.1 Regulations

The U.S. Department of Transportation's Federal Aviation Administration (FAA) regulates UAS used in the national airspace and provides information relevant for public safety drone operations on a dedicated website for public safety and government, www.faa.gov/uas/public_safety.gov.

The FAA defines sUAS in [14 CFR Part 107 – Small Unmanned Aircraft Systems](#). Part 107 specifies [3] operational limitations, remote pilot in command certification and responsibilities, and aircraft requirements. Part 107 requires remote pilots to be FAA-certified, and the three primary steps for flying under Part 107 are detailed on the FAA website titled, “Certificated Remote Pilots including Commercial Operators.” Additional information can be found at www.faa.gov/uas/commercial_operators. Highlighted on this webpage is a 2019 amendment to Part 107 regarding the operation of UAS over people, which permits routine operations of drones over people, moving vehicles, and at night under certain conditions.

In addition to Part 107, [14 CFR Part 89 – Remote Identification of Unmanned Aircraft](#), in effect as of March 16, 2024, requires remote identification (ID) for every UAS that is registered with the FAA. Remote ID provides identification of UAS in flight and the location of their control stations. If a UAS that has already purchased and registered with the FAA does not have Remote ID, the operator will be required to install a Remote ID broadcast module. Additional information on how to be Remote ID-compliant is available at www.faa.gov/uas/getting_started/remote_id.

A list of UAS compliant with Part 107 Operations Over People and Part 89 Remote ID regulations may be found on the titled, “Find your aircraft Declaration of Compliance” at uasdoc.faa.gov/listDocs.

2.6.2 Standards

There are numerous consensus standards for sUAS, and many are under development; this information is documented in the American National Standards Institute (ANSI) publication entitled, “Standardization Roadmap for Unmanned Aircraft Systems.”⁵ ANSI formed the Unmanned Aircraft Systems Standardization Collaborative (UASC) in 2017 to identify existing UAS standards and standards under development, to assess gaps, and to recommend areas for needed standardization and/or pre-standardization research and development. Of the numerous currently available standards, many have not been implemented or adopted by manufacturers. From a public safety operations and training perspective, two sUAS standards are of importance summarized below:

2.6.2.1 National Fire Protection Association 2400 Standard for Small Unmanned Aircraft Systems Used for Public Safety Operations (2019) [4]

NFPA 2400 details the minimum requirements for the safe operation, deployment, and implementation of sUAS, including program criteria and considerations, professional qualifications, and elements of a maintenance program.⁶ The standard was created to assist public safety departments with establishing and operating a sUAS program. This standard was developed by a committee of technical experts including public safety professionals, manufacturers, and government representatives.

2.6.2.2 ASTM International E3426 Standard Test Method for Evaluating Aerial Response Robot Endurance

ASTM E3426 outlines a suite of procedures to measure, assess, and subsequently compare the essential robot capabilities of the sUAS; it can also be used to train and assess sUAS pilots. [5] This standard includes four testing procedures: outdoor movement, indoor movement, indoor hovering, and indoor dwelling. The test apparatuses can be constructed from inexpensive, commonly available materials—such as buckets, dimensional lumber and screws—so that public safety agencies or other organizations can easily replicate the procedures and use them for system evaluation and/or pilot training and assessment.

2.7 Emerging Technologies

Several changes are on the horizon for the sUAS industry. The primary emerging technologies relate to components of the sUAS themselves, not necessarily the sUAS technology as a whole. The greatest improvements are expected to be in data links, particularly video, in the form of lower SWaP with higher quality data transfer both on point-to-point bands and 5G networks; machine vision in the form of object or pattern recognition for navigation in RF- and GNSS-denied environments; and onboard artificial intelligence/machine learning (AI/ML) processing for object/pattern identification and classification.

⁵ Information on the UASC may be found at [ANSI Unmanned Aircraft Systems Standardization Collaborative – UASC](#). The roadmap may be downloaded from this website.

⁶ www.nfpa.org/2400

3.0 PRODUCT INFORMATION

This section provides information on Blue List UAS available for purchase by SLTT responders, all of which appear on the DIU Blue List. Table 3-1 provides general characteristics and specifications of the products, which are listed alphabetically by manufacturer. The information in Section 3.0 was gathered from manufacturer, manufacturer and vendor websites, and internet research; it has not been independently verified by the SAVER program.

Below are definitions of the product information in Table 3-1, listed in column order.

Flight Configuration refers to the type of UAS airframe (i.e., multi-rotor, fixed wing, hybrid, rotary).

Weight refers to weight in pounds (lb) of the UAS in a ready-to-use configuration including the battery.

Dimensions refers to the overall length, width and height (given in inches) of the UAS in a ready-to-use configuration including the battery.

Top Speed refers to the maximum speed (in miles per hour [mph]) at which the UAS can travel.

Max Flight Time refers to the maximum amount of time from the moment of takeoff that a UAS can remain airborne.

Range refers to the maximum distance (in miles) the UAS can operate from the ground control station.

IP Rating refers to the ingress protection (IP) rating of the drone. See Appendix A for tables that detail what various IP numbers indicate.

Payload Capacity refers to the weight (in pounds) the UAS can safely carry in addition to its bare takeoff weight.

Payload identifies how sensors are integrated into the UAS and, in some cases, what payloads are either integrated or available.

Ground Control Station refers to the mechanism used for operating the UAS (e.g., dedicated controller, laptop, mobile application).

Obstacle Avoidance refers to technology incorporated into a UAS to scan for, detect and react to environmental obstacles in real time to mitigate collisions.

Live Streaming refers to the capability for a real-time feed from the camera to be viewable on a ground control station.

GSA Pricing Availability refers to the availability of a long-term government-wide contract with commercial companies via the General Services Administration (GSA) that provides access to commercial products and services at fair and reasonable prices to the government.⁷

MSRP refers to the manufacturer's suggested retail price in U.S. dollars (rounded to the nearest dollar) for whatever comes standard with the UAS. Information on what is included in the MSRP is detailed in individual product sections. Ground control stations, chargers, and additional payloads may not be included in the MSRP, and in those cases, may be purchased separately.

⁷ Information on using the GSA Schedule can be found at www.fema.gov/fact-sheet/purchasing-under-fema-award-using-gsa-schedule

Table 3-1 Product Comparison Matrix

Manufacturer and Product	Flight Configuration	Weight (lb)	Dimensions (in)	Top Speed (mph)	Max Flight Time (min)	Range from CGS (miles)	IP Rating	Payload Capacity (lb)	Payload	Ground Control Station	Obstacle Avoidance	Live Streaming	GSA Pricing Availability	MSRP
AgEagle, eBee TAC	Fixed Wing	3.6	45.7 wingspan	68	90	1.9	N/A	N/A	Swappable integrated payload bay	64-bit PC ground control station	✓	--	✓	\$24,438
Anduril, Ghost X	Rotary	54.9	106.8 x 90	34	80	15	64	20	Swappable integrated payloads	Toughbook 55 plus radio	--	✓	--	N/A
Ascent AeroSystems, Spirit	Multi-rotor	10	12 x 4.2 x 25	60	53	~6.2	56	6.5	Swappable integrated payloads	Navigator Tab 3	--	✓	✓	\$13,999
Blue Halo, Intense Eye V2 Jeti	Multi-rotor	9	36 x 36 x 12	40	32	1.8	N/A	3.5	Integrated FPV camera with bottom payload mount	Laptop CGS plus radio	--	--	--	N/A
Easy Aerial, Osprey	Multi-rotor	14.3	41 x 41 x 10.6	62	45	12.4	54	6.6	Bottom-mounted swappable EO/IR camera	Easy Ground Control Station (tablet + controller)	✓	✓	--	\$49,100
FlightWave, Edge 130	Hybrid	2.8 - 3.2	51 x 30 x 10	65	125	12	54	~1.1	Integrated Overwatch gimbal with EO/IR camera	FlightWave GCS	--	✓	--	\$31,000
Freefly Systems, ALTA X	Multi-rotor	~44	89.5 x 89.5 x 15.2	60	50	~9	N/A	35	Optional FPV camera and bottom-mounted payload bay for multiple sensors	UVX Navigator Tab or Pilot Pro	--	✓	✓	\$36,000

Manufacturer and Product	Flight Configuration	Weight (lb)	Dimensions (in)	Top Speed (mph)	Max Flight Time (min)	Range from CGS (miles)	IP Rating	Payload Capacity (lb)	Payload	Ground Control Station	Obstacle Avoidance	Live Streaming	GSA Pricing Availability	MSRP
Freefly Systems, Astro	Multi-rotor	11.4	55.4 x 55.4 x 14.1	33.6	37	1.2	43*	3.3	LR1 Payload, Gimbaled Alpha 7R IVA Mapping Camera, Wiris Pro Payload, Sentera 6X Multispectral, Sentera 6X Thermal, Sentera 65R, Hovermap ST-X.	Pilot Pro	-	✓	-	\$26,000
Inspired Flight, IF800 TOMCAT	Multi-rotor	18.7	51.8 x 44.8 x 20.3	49	54	2.3	43	6.6	Bottom-mounted	Jeti ds-12 or Laptop GCS	-	✓	✓	\$25,000
Inspired Flight, IF1200A	Multi-rotor	35.9	65.1 x 60.6 x 30.2	56	43	2.3	N/A	19.9	Bottom-mounted	Blue Herelink, Jeti ds-12 or Laptop GCS	-	✓	✓	\$35,000
Parrot Drones, Parrot ANAFI USA GOV	Multi-rotor	1.1	11.1 x 14.7 x 3.2	32.88	32	3	53	-	Integrated RGB and FLIR	Parrot Skycontroller	-	✓	✓	\$14,000
PDW C100	Multi-rotor	20.9	65 x 65 x 15	32	75	6.2	54*	15	Integrated FPV camera, swappable payloads	UXV Technologies SRoC Controller	✓	✓	TBD	\$120,000
Skydio, X2D	Multi-rotor	3	26.1 x 22.4 x 8.3	31	35	6.2	N/A	0.66	Integrated EO/IR	Skydio Enterprise Controller	✓	✓	✓	\$23,997
Skydio, X10D	Multi-rotor	4.7	31.1 x 25.6 x 5.7	45	40	7.45	55	0.77	Integrated EO/IR	Skydio Enterprise Controller	✓	✓	✓	\$25,650
Teal Drones, Teal 2	Multi-rotor	2.75	17 x 19 x 3	23	30	~3.1	53	~0.55	Integrated EO/IR	Teal Air Control	-	✓	✓	\$15,809

Manufacturer and Product	Flight Configuration	Weight (lb)	Dimensions (in)	Top Speed (mph)	Max Flight Time (min)	Range from CGS (miles)	IP Rating	Payload Capacity (lb)	Payload	Ground Control Station	Obstacle Avoidance	Live Streaming	GSA Pricing Availability	MSRP
Vantage Robotics, Vesper	Multi-rotor	1.54	18.7 x 19.6 x 3.1	40	54	~3.1	54	-	Integrated EO/IR	Vision 1, Vision 2 or ATAK	-	✓	✓	\$12,995
Wingtra, WingtraOne Gen II	Hybrid	10	49.2 x 26.8 x 4.7	35.8	54	~1.9	54	1.1	Mountable payloads (camera, multispectral cameras, lidar)	Samsung Galaxy Tab Active 3 with integrated radio	✓	-	✓	\$19,900

N/A indicates data is not available.

- indicates that the system does not have that feature

EO/IR - electro-optical/infrared sensor

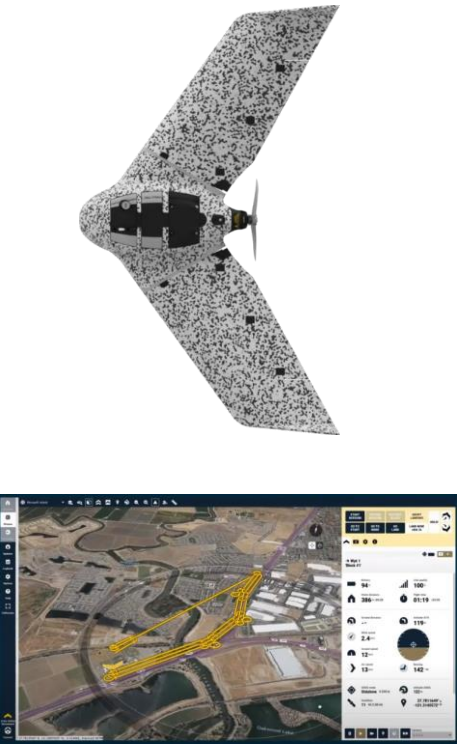
FLIR - forward-looking infrared

FPV - first person view

RGB - red, green, blue wavelength


* - tested to

3.1 AgEagle, eBee TAC

 <p>Figure 3-1 eBee TAC drone and 64-bit PC running eMotion Flight Planning Software <i>Image credit: AgEagle</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Fixed Wing</p> <p>3.6</p> <p>45.7 wingspan</p> <p>68 mph</p> <p>90 minutes</p> <p>1.9</p> <p>Data not available</p> <p>Integrated swappable payload bay for Aeria X 2D photogrammetry camera, SODA 3D photogrammetry camera, thermal camera, Duet T dual RGB and FLIR thermal camera, multispectral camera (MicaSense RedEdge-MX)</p> <p>64-bit PC ground control station</p> <p>eMotion Flight Planning Software</p> <p>Lidar ground avoidance</p> <p>No</p> <p>N/A</p> <p>\$24,438 (GSA pricing)</p> <p>Yes</p>
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- The AgEagle eBee TAC uses a 3700 mAh 15.2V lithium-polymer endurance battery.
- Radio data link encryption AES-256. Can integrate with situational awareness tools such as TAK.
- Operating temperature range is 5 °F to 104 °F. Storage temperature range was not available.
- The MSRP includes the drone, transport case, lifetime hardware, and eMotion ground control software, which includes support as well as software and firmware updates.
- Available payloads and their prices are Duet T (\$9,975), MicaSense RedEdge MX (\$6,284), Aeria X (\$3,990), and SODA camera (\$1,795).
- Accessories include a drone backpack (\$898), a 29.5" x 20" x 13" transport case (\$1,496), a ping USB, a GeoBase plug-and-play GNSS (\$4,987), RTK/PPK activation (\$5,486); remote control to operate drone manually, and radio tracker. Spare and maintenance kits are also available for purchase.
- AgEagle offers online, in-person, and customized training at an additional cost.

3.2 Anduril, Ghost X

 <p>Figure 3-2 Ghost X drone and Toughbook 55 ground control station</p> <p><i>Image credit: Anduril</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Rotary</p> <p>54.9, dual battery</p> <p>44, single battery</p> <p>106.8 x 90</p> <p>34 mph</p> <p>80 minutes (dual batteries, cruise)</p> <p>15 (radio dependent)</p> <p>20</p> <p>NextVision Raptor Camera, Trillium HD45 Camera, Payload Dropper</p> <p>Toughbook 55 and Silvus or Persistent Radio</p> <p>LatticeOS</p> <p>No</p> <p>Yes</p> <p>64 (aircraft)</p> <p>54 (camera)</p> <p>67 (flight-critical components)</p> <p>N/A</p> <p>No</p>
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- The Ghost can be operated in a single or dual battery configuration. Each battery weighs approximately 10.4 pounds and provides approximately 214 Wh/kg.
- Operating and storage temperature ranges are the same, from -4°F to +120°F.
- The GCS radio is either a Silvus (default) or Persistent Systems radio, depending on customer requirements.
- Anduril offers signals intelligence/electromagnetic warfare and vision-based navigation for GPS-denied/-degraded environments.
- For available accessories, training offerings and warranty information, contact Anduril.
- The MSRP is available from Anduril upon request.
- *Note: The Anduril Ghost is also on the Blue List but is not available for new customers.*

3.3 Ascent AeroSystems, Spirit



Figure 3-3 Spirit UAS (K257) drone and ground control station

Image credit: Ascent AeroSystems

Flight Configuration	Multicopter
Weight (lb)	10
Dimensions (in)	12 x 4.2 x 25.5
Top Speed	60 mph (manual) 40 mph (auto)
Max Flight Time	53 minutes (with no payload)
Range (miles)	~6.2 (radio dependent)
Payload Capacity (lb)	6.5 (with one battery)
Payloads	Integrated swappable payload sensors. NextVision EO/IR sensors (DragonEye2, Nighthawk2-UZ, Raptor)
Ground Control Station	Navigator Tab 3, Auterion Skynav, laptop, tablet/cellphone
Software	QGroundControl and/or Mission Planner. ATAK capable.
Obstacle Avoidance	No
Live Stream Capability	Yes
IP Rating	56
MSRP	\$13,999 (aircraft only) \$40,558-\$61,082 (full kit)
GSA Pricing Available	Yes

- The Ascent AeroSystems Spirit can be configured to use one or two 12S size 6Ah 44.4V Li-ion batteries. Each battery weighs three pounds and provides approximately 266.4 Wh.
- Operating temperature range is -40°F to +130°F. Storage temperature range was not available.
- Recommended maintenance includes a 250-hour manufacturer inspection.
- MSRP of \$13,999 is for the Spirit aircraft only.
- GSA pricing varies based upon EO/thermal sensor; DragonEye2 \$40,558; Nighthawk2-UZ \$56,195; Raptor \$61,082. At each of these GSA price points the purchase includes the drone with rotor blades, GPS Module, 2.4 GHz digital data link, AES 256 encryption, two batteries with charger, an EO/thermal sensor with quick-connect landing gear module, Navigator Tab3 GCS, and carrying case (measuring 48" x 12" x 12" and weighing 14 pounds).
- Available accessories include NextVision family of integrated EO/IR sensors, multiple high resolution mapping sensors. Additional payloads, and spare batteries are also available for purchase.
- The Spirit comes with a one-year manufacturer's warranty.
- By customer request, Ascent AeroSystems offers training that can be completed at Ascent AeroSystems or, for an additional cost, a location convenient to the customer.

3.4 Blue Halo, Intense Eye V2 Jeti




Figure 3-4 Intense Eye Version 2 Jeti and ground control station

Image credit: Blue Halo

Flight Configuration	Multicopter
Weight (lb)	9
Dimensions (in)	36 x 36 x 12 with propeller arcs
Top Speed	40 mph
Max Flight Time	32 minutes
Range (miles)	1.8 (radio range)
Payload Capacity (lb)	3.5
Payloads	Integrated FPV camera with bottom payload mount
Ground Control Station	Laptop running GCS software and ground-based telemetry radio
Software	Mission Planner or QGroundControl
Obstacle Avoidance	No
Live Stream Capability	No
IP Rating	Not Available
MSRP	Pricing not available
GSA Pricing Available	No

- The IE-V2 uses one 6S 12Ah 22.2V Li-Po battery that weighs 3.4 pounds and provides approximately 266 Wh. The IE-V2 can also use the 6S 16Ah or the 6S 22Ah Li-Po battery.
- Operating temperature range is 20°F to 110°F. Storage temperature range is 0°F to 120°F.
- The MSRP as well as prices of available accessories, trainings, and warranties offered are available upon request from Blue Halo.

3.5 Easy Aerial, Osprey

 <p>Figure 3-5 Osprey drone and Easy Aerial Easy Ground Control Station <i>Image credit: Easy Aerial</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multicopter</p> <p>14.3</p> <p>41 x 41 x 10.6</p> <p>62 mph</p> <p>45 minutes</p> <p>12.4</p> <p>6.6</p> <p>Integrated NextVision Nighthawk 2V (EO/IR) with zoom (40xEO and 4xIR) camera.</p> <p>Other payloads include the Dragoneye, Echodyne radar, lidar, multispectral camera, thermal camera, LED lights, and speaker.</p> <p>Easy Aerial Easy Ground Control Station (EGCS) tablet and controller</p> <p>Easy Aerial Remote Monitoring System (RMS)</p> <p>Yes</p> <p>Yes</p> <p>54</p> <p>\$49,100</p> <p>No</p>
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- The Easy Aerial Osprey uses a Lithium Ion 865.8 Wh battery.
- Operating temperature range is 5 °F to 115 °F. Storage temperature range is -50 °F to +130 °F.
- Recommended preventative maintenance should be completed every two weeks or 200 flight hours. More in depth maintenance is to be performed every two months or 1,000 flight hours. Battery and propeller replacement recommended every 1,000 flight hours.
- The MSRP includes the drone, EGCS with controller with tablet, NextVision EO/IR Camera (40x zoom), batteries, props, spare props, battery charger, RMS software, and storage/transport case measuring 33.4" x 28.4" x 18.2" and weighing 58 pounds. Other payloads and radios are also available for purchase.
- The Osprey has a 12-month standard manufacturer's warranty.
- Easy Aerial offers a three-day on-site training (in the U.S.) for the Osprey, which includes classroom, simulator, and live flying time, as well as an Easy Aerial certification for \$10,000.

3.6 FlightWave Aerospace Systems Corporation, Edge 130

 <p>Figure 3-6 Edge 130 drone and FlightWave Ground Control Station Image credit: FlightWave</p>	<table border="1"> <tr><td>Flight Configuration</td><td>Hybrid</td></tr> <tr><td>Weight (lb)</td><td>2.8–3.2 (with payloads)</td></tr> <tr><td>Dimensions (in)</td><td>51 x30 x 10</td></tr> <tr><td>Top Speed</td><td>65 mph</td></tr> <tr><td>Max Flight Time</td><td>125 minutes</td></tr> <tr><td>Range (miles)</td><td>12 (clear line of sight)</td></tr> <tr><td>Payload Capacity (lb)</td><td>~1.1</td></tr> <tr><td>Payloads</td><td>Integrated Overwatch Gimbal 3-axis EO/IR camera, Mapping Array-39 MP, 3 RGB camera array</td></tr> <tr><td>Ground Control Station</td><td>FlightWave Ground Control Station</td></tr> <tr><td>Software</td><td>FlightWave Mission Planner</td></tr> <tr><td>Obstacle Avoidance</td><td>No</td></tr> <tr><td>Live-stream Capability</td><td>Yes</td></tr> <tr><td>IP Rating</td><td>54</td></tr> <tr><td>MSRP</td><td>\$31,000</td></tr> <tr><td>GSA Pricing Available</td><td>No</td></tr> </table>	Flight Configuration	Hybrid	Weight (lb)	2.8–3.2 (with payloads)	Dimensions (in)	51 x30 x 10	Top Speed	65 mph	Max Flight Time	125 minutes	Range (miles)	12 (clear line of sight)	Payload Capacity (lb)	~1.1	Payloads	Integrated Overwatch Gimbal 3-axis EO/IR camera, Mapping Array-39 MP, 3 RGB camera array	Ground Control Station	FlightWave Ground Control Station	Software	FlightWave Mission Planner	Obstacle Avoidance	No	Live-stream Capability	Yes	IP Rating	54	MSRP	\$31,000	GSA Pricing Available	No	
Flight Configuration	Hybrid																															
Weight (lb)	2.8–3.2 (with payloads)																															
Dimensions (in)	51 x30 x 10																															
Top Speed	65 mph																															
Max Flight Time	125 minutes																															
Range (miles)	12 (clear line of sight)																															
Payload Capacity (lb)	~1.1																															
Payloads	Integrated Overwatch Gimbal 3-axis EO/IR camera, Mapping Array-39 MP, 3 RGB camera array																															
Ground Control Station	FlightWave Ground Control Station																															
Software	FlightWave Mission Planner																															
Obstacle Avoidance	No																															
Live-stream Capability	Yes																															
IP Rating	54																															
MSRP	\$31,000																															
GSA Pricing Available	No																															



- The Flightwave Edge 130 uses Lithium Ion 86.4 Wh, 14.8V 6AH battery pack (4s2p).
- Operating and storage temperature ranges are 20°F to 115°F.
- Recommended maintenance includes checking propellers and tilt pods before every flight and replacing propellers every 10,000 hours.
- MSRP includes the Edge 130 Blue drone, Edge 130 Blue ground control station and charger, FlightWave Mission Planner, two lithium-ion battery packs and charger, two sets of propellers, Overwatch Gimbal camera payload and data storage card, Mapping Array camera payload and data storage card, Military grade hard case (standard MIL-C-4150J), FlightWaveCare warranty and Edge 130 Blue Training Module.
- The Edge 130 has a one-year manufacturer’s warranty. Extended warranties are not offered.
- Flight Wave offers a two-hour online training with the purchase of Pro Kit. Optional in-person half day training is available in Van Nuys, California for \$3,000.

3.7 Freely Systems, ALTA X

 <p>Figure 3-7 ALTA X drone and Pilot Pro ground control station option Image credit: Freely Systems</p>	<p>Flight Configuration Multirotor</p> <p>Weight (lb) ~44</p> <p>Dimensions (in) 89.5 x 89.5 x 15.2</p> <p>Top Speed 60 mph</p> <p>Max Flight Time 50 minutes</p> <p>Range (miles) ~9</p> <p>Payload Capacity (lb) 35</p>	<p>Bottom payload mount for a wide variety of sensors including Mōvi Carbon, high speed 4K Phantom Veo, Gimballed EO/IR, Hyperspectral sensors, mapping cameras, lidar, and LED lights. Optional FPV camera.</p>
	<p>Ground Control Station UVX Navigator Tablet or Pilot Pro</p> <p>Software QGroundControl</p> <p>Obstacle Avoidance No</p> <p>Live Stream Capability Yes</p> <p>IP Rating N/A</p> <p>MSRP \$18,000–\$36,000</p> <p>GSA Pricing Available Yes</p>	


- The ALTA X requires two 44.4V ALTA X 12S lithium polymer batteries. Each battery weighs 9.85 pounds and provides 710.4 Wh.
- Operating temperature range is -4°F to +122°F. Storage temperature range is -32°F to +122°F.
- Recommended maintenance includes inspecting fastener tightness every 15 flights; wear components and bomb ring latch tightness every 15 flight hours; battery maintenance every three months; and getting it serviced by Alta every year or every 1,000 flight hours.
- The MSRP for the ALTA X includes the drone, cargo landing gear, two flight pack batteries, dual battery charger, UVX Navigator tablet, and travel case.
- Freely Systems provides a one-year limited warranty on parts and labor that does not, however, cover batteries. Extended warranties are not available.
- Freely Systems provides U.S.-based support and makes their documentation available online via Wiki, Knowledge Base and Forums.
- Freely Systems offers one- and two-day training courses at Freely’s facility or on-site for an additional cost, as well as documentation online via Wiki, Knowledge Base and Forums.

3.8 Freefly Systems, Astro

	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p>	<p>Multicopter</p> <p>11.4</p> <p>55.4 x 55.4 x 14.1</p> <p>33.6 mph</p> <p>37 minutes</p> <p>1.2</p> <p>3.3</p>
 <p>Figure 3-8 Astro drone and Pilot Pro ground control station <i>Image credit: Freefly Systems</i></p>	<p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>LR1 Payload, Gimbaled Alpha 7R IVA Mapping Camera, Wiris Pro Payload, Sentera 6X Multispectral, Sentera 6X Thermal, Sentera 65R, Hovermap ST-X</p> <p>Pilot Pro</p> <p>QGC Gov</p> <p>No</p> <p>Yes</p> <p>Tested to IP43</p> <p>\$26,000</p> <p>No</p>

- The Astro requires two SL-8 Air Batteries. These batteries are 6S 21.6V batteries that each weigh 2.28 pounds and provide 157 Wh.
- Operating and storage temperature ranges are -4°F to $+122^{\circ}\text{F}$.
- Recommended maintenance: after every 15 hours, perform a detailed visual inspection of the aircraft, propeller blades and fasteners, vibration isolators, propeller blade washers, landing gear, propeller tension and boom latch tightness. After every 250 flight hours, inspect all fastener locations, check the tightness of motor mounts, propeller mount bolts, prop tension, payload isolation mount, compass mounting bolts, GPS antenna, landing gear bolts, and any payload fasteners. Every three months, inspect the SL 8 batteries. Annually, or every 750 flight hours, send the Astro to Freefly for inspection.
- The MSRP includes the drone, Pilot Pro Controller (Doodle Labs RF, NDAA and DIU Blue 2.4 GHz radio), neck strap for the controller, travel cases for the drone and the controller, three hex drivers (1.55 mm, 2 mm, 2.5 mm), four Proptectors, and spare parts (one Proptector, four isolators and two rubber hole grommets). The MSRP does not include batteries or chargers.
- Accessories available for the Astro include batteries, chargers, spare parts (e.g., kits, propellers, landing gear), and vibration isolator sets. Available mount types include vibration isolation quick release gimbal, vibration isolation cheese plate, and toad in the hole.
- Freefly Systems provides a one-year limited warranty on parts and labor that does not, however, cover batteries. An additional year of warranty that includes a prepaid annual checkup is available for \$4,500.
- Freefly Systems provides U.S.-based customer support and makes their documentation available online via Wiki, Knowledge Base and Forums.
- Freefly Systems offers a one-day training course at Freefly's facility for \$1,200, and a two-day training for \$2,000 per trainee.

3.9 Inspired Flight, IF800 Tomcat

 <p>Figure 3-9 IF800 Tomcat drone and Jeti DS-12 ground control station <i>Image credit: Inspired Flight</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multirotor</p> <p>18.7</p> <p>51.8 x 44.8 x 20.3</p> <p>49 mph</p> <p>54 minutes</p> <p>2.3</p> <p>6.6</p> <p>Bottom-mounted payloads include optical cameras (Phase One iXM-100, Sony A7R) EO/IR (WorksWell WISIR Enterprise), lidar (YellowScan Vx-20, YellowScan Mapper, RIEGL VUX-120), and Micasense Altum multispectrum</p> <p>Jeti DS-12, RFD 900X-US, and encrypted laptop ground station</p> <p>QGroundControl or Mission Planner</p> <p>No</p> <p>Yes</p> <p>43</p> <p>\$25,000</p> <p>Yes</p>
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- The IF800 Tomcat uses two Inspired Flight Tattu 22.8 V lithium polymer smart batteries. Each battery weighs 4.1 pounds and provides 387.6 Wh.
- Operating temperature range is -4°F to $+113^{\circ}\text{F}$. Storage temperature range was not available.
- Recommended maintenance includes preflight inspections, as well as conducting inspections (1) after one month or 50 hours of flight time (e.g., checking that all visible screws are secured and free of defects, cleaning the aircraft and motors with compressed air, ensuring propeller screws going into the motor are secured, checking the metal clips inside the propeller hub for cracking and other visible damage, and inspecting the rubber battery clamp fasteners for deterioration and visible defects); (2) after three months or 100 hours of flight time (checking batteries and motors for wear and tear or other visible damage); and (3) after five months or 200 hours flight time (replacing the propellers and batteries). Additionally, Inspired Flight recommends sending the UAS to them for motor replacement and overall inspection after 1,500 hours of flight time.
- The MSRP for the IF800 Tomcat includes JETI DS-12, 1 RFD 900X-US, encrypted ruggedized laptop ground station, six folding Propellers, two spare folding propellers, one rugged transport case measuring 32" x 21" x 13" and weighing 40 pounds (with drone and accessories).
- Accessories available for purchase include a battery kit (four IFT high voltage smart batteries, one battery charger, and a rugged transport case for \$3,250), and a spare parts kit (four folding propellers, two arm assemblies, one full set of landing gear, and one tool kit for \$3,500).
- Inspired Flight provides a one-year limited warranty with the purchase and offers several extended warranty plans for an additional cost, including Inspired Care Basic (yearly contracts up to three years for \$2,000 per year); Inspired Care Plus (yearly contracts up to three years for \$3,000 per year); and Inspired Care Elite (annual contracts up to three years for \$5,500 per year).
- Inspired Flight offers a free live chat 60-minute virtual training session. Inspired Flight also offers one-to three-day training on the IF800 at Inspired Flight or at a location chosen by the customer for \$2,000 per day (with travel expenses paid by the customer). Inspired Flight also offers rental aircraft and payloads as well as commercial pilot services for hire (\$100–\$300 per hour).
- The IF800 Tomcat is Remote ID-compliant.

3.10 Inspired Flight, IF1200A

 <p>Figure 3-10 IF 1200A drone and Jeti DS-12 ground control station <i>Image credit: Inspired Flight</i></p>	<p>Flight Configuration</p> <p>Weight (pounds)</p> <p>Dimensions (inches)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (pounds)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multirotor</p> <p>35.9</p> <p>65.1 x 60.6 x 30.2</p> <p>56 mph</p> <p>43 minutes</p> <p>2.3</p> <p>19.1</p> <p>Phase One iXM-100 (Optical), Sony A7R (Optical), WorksWell WISIR Enterprise (EO/IR), YellowScan Vx-20, YellowScan Mapper (lidar), RIEGL VUX-120 (lidar), Micasense Altum (multispectrum)</p> <p>Jeti DS-12, RFD 900X-US, Herelink Controller, and encrypted laptop ground station</p> <p>QGroundControl or Mission Planner</p> <p>No</p> <p>Yes</p> <p>N/A</p> <p>\$35,000</p> <p>Yes</p>
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- The IF1200A uses two Tattu 44.4v, 16Ah compact Li-Po smart batteries with 710.4 Wh, each weighing 9.4 pounds.
- The IF1200A features 128–256bit AES encryption. The Herelink Blue GCS uses 128bit AES encryption.
- Operating temperature range is -4°F to $+113^{\circ}\text{F}$. Recommended storage temperature range is 60°F to 80°F .
- Recommended maintenance includes preflight inspections, as well as conducting inspections (1) after one month or 50 hours of flight time (e.g., checking that all visible screws are secured and free of defects, cleaning the aircraft and motors with compressed air, ensuring propeller screws going into the motor are secured, checking the metal clips inside the propeller hub for cracking and other visible damage, and inspecting the rubber battery clamp fasteners for deterioration and visible defects); (2) after three months or 100 hours of flight time (checking batteries and motors for wear and tear or other visible damage); and (3) after five months or 200 hours flight time (replacing the propellers and batteries). Additionally, Inspired Flight recommends sending the UAS to them for motor replacement and overall inspection after 1,500 hours of flight time.
- The MSRP includes JETI DS-12, 1 RFD 900X-US, encrypted ruggedized laptop ground station, two spare folding propellers, one Blue Herelink controller, and one rugged transport case, which measures 26" x 26" x 23" and weighs 64 pounds (with drone and accessories inside).
- Accessories include a battery kit (four 16AH Compact batteries, one TA3000 battery charger, one Pelican transport case for \$5,500) and a spare parts kit (six folding propellers, one clockwise arm assembly, one counterclockwise arm assembly, one full set of landing gear, and one tool kit for \$3,500).
- Inspired Flight provides a one-year limited warranty with the purchase. Inspired Flight also offers several extended warranty plans for an additional cost, including Inspired Care Basic (yearly contracts for up to three years for \$3,000 per year); Inspired Care Plus (yearly contracts for up to three years for \$4,000 per year); and Inspired Care Elite (annual contracts for up to three years for \$7,500 per year).
- Inspired Flight offers a free live chat 60-minute virtual training session. Inspired Flight also offers one-to three-day training sessions on the IF1200A at Inspired Flight or at a location chosen by the customer for \$2,000 per day (with travel expenses paid by the customer). Inspired Flight also offers rental aircraft and payloads and commercial pilot services for hire (\$100–\$300 per hour).
- The IF1200A is Remote ID compliant.

3.11 Parrot Drones, Parrot ANAFI USA GOV

	Flight Configuration Weight (lb) Dimensions (in) Top Speed Max Flight Time Range (miles) Payload Capacity (lb)	Multirotor 1.1 11.10 x 14.68 x 3.22 32.88 mph 32 minutes 3 None	
	Payloads Ground Control Station	Two integrated RGB 21 MP cameras (wide, telephoto) and one FLIR BOSON 320 x 256 IR camera Parrot Skycontroller USA equipped with Android tablet	
<p>Figure 3-11 ANAFI USA GOV drone and Parrot Skycontroller USA ground control station</p> <p><i>Image credit: Parrot</i></p>		Software Obstacle Avoidance Live Stream Capability IP Rating MSRP GSA Pricing Available	FreeFlight 6 USA No Yes 53 \$14,000 Yes


- The Parrot ANAFI uses a Li-Po battery that weighs 0.43 pounds and provides approximately 40 Wh.
- Operating temperature range is -33°F to +122°F. Recommended storage temperature range is 60°F to 80°F.
- The MSRP for the ANAFI USA GOV includes the drone, three batteries, Skycontroller USA, one multi-port fast USB charger, one Skycontroller USA charger, one additional set of propeller blades, three USB-A/USB-C cables, one USB-C/USB-C cable, and a hard case for storage and transport, which measures 17" x 13" x 7" and weighs 11.9 pounds (with drones and accessories inside).
- Accessories, such as spare propellers and smart batteries, are available to purchase separately.
- The Parrot ANAFI USA GOV has a one-year manufacturer's warranty.
- Customer support for the ANAFI USA GOV is available from the place of purchase and training is available from third party vendors.

3.12 Performance Drone Works (PDW), C100

  <p>Figure 3-12 C100 drone with UXV Technologies SRoC controller <i>Image credit: PDW</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p>	<p>Multirotor</p> <p>20.9</p> <p>63 x 65 x 11</p> <p>32</p> <p>75 minutes with ISR Payload</p> <p>6.2</p> <p>10 (with standard batteries) 15 (with heavy lift batteries)</p> <p>4K HDR Color FPV Camera; Swappable payloads including HD40-LV; NextVision Raptor, Dragon Eye, x80; Trillium HD40-XV, and mechanical release device for dropping two separate payloads.</p>
	<p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>UXV Technologies SRoC Controller</p> <p>QGroundControl</p> <p>Yes</p> <p>Yes</p> <p>Tested to IP54</p> <p>\$120,000</p> <p>In process</p>

- The C100 uses four Long Endurance Performance Smart Li-ion batteries, which provide approximately 211 Wh. Additional battery combinations are offered that balance weight, payload capacity, and flight endurance.
- The C100 is AES-256 encrypted, TAK compatible, and uses radio frequency: M1-M6 (1.6 GHz to 2.5 GHz)
- Operating temperature range is 10°F to 135°F. Storage temperature range is -4°F to +140°F.
- Recommended maintenance includes inspecting all critical flight components before each flight. After 25 hours or 30 days, inspect fasteners and tighten loose fasteners to defined torque specifications. After 50 hours or 60 days, check for component wear and tear.
- The MSRP includes C100 aircraft; UXV SROC CGS; field deployment ruck; ruggedized case for aircraft, accessories and sensor storage; 12 long endurance performance smart batteries; charging case; four spare props; four spare legs; two spare antennas; three-year software maintenance and support; and one-year PDW limited warranty.
- Accessories, such as spare propellers, spare smart batteries, sensors, and mechanical release device for dropping two separate payloads, are available to purchase separately.
- PDW provides customer service 24 hours a day, seven days a week via email and phone.
- Two-day training covering preflight operations, day/night, and post flight, field, and depot maintenance is available at the customers' location for \$10,000 and an additional one-day instructor reach back course is available for \$8,000.

3.13 Skydio, X2D (1.8 GHz EO/IR)

 <p>Figure 3-13 X2D drone and Skydio Enterprise controller <i>Image credit: Skydio</i></p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multirotor</p> <p>3</p> <p>26.1 x 22.4 x 8.3</p> <p>31 mph</p> <p>35 minutes</p> <p>6.2 miles</p> <p>0.66</p> <p>Integrated EO/IR: Sony IMX577 1/2.3" 12.3 MP CMOS (EO) and FLIR Uncooled VOx microbolometer (IP)</p> <p>Skydio Enterprise controller</p> <p>Skydio Enterprise application and QGround Control</p> <p>Yes</p> <p>Yes</p> <p>N/A</p> <p>\$23,997</p> <p>Yes</p>
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- X2D requires one lithium-ion battery which provides 94.71 Wh.
- The X2D uses AES-256 wireless encryption.
- Skydio X2D is also available as X2D 1.8 GHz EO, X2D 5 GHz EO, X2D 5 GHz EO/IR, X2D Multiband.
- Operating and storage temperature ranges are 14°F to 109°F.
- The MSRP for the starter kit includes Skydio X2D 5 GHz drone with EO/IR payload, Skydio Enterprise controller, three batteries, dual charger, spare propeller blades set, tactical soft case, and hard case (which measures 22" x 14" x 10" and weighs 23 pounds), and Skydio Autonomy Enterprise perpetual license with one year maintenance and support.
- Accessories available for purchase separately include spare batteries (\$369 each), spare battery chargers (\$439 each), spare propeller kits (\$129 each), spare hardstops (\$29 each), and spare encryption keys (\$499 each).
- Skydio provides a one-year limited manufacturer's warranty. An optional three-year maintenance and support plan is also available for an additional cost.
- Skydio offers a two day in-person training course on the operation of the Skydio X2D, Skydio Enterprise controller, Skydio Enterprise app, and Skydio Autonomy Enterprise software, consisting of a ground school in the classroom and live flight training in the field for up to four students (\$7,800 per student).

3.14 Skydio, X10D (All-Environment Starter Solution [Multi-Band, IR] NA + VT300-Z Kit)


	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multicopter</p> <p>4.7</p> <p>31.1 x 25.6 x 5.7</p> <p>45 mph</p> <p>40 minutes</p> <p>7.45</p> <p>0.77</p> <p>Integrated EO/IR</p> <p>Skydio Enterprise Connect SL/MH</p> <p>QGC Gov</p> <p>Yes</p> <p>Yes</p> <p>55 (drone) 54 (controller)</p> <p>\$25,650</p> <p>Yes</p>
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Figure 3-14 X10D drone and Skydio Enterprise Connect SL/MH ground control station

Image credit: Skydio

- The X10D uses an 18.55V lithium-ion polymer battery with 150 Wh. that weighs 1.56 pounds.
- Operating temperature range is -4°F to +113°F. Storage temperature range was not available.
- Recommended maintenance: after every 10 hours of flight, manually spin motors to check for smooth operation then check arm stops, arm hinge, landing legs, navigation camera protective fins, battery bay, fan inlet, sensor cameras, gimbal motors, and gimbal isolators. At 50 flight hours, inspect the propeller hub, motor wires, fasteners, arm welds, gimbal frame, attachment brackets, USB-C port seals and test lights. At 250 flight hours, replace damaged or worn propellers.
- The MSRP for the Skydio X10D includes one Skydio X10D multi-band drone, one multi-band enterprise controller, one VT300-Z sensor package, one pro case, two wall adapters with USB cable, one set additional propellers, two 256 GB micro SD cards, three batteries, and one dual charger. The MSRP also includes one security key, one subscription to Skydio Autonomy, and one Skydio NightSense perpetual license and hardware with three years of maintenance and support. The perpetual license is non-transferable.
- Skydio provides a one-year limited manufacturer’s warranty.
- Skydio offers in-person training at \$9,000 per four students, as well as an online training for \$300 per student.

3.15 Teal Drones, Teal 2

 <p>Figure 3-15 Teal 2 drone and Teal Air Control ground control station Image credit: Teal Drones</p>	<p>Flight Configuration</p> <p>Weight (lb)</p> <p>Dimensions (in)</p> <p>Top Speed</p> <p>Max Flight Time</p> <p>Range (miles)</p> <p>Payload Capacity (lb)</p> <p>Payloads</p> <p>Ground Control Station</p> <p>Software</p> <p>Obstacle Avoidance</p> <p>Live Stream Capability</p> <p>IP Rating</p> <p>MSRP</p> <p>GSA Pricing Available</p>	<p>Multicopter</p> <p>2.75</p> <p>17 x 19 x 3</p> <p>23 mph</p> <p>30 minutes</p> <p>~3.1 miles</p> <p>~0.55</p> <p>Integrated FLIR Hadron 640R dual EO/IR</p> <p>Teal Air Control (TAC)</p> <p>Teal QGC, Tomahawk Robotics Kinesis, ATAK UAS Tool</p> <p>No</p> <p>Yes</p> <p>53</p> <p>\$15,809</p> <p>Yes</p>
	<ul style="list-style-type: none"> • The Teal 2 requires one Teal Performance Battery Pack, a 22,2 V Li-ion battery pack that weighs approximately 0.84 pounds and produces 60 Wh. • Operating and storage temperature ranges are -32°F to +110°F. • Recommended maintenance includes replacing the propellers every 25 flight hours. • The MSRP for the Teal 2-2.4 GHz system includes the Teal 2, 2.4 GHz drone; Hadron payload with 16MP EO and 640x512 IR, Teal Air controller (TAC), two battery/charger kits (each kit includes one charger and two batteries), Teal 2 tactical cases, field repair kit (tools, two rotor arms, one set of propellers, micro SD card), quick start guide and transport case, which measures 16"W x 9"D x 12"H and weighs six pounds (with drone and accessories inside). • Accessories including spare parts and spare batteries are available for purchase separately. • The Teal 2 has a one-year manufacturer's warranty. • Teal provides online training videos, guides and manuals. 	

3.16 Vantage Robotics, Vesper



	Flight Configuration	Multirotor
	Weight (lb)	1.54
	Dimensions (in)	18.7 x 19.6 x 3.1
	Top Speed	40 mph
	Max Flight Time	54 minutes
	Range (miles)	~3.1 miles
	Payload Capacity (lb)	None
	Payloads	Integrated Dual 4K Sony IMX 334 EO image sensors, One Seek IR sensor in the Axiom Greenseer gimbal.
	Ground Control Station	Vision 1 or Vision 2 CGS or ATAK UAS Tool
	Software	QGroundControl, ATAK UAS Tool, Autodyne Nexus, or DroneSense
	Obstacle Avoidance	No
	Live Stream Capability	Yes
	IP Rating	54
	MSRP	\$12,995 for 2.4 GHz bundle \$13,950 for 1.8 GHz bundle
	GSA Pricing Available	Yes

Figure 3-16 Vesper drone and Vision ground control station option

Image credit: Vantage Robotics

- The Vesper uses a Li-Po 4S65 Wh smart battery that magnetically attaches to the Vesper fuselage.
- Operating temperature range is -4°F to $+113^{\circ}\text{F}$. Storage temperatures range is -4°F to $+140^{\circ}\text{F}$.
- Maintenance includes situational pre- and post-flight cleaning for operations in dust or rain, and quarterly battery charging when in storage.
- The MSRP for the Vesper includes Vesper aircraft (with 1.8 or 2.4 GHz radio), Vision2 GCS (1.8 GHz or 2.4 GHz), SRM-S with applicable radio, Recon Rotor Set, Vesper Field Case, Battery, chargers for CGS and UAS, Vesper Field Repair Kit, and transport case.
- Accessories, such as replacement fuselages, reconnaissance rotor sets, shrouded rotor sets, batteries and other components are available for purchase separately.
- The Vesper offers a Vantage limited warranty.
- Vantage Robotics offers web-based, telephone and video support weekdays from 8 AM–8PM Eastern time.
- Vantage Robotics offers a three-day Vesper Basic Operating Course at an additional cost.

3.17 Wingtra, WingtraOne Gen II



Figure 3-17 WingtraOne Gen II and rugged Samsung Galaxy Tab Active 3 ground control station

Image credit: Wingtra

Flight Configuration	Hybrid
Weight (lb)	10
Dimensions (in)	49.2 x 26.8 x 4.7
Top Speed	35.8 mph
Max Flight Time	59 minutes
Range (miles)	~1.9
Payload Capacity (lb)	1.1
Integrated Payload	Sony RX1R II, Sony a6100, Micasense RedEdge-P, Hesai XT32-M2X Lidar
Ground Control Station	Rugged Samsung Galaxy Tab Active 3 with radio
Software	WingtraPilot
Obstacle Avoidance	Yes
Live Stream Capability	No
IP Rating	54
MSRP	\$19,900*
GSA Pricing Available	Yes

- The WingtraOne Gen II requires two batteries. It uses the Wingtra Battery 2 which is a 4s3p 14.4V Li-ion that weighs 1.3 pounds and provides 99 Wh.
- Wingtra’s Blue License subscription (\$4,900/year) includes ChaCha20 encryption with up to a six-mile telemetry range, air-gapped mode, i.e., operations in disconnected environments with offline maps and elevation data.
- Operating temperature range is 14 °F to 104 °F. Storage temperature range was not available.
- Maintenance on the WingtraOne Gen II should be done every 50 flights hours by visually inspecting the hull, middle stand, side stands, propellers, motor mounts, flaps, and flight batteries for damage. Replace electronic speed controller after 300 flight hours.
- The MSRP for WingtraOne GEN II base package includes Wingtra UAV, Samsung Tab Active 3 with WingtraPilot installed, 2.4 GHz telemetry module, charging station, two set of batteries, carrying sleeve, and carrying case for accessories (which includes one spare propeller and anemometer).
- Accessories for the WingtraOne Gen II include sensors such as RGB61 Payload Kit (\$9,572), Wingtra RX1 RII Payload Kit (\$7,657), Micasense RedEdge-MX Payload Kit (\$6,284), Micasense RedEdge-P Payload Kit (\$9,975) and a PPK unlimited software license (\$6,000, not included in MSRP).
- A warranty is not included with purchase, but a warranty and user fault coverage without a deductible and valid for three years from its start date can be purchased for \$25,000 per aircraft. This includes consumables and unlimited seats for online training. Other warranties and training options are also available through WingtraOne.
- Customer support is available by phone, text, or email.

4.0 MANUFACTURER CONTACT INFORMATION

Additional information on the Blue UAS included in this market survey report can be obtained from the manufacturers listed in Table 4-1.

Table 4-1 Manufacturer Contact Information

Manufacturer/Vendor	Website	Address	Phone Number	Email Address/Web Form
AgEagle Aerial Systems	ageagle.com	8201 E 34th Street N Suite 1307 Wichita, KS 67226	620-325-6363	ageagle.com/contact
Anduril	www.anduril.com	2722 Michelson Drive Irvine, CA 92612	949-891-1607	contact@anduril.com
Ascent AeroSystems	ascentaerosystems.com	100 Research Drive Wilmington, MA 01887	617-932-7874	ascentaerosystems.com/contact
Blue Halo	bluehalo.com	4906 Research Drive NW, Huntsville, AL 35805	703-718-4050	bluehalo.com/bluehalo-contact
Easy Aerial	www.easyaerial.com	141 Flushing Ave, Building 77 Suite 610, Brooklyn, NY 11205	718-406-5293	www.easyaerial.com/contact
FlightWave Aerospace Systems Corporation	www.flightwave.aero	1617 Broadway, 3rd Floor, Santa Monica, CA 90404	866-359-5664	govsales@flightwave.aero
Freefly Systems	freeflysystems.com	15540 Woodinville Redmond Road NE Suite 800 Woodinville, WA 98072	425-485-5500	freeflysystems.com/contact
Inspired Flight	inspiredflight.com	225 Suburban Road San Luis Obispo, CA 93401	805-776-3640	Sales@inspiredflight.com
Parrot Drones	www.parrot.com/us	1815 Purdy Avenue, Miami Beach, FL, 33139	855-431-7993	sales@caroneast.com
Performance Drone Works (PDW)	www.pdw.ai	3414 Governors Drive, Suite 350, Huntsville, AL 35805	256-535-2000	info@pdw.ai
Skydio	www.skydio.com	3000 Clearview Way San Mateo, CA 94402	855-463-5901	pages.skydio.com/contact

Manufacturer/Vendor	Website	Address	Phone Number	Email Address/Web Form
Teal Drones	tealdrones.com	2800 S W Temple Street Unit 2 South Salt Lake, UT 84115	385-281-8415	tealdrones.com/contact
Vantage Robotics	vantagerobotics.com	14477 Catalina Street San Leandro, CA 94577	510-564-4225	sales@vantagerobotics.com
Wingtra	wingtra.com	100 SE 3rd Avenue 10th Floor Fort Lauderdale, FL 33394	N/A	hello@wingtraone.com

5.0 CONCLUSIONS

Over the past decade, first responders have begun integrating sUAS as a resource for a variety of operational applications. UAS, often referred to as drones, can provide first responders with an aerial view of their environment and can be outfitted with various sensors tailored to different applications. UAS are used by first responders in support of public safety activities such as search and rescue, firefighting, and post incident reconstruction.

Publication of the Blue UAS Cleared List, or “Blue List,” by DoD’s DIU may aid responder agencies with their acquisition processes. UAS on the Blue List, or “Blue UAS,” have been vetted to be compliant with DoD policy. This market survey report provides information on 17 UAS – 14 multi-rotor, two hybrid and one fixed-wing – all of which are classified as small UAS (weighing under 55 pounds) and were included on the Blue List during the research and development of this market survey report. Their prices range from \$12,995 to \$120,000; note that prices of two products was not available. These platforms vary in size, weight, features, potential use cases and performance.

- Fifteen platforms can carry a payload, ranging from less than one pound to 35 pounds
- Fourteen platforms have live-streaming capabilities that would allow a real-time feed from the camera to be viewable on a ground control station
- Six products feature obstacle avoidance technology that can scan for, detect, and react to environmental obstacles in real-time to mitigate collisions

Additional specifications such as ground control stations, maximum flight times and IP ratings may also be of interest to responder agencies.

Emergency responder agencies should carefully research the overall capabilities and limitations of UAS in relation to their agency’s operational needs and consult the evolving Blue List for the most current approved platforms and payloads, when making equipment selections.

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Appendix A. INGRESS PROTECTION LEVELS (IP CODE)

This section provides information on the levels of ingress protection as specified by the 2-digit designations in the IEC 60529 standard [6]. Table A-1 provides levels of solid ingress protection (first digit). Table A-2 provides levels of liquid ingress protection (second digit).

Appendix Table A-1 Levels of Solid Ingress Protection per First Digit of IP Code

Digit	Object Size Effective Against	General Description
0	No Protection	No protection against contact and ingress of solids
1	> 50 mm	Large surfaces, e.g., back of hand, but no protection against deliberate contact with body part
2	> 12.5 mm	Prevents entry of fingers and similarly sized objects
3	> 2.5 mm	Prevents entry of tools, thick wires, etc.
4	> 1 mm	Prevents entry of most wires, screws, large ants, etc.
5	Dust Protected	Dust ingress not entirely prevented but does not enter in sufficient quantity to interfere with satisfactory operation of equipment
6	Dust Tight	No ingress of dust

Appendix Table A-2 Levels of Liquid Ingress Protection per Second Digit of IP Code

Digit	Water Exposure Protection	General Description
0	No Protection	No protection
1	Vertically dripping water	Vertically dripping water has no harmful effects
2	Dripping water, enclosure tilted up to 15 degrees	Vertically dripping water has no harmful effects when enclosure is tilted at an angle up to 15 degrees of normal vertical position
3	Spraying water	Water sprayed at angles up to sixty degrees from the vertical position has no harmful effects
4	Splashing water	Water splashed against the enclosure from any direction has no harmful effect
5	Water jets	Water projected by a nozzle (6.3 mm) against enclosure from any direction has no harmful effects
6	Powerful water jets	Water projected in powerful jets against the enclosure from any direction has no harmful effects
7	Temporary immersion in water	Ingress of water in harmful quantity is not possible when the enclosure is temporarily immersed in water under standard conditions or pressure and time
8	Continuous immersion in water	The equipment is suitable for continuous immersion in water under conditions more severe than for numeral 7