



DRONERESPONDERS
Public Safety Alliance

DRONERESPONDERS.ORG

UNMANNED AIRCRAFT SYSTEM PROGRAM CONSIDERATIONS/GUIDELINES

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The following guidelines/considerations are provided to ensure a safe, legal and effective implementation of an unmanned aircraft system (UAS) program.

General Thoughts:

Creating a Public UAS Program is a complex undertaking. Based on the experience of successful programs, the following information is provided to assist in starting a UAS program.

1. Know what is involved. Creating a UAS program requires governance, policies and procedures, defined missions, selection of unmanned aircraft and payloads, training/proficiency, data management, maintenance, thorough documentation of training and flights and ensure protection of civil rights and privacy.
2. Understand the cost implications for the unmanned aircraft system, extra batteries, payload sensors, data storage, software applications, video streaming, training, operational and personnel resource costs.
3. Agency remote pilots should be Federal Aviation Administration (FAA) 14 CFR Part 107 certified which requires passing a written knowledge test and \$150 fee for each remote pilot every 2 years.
4. As a public agency, it is recommended to obtain an FAA Certificate of Authorization (COA) which provides additional operational flight options. The combination of Part 107 and COA offer the most versatile options for flight. To obtain a Tactical BVLOS Waiver (TBVLOS) requires a COA.
 - a. Blanket COA
 - i. is usually issued within two weeks of completed application
 - ii. allows flight anywhere in the U.S. as specified by regulations
 - iii. provides night flight & flight over people within operational perimeter
 - b. Jurisdictional COA
 - i. is a defined geographic area, does much more coordination with airports and other aspects
 - ii. takes much longer time (months) because of the complexity and interactions necessary
 - iii. once approved, assists with flights near airports easier
5. Waivers
 - a. Emergency Situations - Special Government Interest (SGI – formerly eCOAs) - First responders and other organizations responding to natural disasters or other emergency situations may be eligible for expedited approval through our Special Governmental Interest (SGI) process. Operations that may be considered include: Firefighting, Search and Rescue, Law Enforcement, Utility or Other Critical Infrastructure Restoration, Damage Assessments Supporting Disaster Recovery Related Insurance Claims and Media Coverage Providing Crucial Information to the Public

To apply for a waiver through the SGI process you must be an existing Part 107 Remote Pilot with a current certificate OR you must have an existing Certificate of Waiver or Authorization (COA). To submit a waiver through this process, if immediate call the FAA's emergency number. Either before or after it will be necessary to fill out the [Emergency Operation Request Form](#) (MS Word) and send to the FAA's System Operations Support Center (SOSC) at 9-ator-hq-sosc@faa.gov. If approved, the FAA will add an amendment to your existing COA or Remote Pilot Certificate that authorizes you to fly under certain conditions for the specified operation. If denied, operators should NOT fly outside the provisions of their existing COA or part 107. Operators have the option to amend their requests. To access the SGI waiver request form, visit https://www.faa.gov/uas/advanced_operations/emergency_situations/

- b. First Responder Tactical Beyond Visual Line of Sight Waiver (TBVLOS) – NEW JULY 2020
 - i. CAN ONLY BE OBTAINED BY AGENCIES WITH A COA
 - ii. Can only be used in dangerous missions and for the purpose of safeguarding life.
 - iii. The operator may operate within 50 feet above the highest obstacle, no greater than 400 AGL or the highest ceiling in LAANC grids (UASFM value).
 - iv. The UAS must remain within 1500 feet laterally from the PIC.
 - v. PIC will return to Visual Line of Sight (VLOS) operations as soon as practical or upon termination of the threat.
 - vi. Anything beyond the requirements outlines require a Special Government Interest (SGI) Waiver through the FAA's Systems Operations Support Center.
 - vii. DRONERESPONDERS has published a customizable TBVLOS Waiver Request Template available on the DRONERESPONDERS .ORG website in the Resource Center in the Waivers folder.
6. As a remote pilot, there is a great responsibility as each is considered an aviation pilot as they are flying in the National Airspace (NAS) and potentially flying among other UAS and/or manned aircraft.
7. At all times, the Remote Pilot in Command (RPIC) is the final decision on if/when the UAS will or will not be flown.
8. Understand the airspace in the respective UAS operational area. Areas that include military bases, commercial airports, national parks and other restricted airspace may require additional planning and FAA waivers.
9. What mature public UAS programs have learned:
 - a. Agencies fly more missions than ever expected
 - b. Fly many more types of missions than originally planned
 - c. Most agencies start out small with one aircraft to learn
 - d. Needed to purchase additional aircraft and payloads for the missions being flown
 - e. Necessitated the need to train additional remote pilots
 - f. Required more training time
 - g. Some departments are reluctant to let their remote pilots leave for extended periods of time as public safety drone programs transition from "nice to have" to "need to have"
 - h. If they had known what they know now, they would have purchased a different UAS with different payloads.
10. Today, some popular models of UAS provide both visual image and thermal image capabilities which can show both views side by side or separately.
 - a. Most desired payloads/capabilities: Hi-Def digital imaging/video, thermal imaging camera, live streaming video, video zoom, catch/release mechanism, spotlight and speaker
11. In addition to the aircraft & payload, there will be additional costs for extra batteries, parts, controllers, tablets, etc. It's important to know the full costs before starting a UAS program.
12. Utilization of software solutions for mapping, 3-D modeling and others require training, planning and meet any local, state and/or federal data requirements.

UAS Implementation Guidelines:

- Address privacy concerns (FIVE C's Document) at very beginning by engaging your jurisdiction's administration and elected officials from the start. Be transparent, with elected officials, the public and engage the ACLU. DRONERESPONDERS has a Public Outreach Program (Presentation and Methodology for Town Hall meetings as a Template) and can be found in the Resource Center on the DRONERESPONDERS.ORG website.
- Obtain and share success stories from other localities (there are plenty), learn from and share them with officials and the public.
- Define potential missions, plan to use the UAS for multiple mission types. Identify mission types from the beginning and learn from other agencies experiences.
- Purchase UAS or consider a service provider that will be able to meet your defined mission requirements. Consider one or two smaller/less expensive UAS to learn on and to use in precarious situations where the UAS may be contaminated.
- Identify & Implement a Fleet Management Program that can capture flights, battery usage, training, certifications and basically manage all of your operational data.
- Once UAS is purchased, identify if the UAS has programmed geofencing. If so, you can work with the manufacturer to have it removed. DJI will remove the geofencing permanently if a public agency.

- Create a multi-agency and/or multi-discipline UAS team when possible. This brings agencies together and shares the burden of cost of equipment, training and staffing resources.
- Develop a clear policy as to when UAS will be used for law enforcement surveillance and evidentiary purposes.
- Use search warrants as required.
- Establish guidelines within policy to ensure privacy.
- Develop policies and standard operating procedures that address governance, operations, risk assessment, remote pilot qualifications, job performance requirements, training, maintenance, flight documentation, airworthiness, data retention.
- Develop a logistics plan for support of operations (spare aircraft, extra batteries, spare propellers, support video streaming, etc.).
- Develop and explain a data plan for streaming/recording and retention policy (similar to police body-worn cameras).
- Develop and explain the training and skills proficiency plan and safety protocols.
- Utilize the NIST Standard Test Methods for Small Unmanned Aircraft Systems (RobotTestMethods.nist.gov) as minimum basic flight requirements and proficiency assessment.
- UAS is an air operation – if operating at an emergency incident, UAS Ops must be incorporated into the Incident Command System (ICS) to ensure airspace deconfliction from other UAS and manned aircraft (medical helicopter, wildland firefighting aircraft, news media, etc.).
- Develop a maintenance plan for aircraft, batteries, controllers, payload sensors and overall airworthiness.
- Identify liability issues, risk management planning and implement appropriate insurance.
- Hobbyist and recreational remote pilots should NOT be used in public missions as they are not allowed to do so by FAA Rules and regulations.

Tethered Drone Alternative

- For agencies not sure they want to develop a full blown UAS program, tethered drones may be an acceptable alternative to start and evaluate the value. Unlike free flight drones, tethered drones:
 - **Do NOT require a certificated remote pilot or visual observer** (as referenced in the FAA Reauthorization Act). This operation allows tethered public drone operations without a certificated remote pilot.
 - Provides continuous flight for hours because the tether also serves as a continuous power source.
 - Can be mounted in a compartment or on the roof of vehicle or in a portable case.
 - Can provide both visual optics and thermal imaging views.
 - Can stream live video to incident commanders and/or others who need access.
 - Is a simple operation of a one button launch and one button land.
- Utilize Public UAS Standards & Information to organize a UAS Program for more specific and detailed guidance:
 - Public Safety Aviation Accreditation Commission UAS Standards as a reference which can be accessed by visiting www.publicsafetyaviation.org
 - National Fire Protection Association Public Safety UAS Standards - www.nfpa.org/2400
 - ASTM Operational Standards for Small UAS - <https://www.astm.org/standardization-news/?q=update/operations-standards-for-small-unmanned-aircraft-systems-mj14.html>
 - ASTM F38 Subcommittee F38.03 on Personnel Training, Qualification and Certification - <https://www.astm.org/COMMIT/SUBCOMMIT/F3803.htm>
 - **ASTM 3379-20 - Standard Guide for Training for Public Safety Remote Pilot of Unmanned Aircraft Systems (UAS) Endorsement - <https://www.astm.org/Standards/F3379.htm> NEW**
 - For various examples of Public Safety UAS policies and procedures, visit the National Council on Public Safety UAS – www.publicsafetyUAS.org
 - ANSI UAS Standards Collaborative Roadmap - https://www.ansi.org/standards_activities/standards_boards_panels/uassc/overview
 - To join and participate in a nationwide grassroots public safety UAS initiative, visit www.DRONERESPONDERS.org

Join DRONERESPONDERS (it's FREE) and gain access to the Resource Center which contains over 400 public safety UAS documents (SOPS's, training info, checklists, best practices, reports and more. For additional information: Contact Chief Charles L. Werner (Ret.), Director DRONERESPONDERS Public Safety Alliance at email - Charles@DRONERESPONDERS.org