sUAS User’s Manual

M 3134.04

December 2021

Aviation Division
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Section 1  Introduction

The Washington State Department of Transportation (WSDOT) has implemented the use of Small Unmanned Aircraft Systems (sUAS) throughout several of its departments in support of its mission “to provide safe, reliable and cost-effective transportation options to improve communities and economic vitality for people and businesses.” In order to promote safe operations, ensure public and employee safety, and regulatory compliance while carrying out sUAS activities, WSDOT has developed and instituted this sUAS User’s Manual as a departmental guide. Secretary’s Executive Order Number E 1097.02 outlines Washington State Department of Transportation (WSDOT) policy for procurement and use of Unmanned Aircraft Systems (UAS), also known as “Drones” for WSDOT purposes.

Under the Federal Aviation Administration (FAA) Notice of Proposed Rulemaking (June 28, 2016, titled Operation and Certification of Small Unmanned Aircraft Systems), and continual application of evolving drone regulations, the FAA has established operating and certification requirements for drone operations. Part 107 to Title 14 of the Code of Federal Regulations creates the necessary framework for public and commercial operation of sUAS in the National Airspace System and provides safety rules for such operations.

1-1  Use of This Manual

This manual provides the basic framework necessary to maintain, mission plan and operate unmanned aircraft systems within WSDOT. Guidance contained in this user’s manual is intended to comply with FAA regulations, Washington Administrative Codes, Revised Code of Washington, and departmental directives for the use of sUAS weighing less than 55 pounds (25 kilograms). If conflict between the content of this manual and any federal or state regulations exists, the most stringent directive will be applied to ensure safe operations and compliance with regulatory guidance. sUAS Coordinators with direct supervisory roles may prescribe additional (add-to) requirements as needed to ensure safety and operational goals are met.

If regulations referenced in this manual change or safer and more effective operational methods are developed, it is the responsibility of all sUAS crew members to notify and provide input to their supervisory staff to effect changes to this document. The contents of this manual will at a minimum be reviewed annually for accuracy and relevance with current policies and regulations. WSDOT’s Aviation Division will be responsible for the coordination of the annual review of sUAS policy and this manual.

A copy of this manual and all forms specified herein shall be available at every location where sUAS operations are conducted. WSDOT sUAS team members shall study this manual and have a working knowledge of the policies and procedures contained herein.

Safety is the primary consideration for all WSDOT activities, therefore, sUAS operations are to be conducted in a manner that provides an accident free workplace. Planning should eliminate or mitigate the risk of injury to WSDOT personnel and bystanders, damage to equipment, the environment, and private and/or public property.

Ultimately, each sUAS crew member is responsible for their own safety and should asses their own limitations, notifying their supervisor immediately when a task or conditions are beyond their capability, training, or if they believe a situation is unsafe.

1-2  Operations During Periods of Emergency

Nothing in this manual shall be construed as to restrict the safe, rapid deployment of agency-owned or contracted sUAS in response to emergencies or exigent situations to protect life and limb, critical transportation infrastructure, and/or the environment.
Section 2  sUAS Purpose and Program Objectives

2-1 Purpose

WSDOT recognizes the following activities for which sUAS could be used in support of its daily operations. This list includes but is not limited to the following:

Project Operations and Management

- Planning
- Aerial mapping and surveying
- Project documentation
- Design
- Photogrammetry
- Construction
- Monitoring

Facilities/Maintenance Operations

- Planning
- Surveying
- Inspections

Emergency Operations

- Flooding
- Earthquakes
- Landslides
- Rock fall

Public Affairs

- Media relations
- Public outreach
- Operations and maintenance monitoring
- Visual analysis
- 3D reality mesh modeling
- Avalanche detection, monitoring, control
- Landslide/rock fall/debris flow investigation, monitoring, control
- Security
- Monitoring
- Debris flows
- Drought
- Damage to State facilities
- Education – (videography or photography) of facilities

To help meet these activity requirements, select WSDOT personnel shall be trained to provide the necessary expertise in a safe and professional manner. WSDOT sUAS activities are carried out by authorized teams of trained employees.

2-2 Objectives

Objectives of this user’s guide include:

- Ensure the safety of WSDOT sUAS team members and the public when conducting sUAS activities.
- Establish minimum guidelines for qualifications, safety, training, security, and operational procedures when conducting sUAS operations/projects.
- Identify policy to ensure sUAS operations do not intrude upon the privacy and civil rights of citizens and the general public.
- Facilitate the administration of sUAS activities within WSDOT.
Section 3  Definitions, Roles and Responsibilities

This section defines applicable terms and outlines the roles and responsibilities of each WSDOT employee directly involved in sUAS activities. For requirements related to using outside contracting services or coordinating missions/projects with other agencies and organizations, refer to Section 5.

3-1 Definitions

3-1.1 sUAS
sUAS – A Small Unmanned Aircraft System consists of an unmanned aircraft (defined by statute, as an unmanned aircraft weighing less than 55 pounds) and the equipment necessary for the safe and efficient remote operation of that aircraft (digital cameras, sensors and associated hardware and post-processing software).

3-1.2 Commonly Used Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGL</td>
<td>Above Ground Level</td>
</tr>
<tr>
<td>COA</td>
<td>Certificate of Waiver or Authorization (issued by the FAA)</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>HATS</td>
<td>Highway Activity Tracking System</td>
</tr>
<tr>
<td>BVLOS</td>
<td>Beyond Visual Line of Sight</td>
</tr>
<tr>
<td>NAS</td>
<td>National Air Space</td>
</tr>
<tr>
<td>RTH</td>
<td>Return to Home</td>
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<tr>
<td>RTL</td>
<td>Return to Landing</td>
</tr>
<tr>
<td>sUAS</td>
<td>Small Unmanned Aircraft System</td>
</tr>
<tr>
<td>VO</td>
<td>Visual Observer</td>
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<tr>
<td>PIC</td>
<td>Pilot in Command</td>
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</table>

3-2 Roles and Responsibilities

sUAS related duties to the extent applicable, will be included in the Classified Position Description (CPD) for many positions, including but not limited to: Engineers, Technicians, Inspectors, Environmental Scientists, Photographers, Videographers, Geologists, Geotechnical Specialists.

sUAS Personnel – consists of an approving authority for sUAS operations (or delegate), a Region/HQ Division level sUAS Coordinator, a region/HQ Division sUAS Remote Pilot, and may include a Visual Observer, Camera Operator, and Support Personnel.

sUAS Crew – sUAS crew members include the Pilot in Command (sUAS Remote Pilot), and at the discretion of the PIC or sUAS Coordinator may include a Visual Observer, Camera Operator, and Support Personnel.

sUAS Approving Authority – The Approving Authority will assign the duties of sUAS Remote Pilot and sUAS Coordinator to qualified WSDOT employees. Procurement of sUAS systems resides with the approving authority as referenced in paragraph 5.4 (Procurement of sUAS for Agency Use and Use of Privately Owned UAS) of this publication.
**sUAS Coordinator** – Is the administrator of the sUAS Program at a Region or HQ Division level. The sUAS Coordinator oversees and speaks to all sUAS activity within a Region or HQ Division including, but not limited to, contracting, procurement, planning, community engagement and outreach, mission execution, sUAS maintenance needs, incident response, training management, and records retention.

The Aviation Division is responsible for training sUAS Coordinators. The sUAS Coordinator responsibilities include, but are not limited to:

- Assigning a sUAS Remote Pilot and crew members, as necessary, for each sUAS mission.
- Scheduling and planning sUAS activities in a safe manner and in accordance with this manual and WSDOT policy.
- Reviewing the sUAS Mission Plan and Risk Assessment prior to the assigned sUAS activity (emergency responses excepted).
- Contact with the appropriate WSDOT staff for coordination of any nearby facilities, landowners or communities that may be affected by operating the sUAS in their vicinity.
- Serving as the point of contact for any concerns about the safety of sUAS activities.
- Terminating organic or contracted sUAS activities at any time due to unsafe or changing/unanticipated conditions encountered prior to or during flight.
- Ensuring a flight/project log record of all sUAS activities is kept on file in accordance with WSDOT record retention policy.

### 3-2.1 sUAS Remote Pilot and Pilot In Command Designation

**sUAS Remote Pilot** – Is a Part 107 certificated sUAS operator which performs flight control duties for the sUAS. A Pilot In Command is an assigned position of responsibility within the sUAS crew, and must be designated for every mission flown in accordance with [14 CFR Part 107.19](#). The PIC is the remote pilot responsible for the flight planning of assigned sUAS missions, obtaining mission approval, pre/during/post flight activities, and is ultimately responsible for the safe operation of the sUAS and compliance with all applicable regulations (14 CFR Part 107.19). Multiple remote pilots may participate in one flight operation under the supervision of a certificated PIC, such as when conducting operator training. Drone pilots must maintain all Remote Pilot certificate requirements outlined in [14 CFR Part 107.12](#) and this manual.

The sUAS PIC responsibilities include, but are not limited to:

- Conducting and documenting pre-flight assessments using the mission plan and risk assessment processes for review and approval.
- Performing thorough pre-flight inspections of the aircraft transmitter, and ensuring that all equipment and settings are in order prior to initiating flight.
- Conducting pre and post-mission briefings with the sUAS crew addressing crew readiness, environmental conditions, aircraft status, individual duties, emergency procedures, anticipated hazards and specific mission considerations for the sUAS.
- Ensure compliance with Pre-Activity Safety Plan, FAA remote pilot license certificate is on hand, any authorized Certificate of Waivers or related FAA documents, and the specific sUAS applicable manuals are available on-site.
- Operating the sUAS in a safe and effective manner in accordance with the manufacturer’s user manual.
- If required, designating a location where the visual observer (VO) and support personnel shall be positioned.
• Ensuring the sUAS is flown within 14 CFR Part 107 requirements.
• Coordinate for prior authorization of flights conducted in controlled airspace through governing agency (FAA/LAANC).
• Terminating sUAS activities at any time unsafe or unanticipated conditions occur prior to, during flight, or when non-participating manned aircraft enters flight operations area.
• Overseeing all onsite sUAS activities and ensuring that all activities are being carried out in a safe manner.
• Ensuring a copy of the sUAS Flight log is filed in Highway Activity Tracking System (HATS) for all missions flown.

3-2.2 sUAS Visual Observer (VO)

sUAS Visual Observer – A designated crewmember who has been provided with sufficient training to be able to clearly communicate and act as a second set of eyes for the sUAS Remote Pilot. The Visual Observer is assigned by the Pilot in Command and supports the sUAS Remote Pilot in identification of hazards that provides the Remote Pilot with sufficient time to ensure safe operation of sUAS or termination of flight prior to an incident or accident. The Visual Observer may also assist with any emergency response procedures in the event of an emergency, incident, or accident.

The sUAS Visual Observer responsibilities include, but are not limited to:
• Assisting the Remote Pilot in maintaining visual contact on the sUAS vehicle.
• Scanning the airspace where the sUAS is operating for any potential aircraft or collision hazards and maintaining a see-and-avoid awareness of the position of the aircraft and the surrounding airspace through direct visual observation.
• Assisting the Remote Pilot in identifying any potential hazards or changing conditions that may affect the mission or the safety of persons or property.
• Communicating to the Remote Pilot the active flight status of the sUAS and any hazards which may enter the area of operation so that the Remote Pilot can take appropriate action.
• Watching and listening for any abnormal sounds or flight characteristics being exhibited by the sUAS.
• Being prepared to carry out emergency plans and procedures in the event of an emergency incident or accident.

3-2.3 Support Personnel

sUAS Support Personnel – Employees designated at the discretion of the sUAS Coordinator as a crewmember during sUAS operations to assist the Pilot in Command and Visual Observer in the safe operation and accomplishment of the mission. The support personnel’s duties may resemble that of the Visual Observer, but specific duties should be assigned during the pre-mission planning and performed in the support role identified by the Remote Pilot. A support member may perform duties of camera operator. The camera operator may use an optional radio control transmitter to operate only the onboard camera.

The support personnel responsibilities include, but are not limited to:
• Following the instructions of the sUAS PIC.
• Monitoring airspace and site conditions that may adversely affect sUAS flight operations.
• Carry out emergency plans in the event of an emergency incident or accident.
Section 4  Airspace Standards and Rules

4-1 Federal Aviation Administration

The United States has the safest and most complex airspace in the world. The FAA has authority over this airspace from the surface upwards, and is responsible for making sure air traffic flies safely and efficiently.

Anyone operating a sUAS is responsible for flying within FAA guidelines and regulations. Remote Pilots should be knowledgeable of where it is and is not authorized to fly.

4-2 Airspace Categories

There are two categories of airspace or airspace areas:

a. Regulatory (Class A, B, C, D and E airspace areas, restricted and prohibited areas).

b. Non-regulatory (Military Operations Areas, warning areas, alert areas, and controlled firing areas).

c. Within these two categories, there are four types:

1. **Controlled** – A generic term that covers the different classification of airspace (Class A, Class B, Class C, Class D, and Class E airspace) and defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

2. **Uncontrolled** – Class G airspace (uncontrolled) is that portion of airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace. Rules governing VFR flight have been adopted to assist the Remote Pilot in meeting the responsibility to see and avoid other aircraft. Minimum flight visibility and distance from clouds required for VFR flight are contained in 14 CFR Section 91.155.

3. **Special use** – Special use airspace consists of that airspace wherein activities must be confined (except for controlled firing areas, special use airspace areas are depicted on aeronautical charts.) because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both.

4. **Other airspace** – Other airspace includes Military Training Routes, Temporary Flight Restrictions, Parachute Jump Aircraft Operations, Published VFR Routes, and Terminal Radar Service Area (TRSA). Each of these have their own restrictions, altitudes, and other standards. For additional information refer to the FAA Aeronautical Information Manual (AIM).
4-3  sUAS Specific Airspace Rules

FAA Certificated remote pilots with a properly registered aircraft, are authorized flight in Class G airspace as long as all operating requirements in the sUAS Rule (Part 107) are followed.

Flight in controlled airspace (Classes B, C, D, or E) or deviations from existing restrictions, contained in 14 CFR Part 107 rulemaking must be prior-approved through the Certificate of Waiver, UAS Service Supplier Low Altitude Authorization and Notification Capability (LAANC), or directly through an authorization request on the FAA.gov web portal. The Small UAS Rule (14 CFR part 107) is only applicable to unmanned aircraft (drones) that weigh less than 55 pounds at takeoff. To fly an unmanned aircraft that weighs 55 pounds or more, operators must apply for an exemption under the Special Authority for Certain Unmanned Systems (49 U.S.C. §44807) or apply for certification.

The Operations Over People rule became effective on April 21, 2021. Drone pilots operating under Part 107 may fly at night, over people and moving vehicles without a waiver as long as they meet the requirements defined in the rule. Airspace authorizations are still required for night operations in controlled airspace under 400 feet.

Listed below are sUAS specific operational limitations:

a. sUAS operators must keep the aircraft in sight (visual line-of-sight) or have prior approval from the FAA allowing Beyond Visual Line of Sight operations (COA or Waiver).

b. Must fly below 400 feet AGL or within 400 feet of a structure whose height exceeds the 400 foot AGL limitation (e.g. communications towers).

c. Can fly during the civil daylight hours or during the period of civil twilight only when the operator has completed the appropriate FAA prescribed training and has equipped the UAS with anti-collision lighting visible for at least 3 statute miles.

d. Must fly at or below 100 mph.

e. Must yield right of way to manned aircraft.

f. sUAS operators should avoid flight over people. Flight over people is permissive only when operator and sUAS system meet the training and equipment requirements defined within the FAA’s “Operations Over People” rule.

g. Must NOT fly from a moving land or water-borne vehicle unless the small unmanned aircraft is flown over a sparsely populated area.

h. Must NOT fly over stadiums or sports events.

i. Never fly near airports without prior FAA authorization.

j. Never fly near emergency response efforts such as fires.

The FAA may issue a certificate of waiver (see Appendix A and Appendix B for examples of waiver authorizations) to authorize a deviation from any restrictions specified in Part 107 if it finds the proposed sUAS operation can be safely conducted under the terms of the certificate of waiver. A request for a certificate of waiver or authorization must contain a complete description of the proposed operation and justification which outlines the necessity and the safeguards adopted for the operation. The FAA Administrator may prescribe additional limitations which may be considered necessary.

A person who receives a certificate of waiver issued under this section must comply with any conditions or limitations that are specified in the issued certificate of waiver.
4-4 Washington State Department of Enterprise Services Unmanned Aircraft System Rules for State Capital Campus

The sUAS rules prohibit launching, landing or operating sUAS on the Capitol Campus. This includes sUAS as well as remote-control model aircraft flown for recreational and business purposes (Chapter 200-250 Washington Administrative Code).
Section 5  Special Considerations and sUAS Contract Services

5-1 Protection of Individual and Personal Information

UAS operators, whether WSDOT employees or contracted service vendors in support of WSDOT projects, will limit operations to the specific approved purpose of the project and shall employ reasonable precautions to avoid capturing images of the public except those that are incidental to the project. UAS operations shall be in accordance with the Washington State Policy Guidelines for Unmanned Aircraft Systems, WSDOT privacy policies, and the provisions of Revised Code of Washington (RCW 9.73).

5-2 Communications and Community Engagement

Recorded aerial video, when applicable, shall be made available in a timely manner for communications staff to use for public outreach/communication purposes. Regional or programmatic communications staff can request aerial footage for public outreach purposes if it is necessary to facilitate successful project communications.

Public outreach/notification strategies shall be discussed and/or developed for each project utilizing an UAS that could reasonably be viewed by the public when it is in flight, in coordination with regional/program communication staff and WSDOT emergency operation centers as appropriate.

The Intergovernmental and Tribal Relations Office of WSDOT shall provide timely updates on WSDOT UAS usage to the Governor’s Office, the Legislature, the Washington congressional delegation, and tribes, as necessary. A consultation and communication plan shall be developed for each project within the boundaries of an Indian Reservation or off-reservation trust lands.

5-3 Contracting for UAS Services

Contracting for UAS services requires approval of the appropriate appointing authority as defined by Secretary's Executive Order E 1012 “Delegation of Authority”, sub. V. The contracting agent must require vendors demonstrate compliance with all FAA, state, and local regulations, policies, and procedures prior to operations in support of any WSDOT projects.

Deliverables such as data, video capture and still pictures, and products provided through contracted personnel in support of WSDOT projects shall be the responsibility of the contracting or supervisory agent within the WSDOT agency. It is the responsibility of WSDOT personnel to ensure the proper handling and archiving of deliverables by contracted entities flying drones in support of WSDOT activities.

The provisions of the WSDOT Consultant Services Manual M 27-50, Chapter 600 may be used for emergency employment of UAS resources. Contact the Agreement Manager listed on the Consultant Services website for On-Call UAS Services to coordinate use.

5-4 Procurement of UAS for Agency Use and Use of Privately Owned UAS

The procurement of an agency-owned UAS requires the approval of a WSDOT executive as defined in Secretary’s Executive Order E 1012 Delegation of Authority, subsection III.B.1. Approvals beyond procurement may be delegated, consistent with Agency delegation of authority.

WSDOT employees are prohibited from using personally owned sUAS in the performance of their WSDOT work-related daily activities.
Section 6 Qualifications and Training

Employees engaged in sUAS activities shall possess the necessary training and experience and will maintain the appropriate level of competency and proficiency to safely perform their assigned work.

WSDOT Remote Pilots must obtain a FAA “Small UAS Remote Pilot Certificate” by successfully completing the Initial Aeronautics Knowledge Test from an FAA approved testing facility. Operators must also complete a basic flight proficiency training program administered by an approved WSDOT sUAS Remote Pilot/Instructor or at a facility approved by WSDOT for flight training (See Appendix C for an example training plan).

WSDOT Aviation Division is responsible for the training of Regional Coordinators. sUAS operators can coordinate for assistance in developing and executing training programs from WSDOT's Aviation Division through their Regional Coordinators.

6-1 Initial Training

Initial training is the cornerstone of building an effective sUAS program. Basic sUAS airmanship is obtained through the required FAA training for Part 107 certification. Regional sUAS coordinators should assess their organizational specific needs and develop a hands-on training program that ensures new UAS operators have the necessary skills to safely and successfully integrate into their department's scope of work requirements and equipment. Each sUAS remote pilot should record official training conducted and tracked in LMS.

It is the appointed trainer’s responsibility to ensure new drone operators have met the basic Airman Certification Standards for a sUAS Remote Pilot. Upon successful completion of initial training, Remote Pilots shall be issued a locally produced sUAS Operators Training Certificate for their records.

- FAA Small UAS Remote Pilot Certificate.
- Basic flight proficiency training documentation (see Appendix C).
- WSDOT sUAS Operators Training Certificate.

6-1.1 Recurrent Training

WSDOT sUAS Remote Pilots will have a training plan on file that outlines training objectives for the upcoming year. This training plan will be held in conjunction with the operator's normal training file per department policy. The approved training plan will be developed jointly by the Region sUAS Coordinator and the Headquarters sUAS training unit. All mission deployments, including practice or training flights, will be documented and counted towards an operator's sUAS flight experience. The FAA Small UAS Remote Pilot Certificate must be renewed every 24 months.

6-1.2 Good Judgment

WSDOT sUAS Remote Pilots are prohibited from operating aircraft in a careless or reckless manner that could endanger the life or property of another. Remote Pilots are expected to exercise good judgment and conduct themselves in an ethical, responsible, lawful, and safe manner with respect to other sUAS crew members, personnel onsite, and the general public.
Section 7  sUAS Safety Procedures and Mission Planning

Steps outlined in the mission planning, risk assessment, pre and post UAS mission procedures are to be applied to operations conducted by WSDOT personnel, and to the extent possible when contracted services are required. It is the responsibility of the contracting agent or the WSDOT supervisor of the contracted sUAS activity to ensure appropriate mission planning, risk assessment, and risk mitigation steps are performed by the contracted agent prior to any flight activity. It is the duty of every member involved in sUAS activities to contribute to the goal of continued safe operations. This contribution may come in many forms and includes always operating in the safest manner practicable while avoiding taking unnecessary risks. Any safety hazard, whether procedural, operational, or maintenance related should be identified as soon as possible after, if not before, an incident occurs.

7-1  Mission

An UAS mission consists of a combination of actions and steps performed prior, during, and after an activity involving the flight of a drone. During pre-flight planning, the sUAS Remote Pilot shall prepare a mission plan using WSDOT’s Highway Activity Tracking System (HATS). The preflight process will also include the completion of a risk assessment worksheet for review by the sUAS Coordinator. Appendix D of this publication provides an example risk assessment worksheet and shall be used as the minimum starting point for regionally developed risk assessment worksheets. Upon completion of the sUAS mission, the sUAS Remote Pilot will complete the WSDOT sUAS Mission/Flight log in HATS, summarizing the flight activities.

The general elements of the sUAS mission/flight log are:

- Project number/work order number.
- Name and contact information for sUAS Remote Pilot and Coordinator.
- HQ/Region and Org Code.
- Aircraft to be used.
- Departure/arrival date/time.
- Mission location name, description, latitudinal and longitudinal coordinates.
- Purpose and objective of the sUAS mission.
- sUAS Risk Assessment.
- Required Approval.

The sUAS Remote Pilot will provide the collected data in accordance with existing WSDOT policy and procedures.

7-1.1  sUAS Risk Assessment

The sUAS Risk Assessment identifies potential hazards associated with the sUAS mission and describes measures to eliminate, guard against, or avoid those hazards.

At a minimum, it shall include consideration of the following items and potential hazards and corresponding safety measures associated with each of the items:

- Mission complexity.
- Remote pilot readiness.
- Operating Environment.
- Weather considerations prior to flight thru scheduled landing time and within limitations for the specific system restrictions.
• Aircraft condition.
• Risk mitigation.

Crew members involved with sUAS activities are encouraged to visit the site location, if possible, prior to conducting the mission to assist in preparing the sUAS mission plan and risk assessment.

7-2 Pre-sUAS Mission Procedures
At a minimum, the following procedures will be used in pre-sUAS mission planning preparation for the sUAS site. The Region or HQ Division sUAS Coordinator may require additional site-specific requirements.

7-2.1 WSDOT sUAS Operations at WSDOT Facilities & Project Areas
For sUAS operations within a WSDOT controlled boundary, the Region sUAS Coordinator shall contact the appropriate WSDOT facility or project manager prior to conducting the sUAS mission and follow the facilities required methods and procedures for conducting work on their site. This coordination should also include a facility or project representative that can assist in directing the flight for proper image acquisition.

7-2.2 WSDOT sUAS Operations at Non-WSDOT Facilities & Projects
All operations outside of WSDOT Right-Of-Way or Property shall be coordinated in accordance with the Region or Division policy. Where applicable, WSDOT personnel will request consent and provide notification to land and property owners prior to operating or overflight of private property. Operations in controlled airspace should be prior coordinated with the FAA and the controlling agency. Additional precautions will be taken when operating near airports and landing strips not covered under the controlled airspace rules.

7-2.3 Equipment Inspection
In the absence of a manufacturer provided equipment logbook/record, operators are encouraged to maintain a system logbook for continuity. Equipment will be visually inspected before conducting flights as outlined by the manufacture's recommendations. The practice of using a preflight checklist can facilitate the methodical inspection of drone systems prior to flight and ensure compliance with system limitations (see Appendix E for Preflight Checklist example).

7-3 Post-sUAS Flight Procedures
Upon finishing a sUAS mission, the sUAS Remote Pilot will complete the sUAS Mission/Flight Log in HATS summarizing the flight activities with the Region sUAS Coordinator.

7-3.1 Post Mission sUAS Inspection
At a minimum, visually inspect the following components post mission:
• Condition of aircraft including drivetrain, propellers, batteries, and electrical connections.
• Aircraft Radio Control Transmitter (and camera control transmitter if used).
• Camera and gimbal and any other sensor/payload.

Include any issues in the mission/flight log. Repair any deficiencies before flying again, ensuring unserviceable parts are tagged and removed from inventory as applicable. Be especially prudent in inspecting any aerial/ground collisions or cases where loss of power caused a crash, however minor. Only fly a 100% ready sUAS.
Section 8  Crew Equipment, UAV Inspections and Battery Maintenance

8-1  General sUAS Maintenance

Although an airworthiness certification is not required, sUAS aircraft are exposed to high frequency vibrations and should be well maintained to ensure it is always in a condition for safe flight. The sUAS Remote Pilot is responsible for choosing the appropriate equipment. It is important to ensure the safety of the sUAS crew by regular inspection and maintenance of all sUAS aircraft.

8-2  Battery Management

All batteries should be charged, maintained, and stored in accordance with the battery manufacturer's recommendations.
Section 9  Accident Reporting and Review

WSDOT encourages a culture of open reporting of all safety hazards in which management will not initiate disciplinary action against any personnel who, in good faith, disclose a hazard or safety occurrence due to unintentional conduct. WSDOT encourages monitoring of sUAS regulations, technology, practices, and laws to ensure best safety practices are incorporated into the organization.

All sUAS related accidents that result in deaths, injuries, illnesses; incidents or near-misses will be reported as defined in the WSDOT Safety Procedures and Guidelines of Chapter 6 of the Accident Reporting and Review Manual M 75-01. WSDOT Incident/Accident Report Web address: wwwi.wsdot.wa.gov/safety-health/incident-inspection-near-miss-reporting

WSDOT Incident/Accident Report Telephone Contact: 509-577-1610

In addition to the above WSDOT requirements, the FAA requires the following:

14 CFR § 107.9 Accident Reporting – No later than 10 days after an operation that meets the criteria of either paragraph (a) or (b) of this section, a Remote Pilot in command must report to the Federal Aviation Administration in a manner acceptable to the Administrator, any operation of the small unmanned aircraft involving at least:

a. Serious injury to any person or any loss of consciousness; or

b. Damage to any property, other than the small unmanned aircraft, unless one of the following conditions is satisfied:
   1. The cost of repair (including materials and labor) does not exceed $500; or
   2. The fair market value of the property does not exceed $500 in the event of total loss.

Accidents or incidents that meet the FAA's reporting thresholds will be reported in accordance with FAA policy. For information regarding methods of reporting and requirements, reference FAA Advisory Circular (AC) 107-2 and the FAA portal for latest applicable guidance. ([www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf](http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf))
## Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A</td>
<td>Example FAA Expedited SGI Waiver or Authorization Request Form</td>
</tr>
<tr>
<td>Appendix B</td>
<td>Example FAA Certificate of Waiver Request Process (Part 107 deviations)</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Example WSDOT sUAS Remote Pilot Certification Training Plan and Certificate</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Example WSDOT sUAS Risk Assessment Worksheet</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Example WSDOT sUAS Preflight Checklist</td>
</tr>
</tbody>
</table>
# Example FAA Expedited SGI Waiver or Authorization Request Form

## FAA REQUEST FORM FOR EXPEDITED SGI WAIVER OR AUTHORIZATION FOR UAS OPERATION

### Basic Qualifications

- The requesting operator must possess a Certificate of Waiver or Authorization (COA) or Part 107 Pilot License.
- The UAS operation must support an emergency response or other effort being conducted to address exigent circumstances and that will benefit the public good.
- The requested FAA approval cannot be secured via normal processes in time to meet urgent operational needs.

### Operator Information

**Mandatory entry**

- **Operator Organization** (e.g., agency or company)
- **Operator Address**
- **Operator Point-of-Contact** (including name, office + mobile phone number, and email)
- **Pilot and Observers** (including names, mobile phone numbers, and emails)
- **Type of UAS and Registration Number**

### Documentation

If the requested UAS operation will be flown under a pre-existing COA, please attach it hereto and provide the COA number below.

If the requested UAS operation will be flown under Part 107, please provide the Part 107 Pilot License number below.

### Requested Flight Details

- **Enter the date(s) of the proposed UAS operation** (e.g., 03/18/2018 or 03/18/2018-03/21/2018) **Mandatory entry**
- **Enter the times of the proposed UAS operation** (be sure to confirm time zone; e.g., 1200L-1400L daily) **Mandatory entry**
- **Enter the location of the proposed flight** (reference the nearest city or town, and state; e.g., Gulfport, MS)
- **Enter the distance and direction from the nearest airport, and FAA identification of the same** (e.g., 6 NM w of GPT)
- **Identify the class(es) of airspace in which the flight will be conducted** (e.g., Class G/E/D/C/B/A)
Requested altitude of UAS flight: **Mandatory entry**

Enter GIS details defining location of proposed flight (only one area type description needed) **Mandatory entry**

For those flights remaining within a general contiguous area, which can be described as a circular polygon, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the center of that area and the radius of that same area (e.g., XX:XXX:XXN / XX:XXX:XXW - .25NM radius)

For those flights remaining within a general contiguous area, which cannot be easily described as a circular polygon, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the vertices of the general area starting with the most northerly point and then progressing clockwise (e.g., XX:XXX:XXN / XX:XXX:XXW; XX:XXX:XXN / XX:XXX:XXW; XX:XXX:XXN / XX:XXX:XXW)

For those flights following an extended route, provide the latitude and longitude, expressed as degrees/minutes/seconds, of the key waypoints of the route, and, as appropriate provide the width of the route (e.g., XX:XXX:XXN / XX:XXX:XXW; XX:XXX:XXN / XX:XXX:XXW; XX:XXX:XXN / XX:XXX:XXW - .25NM wide)

---

**Nature and Description of Event**

<table>
<thead>
<tr>
<th>Enter the type of urgent UAS operation to be flown</th>
<th>Description of event</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Firefighting</td>
<td></td>
</tr>
<tr>
<td>☐ Law Enforcement</td>
<td></td>
</tr>
<tr>
<td>☐ Search and Rescue</td>
<td></td>
</tr>
<tr>
<td>☐ Local / National / Natural Disaster</td>
<td></td>
</tr>
<tr>
<td>☐ Other (specify below)</td>
<td></td>
</tr>
</tbody>
</table>

---

**Additional Pilot Qualifications**

Enter additional pilot qualifications

☐ Sport/Recreational/Private pilot certificate

☐ Commercial/Airline pilot certificate

☐ Flight instructor certificate

---

**Contacting the SOSC**

The SOSC office and email are staffed/monitored 0600–2400 Eastern Time. For all emergencies, please follow up any email with a phone call to 202-267-8276, which is answered 24/7.
Appendix B  Example FAA Certificate of Waiver Request Process (Part 107 deviations)

1. Must have Drone Zone account (FAA). Log in screen

2. Select “I agree” with System Use Notice
3. Select “Create Airspace Authorization”

4. Select “Create Airspace Authorization”
5. “Complete Operation Parameters” and Select “Next”

6. “LAANC alert message”, select “OK” for Part 107 waiver requests
7. Waiver Request information review and submission

Notes:

- Certificate of Waiver process for deviation requests to Part 107 Small Drone operations
- Ensure requester has a Drone Zone (FAA) account or is able to create one
- Must have access to aviation sectional or equivalent for airspace description and location data
- Confirm request is not within the scope of LAANC approval

Link: https://faadronezone.faa.gov/
## Appendix C  Example WSDOT sUAS Remote Pilot Certification Training Plan and Certificate

### WSDOT sUAS Pilot/Operator Certification Training

**LAST, First**

<table>
<thead>
<tr>
<th>Contents</th>
<th>Ground Instruction</th>
<th>Flight Instruction</th>
<th>Date / Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 01: Mission Plan and Task Assignment</td>
<td>WSDOT sUAS Procedures Guide</td>
<td>Flight Safety and Risk Management are incorporated into every flight</td>
<td>Lesson 1 Completed</td>
</tr>
<tr>
<td>Certificate of Waiver/Authorization</td>
<td></td>
<td>Date:</td>
<td>Initials:</td>
</tr>
<tr>
<td>Approving Authority</td>
<td></td>
<td>Initials:</td>
<td></td>
</tr>
<tr>
<td>Regional Coordinator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot / Operator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Observer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Lesson 02: Preflight Requirements            | POH SAFE & WSDOT Form XXX                        | Candidate will perform a preflight inspection | Lesson 2 Completed |
| Operator’s Manual                             |                                                  | Date:                                          | Initials:         |
| Equipment Inspection                          |                                                  | Initials:                                      |                   |
| Notice to Airmen (NOTAM’s)                    |                                                  |                                               |                   |
| Airspace Restrictions                         |                                                  |                                               |                   |
| Weather Forecast/Observations                  |                                                  |                                               |                   |
| Crew Briefing                                 |                                                  |                                               |                   |

| Lesson 03: Flight Operations                  | POH PAVE WSDOT Form XXX                          | Candidate will conduct flight in a safe and controlled manner | Lesson 3 Completed |
| Required Documents                             |                                                  | Date:                                          | Initials:         |
| On-Site Evaluation                             |                                                  | Initials:                                      |                   |
| Hazards Analysis                               |                                                  |                                               |                   |
| Operational Limitations                        |                                                  |                                               |                   |
| Personal Protective Equipment                  |                                                  |                                               |                   |

| Lesson 04: Post Flight                        | POH WSDOT Form XXX                               | Candidate has demonstrated competency in flight operations | Lesson 4 Completed |
| Equipment Check                               |                                                  | Date:                                          | Initials:         |
| Flight Log Entries                             |                                                  | Initials:                                      |                   |
| Crew Debrief                                  |                                                  |                                               |                   |
| Record Keeping                                |                                                  |                                               |                   |

| Exam                                           |                                                  |                                               |                   |
| Pass Certification Exam                        |                                                  |                                               |                   |
| Course completion recorded in the LMS         |                                                  |                                               |                   |
| Proctored Final Exam                           |                                                  |                                               |                   |

Washington State Department of Transportation 2017
Certificate of Completion

Is hereby granted to

To certify completion of the following training module

Unmanned Aircraft Systems Operator Initial Training

Completed on:  /  /
## Appendix D  Example sUAS Risk Assessment Worksheet

![Risk Assessment Worksheet Image](image-url)

<table>
<thead>
<tr>
<th>MISSION TYPE (Most Complex)</th>
<th>DEPARTURE/MISSION WEATHER (Most severe)</th>
<th>RISK MITIGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day</td>
<td>Night*</td>
</tr>
<tr>
<td>Aerial Imagery/Survey</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Emergency Response</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PILOT</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Last mission flown (days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-6</td>
<td>7-15</td>
<td>16-30</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPERATING ENVIRONMENT</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating over People</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Operating w/ 500 ft near obstacles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Mission Altitude (AGL) in Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-400</td>
<td>&gt;100*</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Operating airspace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncontrolled</td>
<td>Controlled</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature within Aircraft Operating Range*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No (No-Go)</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

| AIRCRAFT                                 |                |                |
| Hardware changes since last flight?       |                |                |
| No                                          | Yes            |                |
| 0                                            | 1              |                |
| Software changes since last flight?        |                |                |
| 0                                            | 1              |                |
| Total                                       |                |                |

<table>
<thead>
<tr>
<th>Mission Risk Summary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission Type</td>
<td>0.00</td>
</tr>
<tr>
<td>Pilot</td>
<td>0.00</td>
</tr>
</tbody>
</table>

| Operating Environment | 0.00  |
| Departure Mission weather | 0.00  |
| Aircraft              | 0.00  |
| Mitigation            | 0.00  |
| Total                 | 0.00  |

<table>
<thead>
<tr>
<th>Threats</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1-3</td>
</tr>
<tr>
<td>Med</td>
<td>4-6</td>
</tr>
<tr>
<td>High</td>
<td>7-9</td>
</tr>
<tr>
<td>Extreme</td>
<td>10-12</td>
</tr>
</tbody>
</table>

*Requires COA or waiver

** 80 minutes before sunset/30 minutes after sunrise

UAS Operator Signature: __________________________ Date: ________ UAS Coordinator Signature: __________________________ Date: ________

Approving Authority Signature: __________________________ Date: ________
## Preflight Checklist

**Pilot In Command:** | **FAA Reg. No.:** | **Date & Time:** 
--- | --- | ---  
**Observer (Optional):** | **Location:**  
**UAS Model:**  

**Purpose of Flight (Check 1):**  
- □ Airport Insp.  
- □ Terrain Mapping  
- □ SAR  
- □ Training  
- □ Other (Describe):  

**CFR Part 107 Waivers Required:**  
- □ Night Operation  
- □ Controlled Airspace  
- □ Other ________  

### A. Pre-Start Checklist

**Important:** Complete all check list items in the order they are presented. If you cannot check off an item **STOP!** and correct the problem before continuing.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Acceptable Condition</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Airspace</td>
<td>Unrestricted airspace or flight authorized</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential obstructions near intended flight path identified</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Weather</td>
<td>Visibility ≥3 miles/500 ft., Wind ≤ ___ mph, Temp &gt;  ≤ ___ °F</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>sUAS Preflight</td>
<td>No structural defects visible, IAW Operations Manual</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>sUAS Battery</td>
<td>Sufficient for intended flight (launch thru planned recovery)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Controller Battery</td>
<td>Sufficient for intended flight (launch thru planned recovery)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Display Device Battery</td>
<td>Sufficient for intended flight</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Memory Card</td>
<td>Installed, sufficient memory space available for flight</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Observer</td>
<td>Present, briefed and ready (Only if designated, otherwise NA)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Confirm Flight Path</td>
<td>Identify mapping perimeter and high detail areas</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Display Device</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Controller Power</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>sUAS Power</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>sUAS Status Lights</td>
<td>Flashing GREEN</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Camera Check</td>
<td>Follow Mode, image type: JPG</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Compass Calibration</td>
<td>Compass calibrated for current location</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Flight Limits Set</td>
<td>Alt. ≤ 400 ft. AGL (higher when w/in 400 ft. of obstacle)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Flight Mode Set to GPS</td>
<td>Controller mode switch in “P”, display status GREEN - RTF</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Take-Off Location</td>
<td>Clear for ≥ 25ft. radius, no overhead obst. w/in line of sight</td>
<td></td>
</tr>
</tbody>
</table>

### B. Motor Start Checklist

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Acceptable Condition</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sUAS Motor Start</td>
<td>sUAS motors start and run at idle, no abnormal noise</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Return-to-Home Point</td>
<td>Home Point Set and verified on map prior to launch</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hover Check</td>
<td>Flight and Camera Gimbal control responses normal</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Flight Telemetry</td>
<td>Telemetry normal (Bat, Alt, Dist., GPS, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

**READY FOR FLIGHT**

**Notes:**