



**Southeastern Pennsylvania Transportation Authority  
Engineering, Maintenance and Construction**

**Engineering, Maintenance & Construction Division  
Standard Operating Procedure**

**Subject: Unmanned Aircraft Systems (Drone) Operations**  
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**ENGINEERING, MAINTENANCE &  
CONSTRUCTION DIVISION SOP Number: C-003**

**UNMANNED AIRCRAFT SYSTEMS (DRONE)  
OPERATIONS**

**Approvals**

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Engineering, Maintenance & Construction Division  
Standard Operating Procedure Number C-003

INSTRUCTIONS FOR UNMANNED AIRCRAFT SYSTEMS (DRONE) OPERATIONS  
FROM OR OVER SEPTA FACILITIES AND PROPERTIES

**1.0 PURPOSE:**

The purpose of these instructions is to outline the procedures and regulatory requirements for SEPTA Personnel or other entities operating unmanned aircraft system (UAS) also referred to as Unmanned Aerial Vehicles (UAV) or Drones on or over SEPTA facilities, property and/or Right-of-Way (ROW).

This SOP is established to require and ensure safe operation of SEPTA's transit and railroad systems, ensure compliance with ALL applicable laws, reduce safety risks, and preserve the safety, security, and privacy of SEPTA employees and transit users. This SOP applies equally to all FAA classifications/types of UAV.

SEPTA Transit Police Department use of Unmanned Aircraft Systems associated with public safety and law enforcement purposes is governed by ***Septa Police Special Operations Standard Operational Procedures, Policy # 9.0.***

**2.0 DEFINITIONS/ACRONYMS:**

**2.1 Acronyms:**

AGL:	Above Ground Level
BFR:	Biennial Flight Review
CFR:	Code of Federal Regulations
FAA:	Federal Aviation Administration
PIC:	Pilot in Charge
PPE:	Personal Protective Equipment
MOA:	Memorandum of Agreement
NAS:	National Air Space
NOTAMs:	Notices to Airmen
ROE:	Right of Entry Permit
ROW:	Right of Way
SEPTA:	Southeastern Pennsylvania Transportation Authority
sUAS:	Small Unmanned Aircraft System
SOP:	Standard Operating Procedure
TSA:	Transportation Security Administration
UA:	Unmanned Aircraft
UAS:	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicles
US	United States
VFR	Visual Flight Rules
VLOS	Visual Line of Sight

## 2.2 Definitions

Control Station	An interface used by the remote Pilot in Charge (PIC) to control the flight path of the small Unmanned Aircraft (UA).
FAA 14 CFR Part 107	The federal regulations set forth by the Federal Aviation Administration (FAA) regarding Unmanned Aircraft System (UAS) operations in the National Air Space (NAS).
Pilot in Charge (PIC)	A person who holds a remote Pilot certificate with a sUAS rating and has the final authority and responsibility for the operation and safety of a sUAS operation conducted under 14 CFR 107.
Small Unmanned Aircraft (UA)	A UA weighing less than 55 pounds and can be flown without the possibility of direct human intervention from within or on the aircraft. Also called a Remotely Piloted Aircraft, Remotely Operated Vehicle, Unmanned Aerial Vehicle (UAV), or Drone.
Small Unmanned Aircraft System (sUAS)	A small UA and its associated elements that are required for the safe and efficient operation of the small UA in the National Air Space that includes the necessary equipment, network, and personnel to control a small UA.
Safety Observer	The Safety Observer, also known as a Visual Observer, is the person acting as a flight crew member who assists the small UA remote PIC to see and avoid other air traffic or objects aloft or on the ground.

## 3.0 INTRODUCTION:

The Southeastern Pennsylvania Transportation Authority (SEPTA) established this policy to govern the operation by any person of a UAV from or above SEPTA facilities

and properties. This SOP extends to any and all property owned, rented, leased, and/or otherwise controlled by SEPTA.

An unmanned aircraft system (UAS) also referred to as Unmanned Aerial Vehicles (UAV), sometimes called a drone, is an aircraft without a human pilot onboard – instead, the UAS/UAV is controlled from an operator on the ground. The operation of an unmanned aircraft system (UAS), a drone, is regulated by the Federal Aviation Administration (FAA). For the purpose of this SOP, the term “**Unmanned Aerial Vehicles**” (UAV) will be utilized.

SEPTA’s Engineering, Maintenance, and Construction Division (EM&C) is responsible for establishing this SOP and in conjunction with the SEPTA Transit Police, is responsible for enforcing the SOP. **SEPTA maintains the authority to "ground" or suspend operations of any UAV that is not compliant with FAA regulations, this SOP, or presents a danger or adverse impact to SEPTA operations, property, employees, or to SEPTA riders.**

#### 4.0 FAA REGULATIONS

##### 4.1 General

The FAA classifies UAS use as one of three types:

- Public - Governmental
- Civil Operations - Non-Governmental
- Model Aircraft - Hobby or recreation only

A summary of FAA requirements is provided in Table 4.1 below.

TABLE 4.1 - SUMMARY OF FAA REQUIREMENTS APPLICABLE TO THIS SOP	
<b>Pilot Requirements</b>	Must have Remote Pilot Airman Certificate Must be 16 years old Must pass TSA vetting
<b>Aircraft Requirements</b>	Must be less than 55 lbs. Must be registered if over 0.55 lbs. (online) Must undergo pre-flight check to ensure UAS is in condition for safe operation
<b>Location Requirements</b>	Class G (uncontrolled) airspace*
<b>Operating Rules</b>	Must keep the aircraft in sight (visual line-of-sight)* Must fly under 400 feet* Must fly during the day* Must fly at or below 100 mph*

**TABLE 4.1 - SUMMARY OF FAA REQUIREMENTS APPLICABLE TO THIS SOP**

	Must yield right of way to manned aircraft* Must NOT fly over people* Must NOT fly from a moving vehicle*
<b>Example Applications</b>	Flying for commercial use (e.g. providing aerial surveying or photography services) Flying incidental to a business (e.g. doing structural, wire or roof inspections or real estate photography)
<b>Legal or Regulatory Basis</b>	Title 14 of the Code of Federal Regulation (14 CFR) Part 107

*\*These rules are subject to FAA Waivers and ATC Authorization in Controlled Airspace under 14 CFR Part 107. Refer to Section 7.1 of this SOP.*

**4.2 Failure to register**

Civil and criminal penalties may apply for failure to register a UAS. Those penalties are on a sliding scale based on the circumstances of the situation and may include a formal warning to monetary fines and/or prosecution.

Using a UAS to take photos/videos for personal use is recreational. Using the same device to take photos/videos for compensation or sale is commercial use. Using a UAS for work, business purposes, compensation, hire or other commercial use requires an FAA Sec. 333 Exemption or a Special Airworthiness Certificate. A Certification of Waiver or Certificate of Authorization means an FAA grant of approval for a specific unmanned operation. (See [www.faa.gov](http://www.faa.gov)).

Additional information and the on-line registration may be obtained at <http://www.faa.gov/uas/registration/>.

**5.0 APPROVAL PROCESS AND REQUIREMENTS**

**5.1 Personnel qualifications**

A. Operator (Pilot In Charge or PIC) and Observer qualifications must be submitted to and approved by the Chief Engineer or designee prior to any operations.

B. UAV Operator

The operator of the UAV is ultimately responsible for its operation and safety during flight. The operator of the UAV is directly responsible for, and the final authority over operation of the UAV. The UAV operator shall have the following minimum qualifications:

- Comply with 14 CFR 107 for flying under small UAS rule.

- SEPTA Railroad or Transit Roadway Worker Protection Certification as appropriate for location of work.
- Logged sufficient flights to be familiar with all flight characteristics.
- Completion of training and testing using the latest revision of ground control software.
- Completion of training and testing using emergency recovery procedures in failed link situations.
- Completion of training and testing using acceptable field repair and maintenance procedures.
- Demonstrated familiarity with mission planning and preflight procedures for any aircraft. If operating a drone under the FAA's Small UAS Rule (Part 107) operator must hold current Remote Pilot Certificate from the FAA.
- **Have your Remote Pilot Certificate available** whenever you fly your UAS.
- If operating a drone under other than the FAA's Small UAS Rule (Part 107), operator must:
  - Hold a current, unrestricted private pilot license.
  - Hold a current, FAA Class 3 Medical certificate and hold a current Biennial Flight Review (BFR)
  - Review endorsement from a FAA Certified Flight Instructor.

C. Safety Observer or Visual Observer

The safety observer shall understand the potential hazard of being in the vicinity of flight operations. The Safety Observer shall have these minimum qualifications:

- Comply with 14 CFR 107 for flying under small UAS (sUAS) rule.
- SEPTA Railroad or Transit Roadway Worker Protection Certification as appropriate for location of work.
- Demonstrated familiarity of the UAV.
- Logged sufficient flights to be familiar with all flight characteristics.
- Completion of training and testing using the latest revision of ground control software.
- Completion of training and testing using mission planning and preflight procedures.
- Completion of training and testing using field repair and maintenance procedures.

## 5.2 Flight Plan

- A. A flight plan must be submitted and approved by the Chief Engineer or designee prior to any operations.
- B. The Chief Engineer or designee shall notify the SEPTA Control Center two (2) hours in advance of any scheduled flights.

C. Launch and landing site selection shall be driven by safety first and foremost. Selection of launch and landing sites will be considered based upon the following criteria:

- Maintain adequate buffer zones between aircraft, people, and structures.
- Approach the landing zone without flying over populated areas.
- Maintain a buffer of at least 25 feet between aircraft operations and the public.
- Site must be free of obstructions to allow for automated return home procedures.

### 5.3 Flight Environment Requirements

- For operations that will be conducted in part or in whole over property not owned or controlled by SEPTA, the Operator shall ensure to SEPTA that they have obtained the appropriate permits and permissions to fly over other property.
- Operations are limited to during Visual Flight Rules (VFR) Meteorological Conditions.
- UAV shall remain within Visual Line of Sight (VLOS) of pilot.
- UAV operations are limited to daylight hours.
- The UAV shall operate outside the fouling distance to rail lines (10 feet from closest rail) and 25 feet from all energized power lines.
- Operations shall not be conducted in adverse weather conditions. These include, but are not limited to:
  - Wind speeds exceeding 15 mph.
  - Snow, rain, and fog.
  - Visibility less than one statute mile.
  - Cloud base less than 500 feet.
- Operators shall only fly in areas where safe distances can be maintained. Tall structures and large metal structures may affect the accuracy of on-board instrumentation.
- The UAV will not be operated outside of rated parameters such as speed and altitude.
- Operations shall avoid densely populated areas.
- Operations shall remain outside of controlled airspace unless contact with the controlling agency has been established and clearance to operate within that airspace has been granted.
- UAV operators and safety observers shall maintain communication at all times.
- Operators shall minimize interference by avoiding areas with high levels of radiofrequency energy, such as radio transmission sites.

## 5.4 Flight Limitations and No Fly Zones

- A. All UAV Operators must abide by regulations set forth by the relevant regulatory agencies.
- B. For safety reasons, flights are limited by height, distance, and No-Fly-Zones. UAV operators need to be aware of all no fly zones near the area of operations. Some examples include:
  - Airspace above 200 feet AGL
  - Airspace within 5 miles of an airport
  - Airspace within 1.5 miles of helipads
  - Federal Government Sites
  - Military Bases
  - Large public events
- C. The FAA's "Pilot Web" site (<https://pilotweb.nas.faa.gov/PilotWeb/>) is an easy to use website where the operator can obtain local Notices to Airmen (NOTAMs) in the area of intended flight. Another resource is the B4UFLY Application that graphically illustrates local no fly zones for UAVs (<http://knowbeforeyoufly.org>).

## 5.5 Maintenance

Required maintenance will be performed per manufacturer's recommendations. A log with all maintenance performed shall be maintained for each aircraft. Submit to SEPTA for record purposes.

## 6.0 SAFETY

### 6.1 Items to Remember

- Trains and transit vehicles may be present and moving during operation. All personnel either located in or operating an UAV within the SEPTA right of way must be certified in the applicable Roadway Worker Safety and be either a SEPTA employee, SEPTA contractor, or have a Right-of-Entry Permit (ROE) from SEPTA. Use of a UAV within SEPTA railroad or rail transit right-of-way (ROW) may require flagging or power protection services.
- **A job safety briefing must be held prior to starting work or flight operations.**
- SAFETY FIRST- safety is more important than the UAV. DO NOT expose yourself to risk if the UAV is in danger. It can be replaced, and you cannot.
- Always be aware of your surroundings. Operations could take place around high voltage equipment, moving vehicles and areas where other hazards may exist.



- Use extreme caution to avoid exposure to electrified infrastructure and equipment, both high and low voltage can be dangerous. Follow clearance limits.
- When operating in a public area, be aware of all vehicle and pedestrian movement.
- Be aware of surface conditions and trip hazards.

## 6.2 Safety Incident Reporting Procedures

A. Any accident, incident, deviation from the approved plan, and/or safety violation associated with the operation of a UAV must be reported to SEPTA's Chief Engineer immediately with a written report provided with within 24 hours.

### B. FAA Reporting

No later than 10 days after an operation that meets the criteria of either paragraph (a) or (b) below, a remote pilot in command must report to the FAA 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.

C. A copy of any reports to the FAA must be provided to SEPTA's Chief Engineer and SEPTA's System Safety Department.

D. An accident or incident report does not inherently imply that disciplinary action is to follow. As such, it is critical that all accident, incident, and/or safety violation are reported and logged in accordance with established procedures. Failure to report an accident, incident, and/or safety violation or knowledge of a failure to report a safety violation may be grounds for disciplinary action.

## 6.3 Personal Protective Equipment (PPE) and Signage

- Safety vests that identify UAV operators are required to be worn by all parties directly involved in operating a UAV.
- Informational UAV operations sandwich boards must be placed in clear view of the public during UAV operations.
- Wear PPE as required by SEPTA policies and procedures.

## **7.0 REQUIRED SUBMITTALS**

**7.1** In addition to submittal requirements specified elsewhere in this policy, the submittals specified in this section must be provided and approved prior to any operations. Waivers from the small UAS rule (14 CFR part 107) issued by the FAA (which allows for a small UAS operation to deviate from certain operating rules if the FAA finds that the proposed operation can be performed safely), must be provided to SEPTA in advance of any operations. SEPTA reserves the right not to accept the waiver for operations on or above SEPTA facilities and property.

If the UAV is being operated on behalf of another organization or utility, a copy of the agreement with that organization and all requirements must be provided to SEPTA.

## **7.2 Right-of Entry Permit (ROE)**

A Right of Entry agreement is required when the UAV operator, safety observer and/or aircraft need to enter onto or over SEPTA property to perform any type of aerial operation or observation and is not a SEPTA employee or is not working under a contract with SEPTA. In these cases, the following documents will be required to perform any type of UAV operation on and over SEPTA property:

- Completed SEPTA Right of Entry Application and payment of fee;
- Completed SEPTA Right of Entry Application Checklist, and
- Executed SEPTA Right of Entry Agreement.

## **7.3 Preflight Readiness, Takeoff and Post Flight Checklists**

Pilots should acquire an FAA Sectional Aeronautical Chart from their local FAA field office. This chart gives information about airports near the alignment and the no-fly zones around them. Takeoff and Post flight checklists must be in the pilot's possession and must be followed during UAV operations.

## **7.4 Airframe and Controller Inspection**

Safety checks specified in the manufacturer's user guide and any SEPTA practices shall be performed prior to each flight. The airframe shall be given a thorough inspection through the use of a checklist.

## **8.0 FLIGHT OPERATION**

### **8.1 Flight Planning**

Each flight will have its own unique circumstances that may affect the operation of the UAV. The UAV Operator will consider the following factors before authorizing any UAV launch.

A. Weather

Prior to flying, the UAV Operator must obtain the current weather from aviationweather.gov. If there is a technical error the closest automated aviation weather reporting system may be used. The Pilot in Charge (PIC) shall have final determination of risk due to weather and authority over any flight of the UAV in circumstances where weather is officially reported to be within limits established in this document.

B. Hazards To The Public

The PIC shall make every effort to ensure that flight operations will not pose any undue risk to people. The PIC shall have final determination of risk to people and authority over any flight.

C. Hazards To Personnel

The PIC shall make every effort to ensure that flight operations will not pose any undue risk to any SEPTA personnel. SEPTA management shall have final determination of risk to personnel and authority over any flight.

D. Proximity To Controlled Airspace

The PIC shall ensure that all unreported operations take place outside controlled airspace. Operations inside any controlled airspace shall be performed with permission of, and in constant communication with the controlling authority of the airspace. The operator shall have final authority over launch after the controlling authority has granted clearance. The controlling authority maintains the right to abort any flight operation regardless of the stage that operation is in. Any breach of controlled airspace must follow Safety Incident Reporting Procedures.

E. Proximity to SEPTA Operations

The PIC shall ensure that all operations take place in a manner as not to adversely affect train, rail transit, and other vehicle movements and SEPTA operations and not be within the direct vision of transit vehicle operators. Flight operations shall be based on all railroad and rail transit tracks being in service with rail vehicles operating on all tracks in either direction. Flight operations shall not be within fouling distance or any rail tracks (10 feet from closest rail) or within 25 feet of power or catenary lines.

## 8.2 Flight Parameters

- A. UAV will be operated during daylight hours (sunrise to sunset, local time) in good weather and within the pilot's visual line of site (VLOS).

- B. Operations from a moving vehicle or aircraft are prohibited.
- C. The pilot must be accompanied by a safety observer who also will be positioned in the line of sight of the aircraft and must be in constant communication with the operator to identify and alert the pilot to any potential obstacles.
- D. Pilots are RESTRICTED from flying above 400 feet above ground level (AGL).
- E. UAV operators shall keep **25 feet** clearance between the aircraft and catenary structures, power lines, substations, or communications towers unless written permission is granted by SEPTA. Large carbon fiber UAVs tend to be used with DSLR cameras and these larger video cameras are a serious hazard to electrical infrastructure and should not be flown at all near SEPTA power facilities. Anyone operating an unmanned aircraft that has accidentally come into contact with electricity or transmission lines shall not attempt to retrieve the aircraft and shall immediately notify SEPTA for assistance.
- F. Careless or reckless operations are prohibited.
- G. Flying above, near, in or around groups of people is prohibited. Always take off and land at least 25 feet away from people that are unfamiliar with the operation of the UAV and 7 feet from those directly involved in UAV operations.

## **8.2 Privacy**

The UAV Operator must not operate the UAV in any way that may invade personal privacy and will comply with any federal, state, or local privacy laws that may apply in areas where the UAV is operated. In addition, as a practical matter, flights, including photography and video recordings, will record only assets owned or operated by SEPTA on SEPTA property. If recordings include areas outside of SEPTA right-of-way, the Operator/Applicant is responsible for proper editing and privacy.

## **8.3 Operations inside Controlled Airspace**

UAV operations inside controlled airspace are prohibited unless approved by the FAA and a Memorandum of Agreement (MOA) is first established with the airport authority. Pilots will need to obtain clearance from the airports control tower prior to operating in controlled airspace.

## **8.4 Accessing Adjacent Property**

The UAV Operator shall not operate the UAV while standing on private property or in airspace above private property without first obtaining consent from the property owner, and shall not enter upon adjacent private property without first obtaining consent from the property owner.

## **8.5 Calibrating Aircraft Instrumentation**

Always calibrate instrumentation such as the aircraft compass at every new flight location. Aircraft instrumentation may be sensitive to environmental conditions, which may lead to incorrect sensor data and lead to poor flight performance or flight failure. Regular calibration is required for optimal performance. UAV Operators can refer to the relevant section of the appropriate user manuals.

**End of SOP**