

Northwestern

# Unmanned Aircraft Systems

Environmental Health and Safety

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## I. Purpose

This program promotes safe, responsible, and respectful unmanned aircraft system (UAS or 'drone') operations and provides guidance to the Northwestern community and its visitors on UAS operations.

## II. Scope

This program applies to any Northwestern faculty, staff, student, visitors, or third party (e.g., vendor, contractor) who operates a UAS on behalf of Northwestern on, above, or inside University property within the United States, including activities conducted off University property within the United States. This program does not apply to UAS operations for law enforcement, public safety purposes, or emergency response situations.

## III. Definitions

- A. **Federal Aviation Administration (FAA):** The U.S. federal agency that regulates UAS operations.
- B. **Non-Hobbyist UAS Use:** The use of UAS on, above, or inside University property for commercial or non-recreational use.
- C. **Open-Air Assemblies:** Outdoor areas that include but are not limited to sporting events, concerts, parades, protests, political rallies, community festivals, or parks and beaches during certain events.
- D. **Outdoor Hobbyist UAS Use:** The use of UAS on or above University property strictly for [hobby or recreational purposes](#).
- E. **Preapproved Location:** A location on University property that Environmental Health and Safety (EHS) has approved for recurring indoor UAS operations. Preapproved Locations include [The Garage](#) and individual laboratories using small UAS for research purposes. UAS operations in Preapproved Locations do not require EHS flight approval.
- F. **Remote Pilot in Command (PIC):** The person directly responsible for and is the final authority as to the operations of UAS.
- G. **Small UAS:** A UAS weighing less than 55 pounds on takeoff, including everything that is on board or otherwise attached to the aircraft.
- H. **University property:** Any buildings, grounds, or land that are owned or controlled by the University.
- I. **Unmanned Aircraft System (UAS):** Any remotely controlled or operated device that is used (or intended or designed to be used) to fly in the air. UAS includes drones as well as model aircraft.

## IV. Responsibilities

- A. **Environmental Health and Safety (EHS)**
  - i. Adhere to the requirements of this program.
  - ii. Review and revise this program, as necessary.
  - iii. Review and approve all UAS flight requests, in collaboration with Northwestern Police, Athletics, Global Marketing, Facilities, and other departments, as necessary.
  - iv. Assist departments in evaluating appropriate spaces for indoor and outdoor UAS use.
  - v. Report any accidents or injuries to the FAA and other agencies, as necessary.
  - vi. Provide guidance and consultation, as necessary.

**B. Departments and Units**

- i. Adhere to the requirements of this program.
- ii. Ensure UAS pilots are adequately trained and licensed for UAS operations.
- iii. Maintain UAS equipment as necessary, and in accordance with FAA requirements and manufacturer guidelines.
- iv. Submit UAS flight requests to EHS for review and approval.
- v. Report UAS concerns or questions to EHS.

**C. Contractors, Vendors, and Other Non-Affiliates**

- i. Adhere to the requirements of this program.
- ii. Ensures UAS pilots (including subcontractors) are adequately trained and licensed for UAS operations.
- iii. Maintain UAS equipment as necessary, and in accordance with FAA requirements and manufacturer guidelines.
- iv. Execute a contract holding the University harmless from any claims, harm to individuals, or property loss resulting from such UAS operations;
- v. Provide proof of any insurance [required](#) by the University;
- vi. Immediately report UAS concerns, incidents, or questions to Northwestern representatives.

**D. Remote Pilot in Command (PIC)**

- i. Adhere to the requirements of this program.
- ii. Be adequately certified and trained.
- iii. For non-hobbyist UAS operations, maintain possession of the EHS approval (e.g., email) at all times during UAS operations.
- iv. When conducting UAS operations, must have proof of training, photo identification, Remote Pilot Certificate, and FAA UAS registration readily available, upon request.
- v. Encouraged to use the [FAA B4UFLY App](#) to identify where UAS can and cannot fly.
- vi. Immediately report UAS concerns, incidents, or questions to Northwestern representatives.

## V. General Requirements

- A. With limited exceptions, including but not limited to outdoor hobbyist UAS use and certain indoor UAS operations, any outdoor operation of UAS in the U.S. requires FAA authorization, which among other things requires obtaining a remote pilot certificate and adhering to certain flight restrictions, or obtaining an FAA exemption from such restrictions.

**B. FAA UAS Registration**

- i. All UAS for hobby and non-hobbyist use must be registered, except those that weigh 0.55 pounds or less (less than 250 grams) and are flown exclusively for outdoor hobbyist use.
- ii. Any small UAS that weighs over 0.55 pounds and is flown outdoors must be [registered](#) with the FAA and [marked](#) with a registration number on the exterior.
- iii. FAA registrations are valid for 3 years and must be kept current.
- iv. Effective September 16, 2023, UAS requiring an FAA registration number will also be required to broadcast [Remote ID](#) information.
- v. Information on registering UAS weighing over 55 pounds is available [here](#).

- C. UAS owners and PICs are responsible for complying with all applicable laws, regulations, city and state ordinances, University policies, and (if operated off University property) any requirements imposed by owners of property where UAS are operated.
- D. Any UAS operation that creates a hazard, safety risk, security risk, privacy risk, undue public alarm or panic, disrupts University operations, property damage risk, or environmental risk is prohibited.
- E. Any UAS operations for illegal surveillance or invasion of privacy, package delivery, and any activity prohibited by law, University policy, or this program, is prohibited.
- F. UAS operations may not be used to stalk or harass any person or animal.
- G. All non-hobbyist UAS operations must be in accordance with [FAA Part 107 – Small Unmanned Aircraft Systems](#) and the applicable sections of this program.
- H. All outdoor hobbyist UAS operations must be in accordance with the [FAA Rules for Recreational Fliers](#) and the applicable sections of this program.
- I. If exceptions to the requirements of this program are necessary for operational or research purposes, EHS approval and a waiver or exemption from the FAA are required.
- J. FAA [waivers](#) are required for any of the following UAS operations:
  - i. Fly a small UAS from a moving aircraft or a vehicle in populated areas
  - ii. Fly a small UAS during periods of civil twilight and at night without anti-collision lighting
  - iii. Fly a small UAS beyond the PIC's ability to clearly determine the position, altitude, attitude, and movement of the UAS, with unaided vision
  - iv. Use a visual observer without following all visual observer requirements
  - v. Fly multiple small UAS with only one PIC
  - vi. Fly over a person with a small UAS which does not meet the FAA requirements of [Subpart D – Operations Over Human Beings](#).
  - vii. Fly a small UAS:
    - a. Over 100 miles per hour groundspeed
    - b. Over 400 feet above ground level (AGL)
    - c. With less than 3 statute miles of visibility
    - d. Within 500 feet vertically or 2000 feet horizontally from clouds
    - e. Fly over moving vehicles with a small UAS which does not meet FAA requirements of [Subpart D – Operations Over Human Beings](#).
- K. UAS operations may only occur in pre-approved locations or areas pre-approved by EHS (see **Section XIV – Notification and Approval**).
- L. UAS operations must be in accordance with Northwestern's [filming and photography requirements](#).
- M. UAS operations may not photograph, record, or monitor areas where other members of the University community or the general public would have a reasonable expectation of privacy. UAS operations should follow the National Telecommunications and Information Administration (NTIA)'s [Voluntary Best Practices for UAS Privacy, Transparency, and Accountability](#).

## VI. Operations – General Safety

- A. PICs must complete a pre-flight UAS inspection in accordance with manufacturer recommendations, and an inspection of the UAS operations area. Any UAS deficiencies, hazards, or other conditions that may result in unsafe UAS operations must be corrected before commencing UAS operations.

- B. Weather forecasts must be analyzed before UAS operations to ensure that UAS can operate in the anticipated conditions (e.g., wind, rain). UAS must not be operated in inclement weather.
- C. If new hazards are introduced during UAS operations, operations must be suspended immediately until corrected.
- D. PICs must adhere to manufacturer operating guidelines and UAS equipment limitations.
- E. PICs must operate UAS in a manner consistent with FAA safety requirements and this program, including but not limited to:
  - i. Maintaining safe UAS distance from, and yield right of way to, pedestrians, vehicles, manned aircraft, marine operations, animals, and property.
  - ii. Maintaining safe UAS course, speed, and trajectory at all times to avoid collision with pedestrians, vehicles, animals, and property.
  - iii. Never operating the UAS in a careless or reckless manner;
  - iv. Flying under 400 feet above ground level (AGL) unless a waiver is obtained.
  - v. Keeping the UAS within visual line-of-sight unless a waiver is obtained, with limited exceptions including but not limited to indoor unoccupied space inspections (e.g., crawl spaces, confined spaces, tunnels);
  - vi. Maintaining speeds of less than 100 mph unless a waiver is obtained; and
  - vii. Suspending or canceling flights immediately when FAA or this program's requirements cannot be met.
- F. UAS are permitted to carry an external load if the UAS is specifically designed for such an application and the load is securely attached and does not adversely affect the flight characteristics or controllability of the UAS.
- G. Noise produced from UAS operations must be in accordance with local ordinances.
- H. Store UAS in dry, cool locations and in accordance with manufacturer guidelines.
- I. UAS can be disposed of as [Universal Waste](#), as long as it has not been contaminated with any hazardous materials. If the UAS contains reacting and/or leaking batteries it is considered hazardous waste and must be disposed of properly. Contact [ehs@northwestern.edu](mailto:ehs@northwestern.edu) for more information.

## VII. Indoor Operations

- A. Hobbyist UAS operations are not permitted indoors.
- B. Every effort must be made to avoid indoor UAS operations by alternative means, when feasible.
- C. UAS operations are generally not permitted in residence halls unless approved by EHS.
- D. Indoor UAS PICs must meet the training requirements of **Section XVII – Training**.
- E. Indoor UAS operations over people is generally not permitted.
- F. EHS will evaluate all requests for indoor small UAS operations and will approve or deny such requests on a case-by-case basis, in collaboration with building managers and any affected University departments or units. When permitted by EHS:
  - i. The small UAS may not contain any exposed rotating parts (e.g., use of propeller guards) that would lacerate human skin upon impact with an individual or would cause damage to property such as light fixtures, fire detection equipment, and sprinkler heads.
  - ii. UAS equipment must be designed for indoor use.
  - iii. A written safety plan must be developed, which must include:
    - a. Procedures to ensure no conflict between UAS and people, animals, equipment, and property;

- b. A plan for all UAS movements (take-off, landing, flight paths);
- c. Established safe speeds and distances to people, equipment, animals, and property (e.g., sprinkler heads, electrical panels, fixtures, alarm systems);
- d. Access control plan for the operating area; and,
- e. Emergency procedures (e.g., collisions, UAS malfunctions).

## VIII. Impacts to Walkways, Roadways, and Public Areas on Campus

- A. Every effort must be made to avoid UAS operations that impede walkways, roadways, and public areas on campus by alternative means, when feasible.
- B. EHS will evaluate all requests for UAS operations over people and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- C. UAS operations such as window/façade cleaning, must take into consideration the impact hoses and other equipment may have, as well as any chemicals used that may impact the environment, landscaping, vegetation, or campus property.
- D. When operations are permitted by EHS, a written safety plan must be developed and provided to EHS, which must include:
  - i. Procedures to ensure no conflict between UAS and people, animals, equipment, and property;
  - ii. A plan for all UAS movements (take-off, landing, flight paths);
  - iii. Established safe speeds and distances to people, animals, equipment, and property;
  - iv. Access control plan for the operating area; and,
  - v. Emergency procedures (e.g., collisions, malfunctions).

## IX. Operations Over People

- A. Every effort must be made to avoid UAS operations over people by alternative means, when feasible.
- B. EHS will evaluate all requests for UAS operations over people and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- C. When operations are permitted by EHS, small UAS operations over people may occur when the small UAS does not contain any exposed rotating parts that would lacerate human skin upon impact with an individual (e.g., propeller guards), and:
  - i. The person or persons are directly participating in the small UAS operations (e.g., photoshoot); or
  - ii. The person or persons are located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small UAS; or
  - iii. The small UAS operations meet the [FAA Part 107 Subpart D – Operations over Human Beings](#) requirements (e.g., category 1, 2, 3, or 4 operations and [Remote ID](#)).
- D. The PIC must consider the small UAS course, speed, and trajectory, including the possibility of a catastrophic failure, to determine if the small UAS would go over or strike a person not directly involved in the flight operation (i.e., non-participant). In addition, the PIC must take steps using a safety risk-based approach to ensure that:

- i. The UAS does not operate over non-participants who are not under a covered structure or in a stationary covered vehicle;
  - ii. The UAS will pose no undue hazard to other aircraft, people, or property in the event of a loss of control of the UAS for any reason; and
  - iii. The UAS is not operated in a careless or reckless manner so as to endanger the life or property of another.
- E. If the PIC is unable to comply with the requirements in this section, then the flight must not take place or the flight must be immediately and safely terminated.

## X. Operations at Night

- A. Every effort must be made to avoid UAS operations over people by alternative means, when feasible.
- B. EHS will evaluate all requests for night UAS operations and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- C. When operations are permitted by EHS:
  - i. The PIC must complete an updated initial knowledge test or online recurrent training that includes safe UAS operations at night, and
  - ii. The small UAS must have lighted anti-collision lighting visible for at least three (3) statute miles that has a flash rate sufficient to avoid a collision.

## XI. Moving Vehicles

- A. EHS will evaluate all requests for UAS operations involving moving vehicles and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- B. When operations are permitted by EHS:
  - i. Small UAS operations are permitted over moving vehicles when the small UAS meets the requirements of [FAA Part 107 Subpart D – Operations over Human Beings](#) category 1, 2, or 3, and either:
    - a. The small UAS must remain within or over a closed- or restricted-access site, and all people inside a moving vehicle within the closed- or restricted-access site must be on notice that a small UAS may fly over them; or
    - b. The small UAS does not maintain sustained flight over moving vehicles.
  - ii. Small UAS operations are permitted for category 4 operations as long as the applicable operating limitations in the approved Flight Manual or as otherwise specified by the Administrator do not prohibit such operation.

## XII. Outdoor Athletics Fields

- A. EHS will evaluate all requests for UAS operations over outdoor athletics fields and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- B. UAS operations are [prohibited](#) in and around Ryan Field, at or below 3,000-feet above ground level (AGL) within a 3 nautical mile radius, beginning one hour before and ending one hour after the scheduled time of any Northwestern football game.
- C. UAS operations over Northwestern Athletics fields require pre-approval from Northwestern Athletics (see **Section XIV – Notification and Approval**).



### XIII. Open-Air Assemblies

- A. EHS will evaluate all requests for UAS operations involving open-air assemblies and will approve or deny such requests on a case-by-case basis, in collaboration with any affected University departments or units.
- B. When operations are permitted by EHS, UAS operations must adhere to FAA regulations and this program.

### XIV. Notification and Approval

- A. A Northwestern representative must submit a [UAS Flight Request Form](#) for all non-hobbyist outdoor and indoor UAS operation on, above, or inside university property with at least 48 hours' notice prior to operating a UAS, and must provide the following information for EHS review:
  - ii. Pilot in Command (PIC) contact information (i.e., phone and email) and FAA license number
  - iii. UAS weight and FAA registration number
  - iv. If the flight is over Northwestern athletics fields, obtain pre-approval from Northwestern Athletics and provide the name of the approver
  - v. Flight plan, including the purpose, date, time, and flight duration
  - vi. Upload the following documentation:
    - a. FAA PIC license
    - b. PIC night training certificate (for night flights)
    - c. Flight plan map indicating all areas of operation.
    - d. Certificate of Insurance (COI) and contract if the PIC is a contractor or vendor
    - e. A written safety plan for indoor flights or flights that will impact walkways, roadways, or other public areas on campus.
    - f. Documentation of any FAA waivers or exemptions obtained; and
  - vii. Departments or units with regular UAS flight needs may submit a general outline of proposed use and flight plans to EHS for review and approval in place of individual flight notice. Generally, blanket approvals cannot exceed 30 days. In these instances, EHS may instruct PICs or Northwestern representatives to perform specific notifications (e.g., Northwestern Police) before all flights.
- B. EHS will review UAS flight requests and:
  - i. Approve the request in writing to the requester, copying any additional relevant parties for awareness (e.g., Northwestern Police, Facilities), as necessary,
  - ii. Request additional information from the requester and/or other stakeholders for further evaluation, or
  - iii. Deny the request if it does not meet the requirements of this program.
- C. EHS or NPD may suspend or cancel any UAS operation at any time, regardless if previously approved.
- D. Any deviations to the flight plan (e.g., date, time, location, purpose) post EHS approval must be communicated to EHS prior to carrying out any deviations from the approved flight plan. EHS will review the flight plan deviation and approve or deny the request on a case-by-case basis.
- E. If UAS operations will occur off University property, any required permissions or other information relating to the coordination of UAS activity with local authorities and/or property owners is the responsibility of the PIC and/or UAS owner.

## XV. Outdoor Hobbyist UAS Operation

- A. Outdoor Hobbyist UAS operations are permissible where such use is:
  - i. Restricted to two approved areas on the Evanston campus, [Long Field](#) and the [Lakefill](#), and occurs only when these locations are not in use for University events; and
  - ii. Consistent with this program and FAA safety and registration [requirements](#) for recreational UAS use.
- B. UAS operations conducted as part of a student's work in a start-up (e.g., The Garage accelerator program) would not qualify as Outdoor Hobbyist UAS use. UAS operators in such cases must follow the FAA requirements and this program for non-hobbyist UAS outdoor operations.

## XVI. Emergencies, Incidents, and Reckless UAS Operations:

- A. Any accident resulting in personal injury or property damage (other than damage solely to the UAS itself) or incident involving reckless or improper operation of UAS must be promptly reported to University Police at (847) 491-3456 or [universitypolice@northwestern.edu](mailto:universitypolice@northwestern.edu) and Risk Management [here](#).
- B. The PIC must report an accident to the FAA within 10 days if it results in at least serious injury to any person or any loss of consciousness, or if it causes damage to any property (other than the UAS or drone) in excess of \$500 to repair or replace the property.
- C. Any emergency must be promptly reported by dialing 911.
- D. Northwestern may, at its discretion, suspend any UAS operation deemed dangerous, interfering with, or interrupting the operations of the university. Should a discrepancy between this program and FAA regulations or other laws exist, the more restrictive will govern.

## XVII. Training

- A. UAS PICs must be appropriately trained in accordance with FAA regulations and this program.
- B. Hobbyist PICs must complete [The Recreational UAS Safety Test \(TRUST\)](#) before UAS operations.
- C. Non-hobbyist PICs must be an FAA-Certified Drone Pilot by [obtaining](#) a Remote Pilot Certificate prior to UAS operations, whether indoor or outdoor. Certificates must be kept current by completing one of the following online training courses within the previous 24 calendar months:
  - i. [Training](#) for PICs who hold a Part 107 remote pilot certificate
  - ii. [Training](#) for PICs who hold a Part 107 remote pilot certificate who are also certificated with a current [flight review](#) under [Part 61](#)
- D. For UAS operations at night, PICs must have completed an updated initial knowledge test or online recurrent training that includes safe UAS operations at night.

## XVIII. Purchasing and Insurance

- A. Any unit, faculty, staff, or student using University funds, sponsored project funds, or funds distributed through a University account to purchase a UAS (or the parts to assemble a UAS) must assess the ability to operate the UAS consistent with applicable

- law, regulations, city ordinances, this program, and (if operated off University property) any requirements imposed by owners of property where UAS are operated.
- B. University-owned UAS will be insured for any liability arising out of their operation only if such UAS are in accordance with this program. The University will not insure unregistered UAS.
  - C. Any physical damage to the UAS is the responsibility of the UAS owner.

## XIX. Export Controls

Export controls: UAS owners and operators must act in accordance with export control regulations, including the [Export Administration Regulations](#) and the [International Traffic in Arms Regulations](#). These regulations cover physical exports of UAS as well as transfer of UAS technology to foreign nationals, regardless of location. The [Export Controls Compliance](#) policy provides additional guidance.

## XX. Consequences of Violating this Program

- A. Failure to comply with this program may result in the suspension or cancellation of UAS operations. The University reserves the right to suspend or prohibit UAS operations as it deems appropriate.
- B. In addition, violations of laws, regulations, or city ordinances relating to UAS operation could lead to legal action or criminal proceedings.

## XXI. Regulatory and Related Information

Northwestern and contractors will comply with the FAA standards and any other applicable codes and standards, including:

[UAS Flight Request Form](#)

[FAA B4UFY App](#)

[FAA 14 CFR Part 107 Small Unmanned Aircraft Systems](#)

[FAA Recreational Flyers & Community-Based Organizations](#) (Hobbyist UAS Operations)

[FAA 14 CFR Part 107 Waiver](#)

[FAA Certificated Remote Pilots including Commercial Operators](#)

[FAA Aircraft Registration](#) (Large UAS FAA Registration)

[FAA DroneZone](#) (Small UAS FAA Registration)

[FAA UAS FAQ page](#)

[FAA Operations Over People](#)

[Export Administration Regulations](#)

[Export Controls Compliance Policy](#)

[International Traffic in Arms Regulations](#)

[NTIA Voluntary Best Practices for UAS Privacy, Transparency, and Accountability](#)

## XXII. Contacts

- A. For questions contact Environmental Health and Safety at [ehs@northwestern.edu](mailto:ehs@northwestern.edu) or (847) 467-6342.
- B. For questions regarding export compliance contact Export Controls Compliance at [exportcontrols@northwestern.edu](mailto:exportcontrols@northwestern.edu).