Texas Department of Transportation

Uncrewed Aircraft Systems

2026 External Pilot Flight Operations Manual

Contents

External UAS Pilot Use Only

For the purposes of this manual, "External Pilot" refers to any non-TxDOT individual or organization providing UAS services to TxDOT, including but not limited to contractors, consultants, vendors, or external agency personnel.

This manual establishes the minimum operational, safety, administrative, and reporting requirements for all External UAS Pilots conducting UAS operations for TxDOT. It is formatted to align with the TxDOT internal Flight Operations Manual. Pilots are responsible for certification, training, currency, and compliance with planning, operations, emergency response, reporting, and documentation procedures. All publications and documents necessary for TxDOT UAS operations will be located at https://www.txdot.gov/business/aviation/uas-services.html. For all questions or concerns, contact Emerging Aviation Technology Section (EATS) Coordinators by email at TxDOT-UASCoord@txdot.gov or by listed phone contact information. If a conflict exists between Emerging Aviation Technology Section (EATS) requirements and external pilot organizational requirements, notify EATS for further coordination.

1. Program Scope & Governance

Applicability - This manual is for users who may have no prior exposure to TxDOT UAS procedures; therefore, all operational requirements are explained without assuming previous knowledge. This publication does not cover emergency/critical incident response, but emergency procedure documents can be provided for Skydio X10, Trinity Pro, and Wispr Ranger Pro aircraft. Any other aircraft used will require specific emergency procedures for that aircraft to be on hand.

Program Organization - The UAS Program is managed by the Emerging Aviation Technology Section (EATS) within the Aviation Division (AVN). The EATS Director delegates day-to-day program management and flight approval authority to EATS Coordinators.

Roles and Responsibilities

EATS Coordinators - Program managers and approval authority for TxDOT UAS flights; maintain program standards, records, and safety oversight.

District/Division UAS Coordinators - Assigned by each District/Division that operates aircraft; track aircraft location, storage, sharing, pilot currency, and maintenance; serve as local subject-matter experts. These Coordinators will be the local level points of contact for external UAS Pilots supporting TxDOT projects within their assigned District.

Remote Pilot in Command (RPIC) - Must hold a valid FAA Remote Pilot Certificate issued under 14 CFR Part 107 Subpart C (§107.61–§107.73) and must maintain current FAA recurrent training status.
Visual Observer (VO) - Must be designated by the RPIC and trained and briefed on communication procedures, airspace hazards, mission objectives, emergency actions, and lost-link/RTH procedures prior to flight.
External Pilots shall:

a. Ensure all operations follow FAA Part 107, Texas statutes, and TxDOT policies.
b. Provide properly certificated Remote Pilots in Command (RPICs) and trained VOs.
c. Maintain equipment, logs, maintenance records, and required insurance.
d. Submit mandatory documents (Flight Plan, Project Risk Assessment, Pre-Approval forms when required).
e. Ensure personnel are trained, qualified, and current on the aircraft and mission type to be performed.
f. Immediately cease operations if ordered by TxDOT personnel.

TxDOT Shall:

a. Provide oversight of all contractor operations supporting TxDOT projects.
b. District/Division UAS Coordinators provide localized oversight and provide support to contractors when needed.
c. TxDOT may impose additional restrictions at its discretion.

d. TxDOT does not provide indemnification of external pilot aircraft and operations. This will be the responsibility of the external organization.

2. Compliance & Policy Baseline

Federal Aviation Administration (FAA) Part 107 - All external UAS support operations shall comply with 14 CFR Part 107 and any applicable waivers or authorizations. TxDOT does not grant deviations from Part 107; where required, obtain LAANC authorizations, waivers, or Certificates of Authorization (COA) through standard FAA processes.

Texas Government Code Chapter 423 (Use of Unmanned Aircraft) – External and contractor flight crews will respect privacy boundaries and only collect data consistent with agency mission, minimizing incidental capture and managing sensitive data appropriately while supporting TxDOT projects.

Prohibited Technologies – External organizations will comply with statewide guidance on prohibited technologies and TxDOT IT security policy. Do not use prohibited software/applications/firmware/hardware without a documented exemption.

Insurance/Indemnification – External Pilot aircraft and operations indemnification will be the responsibility of the organic organization they belong to.

In-Flight Emergency Actions/Critical Incident Response - This publication does not cover emergency/critical incident response, but emergency procedure documents can be provided for Skydio X10, Trinity Pro, and Wispr Ranger Pro aircraft upon request. Any other aircraft flown by external UAS Pilots will require specific emergency procedures for that aircraft to be on hand.

3. Pilot Qualifications & Currency

Baseline Requirements (RPIC)

a. Current FAA Remote Pilot Certificate (Part 107).
b. External pilot will manage all refresher training.
c. Competency in the flight mode(s) to be used (manual, automated, GPS-denied, confined space, etc.)

Currency

a. Standard currency - must have flown in the past 30 days
b. If currency lapses – reestablish currency with 3 Takeoff and Landings with 30 minutes of flight time.
c. Trained and qualified on the specific airframe to be used.

Visual Observer (VO) - Must be assigned and approved by the RPIC. VO will be briefed by the RPIC on communications, hazards, route, return-to-home (RTH) altitude, and emergency actions.

4. Flight Planning & Approvals

Flight Plan Required - Submit a Flight Plan for every mission using the TxDOT UAS Flight Plan Webform. The Flight Plan serves as the official record of UAS activity. If Webform is not working correctly, notify EATS Coordinators for additional coordination. EATS will provide a PDF flight plan and email for submission.

Operations that always require Pre-Approval: (Submit before flying)

a. Operations in controlled airspace (Class B/C/D or Class E to surface) or requiring LAANC/COA/NOTAM.
b. Within 2 NM of an airport or heliport with a paved surface.
c. Any operation requiring a deviation from the operating rules in Section 5.
d. Traffic control beyond warning signs (e.g., cones, speed reduction, or lane closure).
e. Operations inside or over a railroad right-of-way (defined here as 50 ft from the edge of the railway to the centerline)
f. Heightened privacy considerations (Section 5 – Privacy).
g. Dense urban environments (urban canyons).
h. Missions near industrial facilities, airports without paved surfaces, ports, or energy corridors.
i. Heavy construction zones, constrained ROWs, or obstructions limiting maneuvering.

j. High-risk environmental conditions (gusty winds, turbulence channels, thermals near pavement or structures).
k. Confined or GPS-denied environments.

Operations that do not require Pre-Approval (Standard Flight) - Standard operations that remain within Part 107, follow Section 5 rules, and present no identified elevated hazards may be flown without pre-approval, provided all information has been provided in flight plan.

Flight Plan Components - Required for all UAS flights. Must include:

a. Project description and mission purpose
b. Maps showing operational area
c. Dates, times, airspace classification, NOTAMs, authorizations
d. Privacy considerations

If Flight plan Webform is not functioning correctly, complete and submit a PDF flight plan to the following email: **TxDOT-UASFlightPlan@txdot.gov.**

5. Operating Rules Near Roads, Rails, & Infrastructure

Takeoff and Landing Rules

a. Minimum crew: RPIC + VO.
b. Takeoff/Landing standoff from highways: ≥20 ft from outer edge of travel lane where posted speed ≥40 mph; otherwise ≥10 ft.
c. Rail standoff: ≥50 ft from the edge of railway for takeoff/landing; entry into railroad ROW requires pre-approval.
d. Road crossings: comply with 14 CFR §107.145 (operations over moving vehicles). For posted speed >40 mph, cross at ≥50 ft AGL, linger no longer than necessary, avoid having a vehicle directly beneath when feasible.
e. No takeoff/landing between lanes of a divided highway.
f. No operations under an overpass with traffic on a lower roadway without an approved traffic control plan.

Privacy

a. Collect only data relevant to TxDOT's mission.
b. Limit incidental capture outside the project area whenever practical.

c. All data collected will be considered TxDOT property and should be saved, filed, and maintained in accordance with TxDOT records policy.

6. On-Site Operations & Crew Management

a. RPIC Authority and Crew Duty Day Limits
The Remote Pilot in Command (RPIC) is responsible for managing all onsite UAS operations and retains operational authority unless the TxDOT UAS Coordinator is present.

b. To reduce cumulative fatigue and ensure safe decision-making, all flight crews will adhere to the following duty and flight-time limitations:
Maximum flight time: 6 hours of actual stick-time within any 24-hour period. Maximum duty day: 12 hours total work time per calendar day (including setup, transit, breaks, and post-flight tasks).
Minimum rest: At least 48 consecutive hours off within any 14-day period.
These limits help prevent fatigue-related risk during planning, flight operations, and post-flight tasks.

c. Crew fitness: use IMSAFE (Illness, Medication, Stress, Alcohol, Fatigue, Emotion) and report concerns to the RPIC; RPIC decides go/no-go.

d. Pre-Flight Safety & Weather Briefing
Before beginning operations, the RPIC will conduct a safety and weather briefing that includes:
Traffic: Ground vehicles, pedestrian flow, other aircraft.
Environmental hazards: Obstacles, terrain, power lines, wildlife activity.
Weather considerations:
Current and forecast wind, temperature, visibility, and ceiling.

Density altitude effects for fixed-wing systems
Potential weather changes during mission duration
Weather triggers for "knock-it-off" or early landing

e. On-location risk walk-through identifies hazards missed in planning; adjust flight plan and mitigation as needed; document changes.

f. Communications check: RPIC/VO radio or phone, roles, callouts; confirm RTH coordinates/altitude.
g. Pre-flight checklist execution; announce start of operations; maintain continuous RPIC–VO comms; announce landing; conduct post-flight debrief and secure site.

7. General Aircraft Emergency & Incident Response

Activation - When an in-flight emergency occurs, the RPIC announces the emergency, prioritizes safety of people first, prevents chain reactions, and lands/ditches promptly as conditions dictate. After stabilization, notify the appropriate District/Division Coordinator. District/Division Coordinator will notify AVN/EATS for situational awareness or any further guidance. (Section 8).

TxDOT Reporting — UAS Accident Report required when:

a. Any In-Flight Emergency Plan or DARP activation.
b. Unplanned proximity within 20 ft of another vehicle (UAS, roadway vehicle, watercraft, or rail).
c. Unplanned proximity within 10 ft of a fixed object (building, pole, utility line, tree, bridge, dam, etc.).
d. Any injury, property damage, fire, or hazardous condition caused by the UAS.
e. Submit the UAS Accident Report to the designated EATS/AVN mailbox and notify your District/Division UAS Coordinator.

8. Reporting Requirements (TxDOT, FAA, NTSB)

Public/Media – External/contractor pilots are providing services for TxDOT projects. As such, in the event of any incident, only the TxDOT Chief Communications Officer (or designee) may respond to media/public inquiries.

FAA & NTSB Notifications - The RPIC will communicate as soon as possible with District/Division Coordinators who will then contact EATS Director/Coordinators when able to determine notifications requirements based on current FAA/NTSB criteria. If thresholds are met (e.g., serious injury/loss of consciousness or significant property damage for FAA; certain serious incidents for NTSB), make timely reports via the appropriate channels.

FAA Reportable Criteria

a. Serious injury to any person or any loss of consciousness
b. Damage to property
c. Repair cost exceeds $500 or the fair market value exceeds $500 in the event of total loss

NTSB Reportable Criteria

a. A person suffers serious injury or death
b. UAS weighs at least 300 pounds and sustains substantial damage
c. Any listed incident under 49 CFR §830.5 occurs - Flight control system failure, in-flight fire, mid-air collision

9. Maintenance, Registration & Records

a. Maintain aircraft and control systems per manufacturer recommendations; document all scheduled and unscheduled maintenance in a maintenance log.

b. After maintenance, firmware, or software updates, perform a functional test and verify airworthiness before mission use.
c. All aircraft will be registered with the FAA and display the registration number on the aircraft per FAA requirements. Pilot will verify aircraft registration.
d. Pilot Logs: record date(s), aircraft model and registration, total flight minutes, and mission type for each project, and be able to provide to TxDOT Coordinators upon request.
e. Record Retention: Products collected, processed, and stored for TxDOT projects will follow TxDOT records management policies. To include all UAS records (plans, approvals, logs, data, reports).

10. Safety

Contractor must:

Follow the TxDOT Handbook of Safe Practices

a. Identify nearest emergency medical facilities
b. Ensure crew can describe location to 9-1-1
c. Maintain communications plan

d. Use appropriate PPE, safety equipment, and fire extinguishers
e. Follow safe battery and fuel handling procedures
f. Protect crew from environmental and roadway hazards

B. IMSAFE Health Check - All crew must self-assess for: Illness, Medication, Stress, Alcohol, Fatigue, Emotion.

C. On-location Risk Assessment
RPIC must:

a. Walk site
b. Identify hazards missed in planning
c. Update mitigation measures
d. Document changes

D. Standard Flight Procedure

a. Site safety briefing
b. Verify Communications
c. Pre-flight inspection and checklist use
d. Takeoff announcement
e. Constant RPIC and VO communication
f. Post-flight briefing and documentation

7. General Emergency Procedures

Contractors must follow TxDOT emergency procedures for:

a. Total/Partial power loss
b. Loss of control
c. Fly-away
d. Airspace encroachment
e. Bird/fixed-object strike
f. Interference with crew
g. Nearby emergency operations
h. Emergency contacts must be notified per TxDOT policy
i. Contractor must complete an Accident Report when emergency actions occur

8. Downed Aircraft Recovery Plan (DARP)

Contractors must:

a. Never recover aircraft from hazardous locations (Utility lines, dangerous terrain, water > 5 ft, roadways with heavy traffic)
b. Obtain landowner permission for private property recovery
c. Document recovery with photos, notes, sketches
d. Complete Accident Report
e. Follow all DARP checklist procedures

9. Accident, Incident, and Near-Miss Reporting

A. Contractors must report to TxDOT when:

a. Emergency plan or DARP is activated
b. Damage to property occurs
c. Injury occurs
d. Fire or hazardous conditions occur
e. Near miss with any other aircraft

Report must include:

a. Date, time, location
b. Crew involved
c. Description of incidents and actions taken
d. Supporting photos or sketches

Report must be emailed to: TxDOT-UASCoord@txdot.gov within 1 day of event
FAA and NTSB reporting requirements must also be followed when applicable.

10. Maintenance and Documentation Requirements

Contractors must maintain the following documentations upon request from authorities or officials:

a. Pilot logs
b. Aircraft maintenance logs
c. Aircraft FAA registration markings
d. Training documentation

11. Privacy and Data Handling Requirements

Contractors must:

a. Comply with Texas Government Code Chapter 423

b. Avoid collecting imagery outside project limits
c. Delete incidental imagery that may violate privacy
d. Seek pre-approval when privacy concerns are anticipated

Appendices

Appendix A — Glossary & Acronyms

- **AVN** — Aviation Division
- **EATS** — Emerging Aviation Technology Section
- **IMSAFE** — Illness, Medication, Stress, Alcohol, Fatigue, Emotion
- **LAANC** — Low Altitude Authorization and Notification Capability
- **NAS** — National Airspace System
- **NOTAM** — Notice to Air Missions
- **RPIC** — Remote Pilot in Command
- **RTH** — Return to Home
- **SMS** — Safety Management System
- **UAS** — Uncrewed Aircraft System
- **VO** — Visual Observer.