

Division of Intermodal, Aviation Programs



Uncrewed Aircraft Systems FY 2025 Annual Report



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Photo: Northbound Interstate-75 at Interstate-16, Macon
Cover Photo: Interstate-75 South of Macon to Interstate-75 West of Bolingbroke Boling

Fiscal Year 2025 UAS Program Overview

The Georgia Department of Transportation (GDOT) continues to expand and innovate its Uncrewed Aircraft Systems (UAS) Program. In Fiscal Year 2025 (FY25), the program grew in fleet capability, staffing, policy, and operational output, achieving its highest-ever flight hours.

The mission of the GDOT UAS Program is to integrate uncrewed aircraft into transportation operations to improve safety, efficiency, and decision-making across the state.

The program is headquartered in GDOT's Intermodal Division, which leads research and development, policy creation, training programs, and specialized missions. Day-to-day operations are carried out by a decentralized network of pilots embedded in districts and offices statewide, who receive training, guidance, resources, and technical support from the Intermodal team, balancing statewide standardization with local operational flexibility.

FY25 at a Glance:

- **Staff Expansion:** Three new positions were added: an Aviation Technology Manager to lead AAM and UAS policy, planning, and strategy; a UAS Program Development Manager to expand advanced capabilities and data integration; and a full-time UAS Pilot dedicated to field operations, project delivery, and emergency response.
- **Fleet Upgrades:** Two advanced National Defense Authorization Act (NDAA)-compliant platforms were added: the Skydio X10 for autonomous close-quarters inspection and the Harris Aerial H6 with RIEGL VUX-100 LiDAR for survey-grade mapping.
- **Policy & Strategy:** GDOT released a revised UAS Policy, updated Emergency Response SOP, and a new Strategic Plan with clear goals through FY35, emphasizing NDAA-compliant platform acquisition, greater UAS utilization and integration, mission planning software, and enhanced training and emergency response capability.
- **Operational Output:** The program achieved its highest number of flight hours and average minutes per flight since inception, reflecting growing demand and more complex UAS-supported work.

These advancements, along with targeted research and development, position GDOT to modernize aerial data collection, prepare for Beyond Visual Line of Sight (BVLOS) operations, and enhance statewide readiness for emerging technologies including LiDAR mapping, AI-driven inspections, and advanced photogrammetry.

Regulatory Landscape

FY25 saw major policy shifts at both federal and state levels impacting GDOT's UAS operations. At the federal level, two executive orders (EO) were issued in June 2025, *Unleashing American Drone Dominance* and *Restoring American Airspace Sovereignty*.

The EOs directed the FAA to accelerate BVLOS rulemaking, launch a national electric vertical takeoff and landing (eVTOL) pilot program, and update integration plans for the national airspace. They also emphasized domestic manufacturing and opened new grant opportunities for counter-UAS capabilities.

In Congress, the Drones for America Act (S. 2168) was introduced. It proposes a phased ban on Chinese drone systems and components, along with interim escalating tariffs to discourage the procurement of these platforms.

At the state level, Georgia continued to restrict drone operations near major public events and critical infrastructure. Proposed bills aimed at banning foreign-manufactured drones and requiring Homeland Security approval for agency purchases did not pass but reflect growing legislative interest in cybersecurity and procurement controls.

Flight Statistics

Flight activity in FY25 reached the highest level in recent years, reflecting the program's growing maturity and expanding role in GDOT operations. The program recorded 420 operations, totaling 8,482 minutes (141.4 hours) of flight time. This is the highest total in annual flight time and average minutes per flight since the program's inception.

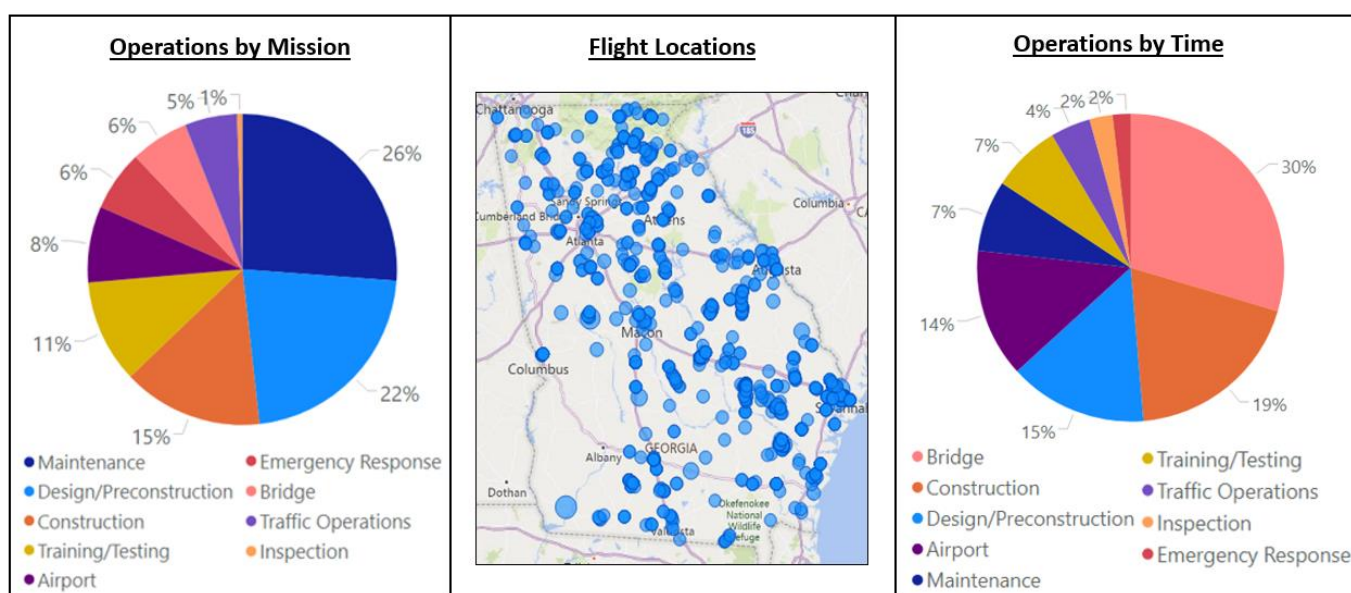
The average flight lasted 20.2 minutes, reflecting a shift toward more complex missions such as photogrammetry and orthomosaic generation, rather than simple photo capture. These missions supported a variety of deliverables, including quantity measurements, plan sheet overlays, topographic mapping, and centimeter-level survey accuracy for project planning and verification.

Fiscal Year	Missions Flown	Flight Time (min)	Avg. Min per Flight
FY21	350	5,290	15.11
FY22	267	4,738	17.75
FY23	367	4,208	11.47
FY24	267	4,352	16.3
FY25	420	8,482	20.2

Compared to FY24, FY25 showed strong growth across all key metrics:

- **Mission count increased by 57%**, rising from 267 to 420 flights.
- **Total flight time nearly doubled**, increasing by approximately 95% from 4,352 to 8,482 minutes.
- **Average flight duration grew by 24%**, from 16.3 to 20.2 minutes, reflecting deeper, more data-intensive operations.

These trends demonstrate both increased demand and expanded mission complexity and platform capability. With new staffing, updated policies, and greater use of advanced aircraft, the program is now supporting a broader range of projects than ever before and is positioned for continued growth in the coming years.



The charts above illustrate the program's statewide reach and the variety of missions supported using available data from the department's drone tracking software. The Flight Locations map shows activity across Georgia, from major metro areas to rural communities, reflecting the ability to deploy UAS resources wherever they are needed.

The Operations by Mission chart shows that maintenance flights made up the largest share of missions, though these were typically short in duration. In contrast, mission types such as bridge inspections and construction monitoring occurred less frequently but involved more complex, data-rich operations.

The Operations by Time chart highlights this distinction. Bridge inspections accounted for the greatest share of total flight hours despite representing a smaller portion of missions, highlighting their complexity and the high value of the detailed data they deliver.

Key Projects

Throughout FY25, the GDOT UAS Program conducted diverse missions that demonstrated the expanding capabilities and impact of drone technology across the department.

Each highlighted project represents a key use case where UAS technology delivered measurable benefits in efficiency, data quality, and operational safety. These missions also provided valuable lessons that continue to inform program development and innovation.

Below are summaries of selected projects from FY25, showcasing the program's alignment with GDOT's broader transportation goals and its commitment to leveraging emerging technologies to improve statewide operations.

Columbus Rail Corridor Survey

The UAS Program surveyed a decommissioned rail corridor in Columbus, Georgia, to determine parcel ownership and assess GDOT's land interests.



A consultant-provided survey plat was overlaid with current aerial imagery, aligning it to existing plan sheets. This visual integration allowed project staff to see actual site conditions alongside engineering layouts.



The high-resolution aerial data also enabled calculation of the percentage of corridor segments on GDOT-owned versus privately owned land. The UAS survey cost approximately \$2,000, compared to an estimated \$38,954 for a traditional survey, delivering accurate, timely, and visually rich data to support more informed planning and review.

Construction Progress Monitoring – I-20/SR-138 Interchange

Quarterly UAS flights at the I-20/SR-138 interchange in Conyers, Georgia, document construction progress and visualize changes over time. Imagery is processed and then analyzed using a timeline tool, which allows project staff to compare current conditions with previous flights and quickly identify changes or potential issues. Using GDOT's FAA waiver for operations over people and property, the flights safely captured comprehensive imagery while minimizing on-site exposure. The two-hour total flight time covering just over 100 acres provided centimeter-level accuracy, reduced work hours and personnel risk, and delivered high-quality visual records to support project oversight.



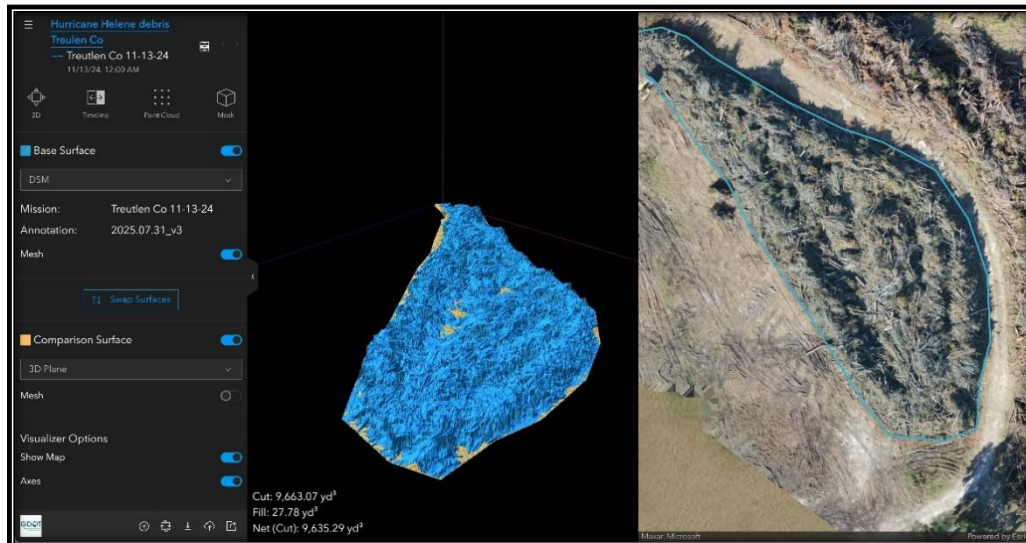
Hurricane Helene Debris Management

Following Hurricane Helene, UAS flights documented debris stockpiles to support cleanup and disposal operations. Photogrammetry and orthomosaic processing created detailed site maps, and built-in measurement tools enabled fast, precise volume calculations. This capability can improve inventory tracking, optimize resource allocation, and support informed decision-making during disaster response while reducing survey time, improving accuracy, and minimizing field exposure.

Hurricane Helene Debris Stockpile Measurements



Aerial orthomosaic of debris stockpile created through UAS photogrammetry



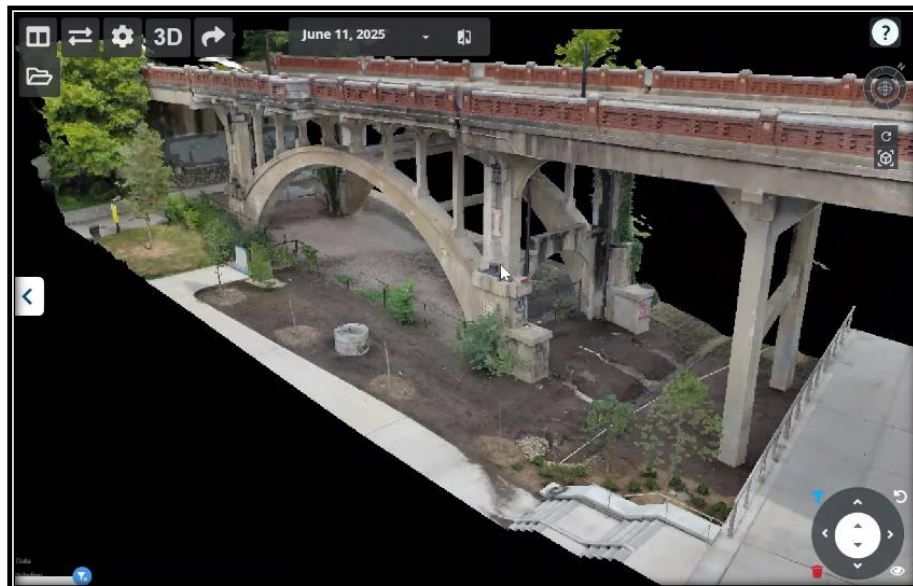
3D volumetric model and measurement outputs used for precise stockpile volume calculations

Skydio 3D Scan Infrastructure Modeling

Two years ago, early 3D scanning efforts produced low-resolution, incomplete models of a GDOT-owned bridge located at Piedmont Park. In FY25, the newly acquired Skydio X10 captured complete, high-resolution 3D models with significantly greater clarity and detail. This capability allows bridges to be inspected from the air rather than requiring extensive lane closures or placing inspectors in high-risk positions, improving safety while maintaining accuracy. The repeatable scans also create permanent digital twins for tracking changes over time. Upcoming enhancements will integrate AI-powered pavement crack detection to automate defect identification and further increase efficiency.



2023 Piedmont Park Bridge Model



2025 Piedmont Park Bridge Model

Fleet Overview

GDOT's UAS fleet is a diverse mix of 27 active aircraft, combining small rapid-deployment drones, enterprise-grade inspection platforms, and heavy-lift mapping systems. In FY25 the fleet expanded with the acquisition of two advanced NDAA-compliant platforms: the Skydio X10, which provides autonomous inspection capability in GPS-denied environments, and the Harris Aerial H6 with RIEGL VUX-100 LiDAR, which delivers survey-grade mapping to support planning, design, and construction. These additions significantly increase the program's ability to perform complex, high-value missions.

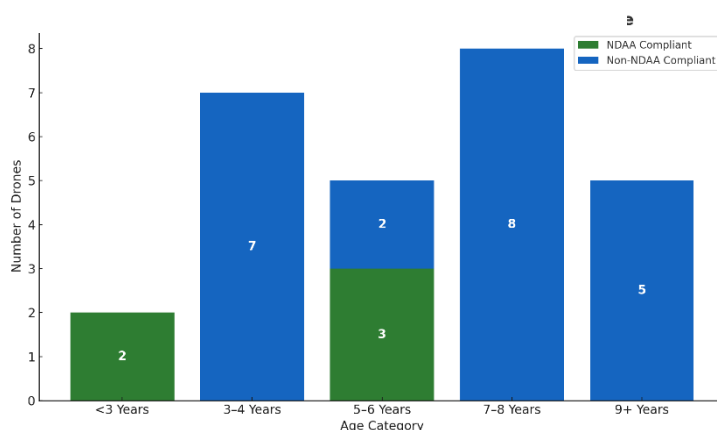


Skydio X10



Harris Aerial H6

While the fleet remains operationally strong, more than two-thirds of the aircraft are over five years old. These older platforms are increasingly prone to operational issues, have reduced firmware support, and face battery degradation and limited parts availability. Most are non-NDAA compliant DJI models, which could be affected by future procurement or operational restrictions under pending federal and state legislation.



The UAS Program Strategic Plan focuses on:

- **Phased Replacement:** Retire the oldest units first and replace them with NDAA-compliant platforms.
- **Capability Modernization:** Increase use of LiDAR, AI-driven inspections, and automated flight planning.
- **Balanced Fleet Mix:** Maintain the right combination of general purpose, endurance, and specialized UAS.

Training and Personnel

The GDOT UAS Program relies on a skilled pilot corps supported by clear policies, consistent standards, and ongoing professional development. In FY25, three new positions were added to complement the existing UAS Program Operations Manager role. Together, these four positions provide a balanced leadership and operational structure for the program.

This expanded structure ensures that the program supports statewide UAS operations while building long-term capacity for advanced technologies, specialized training, and statewide coordination.

The **Aviation Technology Manager** leads AAM and UAS policy, planning, and strategy, managing the overall UAS/AAM team.

The **UAS Program Development Manager** implements advanced technologies such as LiDAR, expands data integration, works to improve survey accuracy, and supports research and development.

The **Full-Time UAS Pilot** provides dedicated flight operations support for projects, training, and emergency response.

The **UAS Program Operations Manager**, an existing leadership position, oversees the statewide pilot team, training, and fleet management, and advances applied tools for mapping and modeling.

The program has about 30 active pilots and 60 candidates seeking training. Pilots support the program alongside their primary duties, using drones as an added tool to improve efficiency, safety, and data-driven decision-making.

Training focuses on Part 107 certification and renewals, emergency response SOP updates, Visual Observer training, and advanced mission planning. In FY26, the program will expand with in-field training, a comprehensive pilot workbook, and additional knowledge-based tests to strengthen readiness and mission performance.



UAS Program Operations Manager, Demario Hall
UAS Program Development Manager, Douglas Madrid

Policy and Strategic Updates

In FY25, the UAS Program finalized a comprehensive update to *Policy 3545 – Policy and Operational Guidelines for UAS*, establishing standardized procedures, safety protocols, and operational requirements for all GDOT-related UAS activities. The policy reinforces FAA compliance, expands the authority of the UAS Program over procurement, and strengthens coordination across districts and divisions.

The program also completed an update to its UAS Disaster Response SOP, which establishes a standardized framework for safe and coordinated drone deployment during emergencies. The SOP defines roles and responsibilities for managers, pilots, and visual observers, and provides checklists to ensure readiness, documentation, and equipment standards are met, strengthening GDOT's ability to deliver rapid situational awareness, support damage assessments, and integrate aerial data into real-time decision-making.

The UAS Strategic Plan, completed in May 2025, provides a strategy to advance the program through FY35. It sets a phased approach to strengthen fleet readiness, expand use cases and implementation, and prepare for future technologies. It calls for acquiring more capable NDAA-compliant aircraft, implementing new software for mission planning and analysis, and expanding emergency response capabilities. It also supports innovation through a testing sandbox, expanded partnerships, and the integration of advanced capabilities such as Beyond Visual Line of Sight (BVLOS) operations.

Looking Ahead

The GDOT UAS Program will build on FY25 advancements by accelerating fleet modernization, expanding pilot training, and implementing advanced capabilities developed through the program's research and development efforts. FY26 priorities include increasing department-wide UAS utilization, acquiring additional NDAA-compliant aircraft to replace aging platforms, introducing the WingtraRay fixed-wing vertical take-off and landing (VTOL) UAS for large-scale mapping missions, and implementing new software to enhance mission planning, data processing, and analysis.

The program will launch in-field pilot training and publish a pilot training workbook with tests to strengthen statewide proficiency. Capabilities proven through R&D, such as AI-enabled inspection tools, advanced LiDAR workflows, and autonomous flight planning, will be implemented across the pilot network to increase efficiency and data quality.

Long-term goals through FY35 focus on enabling BVLOS operations, integrating UAS data into enterprise systems, enhancing emergency response readiness, and maintaining Georgia's leadership in safe, effective transportation drone operations.

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