Georgia Department of Transportation

Division of Intermodal, Aviation Program

FY 2022 Annual Report Unmanned Aircraft Systems

I-16 & I-75 Intersection Project

Photo by District 3 UAS Pilot

Contents

I-16 Overpass Bridge at MM 77 hit by dump truck on 7/15/21-Photo by Josh Woodard

INTRODUCTION

Fiscal Year (FY) 2022 saw continuing impacts from the COVID-19 pandemic with ongoing issues regarding employee safety, mobility, working environment, and public interaction carrying over from FY 21. Like all other functions of the Georgia Department of Transportation (GDOT), the Unmanned Aircraft Systems (UAS) Program had to learn to adapt to changing work paradigms. For several months at the beginning of the FY, GDOT employees were cautioned to limit activities outside the workplace. For the UAS Program, this translated to reduced usage numbers and metrics that will be highlighted later in this report.

The formal UAS Program is now in its seventh year. On August 1, 2022, GDOT welcomed Demario Hall to the position of UAS Program Manager. Demario brings a very deep base of knowledge in UAS and aviation. He holds a Bachelor of Science in Aviation Management from California State University – Los Angeles and a Master of Science in Business Administration from Embry-Riddle Aeronautical University.

Advanced Air Mobility (AAM) is defined as a safe, accessible, automated, and affordable air transportation system for passengers and cargo capable of serving hard-to-reach urban and rural locations. GDOT UAS and AAM Programs have been very involved on the national scene and have seen tremendous exposure through collaborative efforts with the Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), Association of Uncrewed Vehicle Systems International (AUVSI), and several National Aeronautics and Space Administration (NASA) working groups. Under the guidance of UAS Program Development Manager Matt Coffelt, the UAS/AAM Programs at GDOT are poised to move the department and the state of Georgia forward in these emerging and fast-growing transportation modes.

GDOT POLICY SUMMARY

The FAA issued 14 CFR Part 107 on August 29, 2016. It set forth safety regulations for small UAS weighing less than 55 pounds for non-hobbyist operations. The purpose of this policy and subsequent application to GDOT is twofold:

(1) To ensure GDOT and its employees remain compliant with 14 CFR Part 107 and all applicable state and federal laws.

(2) To establish internal GDOT procedural and operational requirements to ensure the safety and efficiency of all UAS flight operations conducted by GDOT personnel.

GDOT UAS policies and procedures cover the following UAS elements:

Equipment Registration

The GDOT district or office that purchased the aircraft must register the equipment in accordance with FAA rules and regulations. A proposed change is to have the UAS Program Manager assume responsibility for registration.

UAS Pilot-In-Command

GDOT personnel may not fly a department-owned UAS until he/she has obtained a FAA Remote Pilot Certificate with a small UAS rating.

Visual Observer

UAS flights must utilize a “two-person rule” as the minimum at all times and it is the duty of the Pilot-In-Command to operate the UAS safely. The UAS Pilot-In-Command designates a Visual Observer (VO) for UAS flights. The VO provides an additional set of eyes for the pilot and watches for air traffic obstacles or objects aloft or on the ground. Visual Observer Training is now available to all GDOT employees online through the ELMS Training Portal.

UAS BY THE NUMBERS

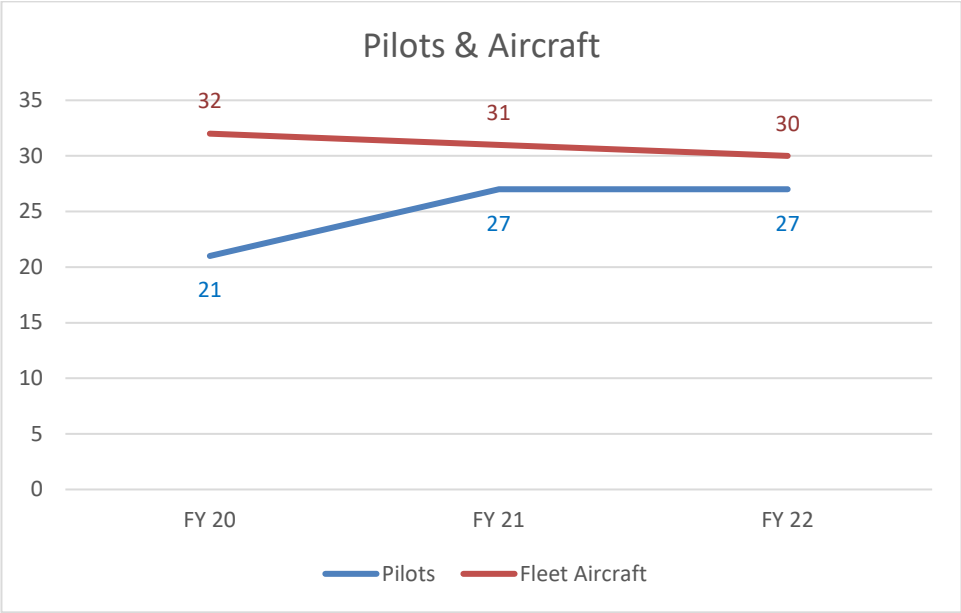

Figure 1

For FY 22 the Program added 6 new Pilots and lost 6 due to changes in position, retirement, or left the department.

Fleet aircraft total decreased due to decommissioning of obsolete technology. For more information, see page 4.

Distribution of Department UAS Pilots

Traffic Ops, H.E.R.O. Unit: One Pilot, Four in Training

Traffic Ops/TMC: No Pilots

Division of Intermodal: Four UAS Pilots, One in Training

District 1: One Pilot, Two in Training

District 2: One Pilot, None in training

District 3: One Pilot, Four in training

District 4: Two Pilots, One in training

District 5: Five Pilots, Three in training

District 6: Two Pilots, Two in training

District 7: One Pilot, One in training

Bridge Design: Two Pilots, One in training

State Maintenance Office: One Pilot

Bridge Inspection: Three Pilots, Five in training

Communications: One in training

State Location (ODPS): Two Pilots

TIA: One in training

Office of Legal: One Pilot

GDOT is currently holding steady on the number of pilots within the UAS Program but has experienced pilot turnover primarily due to three factors, which include Part 107 holders being either promoted to fill supervisory positions, retiring or leaving the department. To address the transitional aspect of the pilots in the program, the UAS Program management team will be soliciting referrals or recommendations from office heads for new program candidates. As a reminder, a goal of the UAS program is to have four active, licensed pilots in each district and business unit.

Fiscal Year Operational Measures – FY 20 compared to FY 22

The limitations encountered by COVID protocols show aggregate missions flown are down by 252 flights, or 49 percent, for FY 22 (Figure 2), and the Mission Flight Times from FY 20 to FY 22 are down by 1,625 total minutes, or 26 percent (Figure 3).

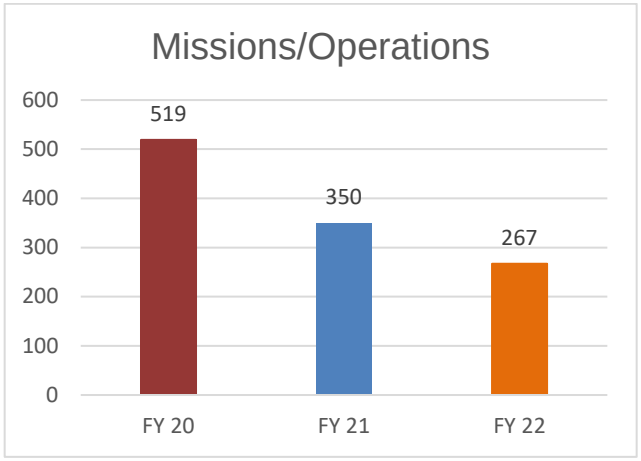

Figure 2

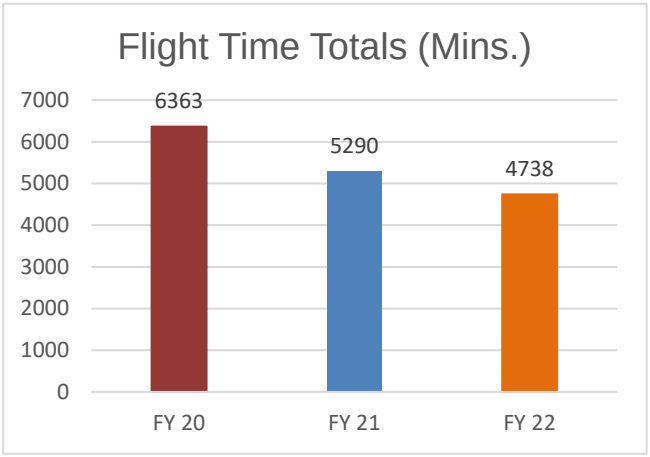

Figure 3

A comparison of Average Flights per Pilot between FY 20 and FY 22 shows a drop from 6.179 flights to 2.302 flights, respectively (Figure 4). This reduction in flights per pilot drops the Quarterly Missions per Pilot metric below the program goal of three ten-minute flights per pilot per quarter. The Average Minutes per Flight rose slightly from 12.26 minutes in FY 20 to 17.75 minutes in FY 22, an increase of 5.49 minutes per flight (Figure 5).

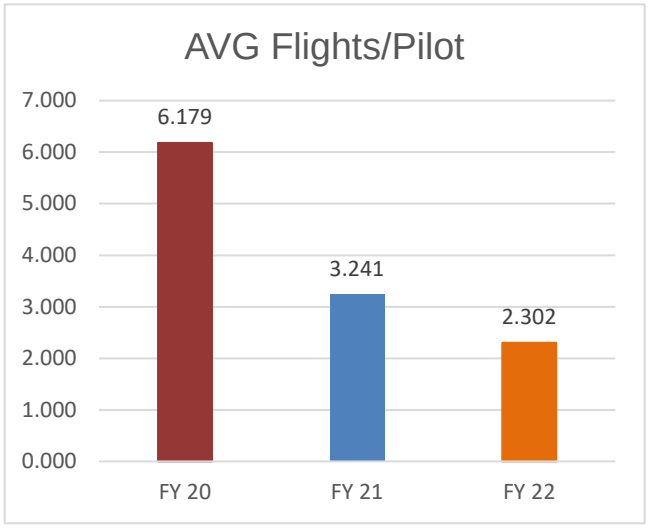

Figure 4

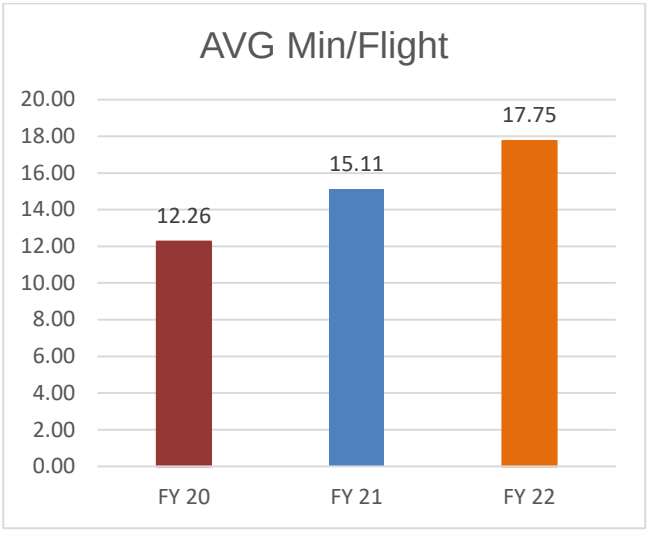

Figure 5

The fleet of GDOT UAS is aging, as a significant number of aircraft are three or more years old. With the rapid rate of technological advancement, there will be a need to replace GDOT's aging fleet with more advanced technology. Beginning in December 2022, Remote ID will be required for all new aircraft. Remote ID refers to the required ability of a drone in flight to provide identification and location information that can be received by people within the range of local radio signals. The FAA likens it to a "digital license plate" for a drone. Once new UAS are available with Remote ID, all UAS being acquired by GDOT will be equipped with Remote ID technology and existing UAS should be retrofitted, if possible. Consequently, the acquisition of new/additional aircraft should be delayed until UAS equipped with Remote ID are available in the first half of FY 23.

INDUSTRY AND OTHER AGENCY PARTNERSHIPS

GDOT has made information about its UAS Program available to other states and has learned from other state DOTs, vendors, and industry leaders and officials. This interaction and collaboration has given GDOT insight into policies, procedures, and objectives related to emerging technology, UAS purchases, and UAS flight team criteria.

Representatives from GDOT's Division of Intermodal participated in several state and national meetings during FY 22 including:

- Attended the 2022 FAA Southern Region Airports Conference
- Served on the UAS working group for the Georgia Department of Economic Development
- Continued participation in Georgia Emergency Management Agency UAS Working Group Meetings
- Augusta Regional Airport's SKYWORX Xponential Xpo
- Attended ARC-CAL-NARI Working Groups on AAM Ecosystems, Supply Chains, Airspace, and Community Integration
- Attended NASAO UAS/AAM Webinar
- Attended AUVSI Xponential Conference
- Attended and presented at FHWA EDC 5 Conference
- Represented the UAS Program in ongoing UAS research project update meetings through the GDOT Office of Research

OTHER STATE DOT USE OF UAS

GDOT continues to explore every opportunity to collaborate with other state DOTs, state agencies, and private corporate partners with virtual calls, webinars, and conferences. The GDOT UAS Program Manager spearheaded the creation of a Southeast Region DOT UAS Working Collaborative to increase awareness and assist other states as they develop their own UAS Programs. As acceptance and understanding of the technological capabilities of UAS increases, collaboration with industry partners will become more essential.

FUTURE OF UAS AT GDOT

The GDOT UAS Program Manager Demario Hall and Program Development Manager Matt Coffelt will continue to identify new opportunities to expand collaboration and information sharing and will share case studies and best management practices to move the program forward. Using universities and research organizations to assist with policy refinement and the training program, GDOT will continue to improve and expand the use of UAS for emergency operations, bridge inspections, traffic operations, landslide monitoring, project mapping, and converting collected data into 2D and 3D plans and models.

As GDOT continues to utilize this emerging technology, the UAS Program will continue to flourish and show dividends and provide improved data and results. Flight data over the past few years indicates that GDOT pilots are becoming more adept at managing the resources and technology. The UAS Program will continue to develop a robust group of pilots capable of providing high-quality, actionable data, and will strive to keep up with the technology as it continues to advance at a rapid pace.

GAINING EXPOSURE FOR THE UAS PROGRAM

The UAS Program staff has begun several initiatives to increase exposure for the GDOT UAS Program both internally and externally. These efforts include submitting articles on UAS operations to GDOT's Office of Strategic Communications for inclusion in the Milepost magazine, The Extra Mile blog, and the GDOT podcast Ahead of the Curve. Additionally, the UAS Program is working with the Office of Strategic Communications to develop a UAS and AAM landing page on the GDOT Intermodal website with internal and external content.

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GDOT Policy 3541-1: Policy and Operational Guidelines for Small Unmanned Aircraft Systems

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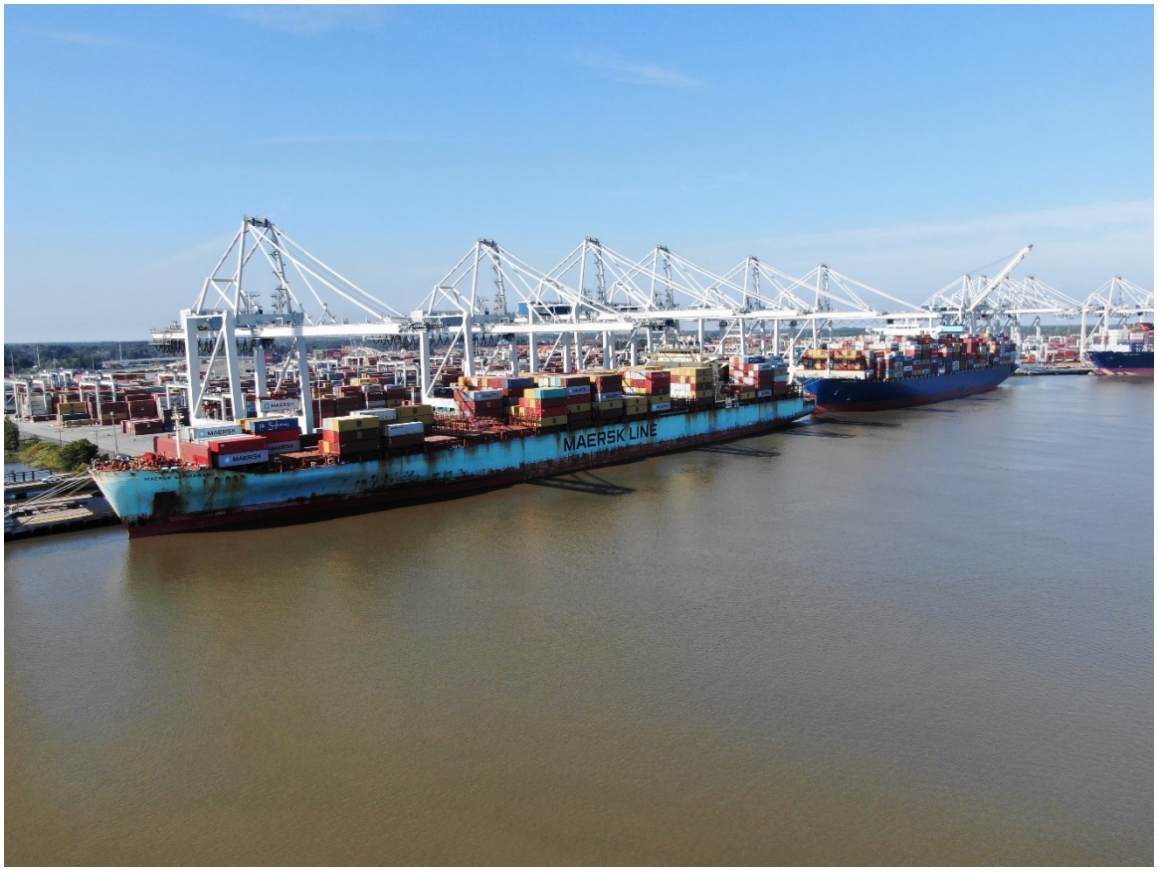
Garden City-Ocean Terminal (Savannah, Chatham County); Photo Credit Matt Coffelt



Thomaston Upson County Airport; Photo Credit Jeff Griffith