

Flying to the Future – Building the Foundation for an Unmanned Aircraft Industry in Alaska



What is a UAS?





<https://store.dji.com/guides/mavic-mini-hands-on-review/>

UAS Variety



<https://skyfront.com/perimeter-8/>



<https://www.aerospacetestinginternational.com/news/flight-testing/hawk30-high-altitude-drone-reaches-new-heights-during-test-flight.html>



Potential UAS Missions

- Cargo delivery
- Infrastructure surveillance
- Oil spill response
- Mammal surveys
- Wildfire response
- Search and Rescue
- And the list goes on...



Cessna 208 Grand Caravan

<https://evertsair.com/about/our-fleet/cessna-208-grand-caravan>



Trans-Alaska Pipeline

Using Unmanned Aircraft Systems (UAS) for Aviation Missions

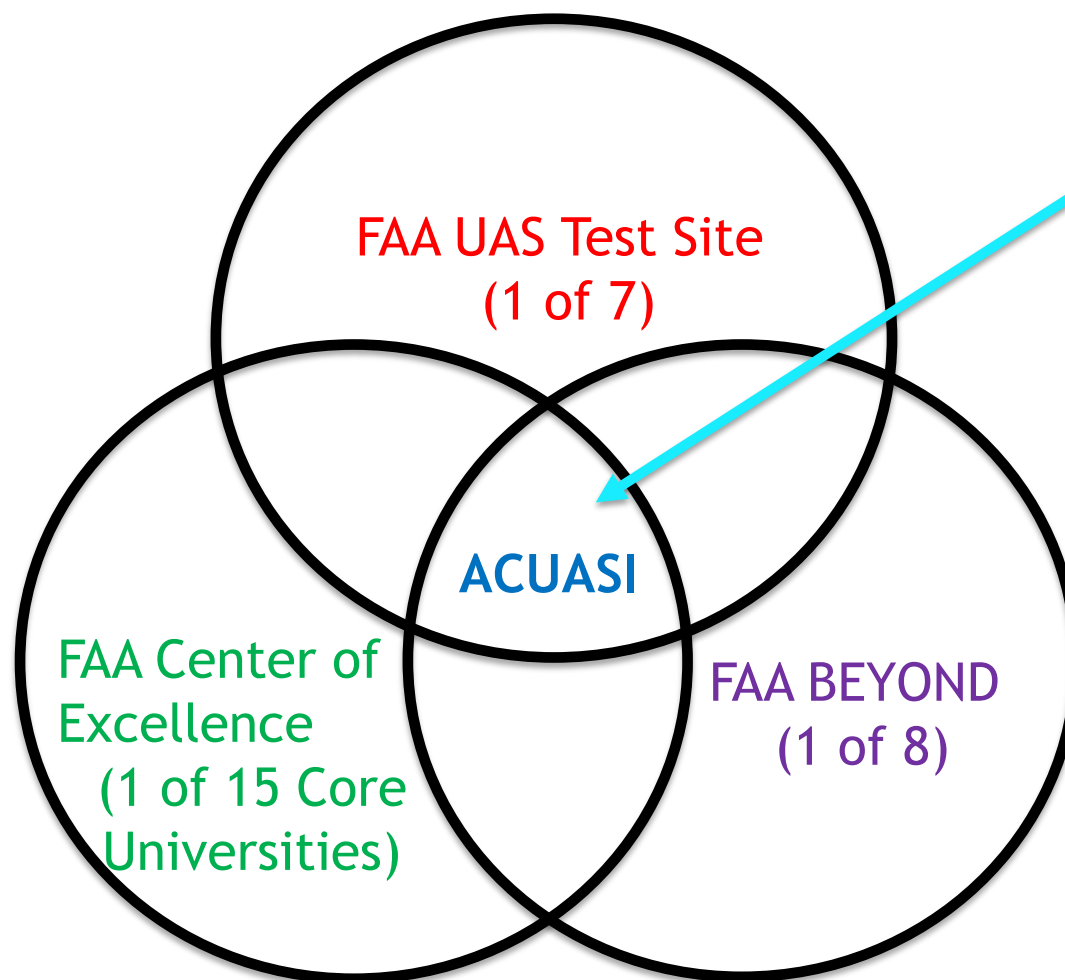
- UAS will be able to perform many of the potential aviation missions:
 - More safely
 - During periods manned aircraft cannot fly under visual flight rules
 - More cost effectively
- The University of Alaska is:
 - Using and testing the technologies needed to conduct these operations
 - Helping the Federal Aviation Administration develop appropriate rules and regulations

The Alaska Center for UAS Integration (ACUASI)

- ACUASI is the University of Alaska's UAS Research Program
- ACUASI's Return on Investment is ~14:1
- Our missions include:
 - Assisting the FAA in the safe integration of UAS into the National Airspace System
 - Supporting Alaskan UAS users and industry
 - Conducting scientific research



FAA Recognition of ACUASI's Expertise



ACUASI is the only organization in the country with all three programs

Partners



- Alyeska Pipeline Service Company
- Anduril
- Cherokee Nation
- Doyon Limited
- DRONERESPONDERS
- Echodyne
- Fairbanks International Airport
- Fairbanks North Star Borough
- Griffon Aerospace
- Insitu
- Iris Automation
- Merck
- Merlin Labs
- North Slope Borough
- Parallel Flight Technologies
- Phenix Solutions
- Pierce Aerospace
- Skyfront
- Skyward
- State of Alaska Department of Transportation and Public Facilities
- Tanana Chiefs Conference
- Turnagain Arm Heavy Lift
- Unmanned Systems Alaska
- Vanilla
- Vigilant Aerospace Systems
- Volansi

Key Partner - State of Alaska Department of Transportation & Public Facilities (ADOT&PF)



- ADOT&PF is working with the Federal Aviation Administration (FAA) to enhance UAS access to Alaskan airspace
- ADOT&PF operates airports across Alaska
 - Facilitating UAS integration at airports
 - Providing ingress and egress from Coastal Launch Sites to Permanent Areas in the Arctic
- ADOT&PF operates UAS for a wide variety of infrastructure monitoring use cases



FAA Center of Excellence for UAS Research (ASSURE)

- Involved in multiple projects focused on:
 - Ensuring safety of cargo operations
 - Minimizing risks from operations at airports
 - Safely flying Beyond Visual Line of Sight (BVLOS) of the Pilot in Command



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Essential for many Alaskan missions, but almost impossible under current FAA rules and regulations



Experience Flying BVLOS

- Transport Canada

- ~20,000 nautical miles of BVLOS flights
- Development of Concepts for of Operations (CONOPS) for operating at airports
- Road and land surveys
- Marine mammal surveys (North Atlantic Right Whales, Gaspé, Canada)



Testing Technology Required to Advance BVLOS Operations

- ACUASI and its partners are testing onboard and ground-based Detect and Avoid (DAA) systems that identify aircraft near the UAS and either alert the UAS pilot to avoid or autonomously move to avoid the aircraft
- Intruders - manned helicopter and fixed-wing and small UAS (and bonus F15s)



First FAA-approved, no-human-eyes-on- the-aircraft, BVLOS waiver under the small unmanned aircraft rule (Part 107)

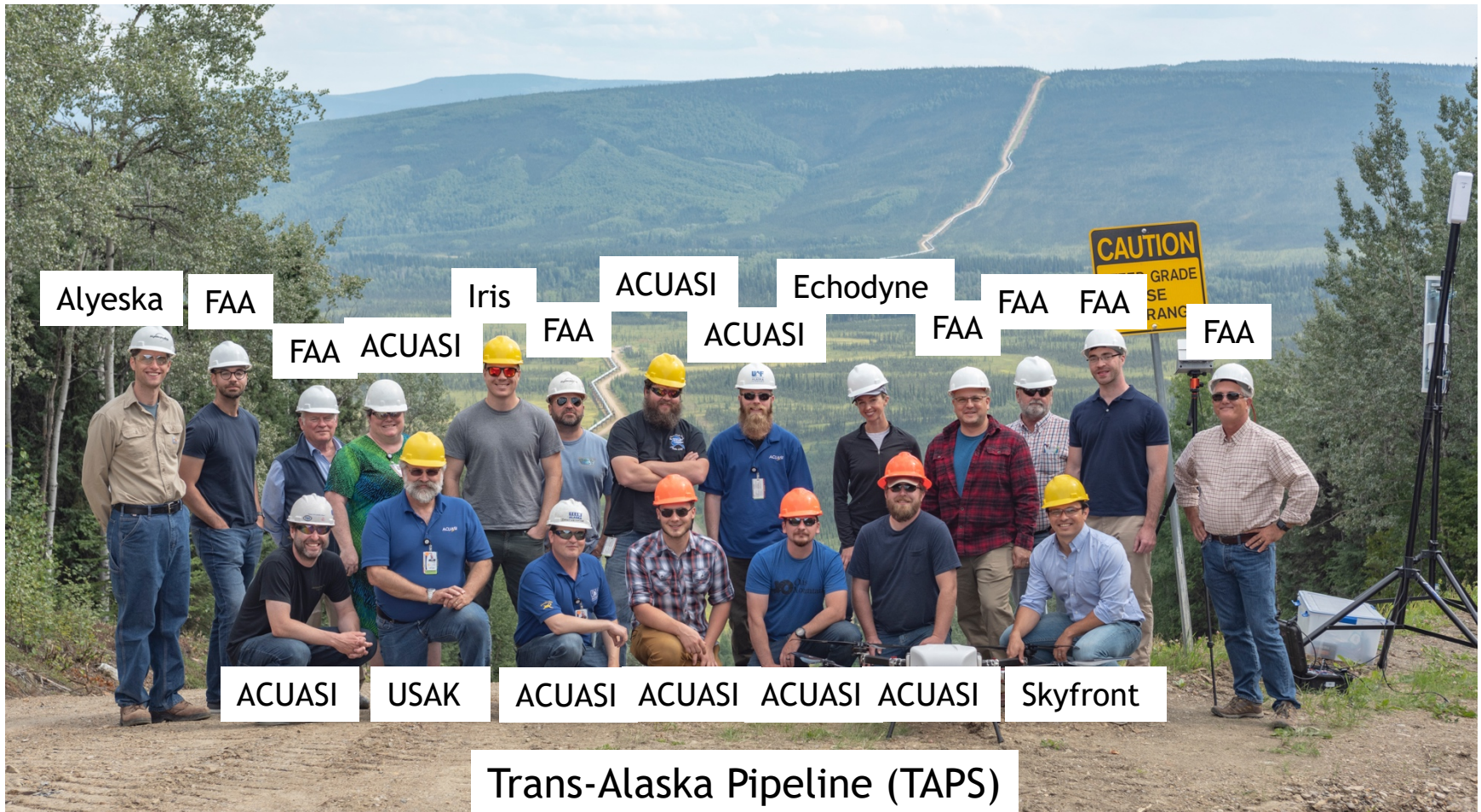
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION CERTIFICATE OF WAIVER	
ISSUED TO	Issued To: University of Alaska Fairbanks Responsible Party: Nicholas Adkins Waiver Number: 107W-2019-03901
ADDRESS —	Address: 2160 Koyukuk Dr. Fairbanks, AK 99775
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED Small unmanned aircraft system (sUAS) operations beyond the visual line of sight of the remote pilot in command (PIC) and Visual Observer (VO), in lieu of visual line of sight (VLOS).	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE 14 CFR § 107.31 — Visual line of sight aircraft operation, 14 CFR § 107.33(b) and (c)(2) — Visual observer, and	
STANDARD PROVISIONS	
1. A copy of the application made for this certificate shall be attached to and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.	

Waiver Specific Special Provisions. sUAS operations beyond the visual line of sight (BVLOS) of the remote PIC and VO(s) may be conducted under this waiver when the operation complies with the following provisions:

OPERATIONAL PROVISIONS

8. ~~Operations under this Waiver must utilize at least one VO. The VO may use unaided human vision or the Detect systems described in the application to identify non-participating aircraft;~~
9. If not using the Detect systems described in the waiver application, the remote PIC must ensure sufficient VO(s) are used to observe the airspace to detect and track all air traffic or hazards;

First BVLOS in the Nation under the Small UAS Rule - July 31, 2019



Next Steps - Pipeline Monitoring under BEYOND

- FAA granted UAF a waiver for operations along a 20-mile corridor over TAPS for conducting BVLOS pipeline monitoring testing
- Multiple companies intend to fly the corridor to demonstrate various aircraft, DAA, and monitoring technologies when COVID-19 restrictions are lessened
- ACUASI is working with the companies to highlight technologies of use to pipeline operators



Cargo Delivery



- Goal:
 - To deliver cargo to remote communities via UAS
- Last ‘hundreds of miles’ problem
- UAS can fly when manned aircraft may not be able to (e.g., foggy conditions)
- Cargo carrying BVLOS for hire can only be done under a Part 135 certificate
- Unmanned Systems Alaska, a Fairbanks-based UAS company, has applied for a Part 135 Certificate.



Medical Supply Delivery



- UAF, a local medical service provider, Unmanned Systems Alaska, a major pharmaceutical company, and the FAA
- Flights between Fairbanks Memorial Hospital and Tanana Valley Clinic
- This effort will be conducted under BEYOND



ACUASI Future



ACUASI will continue to lead the way to the safe integration of UAS into the Alaskan airspace

- ACUASI will be flying large UAS from Alaskan airports to demonstrate UAS capabilities and test Alaskan business cases
- ACUASI and its partners will be developing the technology and processes for monitoring oil and gas infrastructure
- ACUASI will be transferring commercial operations it pioneered to Alaskan companies

The University of
Alaska and its partners
will lead the way to
routine UAS operations
in Alaska!

