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Centers of Excellence (COE) Grant Program Overview

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Federal Aviation Administration

Agenda

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- Grants Portfolio
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- COE Members
- COE Program Descriptions and Projects
- Grants Awarded for FY20-24
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Purpose

To provide an overview of the FAA's Grants Portfolio with an emphasis on the Centers of Excellence (COE) grant program and to facilitate discussion on grant awards to colleges and universities for aviation-related research projects.

Grants Portfolio

Program	Description	Key Features
Aviation Workforce Development (AWD)	Supports the recruitment of aircraft pilots or unmanned aircraft systems operators and the development of the aircraft pilots or unmanned aircraft systems operators' workforce and aviation maintenance technical workers and the development of the aviation maintenance workforce through education, outreach, recruitment, and military career transition.	• Sponsor: NextGen (ANG) • Discretionary Grant • NOFO release with a 30-day open application period • Up to $1,000,000 per award • $20M for each program from FY2025-2028 • Period of Performance: 12 to 24 months • Accredited institutions of higher education, high or secondary schools, post-secondary schools, Flight Schools, FAA certificate holders, 501c(3), labor organizations, state, local, territorial, and tribal government
Fueling Aviation's Sustainable Transition (FAST)	FAST-SAF - Projects located in the U.S. that produce, transport, blend, or store sustainable aviation fuel (SAF) to meet U.S. aviation climate goals to reduce aviation carbon emissions FAST-Tech - Projects located in the U.S. that develop, demonstrate, or apply low-emission aviation technologies (Tech) to meet U.S. aviation climate goals to reduce aviation carbon emissions	• Sponsor: Policy International Affairs & Environment (APL) • Discretionary Grant • NOFO release with a 60-day open application period. No planned open period for FAST projects • $291M for project FY2022-2026 • Period of Performance: 12 to 60 months • State and local governments, airports, air carriers, academic and research institutions, other aviation industries, nonprofits, and Federally funded research and development centers
Aviation Research (AR)	Supports enhancements in airport operations, air traffic, and airspace management capabilities, and the adoption of innovative technologies for aerospace vehicles, airports, and spaceports, and seeks to maximize the utilization of the NAS airport and spaceport infrastructure.	• Sponsor: Air Traffic Organization (ATO), Aviation Safety (AVS), Airports (ARP), Policy International Affairs & Environment (APL), Commercial Space Transportation (AST), and NextGen (ANG) • NOFO release with an open application period through 2027 for submissions of white papers and proposals • Proposals are selected for funding on a rolling basis after review of merit, relevancy to the mission, and funding availability. • Period of Performance: 6 to 60 months • Accredited institutions of higher education (colleges, universities) • Nonprofit organizations such as independent museums, observatories, research laboratories, hospitals, consortia, professional, scientific, and educational associations or societies, and similar organizations

Grants Portfolio *(continued)*

Program	Description	Key Features
Centers of Excellence (COE)	COE helps develop the nation's technology base while educating the next generation of aviation professionals, while enabling collaboration and coordination between government, academia, and industry to advance aviation technologies and expand FAA research capabilities through congressionally required matching contributions.	• Discretionary Grant • Each COE program (see list below) consists of a team with one lead university and multiple core university members • Packages submitted by the Sponsor Organization for each COE program area on a rolling basis • Period of Performance: Up to five years and can be extended annually • Cost Sharing Requirement: 1-1 • Accredited institutions of higher education (colleges, universities)

COE Programs:

Name	FAA Sponsor Organization
Alternative Jet Fuels and Environment (ASCENT)	Office of Policy, International Affairs & Environment (APL)
General Aviation (PEGASAS)	Office of NextGen (ANG)
Joint Center for Advanced Materials and Structures (JAMS)	Office of NextGen (ANG)
Technical Training and Human Performance (TTHP)	Air Traffic Organization (ATO)
Unmanned Aircraft Systems (ASSURE)	Aviation Safety (AVS)

Legislative Authority

Centers of Excellence (COE) – P.L. 101-508, Sec. 9209

Title 49 of United States Code 44513

The Administrator may make grants to one or more colleges or universities to establish and operate several regional centers of air transportation excellence, whose locations shall be geographically equitable.

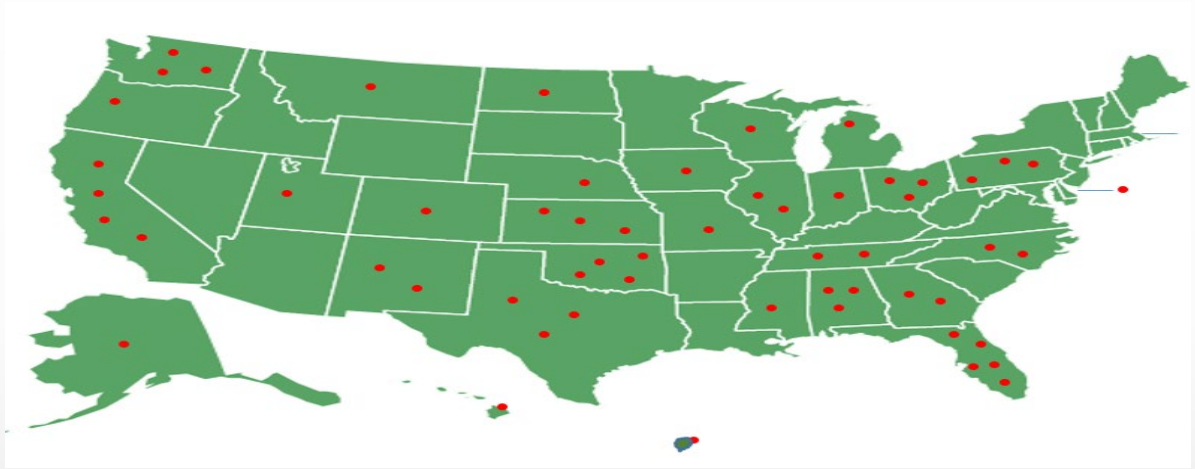
The responsibilities of each regional center shall include, but not be limited to, the conduct of research concerning airspace and airport planning and design, the air transportation environment, aviation safety and security, the supply of trained air transportation personnel including pilots and mechanics, and other aviation issues pertinent to developing and maintaining a safe and efficient air transportation system....each center may make contracts with nonprofit research organizations and other appropriate persons.

COE Core Members (as of FY24)

Technical Training & Human Performance (TTHP)
Embry-Riddle Aeronautical University (Lead)
University of Oklahoma (Lead)
Wichita State University (Co-Lead)
Auburn University
Drexel University
Inter-American University (HSI)
Oklahoma State University
Purdue University
The Ohio State University
Tulsa Community College
University Of Akron
University Of Nebraska at Omaha
University Of North Dakota
University Of Wisconsin-Madison
Western Michigan University

Advanced Materials (JAMS)
University of Washington (Co-Lead)
Wichita State University (Co-Lead)
Auburn University
Northwestern University
Mississippi State University
Oregon State University
University of California – LA
University of California – SD
Edmonds College
Florida International University
Purdue University
University of Utah
University of Delaware
Washington State University

General Aviation (PEGASAS)
Purdue University (Lead)
Florida Institute of Technology
Georgia Institute of Technology
Iowa State University
Ohio State University
Texas A & M University



Unmanned Aircraft Systems (ASSURE)
Mississippi State University (Lead)
Drexel University
Embry Riddle Aeronautical University
Kansas State University
Montana State University
New Mexico State University (HSI)
North Carolina State University
Oregon State University
The Ohio State University
Sinclair Community College
University of Alabama in Huntsville
University of Alaska Fairbanks (AIANSI)
University of California, Davis
University of Kansas
University of North Dakota
University of Vermont
Wichita State University
Virginia Tech University

Alternative Jet Fuels & Environment (ASCENT)
Washington State University (Lead)
Massachusetts Institute of Technology (Co-Lead)
Boston University
Georgia Institute of Technology
Missouri University of Science & Technology
Oregon State University
Pennsylvania State University
Purdue University
Stanford University
University of Dayton
University of Hawaii (AIANSI)
University of Illinois – UC
University of North Carolina – CH
University of Pennsylvania
University of Tennessee
University of Washington (AIANSI)

Number of COE universities: 69
Green denotes Congressional Mandated COE

Alternative Jet Fuels and Environment (ASCENT)

Program	Description	FY 24 Funding Amount
Alternative Jet Fuels and Environment (ASCENT)	This Center (also known as the Aviation Sustainability Center – ASCENT) focuses on meeting the environmental and energy goals, including reducing the number of people exposed to significant noise around U.S. airports; reducing significant air quality impacts attributable to aviation, achieving carbon neutral growth, and exploring ways to produce sustainable alternative jet fuels at a commercial scale.	$34,132,344

Project Example

Project: Understanding Changes in Aviation Emissions Due to SAF with New Combustor Engine Technology

University: Missouri University of Science and Technology

Project Period of Performance: 11/16/2023 through 07/31/2025

Description: The research team with the guidance of emissions specialists at various original equipment manufacturers (OEMs) conduct ground-based field measurement campaigns of nvPM and combustion gas emissions from engines on commercial widebody transport, business jet aircraft, and new combustor technologies burning both conventional fuels and sustainable aviation fuels (SAF). The ground testing with 100% HEFA-SPK as well as SAF blends investigates the effects of fuel composition on emissions of different aircraft engine types and helps quantify the effects of fuel composition on particulate emissions for these engines, improving our understanding of the potential environmental impact benefits of SAF.

General Aviation (PEGASAS)

Program	Description	FY 24 Funding Amount
General Aviation (PEGSAS)	This Center (also known as the Partnership to Enhance General Aviation Safety, Accessibility and Sustainability - PEGASAS) focuses on general aviation safety, accessibility, and sustainability by partnering the FAA with a national network of world-class researchers, educators and industry leaders.	$1,368,859

Project Example

Project: Rotorcraft Aviation Safety Information Analysis & Sharing (R-ASIAS)

University: Georgia Institute of Technology (GIT)

Project Period of Performance: 8/1/24 through 7/31/2025

Description: Conduct data analysis, artificial intelligence, and machine learning to aid in the development of analysis tools, techniques, and other capabilities for rotorcraft systems that enable the detection of safety-critical issues.

Joint Center for Advanced Materials and Structures (JAMS)

Program	Description	FY 24 Funding Amount
Advanced Materials (JAMS)	This Center (also known as Joint Center for Advanced Materials and Structures – JAMS) focuses on ensuring the safe and reliable application of composites and advanced materials to commercial aircraft, as well as being a leader in international coordination of research, development, and standardization for structures constructed from these new materials.	$14,515,565

Project Example

Project: Evaluation of Aged Structural Bonds on Rotor Blades

University: Wichita State University

Project Period of Performance: 2/18/22 through 12/6/2026

Description: Focuses on long-term behavior of non-metallic materials (including adhesive bonds) is affected by environmental and load-induced threats during service. The exact aging mechanisms, their dependence on process details and service experience, and the resulting correlation to structural performance, are not well understood, even for materials and structures in use for many years. This is particularly critical for bonded structures where there have been incidents and accidents in service such as rotorcraft applications. This leads us to question whether current certification practices documented in AC20-107B "Composite Aircraft Structure" and other FAA and industry publications, effectively interrogate long-term performance of bonded structure, and what methods can be used in production or service to measure and ensure quality over the life of the structure.

Technical Training and Human Performance (TTHP)

Program	Description	FY 24 Funding Amount
Technical Training and Human Performance (TTHP)	This Center focuses on research and development of technical training for air traffic controllers, aviation safety inspectors, engineers, technicians, and pilots. The goal is to enhance personnel with training, simulation, and adaptive learning technologies to analyze human performance.	$1,011,892

Project Example

Project: Impact of High Intensity RF on UAS EMC-EMI and Operations (SA008)

University: University of Oklahoma

Project Period of Performance: 9/6/22 through 9/05/2024

Description: This research supports workforce development and technical training needs of FAA Technical Operations AJW-124 and will support future UAS training for maintenance functions within FAA Technical Operations. Researchers will investigate RF Interference (RFI) as a potential operational hazard risk for small UAS (sUAS) and develop Safety Management processes to improve technical training. The HIRF study and Safety Management System processes will be incorporated into the sUAS flight training program to provide situational awareness when operating on an airport environment after a significant event.

Unmanned Aircraft Systems (ASSURE)

Program	Description	FY 24 Funding Amount
Unmanned Aircraft Systems (ASSURE)	This Center (also known as the Alliance for System Safety of UAS through Research Excellence – ASSURE) focuses on research needed to quickly, safely and efficiently integrate unmanned aircraft systems into our National Airspace System (NAS) with minimal changes to current operations. The vision is to aid the UAS market to safely grow by conducting research that quickly, safely and effectively enables flight alongside manned aircraft around the world.	$10,796,641

Project Example

Project: Conduct Safety Risk Management Analysis on small Unmanned Aircraft Detect and Avoid Systems (A71)

University: Kansas State University (Lead), Embry Riddle Aeronautical University, University of North Dakota, Drexel University

Project Period of Performance: 2/1/2024 through 5/31/2026

Description: New and refined safety analysis methods are needed to assess potential hazards for Unmanned Aircraft (UA) Detect and Avoid (DAA) systems. This research will develop analysis tools and methods of risk assessment for small remotely piloted DAA systems that enable safety optimization of DAA design and operations. Through an analysis of DAA systems and operations, the research team will identify disconnects between existing risk assessment methodologies, such as those highlighted in FAA Order 8040.6, and their application to DAA. Additionally, this research will identify hazards and new risk assessment strategies and explore their application to DAA systems and DAA-enabled UAS operations. Ultimately this research will derive toolsets and methods for assessing risk for DAA systems and operations while identifying significant contributions to risk and strategies for mitigation. This information will aid the development of DAA industry standards by exploring current industry complexities associated with the integration of DAA and highlight areas of interest for future research into DAA-enabled UAS operations. This information will also aid the FAA in performing safety risk assessments on DAA industry standards and applicant requests for operational approval.

Grants Awarded by COE Program for FY20-24

Program	FY20		FY21		FY22		FY23		FY24	
	Number	Funding	Number	Funding	Number	Funding	Number	Funding	Number	Funding
ASCENT	84	$34,159,355	45	$14,438,292	43	$16,022,021	46	$22,514,791	73	$34,132,344
PEGASAS	10	$779,207	12	$706,937	9	$491,430	10	$546,954	17	$1,368,859
JAMS	34	$14,923,227	24	$21,198,809	3	$325,000	22	$15,968,142	19	$14,515,565
TTHP	5	$300,000	9	$854,996	14	$682,640	2	$249,837	8	$1,011,892
ASSURE	29	$13,363,638	57	$19,144,547	24	$22,638,252	10	$9,480,839	23	$10,796,641
TOTALS	**162**	**$63,525,427**	**147**	**$56,343,581**	**93**	**$40,159,343**	**90**	**$48,760,563**	**140**	**$61,825,301**

Questions?