



U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

July 3, 2023

The Honorable Maria Cantwell
Chair, Committee on Commerce
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Chair Cantwell:

Enclosed, please find the report of the Federal Aviation Administration (FAA) to Congress on the FAA Centers of Excellence (COE) program for Fiscal Year (FY) 2022. This report fulfills the requirements in 49 U.S.C. § 44513(h).

Section 44513(h) requires the FAA to submit an annual report listing (1) the research projects that have been initiated by each center in the preceding year, (2) the amount of funding for each research project, and the funding source, (3) the institutions participating in each research project and their shares of the overall funding for each research project, and (4) the level of cost-sharing for each research project. The enclosed report contains COE program descriptions, narratives for each of the five active COEs, and attachments that list the required details of the FY 2022 awards and COE funding summaries.

We have sent similar letters to Chairman Lucas and Ranking Members Cruz and Lofgren.

Sincerely,

Polly Trottenberg
Acting Administrator

Enclosure



U.S. Department
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**Federal Aviation
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Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

July 3, 2023

The Honorable Frank Lucas
Chairman Committee on Science
Space, and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Lucas:

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Sincerely,

A handwritten signature in black ink that reads "Polly Trottenberg". The signature is fluid and cursive, with the first name "Polly" and last name "Trottenberg" clearly distinguishable.

Polly Trottenberg
Acting Administrator

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U.S. Department
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**Federal Aviation
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Office of the Administrator

800 Independence Ave., S.W.
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July 3, 2023

The Honorable Ted Cruz
Ranking Member, Committee on Commerce
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Ranking Member Cruz:

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We have sent similar letters to Chairman Lucas, Chair Cantwell, and Ranking Member Lofgren.

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Polly Trottenberg
Acting Administrator

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**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

July 3, 2023

The Honorable Zoe Lofgren
Ranking Member, Committee on Science
Space, and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Ranking Member Lofgren:

Enclosed, please find the Federal Aviation Administration's (FAA) report to Congress on the FAA Centers of Excellence (COE) program for Fiscal Year (FY) 2022. This report fulfills the requirements in Title 49 of the United States Code § 44513(h).

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We have sent similar letters to Chairman Lucas, Chair Cantwell, and Ranking Member Cruz.

Sincerely,

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Polly Trottenberg
Acting Administrator

Enclosure

Federal Aviation Administration
Air Transportation Centers
of Excellence
Congressional Report

Fiscal Year 2022



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Congressional Report - Fiscal Year 2022

Federal Aviation Administration Air Transportation Centers of Excellence Fiscal Year 2022 Overview

Legislative Mandate

The Federal Aviation Administration (FAA) submits this report on the FAA Air Transportation Centers of Excellence (COE) for Fiscal Year (FY) 2022 in response to the mandate in 49 U.S.C. § 44513(h):

(h) Annual Report.—The Administrator shall transmit annually to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate at the time of the President’s budget request a report that lists—

- (1) the research projects that have been initiated by each Center in the preceding year;*
- (2) the amount of funding for each research project and the funding source;*
- (3) the institutions participating in each research project and their shares of the overall funding for each research project; and*
- (4) the level of cost-sharing for each research project.*

Mission

The FAA COE program’s mission is to help develop the nation’s technology base while educating the next generation of aviation professionals. The program enables collaboration and coordination between government, academia, and industry to advance aviation technologies and expand FAA research capabilities through congressionally required matching contributions. Once selected, the core and affiliate university members and industry partners serve the FAA as a primary source of subject matter expertise for a 10-year period.

Selection Criteria

Section 44513(d) provides selection criteria that must be considered when designating members of each COE team. The FAA Administrator and the Secretary of Transportation have used these criteria to conduct an open and rigorous competitive process for selecting COE team members throughout the United States over the past two decades. Each COE member is required to match federal governmental grant awards dollar-for-dollar with contributions from non-federal sources in order to establish and operate the COE and conduct the research activities that the grant recipient carries out there under 49 U.S.C. §44513(f).

Background

The FAA awarded the first COE grants in 1993. Since this time, the FAA has established 13 COE teams, including 92 core universities. COE partners and their non-federal affiliates were required to provide more than \$494 million in matching contributions to augment FAA research grants since inception. Current and previous COE members have conducted mission-critical research in the following focus areas:

- Technical training and human performance
- Unmanned aircraft systems
- Alternative jet fuels and environment
- General aviation safety, accessibility, and sustainability
- Commercial space transportation
- Advanced materials
- Airliner cabin environment and intermodal transportation research
- Aircraft noise and aviation emissions mitigation
- General aviation research
- Airworthiness assurance
- Operations research
- Airport technology
- Computational modeling of aircraft structures.

Through these long-term cost-sharing activities, the government and university-industry teams leveraged resources to advance the future of the nation's aviation industry. Furthermore, students have gained valuable hands-on educational experience applicable to aviation and aerospace careers, as evidenced by the more than 3,000 resulting doctoral dissertations and theses.

Determining Funding Levels

Each FAA sponsoring office commits to an annual minimum funding level over the 10-year period based on the sponsoring office's budget and the forecasted research required in each critical area. The agency chose a 10-year timeframe to provide ample opportunity for COE teams to generate matching contributions and educate a pool of future aviation professionals. The FAA allows for an additional two-year period to ensure orderly closeout of all activities. Some COE teams have been extended beyond this 10-year period based on congressional direction. The FAA awards additional funding based on the current requirements for selected research areas and the needs of various sponsors.

Following the competitive process used to select each COE team, the FAA may also execute Indefinite Delivery Indefinite Quantity (IDIQ) contracts to procure deliverables for the government's sole benefit. Contract awards are shown in this report, as well as matching contributions when applicable. Matching contributions are negotiable when provided as cost-share for work performed under the contract vehicle for the FAA's benefit.

Self-Sufficient National Resources

After completing the initial requirements, COE teams are positioned to establish themselves as a national resource capable of serving the aviation community and the nation. As a self-sufficient national aviation resource, a successful COE team will be able to exist without full reliance on the FAA and an annual FAA base funding commitment. Recognized for their superior expertise, COE members are expected to generate funding, compete, and conduct research activities for the aviation community and the FAA, as needed.

There currently are five active COE teams and eight centers deemed either self-sufficient, closed, or re-competed. The three centers that have satisfied their COE requirements and been deemed self-sustaining national resources by the FAA are the National COE team for Aviation Operations Research, the COE team for Airport Technology Research, and the COE team for Airliner Cabin and Research in the Intermodal Transport Environment.

Closed and Re-competed COE

The COE teams for Airworthiness Assurance (FY1997-2007), Computational Modeling of Aircraft Structures (FY1992-1996), and Commercial Space Transportation (FY2010-2022) have closed. The COE team for Aircraft Noise and Emissions Mitigation (FY2003-2014) was re-competed and replaced by the COE team for Alternative Jet Fuels and Environment. The COE team for General Aviation Research (FY2001-2013) was re-competed and replaced by the COE team for General Aviation Safety, Accessibility, and Sustainability.

Fiscal Year 2022 COE Activities

In FY 2022, the FAA supported six active COE public-private partnerships with academic institutions and their industry affiliates. Upon approval from the Secretary of Transportation, the FAA COE Program Management Office executed 95 grant awards for approximately \$40.7 million during FY 2022 for years of funding 2020, 2021, and 2022. The FAA awarded these grants to 73 core universities in support of 65 projects.

Grant Federal Cost Share

Section 44513(f) requires matching contributions from COE grant recipients, and those matching contributions would provide a minimum of \$40 million to offset the cost of conducting mission-critical research with COE partners.¹

¹ The \$40 million offset cost is for FY 2022.

COE Narratives

The following sections contain descriptions for each of the active COEs. Attachments to this document list grant and contract awards executed during FY 2022, as well as the names of current university members of each COE team. In accordance with § 44513(h)(4), the attachments also list matching contributions.

Narratives follow for each of the six active COE teams:

- COE for Technical Training and Human Performance
- COE for Unmanned Aircraft Systems
- COE for Alternative Jet Fuels and Environment
- COE for General Aviation Safety, Accessibility, and Sustainability
- COE for Commercial Space Transportation
- Joint COE for Advanced Materials

For more information, see: <http://www.faa.gov/go/coe>

Attachment I: COE Summary Table

Attachment II: Fiscal Year 2022 Grant Awards

Appendix A - COE for Technical Training and Human Performance

Appendix B - COE for Unmanned Aircraft Systems

Appendix C - COE for Alternative Jet Fuels and Environment

Appendix D - COE for General Aviation Safety, Accessibility and Sustainability

Appendix E - COE for Commercial Space Transportation

Appendix F - Joint COE for Advanced Materials

Attachment III: Fiscal Year 2022 Contract Awards

Appendix A - COE for Unmanned Aircraft Systems

Appendix B - COE for General Aviation Safety, Accessibility and Sustainability

COE for Technical Training and Human Performance

The FAA Administrator and Secretary of Transportation selected the Technical Training and Human Performance (TTHP) COE team in August 2016. The COE team's mission is to establish and manage a consortium among government, academia, and industry to evaluate and create solutions to enhance air transportation personnel training and operational performance. The team conducts research predominantly on topics of critical interest and seeks solutions in the following training and human performance areas:

- Workforce development and training
- Human factors
- Safety
- Analytics.

Sponsored by the FAA's Air Traffic Organization, research efforts include human factors training, modular curriculum design, virtual training delivery, simulation, applied game theory, visual search patterns, and learner data management, as well as other techniques aimed at understanding best practices, applying lessons learned, and advancing the state of technical training and human performance. The results of the research will inform future technical training for aviation professions across the FAA.

The Center has expanded the number of research efforts and sponsoring organizations throughout the FAA and added additional industry partners. The Center comprises 15 core universities, 11 affiliate universities, and more than 40 industry partners.

Under the leadership of The University of Oklahoma, Embry-Riddle Aeronautical University, and Wichita State University, the following universities serve as core members of the team: Auburn University, Drexel University, Inter-American University, The Ohio State University, Oklahoma State University, Purdue University, Tulsa State Community College, University of Akron, University of Nebraska-Omaha, University of North Dakota, University of Wisconsin-Madison, and Western Michigan University.

During FY 2022, the FAA awarded grants totaling approximately \$0.7 million to five core members (see Attachment II, Appendix A). Members proposed to match grant awards dollar-for-dollar from non-federal sources. The FAA has not executed IDIQ contracts with TTHP COE members.

The COE TTHP team's research projects align with the Department of Transportation (DOT) strategic goals of Safety, Transformation, and Organizational Excellence.

For additional information, see <http://www.coetthp.org>

COE for Unmanned Aircraft Systems

The FAA Administrator and Secretary of Transportation selected the Alliance for System Safety of Unmanned Aircraft Systems (UAS) through Research Excellence (ASSURE) as the COE team for UAS in FY 2015. The COE team's mission is to help the UAS market safely grow while providing the FAA with the research needed to integrate UAS into the National Airspace System (NAS) quickly, safely, and efficiently with minimal changes to current operations. The COE team focuses research efforts on the following topic areas:

- Air traffic control interoperability
- Airport ground operations
- Control and communication
- Detect and avoid
- Human factors
- Low altitude operations safety
- Noise reduction
- Spectrum management
- UAS crew training and certification, including pilots
- UAS traffic management
- UAS wake separation standards for UAS integration into the NAS.

Led by Mississippi State University, the following universities also serve on the core team: Drexel University, Embry-Riddle Aeronautical University, Kansas State University, Montana State University, New Mexico State University, North Carolina State University, The Ohio State University, Oregon State University, Sinclair Community College, University of Alabama-Huntsville, University of Alaska-Fairbanks, University of California-Davis, University of Kansas, University of North Dakota, University of Vermont, and Wichita State University.

Affiliate members of the COE team include Auburn University, Concordia University, Indiana State University, Louisiana Tech University, University of Southampton, Technion-Israel Institute of Technology, Tuskegee University, and Nanyang Technological University.

During FY 2022, the FAA awarded grants totaling approximately \$22.6 million to 12 of the core members (see Attachment II, Appendix B). Members matched grant awards dollar-for-dollar from non-federal sources. The FAA also executed IDIQ contracts with COE members to procure deliverables for the government's sole benefit. In FY 2022, the FAA awarded no task orders to COE members through the IDIQ contract vehicle (see Attachment II, Appendix B).

The COE UAS team's research projects align with the DOT strategic goals of Safety, Transformation, and Organizational Excellence, see: <http://www.assureuas.org>

COE for Alternative Jet Fuels and Environment

The FAA Administrator and Secretary of Transportation selected the COE team for Alternative Jet Fuels and Environment (AJFE), also known as the Aviation Sustainability Center or ASCENT, in September 2013. The COE team's mission is to help the aviation industry overcome the environmental and energy challenges facing aviation by developing science-based, cost-effective solutions that reduce noise, improve air quality, reduce climate impacts, and improve energy efficiency. A major focus of the COE team is to explore ways to produce sustainable aviation fuels at commercial scale, thus creating an industry with a substantial environmental benefit that also provides large-scale economic development and job creation, especially in rural areas. The COE team's research and development efforts address the following major topic areas:

- Feedstock development, processing, and conversion to alternative jet fuels
- Regional supply and refining infrastructure for alternative jet fuels
- Environmental benefits analysis of alternative jet fuel use
- Aircraft component deterioration and wear assessment due to alternative jet fuel use
- Fuel performance testing of alternative jet fuels
- Aviation noise and impacts
- Aviation emissions and impacts
- Aircraft technology assessment
- Environmentally and energy-efficient gate-to-gate aircraft operations
- Aviation modeling and analysis.

The COE AJFE team research projects align with the DOT strategic goals of Transformation, Climate and Sustainability, Safety, and Economic Strength & Global Competitiveness. Innovation is required to develop the technological, operational, and fuels-related measures required to reduce aviation's environmental impact. New aircraft and engine technologies that reduce noise, emissions, and fuel burn, as well as updated policies and regulatory frameworks that better reflect our improved understanding of environmental and energy impacts, are necessary to improve the efficiency, effectiveness, and accountability of the NAS. These advancements will promote aviation growth, including integrating new entrants such as supersonic aircraft, unmanned aerial systems, urban air mobility vehicles, and commercial space vehicles.

Under the joint leadership of Washington State University and the Massachusetts Institute of Technology, the following universities also serve on this core team: Boston University, Georgia Institute of Technology, Missouri University of Science and Technology, Oregon State University, Pennsylvania State University, Purdue University, Stanford University, University of Dayton, University of Hawaii, University of Illinois, University of North Carolina, University of Pennsylvania, University of Tennessee, and the University of Washington. During FY 2022, the FAA awarded grants totaling approximately \$16 million to 10 core members (see Attachment II, Appendix C). Members matched grant awards dollar-for-dollar from non-federal sources. The FAA has not executed IDIQ contracts with AJFE COE members. For additional information, see: <http://ascent.aero/>

COE for General Aviation Safety, Accessibility, and Sustainability

The FAA Administrator and Secretary of Transportation selected a team of universities in 2013 to lead a COE team for General Aviation Safety, Accessibility, and Sustainability, also known as PEGASAS. The COE team performs projects that support the FAA's needs across diverse areas of general aviation (GA). The COE team's past research efforts included:

- Airport safety
- Airport pavements
- Software and systems
- Human factors
- Weather technology on the flight deck
- Structures and propulsion
- Electric vertical take-off and landing
- Urban air mobility.

Additional research focused on GA flight safety, with projects examining how to use recorded flight data to improve aviation safety for fixed-wing aircraft and rotorcraft. The team also has examined how pilots use flight deck information, such as angle of attack indicators, weather information, and advanced sensor displays. These efforts included flight testing, algorithm development, and human factors research. Results from the projects helped the FAA provide guidance and develop or update advisory circulars. This improves overall aviation safety since many COE GA team projects also apply to commercial operations.

Under Purdue University's leadership, the following universities serve as core members of the team: Florida Institute of Technology, Georgia Institute of Technology, Iowa State University, The Ohio State University, and Texas A&M University.

During FY 2022, the FAA awarded grants totaling approximately \$0.5 million to five of its core members (see Attachment II, Appendix D). Members matched grant awards dollar-for-dollar from non-federal sources. The FAA also executed IDIQ contracts with COE members to procure deliverables for the government's sole benefit. In FY 2022, the FAA awarded no task orders to COE members through the IDIQ contract vehicle (see Attachment III, Appendix B).

The COE GA team's research projects align with the DOT strategic goals of Safety, Economic Strength & Global Competitiveness, and Transformation.

For additional information, see: <https://www.pegasas.aero/>

COE for Commercial Space Transportation

The FAA Administrator and Secretary of Transportation selected the COE team for Commercial Space Transportation (CST) in FY 2010, with the Period of Performance ending on August 22, 2022. CST research focuses on four areas aligned with DOT and National Space Council priorities. These include the safe integration of commercial space operations into the NAS, spaceport infrastructure, systemic safety initiatives, and regulatory reform. The mission of the FAA's Office of Commercial Space Transportation (AST) is to regulate commercial space launch and reentry operations, only to the extent necessary, to ensure compliance with international obligations of the U.S., and to protect the public health and safety, the safety of property, and the national security and foreign policy interests of the United States.

In addition, AST's mission includes encouraging, facilitating, and promoting commercial space launches and reentries performed by the private sector. More recently, Congress tasked AST with promoting the continuous improvement of the safety of launch vehicles designed to carry humans. AST will facilitate U.S. global leadership in CST by researching solutions that optimize safety and efficiency through innovation, collaborative research, and prototype development. AST's R&D portfolio is designed to optimize AST's mission execution by developing improved regulations, safety assessment tools, and public safety technologies. Funding supports regulatory research to address lessons learned and to keep pace with the dynamic CST industry.

CST's research and development had four major areas. Each research area had multiple goals that correspond to the AST mission goals of public safety and industry promotion.

Aerospace Access and Operations

- **Public Safety Goals:**
 - Improve analytical and computational methods to evaluate uninvolved public and property safety
 - Situational awareness and understanding of risks posed by resident space objects
- **Industry Promotion Goals:**
 - Safe and equitable sharing of the NAS by air and space transportation operators, with minimal disruption caused by commercial space traffic (outbound and inbound)
 - Improve spaceport interoperability and development of necessary spaceport industry infrastructure resources

Aerospace Vehicles

- **Public Safety Goals:**
 - Improve vehicle safety and risk analyses and management, including knowledge of all safety-critical components and systems of the space vehicles and their

operations.

Industry Promotion Goals:

- Improve the manufacturability, assembly, and operational efficiencies of space transportation vehicles, systems, and subsystems

Human Operations and Spaceflight

- **Public Safety Goals:**

- Identification and reduction of avoidable risks of human spaceflight

- **Industry Promotion Goals:**

- Facilitate the continuous improvement of human-carrying vehicles' operational safety (during both launch and reentry) and spaceports

Industry Innovation

- **Public Safety Goals:**

- Develop improved criteria for evaluating public safety, such as performance-based requirements for protecting public property and critical assets

- **Industry Promotion Goals:**

- Encourage the growth of evolving space industry sectors through relevant economic, legal, legislative, regulatory, and market analyses and modeling
- Support effective policy decision-making
- Provide a better understanding of the relationship between governmental policy, innovation adoption, and industry growth

Projects conducted by the COE CST team align with the DOT strategic goals of Safety, Economic Strength & Global Competitiveness, Equity, Climate & Sustainability, Transformation, and Organizational Excellence.

The following universities serve as core members under the leadership of the University of Colorado-Boulder: New Mexico State University, New Mexico Institute of Mining and Technology, Florida Institute of Technology, Florida State University, Stanford University, University of Central Florida, University of Florida, Baylor College of Medicine, and the University of Texas Medical Branch at Galveston.

During FY 2022, the FAA awarded grants totaling approximately \$0.5 million to two of its core members (see Attachment II, Appendix E). These were the last set of awards, as the Center closed in FY 2022. Members matched grant awards dollar-for-dollar from non-federal sources. The FAA has not executed IDIQ contracts with CST COE members.

For additional information, see: <http://www.coe-cst.org/>

COE for Joint Advanced Materials and Structures

The Joint Centers of Excellence for Advanced Materials (JAMS) was established by the FAA in January 2004 to assist in ensuring the safe and reliable application of composites and advanced materials to commercial aircraft. In compliance with Section 762 of the FAA Reauthorization Act of 2018, the FAA continues to operate JAMS. JAMS conducts applied research on the following topics:

- Damage tolerance of advanced composite structures
- Durability of adhesively bonded structure
- Additive manufacturing technologies
- Crashworthiness of composite airframes and seating systems
- Environmental and aging effects on in-service composite structures
- Lightning strike on composite airframe
- Emerging material systems and innovative production technologies
- Maintenance and inspection of advanced composites.

While traditional composites have been used in aircraft structure for some time, non-traditional composites, as well as other advanced materials and processes such as additive manufacturing, are used in aviation products. All of these materials are expanding into new applications, with composites expanding to new aviation products to replace traditional metal construction, without commensurate standards and the existing service experience. By comparison, additive manufacturing applications are just getting started in different areas that introduce new challenges. The common goal of this joint Center is to create a cost-sharing academic, industrial, and governmental partnership that helps the FAA to keep abreast with industry advances in all these applications.

Under the University of Washington and Wichita State University's joint leadership, the following universities currently serve as core JAMS members: Florida International University, Oregon State University, University of Utah, Washington State University, Mississippi State University, Auburn University, and the University of California - San Diego. The members are forging a union between the public sector, the private sector, and academic institutions to create a world-class capability to identify solutions for existing and potential advanced materials and structures issues.

The main focus of this partnership is the research, engineering, and development of information used to assure safety and standardize certification of existing and emerging structural applications of composites and advanced materials. Specifically, projects include the evaluation of past applications, the documentation of industry best practices, the performance of applied research, and the development of standard engineering practices.

This Joint Center of Excellence, working with industry and government, also plays an important role in technology transfer, training, and continuing education for the aviation industry and

regulators. JAMS strives for international standardization; develops consensus for developed protocols; identifies standardized criteria for material and process control; and promotes shared material databases worldwide.

The JAMS COE team's research projects align with the DOT strategic goals of Safety, Equity, Transformation, and Organizational Excellence.

During FY 2022, the FAA awarded grants totaling approximately \$0.3 million to two core members (see Attachment II, Appendix F). Members matched grant awards dollar-for-dollar from non-federal sources. The FAA has not executed IDIQ contracts with JAMS COE members.

For additional information, see: <http://www.jams-coe.org/>

Attachment I - Summary Table
Centers of Excellence Grant and Contracts Awards
FY 2021 – FY 2022
(In Whole Dollars)

CENTER OF EXCELLENCE	Grants		Contracts	
	FY 2021	FY 2022	FY 2021	FY 2022
Technical Training and Human Performance (TTHP)	854,996	682,640	0	0
Unmanned Aircraft Systems (UAS)	19,144,548	22,638,252	0	0
Alternative Jet Fuels and Environment (AJFE)	14,438,292	16,022,021	0	0
General Aviation (GA)	706,937	491,430	0	0
Commercial Space Transportation (CST)	0	495,264	0	0
Joint Center of Excellence for Advanced Materials (JAMS)	21,198,809	375,000	0	0
TOTAL	56,343,582	40,704,607	0	0

FY 2021 Funding Source

Funding Year	RE&D	Operations	Total
2019	13,145,635	230,000	13,375,635
2020	22,952,035	0	22,952,035
2021	19,390,915	624,996	20,015,911
			56,343,581

FY 2022 Funding Source

Funding Year	RE&D	Operations	Total
2020	10,154,238	0	10,154,238
2021	15,691,088	0	15,691,088
2022	14,396,065	463,216	14,859,281
			40,704,607

Attachment II - Fiscal Year 2022 Grant Awards

Appendix A - COE for Technical Training and Human Performance

Appendix B - COE for Unmanned Aircraft Systems

Appendix C - COE for Alternative Jet Fuels and Environment

Appendix D - COE for General Aviation Safety, Accessibility, and Sustainability

Appendix E - COE for Commercial Space Transportation

Appendix F - Joint COE for Advanced Materials



**FAA Centers of Excellence
Technical Training and Human Performance Grant Awards
Fiscal Year 2022
Core Members: 15 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2016–2024
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
16-C-TTHP-DU-007	Go-Around Procedures and Training Recommendations	Drexel University	49,424	0	Drexel University	49,424	49,424
15-C-TTHP-ERAU-056	Go-Around Procedures and Training Recommendations	Embry-Riddle Aeronautical University	150,000	0	Embry-Riddle Aeronautical University	150,000	150,000
16-C-TTHP-PU-012	Auto-Flight Mode Confusion: Accidents and Incidents	Purdue University	60,000	0	Purdue University	60,000	60,000
16-C-TTHP-OSU-014	Reliance on Automated or Complex Flight Deck Systems in Commercial Aircraft: Evaluating Compliance to 14 CFR 25.1302(c) and 25.1329 (i)	The Ohio State University	90,000	0	The Ohio State University	90,000	90,000
16-C-TTHP-OK-050	Auto-Flight Mode Confusion: Accidents and Incidents	The University of Oklahoma	4,813	2,000	The University of Oklahoma	4,813	4,813
16-C-TTHP-OK-049	FAA AVS Technical Lead Support The University of Oklahoma (OK) for Reliance on Automated or Complex Flight Deck Systems in Commercial Aircraft (Ohio State)	The University of Oklahoma	9,221	2,500	The University of Oklahoma	9,221	9,221
16-C-TTHP-OK-051	FAA AVS Technical Lead Support The University of Oklahoma (OK) for Review and Analysis of Methods to Evaluate Workload University of North Dakota (UND)	The University of Oklahoma	9,221	2,500	The University of Oklahoma	9,221	9,221
16-C-TTHP-OK-052	Impact of High Intensity Radio Frequencies (RF) on Unmanned Aircraft Systems /Electromagnetic Compatibility (EMC) Electromagnetic Interference (EMI) and Operations	The University of Oklahoma	150,000	0	The University of Oklahoma	150,000	150,000

**FAA Centers of Excellence
Technical Training and Human Performance Grant A Grant Awards
Fiscal Year 2022
Core Members: 15 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2016–2024
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
16-C-TTHP-UND-014	FAA Aviation Safety (AVS) Review and Analysis of Methods to Evaluate Workload	University of North Dakota	99,812	0	University of North Dakota	99,812	99,812
16-C-TTHP-WISU-036	Analysis to Determine the Effects of High Intensity Radiated Fields (HIRF) with Unmanned Aircraft Systems Operations (Admin.)	Wichita State University	15,000	12,000	Wichita State University	15,000	15,000
16-C-TTHP-WISU-035	Autoflight Mode Confusion: Analysis of Accidents and Incidents (Admin.)	Wichita State University	5,187	4,150	Wichita State University	5,187	5,187
16-C-TTHP-WISU-033	Go-Around Procedures and Training Recommendations	Wichita State University	20,000	16,000	Wichita State University	20,000	20,000
16-C-TTHP-WISU-038	Reliance on Automated or Complex Flight Deck Systems in Commercial Aircraft Evaluation of Design Characteristics	Wichita State University	9,981	9,981	Wichita State University	9,981	9,981
16-C-TTHP-WISU-037	Review and Analysis of Methods to Evaluate Workload (Admin.)	Wichita State University	9,981	7,985	Wichita State University	9,981	9,981
		Total	682,640	57,116		682,640	682,640

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

Technical Training and Human Performance
Funding by Fiscal Year
(In millions)

Fiscal Year	Funding Level
FY 2016	5.0
FY 2017	1.5
FY 2018	0.0
FY 2019	2.0
FY 2020	0.3
FY 2021	0.9
FY 2022	0.7
Total	10.4

**FAA Centers of Excellence
Unmanned Aircraft Systems (UAS) Grant Awards
Fiscal Year 2022
Core Members: 17 Industry Members: Approximately 130
Cooperative Agreement Period of Performance: 2016–2025
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
15-C-UAS-DU-012	Evaluate UAS Electromagnetic Compatibility (EMC)	Drexel University	325,830	0	Drexel University	325,830	325,830
15-C-UAS-DU-013	Illustrate the Need for Unmanned Aircraft Systems Cybersecurity Oversight and Risk Management	Drexel University	608,783	0	Drexel University	608,783	608,783
15-C-UAS-ERAU-031	Investigate Detect and Avoid (DAA) Track Classification and Filtering	Embry-Riddle Aeronautical University	371,000	0	Embry-Riddle Aeronautical University	371,000	371,000
15-C-UAS-KSU-031	Disaster Preparedness and Emergency Response Phase III	Kansas State University	145,000	0	Kansas State University	145,000	145,000
15-C-UAS-KSU-033	STEM Outreach to Minority K-12 Students Using UAS as a Learning Platform	Kansas State University	100,000	0	Kansas State University	100,000	100,000
15-C-UAS-KU-010	Evaluate UAS Electromagnetic Compatibility (EMC)	University of Kansas	325,000	0	University of Kansas	325,000	325,000
15-C-UAS-KU-011	Illustrate the Need for UAS Cybersecurity Oversight and Risk Management	University of Kansas	651,982	0	University of Kansas	651,982	651,982
15-C-UAS-MSU-062	Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program	Mississippi State University	1,431,932	0	Mississippi State University	1,431,932	1,431,932
15-C-UAS-MSU-064	Investigate Detect and Avoid (DAA) Track Classification and Filtering	Mississippi State University	330,000	0	Mississippi State University	330,000	330,000
15-C-UAS-MSU-069	Investigate Detect and Avoid (DAA) Track Classification and Filtering	Mississippi State University	20,581	0	Mississippi State University	20,581	20,581

**FAA Centers of Excellence
Unmanned Aircraft Systems (UAS) Grant Awards
Fiscal Year 2022
Core Members: 17 Industry Members: Approximately 130
Cooperative Agreement Period of Performance: 2016–2025
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
15-C-UAS-MSU-071	ASSURE COE Program Management	Mississippi State University	1,347,909	0	Mississippi State University	1,347,909	1,347,909
15-C-UAS-NCSU-015	Disaster Preparedness and Emergency Response Phase III	North Carolina State University	200,000	0	North Carolina State University	200,000	200,000
15-C-UAS-NCSU-016	STEM Outreach to Minority K-12 Students Using UAS as a Learning Platform	North Carolina State University	125,000	0	North Carolina State University	125,000	125,000
15-C-UAS-NMSU-040	Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program	New Mexico State University	3,600,000	0	New Mexico State University	3,600,000	3,600,000
15-C-UAS-NMSU-043	Disaster Preparedness and Emergency Response Phase III	New Mexico State University	400,000	0	New Mexico State University	400,000	400,000
15-C-UAS-ORSU-016	Illustrate the Need for UAS Cybersecurity Oversight and Risk Management	Oregon State University	609,226	0	Oregon State University	609,226	609,226
15-C-UAS-OSU-033	Investigate Detect and Avoid (DAA) Track Classification and Filtering	Ohio State University	711,860	0	The Ohio State University	711,860	711,860
15-C-UAS-SCC-002	STEM Outreach to Minority K-12 Students Using UAS as a Learning Platform	Sinclair Community College	6,000	0	Sinclair Community College	6,000	6,000

**FAA Centers of Excellence
Unmanned Aircraft Systems (UAS) Grant Awards
Fiscal Year 2022
Core Members: 17 Industry Members: Approximately 130
Cooperative Agreement Period of Performance: 2016–2025
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
15-C-UAS-UAF-026	Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program	University of Alaska - Fairbanks	4,050,000	0	University of Alaska - Fairbanks	4,050,000	4,050,000
15-C-UAS-UAH-027	Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program	University of Alabama - Huntsville	1,250,036	0	University of Alabama - Huntsville	1,250,036	1,250,036
15-C-UAS-UAH-032	Disaster Preparedness and Emergency Response Phase III	University of Alabama - Huntsville	828,070	0	University of Alabama - Huntsville	828,070	828,070
15-C-UAS-UND-044	Evaluation of Unmanned Aircraft Systems (UAS) Integration Safety and Security Technologies in the National Airspace System (NAS) Program	University of North Dakota	3,600,000	0	University of North Dakota	3,600,000	3,600,000
15-C-UAS-UND-046	Evaluate UAS Electromagnetic Compatibility (EMC)	University of North Dakota	325,043	0	University of North Dakota	325,043	325,043
15-C-UAS-UND-047	Investigate Detect and Avoid (DAA) Track Classification and Filtering	University of North Dakota	80,000	0	University of North Dakota	80,000	80,000
		Total	21,443,252	0		21,443,252	21,443,252

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

Unmanned Aircraft Systems Total Funding Awarded by Fiscal Year
(In Millions of Dollars)

Fiscal Year	Funding Level
FY 2015	4.8
FY 2016	3.4
FY 2017	3.8
FY 2018	6.1
FY 2019	3.5
FY 2020	13.4
FY 2021	19.1
FY 2022	22.6
Total	76.7

FAA Centers of Excellence Alternative Jet Fuels and Environment Grant Awards Fiscal Year 2022 Core Members: 16 Industry Members: Approximately 64 Cooperative Agreement Period of Performance: 2013–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award – Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Funds)	Required 50 Percent Match Amount	Total Matching Amount ³
13-C-AJFE-BU-028	Community Measurement of Aviation Emission Contribution of Ambient Air Quality	Trustees of Boston University, BUMC	549,921	0	Trustees of Boston University, BUMC	549,921	549,921
13-C-AJFE-GIT-116	Noise Generation and Propagation from Advanced Combustors	Georgia Tech Research Corporation	500,000	0	Georgia Tech Research Corporation	500,000	500,000
13-CAJFE-GIT-117	Integrated Noise and CO2 Standard Setting Analysis	Georgia Tech Research Corporation	300,000	0	Georgia Tech Research Corporation	300,000	300,000
13-C-AJFE-GIT-121	Continuous Lower Energy, Emissions, and Noise (CLEEN) II- Aircraft Technology Modeling and Assessment	Georgia Tech Research Corporation	250,000	0	Georgia Tech Research Corporation	250,000	250,000
13-C-AJFE-GIT-122	Aviation Environmental Design Tool Evaluation and Development Support	Georgia Tech Research Corporation	900,000	0	Georgia Tech Research Corporation	900,000	900,000
13-C-AJFE-GIT-123	Analytical Methods for Expanding the Aviation Environmental Design Tool Aircraft Fleet Database	Georgia Tech Research Corporation	150,000	0	Georgia Tech Research Corporation	150,000	150,000
13-C-AJFE-GIT-124	Noise Certification Streamlining	Georgia Tech Research Corporation	250,000	0	Georgia Tech Research Corporation	250,000	250,000
13-C-AJFE-GIT-125	Noise Model Validation for Aviation Environmental Design Tool	Georgia Tech Research Corporation	235,000	0	Georgia Tech Research Corporation	235,000	235,000
13-C-AJFE-GIT-126	Alternative Design Configurations to meet Future Demand	Georgia Tech Research Corporation	500,000	0	Georgia Tech Research Corporation	500,000	500,000

FAA Centers of Excellence Alternative Jet Fuels and Environment Grant Awards Fiscal Year 2022 Core Members: 16 Industry Members: Approximately 64 Cooperative Agreement Period of Performance: 2013–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award – Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Funds)	Required 50 Percent Match Amount	Total Matching Amount ³
13-C-AJFE-GIT-127	Reduction of non-volatile particulate matter emissions from aero-engine fuel injectors	Georgia Tech Research Corporation	500,000	0	Georgia Tech Research Corporation	500,000	500,000
13-C-AJFE-GIT-128	CAEP Stringency Analysis Modeling	Georgia Tech Research Corporation	690,000	0	Georgia Tech Research Corporation	690,000	690,000
13-C-AJFE-MIT-092	Surface Analysis to Support Aviation Environmental Design Tool Aircraft Performance Module (APM) Development	Massachusetts Institute of Technology	75,000	0	Massachusetts Institute of Technology	75,000	75,000
13-C-AJFE-MIT-093	Comparative Assessment of Electrification Strategies for Aviation	Massachusetts Institute of Technology	160,000	0	Massachusetts Institute of Technology	160,000	160,000
13-C-AJFE-MIT-094	Aircraft Noise Exposure and Market Outcomes in the United States	Massachusetts Institute of Technology	100,000	0	Massachusetts Institute of Technology	100,000	100,000
13-C-AJFE-MIT-095	Integrated Noise and CO2 Standard Setting Analysis	Massachusetts Institute of Technology	300,000	0	Massachusetts Institute of Technology	300,000	300,000
13-C-AJFE-MIT-096	Alternative Jet Fuels Supply Chain Analysis	Massachusetts Institute of Technology	450,000	0	Massachusetts Institute of Technology	450,000	450,000
13-C-AJFE-MIT-097	Combustion Concepts for Next-Generation Aircraft Engines	Massachusetts Institute of Technology	300,000	0	Massachusetts Institute of Technology	300,000	300,000
13-C-AJFE-MIT-098	Comparative Assessment of Electrification Strategies for Aviation	Massachusetts Institute of Technology	300,000	0	Massachusetts Institute of Technology	300,000	300,000
13-C-AJFE-MIT-099	Improving Policy Analysis Tools to Evaluate Higher-Altitude Aircraft Operations	Massachusetts Institute of Technology	500,000	0	Massachusetts Institute of Technology	500,000	500,000
13-C-AJFE-MIT-100	Contrail Avoidance Decision Support and Evaluation	Massachusetts Institute of Technology	550,000	0	Massachusetts Institute of Technology	550,000	550,000

FAA Centers of Excellence Alternative Jet Fuels and Environment Grant Awards Fiscal Year 2022 Core Members: 16 Industry Members: Approximately 64 Cooperative Agreement Period of Performance: 2013–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award – Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Funds)	Required 50 Percent Match Amount	Total Matching Amount ³
13-C-AJFE-MIT-101	Hydrogen and Power to Liquid Concepts for SAF Production	Massachusetts Institute of Technology	300,000	0	Massachusetts Institute of Technology	300,000	300,000
13-C-AJFE-MIT-102	Integrated Noise and CO2 Standard Setting Analysis	Massachusetts Institute of Technology	600,000	0	Massachusetts Institute of Technology	600,000	600,000
13-C-AJFE-MIT-103	NOx Cruise/Climb Metric System Development	Massachusetts Institute of Technology	250,000	0	Massachusetts Institute of Technology	250,000	250,000
13-C-AJFE-MST-021	Measurement and Prediction of non-volatile particulate matter size and number emissions from	The Curators of the Univ. of Missouri - Rolla	650,230	0	The Curators of the Univ. of Missouri - Rolla	650,230	650,230
13-C-AJFE-MST-023	Transitioning a Research non-volatile particulate matter Mass Calibration Procedure to Operations	The Curators of the Univ. of Missouri - Rolla	99,999	0	The Curators of the Univ. of Missouri - Rolla	99,999	99,999
13-C-AJFE-MST-024	Measurement and Prediction of non-volatile particulate matter size and number emissions from sustainable and conventional aviation fuels	Missouri University of Science and Technology	1,399,770	0	Missouri University of Science and Technology	1,399,770	1,399,770
13-C-AJFE-PSU-085	Risk-Informed Alternative Jet Fuel (AJF) Supply Chain Analysis	Pennsylvania State University – Univ. Park	100,000	0	Pennsylvania State University – Univ. Park	100,000	100,000
13-C-AJFE-PSU-086	Support for supersonic aircraft en-route noise efforts in International Civil Aviation Organization Committee on Aviation Environmental Protection	Pennsylvania State University	110,000	0	Pennsylvania State University	110,000	110,000
13-C-AJFE-PSU-088	Turbine Cooling Through Additive Manufacturing	Pennsylvania State University	400,000	0	Pennsylvania State University	400,000	400,000
13-C-AJFE-PSU-089	Noise Model Validation for Aviation Environmental Design Tool	Pennsylvania State University	140,000	0	Pennsylvania State University	140,000	140,000

FAA Centers of Excellence Alternative Jet Fuels and Environment Grant Awards Fiscal Year 2022 Core Members: 16 Industry Members: Approximately 64 Cooperative Agreement Period of Performance: 2013–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award – Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Funds)	Required 50 Percent Match Amount	Total Matching Amount ²
13-C-AJFE-PU-048	Alternative Jet fuel supply Chain Analysis - CORSIA Fuel Support	Purdue University	350,000	0	Purdue University	350,000	350,000
13-C-AJFE-PU-049	Impact of Fuel Heating on Combustion Performance and Emissions	Purdue University	250,000	0	Purdue University	250,000	250,000
13-C-AJFE-SU-034	Validation of Low Exposure Noise Modeling by Open Source Data Management and Visualization Systems Integrated with AEDT	Board of Trustees of Leland Stanford Jr Univ. CS	90,000	0	Board of Trustees of Leland Stanford Jr Univ. CS	90,000	90,000
13-C-AJFE-SU-035	Chemical Kinetics Combustion Experiments	Board of Trustees of Leland Stanford Jr Univ. CS	200,000	0	Board of Trustees of Leland Stanford Jr Univ. CS	200,000	200,000
13-C-AJFE-UD-042	Fuel Testing Approaches for Rapid Jet Fuel Prescreening	University of Dayton Research Institute	195,000	0	University of Dayton Research Institute	195,000	195,000
13-C-AJFE-UD-043	Alternative Jet Fuels Test and Evaluation	University of Dayton Research Institute	1,499,940	0	University of Dayton Research Institute	1,499,940	1,499,940
13-C-AJFE-UD-044	Fuel Composition Impact on Combustor Durability	University of Dayton Research Institute	200,000	0	University of Dayton Research Institute	200,000	200,000
13-C-AJFE-UI-042	Evaluation of FAA Climate Tools	Board of Trustees of the Univ. of Illinois	199,999	0	Board of Trustees of the Univ. of Illinois	199,999	150,898 ⁴
313-C-AJFE-UI-043	Alternative Fuels Test Database Library	Board of Trustees of the Univ. of Illinois	150,000	0	Board of Trustees of the Univ. of Illinois	150,000	183,110 ⁴
13-C-AJFE-UI-044	Fuel Testing Approaches for Rapid Jet Fuel Prescreening	Board of Trustees of the Univ. of Illinois	150,000	0	Board of Trustees of the Univ. of Illinois	150,000	192,000 ⁴
13-C-AJFE-UTENN-017	Techno-Market Analysis of US Biorefinery Supply Chains from Feedstock to Alternative Jet Fuels	University of Tennessee	200,000	0	University of Tennessee	200,000	200,000

FAA Centers of Excellence Alternative Jet Fuels and Environment Grant Awards Fiscal Year 2022 Core Members: 16 Industry Members: Approximately 64 Cooperative Agreement Period of Performance: 2013–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award – Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Funds)	Required 50 Percent Match Amount	Total Matching Amount ³
13-C-AJFE-WaSU-032	Alternative Jet Fuel Supply Chain Analysis	Washington State University	469,136	0	Washington State University	469,136	469,136
13-C-AJFE-WaSU-033	Hydrogen production alternatives for sustainable aviation fuel (SAF) production	Washington State University	458,026	0	Washington State University	458,026	458,026
		Total	16,022,021	0		16,022,021	16,048,030⁴

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

⁴Individual project amounts differ from the required 50 percent match, but the Board of Trustees of the University of Illinois’ combined total contribution for these three projects exceeds the required total match amount by \$26,009.

Alternative Jet Fuels and Environment Total Funding Awarded by Fiscal Year (In Millions of Dollars)

Fiscal Year	Funding Level
FY 2013	0.1
FY 2014	9.3
FY 2015	10.6
FY 2016	9.4
FY 2017	9.8
FY 2018	3.1
FY 2019	7.7
FY 2020	34.2
FY 2021	14.4
FY 2022	16.0
Total	114.6

FAA Centers of Excellence General Aviation Safety, Accessibility, and Sustainability Grant Awards Fiscal Year 2022 Core Members: 6 Industry Members: Approximately 35 Cooperative Agreement Period of Performance: 2012–2023 (In Whole Dollars)							
Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
12-C-GA-FIT-054	Enhanced Hands-Minimized Weather Interfaces for Pilots	Florida Institute of Technology	43,155	0	Florida Institute of Technology	43,155	43,155
12-C-GA-FIT-055	Management & Administration	Florida Institute of Technology	5,000	0	Florida Institute of Technology	5,000	5,000
12-C-GA-GIT-060	Rotorcraft Aviation Safety Information Analysis & Sharing	Georgia Tech Research Corporation	207,500	0	Georgia Tech Research Corporation	207,500	207,500
12-C-GA-GIT-062	Management & Administration	Georgia Tech Research Corporation	5,000	0	Georgia Tech Research Corporation	5,000	5,000
12-C-GA-ISU-052	Augmented Weather Interfaces Project	Iowa State University of Science and Technology	70,000	0	Iowa State University of Science and Technology	70,000	70,000
12-C-GA-ISU-054	Management & Administration	Iowa State University of Science and Technology	5,000	0	Iowa State University of Science and Technology	5,000	5,000
12-C-GA-OSU-071	Management & Administration	The Ohio State University	5,000	0	The Ohio State University	5,000	5,000
12-C-GA-PU-110	Enhanced Hands-Minimized Weather Interfaces for Pilots	Purdue University	60,000	0	Purdue University	60,000	60,000
12-C-GA-PU-111	Management & Administration	Purdue University	90,775	0	Purdue University	90,775	90,775
		Total	491,430	0		491,430	491,430

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

General Aviation Safety, Accessibility, and Sustainability Total Funding Awarded by Fiscal Year
(In Millions of Dollars)

Fiscal Year	Funding Level
FY 2012	0.5
FY 2013	1.7
FY 2014	3.2
FY 2015	3.1
FY 2016	3.7
FY 2017	3.3
FY 2018	0.3
FY 2019	2.0
FY 2020	0.8
FY 2021	0.7
FY 2022	0.5
Total	19.8

**FAA Centers of Excellence
Commercial Space Transportation (CST) Grant Awards
Fiscal Year 2022
Core Members: 10 Industry Members: Approximately 35
Cooperative Agreement Period of Performance: 2010–2022
(In Whole Dollars)**

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award	Total Sub- Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
15-C-CST-UC-029	FAA Centers of Excellence Commercial Space Transportation Executive Director and Administration	University of Colorado Boulder	395,264	0	University of Colorado Boulder	395,264	395,264
15-C-CST-NMT-025	Orion Management Information System Integration and Centers of Excellence Program Support	New Mexico Institute of Mining and Technology	100,000	0	New Mexico Institute of Mining and Technology	100,000	100,000
		Total	495,264	0		495,264	495,264

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

Commercial Space Transportation Total Funding Awarded by Fiscal Year
(In millions of dollars)

Fiscal Year	Funding Level
FY 2010	2.0
FY 2011	1.1
FY 2012	1.1
FY 2013	1.1
FY 2014	1.1
FY 2015	1.3
FY 2016	1.2
FY 2017	1.3
FY 2018	0.8
FY 2019	0.0
FY 2020	3.4
FY 2021	0.0
FY 2022	0.5
Total	14.9

FAA Centers of Excellence
Joint COE for Advanced Materials (JAMS) Grant Awards
Fiscal Year 2022
Core Members: 9 Industry Members: Approximately 25
Cooperative Agreement Period of Performance: 2004–2023
(In Whole Dollars)

Grant Number	Research Projects	Center of Excellence Award Recipients	FAA Grant Award - Subject to Matching Requirement	Total Sub-Award Amount	Non-Federal Organizations Providing Match (Source of Matching Contribution)	Required 50 Percent Match Amount	Total Matching Amount ³
12- C- AM-OSU-014	Correlation of ULTEM 9085 Physical, Chemical, and Mechanical Properties	Oregon State University	150,000	0	Oregon State University	150,000	150,000
12-C-AM-WISU-179	Composites Materials Handbook (CMH-17)	Wichita State University	125,000	0	Wichita State University	125,000	125,000
12-C-AM-WISU-178	Development and Safety Management of Composite Certification Guidance	Wichita State University	100,000	0	Wichita State University	100,000	100,000
		Total	375,000	0		375,000	375,000

³Reflects matching amounts Non-Federal Organizations have proposed and committed to the project.

Joint COE for Advanced Materials
Total Funding Awarded by Fiscal Year
(In millions of dollars)

Fiscal Year	Funding Level
FY 2004	2.4
FY 2005	2.7
FY 2006	2.8
FY 2007	1.4
FY 2008	3.7
FY 2009	2.0
FY 2010	2.5
FY 2011	2.3
FY 2012	2.2
FY 2013	1.8
FY 2014	2.4
FY 2015	2.4
FY 2016	5.6
FY 2017	4.9
FY 2018	1.5
FY 2019	5.2
FY 2020	14.9
FY 2021	21.2
FY 2022	0.4
Total	82.3

Attachment III - Fiscal Year 2022 Contract Awards

Appendix A - COE for Unmanned Aircraft Systems

Appendix B - COE for General Aviation Safety, Accessibility, and Sustainability



**FAA Centers of Excellence
Unmanned Aircraft Systems - ASSURE Contract Awards
Fiscal Year 2022
(In Whole Dollars)**

Contract Number	Title of Research	COE Award Recipients	FAA Award Amount	Sub-Award Recipients	Total Sub-Award Amounts	Source of Matching Contribution	Amount/Value of Contribution (FY 2022)
	None awarded in FY22		0		0	0	0
		Total	0		0	0	0

Note: Contracts are awarded by (Acquisitions and Contracting Division). The requirements of the Indefinite Delivery Indefinite Quantity contracts determined the award amounts and matching contributions.

Unmanned Aircraft Systems - ASSURE
Total Contract Funding Awarded by Fiscal Year
(In millions of Dollars)

Fiscal Year	Funding Level
FY 2018	0.1
FY 2019	2.0
FY 2020	0.0
FY 2021	0.3
FY 2022	0.0
Total	2.4

FAA Centers of Excellence (COE) General Aviation (GA) Contract Awards Fiscal Year 2022							
Contract Number	Title of Research	COE Award Recipients	FAA Award Amount	Sub-Award Recipients	Total Sub-Award Amounts	Source of Matching Contribution	Amount/Value of Contribution (FY 2022)
	None awarded in FY22		0		0	0	0
		Total	0		0	0	0

Note: Contracts are awarded by (Acquisitions and Contracting Division). The requirements of the Indefinite Delivery Indefinite Quantity contracts determined the award amounts.

General Aviation
Total Contract Funding Awarded by Fiscal Year
(In millions of Dollars)

Fiscal Year	Funding Level
FY 2012	0.0
FY 2013	0.1
FY 2014	1.6
FY 2015	1.8
FY 2016	0.0
FY 2017	0.0
FY 2018	0.06
FY 2019	0.05
FY 2020	0.0
FY 2021	0.0
FY 2022	0.0
Total	3.6