



U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

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

October 15, 2020

The Honorable Roger F. Wicker
Chairman, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Chairman Wicker:

As directed by 49 U.S.C. § 44513(h), enacted in the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (P.L. 112-95), I am pleased to provide you with a report on the FAA Centers of Excellence (COE) program for Fiscal Year 2019.

In accordance with Section 44513(h), the FAA is required to annually submit a 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 six active COEs, and attachments that list the required details of the FY 2019 awards and COE funding summaries.

Identical letters have been sent to Senator Cantwell, Chairwoman Johnson, and Congressman Lucas.

Sincerely,

A handwritten signature in black ink that reads "Steve Dickson". The signature is fluid and cursive, with the first name "Steve" and last name "Dickson" clearly legible.

Steve Dickson
Administrator

Enclosure



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800 Independence Ave., S.W.
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October 15, 2020

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

Dear Senator Cantwell:

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800 Independence Ave., S.W.
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October 15, 2020

The Honorable Eddie Bernice Johnson
Chairwoman, Committee on Science,
Space, and Technology
House of Representatives
Washington, DC 20515

Dear Chairwoman Johnson:

As directed by 49 U.S.C. § 44513(h), enacted in the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (P.L. 112-95), I am pleased to provide you with a report on the FAA Centers of Excellence (COE) program for Fiscal Year 2019.

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800 Independence Ave., S.W.
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October 15, 2020

The Honorable Frank D. Lucas
Ranking Member, Committee on Science,
Space, and Technology
House of Representatives
Washington, DC 20515

Dear Congressman Lucas:

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**Federal Aviation Administration
Air Transportation Centers
of Excellence
Congressional Report**

Fiscal Year 2019



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Congressional Report Overview - Fiscal Year 2019

Federal Aviation Administration (FAA) Air Transportation Centers of Excellence (COE) Program Fiscal Year (FY) 2019 Overview

Overview

Congress mandated the establishment of FAA Air Transportation Centers of Excellence in the Omnibus Budget Reconciliation Act of 1990 Public Law (P.L.) 101-508, Title IX – Transportation, Section 9209 – Aviation Research and Centers of Excellence, now codified at 49 U.S.C. § 44513. Subsequently, the FAA Modernization and Reform Act of 2012 (P.L. 112-95), Section 907(b), amended § 44513 by adding that the FAA Administrator shall transmit annually to specified Congressional committees 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 project; and,
- (4) the level of cost-sharing for each research project.

This report is submitted in response to that mandate.

Mission

The mission of the FAA's COE program is to help develop the nation's technology base and leverage resources to advance the technological future of the nation's aviation industry while educating the next generation of aviation professionals. The program enables collaboration and coordination between government, academia, and industry to advance mission-critical aviation technologies and expand FAA research capabilities through congressionally-required matching contributions. 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 and Grant Matching

Section 44513(d) provides criteria that must be considered when selecting members of each COE. The FAA Administrator and the Secretary of Transportation have used these criteria to conduct an open and rigorous competitive process for selecting COE 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 to conduct the research activities that the grant recipient carries out thereunder. (49 USC § 44513(f)).

Determining Funding Levels

Each COE has its own FAA sponsoring office which commits to an annual minimum funding level over the 10-year period. This funding level is determined based on the sponsoring office's budget and the forecasted research required in each critical area. The FAA chose a 10-

year timeframe to provide ample opportunity for COEs to generate matching contributions and educate a future pool of aviation professionals. The FAA allows for an additional two-year period to assure orderly close out of all activities. Some COEs have been extended beyond 10-years based on congressional direction. 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 sole benefit of the government. Contract awards as well as matching contributions, when applicable, are shown in Attachment III. Matching contributions are negotiable when provided as cost share for work performed under the contract vehicle for FAA benefit (vs. public purpose).

Historical COE Results

The Administrator has established 13 COEs — including 92 core universities — since the inception of the program and the first grant award in 1993. Several universities served on multiple COE teams. COE partners and their non-federal affiliates provided more than \$345 million in matching contributions to augment FAA research grants. 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 technological future of the nation's aviation industry. Furthermore, students gained valuable hands-on educational experience applicable to the aviation and aerospace workplace, as evidenced by the more than 3,000 doctoral dissertations, theses, and journal articles produced by the students.

Self-Sufficient National Resources

Centers of Excellence are ultimately positioned to establish themselves as a national resource capable of serving the aviation community and the nation after completion of initial requirements. A successful COE will become self-sufficient once it no longer relies on an annual FAA funding commitment. COE members are expected to generate funding and compete for and

conduct research activities for the aviation community as well as the FAA, as needed once they become self-sufficient.

There are currently six active centers and seven centers deemed either self-sufficient, closed, or re-competed. The three centers that have satisfied their COE requirements, and which the FAA considers to be self-sufficient national resources, are the National Center of Excellence for Aviation Operations Research, the Center of Excellence for Airport Technology Research, and the Center of Excellence for Airliner Cabin and Research in the Intermodal Transport Environment. The Center of Excellence for Airworthiness Assurance and the Center of Excellence for Airport Technology have closed. The Center of Excellence for Aircraft Noise and Emissions Mitigation was re-competed and replaced by the Center of Excellence for Alternative Jet Fuels and Environment. The Center of Excellence for General Aviation Research was re-competed and replaced by the Center of Excellence for General Aviation Safety, Accessibility and Sustainability.

FY 2019 COE Activities

The FAA supported six active COE public-private partnerships with academic institutions, and their industry and other affiliates. Upon approval from the Secretary of Transportation, the FAA COE Program Management Office (PMO) awarded 97 grant awards for approximately \$20 million during FY 2019. The grants were awarded to 31 core universities in support of 58 projects, generating more than \$20 million in matching contributions from industry and other non-federal sources.

Narratives follow for each of the six active COEs:

- 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

The following sections contain descriptions for each of the active COEs. Attachments to this document list grant and contract awards executed during FY 2019 with current university members of each COE. Required matching contributions are included in the attachments in accordance with P.L. 101-508.

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

Attachment I: COE Summary Table

Attachment II: Fiscal Year 2019 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 2019 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 the Secretary of Transportation selected the Technical Training and Human Performance (TTHP) COE team in August 2016. The center's mission is to establish and manage a consortium between government, academia, and industry to evaluate and create solutions for the enhancement of the training and operational performance of all air transportation personnel. The team conducts research predominantly on topics of critical interest that seek solutions in the following training and human performance areas:

- Curriculum architecture
- Content management and delivery
- Simulation and part-task training
- Human factors
- Analytics
- Safety

Sponsored by the FAA's Air Traffic Organization, focus areas include modular curriculum design, virtual training delivery, simulation, applied game theory, visual search patterns, and learner data management, among many others aimed at understanding best practices, applying lessons learned, and advancing the state of technical training. The results of the research will inform future technical training for professions across the FAA.

In less than three years of operation, the center has already expanded the number of research efforts and sponsoring organizations throughout the FAA, as well as added additional industry partners. The center is comprised of 16 core universities, nine affiliate universities, and 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, Ohio State University, Oklahoma State University, Purdue University, Tennessee State 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 2019, the FAA awarded grants to five core members totaling approximately \$2 million as shown in Attachment II, Appendix A. Members matched grant awards dollar for dollar from non-federal sources as mandated by statutory requirements. Based on the competitive process used to select the COE team, the FAA is also planning to execute Indefinite Delivery Indefinite Quantity (IDIQ) contracts to procure deliverables for the sole benefit of the government.

The COE TTHP research projects align with the Department of Transportation strategic goals on Safety (Goal 1) and Innovation (Goal 3).

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

COE for Unmanned Aircraft Systems

The FAA Administrator and the Secretary of Transportation selected the Alliance for System Safety of Unmanned Aircraft Systems (UAS) through Research Excellence (ASSURE) as the COE for UAS in FY 2015. The center's mission is to help the UAS market safely grow while providing the FAA with the research needed to quickly, safely, and efficiently integrate unmanned aircraft systems into the NAS with minimal changes to current operations. The COE 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, Ohio State University, Oregon State University, University of Alabama-Huntsville, University of Alaska-Fairbanks, University of California-Davis, University of Kansas, University of North Dakota and Wichita State University.

Associate members of the COE include: Auburn University, Concordia University, Indiana State University, Louisiana Tech University, University of Southampton, Technion-Israel Institute of Technology, and Tuskegee University.

During FY 2019, the FAA awarded grants to 11 core members totaling approximately \$3.5 million as shown in Attachment II, Appendix B. Members matched grant awards dollar for dollar from non-federal sources as mandated by statutory requirements. Based on the competitive process used to select the COE UAS team, the FAA also executed Indefinite Delivery Indefinite Quantity (IDIQ) contracts to procure deliverables for the sole benefit of the government. In FY 2019, the FAA awarded \$2,029,200 to the COE UAS members through the IDIQ contract vehicle, as shown in Attachment III, Appendix A.

The COE UAS research projects align with the Department of Transportation strategic goals on Safety (Goal 1), Innovation (Goal 3), and Accountability (Goal 4).

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

COE for Alternative Jet Fuels and Environment

The FAA Administrator and the Secretary of Transportation selected the COE for Alternative Jet Fuels and Environment (AJFE), also known as the Aviation Sustainability Center or ASCENT, in September 2013. The center's mission is to assist the FAA in overcoming the environmental and energy challenges facing aviation to allow the nation's air transportation system to grow, thereby ensuring the continued mobility and economic growth that accompanies the air transport sector. The center's research and development efforts address the following major topic areas related to alternative jet fuels:

- Feedstock development
- Processing and conversion research
- Regional supply and refining infrastructure
- Environmental benefits analysis
- Aircraft component deterioration and wear assessment
- Fuel performance testing

Research relating to environmental issues includes:

- Aircraft 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 research projects align with the Department of Transportation strategic goals on Infrastructure (Goal 2), Innovation (Goal 3), and Accountability (Goal 4). Innovation is required to develop the technological and operational measures required to reduce aviation's impacts on the environment. 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 airspace system to our aviation users and stakeholders. These advancements will promote aviation growth including the integration of new entrants such as supersonic aircraft, and unmanned, urban air mobility, and commercial space vehicles.

Under the leadership of co-leads 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 University of Washington.

During FY 2019, the FAA awarded grants to 12 core members totaling approximately \$7.7 million as shown in Attachment II, Appendix C. Members matched grant awards dollar for dollar from non-federal sources as per statutory requirements.

For additional information, see: <http://ascent.aero/>.

COE for General Aviation Safety, Accessibility, and Sustainability

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

- Airport Safety
- Airport Pavements
- Software and Systems
- Human Factors
- Weather Technology in the Cockpit
- Structures and Propulsion
- Electric Vertical Take-off and Landing (eVTOL)
- Urban Air Mobility

Additional research included GA flight safety with projects that include examining how to use recorded flight data to improve aviation safety for fixed-wing and rotorcraft. The team has also examined how pilots use cockpit information such as angle of attack indicators, weather information, and advanced sensor displays. These efforts included flight testing, algorithm development, and human factors. Results from the projects helped the FAA provide guidance and develop or update Advisory Circulars improving overall aviation safety since many COE GA projects are also applicable to commercial operations.

Under the leadership of Purdue University, 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 2019, the FAA awarded grants to all six of its core members totaling approximately \$2 million as shown in Attachment II, Appendix D. Members matched grant awards dollar for dollar from non-federal sources as per statutory requirements. Based on the competitive process used to select the COE GA team, the FAA also executed IDIQ contracts to procure deliverables for the sole benefit of the government. In FY 2019, the FAA awarded \$49,038 to COE members through the IDIQ contract vehicle, as shown in Attachment III, Appendix B.

The COE GA research projects align with the Department of Transportation strategic goals on Safety (Goal 1), Infrastructure (Goal 2), Innovation (Goal 3), and Accountability (Goal 4).

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

COE for Commercial Space Transportation (CST)

The FAA Administrator and the Secretary of Transportation selected the COE for Commercial Space Transportation in FY 2010. The center's research is critical to ensure commercial space launches are safely integrated into the NAS while minimizing the impact to the aviation industry, traveling public, and emerging commercial space industry. Research and development is focused on the following four major areas:

Aerospace Access and Operations

Research goals include:

- Improved management of safety of public and property
- Improved management of external risks to launch and reentry vehicles
- Safe, equitable, and effective sharing of the NAS by air and space transportation operators, with minimal disruption caused by commercial space traffic (outbound and inbound)
- Improved spaceport interoperability and development of necessary spaceport industry infrastructure resources

Aerospace Vehicles

Research goals include:

- Improved vehicle safety and risk analyses and management, including knowledge of all safety-critical components and systems of the space vehicles and their operations
- Improved manufacturability, assembly, and operational efficiencies of space transportation vehicles, systems, and subsystems

Human Operations and Spaceflight

Research goals include:

- Improved management of avoidable risks of human spaceflight
- Continuous improvement of the operational safety of human-carrying vehicles (during both launch and reentry) and spaceports
- Improved methodologies for evaluating public and property, such as performance based requirements

Industry Innovation

Research goals include:

- Encouraging the growth of evolving space industry sectors through relevant economic, legal, legislative, regulatory, and market analyses and modeling
- Supporting effective policy decision making to accomplish the dual regulatory and promotional missions of FAA Office of Commercial Space Transportation
- Providing a better understanding of the relationship of governmental policy, innovation adoption, and industry growth

The following universities serve as core members under the leadership of 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-Galveston.

During FY 2019, the FAA executed no additional grant awards as shown in Attachment II, Appendix E. The FAA sponsoring organization, the Office of Commercial Space Transportation, and core members are preparing for this COE to become self-sufficient after the end of the COE's Phase II Cooperative Agreement in FY 2020.

Research projects conducted by the COE CST align with the Department of Transportation strategic goals on Safety (Goal 1), Infrastructure (Goal 2), Innovation (Goal 3), and Accountability (Goal 4).

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

Joint COE for Advanced Materials

The FAA Administrator and the Secretary of Transportation selected the Joint COE for Advanced Materials in 2004. In compliance with Congressional direction, the COE was extended through December 2020. The center conducts research and development on the following topics to ensure the safe use of composite materials in aircraft products:

- Damage tolerance
- Maintenance practices
- Crashworthiness
- Environmental effects
- Structural integrity of adhesively bonded structures
- Continued operational safety and certification efficiency for emerging technologies
- Composite additive manufacturing

Recent increases in the use of composite materials in commercial and civil aircraft require a proactive approach to maintain safe operations in the NAS. Approaching a century of experience with metals in aircraft, there have been many lessons learned about the behavior of these materials. Without the benefit of that same history for composite materials, the COE is conducting research to address this gap and add to the knowledge base in this area of study. The FAA uses the research to develop regulations, policy, and guidance material for FAA employees and the aircraft industry.

The COE also supports publication of the Composite Materials Handbook-17 (CMH-17), the authoritative worldwide focal point for technical information on composite materials and structures. As an industry-wide global standard, the document provides information and guidance necessary to design and fabricate end items from composite materials. The handbook helps standardize testing and engineering data development methodologies for current and emerging composite materials.

Under the joint leadership of the University of Washington and Wichita State University, the following universities currently serve as core members: Florida International University, Northwestern University, Oregon State University, Purdue University, University of California at Los Angeles, University of Delaware, University of Utah, Washington State University, Mississippi State University, Auburn University, and University of California-San Diego.

During FY 2019, the FAA awarded grants to five core members totaling approximately \$5.2 million as shown in Attachment II, Appendix F. Members match grant awards dollar for dollar from non-federal sources as per statutory requirements.

The COE JAMS research projects align with the Department of Transportation strategic goals on Safety (Goal 1), Innovation (Goal 3), and Accountability (Goal 4).

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

Attachment I - COE Summary Table

CENTER OF EXCELLENCE	Grants		Contracts	
	FY18	FY19	FY18	FY19
Technical Training and Human Performance (TTHP)	\$ 0	\$ 1,976,527	\$ 0	\$ 0
Unmanned Aircraft Systems (UAS)	\$ 6,106,452	\$ 3,532,507	\$ 140,115	\$ 2,029,200
Alternative Jet Fuels and Environment (AJFE)	\$ 3,170,047	\$ 7,685,041	\$ 0	\$ 0
General Aviation (GA)	\$ 315,964	\$ 2,008,423	\$ 56,464	\$ 49,038
Commercial Space Transportation (CST)	\$ 819,879	\$ 0	\$ 0	\$ 0
Joint Center of Excellence for Advanced Materials (JAMS)	\$ 1,456,658	\$ 5,203,186	\$ 0	\$ 0
TOTAL	\$ 11,869,000	\$ 20,405,684	\$ 196,579	\$ 2,078,238

Attachment II - Fiscal Year 2019 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

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Technical Training and Human Performance (TTHP) – Core Members: 16 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2016–2021
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
16-C-TTHP-AU-007	Effective Training and Checking Methods for the Emerging Pilot Workforce	Auburn University	\$595,933	\$0	Auburn University	\$595,933	\$595,933
16-C-TTHP-ERAU-041	FAA COE TTHP Program Support	Embry-Riddle Aeronautical University	\$163,431	\$0	Embry-Riddle Aeronautical University	\$163,431	\$163,431
16-C-TTHP-ERAU-042	AJW-3 Fleet Assessment Modernization Study Phase II	Embry-Riddle Aeronautical University	\$210,326	\$0	Embry-Riddle Aeronautical University	\$210,326	\$210,326
16-C-TTHP-OK-032	Effective Training and Checking Methods for the Emerging Pilot Workforce	University of Oklahoma	\$10,230	\$0	University of Oklahoma	\$10,230	\$10,230
16-C-TTHP-OK-033	ILS Zone 3 Measurement	University of Oklahoma	\$2,626	\$0	University of Oklahoma	\$2,626	\$2,626
16-C-TTHP-OK-034	Ultra lightweight VORILS Receiver	University of Oklahoma	\$120,000	\$0	University of Oklahoma	\$120,000	\$120,000
16-C-TTHP-OK-035	Ultra lightweight VORILS Receiver	University of Oklahoma	\$2,626	\$0	University of Oklahoma	\$2,626	\$2,626
16-C-TTHP-OK-036	OU Program Management and Technical Support (Years 4 and 5)	University of Oklahoma	\$272,306	\$0	University of Oklahoma	\$272,306	\$272,306
16-C-TTHP-OKSU-005	ILS Zone 3 Measurement	Oklahoma State University	\$155,000	\$0	Oklahoma State University	\$155,000	\$155,000
16-C-TTHP-WISU-014	Effective Training and Checking Methods for the Emerging Pilot Workforce	Wichita State University	\$39,770	\$30,100	Wichita State University Orion America Technologies, LLC	\$9,670 \$30,100	39,770
16-C-TTHP-WISU-015	ILS Zone 3 Measurement	Wichita State University	\$8,224	\$5,000	Wichita State University Orion America Technologies, LLC	\$3,224 \$5,000	\$8,224

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Technical Training and Human Performance (TTHP) – Core Members: 16 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2016–2021
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
16-C-TTHP-WISU-016	Ultra lightweight VORILS Receiver	Wichita State University	\$6,824	\$5,000	Wichita State University Orion America Technologies, LLC	\$1,824 \$5,000	\$6,824
16-C-TTHP-WiSU-017	AJW-3 Fleet Assessment Modernization Study	Wichita State University	\$15,000	\$10,067	Wichita State University Orion America Technologies, LLC	\$4,933 \$10,067	\$15,000
16-C-TTHP-WiSU-018	WSU Administrative Program Management Support	Wichita State University	\$374,231	\$263,722	Wichita State University Orion America Technologies, LLC	\$110,509 \$263,722	\$374,231
Total			\$1,976,527	\$313,889		Total	\$1,976,527

Technical Training and Human Performance
Funding to Date:

Fiscal Year	Funding Level
FY16	\$5.0M
FY17	\$1.5M
FY18	\$0
FY19	\$2M
Total	\$8.5M

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Unmanned Aircraft Systems (UAS) – Core Members: 16 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2015–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
15-C-UAS-DU-06	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	Drexel University	\$180,000	\$0	Drexel University	\$189,000	\$189,000
15-C-UAS-ERAU-012	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	Embry-Riddle Aeronautical University	\$255,000	\$0	Embry-Riddle Aeronautical University	\$255,000	\$255,000
15-C-UAS-KSU-008	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	Kansas State University	\$250,016	\$0	Kansas State University	\$262,517	\$262,517
15-C-UAS-KSU-009	Establish Risk Based Thresholds for Approvals Needed to Certify UAS for Safe Operation	Kansas State University	\$305,037	\$90,000	Kansas State University	\$320,289	\$320,289
15-C-UAS-MSU-037	UAS Airborne Collision Severity Evaluation - Structural Impact	Mississippi State University	(\$274,872)	\$0	Mississippi State University	(\$274,872)	(\$274,872)
15-C-UAS-MSU-039	COE UAS Program Management	Mississippi State University	\$1,076,940	\$0	Mississippi State University	\$1,076,940	\$1,076,940
15-C-UAS-NMSU-022	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	Board of Regents - New Mexico State University - MSC PSL	\$50,000	\$0	Board of Regents - New Mexico State University - MSC PSL	\$50,000	\$50,000
15-C-UAS-NMSU-023	STEM Outreach – UAS as a STEM Outreach Learning Platform for K-12 Students and Educators (STEM III)	Board of Regents - New Mexico State University - MSC PSL	\$82,884	\$72,000	Board of Regents - New Mexico State University - MSC PSL	\$258,880	\$258,880
15-C-UAS-OSU-016	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	The Ohio State University	\$302,325	\$0	The Ohio State University	\$317,441	\$317,441
15-C-UAS-OSU-017	STEM Outreach – UAS as a STEM Outreach Learning Platform for K-12 Students and Educators (STEM III)	The Ohio State University	\$70,001	\$0	The Ohio State University	\$70,001	\$70,001
15-C-UAS-UAF-07	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	University of Alaska-Fairbanks	\$50,000	\$0	University of Alaska-Fairbanks	\$50,000	\$50,000

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Unmanned Aircraft Systems (UAS) – Core Members: 16 Industry Members: Approximately 40
Cooperative Agreement Period of Performance: 2015–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
15-C-UAS-UAF-08	STEM Outreach – UAS as a STEM Outreach Learning Platform for K-12 Students and Educators (STEM III)	University of Alaska-Fairbanks	\$56,400	\$0	University of Alaska-Fairbanks	\$56,400	\$56,400
15-C-UAS-UAH-010	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	University of Alabama in Huntsville	\$179,954	\$0	University of Alabama in Huntsville	\$188,952	\$188,952
15-C-UAS-UAH-011	STEM Outreach – UAS as a STEM Outreach Learning Platform for K-12 Students and Educators (STEM III)	University of Alabama in Huntsville	\$150,000	\$0	University of Alabama in Huntsville	\$150,000	\$150,000
15-C-UAS-UCD-002	STEM Outreach – UAS as a STEM Outreach Learning Platform for K-12 Students and Educators (STEM III)	University of California-Davis	\$99,730	\$0	University of California-Davis	\$101,590	\$101,590
15-C-UAS-UND-014	Integrating Expanded and Non-Segregated UAS Operations into the NAS: Impact on Traffic	University of North Dakota	\$229,220	\$0	University of North Dakota	\$240,681	\$240,681
15-C-UAS-UND-015	Establish Risk-Based Thresholds for Approvals Needed to Certify UAS for Safe Operation	University of North Dakota	\$195,000	\$0	University of North Dakota	\$204,750	\$204,750
15-C-UAS-WISU-09	UAS Airborne Collision Severity Evaluation - Structural Impact	Wichita State University	\$274,872	\$0	Wichita State University	\$274,872	\$274,872
Total			\$3,532,507	\$162,000		Total	\$3,792,441

Unmanned Aircraft Systems
Funding to Date:

Fiscal Year	Funding Level
FY15	\$4.7M
FY16	\$3.5M
FY17	\$3.9M
FY18	\$6.1M
FY19	\$3.5M
Total	\$21.7M

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Alternative Jet Fuels and Environment (AJF&E) – Core Members: 16 Industry Members: Approximately 60
Cooperative Agreement Period of Performance: 2013–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
13-C-AJFE-BU-016	Noise Impact Health Research Cardiovascular Disease and Aircraft Noise Exposure	Trustees of Boston University, BUMC	\$1,729,286	\$0	Trustees of Boston University, BUMC	\$1,729,286	\$1,729,286
13-C-AJFE-GIT-045	CLEEN II System Level Assessment	Georgia Institute of Technology	\$170,000	\$0	Georgia Institute of Technology	\$170,000	\$170,000
13-C-AJFE-GIT-046	Takeoff /Climb Analysis to Support AEDT APM Development	Georgia Institute of Technology	\$175,000	\$0	Georgia Institute of Technology	\$175,000	\$175,000
13-C-AJFE-GIT-047	Advanced combustion (area# 3)	Georgia Institute of Technology	\$30,000	\$0	Georgia Institute of Technology	\$30,000	\$30,000
13-C-AJFE-GIT-048	Noise Power Distance Re-Evaluation	Georgia Institute of Technology	\$220,000	\$0	Georgia Institute of Technology	\$220,000	\$220,000
13-C-AJFE-GIT-049	Parametric Uncertainty Assessment for AEDT 2b	Georgia Institute of Technology	\$300,000	\$0	Georgia Institute of Technology	\$300,000	\$300,000
13-C-AJFE-MIT-051	Analytical Approach for Quantifying Noise from Advanced Operational Procedures	Massachusetts Institute of Technology	\$250,000	\$0	Massachusetts Institute of Technology	\$250,000	\$250,000
13-C-AJFE-MIT-052	Clean Sheet Supersonic Engine Design and Performance	Massachusetts Institute of Technology	\$250,000	\$0	Massachusetts Institute of Technology	\$250,000	\$250,000

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Alternative Jet Fuels and Environment (AJF&E) – Core Members: 16 Industry Members: Approximately 60
Cooperative Agreement Period of Performance: 2013–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
13-C-AJFE-MIT-053	Naphthalene Removal Assessment	Massachusetts Institute of Technology	\$350,000	\$0	Massachusetts Institute of Technology	\$350,000	\$350,000
13-C-AJFE-MIT-054	Analysis to Support the Development of an Engine nvPM Emissions Standard	Massachusetts Institute of Technology	\$200,000	\$0	Massachusetts Institute of Technology	\$200,000	\$200,000
13-C-AJFE-MST-012	Reexamination of Engine to Engine PM Emissions variability using an ARP Reference Sampling and Measurement System	The Curators of the University of Missouri - Rolla	\$1,217,221	\$1,009,999	The Curators of the University of Missouri - Rolla	\$1,217,221	\$1,217,221
13-C-AJFE-PSU-046	Alternative Jet Fuel Supply Chain Analysis -Mid Atlantic	Pennsylvania State University	\$207,623	\$0	Pennsylvania State University	\$207,623	\$207,623
13-C-AJFE-PSU-047	Identification of Noise Acceptance Onset for Noise Certification Standards of Supersonic Airplane	Pennsylvania State University	\$390,000	\$0	Pennsylvania State University	\$390,000	\$390,000
13-C-AJFE-PSU-048	Outreach Project	Pennsylvania State University	\$30,000	\$0	Pennsylvania State University	\$30,000	\$30,000
13-C-AJFE-PSU-049	Quantifying Uncertainties in Predicting Aircraft Noise in Real-World Situations	Pennsylvania State University	\$170,000	\$0	Pennsylvania State University	\$170,000	\$170,000
13-C-AJFE-PU-028	National Jet Fuels Combustion Program: Area #5 Atomization Tests and Models	Purdue University	\$120,000	\$0	Purdue University	\$120,000	\$120,000

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Alternative Jet Fuels and Environment (AJF&E) – Core Members: 16 Industry Members: Approximately 60
Cooperative Agreement Period of Performance: 2013–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
13-C-AJFE-PU-029	Techno-Economic and Life-Cycle Analysis of Alternative Aviation Biofuels Supply Chains	Purdue University	\$400,000	\$0	Purdue University	\$400,000	\$400,000
13-C-AJFE-PU-031	Quantifying Uncertainties in Predicting Aircraft Noise in Real-World situation	Purdue University	\$85,000	\$0	Purdue University	\$85,000	\$85,000
13-C-AJFE-SU-020	Shock Tube and Flow Reactor Studies of the Kinetics of Jet Fuels	Stanford University	\$110,000	\$0	Stanford University	\$110,000	\$110,000
13-C-AJFE-UH-011	Alternative Jet Fuel Supply Chain Analysis-Tropical Region Analysis	University of Hawaii	\$200,000	\$0	University of Hawaii	\$200,000	\$200,000
13-C-AJFE-UI-026	Alternative Fuels Test Database Library	Board of Trustees of the University of Illinois	\$130,000	\$0	Board of Trustees of the University of Illinois	\$130,000	\$130,000
13-C-AJFE-UNC-010	Development of Aviation Air Quality Tools for Airport-Specific Impact Assessment: Air Quality Modeling	University of North Carolina at Chapel Hill	\$300,000	\$0	University of North Carolina at Chapel Hill	\$300,000	\$300,000
13-C-AJFE-UTENN-009	Techno-Market Analysis of US Biorefinery Supply Chains from Feedstock to Alternative Jet Fuels	University of Tennessee	\$260,000	\$0	University of Tennessee	\$260,000	\$260,000
13-C-AJFE-WaSU-019	Program Office for Center of Excellence for Alternative Jet Fuels and Environment	Washington State University	\$390,911	\$0	Washington State University	\$390,911	\$390,911
Total			\$7,685,041	\$1,009,999		Total	\$7,685,041

Alternative Jet Fuels and Environment
Funding to Date:

Fiscal Year	Funding Level
FY13	\$100K
FY14	\$9.3M
FY15	\$10.6M
FY16	\$9.4M
FY17	\$9.8M
FY18	\$3.1M
FY19	\$7.7M
Total	\$50M

**Congressional Report-Fiscal Year 2019
 FAA Centers of Excellence (COE)
 COE for General Aviation Safety, Accessibility, and Sustainability – Core Members: 6 Industry Members: Approximately 35
 Cooperative Agreement Period of Performance: 2012–2020
 Grant Awards**

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
12-C-GA-FIT-030	Augmented Weather Interfaces	Florida Institute of Technology	\$109,522	\$0	Florida Institute of Technology	\$109,522	\$109,522
12-C-GA-FIT-031	Helicopter Operations Weather Information (HOWI)	Florida Institute of Technology	\$75,003	\$0	Florida Institute of Technology	\$75,003	\$75,003
12-C-GA-FIT-032	Management and Administration	Florida Institute of Technology	\$5,000	\$0	Florida Institute of Technology	\$5,000	\$5,000
12-C-GA-FIT-033	Rotorcraft Wire Strikes	Florida Institute of Technology	\$10,000	\$0	Florida Institute of Technology	\$10,000	\$10,000
12-C-GA-FIT-034	Scenario Based Training for Rotorcraft Phase 2	Florida Institute of Technology	\$20,000	\$0	Florida Institute of Technology	\$20,000	\$20,000
12-C-GA-GIT-034	General Aviation 2030- GA Exploratory Analysis	Georgia Institute of Technology	\$25,000	\$0	Georgia Institute of Technology	\$25,000	\$25,000
12-C-GA-GIT-036	Rotorcraft ASIAs	Georgia Institute of Technology	\$231,601	\$0	Georgia Institute of Technology	\$231,601	\$231,601
12-C-GA-GIT-037	General Aviation 2030 - GA Exploratory Analyses	Georgia Institute of Technology	\$40,000	\$0	Georgia Institute of Technology	\$40,000	\$40,000
12-C-GA-GIT-038	Helicopter Operations Weather Information (HOWI)	Georgia Institute of Technology	\$141,392	\$0	Georgia Institute of Technology	\$141,392	\$141,392
12-C-GA-GIT-039	Management and Administration	Georgia Institute of Technology	\$5,000	\$0	Georgia Institute of Technology	\$5,000	\$5,000
12-C-GA-GIT-040	Rotorcraft Wire Strikes	Georgia Institute of Technology	\$190,000	\$0	Georgia Institute of Technology	\$190,000	\$190,000
12-C-GA-GIT-041	Scenario Based Training for Rotorcraft Phase 2	Georgia Institute of Technology	\$66,327	\$0	Georgia Institute of Technology	\$66,327	\$66,327

**Congressional Report-Fiscal Year 2019
 FAA Centers of Excellence (COE)
 COE for General Aviation Safety, Accessibility, and Sustainability – Core Members: 6 Industry Members: Approximately 35
 Cooperative Agreement Period of Performance: 2012–2020
 Grant Awards**

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
12-C-GA-ISU-026	Heated Pavements	Iowa State University of Science and Technology	\$80,000	\$0	Iowa State University of Science and Technology	\$80,000	\$80,000
12-C-GA-ISU-028	Heated Pavements	Iowa State University of Science and Technology	\$60,000	\$0	Iowa State University of Science and Technology	\$60,000	\$60,000
12-C-GA-ISU-030	Heated Pavements -1	Iowa State University of Science and Technology	\$206,063	\$0	Iowa State University of Science and Technology	\$206,063	\$206,063
12-C-GA-ISU-032	RE-Evaluation of Emergency Vehicle Colors for Safety and Identification	Iowa State University of Science and Technology	\$30,000	\$0	Iowa State University of Science and Technology	\$30,000	\$30,000
12-C-GA-ISU-034	Augmented Weather Interfaces	Iowa State University of Science and Technology	\$237,428	\$112,986	Iowa State University of Science and Technology Western Michigan University	\$124,442 \$112,986	\$237,428
12-C-GA-ISU-035	Management and 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-ISU-036	Rotorcraft Wire Strikes	Iowa State University of Science and Technology	\$85,707	\$0	Iowa State University of Science and Technology	\$85,707	\$85,707
12-C-GA-OSU-053	Re-evaluation of Effectiveness of Emergency Vehicle Colors in Safety and Identification	The Ohio State University	\$30,000	\$0	The Ohio State University	\$30,000	\$30,000
12-C-GA-OSU-056	Management and Administration	The Ohio State University	\$5,000	\$0	The Ohio State University	\$5,000	\$5,000
12-C-GA-PU-087	Management and Administration	Purdue University	\$150,000	\$0	Purdue University	\$150,000	\$150,000
12-C-GA-PU-088	Helicopter Operations Weather Information	Purdue University	\$74,531	\$0	Purdue University	\$74,531	\$74,531
12-C-GA-PU-089	Augmented Weather Interfaces	Purdue University	\$68,849	\$0	Purdue University	\$68,849	\$68,849

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
COE for General Aviation Safety, Accessibility, and Sustainability – Core Members: 6 Industry Members: Approximately 35
Cooperative Agreement Period of Performance: 2012–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
12-C-GA-PU-090	General Aviation 2030 - GA Exploratory Analyses	Purdue University	\$22,000	\$0	Purdue University	\$22,000	\$22,000
12-C-GA-TEES-029	Re-evaluation of Effectiveness of Emergency Vehicle Colors in Safety and Identification	Texas A&M Engineering Experiment Station	\$30,000	\$0	Texas A&M Engineering Experiment Station	\$30,000	\$30,000
12-C-GA-TEES-032	Management and Administration - 0	Texas A&M Engineering Experiment Station	\$5,000	\$0	Texas A&M Engineering Experiment Station	\$5,000	\$5,000
Total			\$2,008,423	\$112,986		Total	\$2,008,423

General Aviation
Funding to Date:

Fiscal Year	Funding Level
FY12	\$50K
FY13	\$1.7M
FY14	\$3.2M
FY15	\$3.1M
FY16	\$3.7M
FY17	\$3.3M
FY18	\$315K
FY19	\$2M
Total	\$17.3M

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Commercial Space Transportation (CST) – Core Members: 10 Industry Members: Approximately 35
Cooperative Agreement Period of Performance: 2010–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
None	None awarded in FY19						
		Total	\$0	\$0		Total	\$0

Commercial Space Transportation
Funding to Date:

Fiscal Year	Funding Level
FY10	\$2.0M
FY11	\$1.1M
FY12	\$1.1M
FY13	\$1.1M
FY14	\$1.1M
FY15	\$1.3M
FY16	\$1.2M
FY17	\$1.3M
FY18	\$820K
FY19	\$0
Total	\$11.02M

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Joint COE for Advanced Materials (JAMS) – Core Members: 13 Industry Members: Approximately 50
Cooperative Agreement Period of Performance: 2004–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
12-C-AM-MSU-002	Effects of New Jet Fuel Exposure & Post-Crash Fire Forensic Analysis on Aerospace Composites	Mississippi State University	\$500,000	\$0	Mississippi State University	\$500,000	\$500,000
12-C-AM-OSU-011	Evaluation of Parameters used in Progressive Damage Models	Oregon State University	\$167,000	\$0	Oregon State University	\$167,000	\$167,000
12-C-AM-UU-023	Development and Evaluation of Fracture Mechanics Test Methods for Sandwich Composites	The University of Utah	\$75,000	\$0	The University of Utah	\$75,000	\$75,000
12-C-AM-UU-024	Development of a Building Block Approach for Crashworthiness Testing of Composites	The University of Utah	\$75,000	\$0	The University of Utah	\$75,000	\$75,000
12-C-AM-UW-043	Administration of JAMS-AMTAS Center of Excellence	University of Washington	\$82,186	\$0	University of Washington	\$82,186	\$82,186
12-C-AM-WISU-110	Composite Materials Handbook-17 (CMH-17)	Wichita State University	\$125,000	\$0	Wichita State University	\$125,000	\$125,000
12-C-AM-WISU-111	Development and Safety Management of Composite Certification Guidance	Wichita State University	\$179,000	\$0	Wichita State University	\$179,000	\$179,000
12-C-AM-WISU-112	Composite Repair Materials Guidance for Aircraft Maintainability and Safety Assurance	Wichita State University	\$425,000	\$0	Wichita State University	\$425,000	\$425,000
12-C-AM-WISU-113	Resin Infused Fiber Reinforced Materials Guidelines for Aircraft Design and Certification	Wichita State University	\$700,000	\$0	Wichita State University	\$700,000	\$700,000
12-C-AM-WISU-114	Ceramic Matrix Composite (CMC) Materials Guidelines for Aircraft Design and Certification	Wichita State University	\$350,000	\$0	Wichita State University	\$350,000	\$350,000
12-C-AM-WISU-115	Polymer-Based Additive Manufacturing (PBAM) Guidelines for Aircraft Design and Certification	Wichita State University	\$750,000	\$0	Wichita State University	\$750,000	\$750,000
12-C-AM-WISU-116	Advanced Fiber Reinforced Polymer Composite Materials Guidance for Aircraft Design Certification Process and Control	Wichita State University	\$700,000	\$0	Wichita State University	\$700,000	\$700,000

Congressional Report-Fiscal Year 2019
FAA Centers of Excellence (COE)
Joint COE for Advanced Materials (JAMS) – Core Members: 13 Industry Members: Approximately 50
Cooperative Agreement Period of Performance: 2004–2020
Grant Awards

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)	Amount/Value of Contribution (FY19)	Total Matching Amount
12-C-AM-WISU-117	Adhesive Qualification Guidance for Aircraft Design and Certification	Wichita State University	\$350,000	\$0	Wichita State University	\$350,000	\$350,000
12-C-AM-WISU-118	Adhesive Bond Qualification Guidance for Aircraft Design and Certification	Wichita State University	\$650,000	\$0	Wichita State University	\$650,000	\$650,000
12-C-AM-WISU-119	Administration of the Center of Excellence for Composites and Advanced Materials (CECAM)	Wichita State University	\$75,000	\$0	Wichita State University	\$75,000	\$75,000
		Total	\$5,203,186	\$0		Total	\$5,203,186

Joint COE for Advanced Materials
Funding to Date:

Fiscal Year	Funding Level
FY04	\$2.4M
FY05	\$2.7M
FY06	\$2.8M
FY07	\$1.4M
FY08	\$3.7M
FY09	\$2.0 M
FY10	\$2.5M
FY11	\$2.3M
FY12	\$2.2M
FY13	\$1.8M
FY14	\$2.4M
FY15	\$2.4M
FY16	\$5.6M
FY17	\$4.9M
FY18	\$1.5M
FY19	\$5.2M
Total	\$45.8M

Attachment III -Fiscal Year 2019 Contract Awards

Appendix A - COE for Unmanned Aircraft Systems

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

**Congressional Report-Fiscal Year 2019
 FAA Centers of Excellence (COE)
 Unmanned Aircraft Systems (UAS)
 Contract Awards**

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 (FY19)
692M15-19-F-00156	eCommerce, Emerging UAS Network and Implications on NAS Integration	Mississippi State University	\$1,200,000		\$0		\$0
692M15-19-F-00411	Airborne Collision Severity Evaluation – ATO Safety Office Study	Wichita State University	\$829,200		\$0	Wichita State University	\$829,200
		Total	\$2,029,200*			Total	\$829,200

*Note- Contracts are awarded by the FAA’s Acquisitions and Contracting Division, which is separate from the COE program office. The award amounts and matching contributions were determined by the requirements of the IDIQ contracts.

**Unmanned Aircraft Systems
 Contract Funding to Date:**

Fiscal Year	Funding Level
FY18	\$140K
FY19	\$2M
Total	\$2.14M

**Congressional Report-Fiscal Year 2019
 FAA Centers of Excellence (COE)
 General Aviation (GA)
 Contract Awards**

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 (FY19)
DTFACT-13-D-00010	WTIC Helicopter Gap Analysis	Purdue University	\$11,814		\$0		\$0
DTFACT-13-D-00010	ARFF Alternative Aviation Fuels and Drop-In Fuels Fire Safety	Purdue University	\$8,206		\$0		\$0
DTFACT-14-D-00004	WTIC Helicopter Gap Analysis	Florida Institute of Technology	\$9,450		\$0		\$0
DTFACT-13-D-00011	WTIC Helicopter Gap Analysis	Georgia Institute of Technology	\$9,568		\$0		\$0
DTFACT-14-D-00002	COE-GA Management and Administration	Iowa State University	\$5,000		\$0		\$0
DTFACT-14-D-00006	COE-GA Management and Administration	Texas A&M University	\$5,000		\$0		\$0
		Total	\$49,038*			Total	\$0

*Note- Contracts are awarded by the FAA's Acquisitions and Contracting Division, which is separate from the COE program office. The award amounts were determined by the requirements of the IDIQ contracts.

General Aviation
Contract Funding to Date:

Fiscal Year	Funding Level
FY12	\$0
FY13	\$150K
FY14	\$1.6M
FY15	\$1.8M
FY16	\$0
FY17	\$0
FY18	\$56.5K
FY19	\$49K
Total	\$3.6M