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

Office of the Administrator

800 Independence Ave., SW.
Washington, DC 20591

April 13, 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 2018.

Section 44513(h) requires the FAA annually to 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 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 2018 awards and COE funding summaries.

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

If I can be of further assistance, please contact me or the Office of Government and Industry Affairs at 202-267-3277.

Sincerely,

Steve Dickson
Administrator

Enclosure

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

800 Independence Ave., SW.
Washington, DC 20591

April 13, 2020

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

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April 13, 2020

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

Dear Chairwoman Johnson:

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800 Independence Ave., SW.
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April 13, 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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Enclosure

Federal Aviation Administration Air Transportation Centers of Excellence Congressional Report

Fiscal Year 2018

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Congressional Report – Fiscal Year 2018 Narrative

Federal Aviation Administration (FAA)
Air Transportation Centers of Excellence (COE) Program
Fiscal Year (FY) 2018 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 – Aviation Safety and Capacity Expansion Act. Subsequently, the FAA Modernization and Reform Act of 2012 (P.L. 112-95), Section 907 (b), amended Section 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 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 COE Program mission is to enhance FAA's access to university research capabilities through research grants for public purposes and promote the growth of a scientifically and technologically trained current and future workforce to serve the aviation community. The FAA supports and recognizes the critical need to develop the nation's technology base while educating the next generation of aviation professionals.

P.L. 101-508 provides selection criteria that must be considered when designating members of a COE team. The FAA Administrator and the Secretary of Transportation have used these criteria to select the COEs in mission critical topic areas over the past two decades.

Following an open dialogue and rigorous competitive process, the selected COE university teams generate 1:1 matching contributions from non-federal sources to augment FAA research capabilities. Once selected, the core and affiliate university members and industry partners serve the FAA as a primary source of subject-matter-expertise over a period of 10 years.

In compliance with P.L. 101-508, the FAA has entered into cooperative agreements with competitively selected COEs established throughout the United States. The COE members have conducted mission-critical research in technology areas that have focused on the following topics:

- technical training and human performance
- unmanned aircraft systems
- alternative jet fuels and environment
- general aviation safety, accessibility, and sustainability
- commercial space transportation
- advanced materials and structures
- 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

The COE Program facilitates collaboration and coordination between government, academia, and industry to advance aviation technologies and expand FAA research capabilities through congressionally required matching contributions. In accordance with P.L. 101-508, the COE members match FAA grant awards to *establish, operate, and conduct research*, dollar-for-dollar, with contributions from non-federal sources.

Since the inception of the COE Program and the first grant award in 1993, the Program has awarded 13 COEs and has included 92 core universities. Several universities have served on multiple COE teams. With their non-federal affiliates, COE partners have provided more than $325 million in matching contributions to augment FAA research grants. Through these long-term cost-sharing activities, the government and university-industry teams leverage resources to advance the technological future of the nation's aviation industry while educating and training the next generation of aviation scientists and professionals. Additionally, students have had the opportunity to gain hands-on experience applicable to the aviation and aerospace workplace, while producing more than 3,000 doctoral dissertations, theses, and journal articles.

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 FAA considers 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.

The FAA sponsoring office commits to an annual minimum funding level in support of research and related COE activities over a period of 10 years. The FAA allows for an additional two-year period to assure orderly close out of all activities. The annual minimum funding is determined based on the sponsoring office's budget and the forecasted research required in each critical area. 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 an Indefinite Delivery Indefinite Quantity (IDIQ) contract to procure deliverables for the sole benefit of the government. Contract awards are shown in this report, as well as matching contributions when applicable. Matching contributions provided as cost share for work performed under the contract vehicle for FAA benefit (vs. public purpose) is negotiable.

The FAA made the determination that COE funding would be made available for 10 years in order to provide ample opportunity for the COE to generate matching contributions and educate

a pool of future professionals. Concurrently, the COE is ultimately positioned to establish itself as a national resource that is capable of serving the aviation community and the nation after completion of initial requirements. As a self-sufficient national aviation resource, a successful COE 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, and compete for and conduct research activities for the aviation community as well as the FAA, as needed.

During Fiscal Year (FY) 2018, FAA supported six active COE public-private partnerships throughout the United States with academic institutions and their industry and other affiliates. Upon approval from the Secretary of Transportation, the FAA COE Program Management Office (PMO) awarded 61 grant awards for over $11.8 million during FY 2018. The grants were awarded to 24 core universities in support of 40 projects and generated more than $12 million in matching contributions from industry and other nonfederal 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 and Structures

This report contains Attachments that list grant and contract awards executed during FY 2018 to the 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 2018 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 and Structures

Attachment III: Fiscal Year 2018 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 (TTHP)

The FAA Administrator with the Secretary of Transportation selected the COE for Technical Training and Human Performance (TTHP) team in August 2016. The mission of the COE 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 Center 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; and safety. Center research includes 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.

The COE TTHP research projects align with the Department of Transportation strategic goals on Safety (Goal 1) and Innovation (Goal 3). Sponsored by the Air Traffic Organization, the COE TTHP focuses on improving training and performance of those who operate the National Airspace System. In year two (2) of operation, the Center has already expanded the number of research efforts and sponsoring organizations to include other sponsors throughout the FAA, as well as adding additional industry partners. The Center is comprised of 16 core universities, nine (9) 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 North Dakota, University of Wisconsin – Madison, and Western Michigan University.

The newly established COE TTHP became fully operational in January 2017. Initial base funding of $5 million supported 66 COE projects. Thereafter, FAA awarded $1.5M in support of an additional 21 projects. During FY 2018, the FAA executed no additional grant awards as shown in Attachment II, Appendix A; however, the COE core members generated $4.4 million in matching contributions to satisfy previously awarded requirements.

Based on the competitive process used to select the COE team, the FAA is also planning to execute an Indefinite Delivery Indefinite Quantity (IDIQ) contract to procure deliverables for the sole benefit of the government.

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

COE for Unmanned Aircraft Systems (UAS)

The FAA Administrator with the Secretary of Transportation selected the COE for Unmanned Aircraft Systems in FY 2015. The COE for Unmanned Aircraft Systems (UAS) 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 and UAS wake separation standards for UAS integration into the national airspace (NAS).

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

The Alliance for System Safety of UAS through Research Excellence (ASSURE) was selected as the FAA's COE for UAS. Led by Mississippi State University, the following universities also serve on this COE 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, Wichita State University. Associate members of the COE include: Auburn University, Concordia, Indiana State University, Louisiana Tech University, Southampton, The Technion – Israel Institute of Technology, and Tuskegee University.

The mission of the COE UAS is to provide the FAA the research needed to quickly, safely, and efficiently integrate unmanned aircraft systems into our NAS with minimal changes to our current operations.

During FY 2018, FAA awarded grants to 10 core members totaling approximately $6.1 million as shown in Attachment II, Appendix B. Members match grant awards dollar-for-dollar from non-federal sources in keeping with statutory requirements. Based on the competitive process used to select the COE UAS team, the FAA also executed an IDIQ contract to procure deliverables for the sole benefit of the government. In FY 2018, the FAA awarded $140,114 to the COE UAS members through the IDIQ contract vehicle, as shown in Attachment III, Appendix A.

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

COE for Alternative Jet Fuels and Environment (AJFE)

The FAA Administrator with 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 research and development efforts of this COE 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, and fuel performance testing. Areas relating to environmental issues are: aircraft noise and impacts, aviation emissions and impacts, aircraft technology assessment, environmentally and energy efficient gate-to-gate aircraft operations, and 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). The work of COE AJFE to aid the FAA in overcoming the environmental and energy challenges facing aviation will allow the nation's air transportation system to grow, thereby ensuring the continued mobility and economic growth that accompanies the air transport sector. Innovation is required in developing the technological and operational measures to reduce aviation's impacts on the environment, which will also improve the efficiency of the airspace system and promote growth of the sector to include new entrants such as supersonic aircraft, unmanned vehicles, urban air mobility, and commercial space. Innovations in 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. The COE AJFE is helping the FAA achieve environmental protection to enable sustained aviation growth.

Under the leadership of Washington State University and the Massachusetts Institute of Technology serving as Co-Lead, the following universities also serve on this team: Boston University, Georgia Tech Research Corporation, 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 2018, FAA awarded grants to six core members totaling approximately $3.2 million as shown in Attachment II, Appendix C. Members match grant awards dollar-for-dollar from non-federal sources in keeping with statutory requirements.

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

COE for General Aviation Safety, Accessibility and Sustainability (GA)

The FAA Administrator with the Secretary of Transportation selected the COE for General Aviation Safety, Accessibility and Sustainability in 2013. This COE performs projects that support the FAA's needs across diverse areas of general aviation. The COE GA efforts have supported improving *airport safety* by investigating airport pavement, LED lighting, pavement markings, rumble strips, and other topics with applications to small GA airports. The COE GA has also supported GA *flight safety* with projects that include examining how to use recorded flight data, for fixed-wing and rotorcraft, to improve aviation safety.

Additional efforts have examined how pilots make use of information in the cockpit such as angle of attack indicators, weather information, and advanced sensor displays. These efforts include aspects that span flight testing, algorithm development, and human factors. Results from COE GA projects have informed the FAA on providing guidance, including input used by the FAA to develop or update Advisory Circulars, to contribute to the enhancement of not only GA safety but to aviation safety generally, as many COE GA projects that focus on GA also apply 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.

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).

During FY 2018, FAA awarded grants to two core members totaling approximately $316K as shown in Attachment II, Appendix D. Members match grant awards dollar-for-dollar from non-federal sources in keeping with statutory requirements. Based on the competitive process used to select the COE GA team, the FAA also executed an IDIQ contract to procure deliverables for the sole benefit of the government. In FY 2018, the FAA awarded $56,464 to COE GA members through the IDIQ contract vehicle, as shown in Attachment III, Appendix B.

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

COE for Commercial Space Transportation (CST)

The FAA Administrator with the Secretary of Transportation established the COE for Commercial Space Transportation (CST) in FY 2010. 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).

The research and development efforts of the COE for CST address four major areas:

- Space launch traffic management and launch operations;
- Launch vehicles, operations, technologies and payloads;
- Human spaceflight;
- Industry viability (commercial, policy, international, legal, and regulatory).

Research goals in these four areas 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 national air space 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;
- 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;
- 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 safety, such as performance based requirements;
- Encouraging the growth of evolving space industry sectors through relevant economic, legal, legislative, regulatory, and market analyses and modeling;
- Supporting effective policy decision-making in the accomplishment of the dual regulatory and promotional missions of the FAA Office of Commercial Space Transportation;
- Providing a better understanding of the relationship of governmental policy, innovation adoption, and industry growth.

The COE CST research is critical to ensure the safety of the public as commercial space launches need to be safely integrated into the national air space while also minimizing the impact to the aviation industry, the traveling public, and the emerging commercial space industry.

The following universities serve as COE CST 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 2018, FAA awarded grants to six core members totaling approximately $820K as shown in Attachment II, Appendix E. Members match grant awards dollar-for-dollar from non-federal sources in keeping with statutory requirements. 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 (FY 2020).

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

Joint COE for Advanced Materials and Structures (JAMS)

The FAA Administrator with the Secretary of Transportation selected the Joint COE for Advanced Materials and Structures in 2003. In compliance with Congressional direction, the COE was extended through December, 2019.

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

This COE conducts research and development on the following topics to ensure the safe use of composite materials in aircraft products: damage tolerance of composites, composite maintenance practices, crashworthiness of composites, environmental effects of composites, structural integrity of adhesively bonded structure, continued operational safety and certification efficiency for emerging composite technologies, and 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 National Airspace System. 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 history for composites, this COE has been conducting research that addresses this gap and adds to the knowledge base of composite materials. The FAA uses the research output to develop regulations, policy, and guidance materials that guide FAA employees and the aircraft industry towards the highest levels of safety. Additionally, as a major research output, the joint COE 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, it provides information and guidance necessary to design and fabricate end items from composite materials. Through publication of the COE research output, the handbook aims to 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: Edmonds Community College, Florida International University, Northwestern University, Oregon State University, Purdue University, University of California at Los Angeles, University of Delaware, University of Utah, Tuskegee University, Washington State University, Mississippi State University, Auburn University, and University of California San Diego.

During FY 2018, FAA awarded grants to six core members totaling approximately $1.4M as shown in Attachment II, Appendix F. Members match grant awards dollar-for-dollar from non-federal sources in keeping with statutory requirements. The FAA conducted a final assessment of the COE, and stakeholder and participant input confirmed the success of this partnership. The COE members are entering the 15th year of operation and considering alternative strategies to achieve self-sufficiency.

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

Attachment I - COE Summary Table

CENTER OF EXCELLENCE	Grants		Contracts	
	FY 17	FY 18	FY 17	FY 18
Technical Training and Human Performance (TTHP)	$ 1,538,757	$ 0	$ 0	$ 0
Unmanned Aircraft Systems (UAS)	$ 3,883,711	$ 6,106,452	$ 0	$ 140,115
Alternative Jet Fuels and Environment (AJFE)	$ 9,809,723	$ 3,170,047	$ 0	$ 0
General Aviation (GA)	$ 3,267,686	$ 315,964	$ 0	$ 56,464
Commercial Space Transportation (CST)	$ 1,264,293	$ 819,879	$ 0	$ 0
Joint Center of Excellence for Advanced Materials (JAMS)	$ 4,894,469	$ 1,456,658	$ 0	$ 0
TOTAL	**$ 24,658,639**	**$ 11,869,000**	**$ 0**	**$ 196,579**

Attachment II -Fiscal Year 2018 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 and Structures

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Technical Training and Human Performance (TTHP) – Core Members: 16 Industry Members: Approximately 40
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 (FY 18)	Total Matching Amount
No awards	**N/A**	**N/A**	**$0**	**$0**		**$0**	**$0**
		Total	**$0**	$0		**Total**	**$0**

Technical Training and Human Performance
Funding-to-date:

Fiscal Year	Funding Level
FY16	$5.0M
FY17	$1.5M
FY18	$0
Total	**$6.5M**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Unmanned Aircraft Systems (UAS) – Core Members: 16 Industry Members: Approximately 40
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 (FY 18)	Total Matching Amount
15-C-UAS-OSU-012	**Airborne Collision Severity Evaluation - Engine Ingestion**	**The Ohio State University**	**$867,456.00**	**NA**	**The Ohio State University**	**$867,456.00**	**$867,456.00**
15-C-UAS-UAH-05	**Airborne Collision Severity Evaluation - Engine Ingestion**	**University of Alabama in Huntsville**	**$492,252.00**	**NA**	**University of Alabama in Huntsville**	**$492,252.00**	**$492,252.00**
15-C-UAS-WISU-06	**Airborne Collision Severity Evaluation - Engine Ingestion**	**Wichita State University**	**$172,544.00**	**NA**	**Wichita State University**	**$172,544.00**	**$172,544.00**
15-C-UAS-WISU-07	**Airborne Collision Severity Evaluation - Structural Impact**	**Wichita State University**	**$963,720.00**	**NA**	**Wichita State University**	**$963,720.00**	**$963,720.00**
15-C-UAS-ERAU-09	**Airborne Collision Severity Evaluation - Structural Impact**	**Embry-Riddle Aeronautical University**	**$139,400.00**	**NA**	**Embry-Riddle Aeronautical University**	**$139,400.00**	**$139,400.00**
15-C-UAS-MSU-032	**Airborne Collision Severity Evaluation - Structural Impact**	**Mississippi State University**	**$274,872.00**	**NA**	**Mississippi State University**	**$274,872.00**	**$274,872.00**
15-C-UAS-MTSU-010	**Airborne Collision Severity Evaluation - Structural Impact**	**Montana State University**	**$328,290.00**	**NA**	**Montana State University**	**$328,290.00**	**$328,290.00**
15-C-UAS-UAH-06	**Airborne Collision Severity Evaluation - Structural Impact**	**University of Alabama in Huntsville**	**$496,604.00**	**NA**	**University of Alabama in Huntsville**	**$496,604.00**	**$496,604.00**
15-C-UAS-MSU-033	**ASSURE Program Management**	**Mississippi State University**	**$500,000.00**	**NA**	**Mississippi State University**	**$500,000.00**	**$500,000.00**
15-C-UAS-UND-011	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**University of North Dakota**	**$350,000.00**	**NA**	**University of North Dakota**	**$350,000.00**	**$350,000.00**
15-C-UAS-UAF-05	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**University of Alaska-Fairbanks**	**$125,000.00**	**NA**	**University of Alaska-Fairbanks**	**$125,000.00**	**$125,000.00**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Unmanned Aircraft Systems (UAS) – Core Members: 16 Industry Members: Approximately 40
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 (FY 18)	Total Matching Amount
15-C-UAS-NMSU-019	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**The Regents of New Mexico State University**	**$350,000.00**	**NA**	**The Regents of New Mexico State University**	**$350,000.00**	**$350,000.00**
15-C-UAS-MSU-031	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**Mississippi State University**	**$75,000.00**	**NA**	**Mississippi State University**	**$75,000.00**	**$75,000.00**
15-C-UAS-OSU-011	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**The Ohio State University**	**$146,598.00**	**NA**	**The Ohio State University**	**$146,598.00**	**$146,598.00**
15-C-UAS-KSU-007	**Small UAS Detect and Avoid Requirements Necessary for Limited BVLOS Operations: Separation Requirements and Testing**	**Kansas State University**	**$25,000.00**	**NA**	**Kansas State University**	**$25,000.00**	**$25,000.00**
15-C-UAS-UND-012	**UAS Parameters, Exceedances, Recording Rates for ASIAS**	**University of North Dakota**	**$199,716.00**	**NA**	**University of North Dakota**	**$199,716.00**	**$199,716.00**
15-C-UAS-ERAU-010	**UAS Parameters, Exceedances, Recording Rates for ASIAS**	**Embry-Riddle Aeronautical University**	**$100,000.00**	**NA**	**Embry-Riddle Aeronautical University**	**$100,000.00**	**$100,000.00**
15-C-UAS-MSU-034	**UAS Parameters, Exceedances, Recording Rates for ASIAS**	**Mississippi State University**	**$100,000.00**	**NA**	**Mississippi State University**	**$100,000.00**	**$100,000.00**
15-C-UAS-NMSU-018	**UAS Test Data Collection and Analysis**	**The Regents of New Mexico State Univ-MSC PSL**	**$60,000.00**	**NA**	**The Regents of New Mexico State Univ-MSC PSL**	**$60,000.00**	**$60,000.00**
15-C-UAS-UND-010	**UAS Test Data Collection and Analysis**	**University of North Dakota**	**$240,000.00**	**NA**	**University of North Dakota**	**$240,000.00**	**$240,000.00**
15-C-UAS-UAF-04	**UAS Test Data Collection and Analysis**	**University of Alaska-Fairbanks**	**$60,000.00**	**NA**	**University of Alaska-Fairbanks**	**$60,000.00**	**$60,000.00**
15-C-UAS-MSU-030	**UAS Test Data Collection and Analysis**	**Mississippi State University**	**$40,000.00**	**NA**	**Mississippi State University**	**$40,000.00**	**$40,000.00**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Unmanned Aircraft Systems (UAS) – Core Members: 16 Industry Members: Approximately 40
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 (FY 18)	Total Matching Amount
		Total	**$6,106,452.00**	NA		**Total**	**$6,106,452.00**

Unmanned Aircraft Systems
Funding-to-date:

Fiscal Year	Funding Level
FY15	$4.7M
FY16	$3.5M
FY17	$3.9M
FY18	$6.1M
Total	**$18.2M**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Alternative Jet Fuels and Environment (AJF&E) – Core Members: 16 Industry Members: Approximately 60
Period of Performance: 2013 - 2019
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 (FY 18)	Total Matching Amount
13-C-AJFE-PSU-042	**Acoustical Model of Mach Cut-off Flight**	**Pennsylvania State University**	**$170,000.00**	**NA**	**Pennsylvania State University**	**$170,000.00**	**$170,000.00**
13-C-AJFE-MIT-050	**Aircraft Noise Abatement Procedure Modeling and Validation**	**Massachusetts Institute of Technology**	**$350,000.00**	**NA**	**Massachusetts Institute of Technology**	**$350,000.00**	**$350,000.00**
13-C-AJFE-PU-026	**Aircraft Technology Modeling and Assessment**	**Purdue University**	**$114,185.00**	**NA**	**Purdue University**	**$114,185.00**	**$114,185.00**
13-C-AJFE-GIT-041	**Aircraft Technology Modeling and Assessment**	**Georgia Tech Research Corporation**	**$650,000.00**	**NA**	**Georgia Tech Research Corporation**	**$650,000.00**	**$650,000.00**
13-C-AJFE-WASU-016	**Alternative Jet Fuel Supply Chain Analysis**	**Washington State University**	**$510,918.00**	**NA**	**Washington State University**	**$510,918.00**	**$510,918.00**
13-C-AJFE-UD-021	**Alternative Jet Fuel Test and Evaluation**	**University of Dayton Research Institute**	**$199,966.00**	**NA**	**University of Dayton Research Institute**	**$199,966.00**	**$199,966.00**
13-C-AJFE-MIT-048	**Alternative Jet Fuels Supply Chain Analysis**	**Massachusetts Institute of Technology**	**$575,000.00**	**NA**	**Massachusetts Institute of Technology**	**$575,000.00**	**$575,000.00**
13-C-AJFE-UD-018	**National Jet Fuels Combustion Program-Overall Program Integration and Analysis-Area 7**	**University of Dayton Research Institute**	**$374,978.00**	**NA**	**University of Dayton Research Institute**	**$374,978.00**	**$374,978.00**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Alternative Jet Fuels and Environment (AJF&E) – Core Members: 16 Industry Members: Approximately 60
Period of Performance: 2013 - 2019
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 (FY 18)	Total Matching Amount
13-C-AJFE-PSU-041	**Rotorcraft Noise Abatement Procedures Development**	**Pennsylvania State University**	**$150,000.00**	**NA**	**Pennsylvania State University**	**$150,000.00**	**$150,000.00**
13-C-AJFE-MIT-047	**Surface Analysis to support AEDT APM Development**	**Massachusetts Institute of Technology**	**$75,000.00**	**NA**	**Massachusetts Institute of Technology**	**$75,000.00**	**$75,000.00**
		Total	**$3,170,047.00**	**NA**		**Total**	**$3,170,047.00**

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
Total	**$42.3M**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
General Aviation (GA) – Core Members: 6 Industry Members: Approximately 35
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 (FY 18)	Total Matching Amount
12-C-GA-GIT-026	**Project 5: National General Aviation Flight Information Database**	**Georgia Institute of Technology**	**$15,000.00**	**NA**	**Georgia Institute of Technology**	**$15,000**	**$15,000.00**
12-C-GA-GIT-027	**Project 25: General Aviation 2030: GA Exploratory Analyses**	**Georgia Institute of Technology**	**$74,999.00**	**NA**	**Georgia Institute of Technology**	**$74,999**	**$74,999.00**
12-C-GA-PU-072	**Project 25: General Aviation 2030: GA Exploratory Analyses**	**Purdue University**	**$50,000.00**	**NA**	**Purdue University**	**$50,000**	**$50,000.00**
12-C-GA-GIT-029	**Project 32: Rotorcraft Wire Strike**	**Georgia Institute of Technology**	**$25,000.00**	**NA**	**Georgia Institute of Technology**	**$25,000**	**$25,000.00**
12-C-GA-GIT-028	**Project 2: Rotorcraft ASIAS**	**Georgia Institute of Technology**	**$87,500.00**	**NA**	**Georgia Institute of Technology**	**$87,500**	**$87,500.00**
12-C-GA-PU-073	**Project 5: National General Aviation Flight Information Database**	**Purdue University**	**$63,465.00**	**NA**	**Purdue University**	**$63,465**	**$63,465.00**
		Total	**$315,964.00**	**NA**		**Total**	**$315,964.00**

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
Total	**$15.3M**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Commercial Space Transportation (CST) – Core Members: 10 Industry Members: Approximately 35
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 (FY 18)	Total Matching Amount
15-C-CST-UC-017	Task 330-CU - COE CST Administrative Support	Regents of the University of Colorado	$170,529.00		Regents of the University of Colorado	$37,635.00	$170,529.00
				$132,894.00	Orion America Technologies, LLC	$132,894.00	
15-C-CST-UC-011	Task 372 - Resident Space Object (RSO) System Mechanics	Regents of the University of	$81,700.00	NA	Regents of the University of Colorado	$81,700.00	$81,700.00
15-C-CST-UC-016	Task 186 - Mitigate Threats through Space Environment Modeling/Prediction-CU	Regents of the University of	$33,500.00	NA	Regents of the University of Colorado	$33,500.00	$33,500.00
15-C-CST-FIT-008	Task 378 - Commercial Space Innovation Initiative Policy Research	Florida Institute of Technology	$195,000.00	NA	Florida Institute of Technology	$195,000.00	$195,000.00
15-C-CST-FIT-009	Task 358 - Regulatory Streamlining Workshop	Florida Institute of Technology	$45,000.00	NA	Florida Institute of Technology	$45,000.00	$45,000.00
15-C-CST-NMT-014	Task 323 - Structural Health Monitoring Framework	New Mexico Institute of Mining and Technology	$23,000.00	NA	New Mexico Institute of Mining and Technology	$23,000.00	$23,000.00
15-C-CST-NMT-017	Task 377 - Nitrous Oxide Composite Case Testing	New Mexico Institute of Mining and Technology	$70,000.00	NA	New Mexico Institute of Mining and Technology	$70,000.00	$70,000.00
15-C-CST-NMT-018	Task 303 - OMIS Integration and COE Program Support	New Mexico Institute of Mining and Technology	$50,000.00		New Mexico Institute of Mining and Technology		$50,000.00
				$50,000.00	Orion America Technologies, LLC	$50,000.00	
15-C-CST-SU-014	Task 369 - Dynamic Air Traffic Management during Commercial Space Launches	Leland Stanford Junior University	$20,800.00		Leland Stanford Junior University	$20,800.00	$20,800.00
15-C-CST-UTMB-019	Task 309: Suborbital Pilot Assessment	University of Texas Medical Branch at Galveston	$54,750.00	NA	University of Texas Medical Branch at Galveston	$54,750.00	$54,750.00

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Commercial Space Transportation (CST) – Core Members: 10 Industry Members: Approximately 35
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 (FY 18)	Total Matching Amount
15-C-CST-UTMB-020	**Task 353 - Design and Operational Consideration for Human Space Flight Occupant Safety - UTMB**	**University of Texas Medical Branch at Galveston**	**$75,600.00**	**NA**	**University of Texas Medical Branch at Galveston**	**$75,600.00**	**$75,600.00**
		Total	**$819,879.00**	**$182,894.00**		**Total**	**$819,879.00**

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
Total	**$10.9M**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Joint COE for Advanced Materials and Structures (JAMS) – Core Members: 15 Industry Members: Approximately 50
Period of Performance: 2004-2019
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 (FY 18)	Total Matching Amount
12-C-AM-FIU-012	**Effect of Surface Contamination on Composite Bond Integrity and Durability**	**Florida International University**	**$75,000.00**	**NA**	**Florida International University**	**$75,000.00**	**$75,000.00**
12-C-AM-UCSD-015	**Impact Damage Formation on Composite Aircraft Structures**	**The Regents of the Univ of Calif,UC San Diego**	**$90,000.00**	**NA**	**The Regents of the Univ of Calif,UC San Diego**	**$90,000.00**	**$90,000.00**
12-C-AM-UCSD-014	**Impact Damage Tolerance Guidelines for Stiffened Composite Panels**	**The Regents of the Univ of Calif,UC San Diego**	**$60,000.00**	**NA**	**The Regents of the Univ of Calif,UC San Diego**	**$60,000.00**	**$60,000.00**
12-C-AM-UU-019	**Durability of Adhesively Bonded Joints for Aircraft Structures**	**The University of Utah**	**$75,000.00**	**NA**	**The University of Utah**	**$75,000.00**	**$75,000.00**
12-C-AM-UW-039	**Effects of Moisture Diffusion in Sandwich Composites**	**University of Washington**	**$50,000.00**	**NA**	**University of Washington**	**$50,000.00**	**$50,000.00**
12-C-AM-UW-040	**Improving Adhesive Bonding of Composites Through Surface Characterization**	**University of Washington**	**$75,000.00**	**NA**	**University of Washington**	**$75,000.00**	**$75,000.00**
12-C-AM-WISU-100	**Damage Tolerance Testing and Analysis Protocols for Full-Scale Composite Airframe Structures under Repeated Loading**	**Wichita State University**	**$225,000.00**	**NA**	**Wichita State University**	**$225,000.00**	**$225,000.00**
12-C-AM-WISU-097	**Dynamic Response of Composite Structures Subjected to Blast Loading - Phase V**	**Wichita State University**	**$438,500.00**	**NA**	**Wichita State University**	**$438,500.00**	**$438,500.00**
12-C-AM-WISU-099	**Environmental Factor Influence on Composite Design and Certification**	**Wichita State University**	**$150,000.00**	**NA**	**Wichita State University**	**$150,000.00**	**$150,000.00**

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
Joint COE for Advanced Materials and Structures (JAMS) – Core Members: 15 Industry Members: Approximately 50
Period of Performance: 2004-2019
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 (FY 18)	Total Matching Amount
12-C-AM-WISU-098	**FAA Research Requirement on Lightning Strike Composites Structure**	**Wichita State University**	**$125,000.00**	**NA**	**Wichita State University**	**$125,000.00**	**$125,000.00**
12-C-AM-WSU-009	**Durability of Bonded Aerospace Structure**	**Washington State University**	**$74,408.00**	**NA**	**Washington State University**	**$74,408.00**	**$74,408.00**
		Total	**$1,456,658.00**	**NA**		**Total**	**$1,456,658.00**

Joint COE for Advanced Materials and Structures
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
Total	**$40.6M**

Attachment III -Fiscal Year 2018 Contract Awards

Appendix A- COE for Unmanned Aircraft Systems
Appendix B- COE for General Aviation – Safety, Accessibility and Sustainability

Congressional Report-Fiscal Year 2018
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 (FY 18)
692M15-18-F-00477	**UAS COE IDIQ Contract Kickoff Meeting**	**Drexel University**	**$9,623.00**	**NA**	**NA**	**Drexel University**	**$0**
692M15-18-F-00453	**UAS COE IDIQ Contract Kickoff Meeting**	**Embry-Riddle Aeronautical University**	**$9,945.98**	**NA**	**NA**	**Embry-Riddle Aeronautical University**	**$0**
692M15-18-F-00452	**UAS COE IDIQ Contract Kickoff Meeting**	**Kansas State University**	**$2,546.00**	**NA**	**NA**	**Kansas State University**	**$0**
692M15-18-F-00577	**UAS COE IDIQ Contract Kickoff Meeting**	**Mississippi State University**	**$12,500.00**	**NA**	**NA**	**Mississippi State University**	**$0**
692M15-18-F-00457	**UAS COE IDIQ Contract Kickoff Meeting**	**Montana State University**	**$10,000.00**	**NA**	**NA**	**Montana State University**	**$0**
692M15-18-F-00455	**UAS COE IDIQ Contract Kickoff Meeting**	**New Mexico State University**	**$10,000.00**	**NA**	**NA**	**New Mexico State University**	**$0**
692M15-18-F-00456	**UAS COE IDIQ Contract Kickoff Meeting**	**North Carolina State University**	**$10,000.00**	**NA**	**NA**	**North Carolina State University**	**$0**
692M15-18-F-00468	**UAS COE IDIQ Contract Kickoff Meeting**	**Oregon State University**	**$10,000.00**	**NA**	**NA**	**Oregon State University**	**$0**
692M15-18-F-00463	**UAS COE IDIQ Contract Kickoff Meeting**	**The Ohio State University**	**$9,986.00**	**NA**	**NA**	**The Ohio State University**	**$0**
692M15-18-F-00449	**UAS COE IDIQ Contract Kickoff Meeting**	**University of Alabama Huntsville**	**$9,985.00**	**NA**	**NA**	**University of Alabama Huntsville**	**$0**
692M15-18-F-00450	**UAS COE IDIQ Contract Kickoff Meeting**	**University of Alaska Fairbanks**	**$9,918.00**	**NA**	**NA**	**University of Alaska Fairbanks**	**$0**
692M15-18-F-00597	**UAS COE IDIQ Contract Kickoff Meeting**	**University of California Davis**	**$9,467.00**	**NA**	**NA**	**University of California Davis**	**$0**

Congressional Report-Fiscal Year 2018
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 (FY 18)
692M15-18-F-00497	**UAS COE IDIQ Contract Kickoff Meeting**	**University of Kansas**	**$7,976.00**	**NA**	**NA**	**University of Kansas**	**$0**
692M15-18-F-00451	**UAS COE IDIQ Contract Kickoff Meeting**	**University of North Dakota**	**$9,933.00**	**NA**	**NA**	**University of North Dakota**	**$0**
692M15-18-F-00644	**UAS COE IDIQ Contract Kickoff Meeting**	**Wichita State University**	**$8,235.00**	**NA**	**NA**	**Wichita State University**	**$0**
		Total	**$140,114.98***			**Total**	**$0**

*Note- Contracts are awarded by AAQ-600 (Acquisitions and Contracting Division). The award amounts were determined by the requirements of the IDIQ contracts.

Congressional Report-Fiscal Year 2018
FAA Centers of Excellence (COE)
General Aviation (GA)
Contract Awards

Contract Number	Title of Research	COE Award Recipients	COE Award Recipients	FAA Award Amount	Sub-Award Recipients	Total Sub-Award Amounts	Source of Matching Contribution	Amount/Value of Contribution (FY 18)
DTFACT-14-D-00002	Management and Administrative Support	Iowa State University		$5,000	NA	NA	NA	$0
DTFACT-14-D-00004	Management and Administrative Support	Georgia Institute of Technology		$5,000	NA	NA	NA	$0
DTFACT-14-D-00006	Management and Administrative Support	Texas A&M		$5,000	NA	NA	NA	$0
DTFACT-13-D-00011	Literature Review and SME Panel for Pilot Feedback on Wildlife Safety Concept (WiSC)	Florida Institute of Technology		$41,464	NA	NA	NA	$0
		Total		$56,464*			Total	$0

*Note- Contracts are awarded by AAQ-600 (Acquisitions and Contracting Division). The award amounts were determined by the requirements of the IDIQ contracts.