

# FAA Partnerships

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## 1. Cooperative Research and Development Agreements

The table below details the FAA’s active Cooperative Research and Development Agreements (CRADA).

### 1.1 Academia

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Academia (Active in FY 20)</b>				
4/29/2020	4/29/2022	20-CRADA-0381	University of Dayton Research Institute	The purpose of this agreement is to determine the airworthiness of next generation solid state battery technology before it is fully commercialized. The University of Dayton Research Institute will provide assistance to validate electrolyte safety, and provide insight into unexpected hazards that may need to be addressed.
11/16/2019	11/15/2023	16-CRDA-0340	Rutgers, The State University of New Jersey	The purpose of this agreement is to establish a mechanism for initial FAA Technical Transfer and collaboration to facilitate a preliminary exchange of ideas and solutions by students and faculty, to enhance the Modeling and Simulation Branch’s conflict-probe-related tools and algorithms.

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Academia (Active in FY 20)</b>				
5/24/2019	6/7/2021	17-CRDA-0348	George Mason University School of Business	The purpose of this agreement is to investigate how government organizations and people progress through change. The FAA’s Flight Standards Service (AFS) wants to capitalize on the research being conducted to better understand attachment styles associated with leading people through changes. The George Mason University School of Business and the FAA will undertake a research trial with at least one, but optimally two, groups within the AFS leadership group to gain insight and possibly validate the Attachment Style Index®.
8/15/2018	8/13/2021	18-CRDA-0353	Clarkson University	The purpose of this agreement is to allow Clarkson University personnel access to the test panels in the Full-Scale Aircraft Structural Test and Evaluation Research lab. Clarkson personnel will witness testing and provide guidance on testing and model validation of the Structural Health Monitoring systems installed in the lab. The data will be public and useable by the Society of Automotive Engineers Aerospace Industry Steering Committee as needed.
7/24/2018	8/1/2023	16-CRDA-0335	Fairfield University	The purpose of this agreement is to establish a mechanism for initial FAA Technical Transfer and collaboration to facilitate a preliminary exchange of ideas and solutions by students and faculty to enhance the Modeling and Simulation Branch’s conflict probe related tools and algorithms.
6/14/2018	6/14/2021	18-CRDA-0350	Rowan University	The purpose of this agreement is to establish a collaborative relationship between the FAA and Rowan University, specifically the Engineering Department. Students will gain valuable research and development experience while the FAA benefits from any algorithms or tools created to improve the accuracy and efficiency of NextGen research methodologies.
4/12/2018	4/12/2021	15-CRDA-0308	Rowan University	The purpose of this agreement is the exchange of information on state-of-the-art airport pavement design methods and materials. This includes the exchange of information on airport technology research results related to in-situ laboratory and full scale pavement tests, including airport pavement roughness, runway profiles, friction, pavement modeling, and non-destructive pavement testing; and collaboration on documents for joint submission to the relevant international bodies.

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## 1.2 Industry

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (Active in FY 20)</b>				
8/3/2020	8/1/2025	20-CRADA-0383C (CAMI)	Universal Avionics Systems Corporation	The purpose of this agreement is to conduct Human Performance research using a head-worn Display.
5/26/2020	5/26/2022	20-CRADA-0377	magniX USA, Inc.	The purpose of this agreement is to evaluate the magniX electrical propulsion system to collaboratively advance understanding of the safety risks and hazards associated with use of this technology in aircraft as the primary source of propulsion. In addition, this research will advance and inform the development and verification of safety standards regarding use of this technology.
4/29/2020	4/28/2023	14-CRDA-0298	Astronics AES	The purpose of this agreement is to develop solid-state power control and protective devices for aircraft, and to provide support for industry standards.
4/23/2020	12/4/2020	14-CRDA-0299	Northrop Grumman Systems Corporation	The purpose of this agreement is to perform a variety of operational and technical assessments to meet specific objectives to support integration of Unmanned Aircraft Systems (UAS) into the National Airspace System, to support existing and future certification paths for UAS airframes and system components, and to assist in the Next Generation Air Transportation System (NextGen).
1/21/2020	1/21/2025	20-CRADA-0378C (CAMI)	Rockwell Collins, Inc.	The purpose of this agreement is to conduct collaborative research using Rockwell Collin’s fixed-base flight deck simulator and head-worn display technology to collect human performance data during the use of a head-worn display.
11/14/19	12/31/20	15-CRDA-0310	Arconic (formerly ALCOA)	The purpose of this agreement is to obtain full-scale fuselage-panel test data to demonstrate whether and how fuselage concepts utilizing Emerging Metallic Structures Technologies improve the durability and damage tolerance compared to current baseline aluminum fuselage structures. The single-aisle aircraft fuselage will be used as the baseline structure. Test data will be collected utilizing the unique capabilities of the FAA’s Full-scale Aircraft Structural Test Evaluation and Research facility.
11/7/2019	10/26/2022	13-CRDA-0289	The Boeing Company	The purpose of this agreement is to allow technical evaluation of the FAA’s NextGen concepts and to allow other mutually beneficial aviation research.

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (Active in FY 20)</b>				
10/29/2019	5/15/2025	14-CRDA-0304	Shell Global Solutions (U.S.), Inc.	The purpose of this agreement is to generate laboratory, rig, engine, and aircraft fit-for-purpose test data on unleaded fuels. The goal is to replace the leaded aviation gasoline, 100LL, with an unleaded fuel and approve its use in the majority of the general-aviation piston engines and allow the aircraft fleet to safely operate on this fuel.
10/13/2019	11/4/2022	14-CRDA-0296	Ametek Aerospace and Defense	The purpose of this agreement is to develop solid-state Electronic Power Distribution Systems for aircraft and to provide support for industry standards.
09/25/2019	09/24/2021	19-CRADA-0373	Protean, LLC.	The modeling, simulation, demonstration, testing, and analysis activities set forth in this agreement are intended to collect, analyze, and share the data that will support the increased utilization and safety of low-level helicopter operations for various mission segments.
09/20/2019	10/31/2024	07-CRDA-0236	The Boeing Company	The purpose of this agreement is to allow a long-term partnership to investigate areas of safety and airframe integrity of high importance to industry and the FAA. The verification and certification of the design, analysis, and applications of bonded repairs are very important to the Boeing Company, airplane operators, and the FAA Technical Center.
8/20/2019	8/19/2022	19-CRDA-0366	GE Aviation Systems LLC	The purpose of this agreement is to establish collaboration, provide engineering and research support, and conduct multiple safety-risk assessments using an established FAA methodology.
7/16/2019	7/16/2024	19-CRADA-0374C (CAMI)	Rockwell Collins	The purpose of this agreement is to conduct collaborative research using Rockwell Collins’ advanced vision software and the FAA’s flight deck simulator to collect human performance data from representative samples of the end-user population.
6/27/2019	6/25/2021	19-CRDA-0371	Mistras Group, Inc.	The purpose of this agreement is to provide Mistras Group Inc.'s Acoustic Emission and Non-Contact Ultrasonic Research System technologies to the FAA for testing at the Full-scale Aircraft Structural Test Evaluation and Research lab and the Structural Health Monitoring Lab. Mistras Group, Inc. may provide technical support to the test personnel as they collect and analyze data.
6/27/2019	7/25/2024	14-CRDA-0297	DFW	The purpose of this CRADA is to provide a mechanism for research and exploratory development efforts in aircraft rescue and firefighting at the DFW Fire Training and Research Center, located at Dallas-Fort Worth International Airport (DFW). DFW and the FAA share many common interests in aircraft rescue and firefighting technologies.

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (Active in FY 20)</b>				
3/4/2019	3/4/2022	19-CRDA-0367	Rockwell Collins, A Collins Aerospace Company	The purpose of this CRADA is to establish collaboration and provide engineering and research support to conduct multiple safety risk assessments using an established FAA methodology. The FAA Safety Risk Assessment (SRA) Methodology was established and documented in the SRA Methodology description document (v 1.1), dated 9/5/2018.
12/21/2018	12/21/2021	19-CRDA-0361	Kerr Avionics	The purpose of this agreement is to examine how the FAA can use new technologies present in the latest generation of Enhanced Vision Systems, Synthetic Vision Systems, and Combined Vision Systems for helicopter operators. The goal is to provide credit for reducing the visibility requirements for point-in-space and comparable instrument approaches during the approach segments of the “Proceed Visual Flight Rules” and “Proceed Visual” segments.
12/12/2018	12/13/2021	18-CRDA-0357	Simmonds Precision Products, Inc., A Collins Aerospace Company	The purpose of this agreement is to allow personnel from Simmonds Precision Products, Inc., a Collins Aerospace Company, access to the test panels in the Full-scale Aircraft Structural Test Evaluation and Research lab. These personnel will install their sensors and provide the FAA test group with instructions on the use of their system to collect data while the panels are being tested. The data will be available to the collaborating party, who will have title to the data, and is to be useable by the Society of Automotive Engineers Aerospace Industry Steering Committee.
9/10/2018	9/6/2021	16-CRDA-0336	Astronics Corporation, MaxViz	The purpose of this agreement is to examine how the FAA can use new technologies present in the latest generation of Enhanced Vision Systems/Synthetic Vision System/Combined Vision Systems available to helicopter operators. The goal will be to provide credit for reducing the visibility requirements for Point-In-Space and other comparable instrument approaches during the approach segments of the “Proceed Visual Flight Rules” and “Proceed Visual” segments.
6/1/2018	10/19/2021	15-CRDA-0309	Burlington Northern Santa Fe Railway	The purpose of this agreement is to allow joint FAA and BNSF research in the areas of railway safety and integration of Unmanned Aircraft Systems into the NAS, along with the transfer of applicable technologies.
5/15/2018	8/13/2026	16-CRDA-0338	Afton Chemical Corp.	The purpose of this agreement is to test potentially viable unleaded aviation gasolines.

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (Active in FY 20)</b>				
4/24/2018	4/23/2021	18-CRDA-0352	Metis Design Corp	The purpose of this agreement is to allow Metis access to the test panels in the Full-scale Aircraft Structural Test and Evaluation Research lab, where Metis will install their sensors. Metis will instruct the test group on the use of their system to collect data while the panels are being tested. The data will be public and useable by the Society of Automotive Engineers Aerospace Industry Steering Committee.
1/13/2017	1/13/2022	17-CRDA-0343	Rockwell Collins	The purpose of this agreement is to collaborate with Rockwell at the FAA Cockpit Simulation Facility to develop a high-fidelity rotorcraft simulation capability.
10/28/2016	10/28/2020	16-CRDA-0339	Livermore Software Technology Corporation	The purpose of this agreement is to allow Livermore Software Technology Corporation (LSTC) to continue to implement and support material models developed by the FAA’s Aircraft Catastrophic Failure Prevention Program in LSTC’s LS-DYNA® software. LSTC will provide 256 LS-DYNA® licenses for the FAA to use on the FAA Computing and Analytics Shared Services Integrated Environment High Performance Computer at no cost to the government.
9/29/2014	9/30/2024	18-CRDA-0295	FedEx	The purpose of this agreement is to allow for collaboration on NextGen surface initiatives to evaluate the viability and benefits of new concepts and applications in an operational environment. Specifically, this CRADA will facilitate further evaluation of the Surface Decision Support System and Non-Movement Area surveillance.
7/29/2011	7/29/2021	96-CRDA-0097	The Boeing Company	The purpose of this agreement is to allow research on real-time real-weight pavement testing at the National Aviation Pavement Test Facility, to determine wheel-interaction effects followed by trafficking tests, to develop pavement failure criteria.
12/23/2010	12/23/2020	10-CRDA-0268	United Parcel Service Co.	The purpose of this agreement is to allow for collaboration on NextGen surface initiatives and to evaluate the viability and benefits of new concepts and applications in an operational environment. Specifically, this CRADA will facilitate further evaluation of the Surface Decision Support System and Non-Movement Area surveillance.

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**1.2.1 Industry (International)**

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (International Active in FY 20)</b>				
4/23/2020	11/6/2020	17-CRDA-0345	Thales Avionics SAS	The purpose of this agreement is to examine how the FAA can allow helicopter operators to use new technologies present in the latest generation of Enhanced Vision Systems/Synthetic Vision System/Combined Vision Systems /head-worn display /head-down display systems that are not currently available on the market. These systems enhance safety for Visual Flight Rules and Instrument Flight Rules helicopter operations.
2/5/2020	2/5/2025	20-CRADA-0375C (CAMI)	Adacel Systems, Inc.	The purpose of this agreement is to conduct collaborative research on voice recognition and air traffic control simulation technology.
3/7/2019	3/7/2022	19-CRDA-0358	CMC Electronics Inc.	The purpose of this agreement is to examine how the FAA can utilize new technologies present in the latest generation of Enhanced Vision Systems, Synthetic Vision System, and Combined Vision Systems available to helicopter operators, to provide credit for reducing the visibility requirements for point-in-space and other comparable instrument approaches during the approach segments of both the “Proceed Visual Flight Rules” and “Proceed Visual” segments.
7/2/2018	7/2/2021	12-CRDA-0285	Team Eagle Ltd	The purpose of this agreement is to improve the safety of commercial air travel by developing technology for quantifying the impact of contaminated runway conditions on aircraft wheel braking.
5/8/2018	5/7/2021	18-CRDA-0354	MIPsoft Oy (BlindSquare)	The purpose of this agreement is to evaluate how the BlindSquare indoor-navigation technology developed by MIPsoft Oy can be used to mitigate the wayfinding challenges faced by blind and visually impaired passengers at the airport terminals.

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**1.2.2 Industry (Small Business)**

Period of Performance		CRADA Number	Partner	Subject/Purpose
Start Date	End Date			
<b>Industry (Small Business Active in FY 20)</b>				
2/3/20	2/3/23	20-CRDA-0372	ASA	The purpose of this agreement is to collaborate with Aviation Safety Advancements, Inc. in installing and integrating their patented Aircraft Upset Recovery Augmentation avionics system on one of the FAA's cockpit simulators for testing by the FAA, other government agencies, and industry.
12/20/2019	12/20/2021	20-CRADA-0379	Lectromechanical Design Company LLC.	The purpose of this agreement is to provide data to aerospace standards organizations in the development of protection techniques for aircraft electrical wiring interconnection systems (EWIS). This will help to develop defined and approved approaches to EWIS Physical Hazard Assessments.
3/11/2019	3/11/2022	19-CRDA-0368	Acellent Technologies Inc.	The purpose of this agreement is to provide Acellent Technologies Inc. with access to data from FAA tests at the Full-scale Aircraft Structural Test and Evaluation Research and Structures and Materials labs. Acellent Technologies Inc. will analyze the data and provide the results to the FAA. The FAA will provide aircraft quality test beds in both labs as test specimens. If Acellent Technologies Inc. wishes, they will be granted access to the test facilities.
1/30/2019	1/26/2024	09-CRDA-0257	Diakon Solutions LLC	The purpose of this agreement is to complete the development, test, installation, and implementation of a production-model Aircraft Geometric Height Measurement Element.
6/1/2018	6/16/2021	15-CRDA-0317	ATECH Inc.	The purpose of this agreement is for the FAA and ATECH, Inc., an Engineered Materials Arresting System (EMAS) manufacturer, to share knowledge and periodic reports during their research and development activities. This agreement is needed for a successful EMAS design that will meet FAA Advisory Circular 150-5220-22b.
4/5/2018	4/20/2023	16-CRDA-0326	GSSL, Inc. dba Near Space Corporation	The purpose of this agreement is to explore the use of Automatic Dependent Surveillance–Broadcast (ADS-B) for tracking and trajectory modeling of commercial space and suborbital vehicles using high-altitude unmanned balloons.

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## 2. Centers of Excellence Grants

The table below details the FAA’s active Centers of Excellence (COE) grants.

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
8/11/2020	8/31/2021	13-C-AJFE-MIT	Aircraft Noise Exposure and Market Outcomes in the United States	Massachusetts Institute of Technology	\$380,000
8/11/2020	9/30/2021	13-C-AJFE-WaSU	Alternative Jet Fuel Supply Chain Analysis	Washington State University	\$566,454
8/11/2020	6/30/2021	13-C-AJFE-GIT	Reduction of nvPM emissions from aero-engine fuel injectors	Georgia Tech Research Corporation	\$500,000
8/11/2020	8/31/2021	13-C-AJFE-PSU	Measurements to Support Noise Certification for UAS/UAM Vehicles and Identify Noise Reduction	Pennsylvania State University	\$500,000
8/11/2020	7/31/2021	13-C-AJFE-GIT	Improved Open Rotor Noise Prediction Capabilities	Georgia Tech Research Corporation	\$300,000
8/11/2020	8/31/2021	13-C-AJFE-BU	Improved Engine Fan Broadband Noise Prediction Capabilities	Trustees of Boston University, BUMC	\$300,000
8/11/2020	2/4/2022	13-C-AJFE-MIT	Surface Analysis to Support AEDT APM Development	Massachusetts Institute of Technology	\$200,000
8/11/2020	2/5/2022	13-C-AJFE-WaSU	Administer Program Office of COE for Alternative Jet Fuels and Environment	Washington State University	\$419,206
8/11/2020	2/4/2023	13-C-AJFE-PSU	Support of Supersonic Aircraft En Route Noise Efforts In ICAO CAEP	Pennsylvania State University	\$220,000
8/11/2020	2/5/2022	13-C-AJFE-PSU	Turbine Cooling Through Additive Manufacturing	Pennsylvania State University	\$400,000
8/11/2020	2/5/2022	13-C-AJFE-SU	Open-source Data Collection, Analysis And Mitigation of Aviation Environmental Impacts	Board of Trustees of Leland Stanford, Jr. University CS	\$400,000
8/11/2020	2/5/2022	13-C-AJFE-UNC	Development of Aviation Air Quality Tools for Airport-Specific Impact Assessment: Air Quality Modeling	University of North Carolina at Chapel Hill	\$569,000
8/11/2020	8/31/2021	13-C-AJFE-UD	Fuel Composition Impact on Combustor Durability	University of Dayton Research Institute	\$299,148
8/11/2020	5/31/2022	13-C-AJFE-UD	Evaluation of High Thermal Stability Fuels	University of Dayton Research Institute	\$100,000
8/11/2020	7/31/2021	13-C-AJFE-GIT	Low Emissions Pre-Mixed Combustion Technology for Supersonic Civil Transport	Georgia Tech Research Corporation	\$1,000,000
8/11/2020	5/30/2022	13-C-AJFE-UD	Fuel Testing Approaches for Rapid Jet Fuel Prescreening	University of Dayton Research Institute	\$250,000
8/11/2020	2/4/2022	13-C-AJFE-GIT	Noise Generation and Propagation from Advanced Combustors	Georgia Tech Research Corporation	\$1,500,000
8/11/2020	2/4/2022	13-C-AJFE-MIT	Comparative Assessment of Electrification Strategies for Aviation	Massachusetts Institute of Technology	\$300,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
8/11/2020	2/4/2022	13-C-AJFE-MIT	Combustion Concepts for Next-Generation Aircraft Engines	Massachusetts Institute of Technology	\$300,000
8/11/2020	2/4/2022	13-C-AJFE-MIT	Clean Sheet Supersonic Engine Design and Performance	Massachusetts Institute of Technology	\$400,000
8/11/2020	2/4/2022	13-C-AJFE-GIT	CLEEN II-Aircraft Technology Modeling and Assessment – Benefits Assessments Continuation with Additional	Georgia Tech Research Corporation	\$250,000
8/11/2020	2/4/2022	13-C-AJFE-UI	Alternative Fuels Test Database Library	Board of Trustees of the University of Illinois	\$200,000
8/11/2020	2/5/2022	13-C-AJFE-UD	Alternative Jet Fuels Test and Evaluation	University of Dayton Research Institute	\$1,049,700
8/11/2020	2/4/2022	13-C-AJFE-GIT	Alternative Jet Fuel Supply Chain Analysis	Massachusetts Institute of Technology	\$500,000
8/11/2020	2/4/2022	13-C-AJFE-UT	Techno-Market Analysis of U.S. Biorefinery Supply Chains from Feedstock to Alternative Jet Fuels	University of Tennessee	\$250,000
8/11/2020	2/4/2022	13-C-AJFE-GIT	AEDT Evaluation and Development Support	Georgia Tech Research Corporation	\$700,000
8/11/2020	2/4/2022	13-C-AJFE-PSU	Urban Air Mobility Noise Reduction Modeling	Pennsylvania State University	\$280,000
8/11/2020	5/31/2021	13-C-AJFE-MIT	Analysis to Support the Development of an Engine nvPM Emissions Standard	Massachusetts Institute of Technology	\$200,000
8/11/2020	8/31/2021	13-C-AJFE-MIT	Aircraft Noise Abatement Procedure Modeling and Validation	Massachusetts Institute of Technology	\$370,000
8/11/2020	2/4/2022	13-C-AJFE-PSU	Rotorcraft Noise Abatement Procedures Development	Pennsylvania State University	\$150,000
8/11/2020	2/4/2022	13-C-AJFE-GIT	Noise Power Distance Re-Evaluation	Georgia Tech Research Corporation	\$200,000
8/11/2020	2/4/2022	13-C-AJFE-MIT	Analytical Approach for Quantifying Noise from Advanced Operational	Massachusetts Institute of Technology	\$250,000
8/11/2020	2/4/2022	13-C-AJFE-PU	Aircraft Technology Modeling and Assessment	Purdue University	\$225,000
8/11/2020	2/4/2022	13-C-AJFE-GIT	Aircraft Technology Modeling and Assessment	Georgia Tech Research Corporation	\$1,100,000
8/11/2020	8/31/2021	13-C-AJFE-SU	Shock Tube and Flow Reactor Studies of the Kinetics of Jet Fuels – Rapid IR Fuel Screening	Board of Trustees of Leland Stanford Jr University CS	\$300,000
8/11/2020	7/31/2021	15-C-UAS-UND	Cybersecurity and Safety Literature Review	University of North Dakota	\$144,238
8/11/2020	7/31/2021	15-C-UAS-NMSU	Cybersecurity and Safety Literature Review	The Regents of New Mexico State University -MSC PSL	\$150,000
8/11/2020	7/31/2021	15-C-UAS-ORSU	Cybersecurity and Safety Literature Review	Oregon State University	\$200,000
8/11/2020	3/31/2023	15-C-UAS-UND	Safety Risks and Mitigations for UAS Operations on and around Airports	University of North Dakota	\$320,000
8/11/2020	3/31/2023	15- UAS-UAH	Safety Risks and Mitigations for UAS Operations on and around Airports	University of Alabama in Huntsville	\$219,815

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
8/11/2020	3/31/2023	15-C-UAS-NMSU	Safety Risks and Mitigations for UAS Operations on and around Airports	The Regents of New Mexico State University-MSC PSL	\$320,000
8/11/2020	3/31/2023	15-C-UAS-KSU	Safety Risks and Mitigations for UAS Operations on and around Airports	Kansas State University	\$220,000
8/11/2020	3/31/2023	15-C-UAS-KSU	Safety Risks and Mitigations for UAS Operations on and around Airports	University of Alaska-Fairbanks	\$401,999
8/11/2020	9/30/2022	15-C-UAS-MSU	Validation of ASTM Remote ID Standards - Safety Research Center	Mississippi State University	\$750,000
8/11/2020	9/30/2023	15-C-UAS-MSU	Validation of Low-Altitude Detect and Avoid Standards - Safety Research Center	Mississippi State University	\$1,500,000
8/11/2020	7/31/2022	15-C-UAS-ERAU	Urban Air Mobility: Safety Standards, Aircraft Certification and Impact on Market Feasibility and Growth Potentials	Embry-Riddle Aeronautical University	\$249,923
8/11/2020	7/31/2022	15-C-UAS-NCSU	Urban Air Mobility: Safety Standards, Aircraft Certification and Impact on Market Feasibility and Growth Potentials	North Carolina State University	\$184,999
8/11/2020	7/31/2022	15-C-UAS-MSU	Urban Air Mobility: Safety Standards, Aircraft Certification and Impact on Market Feasibility and Growth Potentials	Mississippi State University	\$315,000
8/11/2020	7/31/2022	15-C-UAS-WISU	Urban Air Mobility: Safety Standards, Aircraft Certification and Impact on Market Feasibility and Growth Potentials	Wichita State University	\$450,000
8/11/2020	10/31/2021	15-C-UAS-UND	UAS Standards Tracking, Mapping, and Analysis	University of North Dakota	\$235,000
8/11/2020	5/31/2022	15- UAS-UAH	Science and Research Panel Support	University of Alabama in Huntsville	\$70,383
8/11/2020	3/30/2022	15-C-UAS-OSU	Identify Wake Turbulence and Flutter Testing Requirements for UAS	The Ohio State University	\$698,921
8/11/2020	3/31/2022	15-C-UAS-KU	Identify Wake Turbulence and Flutter Testing Requirements for UAS	University of Kansas	\$800,000
8/11/2020	10/31/2021	15-C-UAS-ERAU	UAS Standards Tracking, Mapping, and Analysis	Embry-Riddle Aeronautical University	\$264,900
7/29/2020	9/30/2021	12-C-GA-OSU	Management and Administration	The Ohio State University	\$5,000
7/29/2020	7/31/2021	12-C-GA-ISU	Heated Airport Pavement	Iowa State University of Science and Technology	\$150,000
7/29/2020	7/31/2021	12-C-GA-GIT	Rotorcraft ASIAs	Georgia Tech Research Corporation	\$167,500
7/29/2020	9/30/2021	12-C-GA-TEES	Management and Administration	Texas A&M Engineering Experiment Station	\$5,000
7/29/2020	9/30/2021	12-C-GA-PU	Management and Administration	Purdue University	\$135,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
7/29/2020	9/30/2021	12-C-GA-ISU	Management and Administration	Iowa State University of Science and Technology	\$5,000
7/29/2020	9/30/2020	12-C-GA-GIT	Management and Administration	Georgia Tech Research Corporation	\$5,000
7/29/2020	9/30/2021	12-C-GA-FIT	Management and Administration	Florida Institute of Technology	\$5,000
7/29/2020	9/30/2021	12-C-GA-PU	Safety Analysis for General Aviation - Loss of Control	Purdue University	\$185,000
7/20/2020	9/30/2021	16-C-TTHP-OK	Improvements of Flight Inspection Antenna Modeling and Simulation	The University of Oklahoma	\$100,000
7/20/2020	9/30/2021	16-C-TTHP-WISU	Improvements of Flight Inspection Antenna Modeling and Simulation	Wichita State University	\$10,000
7/20/2020	8/10/2021	16-C-TTHP-WISU	Wichita State University (WISU) Administrative Program Management	Wichita State University	\$155,837
7/20/2020	11/30/2020	16-C-TTHP-WISU	UAS Combat Flight Inspection Project Plan	Wichita State University	\$3,000
7/20/2020	11/30/2020	16-C-TTHP-OKSU	UAS Combat Flight Inspection Project Plan	Oklahoma State University	\$29,872
7/15/2020	5/31/2022	15-C-UAS-ORSU	Disaster Preparedness and Response	Oregon State University	\$165,000
7/15/2020	5/31/2022	15-C-UAS-NCSU	Disaster Preparedness and Response	North Carolina State University	\$124,979
7/15/2020	5/31/2022	15-C-UAS-MSU	Disaster Preparedness and Response	Mississippi State University	\$130,000
7/15/2020	5/31/2022	15-C-UAS-UAF	Disaster Preparedness and Response	University of Alaska-Fairbanks	\$245,000
7/15/2020	5/31/2022	15-C-UAS-NMSU	Disaster Preparedness and Response	The Regents of New Mexico State University MSC PSL	\$234,000
7/15/2020	5/31/2022	15-C-UAS-UAH	Disaster Preparedness and Response	University of Alabama in Huntsville	\$1,101,000
7/15/2020	5/7/2021	15-C-UAS-MSU	COE UAS Program Management	Mississippi State University	\$1,290,410
6/12/2020	8/31/2021	13-C-AM-UW	Administration of the FAA Center on Advanced Materials in Transport Aircraft Structures	University of Washington	\$83,439
6/12/2020	8/31/2022	13-C-AM-WISU	Development and Safety Management of Composite Certification Guidance	Wichita State University	\$180,000
6/12/2020	8/31/2022	13-C-AM-WISU	Inspection and Teardown of Aged In-Service Composite Structures	Wichita State University	\$500,000
6/12/2020	9/30/2022	13-C-AM-WISU	Ceramic Matrix Composite Materials Guidelines for Aircraft Design and Certification	Wichita State University	\$500,000
6/12/2020	9/30/2022	13-C-AM-WISU	Resin-Infused Fiber Reinforced Materials Guidelines for Aircraft Design and Certification	Wichita State University	\$600,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
6/12/2020	9/30/2021	13-C-AM-WISU	Correlation between Effects of Defects on Static and Dynamic Strength Behavior of Composite Materials - Phase II	Wichita State University	\$150,000
6/12/2020	9/1/2022	13-C-AM-WISU	Composites Materials Handbook (CMH-17)	Wichita State University	\$125,000
6/12/2020	9/1/2022	13-C-AM-WISU	Administration of the Center of Excellence for Composites and Advanced Materials	Wichita State University	\$75,000
6/12/2020	5/31/2022	12-C-AM-AU	Factors Affecting Qualification/Certification: The Effect of Machine and Machine-to-Machine Variability on Mechanical Properties of Additive Manufactured Materials	Auburn University	\$1,799,967
6/12/2020	5/31/2022	12-C-AM-AU	Factors Affecting Qualification/Certification: Evaluating the Criticality of Inherent Anomalies/Defects on the Fatigue Behavior of AM Metallic Parts	Auburn University	\$1,199,990
6/12/2020	8/31/2021	13-C-AM-UW	Nanomechanical Characterization of Adhesive Bondlines	University of Washington	\$150,000
6/12/2020	9/30/2021	13-C-AM-UCSD	Impact Damage Tolerance Guidelines for Stiffened Composite Panels	The Regents of the University of California UC San Diego	\$396,698
6/5/2020	11/30/2020	13-C-AJFE-GIT	Predictive Simulation of nvPM Emissions in Aircraft Combustors	Georgia Tech Research Corporation	\$500,000
6/5/2020	3/31/2021	13-C-AJFE-SU	Physics-Based Analyses and Modeling for Supersonic Propulsion Exhaust Noise	Board of Trustees of Leland Stanford Jr University CS	\$200,000
6/5/2020	4/29/2021	13-C-AJFE-UI	Modeling Supersonic Jet Noise Reduction with Global Resolvent Modes	Board of Trustees of the University of Illinois	\$199,956
6/5/2020	12/29/2020	13-C-AJFE-UH	Alternative Jet Fuel Supply Chain Analysis Tropical Region Analysis	University of Hawaii	\$200,000
6/5/2020	12/31/2021	13-C-AJFE-PSU	Noise Model Validation for AEDT	Pennsylvania State University	\$115,000
6/5/2020	6/30/2021	13-C-AJFE-GIT	Supersonic Jet Noise Reduction - Jet Noise Modeling to Support Low Noise Supersonic Aircraft Technology Development	Georgia Tech Research Corporation	\$100,000
6/5/2020	3/30/2021	13-C-AJFE-GIT	Modeling and Measurements of Supersonic Civil Transport Jet Noise	Georgia Tech Research Corporation	\$250,000
6/5/2020	5/31/2021	13-C-AJFE-UD	Evaluation of High Thermal Stability Fuels	University of Dayton Research Institute	\$184,997
6/5/2020	6/30/2021	13-C-AJFE-GIT	Alternative Design Configurations to meet Future Demand	Georgia Tech Research Corporation	\$250,000
6/5/2020	6/30/2021	13-C-AJFE-GIT	Parametric Noise Modeling for Boundary Layer Ingesting Propulsors	Georgia Tech Research Corporation	\$300,000
6/5/2020	6/30/2021	13-C-AJFE-GIT	Noise Model Validation for AEDT	Georgia Tech Research Corporation	\$235,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
6/5/2020	7/31/2021	13-C-AJFE-GIT	Noise Certification Streamlining	Georgia Tech Research Corporation	\$250,000
6/5/2020	6/30/2021	13-C-AJFE-GIT	Analytical Methods for Expanding the AEDT Aircraft Fleet Database	Georgia Tech Research Corporation	\$150,000
6/5/2020	5/31/2021	13-C-AJFE-PSU	Jet noise modeling to support low noise supersonic aircraft technology development	Pennsylvania State University	\$100,000
6/5/2020	5/31/2021	13-C-AJFE-UD	Fuel Testing Approaches for Rapid Jet Fuel Prescreening	University of Dayton Research Institute	\$159,998
6/5/2020	11/30/2020	13-C-AJFE-PU	Impact of Fuel Heating on Combustion and Emissions	Purdue University	\$250,000
6/5/2020	11/30/2020	13-C-AJFE-UI	Fuel Testing Approaches for Rapid Jet Fuel Prescreening	Board of Trustees of the University of Illinois	\$150,000
6/5/2020	9/30/2020	13-C-AJFE-PSU	Combustor Wall Cooling with Dirt Mitigation	Pennsylvania State University	\$150,000
6/5/2020	9/30/2020	13-C-AJFE-MST	Transitioning a research nvPM mass calibration procedure to operations	Missouri University of Science and Technology	\$846,707
6/5/2020	6/30/2022	13-C-AJFE-GIT	Geospatially Driven Noise Estimation Module	Georgia Tech Research Corporation	\$250,000
2/18/2020	8/31/2021	12-C-AM-WISU	Core Materials Qualification Guidance for Aircraft Design and Certification	Wichita State University	\$500,000
2/18/2020	9/30/2022	12-C-AM-WISU	Evaluation of Aged Structural Bonds on Rotor Blades	Wichita State University	\$350,000
2/18/2020	9/30/2020	12-C-AM-WISU	FAA Research Requirement on Lightning Strike of Composites Structure	Wichita State University	\$125,000
2/18/2020	8/31/2021	12-C-AM-UU	Development and Evaluation of Fracture Mechanics Test Methods for Sandwich Composites	The University of Utah	\$100,000
2/18/2020	8/31/2021	12-C-AM-WISU	Development and Safety Management of Composite Certification Guidance	Wichita State University	\$180,000
2/18/2020	8/31/2021	12-C-AM-WISU	Composites Materials Handbook (CMH-17)	Wichita State University	\$125,000
2/18/2020	12/15/2020	12-C-AM-WSU	Durability of Bonded Aerospace Structure	Washington State University	\$75,000
2/18/2020	8/31/2022	12-C-AM-UW	Safety of Certification of Discontinuous Fiber Composite Structures	University of Washington	\$698,539
2/18/2020	8/31/2021	12-C-AM-WISU	Administration of the Center of Excellence for Composites and Advanced Materials	Wichita State University	\$75,000
2/18/2020	8/31/2021	12-C-AM-WISU	Adhesive Bond Qualification Guidance for Aircraft Design Certification	Wichita State University	\$900,000
2/18/2020	8/31/2021	12-C-AM-WISU	Investigation of Static Strength Variability Between Composites and Metallic with respect to Overload Factors	Wichita State University	\$100,000
2/18/2020	8/31/2021	12-C-AM-WISU	Development of a Higher Level Building Block Testing Standards	Wichita State University	\$875,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
2/18/2020	8/31/2021	12-C-AM-WISU	Composite Materials Handbook (CMH-17) for Additive Manufacturing	Wichita State University	\$200,000
2/18/2020	8/31/2021	12-C-AM-WISU	Polymer-Based Additive Manufacturing Guidelines for Aircraft Design and Certification	Wichita State University	\$2,800,000
2/18/2020	8/31/2021	12-C-AM-WISU	Thermoplastic Welding Process Qualification Protocols for Aircraft Design and Certification	Wichita State University	\$350,000
2/18/2020	8/31/2021	12-C-AM-WISU	Ceramic Matrix Composite Materials Guidelines for Aircraft Design and Certification	Wichita State University	\$350,000
2/18/2020	8/31/2021	12-C-AM-WISU	Advanced Fiber Reinforced Polymer Composite Materials Guidance for Aircraft Design Certification Process and Process Control	Wichita State University	\$475,000
2/18/2020	8/31/2021	12-C-AM-WISU	Development of Guidance for Technical Standard Order for Composite Materials	Wichita State University	\$150,000
2/18/2020	8/31/2021	12-C-AM-WISU	Correlation Between Effects of Defects on Static and Dynamic Strength Behavior of Composite Materials	Wichita State University	\$299,972
2/18/2020	12/30/2020	12-C-AM-WISU	FAA CSET, CMT, CMfgT and Adhesive Online Courses – Mod and Implementation Phase II	Wichita State University	\$100,000
2/12/2020	1/31/2020	12-C-AM-WISU	Inspection and Teardown of Aged In-Service Bonded Repairs	Wichita State University	\$250,000
2/12/2020	6/30/2022	15-C-UAS-MSU	UAS Safety Case Development, Process Improvement, and Data Collection	Mississippi State University	\$150,000
2/12/2020	6/30/2022	15-C-UAS-UND	UAS Safety Case Development, Process Improvement, and Data Collection	University of North Dakota	\$545,000
2/12/2020	9/30/2021	15-C-UAS-ORSU	Establish pilot proficiency requirements	Oregon State University	\$248,000
2/12/2020	9/30/2021	15-C-UAS-DU	Establish Pilot Proficiency Requirements	Drexel University	\$192,000
2/12/2020	9/30/2019	15-C-UAS-KSU	Establish Pilot Proficiency Requirements	Kansas State University	\$60,000
2/12/2020	11/30/2021	15-C-UAS-UND	Develop Risk-Based Training and Standards for Operational Approval and Issuance	University of North Dakota	\$150,000
2/12/2020	11/30/2019	15-C-UAS-UAF	Develop Risk-Based Training and Standards for Operational Approval and Issuance	University of Alaska-Fairbanks	\$150,000
2/12/2020	11/30/2021	15-C-UAS-KSU	Develop Risk-Based Training and Standards for Operational Approval and Issuance	Kansas State University	\$198,161
2/12/2020	12/31/2020	15-C-UAS-UND	UAS Flight Data Collection and Analysis Phase II	University of North Dakota	\$74,953

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
2/12/2020	12/31/2020	15-C-UAS-UAF	UAS Flight Data Collection and Analysis Phase II	University of Alaska-Fairbanks	\$25,000
2/12/2020	6/30/2022	15-C-UAS-OSU	UAS Safety Case Development, Process Improvement, and Data Collection	The Ohio State University	\$174,958
2/12/2020	6/30/2022	15-C-UAS-KSU	UAS Safety Case Development, Process Improvement, and Data Collection	Kansas State University	\$200,000
2/12/2020	6/30/2022	15-C-UAS-UAF	UAS Safety Case Development, Process Improvement, and Data Collection	University of Alaska-Fairbanks	\$260,000
2/12/2020	6/30/2022	15-C-UAS-NMSU	UAS Safety Case Development, Process Improvement, and Data Collection	The Regents of New Mexico State University MSC PSL	\$149,999
2/5/2020	9/30/2020	13-C-AJFE-SU	Validation of low exposure noise modeling by open source data management and visualization systems integrated with AEDT	Board of Trustees of Leland Stanford Jr University CS	\$169,903
2/5/2020	8/31/2022	13-C-AJFE-BU	Community Measurement of Aviation Emission Contribution of Ambient Air Quality	Trustees of Boston University, BUMC	\$1,299,991
2/5/2020	8/31/2021	13-C-AJFE-MIT	Improving Policy Analysis Tools to Evaluate Higher-Altitude Aircraft Operations	Massachusetts Institute of Technology	\$500,000
2/5/2020	8/31/2020	13-C-AJFE-MIT	Comparative Assessment of Electrification Strategies for Aviation	Massachusetts Institute of Technology	\$300,000
2/5/2020	8/31/2020	13-C-AJFE-MIT	Combustion Concepts For Next-Generation Aircraft Engines	Massachusetts Institute of Technology	\$300,000
2/5/2020	9/14/2020	13-C-AJFE-UTENN	Techno-Market Analysis of U.S. Bio refinery Supply Chains from Feedstock to Alternative Jet Fuels	University of Tennessee	\$250,000
2/5/2020	3/31/2021	13-C-AJFE-MIT	Clean Sheet Supersonic Engine Design and Performance	Massachusetts Institute of Technology	\$400,000
2/5/2020	9/30/2020	13-C-AJFE-PSU	Turbine Cooling Through Additive Manufacturing	Pennsylvania State University	\$400,000
2/5/2020	3/31/2021	13-C-AJFE-MIT	Analytical Approach for Quantifying Noise from Advanced Operational Procedures	Massachusetts Institute of Technology	\$250,000
2/5/2020	8/31/2020	13-C-AJFE-MIT	Alternative Jet Fuels Supply Chain Analysis	Massachusetts Institute of Technology	\$400,000
2/5/2020	8/31/2020	13-C-AJFE-PU	Techno-economic and Lifecycle Analysis of Alternative Aviation Biofuels Supply Chains - 1	Purdue University	\$523,000
2/5/2020	8/31/2020	13-C-AJFE-UNC	Development of Aviation Air Quality Tools for Airport-Specific Impact Assessment: Air Quality Modeling	University of North Carolina at Chapel Hill	\$350,064
2/5/2020	9/30/2020	13-C-AJFE-WaSU	Alternative Jet Fuel Supply Chain Analysis	Washington State University	\$525,001
2/5/2020	9/30/2020	13-C-AJFE-GIT	Noise Generation and Propagation from Advanced Combustors	Georgia Tech Research Corporation	\$1,499,984



Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
2/5/2020	8/31/2020	13-C-AJFE-MIT	Surface Analysis to Support AEDT APM Development	Massachusetts Institute of Technology	\$200,000
2/5/2020	9/30/2021	13-C-CAJFE-PSU	Support for Supersonic Aircraft En Route Noise Efforts in ICAO CAEP	Pennsylvania State University	\$200,000
2/5/2020	8/31/2020	13-C-AJFE-GIT	Noise Power Distance Re-Evaluation	Georgia Tech Research Corporation	\$200,000
2/5/2020	8/31/2020	13-C-AJFE-GIT	AEDT Evaluation and Development Support	Georgia Tech Research Corporation	\$700,000
2/5/2020	8/31/2021	13-C-AJFE-GIT	CLEEN II-Aircraft Technology Modeling and Assessment	Georgia Tech Research Corporation	\$240,000
2/5/2020	9/30/2020	13-C-AJFE-WaSU	Administer Program Office for Center of Excellence for Alternative Jet Fuels and Environment	Washington State University	\$399,713
2/5/2020	8/31/2020	13-C-AJFE-UI	Alternative Fuels Test Database Library	Board of Trustees of the University of Illinois	\$130,000
2/5/2020	8/31/2020	13-C-AJFE-GIT	Aircraft Technology Modeling and Assessment	Georgia Tech Research Corporation	\$1,200,000
2/5/2020	8/31/2021	13-C-AJFE-GIT	Over-Wing Engine Placement Evaluation	Georgia Tech Research Corporation	\$590,000
2/5/2020	8/31/2020	13-C-AJFE-PU	Aircraft Technology Modeling and Assessment	Purdue University	\$222,116
2/5/2020	8/31/2020	13-C-AJFE-PSU	Rotorcraft Noise Abatement Procedures Development	Pennsylvania State University	\$150,000
2/5/2020	8/31/2020	13-C-AJFE-PSU	Urban Air Mobility Noise Reduction Modeling	Pennsylvania State University	\$280,000
2/5/2020	8/31/2019	13-C-AJFE-UD	Alternative Jet Fuels Test and Evaluation	University of Dayton Research Institute	\$1,926,434
2/5/2020	11/29/2020	13-C-AJFE-UD	National Jet Fuels Combustion Program	University of Dayton Research Institute	\$582,983
2/5/2020	9/30/2020	13-C-AJFE-UI	Evaluation of FAA Climate Tools	Board of Trustees of the University of Illinois	\$200,000
2/5/2020	8/17/2020	15-C-CST-FSU	High Temp Pressure Sensor	Florida State University	\$203,313
2/5/2020	8/17/2020	15-C-CST-FSU	Optical Measurements of Rocket Nozzle Thrust and Noise	Florida State University	\$198,984
2/5/2020	7/31/2019	15-C-CST-UCF	Ultra High Temperature Composites Thermal Protection Systems	University of Central Florida	\$47,909
2/5/2020	2/17/2022	15-C-CST-UC	FAA COE CST Executive Director and Administration	University of Colorado Boulder	\$716,667
2/5/2020	8/31/2020	15-C-CST-NMSU	Space Object Database	The Regents New Mexico State University	\$204,533
2/5/2020	6/30/2020	15-C-CST-FIT	Small Launch Vehicle Sector: Industry Dynamics and Public Policy	Florida Institute of Technology	\$149,734
2/5/2020	8/16/2020	15-C-CST-FIT	Measurements of Thunderstorm Electrical Parameters For Improvement of the Lightning Flight Commit Criteria	Florida Institute of Technology	\$163,822
2/5/2020	2/17/2022	15-C-CST-NMT	OMIS Integration and COE Program Support	New Mexico Institute of Mining and Technology	\$150,000

Active COE Grants in FY20					
Award Date	End Date	Grant Number	Grant Title	Recipient Institution	Award Amount
2/5/2020	5/1/2021	15-C-CST-NMT	Structural Health Monitoring Framework	New Mexico Institute of Mining and Technology	\$200,000
2/5/2020	8/31/2020	15-C-CST-UC	CubeSat Cluster Deployment Tracking	University of Colorado Boulder	\$173,653
2/5/2020	8/31/2020	15-C-CST-UC	Resident Space Object System Mechanics	University of Colorado Boulder	\$89,185
2/5/2020	8/17/2020	15-C-CST-NMSU	Spaceport Operations Online Reference Guide: Spaceport Industry Study	The Regents New Mexico State University	\$101,908
2/5/2020	8/17/2020	15-C-CST-UC	Mapping Life Support System Functions and Technologies to Commercial Spaceflight Applications	University of Colorado Boulder	\$149,799
2/5/2020	12/12/2020	15-C-CST-FIT	Human Input Systems for Commercial Space Transportation	Florida Institute of Technology	\$160,000
2/5/2020	8/19/2020	15-C-CST-UCF	Novel Techniques for Efficient Uncertainty Quantification, Probability of Collision, and Benchmarking in Space	University of Central Florida	\$87,414
2/5/2020	8/17/2020	15-C-CST-UTMB	Development of Commercial Space Occupational Medicine Health Standards	University of Texas Medical Branch at Galveston	\$191,803
2/5/2020	12/31/2020	15-C-CST-FIT	Streamlined Export Control for Commercial Space Transportation	Florida Institute of Technology	\$160,000
2/5/2020	9/29/2020	15-C-CST-NMSU	Spaceport Ops Online Reference Guide	The Regents New Mexico State University	\$101,589
2/5/2020	1/30/2021	15-C-CST-UCF	LED-based Low Cost Gas Sensor for Crew and Vehicle Safety	University of Central Florida	\$178,800

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### 3. Aviation Research Grants

The table below details the FAA’s active aviation research grants.

Active Aviation Research Grants in FY 2020					
Award Date	End Date	Grant Award No.	Subject/Purpose	Institution	Total Obligations
9/1/2020	3/30/2023	692M15-20-4-0002	Human Factors research to understand current visual scanning techniques (training, application) in 14 CFR Part 25 aircraft (transport category) to provide FAA with a data-driven foundation for identifying the acceptability of design assumptions and mitigations proposed for new flight deck layout/designs.	University of Michigan	\$376,000
9/1/2020	8/31/2022	692M15-20-4-0003	To study composite bonded repairs and advanced metallic materials for aircraft structures, on site at the FAA William J. Hughes Technical Center.	Drexel University	\$350,000
9/1/2020	2/28/2023	692M15-20-4-0004	Weather Technology in the Cockpit.	Embry-Riddle Aeronautical University	\$186,500
8/1/2020	9/30/2025	692M15-20-4-0005	To enhance the quantitative understanding of all phenomena and mechanisms that govern fuel injection, fuel-air mixing, ignition, burning and the heat flux generated during the operation of FAA’s NexGen burner.	University of Cincinnati	\$100,434
8/1/2020	7/31/2021	692M15-20-4-0006	Evaluation of structural integrity assessment tools for higher-criticality metal additive manufacturing parts.	Southwest Research Institute	\$200,000
7/13/2020	7/12/2021	692M15-20-4-0001	Probabilistic integrity and risk assessment of turbine engines, Phase 3.	Southwest Research Institute	\$1,125,000
4/1/2020	3/31/2021	2016-G-006	Study damage modes in lightweight sandwich structures using analysis and testing (Amendment 12).	National Institute of Aerospace	\$5,513,820
10/1/2019	9/1/2022	692M15-19-4-0004	Develop method to determine surface drop collection efficiency using microwave technique.	Baylor University	\$216,125

Active Aviation Research Grants in FY 2020					
Award Date	End Date	Grant Award No.	Subject/Purpose	Institution	Total Obligations
9/26/2019	9/29/2021	692M15-19-4-0009	Focus on emerging issues in vehicle automation and electric propulsion systems, as well as evaluation of data mining approaches to monitor and quantify degraded braking conditions, and emerging issues in air transportation.	Massachusetts Institute of Technology	\$179,053
9/26/2019	3/26/2021	692M15-19-4-0005	Investigate alternative ways of acceptance of unbound pavement materials (subgrade, subbase, and base) based on modulus, density, or other material properties.	University of El Paso Texas	\$155,000
9/13/2019	9/30/2021	692M15-19-4-0003	Develop methodologies that can be used to decide the cutoff value on the tail of input variable distributions.	Rutgers, The State University of New Jersey	\$260,310
9/1/2019	9/30/2022	692M15-19-4-0010	Conduct research in the areas of lighting technology, human factors, and photometry and radiometry studies focused on airport lighting and visual guidance systems and applications.	Rensselaer Polytechnic Institute	\$216,125
9/1/2019	8/30/2021	692M15-19-4-0011	Novel material fracture design for engine related impact failure.	University of Dayton	\$58,864
5/19/2018	5/18/2021	692M15-18-4-0003	Metal and composite material model development for engine related impact failure.	George Mason University	\$1,800,000
4/6/2018	1/6/2021	692M15-18-4-0002	Support research for head-worn/helmet-mounted Displays (HW/HMD) and Enhanced/ Synthetic/ Combined Vision Systems for rotorcraft. Iowa University's Operator Performance Laboratory (IU-OPL) utilizes an MI-2 helicopter equipped with several sensors and an HMD to conduct flight trials in various environmental conditions to determine pilot performance and human factors issues with vision systems devices. Through the agreement, IU-OPL also assists the FAA with human factors expertise including photometry and luminance measurements for OPL trials to a helipad with	University of Iowa	\$875,068

Active Aviation Research Grants in FY 2020					
Award Date	End Date	Grant Award No.	Subject/Purpose	Institution	Total Obligations
			FAA provided lighting, as well as FAA WJHTC S76 helicopter simulator HW/HMD device integration.		
9/30/2017	9/29/2020	2017-G-012	Conduct synthesis and evaluation of ultra-fire resistant polymers that are environmentally benign.	University of Massachusetts Amherst	\$1,900,905
8/10/2017	8/31/2021	2017-G-011	Continued characterizations of frost evolution on aviation wing-skin surfaces and in cold-soaked fuel frost conditions in the Baylor Climatic and Aviation Frost Facility, the construction of two new wing skins surfaces based on composite materials for frost evolution measurements, and continued analytical model development for frost thickness and roughness evolution on fuel-laden wings following flights.	Baylor University	\$987,772
6/1/2017	5/31/2022	2017-G-006	Conduct research on emerging aviation fire threats, including lithium battery fires.	Rutgers, The State University of New Jersey	\$436,830
6/1/2017	10/31/2021	2017-G-007	Planning and development of roadmap for Emerging Technologies Research.	Wichita State University	\$1,785,000
4/15/2017	12/31/2021	2017-G-004	Gather flight load data for heavy air tankers and develop methodologies to correlate the atmospheric turbulence to structural loads.	Wichita State University	\$449,865
3/13/2017	6/30/2022	2017-G-003	Develop methods and gather data necessary for safe integration of Active Flutter Suppression into new airplanes, and also, to establish safe and achievable free play limits for transport category airplanes.	University of Washington	\$1,700,000
9/1/2016	1/6/2021	2016-G-015	Conduct research for head-worn/helmet-mounted displays and artificial intelligence/machine learning techniques geared towards increasing helicopter safety. Rowan's CAVE VR Lab is being used to develop a VR model of the FAA's Helicopter, Landing Sites, and Flight Instruments.	Rowan University	\$853,212

Active Aviation Research Grants in FY 2020					
Award Date	End Date	Grant Award No.	Subject/Purpose	Institution	Total Obligations
8/22/2016	8/21/2020	2016-G-017	Conduct research to identify and integrate essential fire properties into a numerical framework to better understand and predict flammability of materials.	University of Maryland	\$1,487,103
8/22/2016	2/28/2021	2016-G-012	Conduct research in the major areas of: Ground-Based Communications, Navigation and Surveillance; Platform-Based Communications, Navigation and Surveillance; Satellite Based Communications, Navigation and Surveillance; and Airport Infrastructure, with particular emphasis on bird strike mitigation.	Ohio University	\$999,958
8/1/2016	7/30/2021	2016-G-007	Dynamic material testing for metal and composite engine related impact failure modeling.	The Ohio State University	\$5,398,800
8/1/2016	7/31/2021	2017-G-005	Composite material testing and model development for engine fragment impact.	AZ Board of Regents on behalf of Arizona State University	\$1,900,905
7/1/2016	7/31/2021	2016-G-008	Aerospace Working Group Engine Related Impact Failure and Cabin Interior support, model QA, modeling guidelines development.	Central Connecticut State University	\$1,021,835
4/18/2016	12/31/2020	2016-G-005	Develop SMART (SMall Aircraft Risk Technology) software, a probabilistic risk assessment and risk management tool for small airplanes.	The University of Texas at San Antonio	\$5,400,000
9/1/2015	2/26/2021	2015-G-016	Develop damage tolerance and risk assessments methods for turbine engine life limited parts.	Southwest Research Institute	\$20,070,000
8/27/2015	12/20/2021	2015-G-017	Test and analysis of emerging technologies used in fuselage and wing applications.	Drexel University	\$7,504,413
5/1/2015	3/15/2021	2015-G-009	Provide major advances in our understanding of 3D iced-wing aerodynamics for improved flight safety.	University of Washington	\$14,011,210
4/10/2015	9/30/2020	2015-G-007	Develop nondestructive method to measure residual stress in turbine engine parts.	University of Cincinnati	\$5,600,133

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### 4. Interagency and Other Agreements

The table below details the FAA’s active interagency agreements (IAA) and other vehicles such as memoranda of understanding (MOU), memoranda of agreement (MOA), memoranda of cooperation (MOC), other transaction agreements (OTA), project arrangements (PA), cooperative agreements (CA), research and development agreements (RDA), and reimbursable agreements (RA).

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
11/18/2020	11/18/2023	692M15-18-T-00029	MOU	Lyondell Chemical Company	Provide qualification tests of unleaded aviation gasoline in support of the Piston Aviation Fuels Initiative.
9/24/2020	N/A	692M15-19-T-00019	OTA	Teledyne	Provide a data driven process for the verification and validation of the safe installation of Lithium Ion batteries used in aerospace applications.
8/31/2020	N/A	692M15-20-T-00007	OTA	EP systems	Provide a data-driven process for the verification and validation of the safe installation of Lithium Ion batteries used in aerospace applications.
7/30/2020	7/30/2025	693KA8-20-D-00013	OTA	University Corporation for Atmospheric Research; National Center for Atmospheric Research	Conduct meteorological research and development, related to inflight icing, restricted ceilings and low visibility, convective weather, numerical weather prediction modeling and data assimilation techniques, and turbulence.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
7/21/2020	7/20/2025	ANG-RM- ACT-20-CT- 003979	RA	U.S. Air Force Research Laboratory	Support of MMPDS handbook development.
7/9/2020	9/30/2022	693KA9-20- N-00013	IAA	KBR Wyle	Research and Development support.
5/11/2020	10/31/2020	692M15-18- N-00019	IAA	Volpe National Transportation System Center	Conduct data collection and analysis of high intensity runway edge lights – LED under varying low-visibility conditions using infrared and visible cameras.
5/2020	5/2025	692M15-20- T-00022	IAA	NASA Langley	Collaborate on advanced manufacturing technology research.
4/20/2020	4/19/2022	692M15-20- N-00004	IAA	NASA AMES Research Center	Evaluate the proposed motion cueing criteria and provide technical support to the 14 CFR Part 60 revision.
11/9/2019	9/30/2020	692M15-20- N-00002	IAA	NASA Ames Research Center	Evaluate technology or training solutions to improve go-around safety.



Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
09/27/2019	9/26/2024	IA1-30333	IAA	NASA Langley	Continue research in complex digital airborne systems reliability, safety, risk assessment, and verification. This will include full aircraft systems, hardware, software, cybersecurity, installation, and maintenance of these systems. It may also include, but is not limited to: software digital systems, electrical systems, flight control mechanical, and rotorcraft systems.
9/26/2019	9/25/2022	692M15-19-T-00027	OTA	Texas A&M University	Enhancement of PANDA-AP (Pavement Analysis using Nonlinear Damage Approach for Airports).
9/25/2019	9/24/2023	693KA9-19-N-00016	IAA	UDALL	Environmental conflict resolution.
9/12/2019	3/12/2021	692M15-19-T-00026	OTA	Auburn University	Evaluate and monitor the in-service performance of airport pavements constructed following state specification materials for aircraft less than 60,000 pounds. Identify differences in material requirements in state highway specifications versus FAA standard specifications for flexible pavement materials.
9/11/2019	07/1/2024	692M15-19-T-00020	MOA	University of Pennsylvania	Obtain nationally representative data on the relationship between aircraft noise exposure and residential sleep disturbance necessary to guide the national aviation noise policy, determinants of community noise impacts, land-use guidelines around airports, mitigation funding, and NextGen implementation.
9/11/2019	7/1/2024	692M15-19-T-00021	MOA	Westat	Obtain nationally representative data on the relationship between aircraft noise exposure and residential sleep disturbance necessary to guide the national aviation noise policy, determinants of community noise impacts, land-use guidelines around airports, mitigation funding, and NextGen implementation.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
8/28/2019	8/28/2024	ANG-RM- ACT-19-CT- 003396	RA	Science and Technology	Characterize and assess the vulnerability of wide-body composite aircraft to internal explosions such as are produced by terrorist emplaced improvised explosive devices.
7/25/2019	7/24/2021	692M15-19- N-00010	IAA	Ames Research Center	Develop performance-based standards for novel cockpit pilot interfaces of optionally piloted vehicles to support regulatory, standards, and guidance development.
6/29/2019	6/28/2024	692M15-19- T-00017	IAA	U.S. Department of Agriculture, Wildlife Services	Conduct research on reducing and mitigating wildlife strikes by aircraft.
6/24/2019	6/23/2024	692M15-19- N-00013	IAA	Armstrong Flight Research Center	Develop safety systems and improve methodologies for certifying general aviation aircraft.
6/5/2019	6/4/2024	692M15-19- T-00013	IAA	U.S. Air Force Lifecycle Management Center	Conduct research in complex digital airborne systems reliability, safety, risk assessment, and verification. This will include full aircraft systems, hardware, software, cybersecurity, validation, and verification of these systems. The broad areas of research may include software digital systems, electrical, flight control mechanical and rotorcraft systems.
3/19/2019	Indefinite	Unassigned	MOU	Southwestern Oklahoma State University	Student/research and training.
12/3/2015 10/1/2018	12/2/2020 9/30/2019	AVS-RM- AAC-15- A735; IAA 9531BM19H 0016	MOA/IAA	NTSB	Surface accidents – forensic toxicology analyses of biological specimens.
9/24/2018	9/30/2020	693KA9-18- N-00022	IAA	Volpe	Research and development support.
9/20/2018	3/31/2022	693KA9-18- N-00029	IAA	Safety Net	Certification and operational data analysis support.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
9/17/2018	12/31/2020	DTFAWA-10-C-00080	IAA	MITRE CAASD (Center for Advanced Aviation System Development)	Continue development of a statistical/probabilistic toolset to aid in the calculation of required runway length for airport development projects.
9/1/2018	9/2/2023	692M15-18-N-00022	IAA	Naval Air Warfare Center Weapons Division	Support for transport aircraft safety regulation and analysis for engine related impact failures. Development of Uncontained Engine Debris Damage Assessment Model (UEDDAM). Note 692M15-18-N-00022 has superseded this agreement.
09/2018	09/2023	ANG-RM-ACT-17-CT-001598	RA	Defense Logistics Agency	Support of MMPDS handbook development.
8/1/2018	7/31/2023	692M15-18-T-00015	OTA	Battelle Memorial Institute	Develop and maintain the process and handbook for metallic material property allowables used by the aerospace industry to ensure compliance with material strength requirements.
7/12/2018	7/11/2023	692M15-18-N-00016	IAA	Tyndall Air Force Base	Continue research and exploratory development efforts in aircraft rescue and firefighting. Research and develop, through live fire testing and analysis, implementation of fire and safety standards, and acquisition of new and superior firefighting agents and equipment including the newest generations of fire and rescue vehicles.
6/28/2018	6/27/2023	Unassigned	MOU	OK Office of the Chief Medical Examiner	COOP (Tox samples, etc.)
6/22/18	4/22/23	693KA9-18-N-00009	IAA	Department of Energy	Lifecycle analysis of low carbon and sustainable aviation fuels from co-processing of bio-feedstocks in petroleum refineries.
2/12/2018	2/11/2023	Unassigned	MOU	New Castle High School	Student Internships.
1/18/2018	1/18/2023	692M15-18-T-00003	MOA	National Institute of Aerospace	Conduct research and development, provide for outreach efforts, and establish a framework for partnering in Science, Technology, Engineering, and Mathematics, academic institutional relationships, internships, and K–12 initiatives.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
12/21/2017	12/20/2022	USAMRMC 1223899/8.1 0.17	MOU	Walter Reed Army Institute of Research	Rotations/laboratory training.
7/18/2017	12/31/2021	DTFAVP-17- X-00110	IAA	Harris Miller and Hanson	Helicopter and fixed wing aircraft extended dose response study.
7/1/2017	6/30/2022	DTFAC-17- X-80002	Interagency Agreement	National Centers for Environmental Prediction	Conduct aviation hazard diagnosis and forecast research and development.
5/9/2017	5/8/2021	DTFAC-17- V-00011	MOA	Metropolitan Airports Commission	Conduct indoor navigation technology study for visually impaired passengers inside one of terminals at Minneapolis-St. Paul International Airport.
2/21/2017	2/20/2021	DTFAC-17- X-80000	IAA	Ames Research Center	Design and conduct human-in-the-loop flight simulation experiments to develop and refine stabilized approach criteria.
9/27/16	N/A	N/A	MOU	Massachusetts Port Authority	This MOU establishes a framework for cooperation by the FAA and the port authority in exploring, evaluating, and advancing changes or amendments to PBN procedures that reduce impacts from aircraft overflight noise, while at the same time maintaining the safety and efficiency benefits of PBN procedures at Boston.
9/15/2016	9/14/2021	ANG-RN- ACT-16-CT- 000670	RA	U.S. Forest Service	USFS provides the FAA with funds to gather statistical flight load data and develop methodologies for firefighting missions.
9/8/2016	Until terminated	DTFAC-16- X-0004	IAA	Langley Research Center	Conduct research, development, and testing in the area of aircraft structures and materials.
6/1/2016	5/31/2021	DTFAWA-16- X-80009	IAA	Earth System Research Laboratory	Conduct meteorological research and development related to modeling and data assimilation techniques, and measurement of forecast quality.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
9/30/2015	9/30/2020	DTFAWA-15-A-80010	OTA	Pratt & Whitney	Under CLEEN Phase II, Pratt & Whitney is developing and demonstrating technologies for the engine compressor and turbine to improve engine thermal efficiency and reduce fuel burn for Pratt & Whitney geared turbofan engines. The development work is focused on advanced aerodynamics, cooling, and durability optimization.
9/30/2015	9/30/2020	DTFAWA-15-A-80012	OTA	Rolls-Royce	Under CLEEN Phase II, Rolls-Royce’s advanced Rich-Quench-Lean combustion system employs advanced fuel injection and mixing technologies that will provide significant emissions reduction while simultaneously enabling the increase in turbine entry temperature required by advanced engine cycles.
9/30/2015	9/30/2020	DTFAWA-15-A-80011	OTA	Boeing	Under CLEEN Phase II, Boeing is conducting design and test work in collaboration with Rolls-Royce on a compact nacelle inlet and thrust reverser design for ultra-high bypass engines. The technology is expected to reduce weight and allow for improved acoustic treatment. Boeing is also developing and demonstrating advanced aircraft wing technologies. The Structurally Efficient Wing provides large weight reductions through new manufacturing techniques and advanced composite material technology, resulting in a reduction of aircraft fuel burn.
9/30/2015	9/30/2020	DTFAWA-15-A-80016	OTA	America’s Phoenix, MDS Coating, and Delta Tech Ops	Under CLEEN Phase II, the team is developing and demonstrating a protective leading edge coating for gas turbine engine fan blades. This coating protects against fan blade erosion, a source of lost aerodynamic efficiency in engines in service.

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
9/16/2015	9/16/2020	DTFAWA-15-A-80013	OTA	General Electric	<p>Under CLEEN Phase II:</p> <p>GE conducted extensive rig test validation and development of risk mitigation technologies for the TAPS III low emissions combustor, thus enabling the technology to meet the CLEEN II NOx target.</p> <p>GE is developing novel acoustic liner and fan noise source strength reduction technologies to combat the reduced noise treatment area available in low fan pressure ratio engines.</p> <p>MESTANG is an integrated aircraft power system, designed to support future “more-electric” aircraft architectures, that optimizes new power extraction, generation, distribution, and conversion systems.</p> <p>GE’s FMS software algorithms will optimize aircraft performance during the cruise and descent phases of flight.</p>
8/5/2015	8/5/2020	DTFAWA-15-A-80015	OTA	Collins Aerospace (formerly known as United Technologies Corporation / Rohr Inc.	Under CLEEN Phase II, Collins Aerospace is developing integrated propulsion system nacelle technology to reduce noise, fuel burn, and emissions. The company is advancing innovative acoustic treatment technologies and clean fan duct thrust reverser designs.
8/1/2015	Indefinite	Unassigned	MOA	Aerospace Medicine Research Alignment and Collaboration Council (AMRAC: NASA/USA/USN/USAF/FAA)	Aerospace medicine research alignment and collaboration.
6/6/2014	11/6/2020	DTFAC-17-V-00009	OTA	Elbit Systems, Ltd.	Support use of new technologies present for EVS/SVS/CVS and HWD/HMD available to helicopter operators in order to research regulatory changes from potential minima on helicopter instrument approach procedures.
12/4/2013	12/3/2018	Being updated	MOU	U.S. Air Force	Military egress training

Period of Performance		Contract No.	Vehicle Type	Vendor Org	Purpose
Start Date	End Date				
10/31/2013	10/30/2018	Being Updated	MOU	U.S. Navy	Military egress training.
4/22/2013	Indefinite	Unassigned	MOU	NTSB-FAA-CAMI-ASIAS	NTSB data.
9/24/2012	Indefinite	N/A	Other	Royal Canadian Air Force	Forensic Toxicology Cases ( $\leq 10$ /yr.)
9/13/2012	2/28/2021	DTFACT-12-X-00009	IAA	Department of Energy /National Nuclear Security Administration /Sandia Site Office	Provide engineering support on various FAA airworthiness assurance programs.
8/23/2012	9/30/2037	DTFASO-10-H-00131	MOA	Delaware River and Bay Authority	Allow FAA to build and operate a research taxiway at Cape May County Airport.
7/10/2007	7/9/2012	AST – Being Updated	MOC	AST-CAMI	Collaboration, research, and training support.
10/1/1999	Until terminated	PA-17	PA	Transport Canada	Conduct ground icing research.
1/3/1975	Indefinite	NA	Reimbursable MOA	DOT and NTSB	Aerospace accident forensic toxicology.
2002	Indefinite	Unassigned	MOU	Royal Military College of Canada	Instrument loan.

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## 5. International Agreements

The table below details the FAA’s active international agreements.

Active Agreements in FY 2020 - International				
Effective Date	FAA R&D Program	Agreement Number	Partner	Objective/Purpose
9/19/2019	Harmonizing Safety and Environment Factors	NAT-I-3454-5-9	Eurocontrol	License of Base of Aircraft Data version 4
6/11/2019	Disbond Failures of Sandwich Structures	CON-I-8000-1-1	Technical University of Denmark	Sets forth the terms and conditions under which the FAA and DTU may cooperate to investigate the in-service disbond failures observed in composite sandwich aircraft structures.
12/13/2017	NextGen/SESAR Air Traffic Management Modernization, Civil Aviation Research and Development and Global Interoperability	NAT- I-9406A1-1-1	European Union	Cooperation on research and development for ATM modernization programs, NextGen and SESAR, taking into account the interests of civil and military airspace users.
3/28/2017	GBAS	NAT-I-4016-I	Brazil ANSP	Research and analysis of data collected from ionospheric disturbances and its effect on the system performance of Ground-Based Augmentation Systems.
9/4/2015	Aircraft Icing	CON-I-5102-1-1	Finnish Transport Safety Agency	Aircraft icing research, including frost formation studies, computation fluid dynamics for ground de/anti-icing fluids, and de/anti-icing fluids aerodynamics characteristics.
1/6/2015	Air Traffic Management and Air Transportation Research	NAT- I-3454-1-5	Eurocontrol	Exchange research and development activities such as: procedures, operational safety, capacity enhancements, research results, publications, and/or technical reports related to air traffic management performance research and air transportation research.
9/3/2014	Alternative Fuels	NAT-I-8417 Annex 4	National Research Council of Canada	Aircraft and propulsion system alternative fuels research.
12/9/2013	Aircraft Icing	CON-I-3101-1	Centre National de la Recherche Scientifique	Research of inflight icing conditions, including convective weather ice crystal and super cooled large droplet icing conditions.
12/9/2013	Aircraft Icing	CON-I-3101-1-1	Centre National de la Recherche Scientifique	Research of inflight icing environment and the instrumentation used to measure the variables employed to describe those environments.



Active Agreements in FY 2020 - International				
Effective Date	FAA R&D Program	Agreement Number	Partner	Objective/Purpose
9/24/2013	ATM Performance Measurement	NAT-I-3001	CAA- Singapore	Establish cooperation in performing ATM modernization.
2/12/2013	ATM Performance Measurement	NAT-I-9406-2	European Union	U.S.-EU Coordination of ATM-related operational performance reports.
7/11/2012	Harmonizing Safety and Environment Factors	NAT-I-3454-5-7	Eurocontrol	License of Base of Aircraft Data version 3.X for installation in Noise Integrated Routing System (NIRS), NIRS Screening Tool, Aviation Environmental Development Tool, and Aviation Environmental Screening Tool software.
10/7/2011	Aircraft Icing	CON-I-2901-1	Bureau of Meteorology, Australia	Research of inflight icing conditions, including super cooled large droplet conditions.
10/7/2011	Aircraft Icing	CON-I-2901-1-1	Bureau of Meteorology, Australia	Research of inflight icing environments and the instrumentation used to measure the variables employed to describe those environments.
12/9/2011	Aircraft Icing	NAT-I-8917-1	National Research Council of Canada	Aircraft and Propulsion System Icing Research (Annex 1 to MOC): This agreement forms cooperative research on simulation of ice crystal environments for the investigation of effects of such environments on engines.
9/12/2011	System Safety Management	AIA/CA-52-8-10	CAA- Netherlands	Identify operational enhancements, constraints, and procedures needed to improve the safety and efficiency of terminal area operations.
5/11/2011	Wake Turbulence	NAT-I-8417-1-3	National Research Council of Canada	Research on the effects of aircraft wake turbulence on training aircraft.
6/19/2007	Airport Technology Capacity	AIA/CA-5 Annex 16	La Direction Generale de L'Aviation Civile	Coordination of R&D activities and the sharing of information resulting from related studies, tests, and analyses in the field of airfield pavement.
10/17/2006	Harmonizing Safety and Environment Factors	NAT-I-3454-5-4	Eurocontrol	License of Base of Aircraft Data version 3.X for installation in Aviation Environmental Design Tool/Integrated Noise Model and Aviation Environment Design Tool/Emissions Dispersion Modeling System software.
9/24/2004 ON HOLD	Cooperation in Air Traffic Management Research	NAT-I-3454-1-1	Eurocontrol	Collaborate on Wave Vortex activities – provision of active or real-time sensing and alerting of wake vortex impacts, collaboration on use of current measures and analysis techniques to identify wake dissipation standards/responses under varying operational conditions, and analysis of impact of newer generations of aircraft on proposed wake separation standards.

Active Agreements in FY 2020 - International				
Effective Date	FAA R&D Program	Agreement Number	Partner	Objective/Purpose
9/24/2004	NA	NAT-I-3454	Eurocontrol	Appendices 2, 4, 5, and 6 to Annex 5 of NAT-I-3454 allow for the exchange of trajectory data and modeling tools information between the two entities.
9/24/2004	Air Traffic Management Research	NAT- I-3454-1	Eurocontrol	Air Traffic Management Research: collaborate and share experiences on various ATM research topics that are of interest to both the United States and Europe.
9/24/2004	Harmonizing Safety and Environment Factors	NAT-I-3454-5	Eurocontrol	Collaborate on and share methods for evaluating safety management, ATM security, and ATM environmental factors.
4/2/2004	Fire Safety	AIA/CA-41 Annex 3 Appendix 7	CAA – United Kingdom	Establish a method of cooperation in performing research to improve passenger survivability during aircraft emergencies or accidents involving fire.
7/10/2001	System Safety Management	AIA/CA-52	CAA - Netherlands	Establishes a method of cooperation in R&D programs in the area of aviation system safety including the risks to the public connected with civil aviation activities and operations in the vicinity of airports.
7/10/2001	System Safety Management	AIA/CA-52-8	CAA - Netherlands	Cooperatively study risk, safety modeling, and safety analysis.
4/29/1999	Aircraft Icing	NAT-I-9403-1	Environment and Climate Change Canada	Collaborative research in the area of inflight icing environments and the instrumentation used to measure the variables employed to describe those environments.
6/18/1970	Aircraft Icing	MOC NAT-I-0831 PA-17	Transport Canada	Deicing and Anti-Icing Research: The investigation of aerodynamic flow-off characteristics of anti-icing fluids contaminated with different types of frozen precipitation; the investigation of the effectiveness of proposed laboratory test procedures in evaluating aircraft anti-icing fluids' failure modes in mixed icing conditions; and the investigation into other associated aircraft deicing problems and issues.

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