

FAA UAS Research Framework and Disaster Preparedness Research

Presented to: Members of the NASA Scalable Traffic Management for Emergency REsponse Operations (STEReO) Workshop

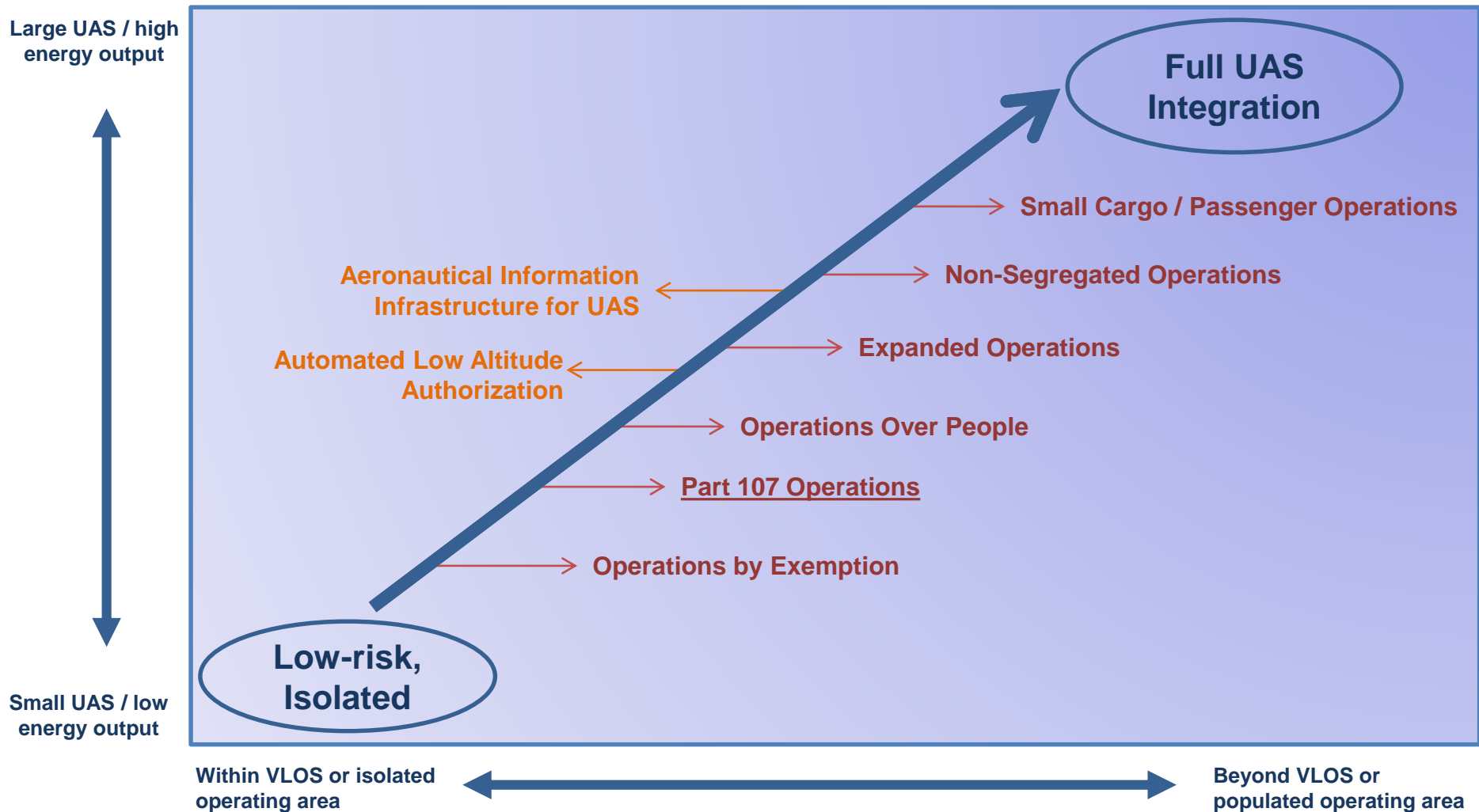
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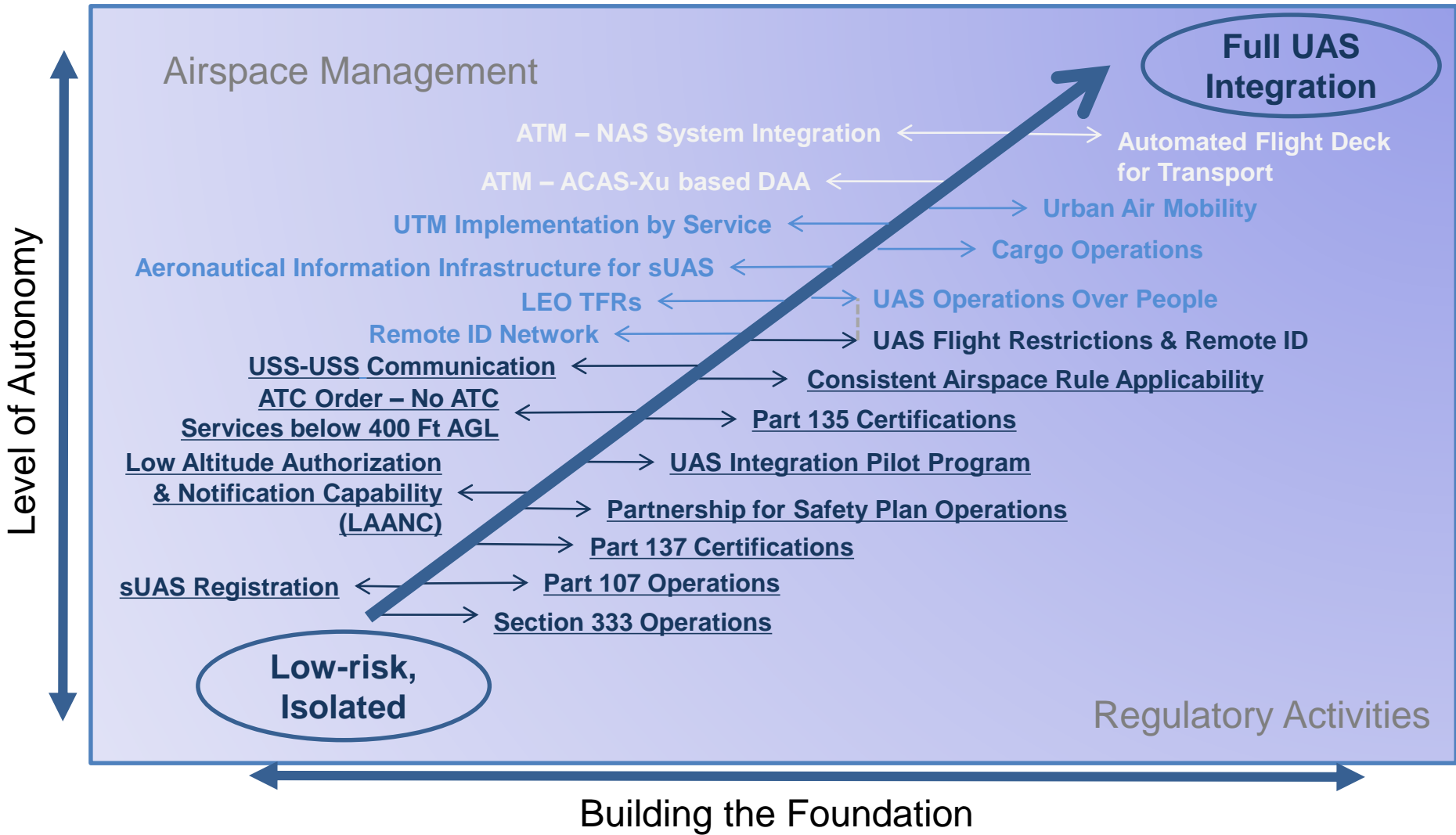


Federal Aviation Administration

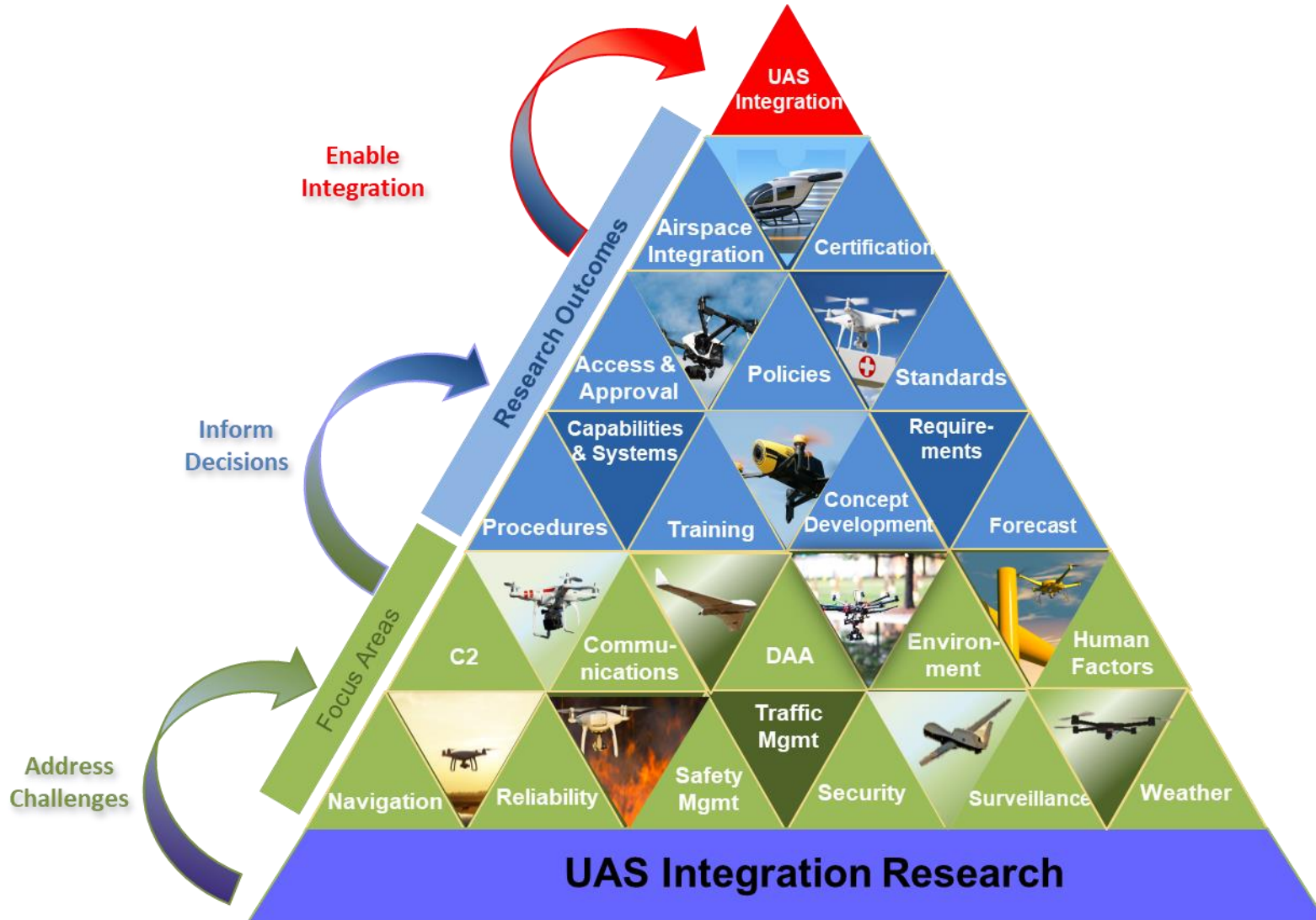
UAS Integration Strategy – 2016



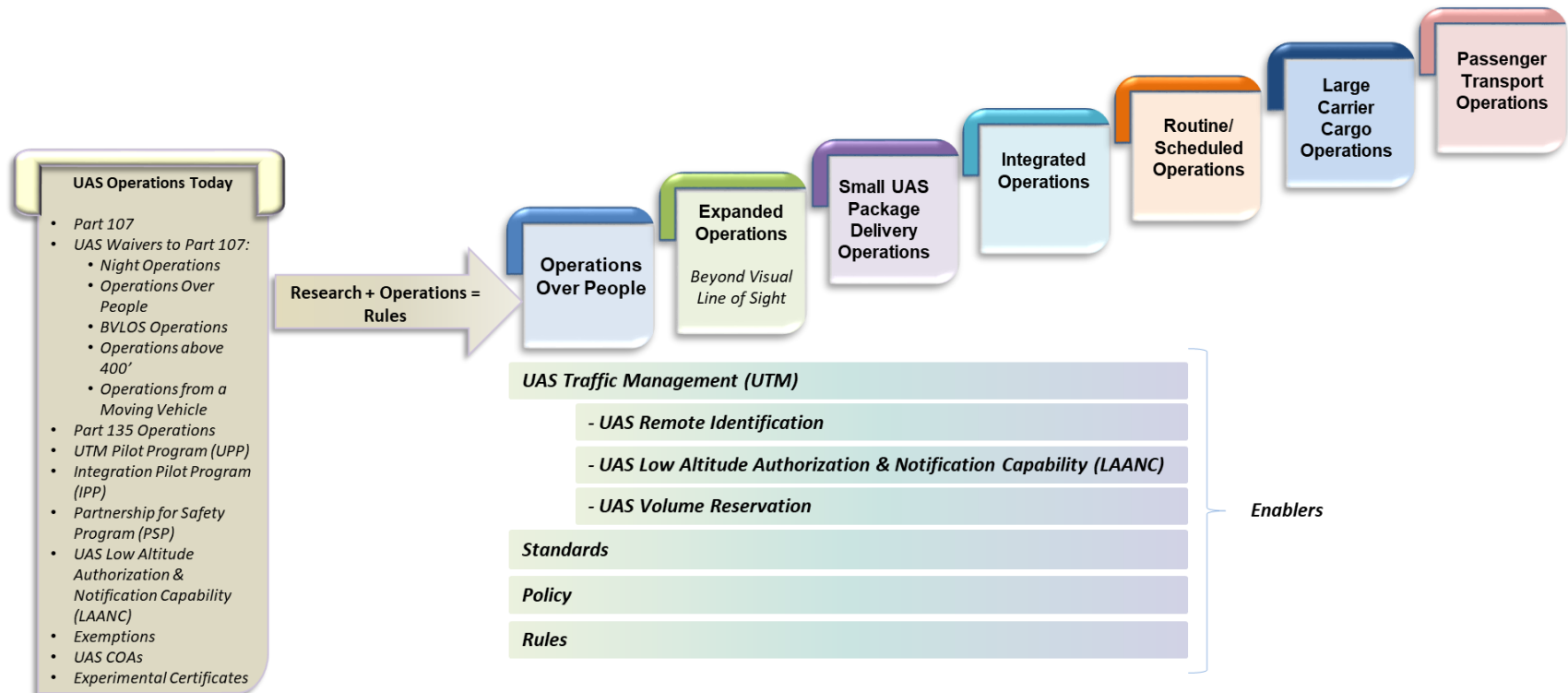
UAS Integration Strategy – 2020



FAA UAS Integration Research Functional Framework



Research Informs UAS Operational Capabilities



UAS Research Collaboration & Partnerships



3-Year UAS RE&D Appropriations Accelerates Research

Recent Appropriations validate the importance of UAS Research activities

FY17 Appropriation

The agreement provides the following levels for specific programs:

Program	Budget	Agreement
FAA Research & Policy	2,025,000	2,025,000
Transportation Research	2,278,000	2,278,000
Advanced Research Support Policy	4,115,000	4,000,000
Advanced Research Support Policy (Core Research)	1,500,000	1,500,000
Continued AAS Initiatives	6,300,000	5,200,000
Unmanned Aircraft Systems Research	19,000,000	20,035,000
Advanced Manufacturing Research (Advanced Systems)	4,115,000	5,000,000
Public Safety Management (Continued and New)	2,000,000	2,000,000
Advanced Research	5,000,000	4,300,000
Unmanned Aircraft Systems Research	4,600,000	6,670,000
Research - Advanced Research for NextGen	1,750,000	1,750,000
Continued Basic Transportation Policy	1,800,000	1,800,000
Research - Next Generation	1,800,000	1,800,000
Research - Air Traffic Management Research Program	8,375,000	8,375,000
Research - System Integration	1,800,000	1,800,000
Research - Information Security	1,800,000	1,800,000
Management & Support	1,000,000	1,000,000

Continued effort on research. The agreement provides \$20,035,000 for Unmanned Aircraft Systems (UAS) Research, an increase of \$2,670,000 above the fiscal year 2016 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system. Of this amount, \$3,650,000 is provided to the NextGen integrated laboratories, in partnership with NASA laboratories, to provide the growth of coverage supporting the integration of UAS into the national airspace. This effort will assure compatibility with national airspace systems through the Transport Traffic Management system, which will ensure an air traffic control network for UAS that will have the capability to communicate with existing NAS infrastructure. Additional funding is provided to UAS Research, \$2,000,000 above the fiscal year 2016 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system. Of this amount, \$3,650,000 is provided to the NextGen integrated laboratories, in partnership with NASA laboratories, to provide the growth of coverage supporting the integration of UAS into the national airspace. This effort will assure compatibility with national airspace systems through the Transport Traffic Management system, which will ensure an air traffic control network for UAS that will have the capability to communicate with existing NAS infrastructure. Additional funding is provided to UAS Research, \$2,000,000 above the fiscal year 2016 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system.

Unmanned aircraft systems research.—The agreement provides \$20,035,000 for Unmanned Aircraft Systems (UAS) Research, an increase of \$2,670,000 above the fiscal year 2016 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system. Of this amount, \$3,650,000 is provided to the NextGen integrated laboratories, in

FY18 Appropriation

The agreement provides the following levels for specific programs:

Program	Budget	Agreement
FAA Research & Policy	2,025,000	2,025,000
Transportation Research	2,278,000	2,278,000
Advanced Research Support Policy	4,115,000	4,000,000
Advanced Research Support Policy (Core Research)	1,500,000	1,500,000
Continued AAS Initiatives	6,300,000	5,200,000
Unmanned Aircraft Systems Research	19,000,000	24,035,000
Advanced Manufacturing Research (Advanced Systems)	4,115,000	5,000,000
Public Safety Management (Continued and New)	2,000,000	2,000,000
Advanced Research	5,000,000	4,300,000
Unmanned Aircraft Systems Research	4,600,000	6,670,000
Research - Advanced Research for NextGen	1,750,000	1,750,000
Continued Basic Transportation Policy	1,800,000	1,800,000
Research - Next Generation	1,800,000	1,800,000
Research - Air Traffic Management Research Program	8,375,000	8,375,000
Research - System Integration	1,800,000	1,800,000
Research - Information Security	1,800,000	1,800,000
Management & Support	1,000,000	1,000,000

Continued effort on research. The agreement provides \$24,035,000 for Unmanned Aircraft Systems (UAS) Research, an increase of \$17,248,000 above the fiscal year 2018 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system. Of this amount, \$12,035,000 is provided to the NextGen integrated laboratories, in partnership with NASA laboratories, to provide the growth of coverage supporting the integration of UAS into the national airspace. This effort will assure compatibility with national airspace systems through the Transport Traffic Management system, which will ensure an air traffic control network for UAS that will have the capability to communicate with existing NAS infrastructure. Additional funding is provided to UAS Research, \$2,000,000 above the fiscal year 2018 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system.

Unmanned aircraft systems (UAS) research.—The agreement provides \$24,035,000, an increase of \$17,248,000 above the budget request. Of the funds provided, \$12,035,000 is to support the expanded role of the UAS Center of Excellence, \$2,000,000 is to expand the Center's role in transportation disaster preparedness and response, and \$10,000,000 is to support UAS research activities at the FAA technical center and other FAA facilities.

FY19 Appropriation

The agreement provides the following levels for specific programs:

Program	Budget	Agreement
FAA Research & Policy	2,025,000	2,025,000
Transportation Research	2,278,000	2,278,000
Advanced Research Support Policy	4,115,000	4,000,000
Advanced Research Support Policy (Core Research)	1,500,000	1,500,000
Continued AAS Initiatives	6,300,000	5,200,000
Unmanned Aircraft Systems Research	19,000,000	24,035,000
Advanced Manufacturing Research (Advanced Systems)	4,115,000	5,000,000
Public Safety Management (Continued and New)	2,000,000	2,000,000
Advanced Research	5,000,000	4,300,000
Unmanned Aircraft Systems Research	4,600,000	6,670,000
Research - Advanced Research for NextGen	1,750,000	1,750,000
Continued Basic Transportation Policy	1,800,000	1,800,000
Research - Next Generation	1,800,000	1,800,000
Research - Air Traffic Management Research Program	8,375,000	8,375,000
Research - System Integration	1,800,000	1,800,000
Research - Information Security	1,800,000	1,800,000
Management & Support	1,000,000	1,000,000

Continued effort on research. The agreement provides \$24,035,000 for Unmanned Aircraft Systems (UAS) Research, an increase of \$17,248,000 above the fiscal year 2019 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system. Of this amount, \$12,035,000 is provided to the NextGen integrated laboratories, in partnership with NASA laboratories, to provide the growth of coverage supporting the integration of UAS into the national airspace. This effort will assure compatibility with national airspace systems through the Transport Traffic Management system, which will ensure an air traffic control network for UAS that will have the capability to communicate with existing NAS infrastructure. Additional funding is provided to UAS Research, \$2,000,000 above the fiscal year 2019 enacted level, to address the host of research challenges associated with the integration of UAS into the NAS system.

Unmanned aircraft systems (UAS) research.—The conferees provide \$24,035,000 for UAS research, including \$12,035,000 for the UAS center of excellence in UAS research, \$2,000,000 to expand the center's role in transportation disaster preparedness and response, and \$10,000,000 to support UAS research activities at the FAA technical center and other FAA facilities.



The FAA Reauthorization Act of 2018

H.R. 302 Legislation Related to UAS Research

- **Sec. 343: UAS Test Sites**
 - Requires the FAA to carry out certain activities and programs in support of the FAA UAS Test Sites
 - COE and IPP Participants are partnered with Test Sites for research activities
- **Sec. 345: Small Unmanned Aircraft Safety Standards**
 - Establish a process to accept risk-based consensus safety standards
 - Research activities inform safety standards and rule making
- **Sec. 351: UAS Integration Pilot Program (IPP)**
 - Codifies pilot program. Notify Congress before initiating any additional rounds of selections/participation
- **Sec. 359: Study on Fire Department and Emergency Service Agency Use of UAS**
 - Report to Congress on use of UAS by fire and emergency service agencies
 - Initiating research effort on use of UAS for Disaster Preparedness & Response
- **Sec. 364: U.S. Counter-UAS System Review of Inter-Agency Coordination Processes;**
 - Review interagency coordination process and standards for operating C-UAS systems
- **Sec. 365: Cooperation Related to Certain Counter-UAS Technology**
 - Requires the FAA to work with government security partners for counter-UAS coordination & system deployment
 - Research activities will support ASH with counter-UAS responsibilities
- **Sec. 376: Plan for Full Operational Capability of UTM**
 - Requires the FAA to create a comprehensive plan for the implementation of UTM systems
 - Completion of UTM Pilot Program (UPP) will inform FAA's UTM Comprehensive Plan
- **Sec. 383: Airport Safety and Airspace Hazard Mitigation and Enforcement**
 - Includes testing and evaluation of detection and mitigation technologies at five airports



Section 359

SEC. 359. STUDY ON FIRE DEPARTMENT AND EMERGENCY SERVICE AGENCY USE OF UNMANNED AIRCRAFT SYSTEMS.

(a) STUDY.—

(1) IN GENERAL.—The Administrator shall **conduct a study on the use of unmanned aircraft systems by fire departments and emergency service agencies.** Such study shall include an analysis of—

(A) how fire departments and emergency service agencies currently use unmanned aircraft systems;

(B) obstacles to greater use of unmanned aircraft systems by fire departments and emergency service agencies;

(C) the best way to provide outreach to support greater use of unmanned aircraft systems by fire departments and emergency service agencies;

(D) laws or regulations that present barriers to career, combination, and volunteer fire departments' ability to use unmanned aircraft systems;

(E) training and certifications required for the use of unmanned aircraft systems by fire departments and emergency service agencies;

(F) airspace limitations and concerns in the use of unmanned aircraft systems by fire departments and emergency service agencies;

(G) roles of unmanned aircraft systems in the provision of fire and emergency services;

(H) technological challenges to greater adoption of unmanned aircraft systems by fire departments and emergency service agencies; and

(I) other issues determined appropriate by the Administrator.

(2) CONSULTATION.—In conducting the study under paragraph (1), the Administrator shall consult with national fire and emergency service organizations.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the study conducted under subsection (a), including the Administrator's findings, conclusions, and recommendations.



Projected Benefit of Research

- **The research effort sets out to answer the following research questions and any related questions that arise during the research process:**
 - What are the use cases for the different disasters preparedness and response efforts that UAS can help facilitate?
 - How is coordination done today with agencies to ensure safe operations after a disaster?
- **Fulfill congressional mandate**
- **The objective is to inform possible regulations and guidelines for UAS to be utilized during emergency response**
- **The research will inform different governmental agencies how they can streamline their use of UAS coordination to ensure that their efforts remain safe in the NAS**



Research Approach

- **Collaborated with government agencies to determine use cases and coordination procedures for emergency preparedness and response**
- **Analyze use cases and identify risks**
- **Through flight testing and mock events, demonstrate the coordination needed with all involved agencies and walk through the steps required for each interaction**
- **Document coordinated UAS procedures and guidelines for emergency response**



Thank You!

