Unmanned Aircraft Systems (UAS) Integration in the National Airspace System (NAS) Project

UAS Tech Forum 2018
Manned and unmanned aircraft will be able to routinely operate through all phases of flight in the NAS, based on airspace requirements and system performance capabilities.
# NASA UAS-NAS Project Activities

## C2 Performance Standards
- **Research C2 SatCom Systems**
- **Develop C2 Prototype Terrestrial System**

### Conduct C2 Flight Test and MS&A
- Data Link
- CNPC Spectrum
- CNPC Security
- BVLOS/BRLOS
- ATC Interoperability

### Develop C2 Requirements

## DAA Performance Standards
- **Develop DAA Test beds**

### Conduct DAA Flight Test and MS&A
- Human Factors Performance Trade-offs
- Low Cost SWaP sensors
- Well Clear
- Collision Avoidance

### Develop DAA Performance & Interoperability Requirements

## Integrated Test & Evaluation
- **Develop DAA Prototype System**

### Live Virtual Constructive (LVC) Test Infrastructure

### Conduct Technology and CONOPS testing

- ACAS Xu FT2
- No Chase COA
- Conduct FT5 Test Scenarios
- Conduct FT6 Test Scenarios

## Systems Integration and Operationalization
- **Develop Robust NASA/Industry Partnership**

### Develop certification compliance toolkit(s)

### Conduct Demo

## Key Products

### C2 Performance Requirements to inform C2 MOPS
- **RTCA**
- Terrestrial MOPS

### DAA Performance Requirements to inform DAA MOPS
- **RTCA**
- Non-Coop Sensor MOPS
- **GBDAA**
- MOPS

## Resultant Outcomes

### Re-usable Test Infrastructure
- **RTCA**
- DAA MOPS Rev A/B

### Substantiated path
- Generic Certification Airworthiness Approaches
UAS-NAS Project
Public/Private Partnerships

- DAA
  - Honeywell
  - Sensor

- C2
  - Rockwell Collins
  - Radio

- SIO
  - General Atomics
  - PAE ISR
  - Bell
FAA/NASA UAS Integration Research Transition Team

- Collaboration between NASA and the FAA is being coordinated through a Research Transition Team (RTT) that includes key NASA and FAA organizations.
- There are currently four Working Groups (WGs) within the UAS Integration RTT:
  - Concepts and Transversal Activities (C&TA) WG, Detect and Avoid (DAA) WG, Command and Control (C2) WG, and the Systems Integration and Operationalization (SIO) WG.
- C&TA WG: Focused on developing commercial concepts of use for UAS Integration.
- DAA WG: Focused on coordinating DAA research.
- C2 WG: Focused on coordinating C2 research.
- SIO WG: Focused on coordinating all aspects of the 2020 SIO demonstration.
- Note: The No Chase COA WG has been closed out.
  - The No Chase COA flight was successfully completed on June 12, 2018.

Collaboration Across RTT WGs
Public/Private Partnerships for Technology Development

US Government Research & Collaboration

DAA
- Honeywell
- Sensor
- Rockwell Collins
- Radio
- General Atomics
- PAE ISR
- Bell

Detect and Avoid (DAA) Working Group

Systems Integration and Operationalization (SIO) Working Group

Command and Control Working Group

Concepts and Transversal Activities (C&TA) Working Group

US Leadership of Emerging Aviation Markets

Public/Private Partnerships for Technology Development

US Government Research & Collaboration