DATAWorks 2018

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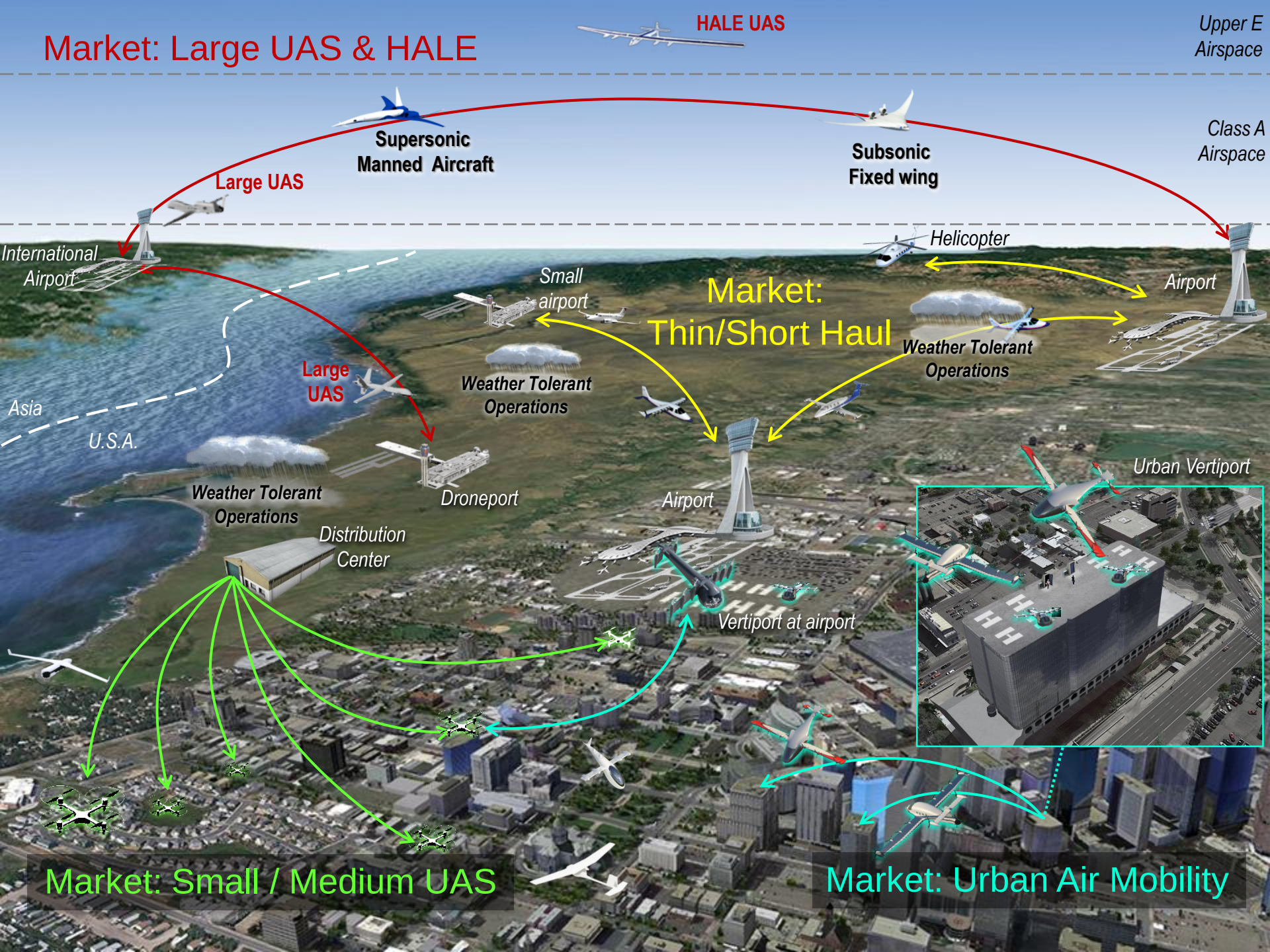
NASA Aeronautics Research Mission Directorate
March 21, 2018


Market: Large UAS & HALE
HALE UAS
Upper E Airspace
Class A Airspace
Supersonic Manned Aircraft
Subsonic Fixed wing
Large UAS
International Airport
Helicopter
Small airport
Market: Thin/Short Haul
Airport
Weather Tolerant Operations
Large UAS
Asia
U.S.A.
Weather Tolerant Operations
Droneport
Urban Vertiport
Airport
Distribution Center
Vertiport at airport
Market: Small / Medium UAS
Market: Urban Air Mobility

NASA Aeronautics

NASA Aeronautics Vision for Aviation in the 21st Century

ARMD continues to evolve and execute the Aeronautics Strategy *https://www.nasa.gov/aeroresearch/strategy*

6 Strategic Thrusts

- Safe, Efficient Growth in Global Operations
- Innovation in Commercial Supersonic Aircraft
- Ultra-Efficient Commercial Transports
- Transition to Alternative Propulsion and Energy
- In-Time System-Wide Safety Assurance
- Assured Autonomy for Aviation Transformation

U.S. leadership for a new era of flight

Broad Strategic Objectives Drives Research, Experiment and Analysis Requirements

- Concept discovery and feasibility
- Technology development and validation
- Models and Methods development and validation
- Standards development and validation
- Policy validation

- Physics-Based Simulation
- Experimental ground test
- Experimental flight test

Safe, Efficient Growth in Global Operations

Applied Traffic Flow Management

Terminal Sequencing and Spacing (TSAS) and Flight deck Interval Management (FIM) – Precision Arrivals

TOC

TOD

Integrated Arrival/Departure/Surface Management – Precision Departures

OFF

ON

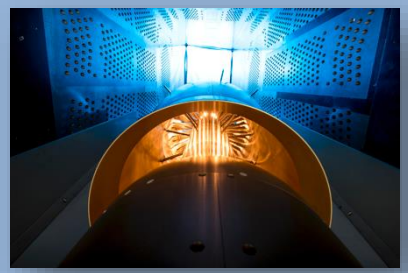
Innovation in Commercial Supersonic Aircraft

Deliver a flight validated community response database to ICAO

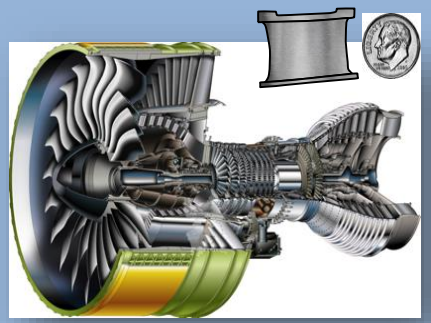
Boom Carpet

Ultra-Efficient Commercial Aircraft / Transition to Alternative Propulsion and Energy

Turbo-Electric Propulsion Architecture



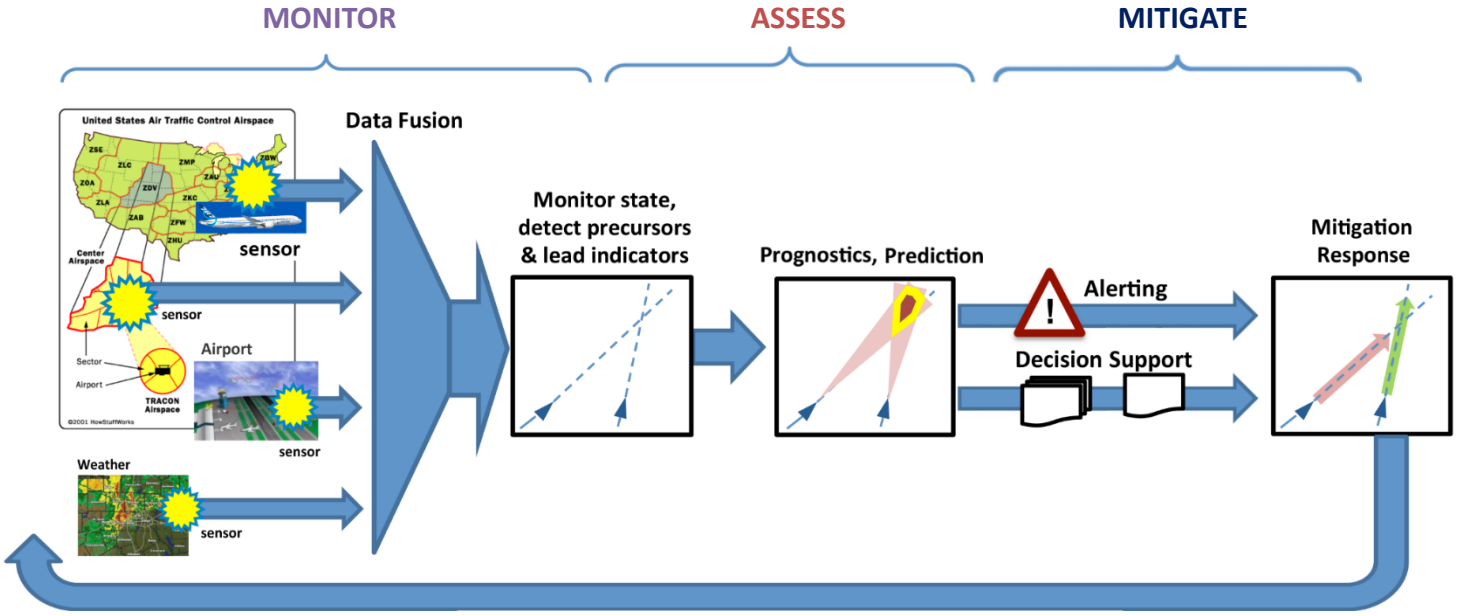
Boundary-Layer Ingesting Propulsor(s)



Ultra-Efficient "Small Core" Turbofan

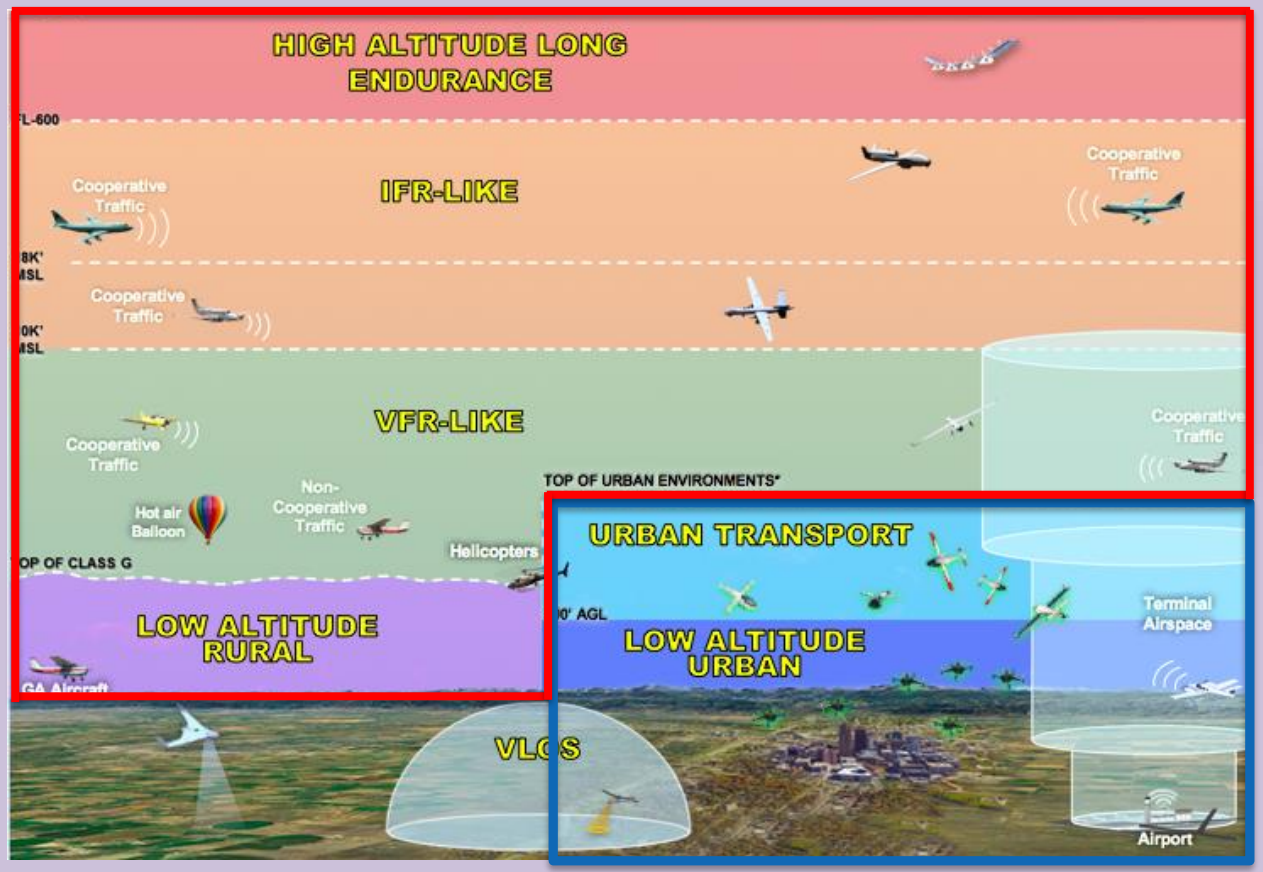
Transforming Propulsion – A Breakthrough Opportunity

In-Time System-Wide Safety Assurance



In-time system-wide safety assurance (ISSA) requires the ability to monitor operations and assets across the system, assess the current and future state of the system, and provide mitigation strategies to eliminate or minimize risk.

Assured Autonomy for Aviation Transformation



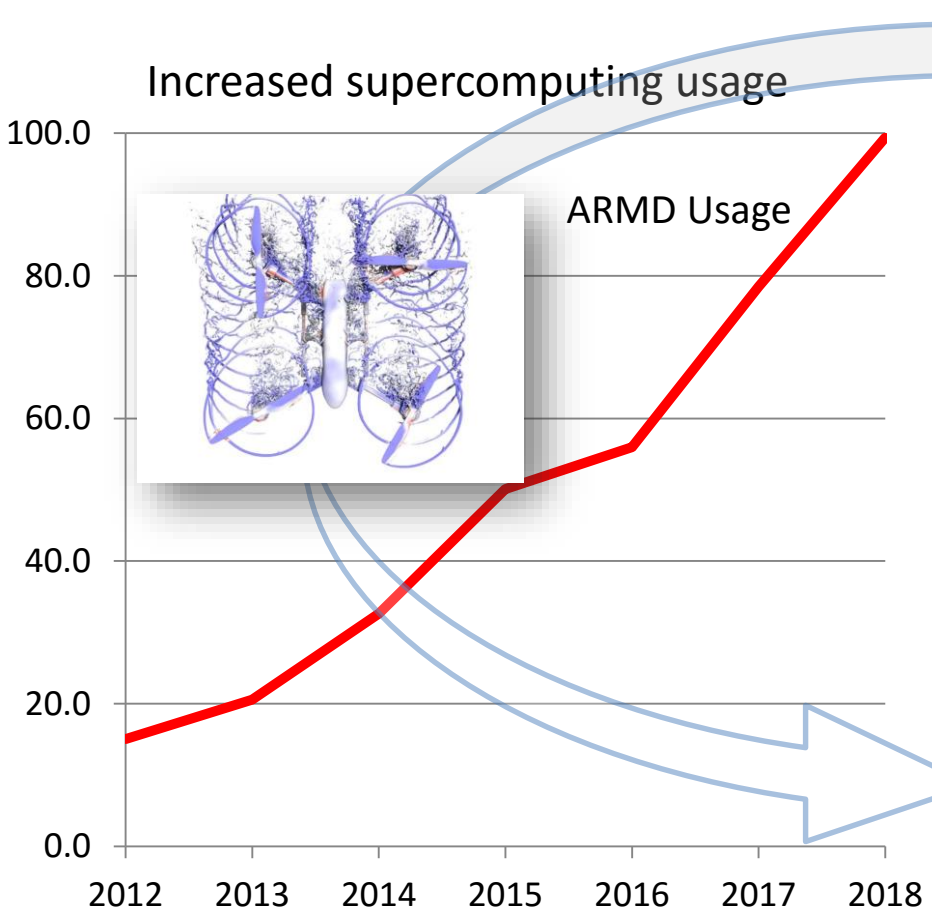
UAS in the NAS – Primary Focus is IFR-Like and VFR-Like Operations with Current NAS System

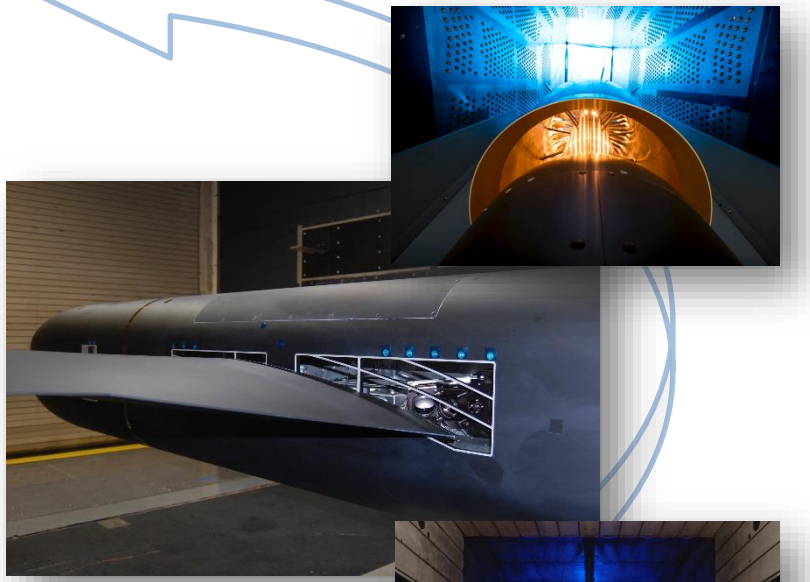
UAS Traffic Management (UTM) Primary Focus in Low Altitude Urban within a New Operational Model

Emerging, Long-Term Urban Air Mobility Focus builds off of UAS in the NAS and UTM to enable Air Taxi type operations in urban areas

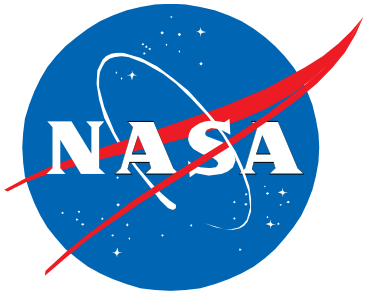
Data Requirements and Ability to Generate Data Growing Rapidly

More extensive testing & more finely detailed measurements required to achieve higher fidelity models and methods





Increased physical testing



Thank You