

EXPLORE FLIGHT

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Aeronautics Research Mission Directorate
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Global Aviation

Achieving Growth and Innovation while Overcoming Challenges



Over Next 20 Years...

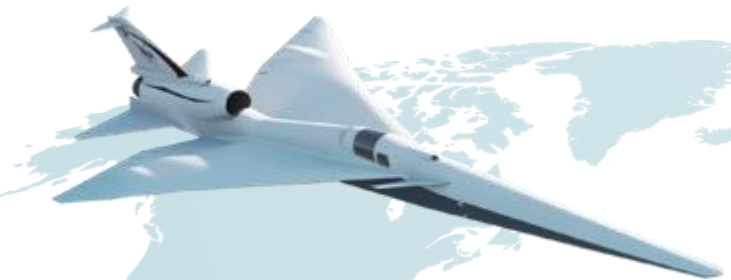
Traditional Aviation grows by 2.5X RPKs and 2X Fleet Size
Emerging aviation markets grow to millions? billions? of operations

While Aviation Also...

Improves Safety
Reduces Environmental Impact
Enhances Mobility
Increases Workforce Productivity

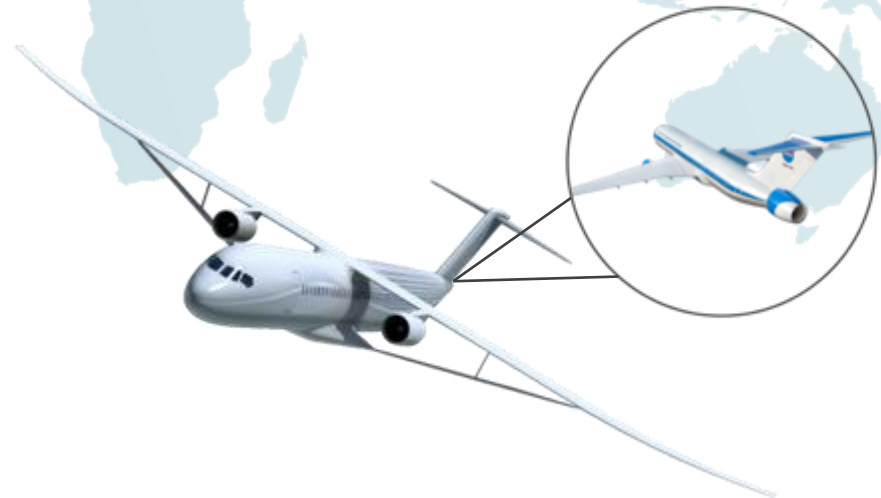
Is it all possible?

Traditional Aviation – A New Era of Innovation



Reintroduction of commercial supersonic flight will emerge as long-standing hurdles are solved

On the horizon is the next generation highly efficient subsonic airliner and the introduction of hybrid-electric propulsion



Emerging Aviation Markets – UAS, UAM and Thin Haul



**Commercial small UAS missions
emerging today and will likely
accelerate in growth**

**eV/S/CTOLs for Urban Air Mobility
and Thin-Haul Intercity markets
will likely emerge in the *early*
2020s and accelerate by *late* 2020s**

The Operating Environment: A More Highly Complex and Dynamic System



Diverse Operations
Service Oriented Architecture
Increasing Autonomy
In-Time System Wide Safety

In-Time System-Wide Safety Assurance



U.S. National Academies Report Identified
4 Fundamental System Element
Development Areas:

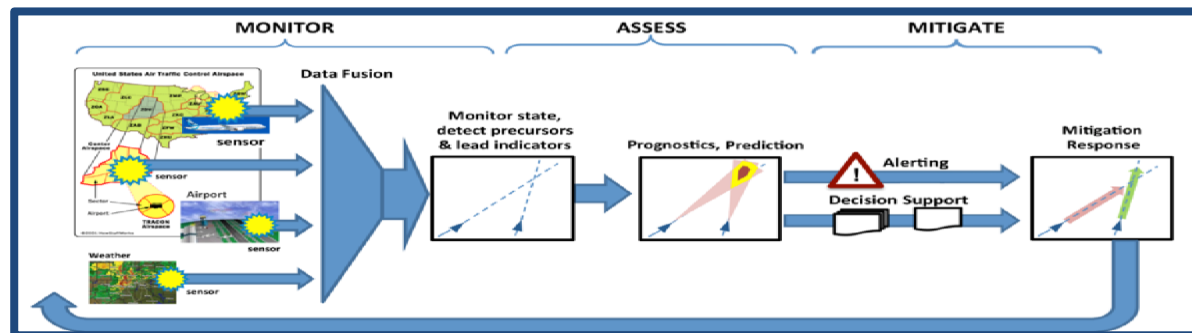
1. Concept of Operations and Risk Prioritization
2. System Monitoring
3. System Analytics
4. Mitigation and Implementation

IN-TIME AVIATION SAFETY MANAGEMENT
Challenges and Research for an Evolving Aviation System



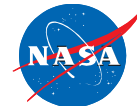
NASA Working to Achieve Three Incremental Milestones

1. Domain-Specific Safety Monitoring and Alerting Tools
2. Integrated Predictive Technologies with Domain-Level Applications
3. Adaptive In-Time Safety Threat Management



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>



Safe, Efficient Growth in Global Operations



Innovation in Commercial Supersonic Aircraft



Ultra-Efficient Commercial Transports



Transition to Alternative Propulsion and Energy

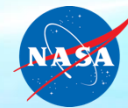


In-Time System-Wide Safety Assurance



Assured Autonomy for Aviation Transformation

U.S. leadership for a new era of flight



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THANK YOU