Advanced Air Vehicles Program
Opening New Aviation Markets for U.S. Leadership
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NASA Aeronautics – Vision for Aviation in the 21st Century

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

U.S. leadership for a new era of flight

6 Strategic Thrusts

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

**Transformative Aeronautics Concepts Program (TACP)**
- High-risk, leap-frog ideas that support all six thrusts
- Critical cross-cutting tool development
- Assured Autonomy for Aviation Transformation

**Safe, Efficient Growth in Global Operations (AOSP)**
- In-Time System-Wide Safety Assurance

**Ultra-Efficient Commercial Vehicles (AAVP)**
- Innovation in Commercial Supersonic Aircraft
- Transition to Alternative Propulsion and Energy

**Flight research-oriented, integrated, system-level R&T that supports all six thrusts**
- X-planes/test environment

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**MISSION PROGRAMS**
- **Airspace Operations & Safety (AOSP)**
  - Safe, Efficient Growth in Global Operations
- **Advanced Air Vehicles (AAVP)**
  - Innovation in Commercial Supersonic Aircraft
  - Transition to Alternative Propulsion and Energy
- **Integrated Aviation Systems (IASP)**
  - Flight research-oriented, integrated, system-level R&T that supports all six thrusts
  - X-planes/test environment

**SEEDLING PROGRAM**
- **Transformative Aeronautical Concepts (TACP)**
  - High-risk, leap-frog ideas that support all six thrusts
  - Critical cross-cutting tool development
  - Assured Autonomy for Aviation Transformation
Advanced Air Vehicles Program

Cutting-edge research that will generate innovative concepts, technologies, capabilities & knowledge to enable revolutionary advances for a wide range of air vehicles.

• **Advanced Air Transport Technology Project (AATT)** Conducts fundamental research to improve aircraft performance & minimize environmental impacts from subsonic air vehicles

• **Revolutionary Vertical Lift Technology Project (RVLT)** Develops & validates tools, technologies & concepts to overcome key barriers, including noise, efficiency, & safety for vertical lift vehicles

• **Advanced Composites Project (AC)** Conducts research to reduce the timeline for development & certification of composite structures for aviation [Completing in early FY20]

• **Commercial Supersonics Technology Project (CST)** Develops tools & explores concepts for potential advanced capabilities & configurations for low boom supersonic aircraft.

• **Hypersonic Technology Project (HT)** Develops tools & technologies in the area of hypersonic flight
A New Era of Flight Is Emerging

Breaking down barriers to open new markets, advance U.S. competitiveness, and make air travel better for all Americans and for people around the world

Electrified Aircraft Propulsion
Making air travel cleaner, quieter, and more affordable (AATT)

Urban Air Mobility
Allowing people to move about more easily (RVLT)

Commercial Supersonic Flight
Making air travel faster (CST)
Enabling Technology Advancement

Simulation-based design for manufacturing & performance

Exploit Simulation Tools
- Engineered materials
- New manufacturing methods
- Novel structural concepts

Application of Tools
- Exercise, refine tools
- Production experience & confidence
- Material selection, process optimization

Advanced Composites Project
- Validated models and tools to predict performance & manufacturability
- Thermoset materials and AFP manufacturing
- Initial tool integration; Benefit demonstrated

Increasing complexity driving up cost and development time

Prior Sim Work
- Insufficient
- Low TRL

Experience-based design for performance