

X-66: Accelerated Learning Through Full Scale Prototyping

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Why invest in Sustainable Flight Demonstrator?

- For decades Government, Industry, and Universities have been working advanced commercial aircraft concepts focused on lowering fuel burn & emissions
- To date, these configuration have not made it to market due to many factors including:
 - Competitive factors
 - Technical, Integration, and Manufacturing Challenges
 - Large cost and risk of taking new configuration from design through certification
- NASA launched the SFD project to:
 - Partner with industry to retire as many technical & manufacturing risks as possible
 - Inform industry decisions associated with next generation single-aisle seat class product for 2030s entry into service
 - Maximize the potential to meet environmental goals articulated in the [U.S. Aviation Climate Action Plan](#)

Blended Wing Body



Transonic Truss-Braced Wing



D-8 Double Bubble



Tail-cone Thruster

Industry Partner selected through Competitive Proposals



- Selected Proposal was awarded a Funded Space Act Agreement (FSAA)
 - Boeing Company for their Transonic Truss Braced Wing (TTBW)
 - NASA providing \$425M in direct payments in addition to labor and facility testing resources
 - Boeing providing an estimated \$725M



- FSAA provides unique approach for project execution
 - Industry led; NASA supported
 - Industry defines requirements and project plan to maximize learning needed for future product consideration
 - Industry owns test aircraft

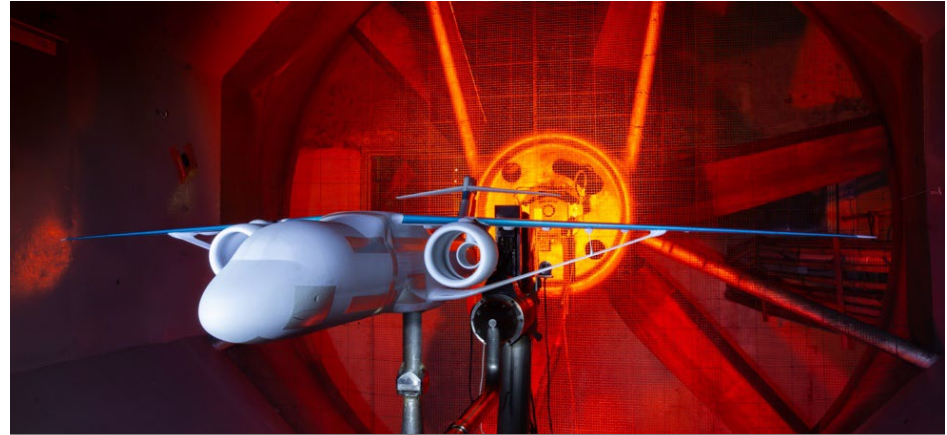
Major NASA Support Activities: Wind Tunnel Testing

National Aeronautics and
Space Administration



12-Ft Low Speed Wind Tunnel (April-June, 2024)

- Verify no deep stall tendency
- Initial low speed Aero and Stability & Control
- Very low cost, 3-D printed model



3-D printed model in 12-Ft Low Speed Tunnel

Photo needs to be
cleared by Boeing

Semi-Span Model in 11-Ft
Unitary Tunnel

11-Ft Unitary Plan Wind Tunnel (July 2024 – Jan 2025)

- Semi- and Full-Span Models
- Subsonic and transonic flight conditions
- Critical for high-lift aerodynamics, buffet & aero loads

X-66 SFD Piloted Simulation

- Full X-66 cockpit with out-the-window visuals
- Purpose: Pilot training, mission planning, emergency procedures, anomaly investigation



Piloted Simulation Design

Reuse of vintage MD-90 Cockpit Components



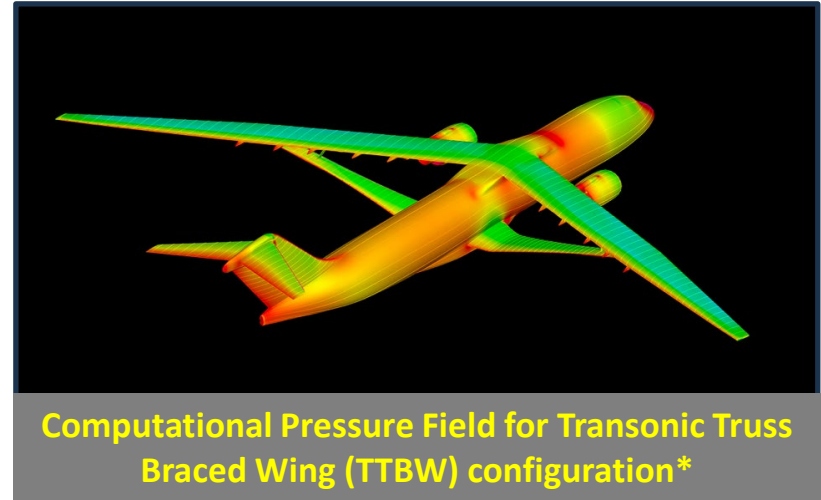
Vintage MD-90 Cockpit Acquired

- Components will be used to build the X-66 piloted simulation



X-66 SFD Computational Fluid Dynamics (CFD)

- Close collaboration with Boeing CFD team
- Low- and high-speed solutions
- Utilizes NASA's High End Computing Facility



* This solution is not an X-66 configuration

X-66 Strut Structural Testing

- Design and fab of test hardware
- Structural characterization of flight strut in NASA Flight Loads Lab



Example Structural Test

Major NASA Support Activities: Flight Test Support

National Aeronautics and
Space Administration

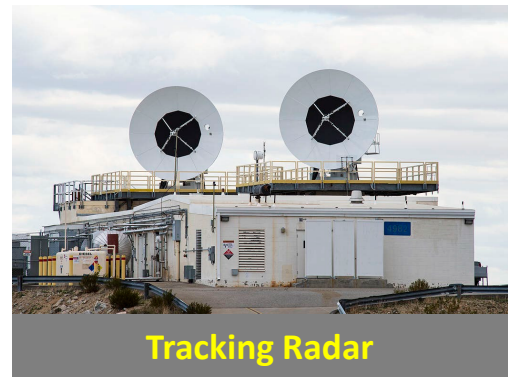


Dryden Aeronautical Test Range

- R-2508 Restricted airspace in California
- Control rooms
- Telemetry, radars
- Communications



Mission Control Room



Tracking Radar

Flight Operations

- F-18, G-III chase aircraft
- Hangar and maintenance facilities
- Fabrication, avionics, and environmental labs



NASA Hangar



Chase Aircraft