Aerion Supersonic Business Jet
Environment-Driven Technology

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FAA Conference on
Supersonic Noise and Research
Washington, DC,
7/14/11 July 14, 2011
Supersonic Design Dichotomy

- Two approaches to civil supersonic flight:
  - Low sonic boom is the primary goal of most programs
  - Maximum fuel efficiency and operational flexibility are Aerion goals, with boom reduction secondary
  - FAA and ICAO require compliance in either case with airport noise and engine emissions regulations
Aerion Design Criteria

- Best possible supersonic cruise efficiency & range
- Equal or greater range at high subsonic speed
- Current production proven engine and systems
- Operationally similar to subsonic aircraft
- Mach 1.6 minimizes technical and business risk
Sonic Boom Approaches

- **Low Boom**
  - Some time savings over populated areas
  - Pending “low boom” regulations and design technology

- **No Boom**
  - Maximize cruise range and efficiency
  - Meet all current regulations (sonic boom, noise, emissions)
  - Supersonic “boom cutoff” overland, when permitted
“Boom Cutoff” Over Populated Areas

- Current
  - FAA: Mach 1 or less over U.S.A.
  - ICAO: “No unacceptable situation on the ground” (no boom?)
- Aerion complies with both rules
  - Efficient subsonic flight over US
  - No boom at Mach 1.1+ where permitted
Traditional Approach

• Delta Wing
  – Lower lift-related drag at supersonic cruise
  – High sweep, short span and less effective flaps

• Result
  – Longer runways and high angle of attack
  – Less efficient at SS cruise and high subsonic speed
Aerion Technology

- Laminar Flow Wing
  - Lower overall supersonic drag
  - Low sweep and powerful flaps

- Additional Benefits
  - Shorter runways and flat approach
  - More efficient subsonic cruise
Laminar Flow Validation

- F-15 tests at NASA Dryden 1999-08
- Full-chord natural laminar flow (NLF)
- New F-15 tests underway since 2010
  - Flow calibration and larger surface

- European Transonic Wind Tunnel (ETW)
- Achieved full chord NLF to 30 million Reynolds no.
Major Systems

- ECS
- Fuel Tanks
- Engines
- APU
- Fuel Tank
- AVIONICS & FLY-BY-WIRE
- FLIGHT CONTROL SYSTEMS

7/14/11
Interior
Performance
Supersonic Overland: NY-LA Mission

G-V at M=0.85: 5:00
Aerion at M=0.98: 4:19
Aerion at M=1.10: 3:52
Operating Expense per NM, 550 hrs/yr Utilization *

* Data from Business & Commercial Aviation 2006 Operations Planning Guide
Conclusions

• Aerion SSBJ offers economics, operating characteristics and flexibility on par with current subsonic aircraft

• Maximum efficiency sub- and supersonic cruise results from NLF wing

• Complies with all regulations and reduces program risk

• Can be first to market
The Virtuous Circle

- Minimum SSBJ environmental impact:
Aerion Supersonic = Quiet, Clean and Economical