Project 10
Aircraft Technology Modeling & Assessment

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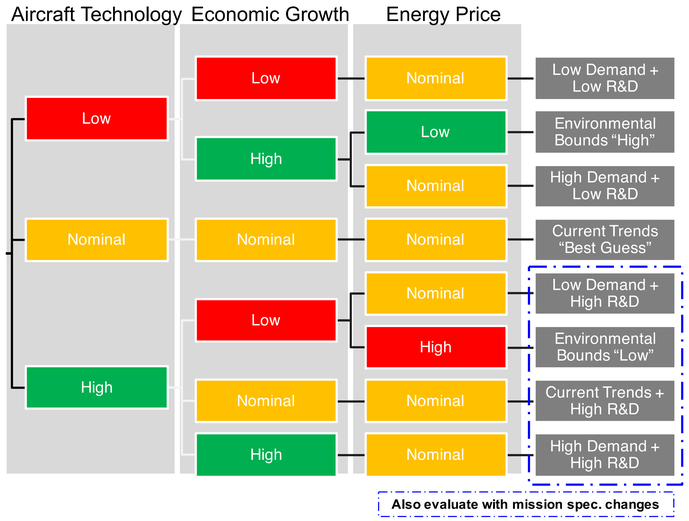
ASCENT 10 Phase I

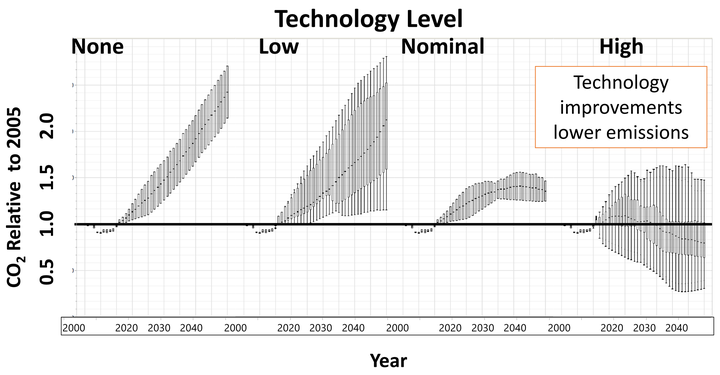
Objective: Define range of scenarios that bound the demand for future aviation activity and assess the effects of different fleet composition and aircraft technology on fuel burn, emissions, and noise from aviation

- Evaluated broad set of future scenarios out to 2050, showing potential benefits of technology on fuel burn, emissions, and noise
- Provided modeling and assessment mechanism for aircraft technology
- Supported NextGen analysis/GATBA Study

Scenarios



Aggregate Simulation Results for CO_2

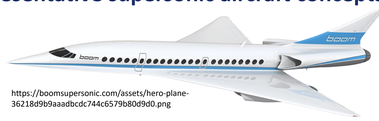


ASCENT 10 Phase II: Supersonic Study

Primary Objectives:

- Assess potential environmental impact of potential future supersonic air travel (domestic & global)
- Develop demand and forecast through 2050
- Analyze existing and future supersonic technologies (e.g. traditional, low sonic boom shape profiles, etc.)
- Provide scenarios with potential changes in fuel burn, CO_2, H_2O, NO_x and noise area exposure

Representative supersonic aircraft concepts



Task 1 — Fleet Assumptions & Demand Assessment

- Determine number of aircraft needed for a different scenarios
- Develop flight schedule

Task 2 — Preliminary Vehicle-level Impact Assessment

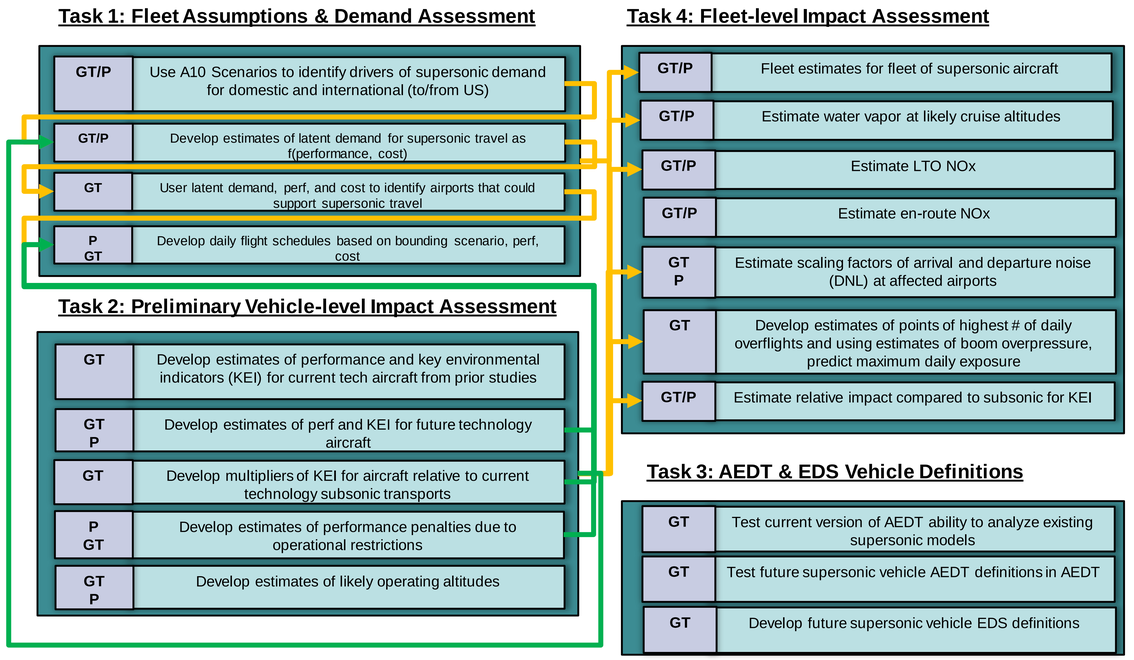
- Estimates for performance and key environmental indicators for current and future technology aircraft

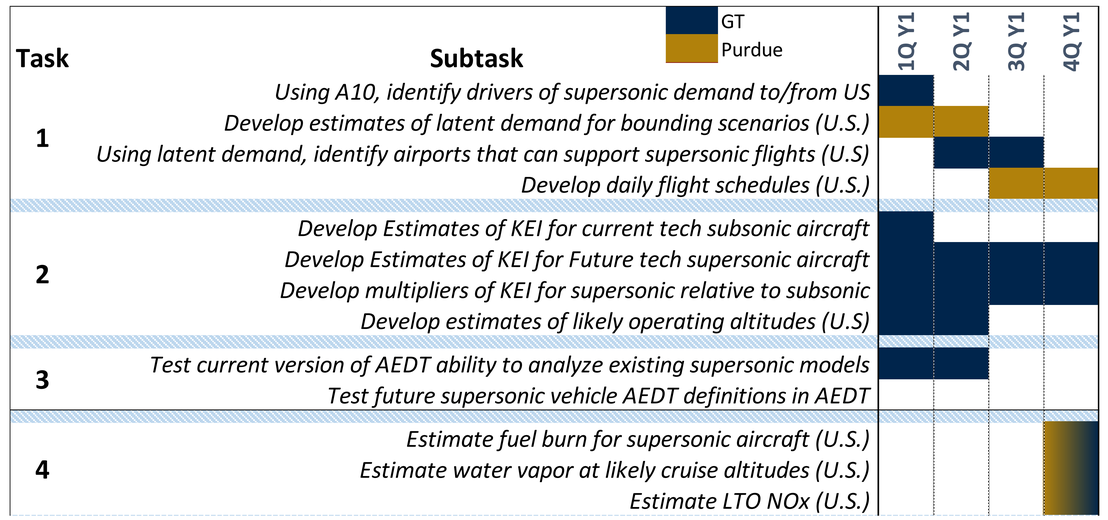
Task 3 — AEDT & EDS Vehicle Definitions

- Perform tests with AEDT vehicle definitions
- Develop recommendations on how to implement supersonic vehicles

Task 4 — Fleet Level Impact Assessment

- Estimate LTO Emissions and Noise
- Estimate cruise water vapor





Year 2:
International scope version of domestic year 1 work

Year 3+:
AEDT and EDS development of future supersonic vehicles
Detailed fleet-level impacts assessment

Current Progress:

- Initiated Study of potential demand for supersonic flights based on prior scenarios
- Tested Concorde AEDT model
- Started work on preliminary vehicle-level impacts
- Started modifications of airline network modeling

KEI: Key Environmental Indicators
AEDT: Aviation Environmental Design Tool
EDS: Environmental Design Sapce
LTO: Landing and Take-Off cycle