



**Federal Aviation  
Administration**

# Commercial Space Transportation (AST)

## *Commercial Space Transportation RE&D Program*

To: REDAC NAS Ops Subcommittee

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# PPT Portfolio Overview

- **The Commercial Space Transportation RE&D portfolio focuses on enabling advances in critical areas such as:**
  - Safe and efficient integration of increased commercial space launch and reentry activity in to the national airspace
  - Advanced safety assessment methods
  - Advanced vehicle safety technologies and methodologies, and
  - Human space flight safety and physiology factors
- **Funding enables maturation of concepts for follow-on use in methods, systems, operations and the regulatory framework**
- **Funding also sustains cooperative, innovative R&D within the FAA's Commercial Space COE**



# *Safe and Efficient Integration*

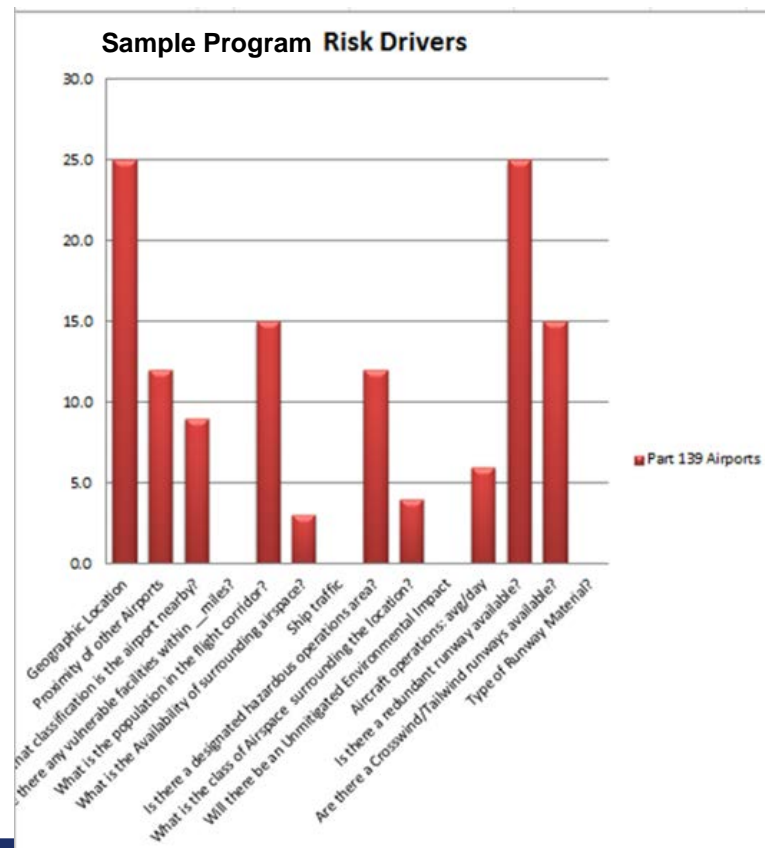
- **Initial R&D targeting critical needs, including:**
  - **Improving integration of launch sites (i.e., spaceports) into the NAS and its system of airports**, including sites in the vicinity of major airports or complex airspace.
  - **Developing and validating improved noise models for commercial space launch operations at inland launch sites**, including spaceports co-located with airports.
  - **Exploring the development of separation standards** for improved airspace management of launch/reentry vehicles during non-explosive phases of flight.



# Leveraging Research: Spaceport Siting & Integration

*Enable applicants to explore trade-space considerations – identifying and quantifying key factors for integrating spaceports in proposed locations*

- Exploratory tool proved viability of concept; further work needed to mature
- Factors include:
  - Inland/coastal
  - Proximity to airports/co-location
  - Proximity to critical infrastructure
  - Horizontal/vertical launch
  - Local airspace
  - Neighboring air & ship traffic
  - Local population density
  - Planned launch services



# Leveraging Research: Noise

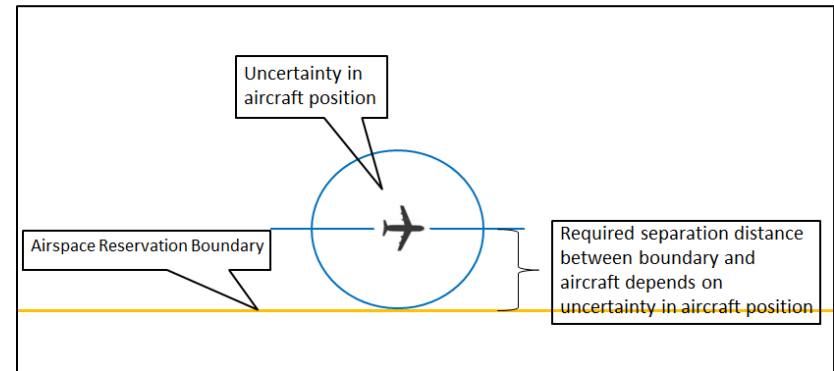
- Modelling & understanding of space vehicle noise, sonic boom, and other effects on environmentally sensitive areas and communities needs further work
  - Gather noise measurements, validate and modify models for rocket noise and sonic boom



# Leveraging Research: Separation Standards

- Research to define separation standards specific to launch/reentry operations:

- Separation of aircraft from airspace (aircraft hazard areas)



- Separation of aircraft from launch/reentry vehicles
  - non-explosive flight phases like captive carry and gliding return



# Moving Forward: Comprehensive Agency Plan to Integrate Commercial Space Operations into the NAS

- New FAA framework to target needed actions
  - “New Entrants Board” – Chaired by Deputy Administrator
  - Commercial Space Transportation – Executive Working Group
- *Development of coordinated Agency plan will drive additional R&D needs*
  - Initial Commercial Space Roadmap published in NAS Enterprise Architecture (EA)
    - Highlights potential gaps & shortfalls
  - Defining “Integration into the NAS”
  - Update Space Vehicle Operations ConOps
  - Prioritized goals, objectives: define updated, coordinated plans to address gaps & shortfalls

# Discussion

