

# Characterizing Operational Impacts of UAS

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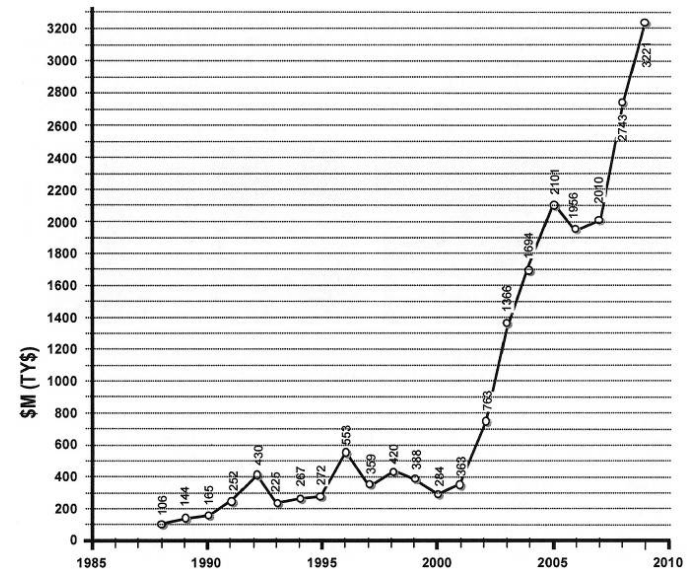
# Problem

- Effects of future unmanned aircraft systems (UAS) operations in the National Airspace System (NAS) are unknown



# Background

- UAS activities are predicted to grow significantly
- UAS operations and aircraft performance differ from those of manned aircraft
- Military and homeland security are driving change



# Objectives

- **Determine a range of potential impacts on the NAS resulting from UAS operations**
- **Develop an impacts taxonomy based on an underlying set of assumptions**
- **Review and analyze UAS economic demand predictions**
- **Link impacts taxonomy with demand predictions**

# Activities

- **Develop detailed assumptions, values, and relationships between UAS and the NAS**
- **Create a model that:**
  - **Dynamically relates UAS and missions to NAS users and supporting infrastructure**
  - **Provides output showing effect on objective impact measures**
  - **Can be adjusted to account for changed assumptions**
- **Perform sensitivity analysis**

# Highlight: Variables



## Aircraft

- Performance and sensitivities

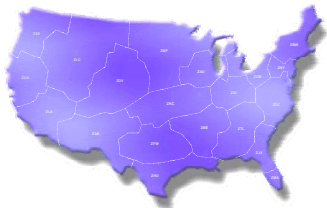
## Mission profiles

- Orbits, tracking, and mission endurance



## NAS usage

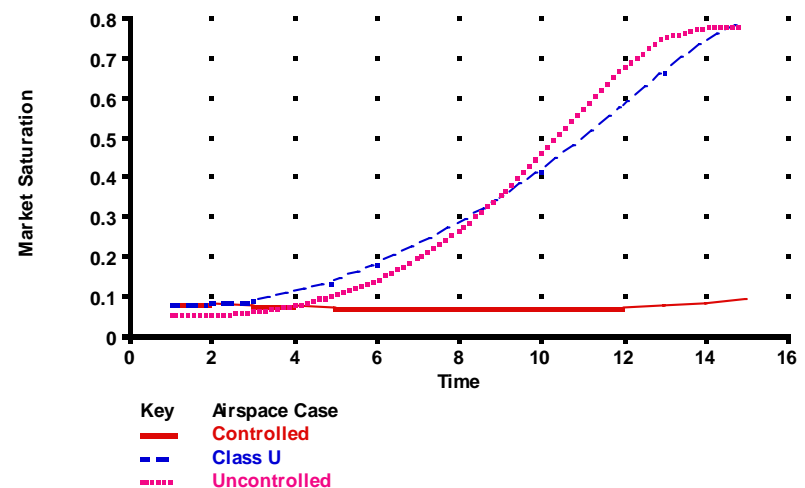
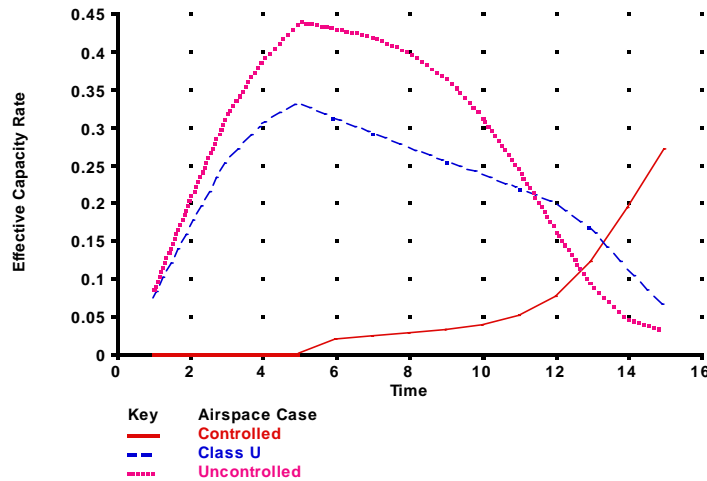
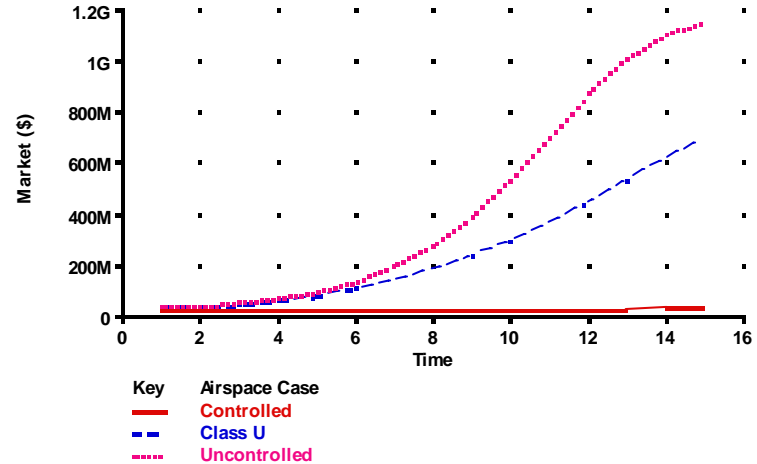
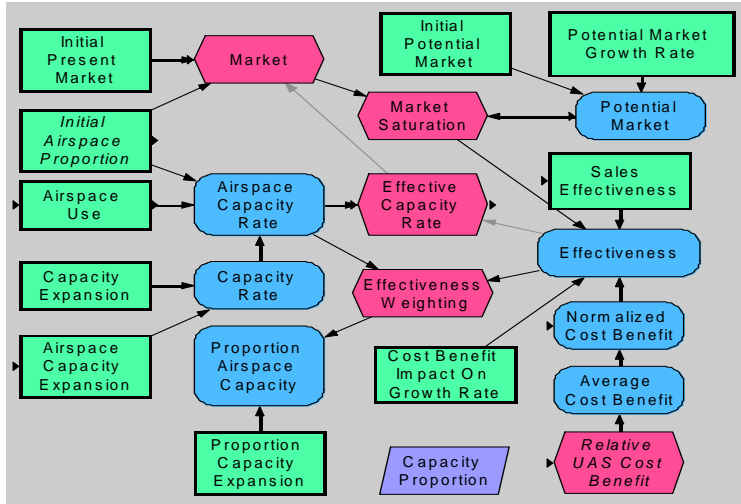
- Air traffic control interactions and infrastructure utilization



## Economic

- Drivers, constraints, and costs

# Demonstration



# Impacts

- Assist FAA and other government policy makers in:
  - understanding potential impacts UA may pose to the current and future NAS
  - preparing, planning, and prioritizing activities and budgets associated with UA operations
- Provide an underlying framework for assessing impacts of *any* new aircraft operations in the NAS
- Provide a foundation for future UAS simulations
- Facilitate a common understanding of UAS future developments/trends

# Future Plans

- **Communicate findings**
- **Establish a basis for simulation to validate analysis**
- **Refine system dynamics model based on new data**

