

SATS: Technologies and Flight Demonstrations

Airspace Systems Programs Office

Enterprise PMC Review

April 27 , 2004

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Project Manager

Small Aircraft Transportation Technologies

- **Currently in the fourth year of the Project and doing well**
- **On schedule for a Demonstration in May-June of 2005**

More than double the number of IMC operations at untowered and non-radar airports using CD&A, ADS-B, automated sequencing, and cockpit display of traffic information



Enhanced single pilot safety and mission reliability using cockpit decision aids, electronic flight bag, Cockpit Associate, and HUD

Reduce lower landing minima at minimally equipped landing facilities to 200-ft ceiling and 1/2-mile visibility using synthetic vision systems, FLIR/low-light camera, DGPS, and WAAS integrity monitoring





Recent Accomplishments

(since Harpers Ferry off-site)

- **Completed HVO1 Flight experiments (GPRA 3R5c)**
- **Upgraded TSAA engineering modeling and simulations and conducted initial analyses** to evaluate the relationship of mobility and en route capacity (operations) (GPRA 3R5e)
- **Completed Interim project assessment** of the impact of SATS (supports APG 4AT12)
- **Conducted the first SATS Technical Exchange Meeting**
- **Completed Technology Demonstration Plan** and drafted Benefits/Value Demonstration Plan
- **Conducted regional LLM/SPP technology demonstrations** at the Andrews-Murphy and Dare County Airports in North Carolina
- **Expanded SATS Alliance outreach program**

HVO1 Flight Experiments Completed

- **6 Evaluation pilots**
- **12 Approaches each pilot – 4 Baseline, 8 SATS HVO**
- **Data Collection – November 2003 to January 2004**



- **GA pilot can sequence and self separate his/her aircraft, while following a traffic aircraft, into a non-towered, non-radar equipped airport during IMC**
- **GA pilots experienced equivalent workload levels, compared with a current day GPS instrument approach into a non-towered, non-radar equipped airport, while performing a representative SATS HVO approach**

Modeling/Simulation/Analyses Developed To Evaluate Relationship between Mobility and Capacity

2010 On-Demand Mobility Forecast

13.4B Transported Passenger Miles
8.3K Additional Business Jets

2022 On-Demand Mobility Forecast

22.0B Transported Passenger Miles
13.5K Additional Business Jets



NAS Capacity and Procedural Requirements may Constrain Potential Air Taxi Flights and Mobility

- Preliminary studies indicate 2010 en route traffic flows may not be compromised
- Discrete, high-value/demand airspace traffic flows have potential to be impacted

Nation-wide Mobility (Hours Saved) Business Travelers

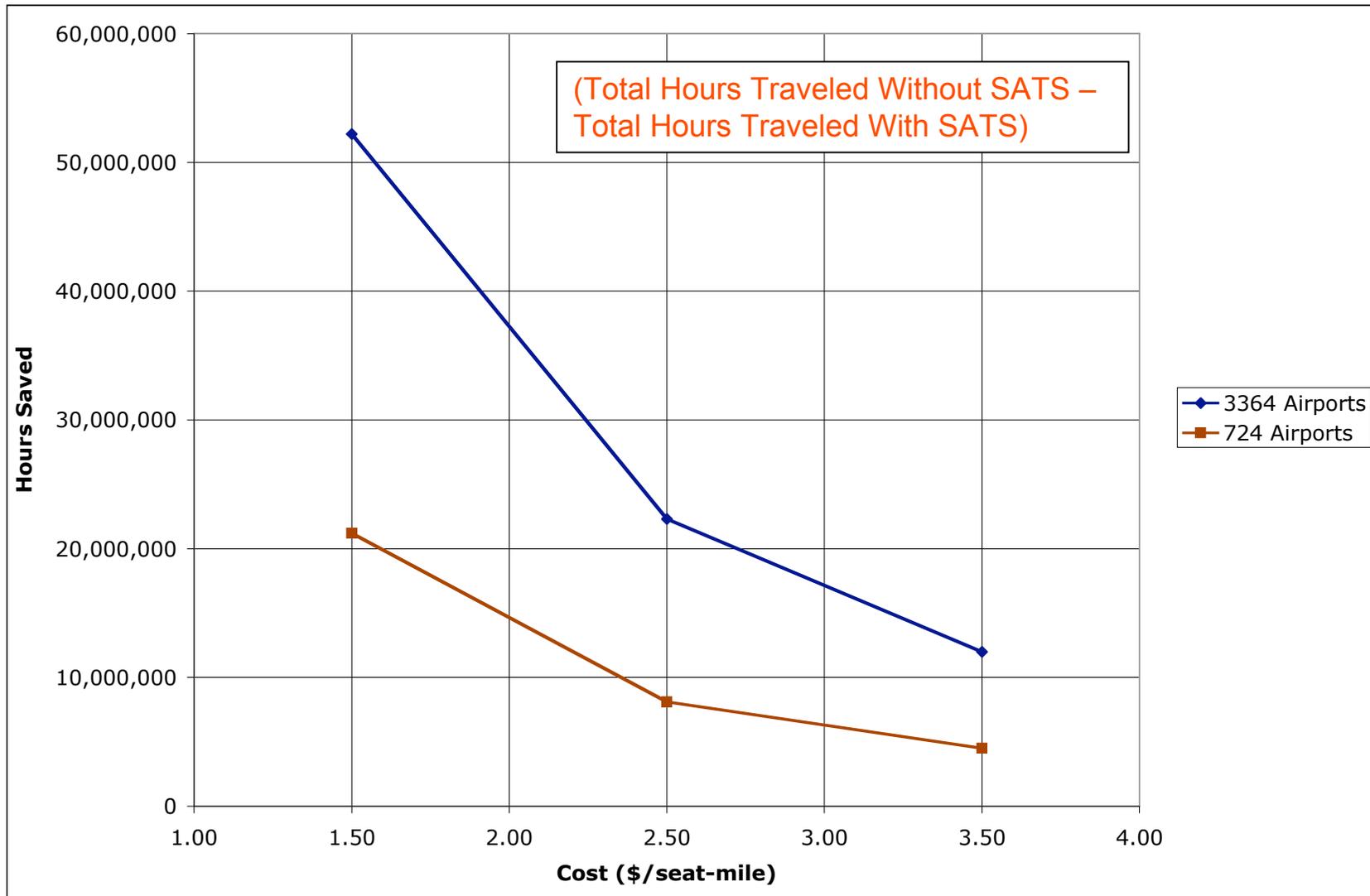
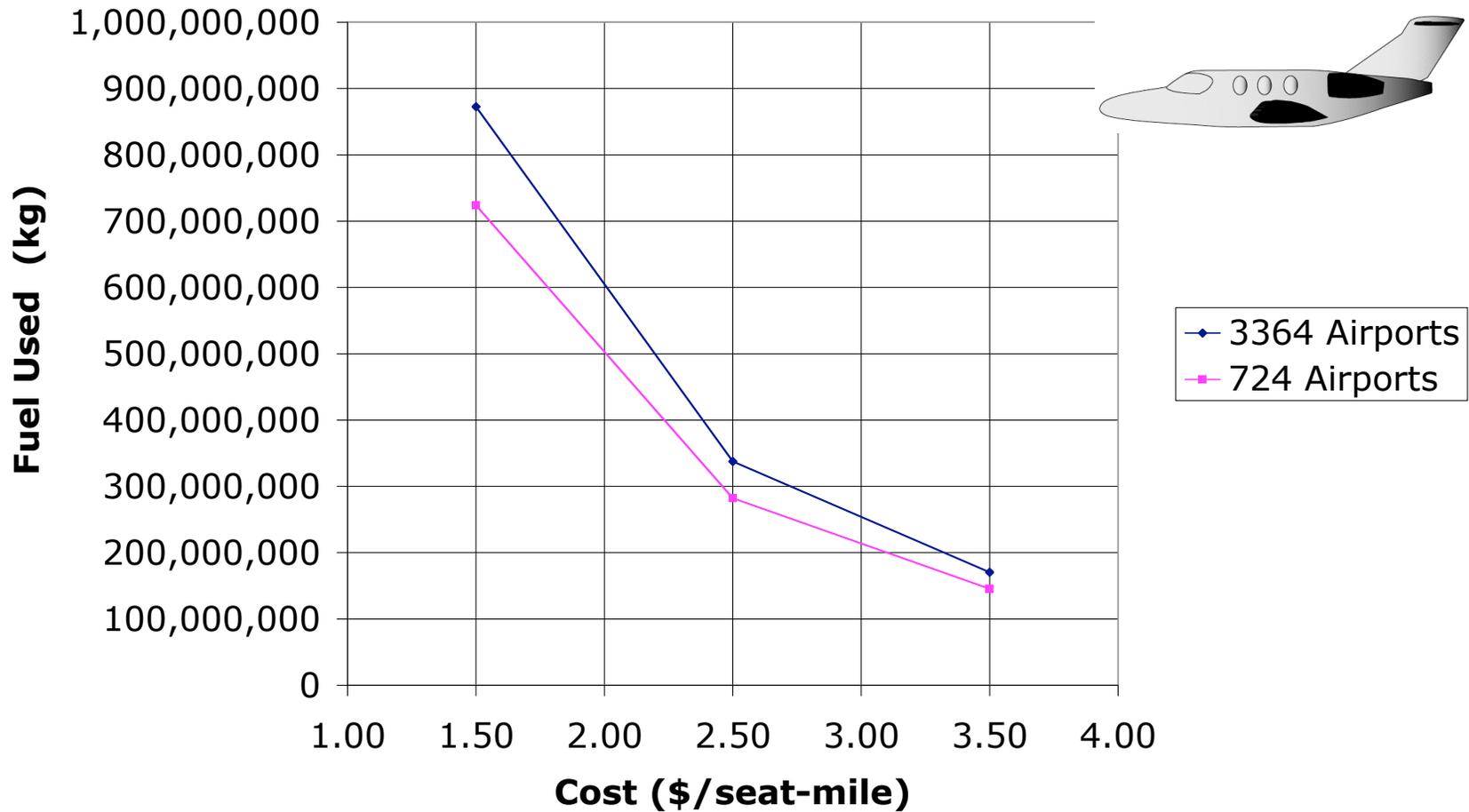


Figure 6

Fuel Used by SATS Business Travelers

Fuel Used by Airlines = 44,000,000,000 kg.





SATS Technical Exchange Meeting

February 17-19, 2004

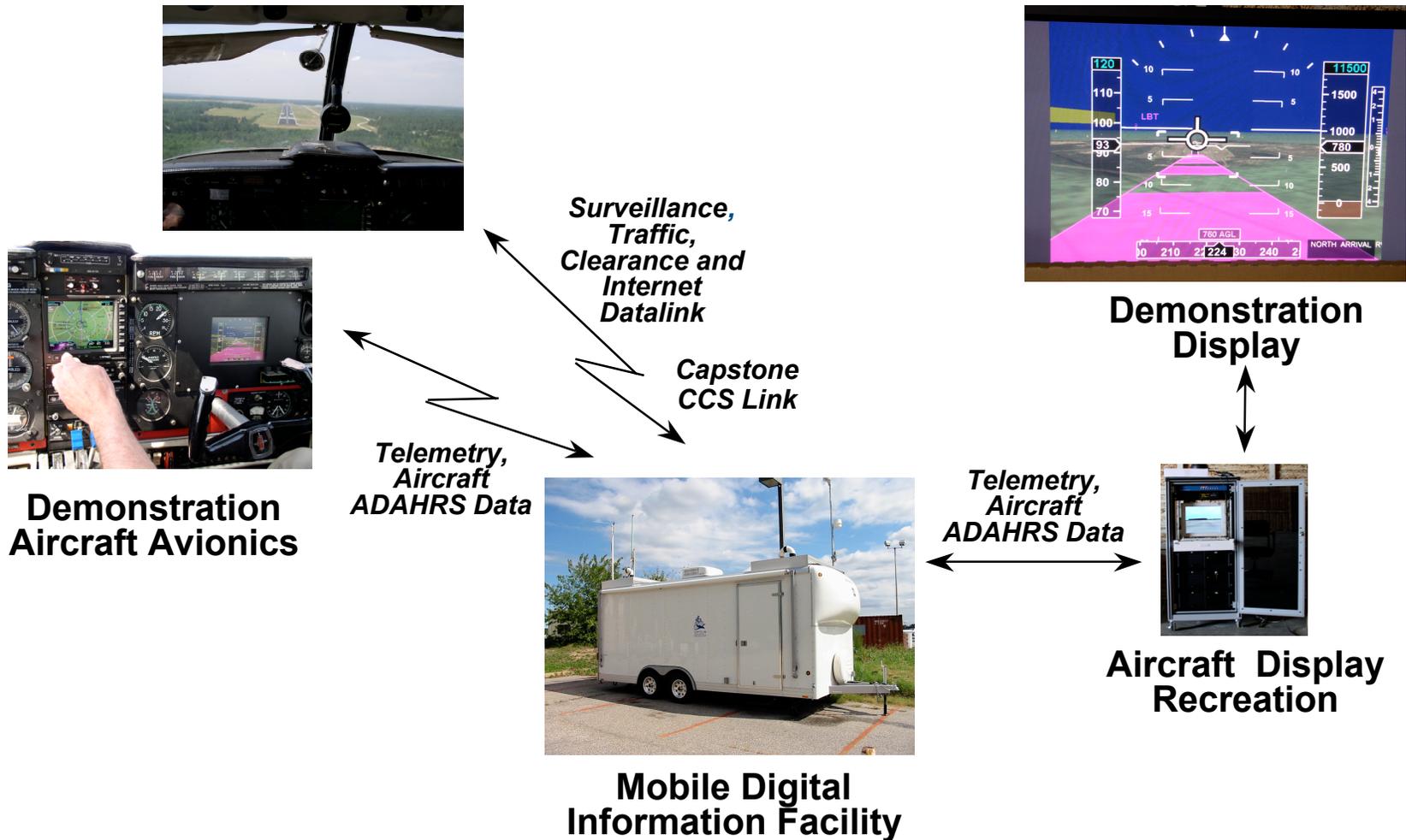
- **Objectives:**
 - Review and discuss the progress, accomplishments, and status of Project
 - » Focus on R&T activities that were of particular importance to the Technology and Value/Benefits Demonstrations
 - Communicate, interact, and share information among the SATS Alliance partners
- **70-80 researchers, engineers, technologists, and managers from SATS Alliance (i.e., NASA, FAA, and NCAM)**
- **Outcome:**
 - No technology gaps were identified
 - Issues and concerns that were identified and worked at the conference, and/or resolution plans were developed
 - Feedback from participants was positive and new networking and teaming relationships were created

Demonstration Planning

- Technology Demonstration Plan completed on schedule
 - Technology Demonstration Plan includes:
 - Static Displays
 - Cockpit Simulations
 - Flight Demonstrations
 - Organizational Responsibilities
- Draft of Benefits/Value Demonstration Plan completed and being reviewed
 - Benefits/Value Demonstration Plan includes:
 - Themes
 - Potential panels
 - Displays and animations
 - Organizational responsibilities
- Service Provider Plan being updated and modified
- Integration of Technology, Benefits, and Service Provider Demonstration Plans into the 2005 Demonstration Plan began; revised 2005 Demonstration Plan to be completed by end of April 2004
- Planning dates for 2005 Demonstration being worked

SATS Technology Demonstration

Real-Time Display of Pilot Primary Flight Display with SVS & HITS



SATS Outreach Trailer in Lansing, MI



Figure 11

SATS Outreach Trailer interior



Figure 12