

**Airspace Systems Program**  
**Virtual Airspace Modeling  
and Simulation Project**  
**Technical Interchange Meeting #1**

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**May 21, 2002**

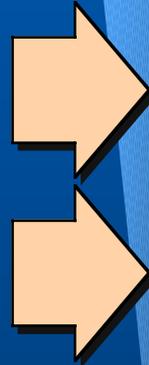
# NASA's Aerospace Technology Enterprise

## Goals

### ◆ Revolutionize Aviation

Enable a safe environmentally friendly expansion of aviation (Baseline: 1997)

*Airspace  
System  
Program*



### ◆ Advance Space Transportation

### ◆ Pioneer Technology Innovation

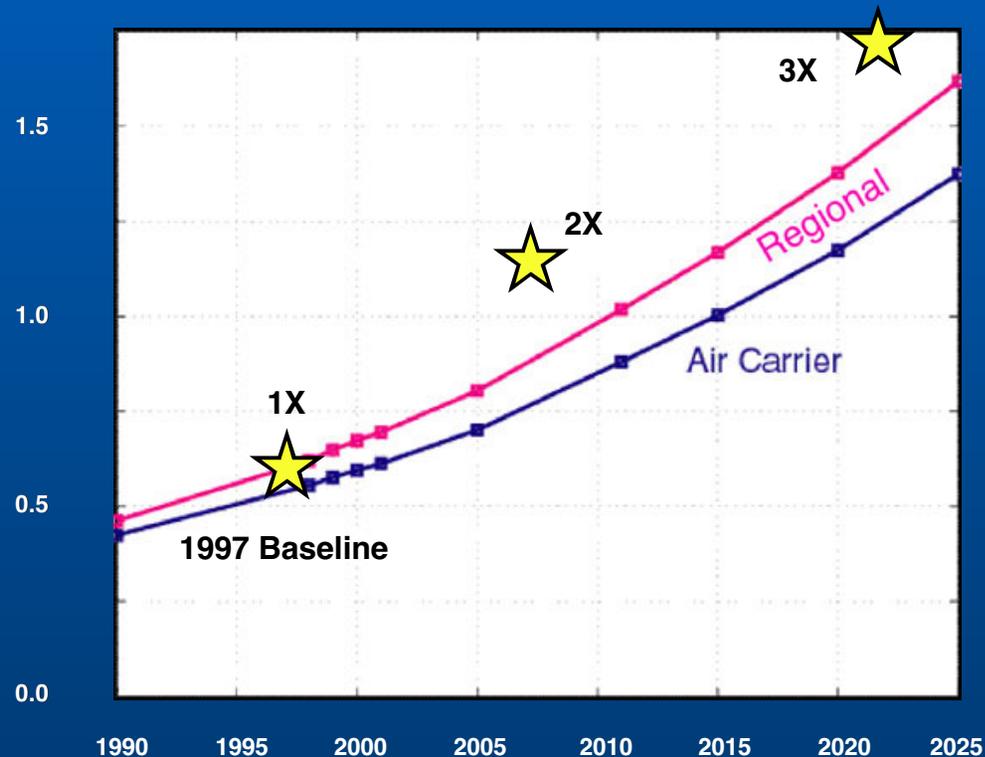
### ◆ Commercialize Technology

## Objectives

- Reduce the aircraft accident rate by a factor of five within 10 years, and by a factor of ten within 25 years
- Double the capacity of the aviation system within 10 years and triple within 25 years based on 1997 levels
- Reduce inter-city door-to-door transportation time by half in 10 years and by two-thirds in 25 years; reduce long-haul transcontinental travel time by half within 25 years
- Reduce NOX emissions of future aircraft by 70% five within 10 years, and by 80% within 25 years.
- Reduce the perceived noise of future aircraft by a factor of two within 10 years, and by a factor of four within 25 years

# NASA Capacity Goals vs. Passenger Demand

ANNUAL PASSENGER ENPLANEMENTS  
(Billions)



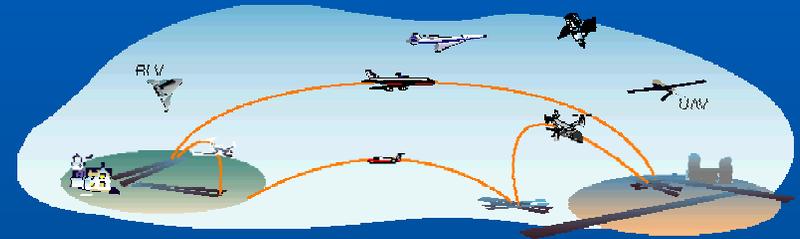
Source: FAA Aerospace Forecasts FY 2000-2011(March, 2000)  
FAA Long-Range Aerospace Forecasts FY 2015, 2020, and 2025 (June, 2000)

**Demand is escalating faster than the  
general economic growth**

# Airspace Systems Goals and Objectives

## Goal:

Enable major increases in the capacity and mobility of the air transportation system through development of revolutionary operations systems & vehicle requirements



## Primary Objectives:

- Improve NAS capacity and mobility
- Develop, validate & transfer advanced concepts, technologies and procedures to the customer community

## Secondary Objectives:

- Improve access, flexibility, collaboration and predictability of the NAS
- Maintain system safety, security and environmental protection
- Enable runway-independent aircraft and general aviation operations
- Enable modeling and simulation of air transportation operations

# Ten Year ATM Modernization - Defined by FAA



## The Operational Evolution Plan (OEP)

- Developed by FAA
- Approved by Secretary of Transportation
- Endorsed by RTCA
- Vetted with Community

Provides National Policy for NAS Modernization

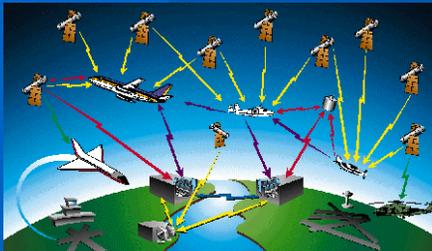
# FAA OEP Defines Causes/Remedies of Delay

- **Arrival Departure Rates**
  - Additional runways and new procedures
  - Smaller gaps in arrival and departure streams
  - Management of surface congestion
- **En Route Congestion**
  - Adapt resources to high-demand areas
  - Take advantage of new aircraft capabilities
  - More flexible routing
- **Airport Weather Conditions**
  - All-weather capability at airports
  - Quick reconfiguration for weather
- **En Route Severe Weather**
  - Joint planning to reduce effects of uncertainty
  - Finding best routes around weather

**But the degree of capacity improvement outlined in this plan falls short of what is needed**

# Airspace Systems Projects

Improve gate-to-gate air traffic management to increase capacity and flexibility



AATT Project '96-'04

Model/simulate the NAS and explore next generation of advanced concepts



VAMS Project '02-'07

Improve public mobility & community access with small aircraft/airports



SATS Program '01-'05

Reduce airport capacity constraints due to weather

*(Completed in 2000)*



TAP Project '94-'00

Understand & model human/ systems



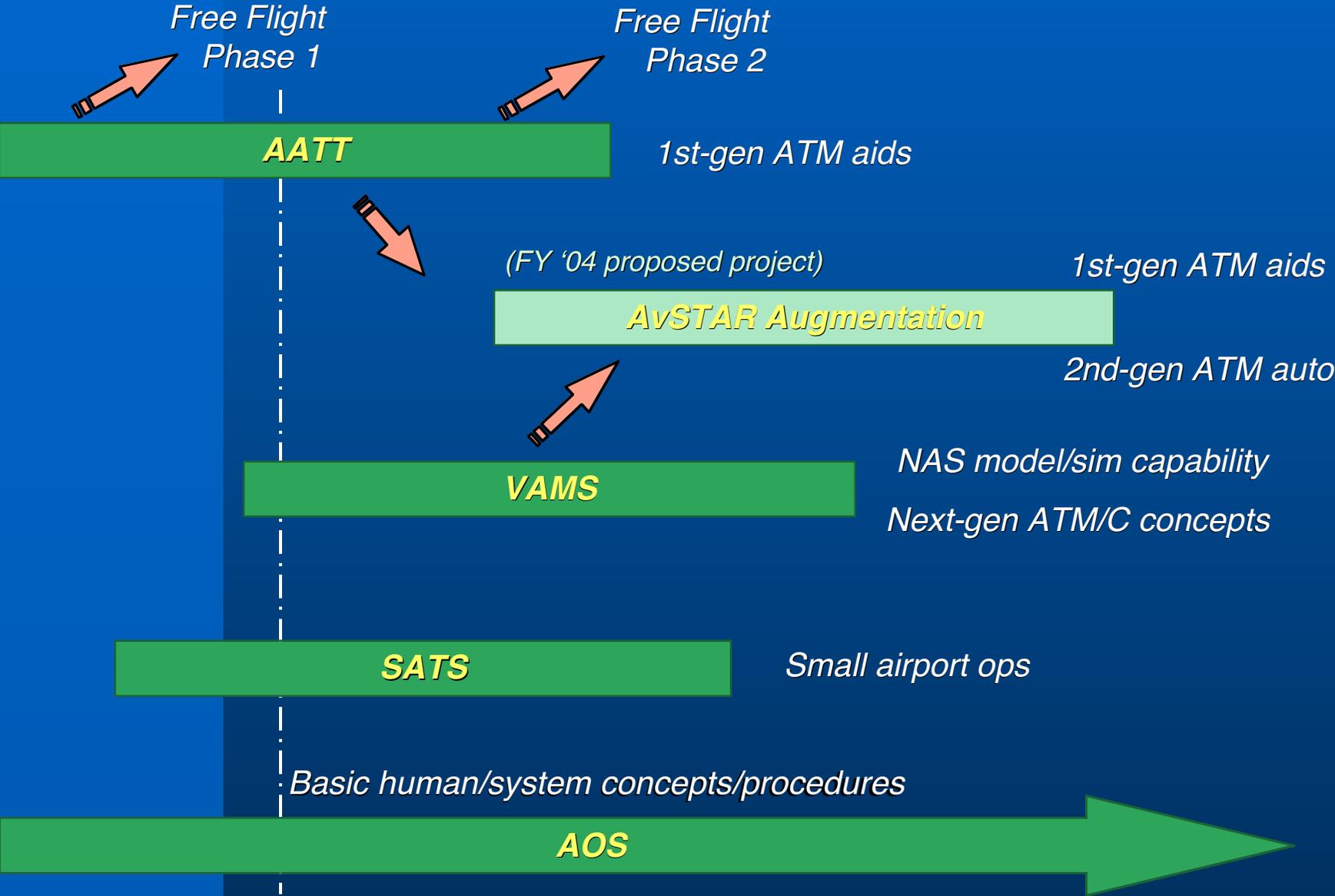
AOS Base Project

Off-load small commuter traffic from runways for use by large transports  
*(Completed in 2001)*



SHCT Project '94-'01

# Airspace Systems Roadmap



# VAMS-AvSTAR Projects

Explore, simulate and develop advanced concepts and technologies for next generation air transportation system

