

6th CNS/ATM Symposium

The Next Generation Air Transportation System

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Background

- ✓ National Civil Aviation Review Commission
 - ✓ President's Commission on Future of Aerospace Industry
 - ✓ National Academy of Science
- ✓ 2003 FAA Reauthorization "Vision 100"
 - ✓ Senior Interagency Policy Committee
- ✓ Joint Planning and Development Office (JPDO)



Real Progress

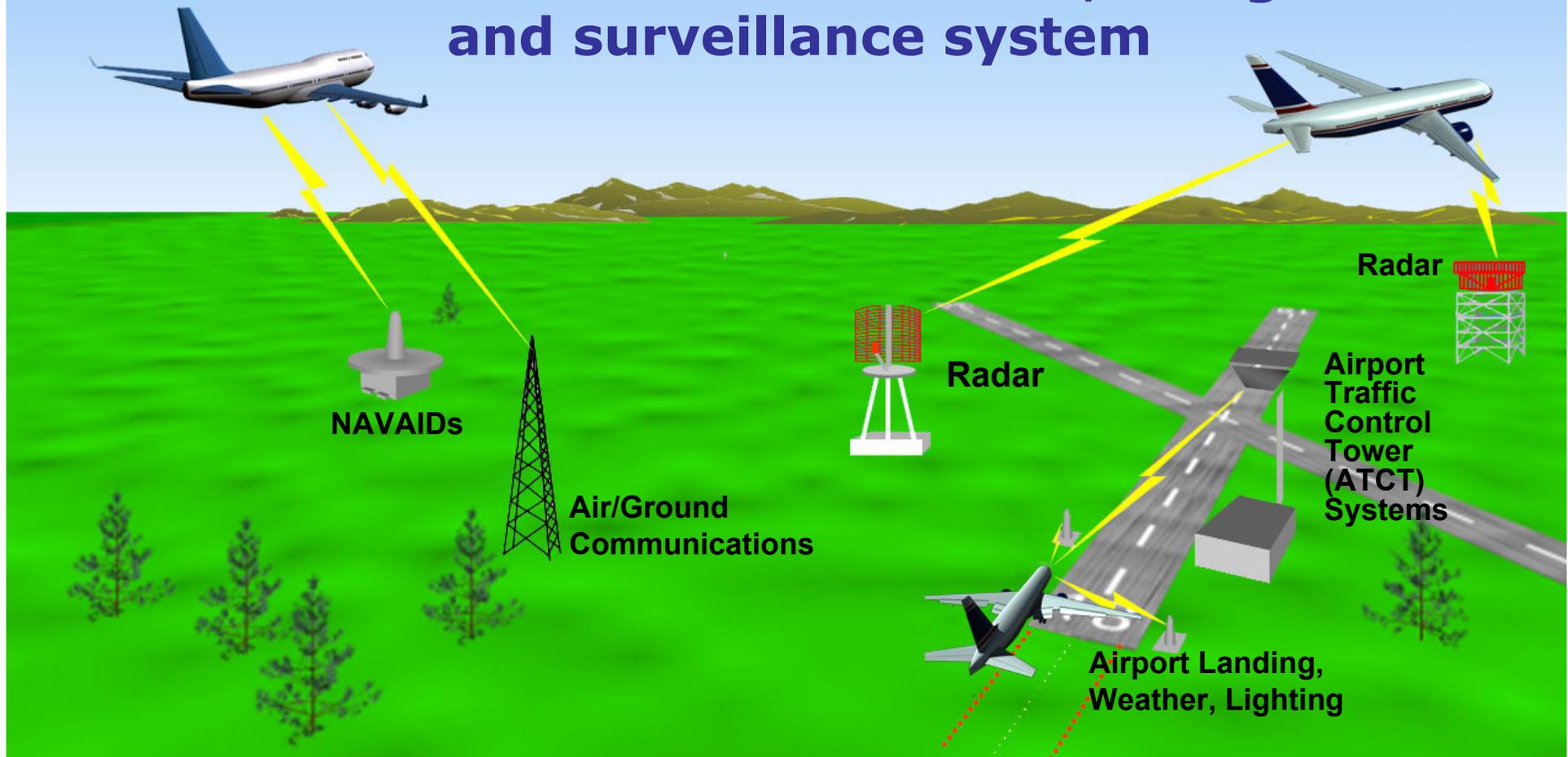
- ✓ Five Government Agencies working together with Private Sector
- ✓ National Plan delivered to Congress
 - ✓ NGATS concept defined
 - ✓ Roadmap being finalized
- ✓ System change begins in FY07

Automatic Dependent Surveillance-Broadcast Network Enabled Information Sharing



Today's Air Transportation System

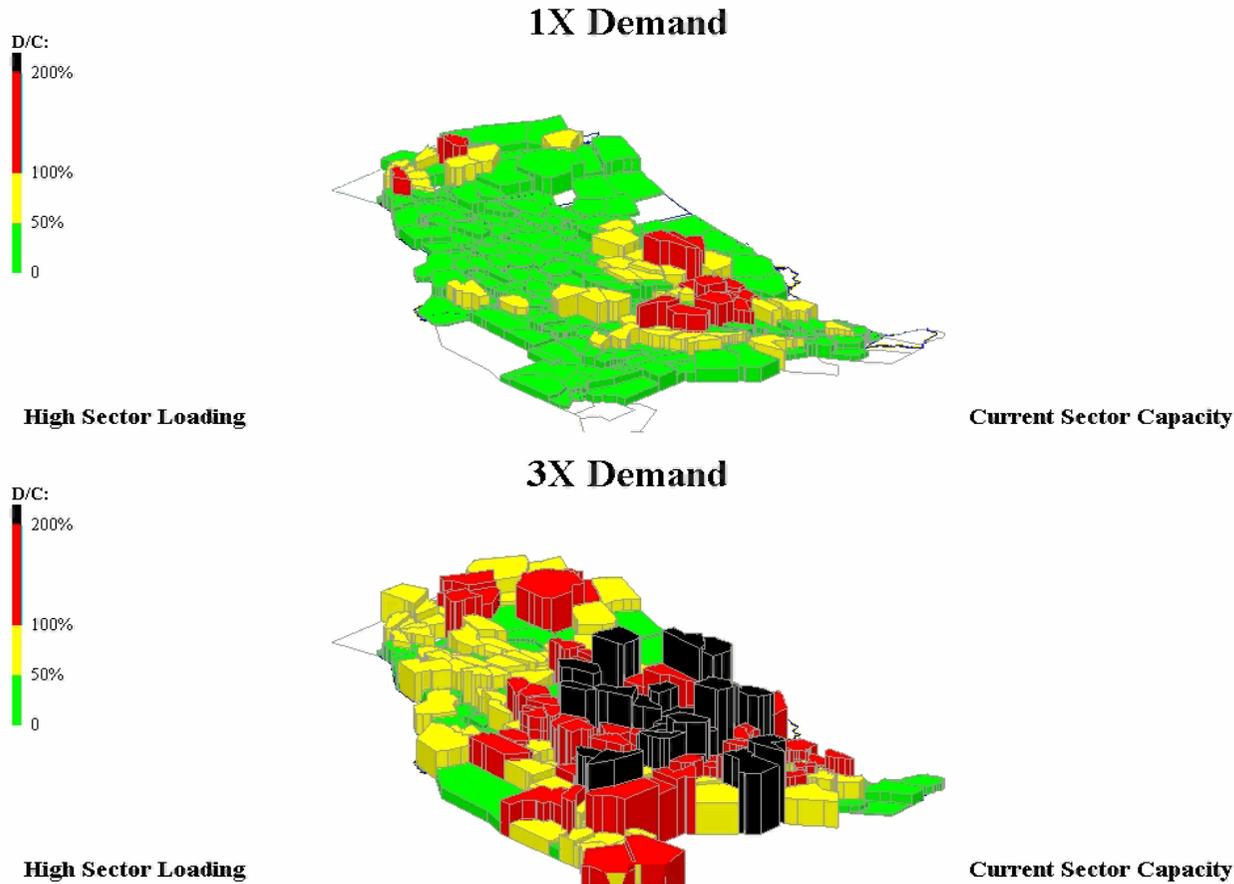
Has evolved to a primarily *ground based, human centric* communications, navigation and surveillance system



2x National Air Space Demand Quickly Overwhelms Near-Term Capacity

(Current Sector Capacity Limits, 2010 Airport Capacities)

NAS Airspace Capacity Analysis



What is NGATS?

Communication Constellation



Navigation Constellation



(Data & Voice Digital Comm)
Aeronautical Information &
Curb-to-Curb 4-D Trajectory

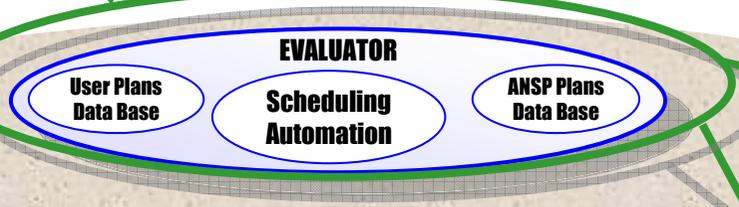
Dynamic
Airspace

NETWORK CENTRIC INFORMATION

Airport



Secured Net-Centric Access Responsive to Needs



**Air Traffic Management
Facilities**
Airborne & Surface



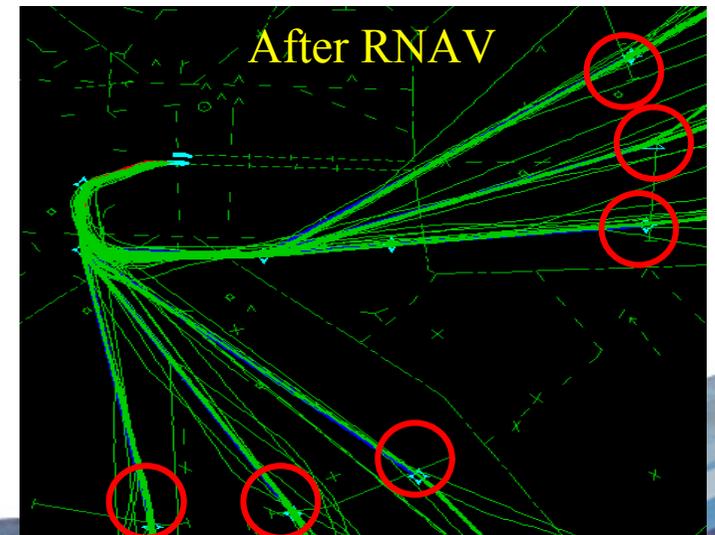
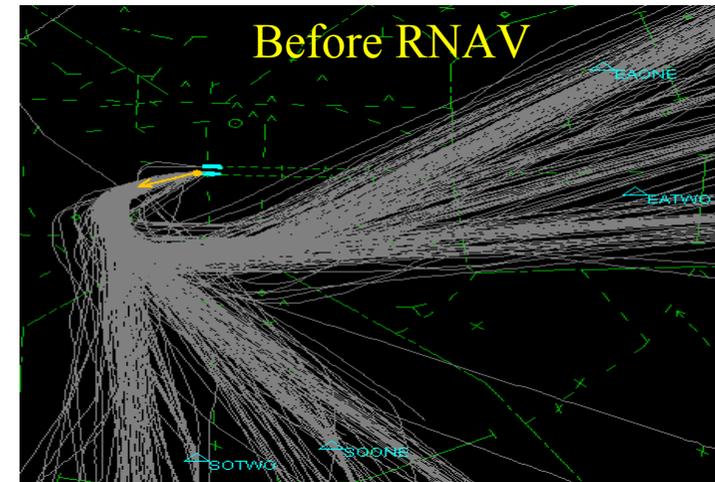
Ground-Based Users
AOC, FBO, Business,
Private, Etc.



Precision Information in Real-time to Create Greater Capacity

Atlanta RNAV Departure Procedures (April 2005)

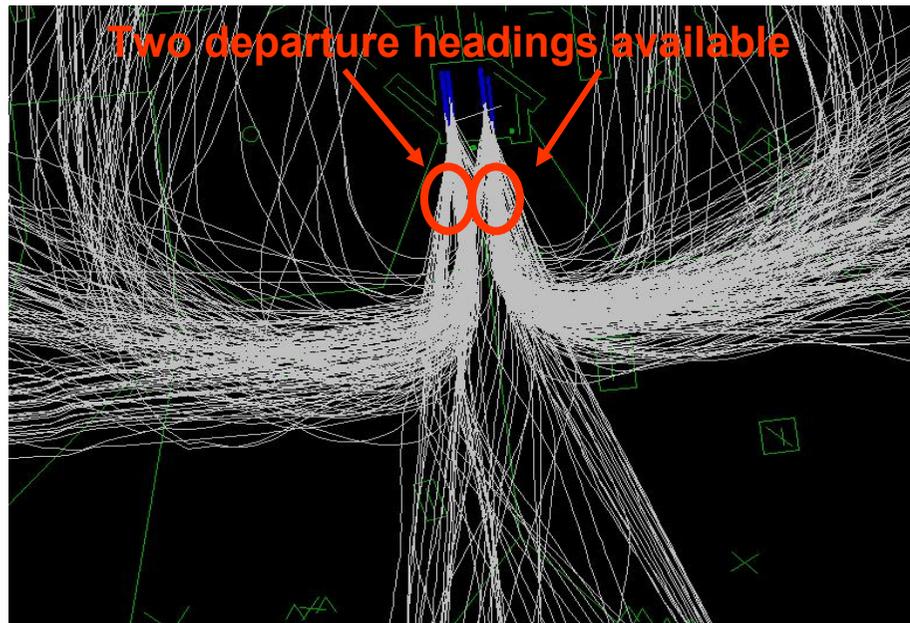
- Approx 90% of 1350 daily IFR departures are RNAV capable
- Structured "lanes" to en route airspace
- Over 4,000 routine daily pilot/controller voice transmissions eliminated (30% reduction)
- Delta Airlines estimates \$30M annual savings
 - Decreased taxi times
 - Decreased departure delays
 - Improved flight profiles
 - Reduced distances



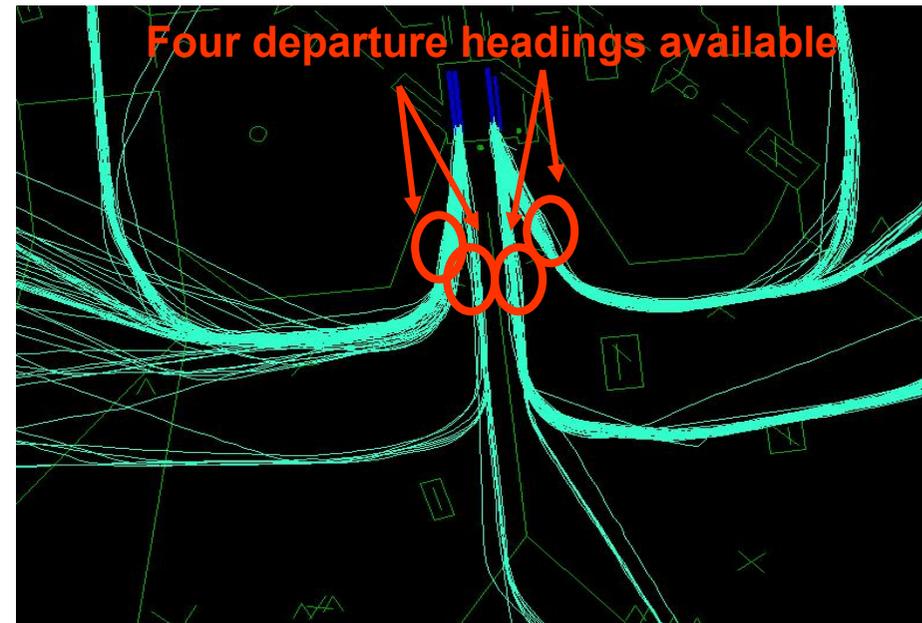
RNAV Standard Instrument Departure Procedures (SIDs)

Dallas/Fort Worth International Airport
Dallas-Fort Worth, Texas, USA

Before RNAV



After RNAV



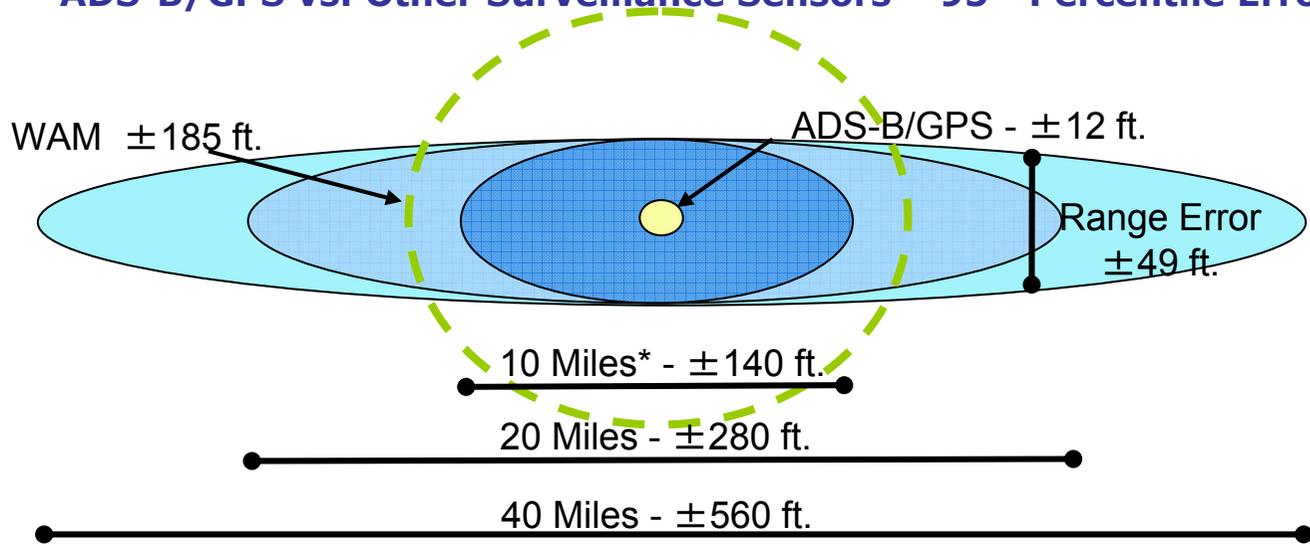
- 85-90% of DFW departing traffic is RNAV capable
- Before RNAV – Aircraft are vectored by ATC
 - Heading, altitude, and speeds issued by controllers
- After RNAV – Aircraft fly pre-defined path (not vectored)
 - Voice transmissions have been reduced
 - Two additional departure heading available



Why ADS-B?

- **OUTPERFORMS** radar in accuracy, detection capability, update rate, and coverage -- at a lower cost

ADS-B/GPS vs. Other Surveillance Sensors – 95th Percentile Errors



* ATCBI-6/Mode S/ASR-11 MSSR performance: Radar azimuth measurement error varies with range from sensor

FAA/SMP Goal Refines Separation Standards



ADS-B - Cooperative surveillance for greater accuracy and reduced costs

MULTIFUNCTIONAL system capable of replacing several sensor types and providing broadcast data services

ASDE Radar



= \$6.91M / Unit

Beacon Radar



= \$2.3M / Unit

PRM Radar



= \$30.1M / Unit

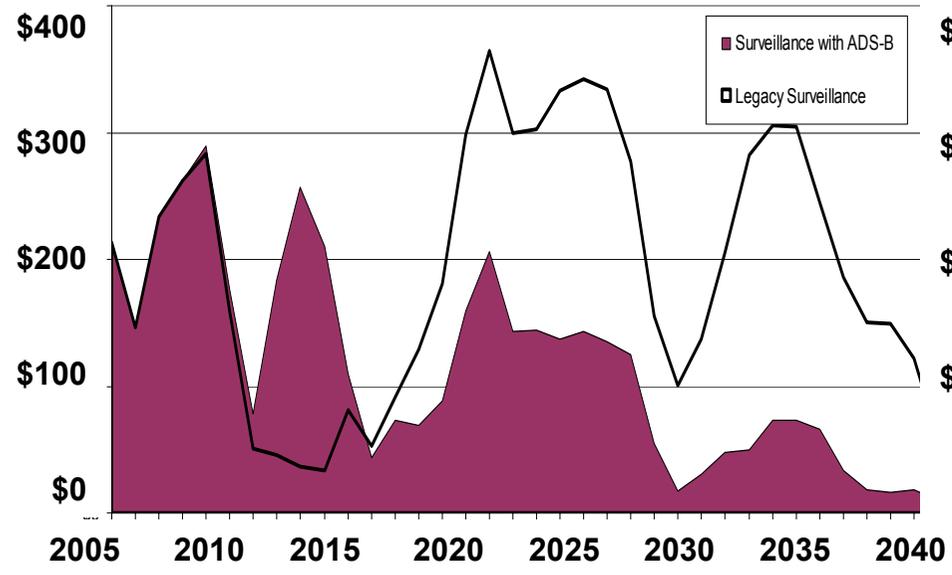


ADS-B = \$1.13M / Unit



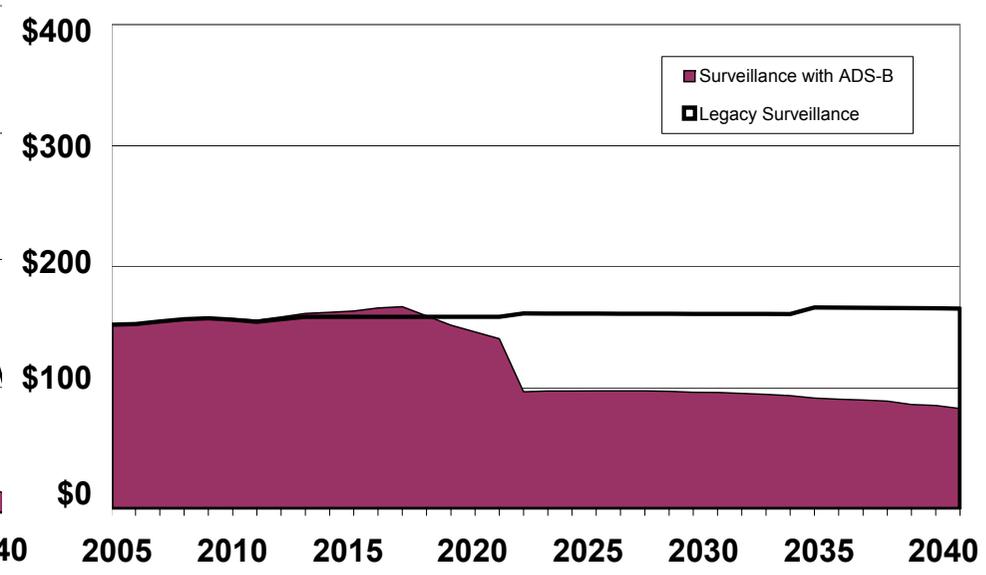
ADS-B Impact on Future Cost

F&E Cost Comparison of Legacy Systems vs. ADS-B (BY05)



Surveillance W/ADS-B Cost (\$M) (F&E)

O&M Cost Comparison of Legacy Systems vs. ADS-B (BY05)



Surveillance W/ADS-B Cost (\$M) (O&M)

Potential for private financing to accelerate deployment and drive costs off government books.

Life Cycle Savings
\$2.8B Capital/\$1.33B O&M



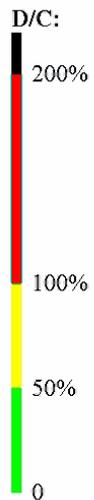
Increase use of advanced automation to dramatically increase productivity





NGATS Goes a Long Way Toward Accommodating 2x Demand

NGATS Airspace Capacity Analysis - Sector Loading



3x Current Monitor Alert Parameter (MAP) Values, 1.3x 2010 Airport Capacities)

NASA ACES B 3.1.1

2X 2/19/2004 Delay - Limited Demand



NGATS solves the capacity problem and does so much more:

- ✓ Provides opportunities for global harmonization
 - ✓ Bolsters national security
 - ✓ Higher productivity
 - ✓ Less infrastructure
- ✓ Leverages government resources

