NAS Operational Evolution Plan

A Foundation for Capacity Enhancement 2001-2010

June 2001

What is the Operational Evolution Plan?

- 10-year plan for operational improvements to increase capacity and safety in the US.
- Credible initiatives that focus on solving problems.
- Integrates program capabilities (Free Flight, WAAS, LAAS, Datalink, ADS-B)
- Specific timetables and accountability.

How is this Plan Different?

- Focus on Operational Solutions.
- Integrates all Actions:
  - Safety Certification
  - Procedures
  - Staffing
  - Equipment
  - Avionics
  - Research (FAA/NASA)

Critical Problems

- Arrival/Departure Rates
- En Route Congestion
- Airport weather conditions
- En Route severe weather

Structure of the Operational Evolution Plan - www.faa.gov

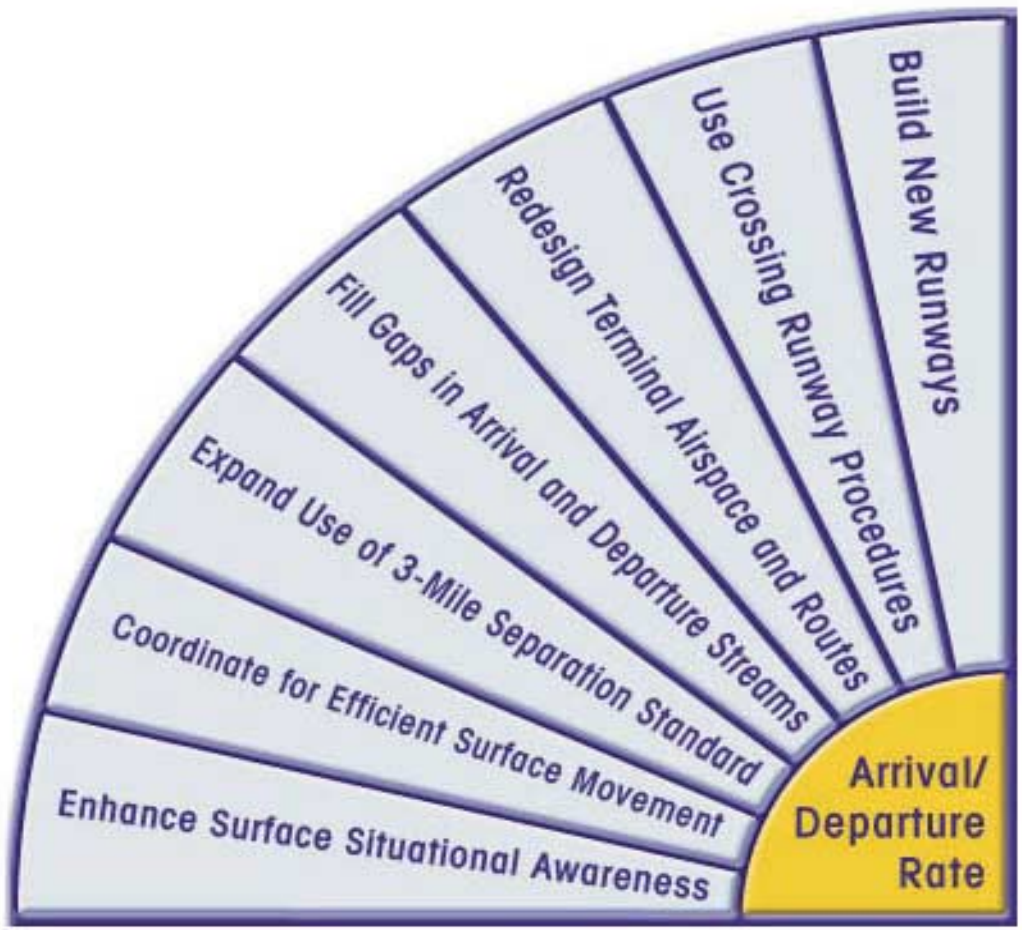
Benefits

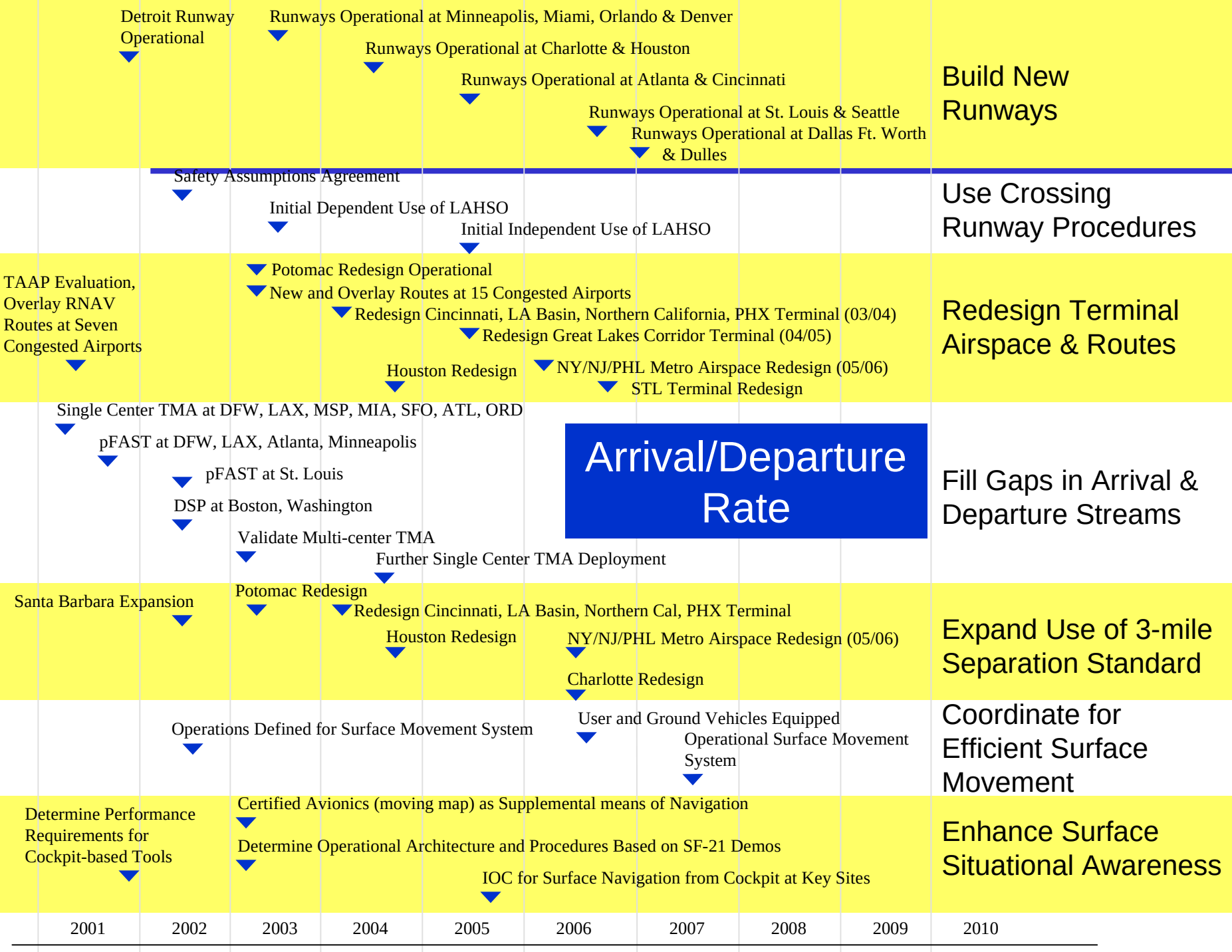
- Accommodates a 30% increase in commercial operations
- Delivers Free Flight capabilities
- Changes airspace and navigation procedure to increase system flexibility and access.
- Builds a foundation for future advancement in free flight concepts.

Commitments

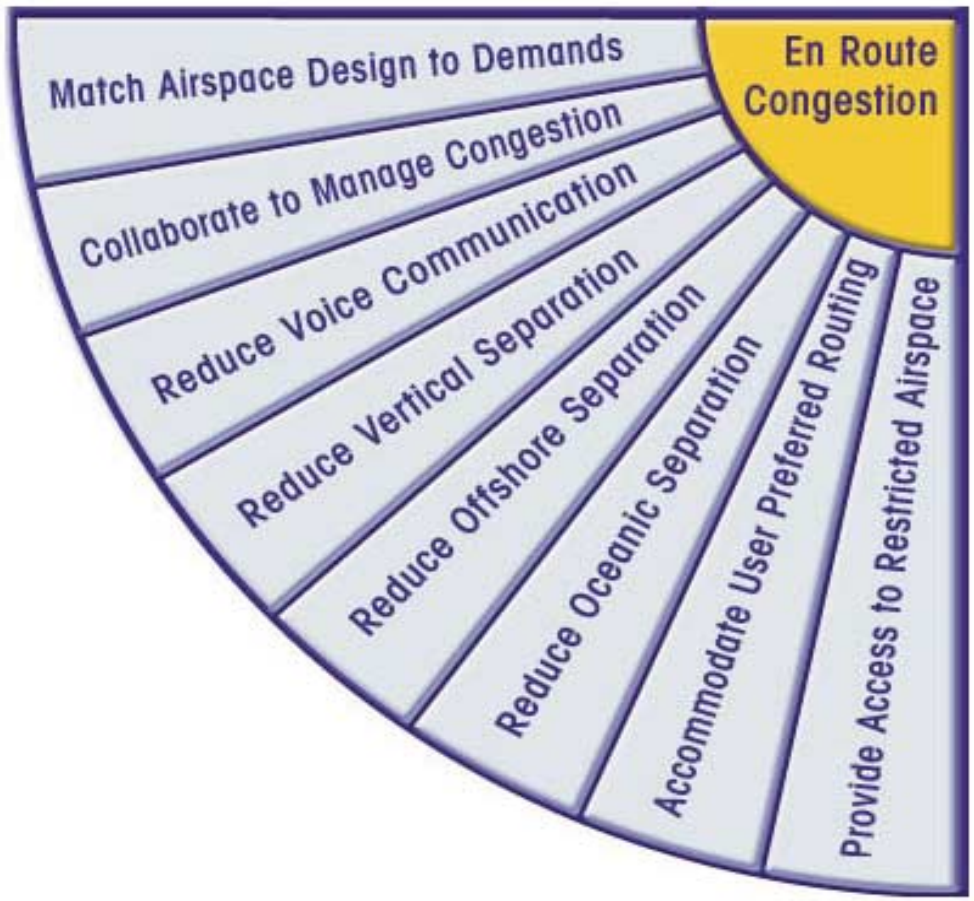
- New Runways
- Increased RNAV procedures
- LAAS in 2002
- WAAS LNAV/VNAV in 2003
- Domestic RVSM by 2004
- Free Flight Phases 1 & 2
- More ADS-B services
- Data link in Miami 2002
- 75 certification positions
- Airspace redesign

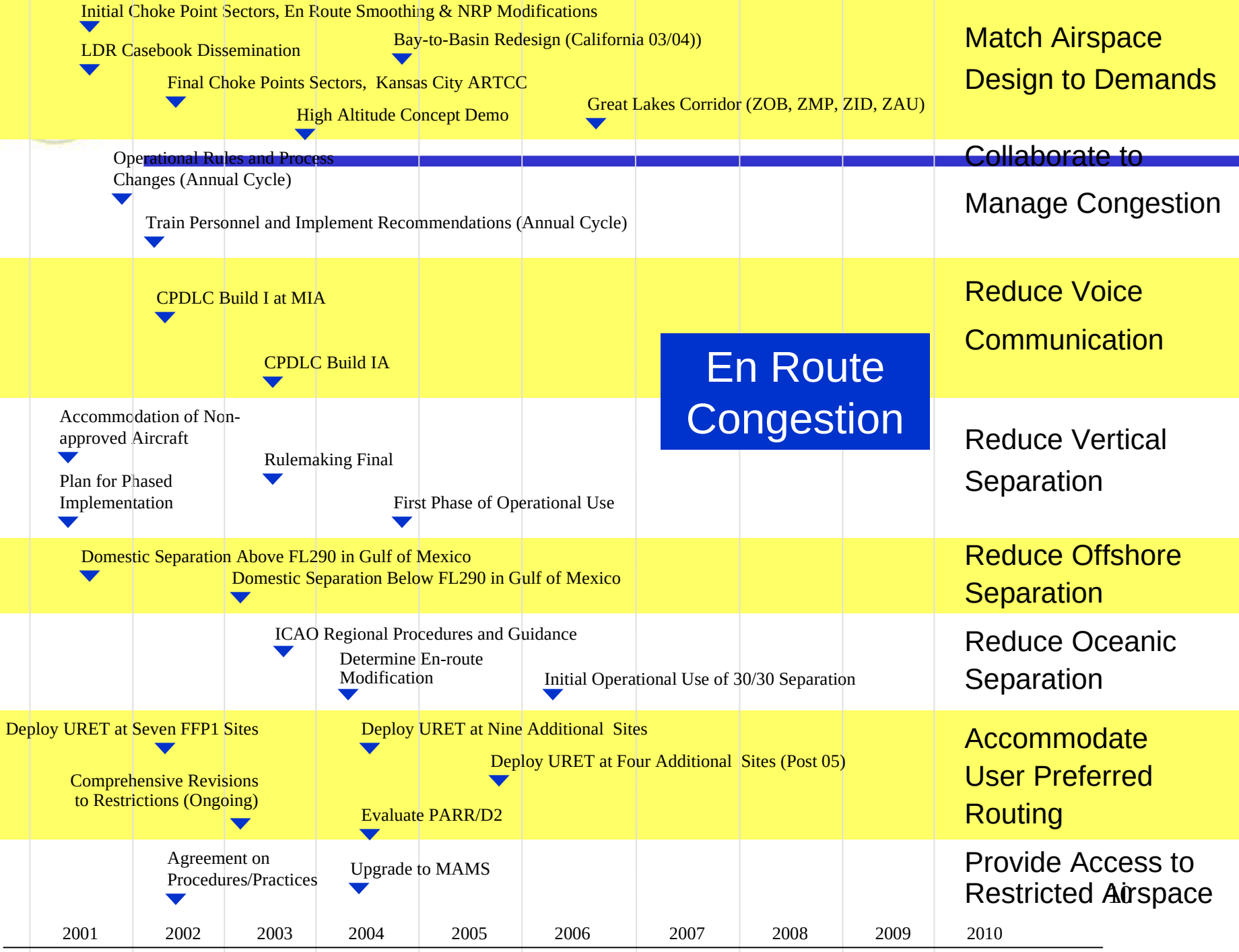
Arrival/Departure Rate



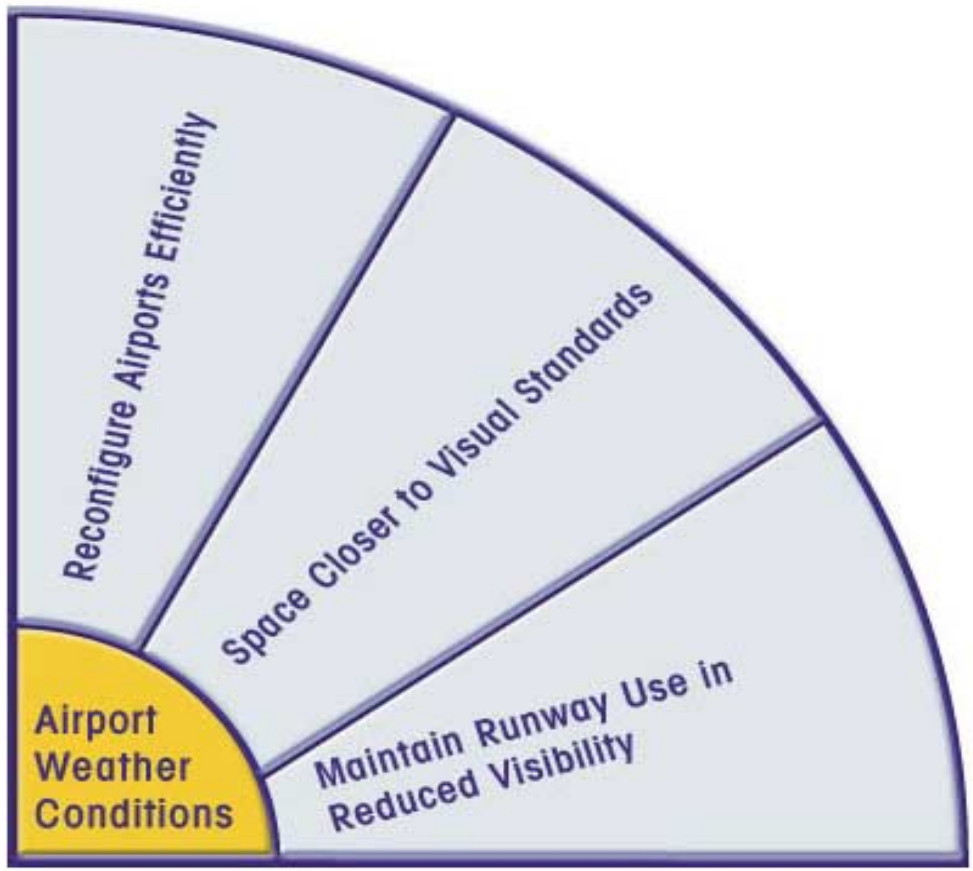

Detroit Runway Operational
Runways Operational at Minneapolis, Miami, Orlando & Denver
Runways Operational at Charlotte & Houston
Runways Operational at Atlanta & Cincinnati
Runways Operational at St. Louis & Seattle
Runways Operational at Dallas Ft. Worth & Dulles
Build New Runways
Safety Assumptions Agreement
Initial Dependent Use of LAHSO
Initial Independent Use of LAHSO
Use Crossing Runway Procedures
TAAP Evaluation, Overlay RNAV Routes at Seven Congested Airports
Potomac Redesign Operational
New and Overlay Routes at 15 Congested Airports
Redesign Cincinnati, LA Basin, Northern California, PHX Terminal (03/04)
Redesign Great Lakes Corridor Terminal (04/05)
Houston Redesign
NY/NJ/PHL Metro Airspace Redesign (05/06)
STL Terminal Redesign
Redesign Terminal Airspace & Routes
Single Center TMA at DFW, LAX, MSP, MIA, SFO, ATL, ORD
pFAST at DFW, LAX, Atlanta, Minneapolis
pFAST at St. Louis
DSP at Boston, Washington
Validate Multi-center TMA
Further Single Center TMA Deployment
Arrival/Departure Rate
Fill Gaps in Arrival & Departure Streams
Santa Barbara Expansion
Potomac Redesign
Redesign Cincinnati, LA Basin, Northern Cal, PHX Terminal
Houston Redesign
NY/NJ/PHL Metro Airspace Redesign (05/06)
Charlotte Redesign
Expand Use of 3-mile Separation Standard
Operations Defined for Surface Movement System
User and Ground Vehicles Equipped
Operational Surface Movement System
Coordinate for Efficient Surface Movement
Determine Performance Requirements for Cockpit-based Tools
Certified Avionics (moving map) as Supplemental means of Navigation
Determine Operational Architecture and Procedures Based on SF-21 Demos
IOC for Surface Navigation from Cockpit at Key Sites
Enhance Surface Situational Awareness
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

En Route Congestion




Initial Choke Point Sectors, En Route Smoothing & NRP Modifications
LDR Casebook Dissemination
Bay-to-Basin Redesign (California 03/04))
Final Choke Points Sectors, Kansas City ARTCC
Great Lakes Corridor (ZOB, ZMP, ZID, ZAU)
High Altitude Concept Demo
Match Airspace Design to Demands
Operational Rules and Process Changes (Annual Cycle)
Train Personnel and Implement Recommendations (Annual Cycle)
Collaborate to Manage Congestion
CPDLC Build I at MIA
CPDLC Build IA
Reduce Voice Communication
En Route Congestion
Accommodation of Non-approved Aircraft
Plan for Phased Implementation
Rulemaking Final
First Phase of Operational Use
Reduce Vertical Separation
Domestic Separation Above FL290 in Gulf of Mexico
Domestic Separation Below FL290 in Gulf of Mexico
Reduce Offshore Separation
ICAO Regional Procedures and Guidance
Determine En-route Modification
Initial Operational Use of 30/30 Separation
Reduce Oceanic Separation
Deploy URET at Seven FFP1 Sites
Deploy URET at Nine Additional Sites
Deploy URET at Four Additional Sites (Post 05)
Comprehensive Revisions to Restrictions (Ongoing)
Evaluate PARR/D2
Accommodate User Preferred Routing
Agreement on Procedures/Practices
Upgrade to MAMS
Provide Access to Restricted Airspace
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

Airport Weather Conditions



PRM Installed at 5 Sites

Pilot Acceptance of SOIA (SFO)

Pilot Acceptance of SOIA (Last site)

Certified WAAS/LAAS Avionics

CAT II/III LAAS Operational at Key Airports

Maintain Runway Use In Reduced Visibility

WAAS LNAV/VNAV Operations NAS Wide

Over 500 Airports Have LNAV/VNAV Procedures

CAT I LAAS Operational at Key Airports

Over 2000 Airports Have LNAV/VNAV Procedures

Pilot & Controller Acceptance of Display as Means for Acquisition

Pilots Trained for Operations

Display Enhanced Acquisition IOC at Key Airports

Space Closer to Visual Standards

Adjust Airport Acceptance Rates

Airport Weather Conditions

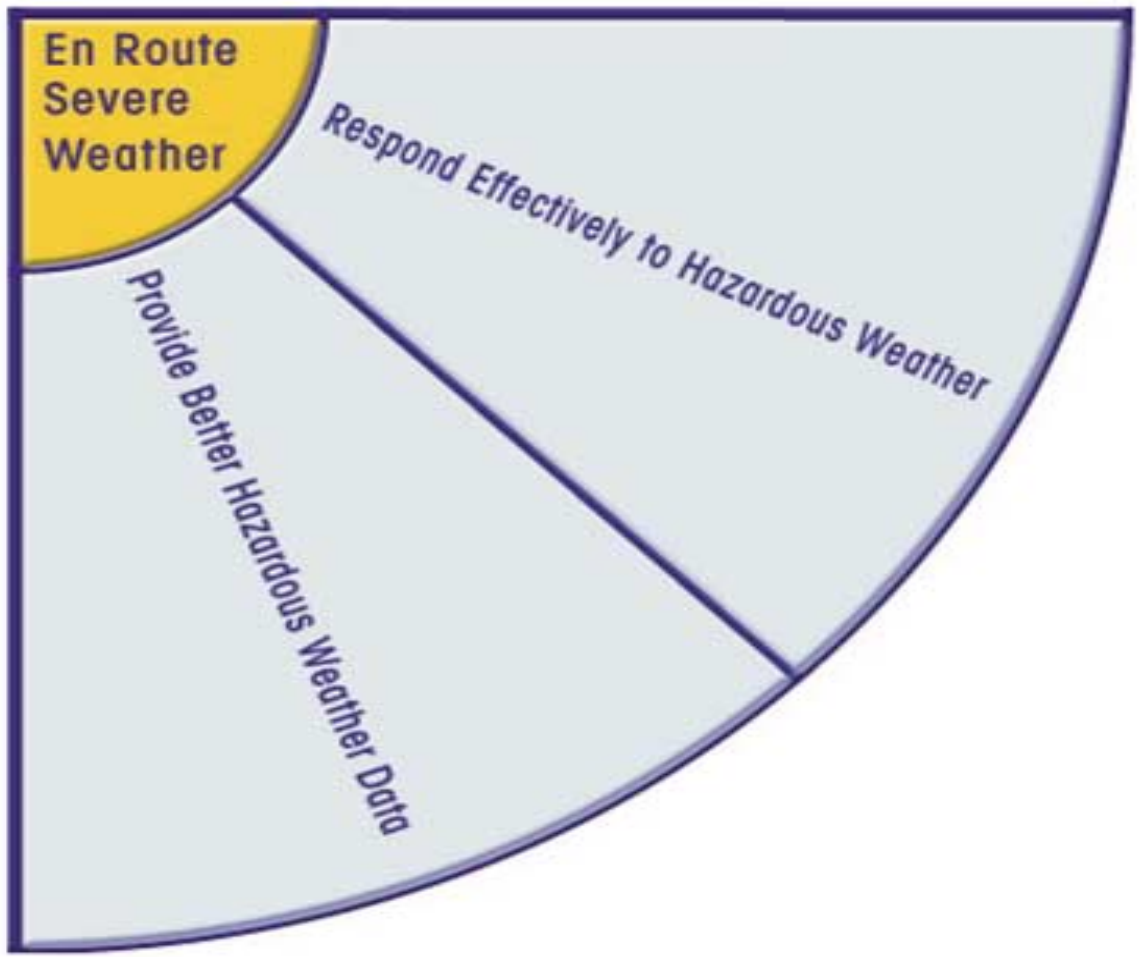
Initial ITWS Deployment

ITWS Deployment Completed

Reconfigure Airport Efficiently

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

En Route Severe Weather



En Route Severe Weather

Decision on Need for Additional Weather Sensors and Radar Facilities

Improvements to Collaborative Convective Forecast Product

Deploy On-DSR Weather Display

ETMS FCA/CCSD

Deployment of Improved Systems for Common Situational Awareness

Deploy Additional CRCT/FCA Capabilities

Provide Better Hazardous Weather Data

Operational Rules and Process Changes (Annual Cycle)

Train Personnel and Implement Recommendations (Annual Cycle)

Respond Effectively to Hazardous Weather

2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

Examples of Benefits: Efficiency

Flight time reduction

Removal of restrictions

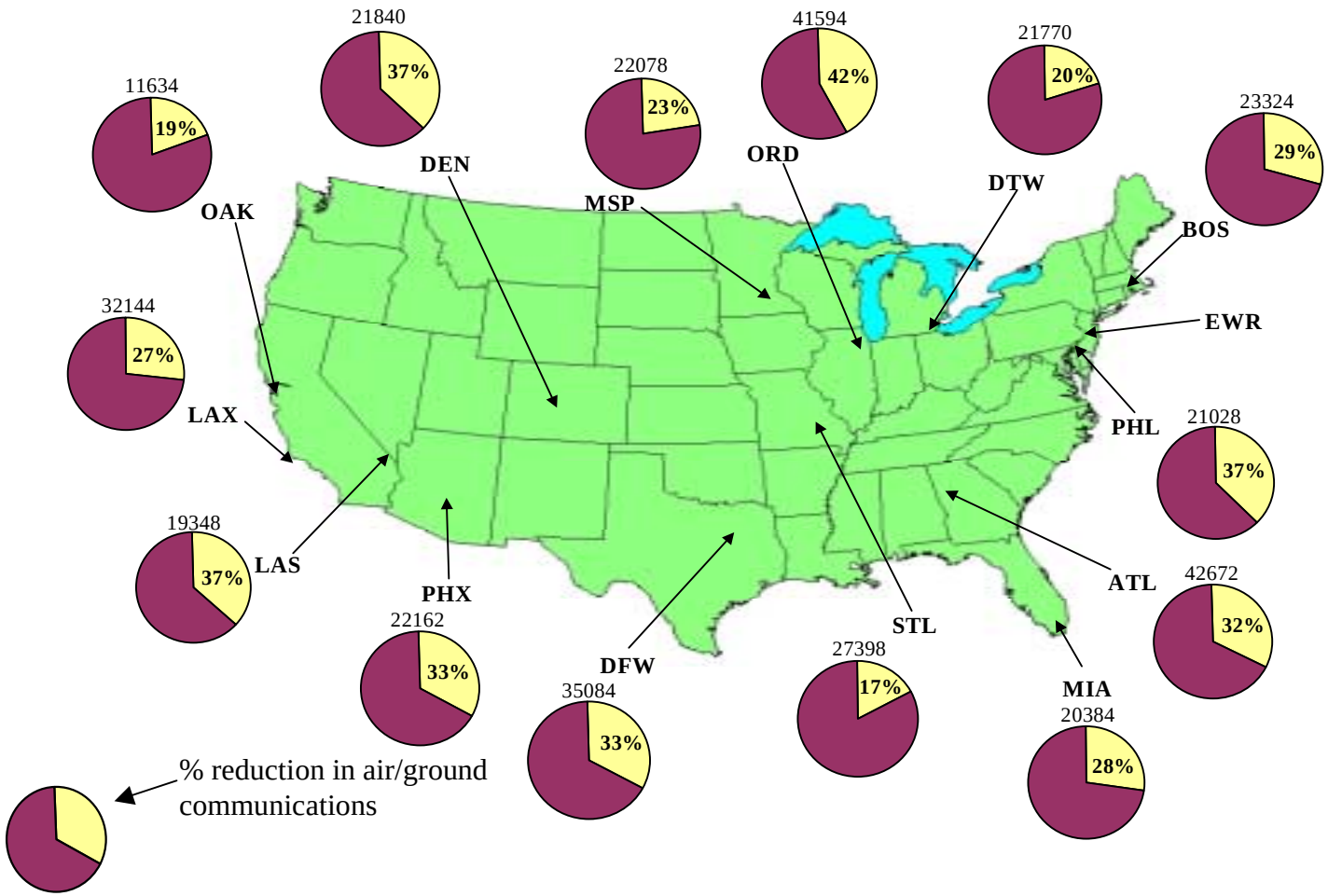
Smoother flow thru airspace (Removing Choke Point)

Access to special use airspace

PROVIDED BY

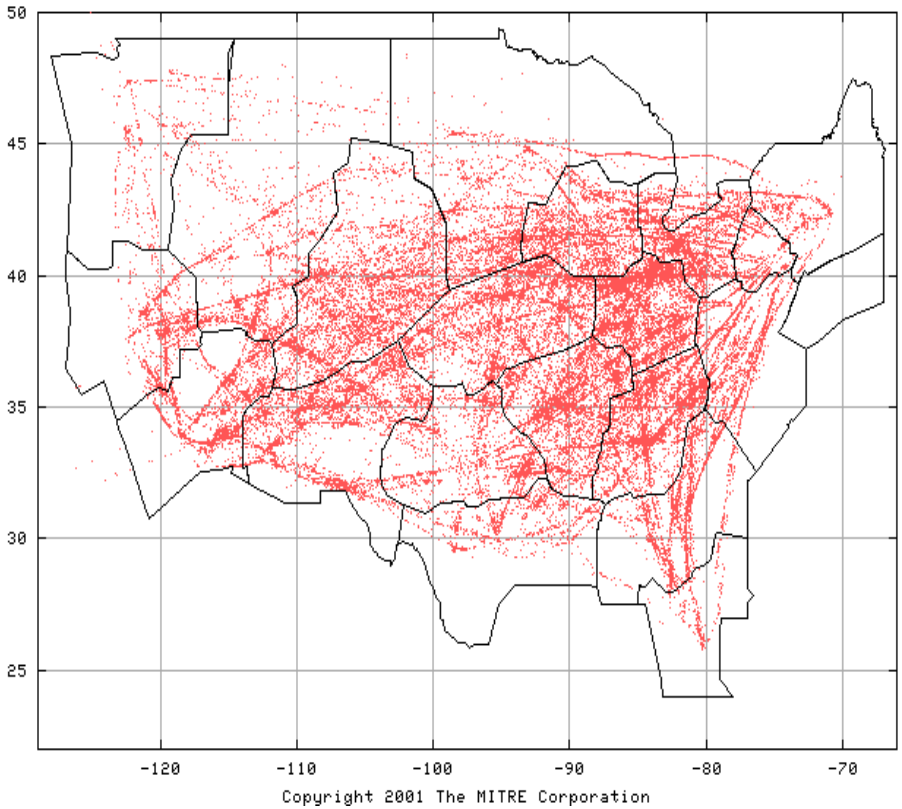
AirSpace Redesign, Additional Sectors, Data Link, Automation Aids (URET, PARR, ETMS), Collaborative Decision Making, MAMS, Procedures (RNAV, LAADR)

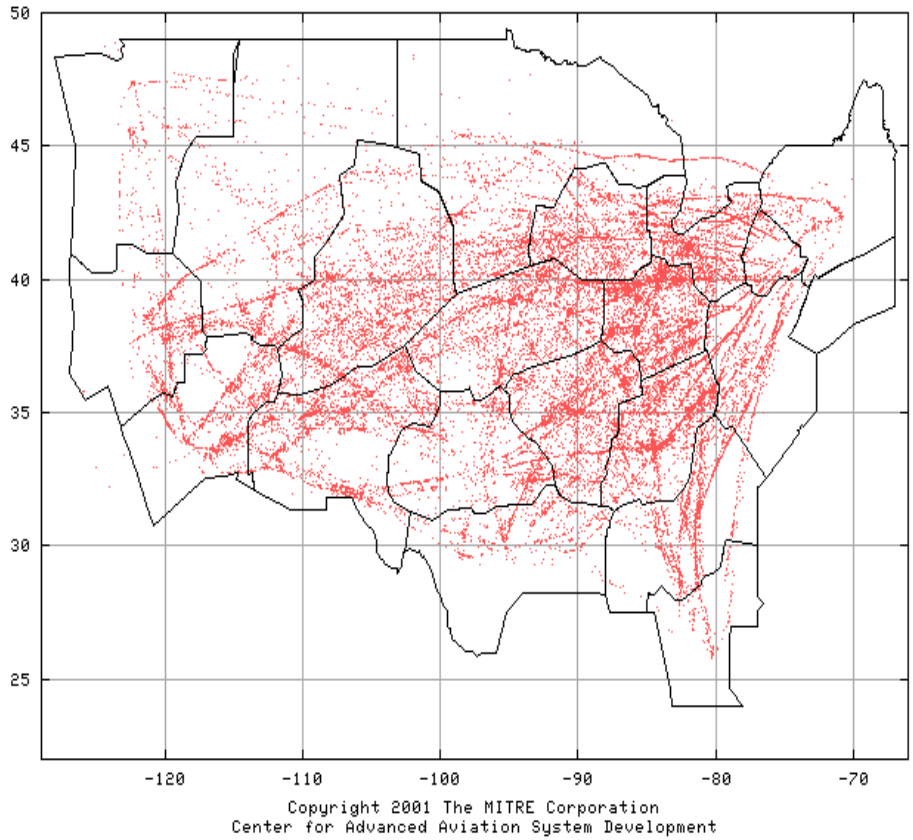
Examples of Benefits: RNAV



17 to 42 percent reduction in air/ground communications

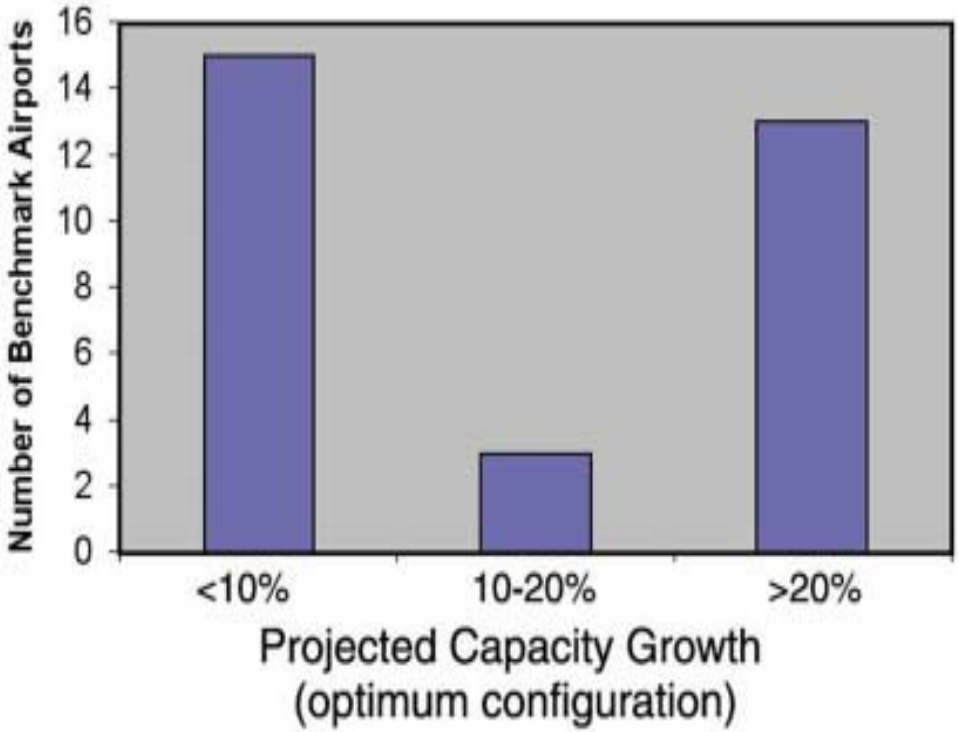
Examples of Benefits: RVSM

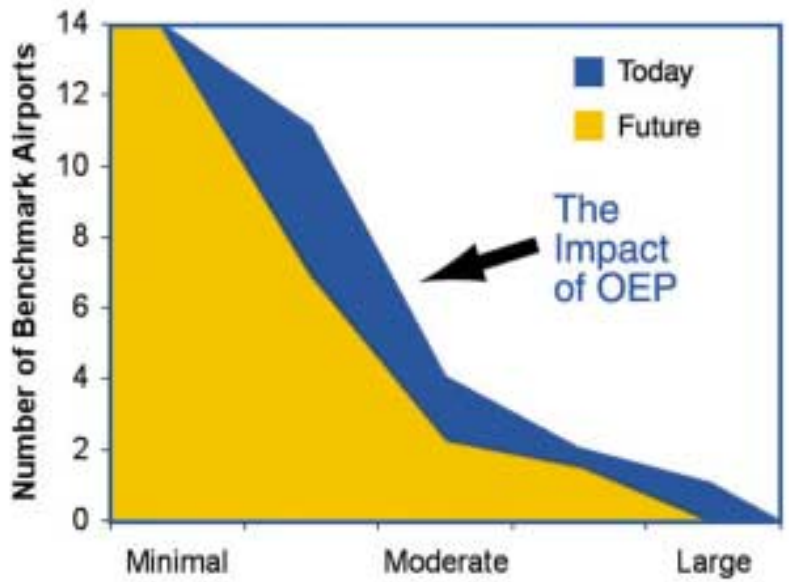




30 to 40 percent reduction of interactions between flights requiring controller intervention

Example of Benefits: Airports





Loss in Throughput from Local Weather

PROVIDED BY
Runways, Automation Aids (TMA, pFAST), Procedures (ADS-B, PRM, RNAV, LAHSO), Navigation Systems (WAAS/LAAS)