

Surveillance and Broadcast Services

Northwest Mountain Region Airports Conference

By: Arthur Sullivan

Date: April 17, 2007



Federal Aviation
Administration



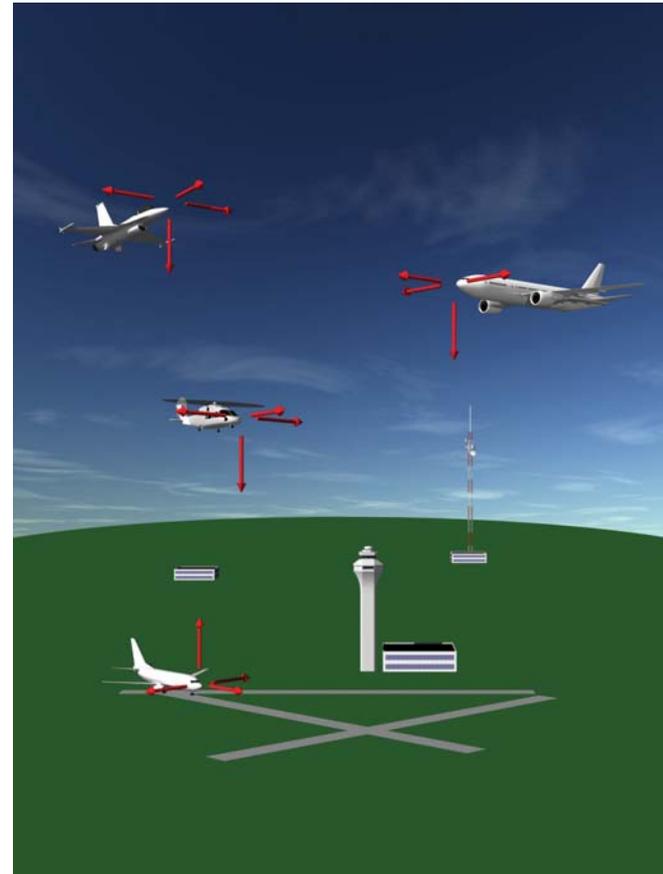
Agenda

- **Background**
- **Program Status**
- **Acquisition Status**
- **Activities in Oregon**
- **Activities in Colorado**



Background: Automatic Dependent Surveillance - Broadcast (ADS-B)

- **Automatic**
 - Periodically transmits information with no pilot or operator input required
- **Dependent**
 - Position and velocity vector are derived from the Global Positioning System (GPS) or a Flight Management System (FMS)
- **Surveillance -**
 - A method of determining position of aircraft, vehicles, or other asset
- **Broadcast**
 - Transmitted information available to anyone with the appropriate receiving equipment



Background: Traffic Information Service - Broadcast / Flight Information Service - Broadcast

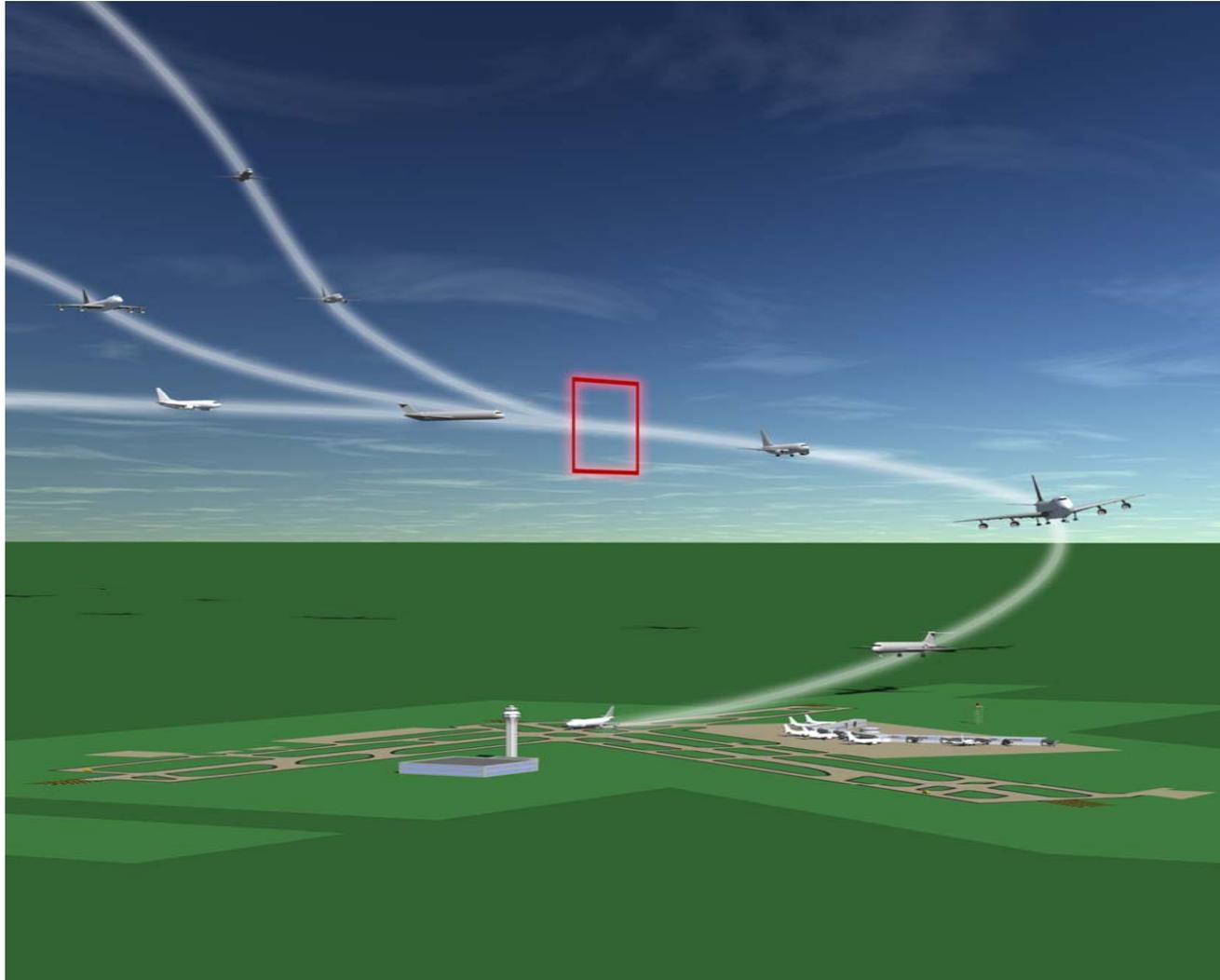
TIS-B is a service which provides ADS-B equipped aircraft with position reports from secondary surveillance radar on non-ADS-B equipped aircraft.



FIS-B transmits graphical National Weather Service products, temporary flight restrictions (TFRs), and special use airspace.

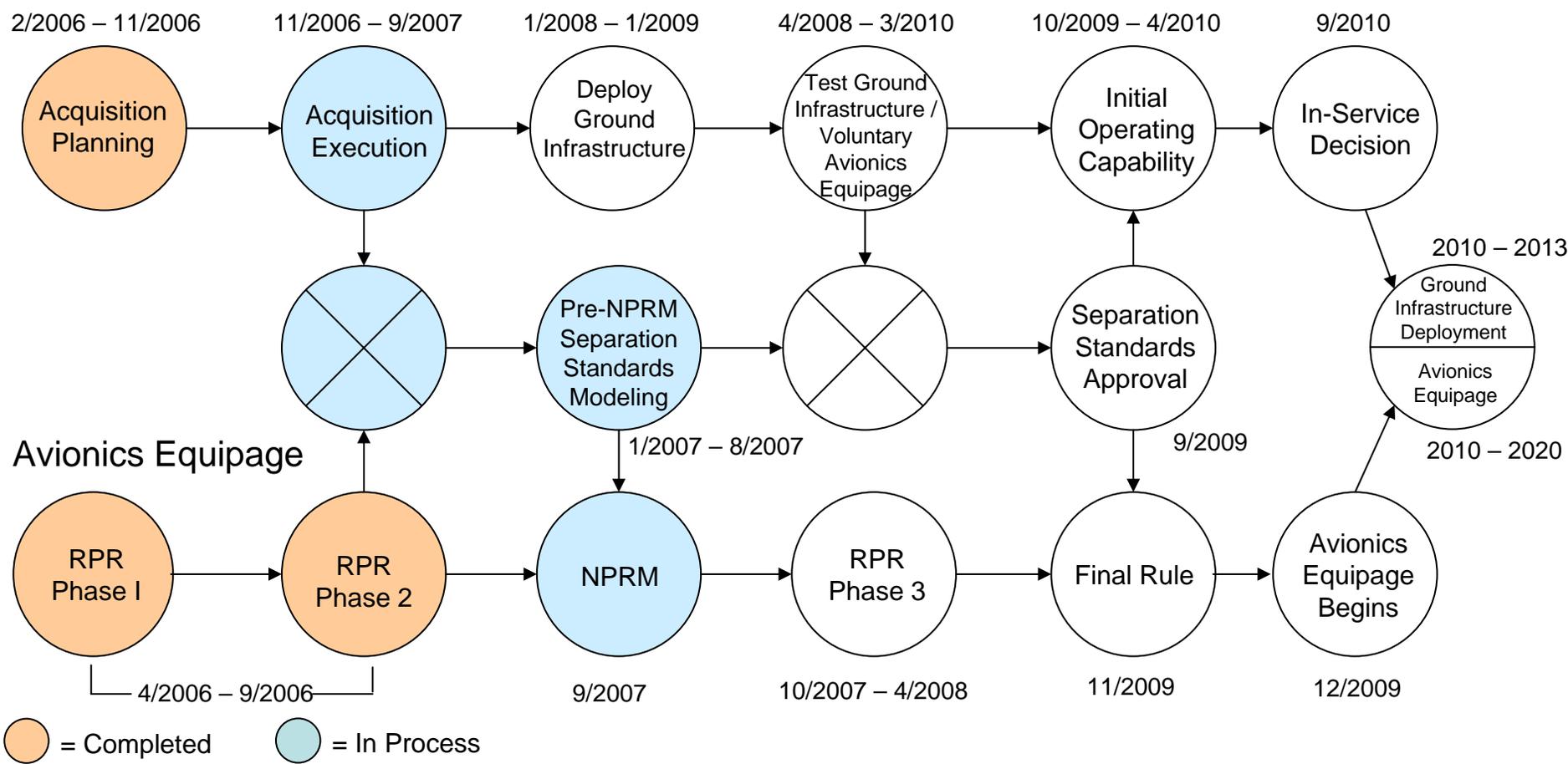


Reliable Precision Operations Improve Predictability, Safety and Airspace System Capacity



Program Status: Dual Track Strategy

Ground Infrastructure



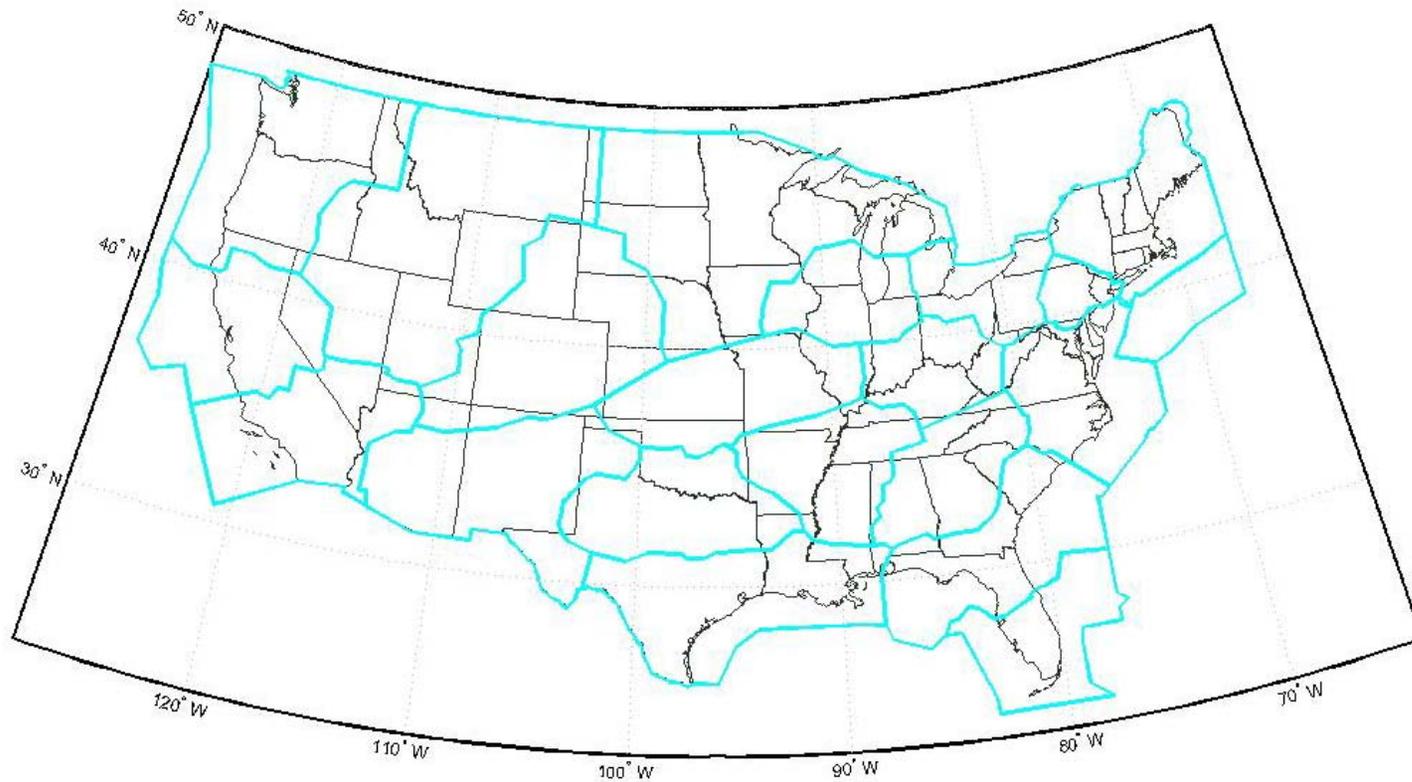
Acquisition Status

- **A Screening Information Request (SIR) was released on November 30, 2006**
- **The purpose of this SIR was to identify offerors who are most likely to receive an ADS-B contract award**
- **SIR responses received on January 24, 2007**
 - The following prime vendors submitted proposals
 - Raytheon
 - Lockheed Martin
 - ITT
- **A down-select decision was announced on February 23, 2007**
- **The Request for Offer (RFO) was released on March 30, 2007**



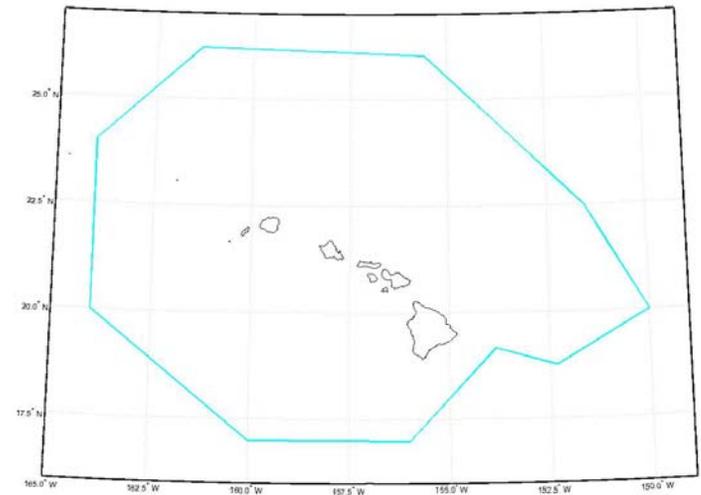
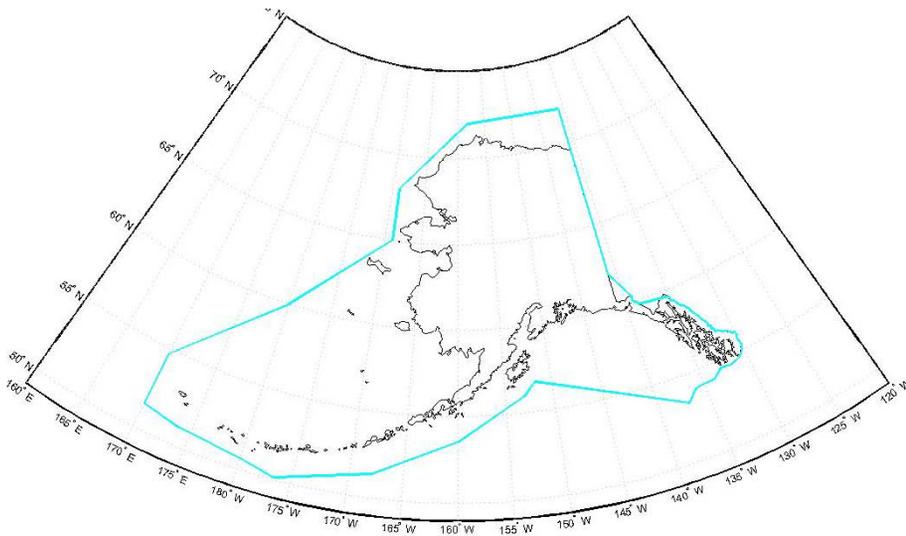
Locations

- **NAS Service Volumes**



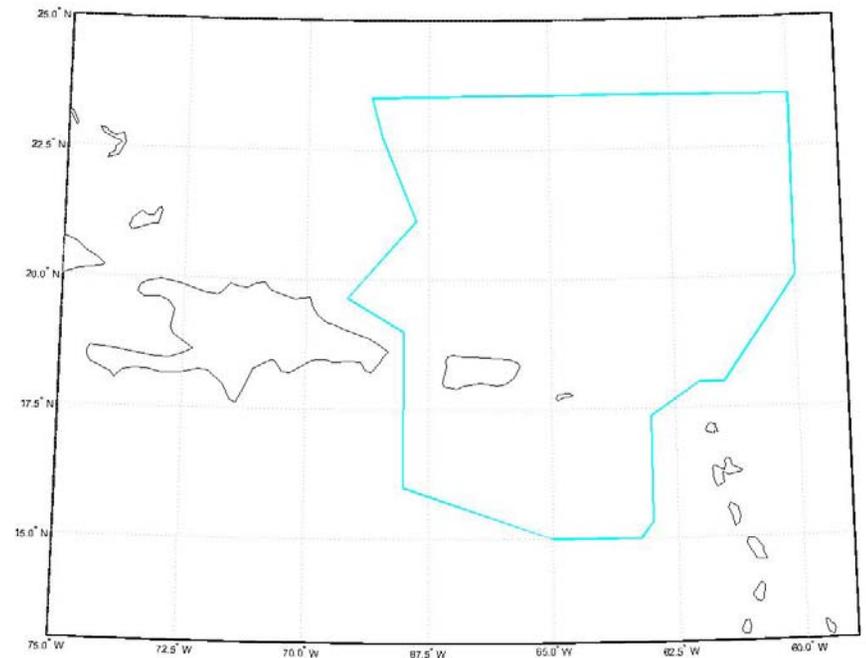
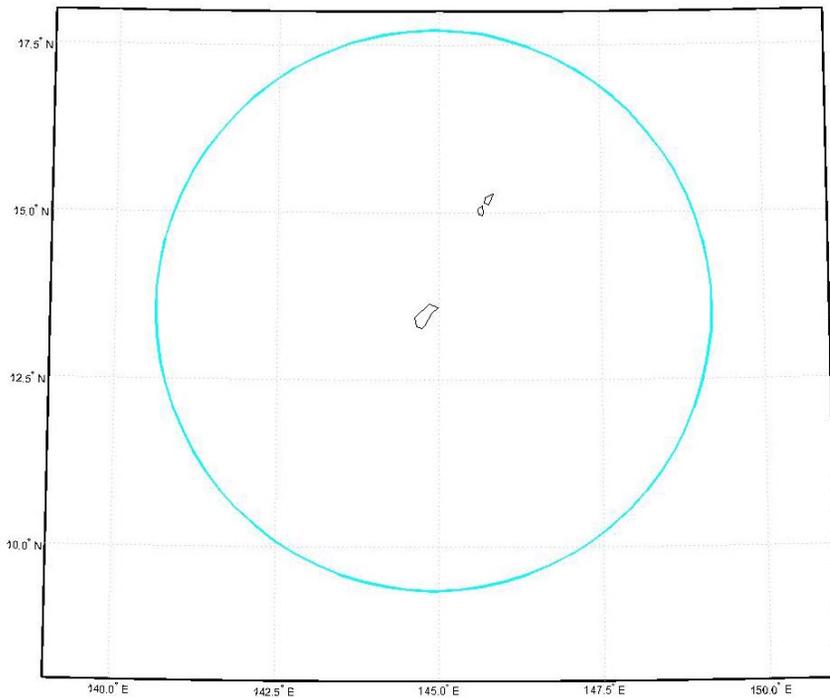
Locations

- **NAS Service Volumes**



Locations

- **NAS Service Volumes**



Memorandum of Agreements (MOAs) with Various States / Institutions For ADS-B Services

AGREEMENT (MOA) - STATE/INDUSTRY
North Carolina State
University Research Foundation - Maryland
Virginia Commonwealth
Expanded Air Services Enterprise - North Dakota
Ohio Aeronautic Institute - Ohio
Maryland State
Pennsylvania Commonwealth
Tennessee State
Oregon State
FAA Vertical Flight Program Office - New York

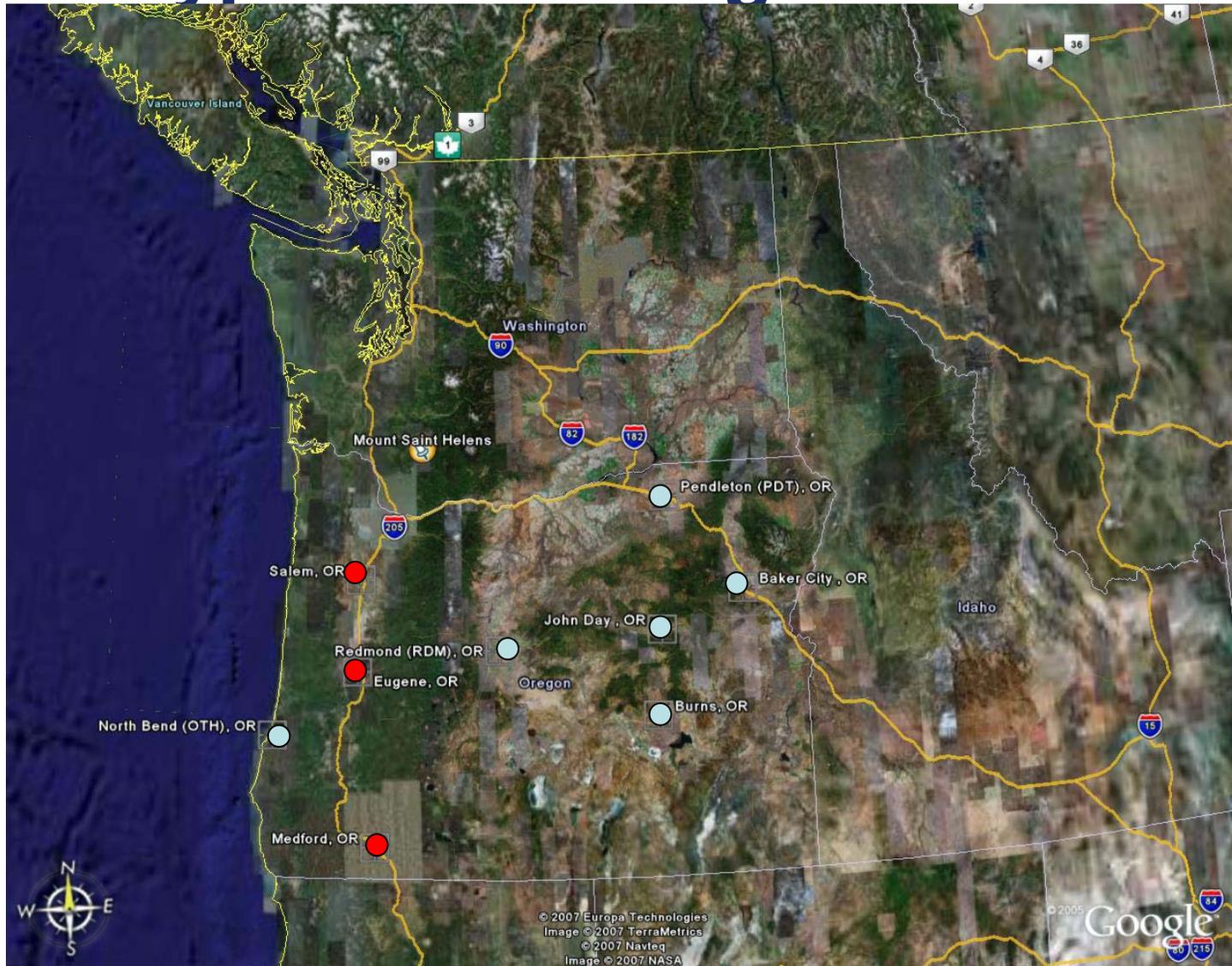
MOA with Oregon

- **The FAA and Oregon set up the agreement to provide the benefits of broadcast services within the state in advance of the national deployment of ADS-B system.**
- **Task**
 - Manage, coordinate and support the installation of Automatic Dependent Surveillance – Broadcast in the state of Oregon (9 UAT GBTs)

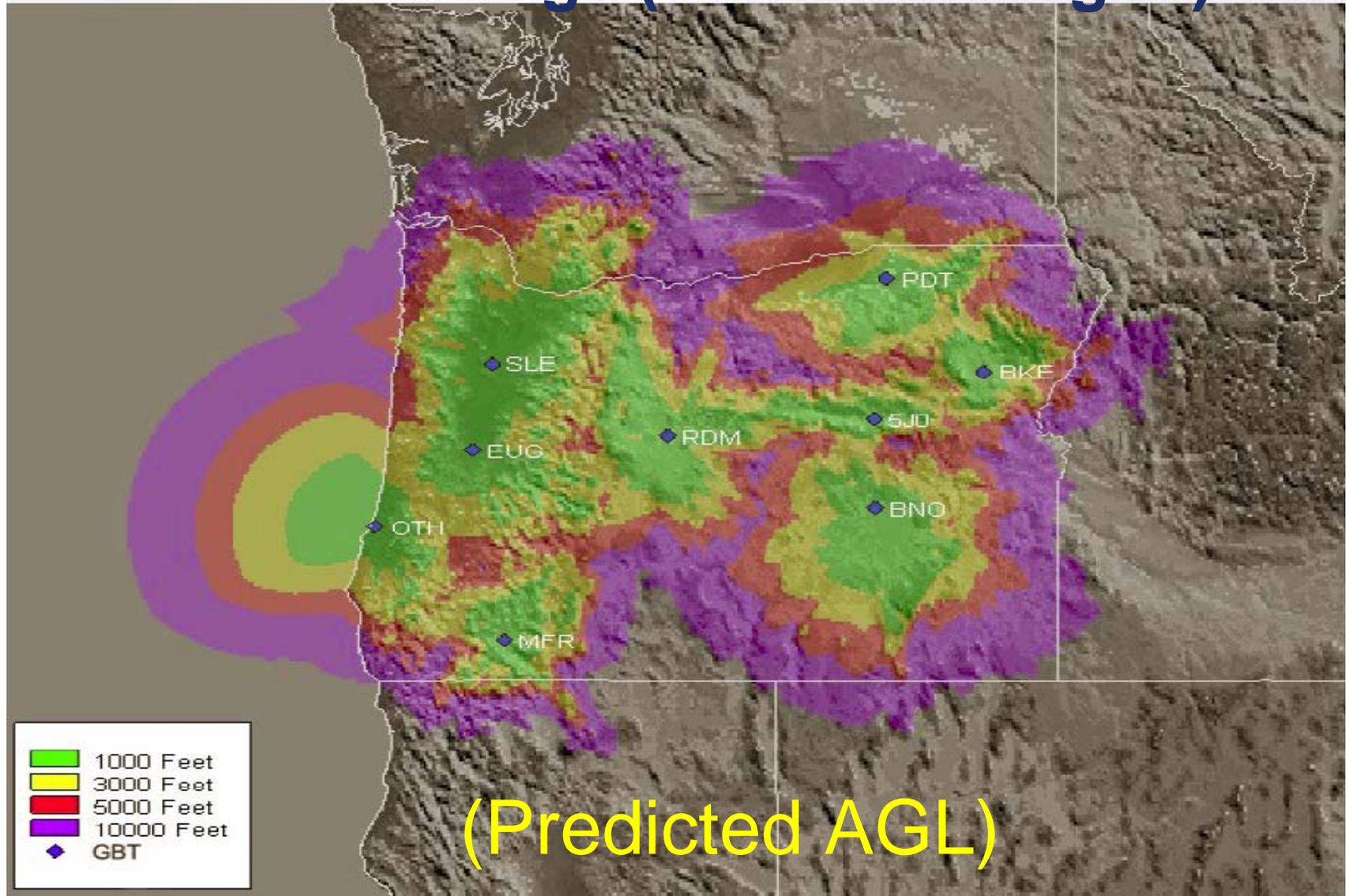
Oregon ADS-B Services

- **FAA Sites (3 sites along I-5 corridor)**
 - Eugene, Salem, Medford
 - Installation complete
 - Uplinking FIS-B
 - TIS-B expected by May 07
- **“Connect Oregon” Sites (6 sites to cover remainder of the state)**
 - Contract Awarded to Sensis Corporation
 - Kickoff meeting with Sensis during the week of April 30, 2007
 - System owned by state; operated and maintained by Sensis
 - FAA will provide TIS-B and FIS-B data to Sensis for distribution over Connect Oregon sites
- ODOT Site Surveys anticipated week of April 30, 2007

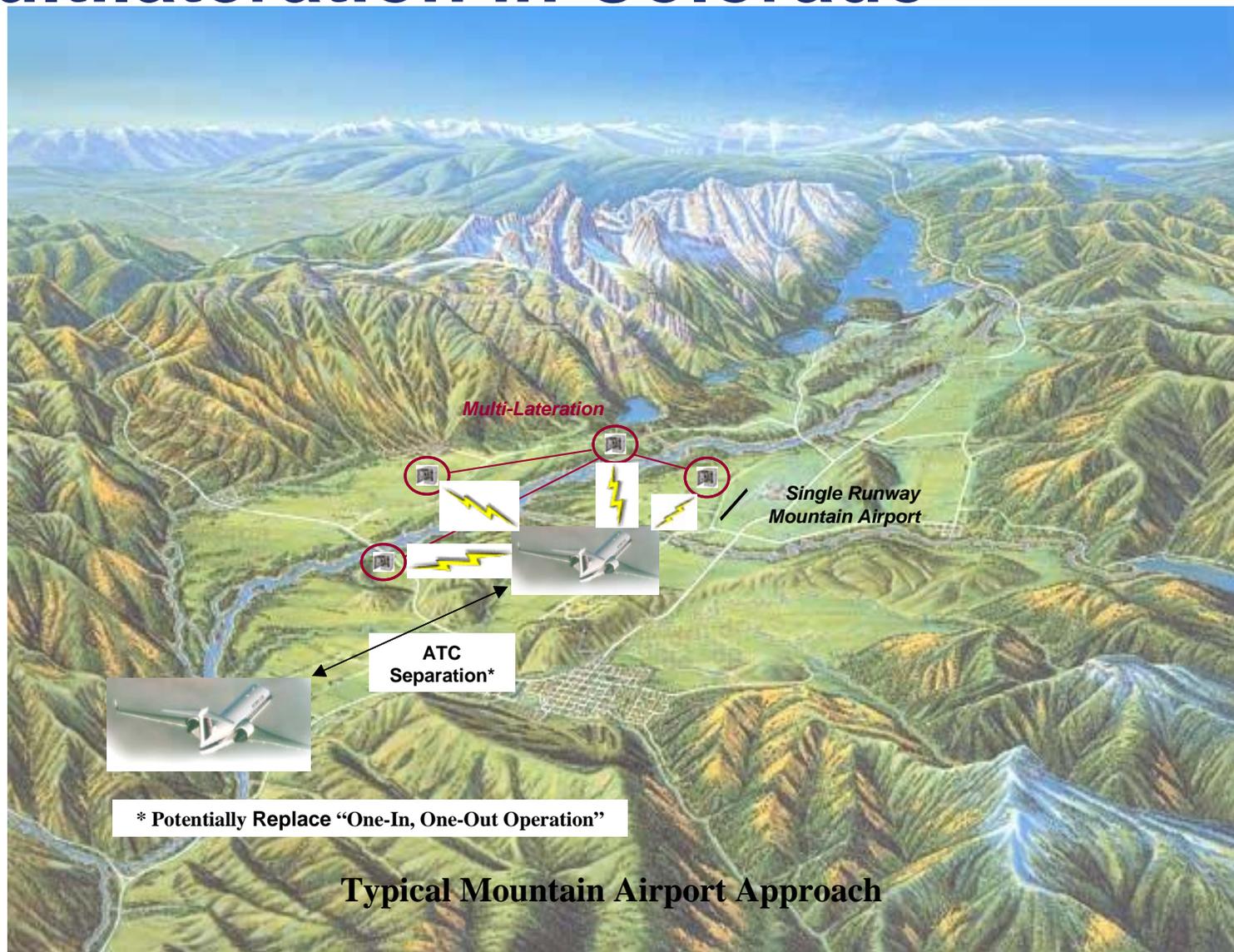
Prototype Sites: Oregon



Predicted Coverage (FAA and Oregon)



Multilateration in Colorado



Colorado Department of Transportation: Problem Statement

- **Increases in air traffic volume have resulted in an increased number of delays and denied service at the Colorado mountain airports, especially during bad weather**
- **Instrument Meteorological Conditions (IMC) reduces acceptance rates for mountain airports from 12-17 flights per hour to 4 per hour**
- **From November to April each year, the Colorado DOT estimates 75 aircraft per airport, per day are delayed or diverted, creating daily revenue loss for the state**

Benefits from Multilateration In Colorado

- **Enhanced Safety:** Increase safety by being able to see aircraft that are currently outside radar coverage
- **Improve Overall Flow Efficiency:** Improve arrival and departure efficiency into and out of Denver International Airport, as well as mountain airports
- **Economic Benefits:** Reduce lost revenue at Colorado ski areas due to diversions of flights to other than destination airports
 - Improved surveillance translates into more efficient flight tracks, which means less fuel burned and increased hourly capacity at Colorado's Mountain Airports. **Total Benefit \$132 Million**

Colorado Scope of Work

- **The surveillance system will supplement long-range radar surveillance by allowing control of approaches and landings at airports within the surveillance area**
- **The control will occur at the Denver Air Route Traffic Control Center (ARTCC)**
- **The requirements for the coverage will be based on the minimum performance necessary to provide air traffic control using En Route separation standards for radar service**



Locations for Multilateration In Colorado

- The airports and associated coverage areas include Hayden / Yampa Valley Regional Airport (HDN) and Rifle – Garfield County Airport (RIL)



Yampa Valley-Hayden (HDN)



Garfield County Regional – Rifle (RIL)

Upcoming Milestones for Colorado

- **Contract Award: April 2007**
- **Initial Operating Capability (IOC): October 2008**
- **Operational Readiness Date (ORD): November 2008**



Summary

- **Technology Portfolio**

- National ADS-B Program

- Funded
 - Contract Award in Progress: Planned for September 2007
 - Notice of Proposed Rulemaking (NPRM): Planned for September 2007
 - Final Rule: Planned for November 2009
 - Compliance 2020
 - Reauthorization Language
 - Authorize a pilot program to promote non-Federal ownership and maintenance of ground-based equipment necessary for one of the FAA's air traffic modernization systems, Automatic Dependent Surveillance-Broadcast (ADS-B).

- Oregon

- Colorado Project

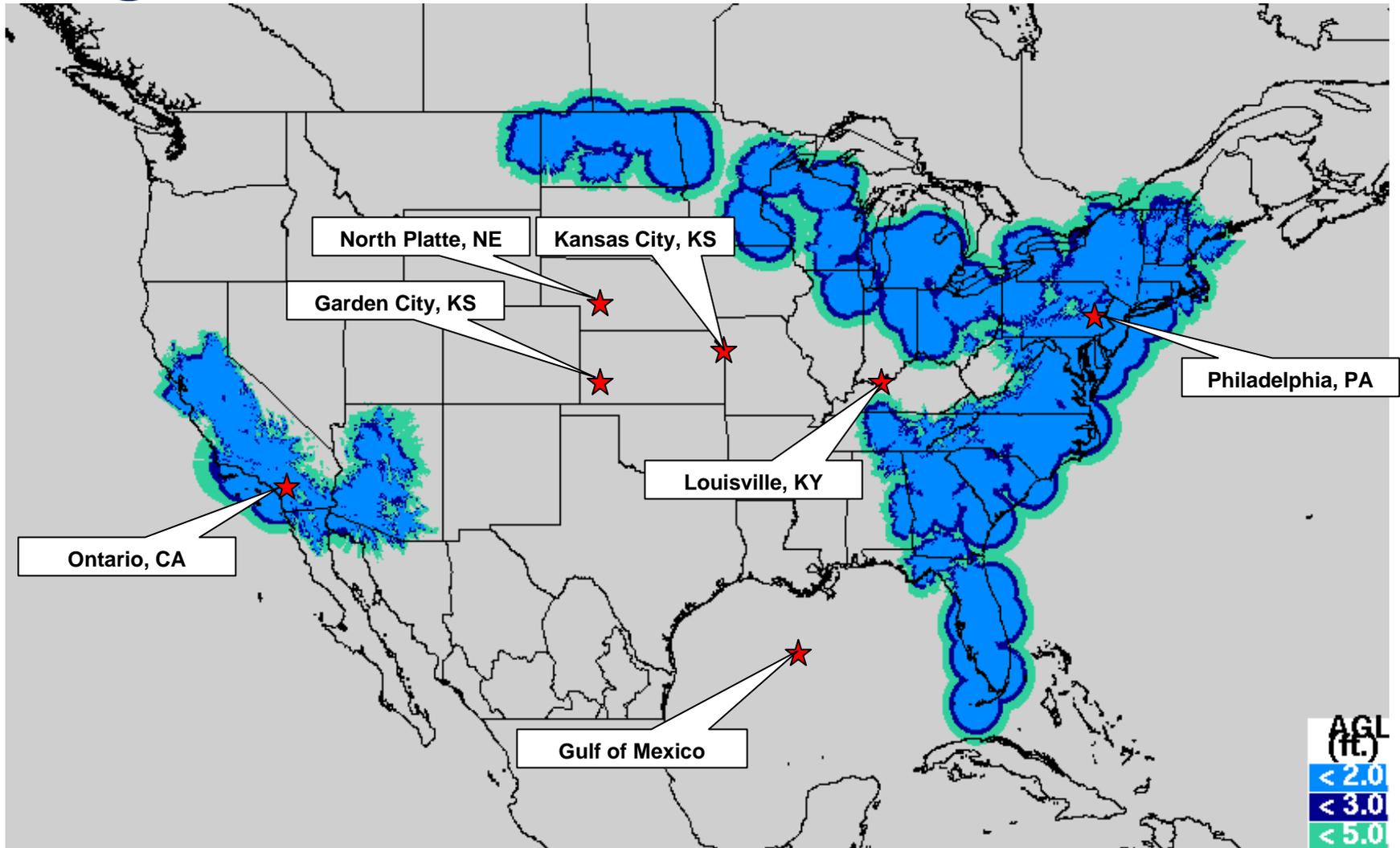
Backup



Segment 1 Schedule

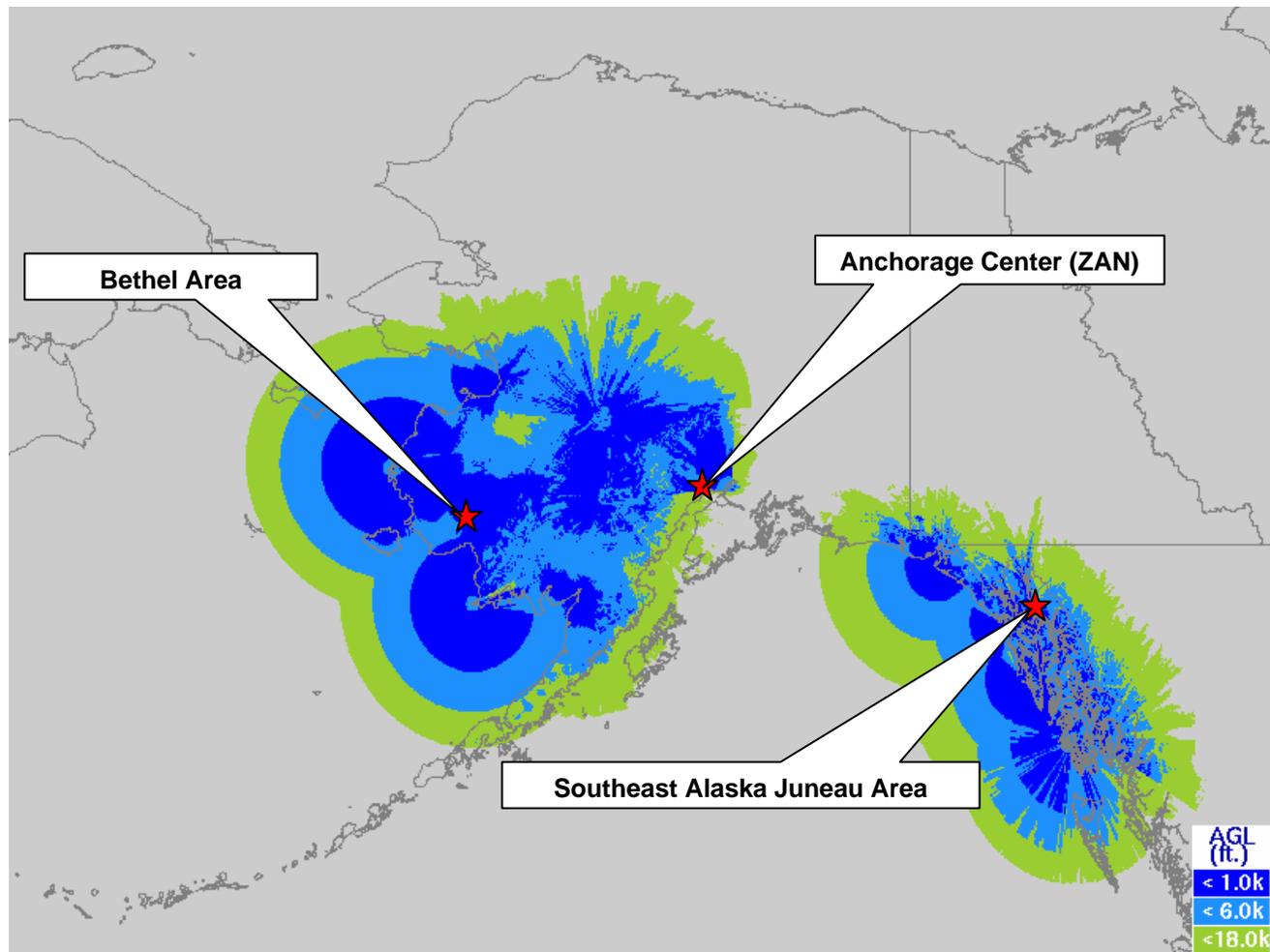
Milestone	Projected Completion Date	Complete
Segment 1 JRC	June 2006	√
Screening Information Request (SIR) Issued	November 2006	√
Segment 2 JRC	February 2007	√
Request for Offer Released	March 2007	√
Contract Award	September 2007	
NPRM Issued	September 2007	
Preliminary Design Review (PDR)	October 2007	
Critical Design Review (CDR)	January 2008	
Key Site Initial Operating Capability (IOC) of Broadcast Services	July 2008	
In-Service Decision (ISD) of Broadcast Services	November 2008	
Terminal Separation Standards Approval at Louisville	June 2009	
En Route Separation Standards Approval for Gulf of Mexico	July 2009	
Terminal Separation Standards Approval at Philadelphia	September 2009	
En Route Separation Standards Approval at Juneau	September 2009	
Gulf of Mexico Comm. and Weather IOC	September 2009	
Louisville IOC of Surveillance and Broadcast Services	October 2009	
Final Rule Published	November 2009	
Gulf of Mexico IOC of Surveillance and Broadcast Services	December 2009	
Philadelphia IOC of Surveillance and Broadcast Services	February 2010	
Juneau IOC of Surveillance and Broadcast Services	April 2010	
Surveillance and Broadcast Services ISD for ADS-B	September 2010	

Segment 1 Locations



[Link to Definition of Program: Segment 1 Locations](#)

Segment 1 Locations (Continued)



Segment 2 Schedule

Milestone	Projected Dates
Segment 2 (2009 – 2014)	
Implementation:	
Continue Initial Aircraft to Aircraft Application Deployment	FY 2010 – FY 2014
Additional Aircraft to Aircraft Application Deployment	FY 2010 – FY 2014
Additional Aircraft to Aircraft Requirements Definition	FY 2010 – FY 2014
Continue / Complete TIS-B / FIS-B Deployment	FY 2009 – FY 2012
Continue / Complete ADS-B NAS Wide Infrastructure Deployment	FY 2010 – FY 2013
Complete 26% Avionics	FY 2014
Lifecycle:	
Targeted Removal of Legacy Surveillance	FY 2016 – FY 2020
Complete 100% Avionics	FY 2020
Complete Removal of Targeted Legacy Surveillance	FY 2023
Complete Targeted Removal of TIS-B	FY 2025

Note: Segments 3 and 4 will focus on the continued definition / deployment of additional aircraft to aircraft applications

Oregon Task Overview

- Contractor
 - **Sensis Corporation; Syracuse, NY (Oregon Contract)**
 - **Subsystem Technologies, Inc; Rosslyn, VA (FAA Contract)**
- Volpe Staffing
 - Steve Nuzzi



Oregon Current Deployment

- **Salem, OR**
 - 1 ADS-B Ground Station (FAA contract)
- **Eugene, OR**
 - 1 ADS-B Ground Station (FAA contract)
- **Medford, OR**
 - 1 ADS-B Ground Station (FAA contract)
- **North Bend (OTH), OR**
 - 1 ADS-B Ground Station (Oregon contract)
- **Redmond (RDM), OR**
 - 1 ADS-B Ground Station (Oregon contract)
- **Pendleton (PDT), OR**
 - 1 ADS-B Ground Station (Oregon contract)
- **John Day (5J0), OR**
 - 1 ADS-B Ground Station (Oregon contract)
- **Burns (BNO), OR**
 - 1 ADS-B Ground Station (Oregon contract)
- **Baker City (BKE), OR**
 - 1 ADS-B Ground Station (Oregon contract)



Oregon Current Deployment (continued)

- **FAA (3) Ground Stations**

Medford, OR (MFR)

- Telco Network Circuit Complete 3/21/07
- All infrastructure installed except GBT radio
- Final installation & activation of radios; week of 3/26/07

Eugene, OR (EUG)

- Telco Network Circuit Complete 3/21/07
- All infrastructure installed except GBT radio
- Final installation & activation of radios; week of 3/26/07

Salem, OR (SLE)

- Telco Network Circuit Complete 3/21/07
- All infrastructure installed except GBT radio
- Final installation & activation of radios; week of 3/26/07

- **ODOT (6) Ground Stations**

Project back on track

- Resignation of Director Aviation
- New Director in place, transition process underway
- Site surveys scheduled for week of April 16th with ODOA

Customer Request From Colorado Department of Transportation

- **The FAA, at the request of the State of Colorado Department of Transportation, Division of Aeronautics, conducted an analysis of various mitigating alternative solutions, which identified that the lack of surveillance contributes to reduced capacity during IMC**
- **The analysis identified a multilateration based technology as the preferred solution to provide surveillance to the Colorado mountain airports**

Colorado MOA Description

- The MOA documents a project to plan, install, test and commission a surveillance capability covering defined areas of Colorado

State of Colorado	Federal Aviation Administration
<ul style="list-style-type: none"> •Acquire equipment (purchase, install, test, and accept) •Initiate Site Survey •Provide a Site Engineering Report (SER) (draft and final) •Secure and deliver sites for sensor equipment, including primary power and telecommunications •Oversee site preparation activities •Oversee vendor interface development •Provide documentation required for FAA certification 	<ul style="list-style-type: none"> •Act as an advisor to the Division of Aeronautics in its evaluation of a qualified contractor by providing technical and business expertise •Provide appropriate guidance, advice, and technical assistance regarding acquisition documentation and approaches •Participate in site survey activities, system design/fabrication, program management, Factory Acceptance Test (FAT), and Site Acceptance Test (SAT) •Oversee installation and checkout of equipment at the Denver Center •Certify the system into the NAS for control of aircraft •Commission the system •Assume ownership of the equipment after SAT •Provide life-cycle O&M support •Upgrade ADS-B capability to incorporate UAT upon approval of ADS-B investment decision



Colorado MOA Locations

- **If a decision is made to proceed with additional airports, the MOA will be amended to provide for planning, design, and installation of the system and the associated costs**
 - Potential additional sites include: Craig-Moffat, Steamboat, Montrose, Telluride, Gunnison, Alamosa, Durango, and Cortez

Existing Scenario At Rifle

- [Video of existing scenario at Rifle](#)

Future Scenario At Rifle

- [Video of future scenario at Rifle](#)

[Seattle Airports Conference April
17 2007.ppt](#)

