E/CAR/WG/31 — IP/11
29/09/09

International Civil Aviation Organization
North American, Central American and Caribbean Office (NACC)
Thirty-First Eastern Caribbean Working Group Meeting
(E/CAR/WG/31)
St. John's, Antigua, 5 to 8 October 2009

Agenda Item 2: Review of Air Navigation Matters
2.2 Air Navigation specific activities:
2.2.2 Communications, Navigation and Surveillance (CNS)

THE FEDERAL AVIATION ADMINISTRATION'S SURVEILLANCE AND BROADCAST SERVICES PROGRAM

(Presented by the United States of America)

SUMMARY

The attached briefing presents information on the Federal Aviation Administration's (FAA's) Surveillance and Broadcast Services Program, including the overall approach, implementation planning, and expected benefits and costs.

1. Introduction

1.1 The attached briefing presents information on the FAA's Surveillance and Broadcast Services Program, including the overall approach, implementation planning, and expected benefits and costs.

2. Discussion

2.1 The following areas of the FAA's Surveillance and Broadcast Services Program are contained in the presentation:

a) Overview
b) Business Case
c) Strategy
d) Program Status
e) Domestic and International Collaboration
f) Next Steps

3. Conclusion

3.1 States are invited to take into account the information presented in the attached briefing to better understand the United States plans for surveillance and broadcast services.

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Surveillance and Broadcast Services

Overview Briefing

By: Federal Aviation Administration's Air Traffic Organization

To: The Thirty-First ICAO Eastern Caribbean Working Group

Date: October 5-9 2009

Agenda

- Overview
- Business Case
- Strategy
- Program Status
- Domestic and International Collaboration
- Next Steps

Critical Services: 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)
- **Surveillance -**
  - A method of determining position of aircraft, vehicles, or other asset
- **Broadcast**
  - Transmitted information available to anyone with the appropriate receiving equipment

Essential Services: Traffic 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.

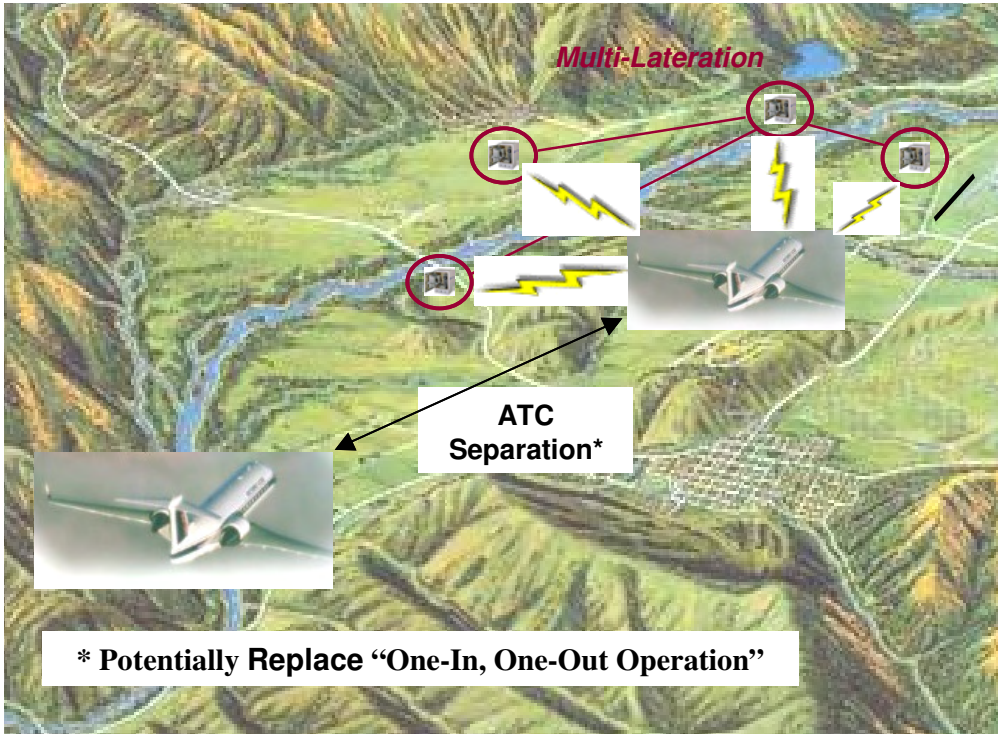
Essential Services: Flight Information Service - Broadcast

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

Wide Area Multilateration (WAM)

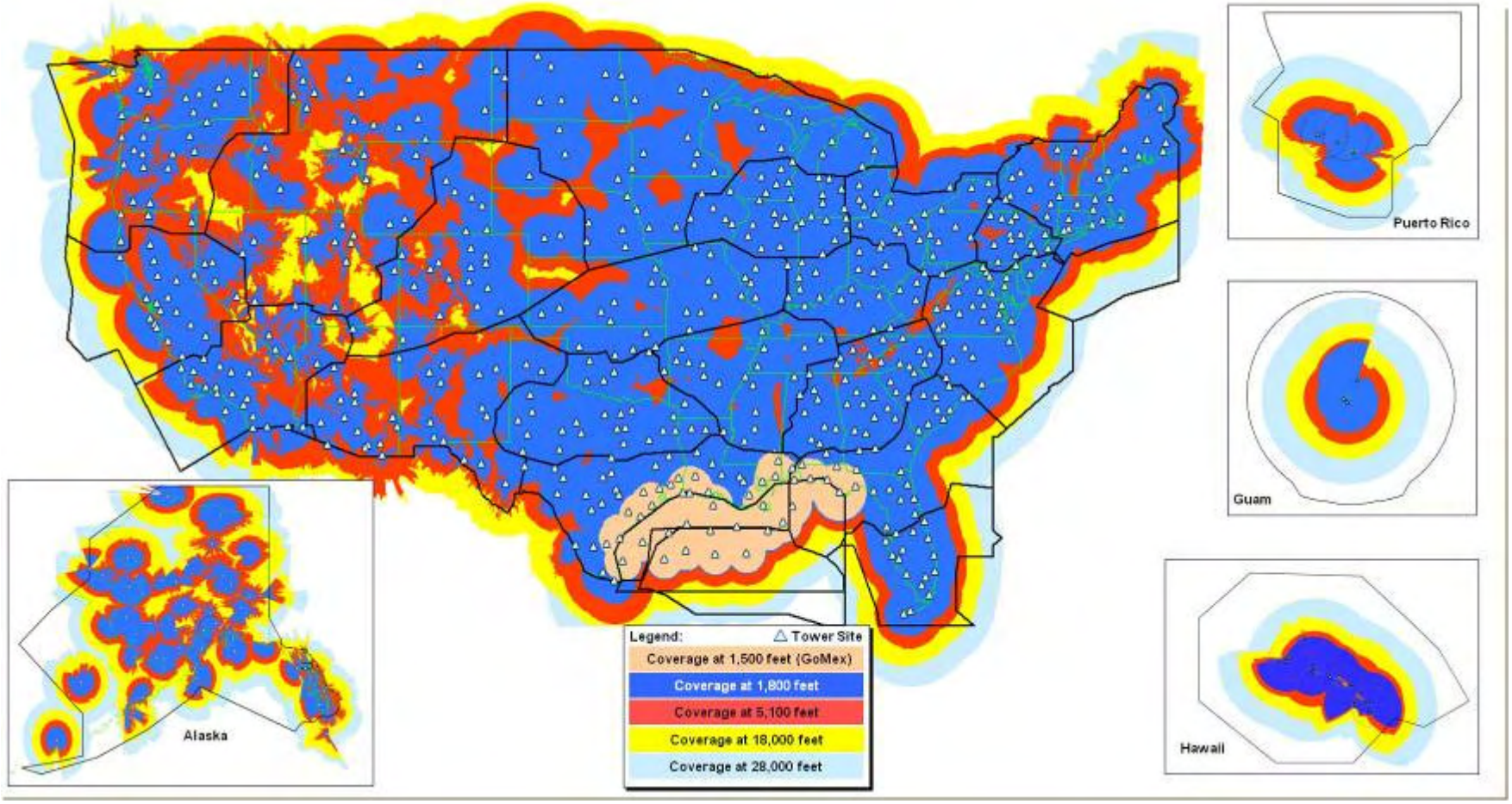
- Multilateration is a surveillance technology that works by employing multiple remote sensors throughout an area to compensate for terrain obstructions.
- The data from multilateration sensors is used to determine aircraft position and identification. This data is processed for Air Traffic Control use and provides En Route separation services

Typical Mountain Approach (Single Runway/mountain airport)

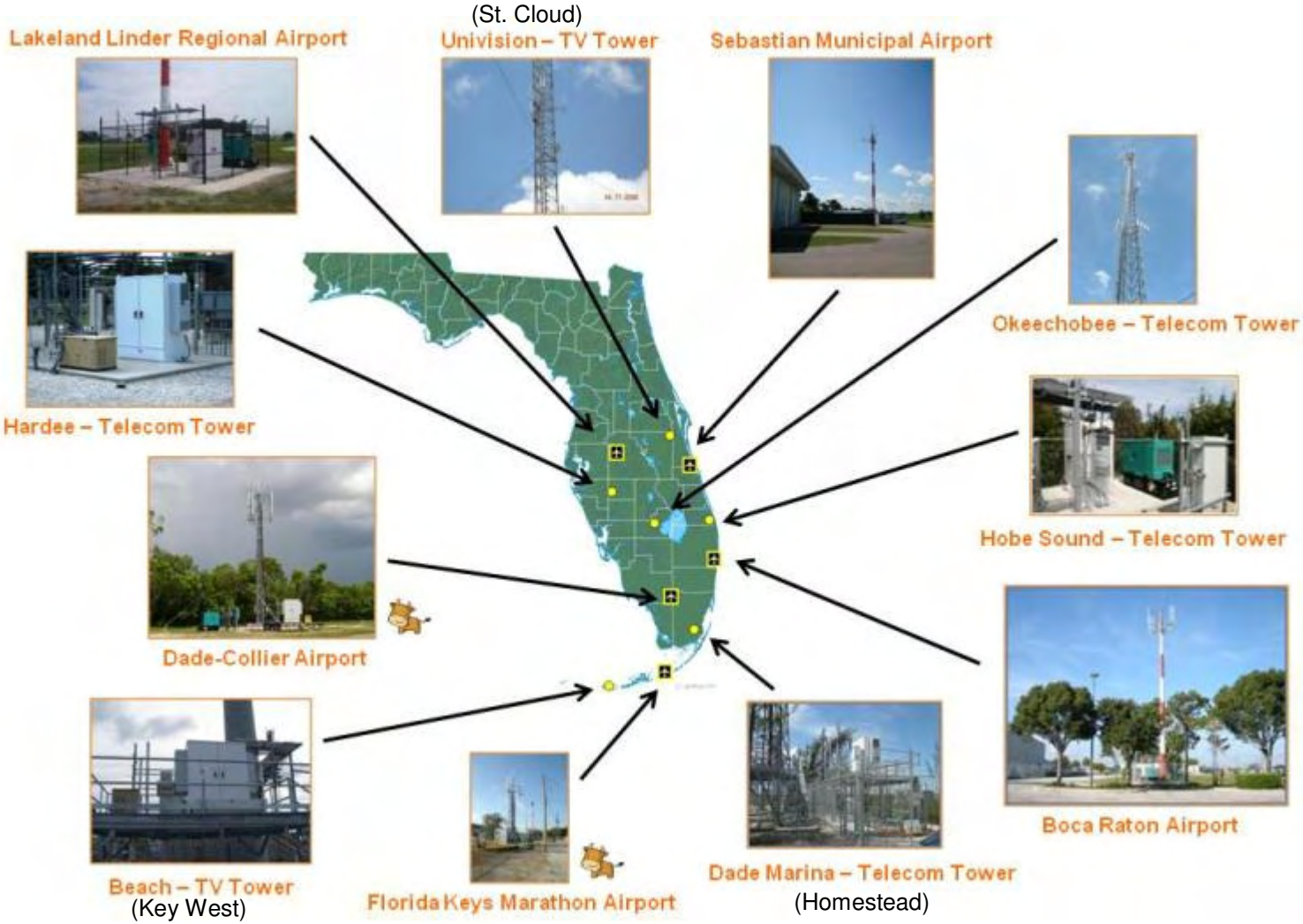


Juneau, Alaska and Yampa Valley, Craig-Moffat, Steamboat Springs, Garfield County Regional in Colorado will be the first to receive multilateration systems.

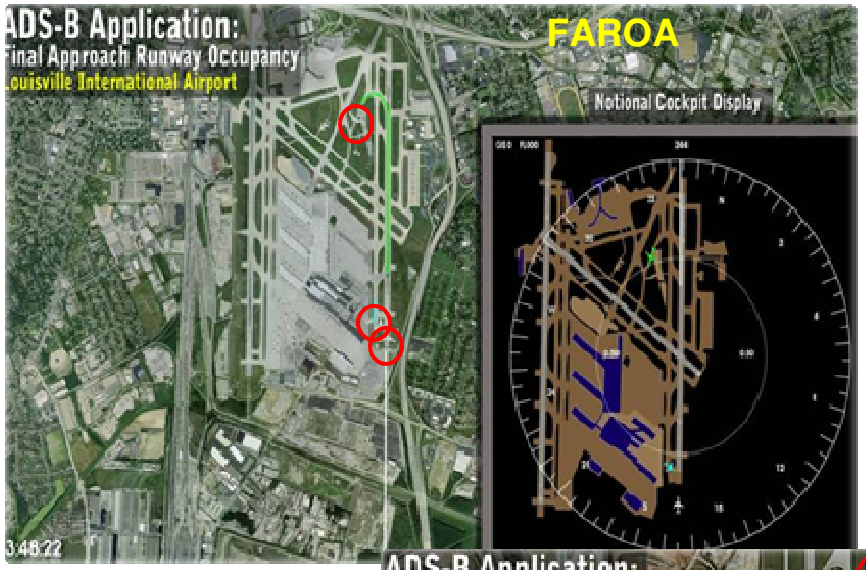
Ground Infrastructure: 794 Ground Station Solution Provides National Coverage

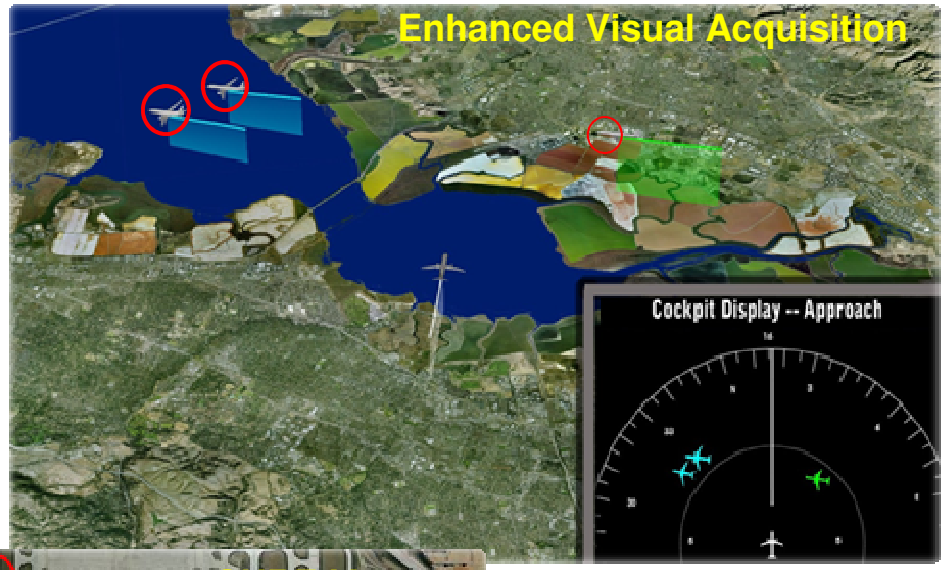


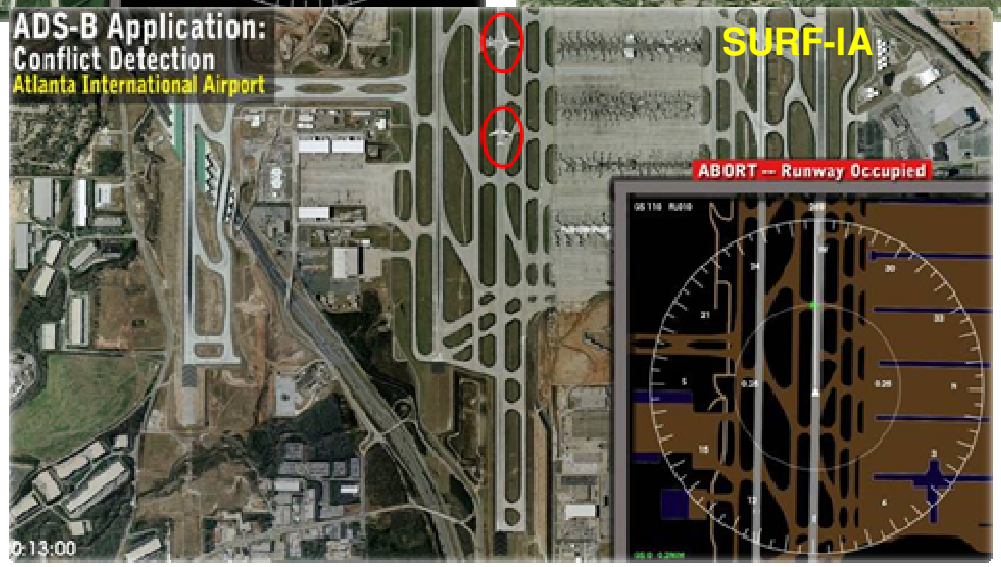
Essential Services: Miami



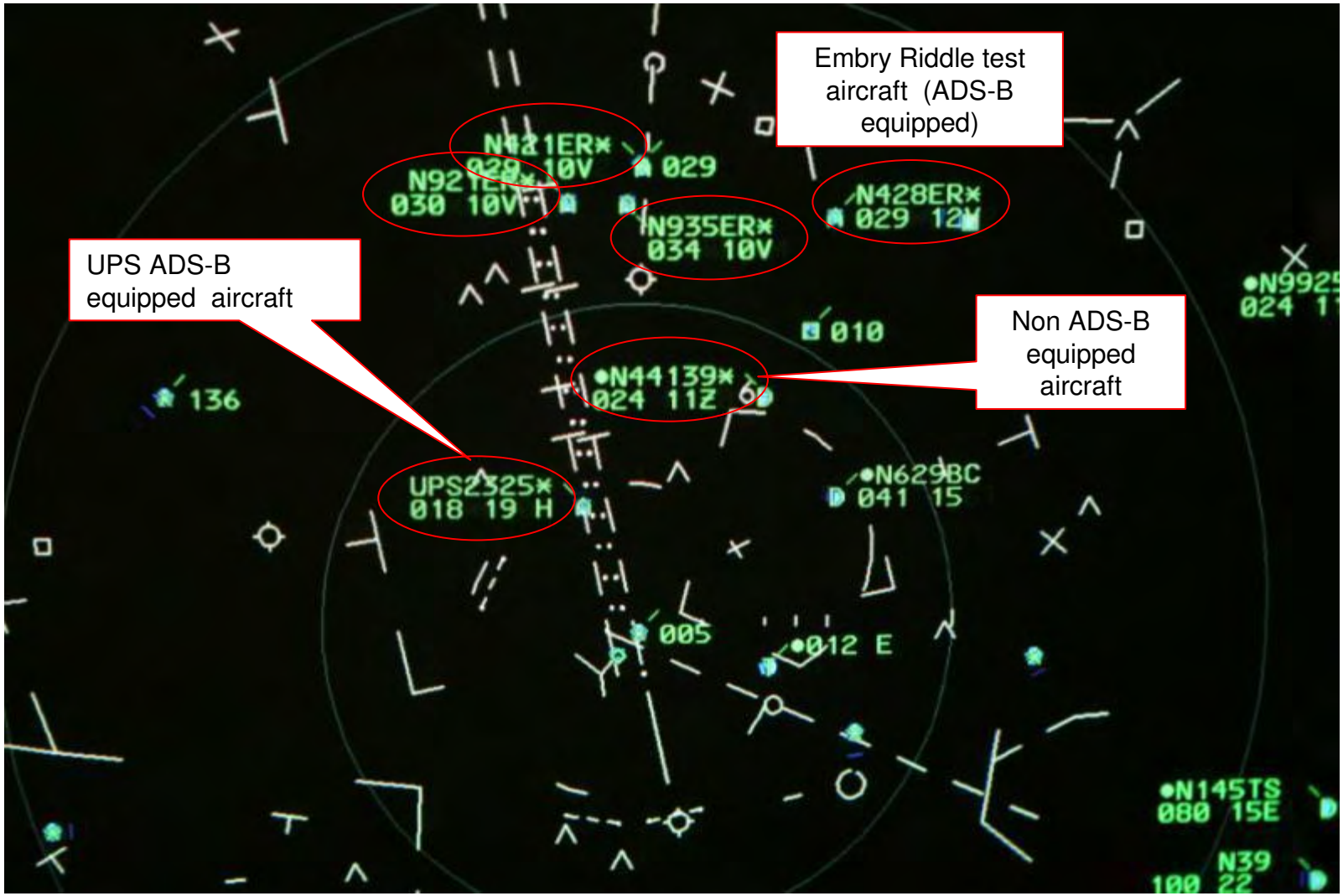
ADS-B Applications



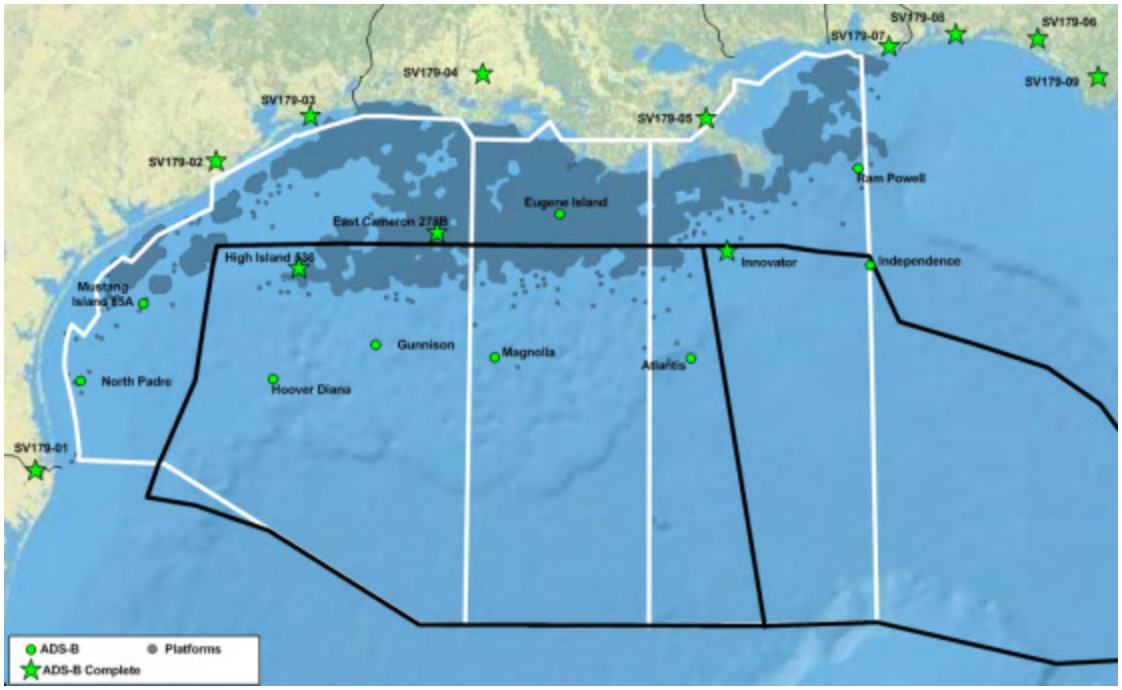




ARTS Color Display (ACD)



Gulf of Mexico ADS-B Deployment Plan



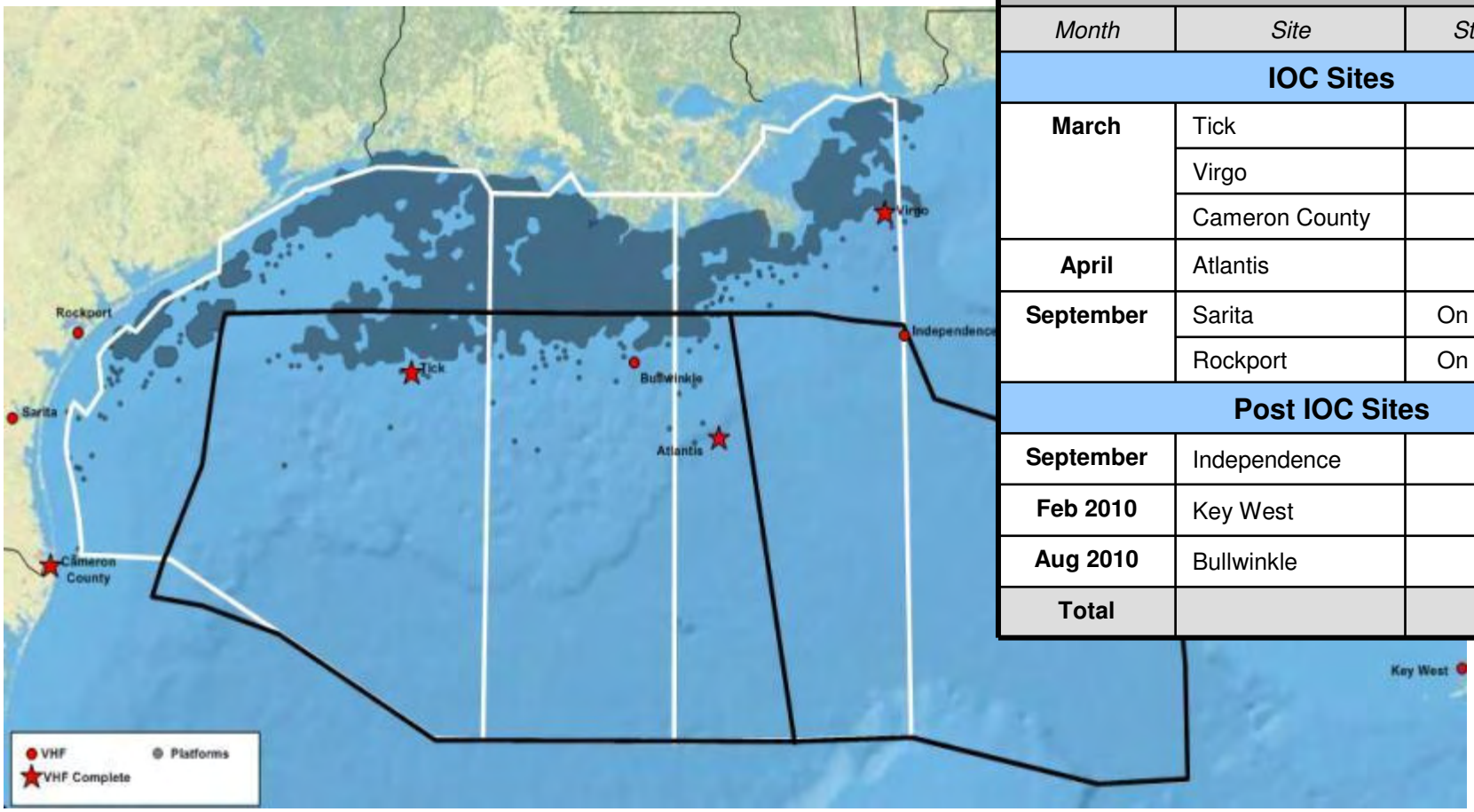
Note: White Border – Low Altitude Sector Boundaries

Black Border – High Altitude Sector Boundaries

ADS-B			
Month	*Site*	*Status*	*Total*
May	Innovator	√	4
	Steelfield Road (6)	√	
	Navarre (8)	√	
	White City (9)	√	
June	*Jack Edwards Airport* (7)*	√	6
	Brazoria Airport (2)	√	
	Crown (3)	√	
	Vanguard (4)	√	
	Pt. Ala Hache (5)	√	
	Brownsville Airport (1)*	√	
July			0
August	High Island 536C	√	2
	East Cameron 278B	√	
September	North Padre Island 975		4
	Mustang Island 85A		
	Independence		
	Eugene Island 215		
October	Ram-Powell		5
	Magnolia		
	Hoover-Diana		
	Atlantis ADS-B		
	Gunnison		
Total			21

• Specific site deployment is dynamic & changes weekly based on platform availability & deployment agreements between ITT and platform owner

Gulf of Mexico VHF Communications Status

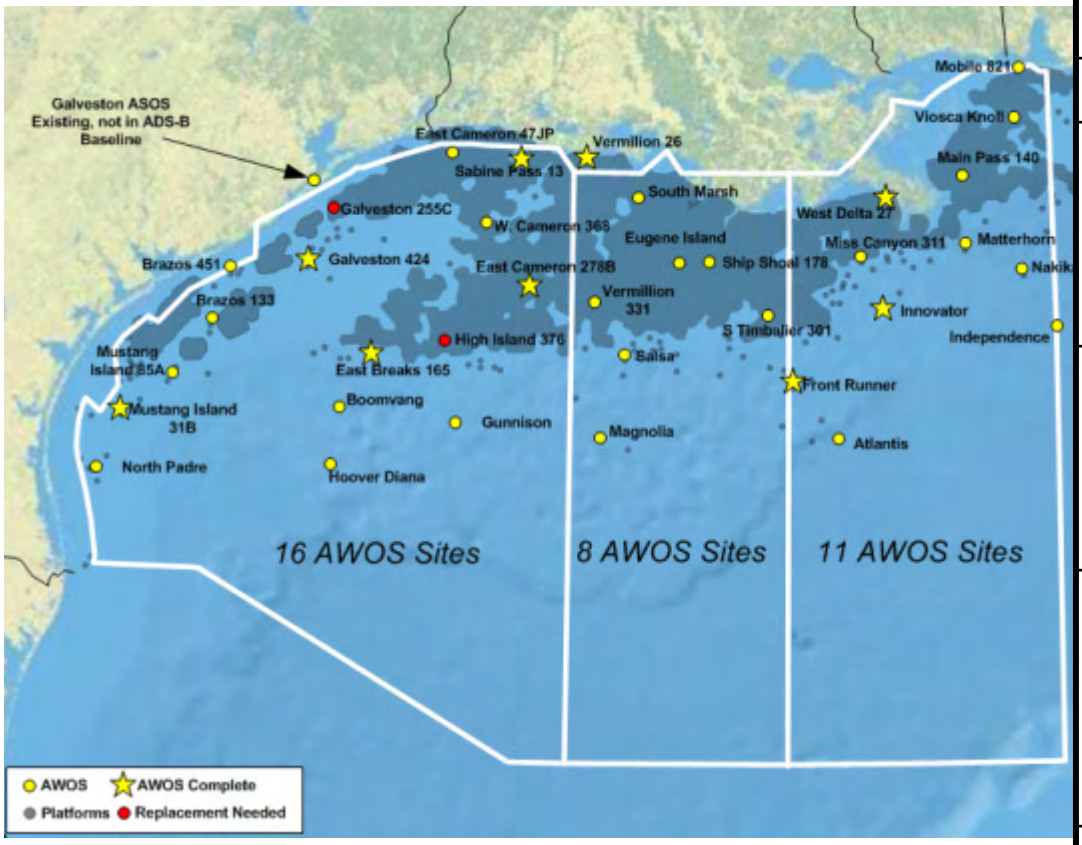


Air-To-Ground (VHF) Communications			
Month	*Site*	*Status*	*Total*
IOC Sites			
March	Tick	√	3
	Virgo	√	
	Cameron County	√	
April	Atlantis	√	1
September	Sarita	On Track	2
	Rockport	On Track	
Post IOC Sites			
September	Independence		1
Feb 2010	Key West		1
Aug 2010	Bullwinkle		1
Total			9

Note: White Border – Low Altitude Sector Boundaries

Black Border – High Altitude Sector Boundaries

Gulf of Mexico AWOS Deployment Plan



AWOS			
Month	*Site*	*Status*	*Total*
March	West Delta 27	√	1
May	Innovator	√	1
June	Vermilion 26	√	3
	East Breaks 165	√	
	Galveston 424C	√	
July	Mustang Island 31	√	2
	Front Runner Spar	√	
August	East Cameron 278B	√	2
	Sabine Pass 13	√	
September	Ship Shoal 178		7
	North Padre 975		
	Mustang Island 85A		
	Independence		
	Eugene Island 215		
	Mississippi Canyon 311		
	South Marsh 268		
October	Magnolia		7
	Hoover Diana		
	Gunnison		
	Boomvang		
	West Cameron 368		
	Viosca Knoll 203		
	Main Pass 140		
November	Nakika		8
	Brazos 451		
	Matterhorn		
	Mobile 821		
	East Cameron 47JP		
	Brazos 133		
	Vermillion 331		
	South Timbalier 301		
December	Salsa		4
	Atlantis AWOS		
	Galveston 255		
	High Island 376		
Total			35

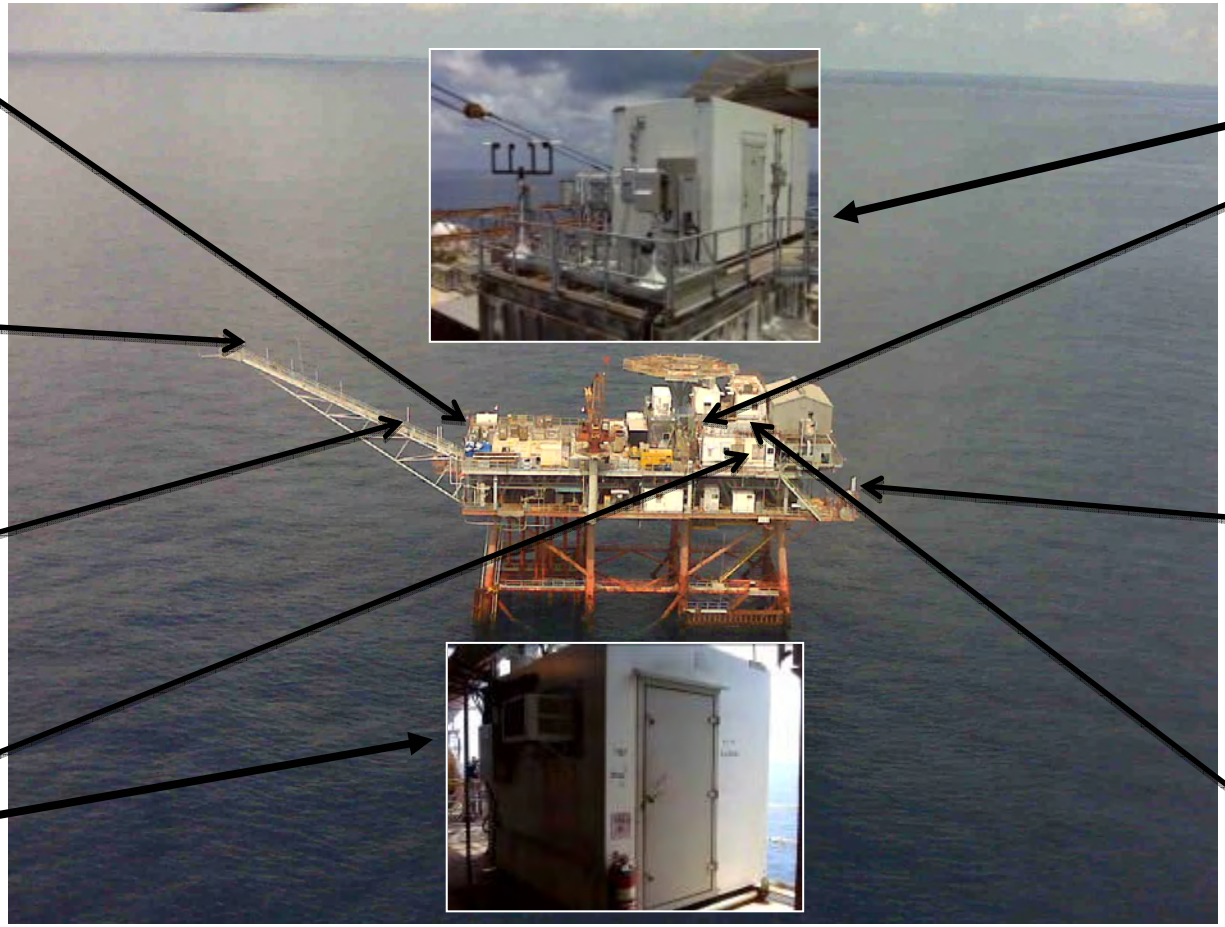
• Specific site deployment is dynamic and changes regularly (weekly) based on platform availability and deployment agreements between ITT and platform owner

New ADS-B and AWOS Installation

East Cameron 278

Apache Corporation

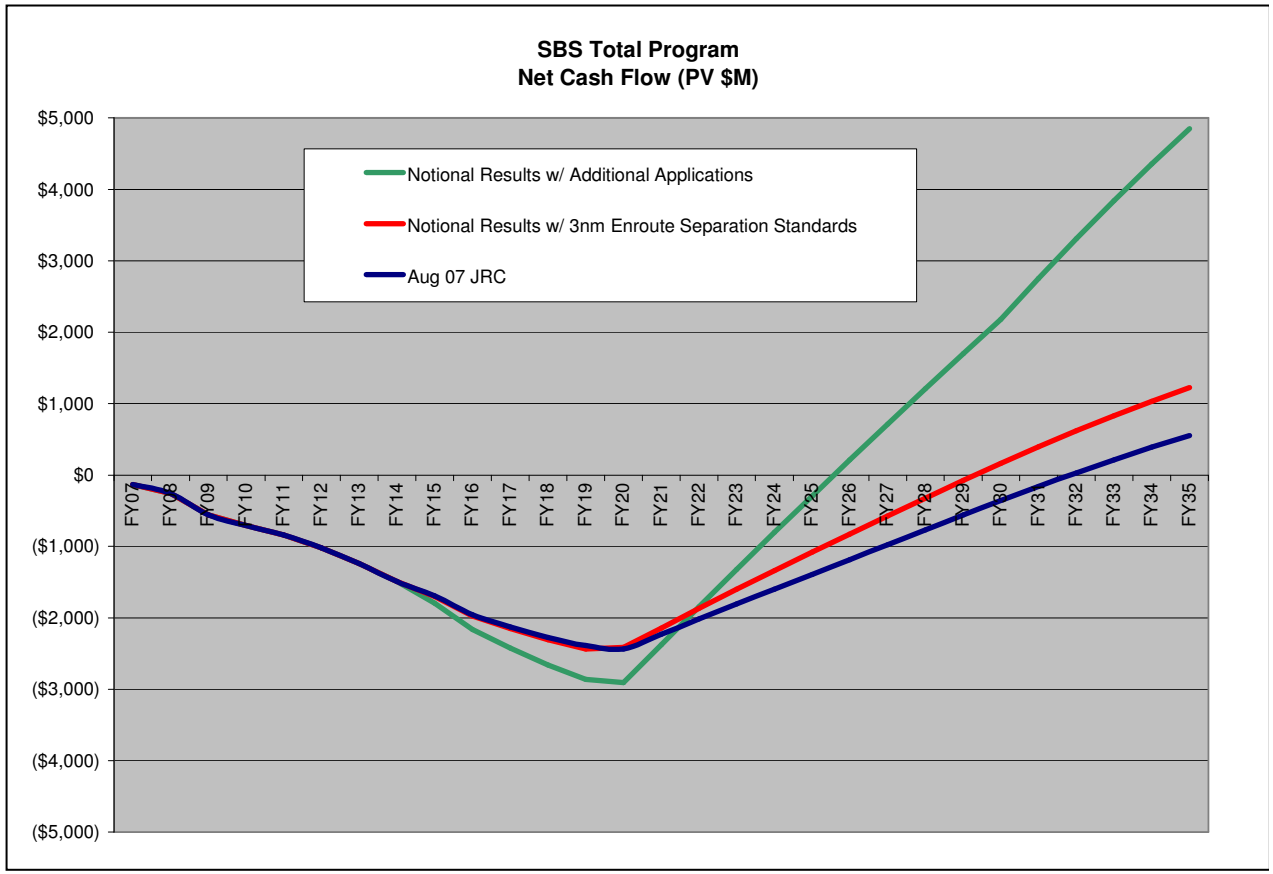
August, 2009



Business Case Summary

- **Total Cost / Benefit Summary (Risk Adjusted, Present Value) Through 2035**

	Total
Costs	
FAA	1882.0
Aviation System User	2631.1
Total FAA, User and Other Costs	**4513.1**
Benefits	
FAA	451.7
Aviation System User	4591.5
Total FAA, User and Other Benefits	**5043.2**



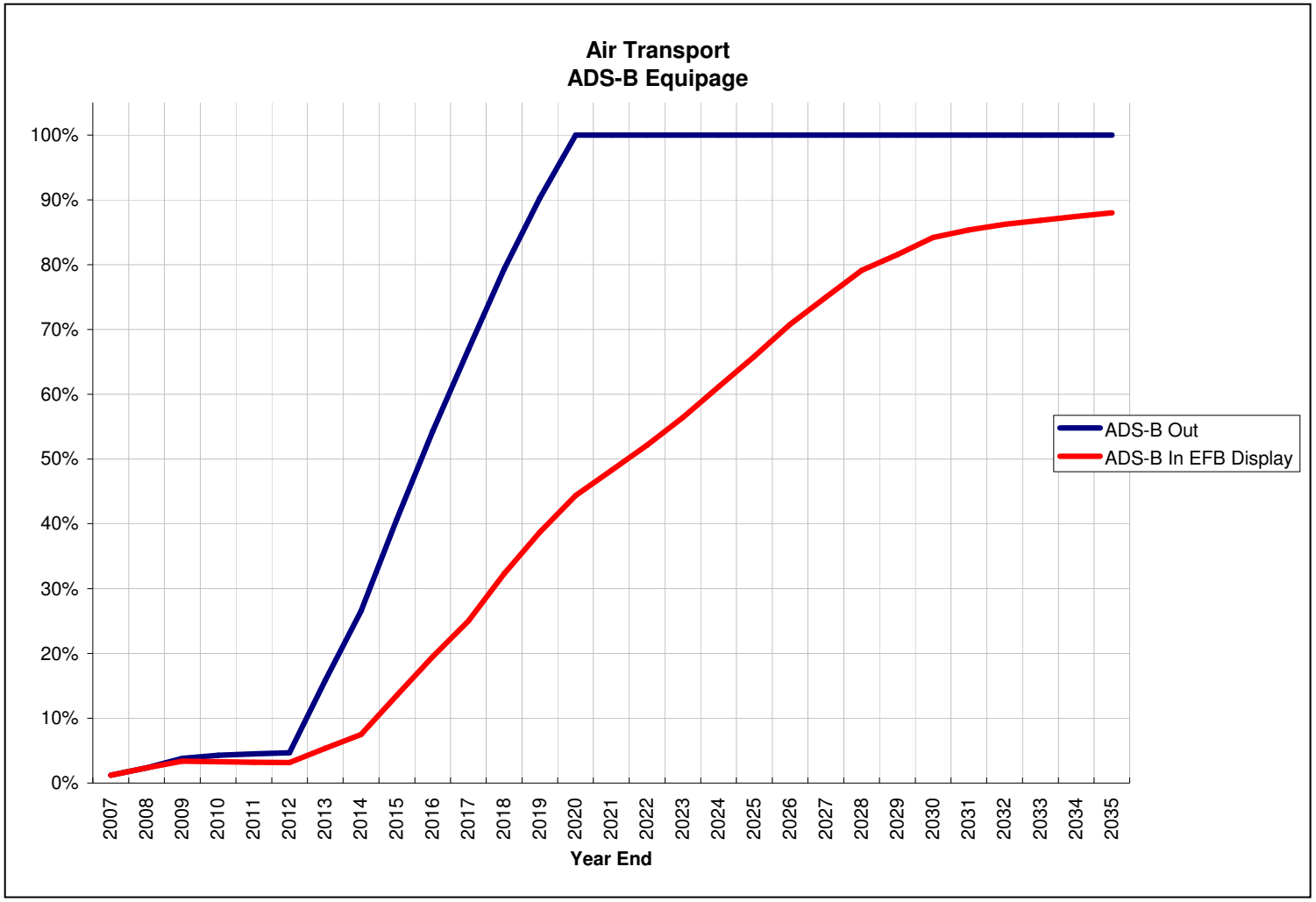
- **FAA Baseline Cost Summary**

Estimated Cost	Baselined								Total Baselined (FY07 - FY14)
	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	
Segment 1 and 2 F&E Program Plan	$90.0	$100.0	$308.4	$198.2	$175.2	$284.2	$270.7	$254.7	**$1,681.5**

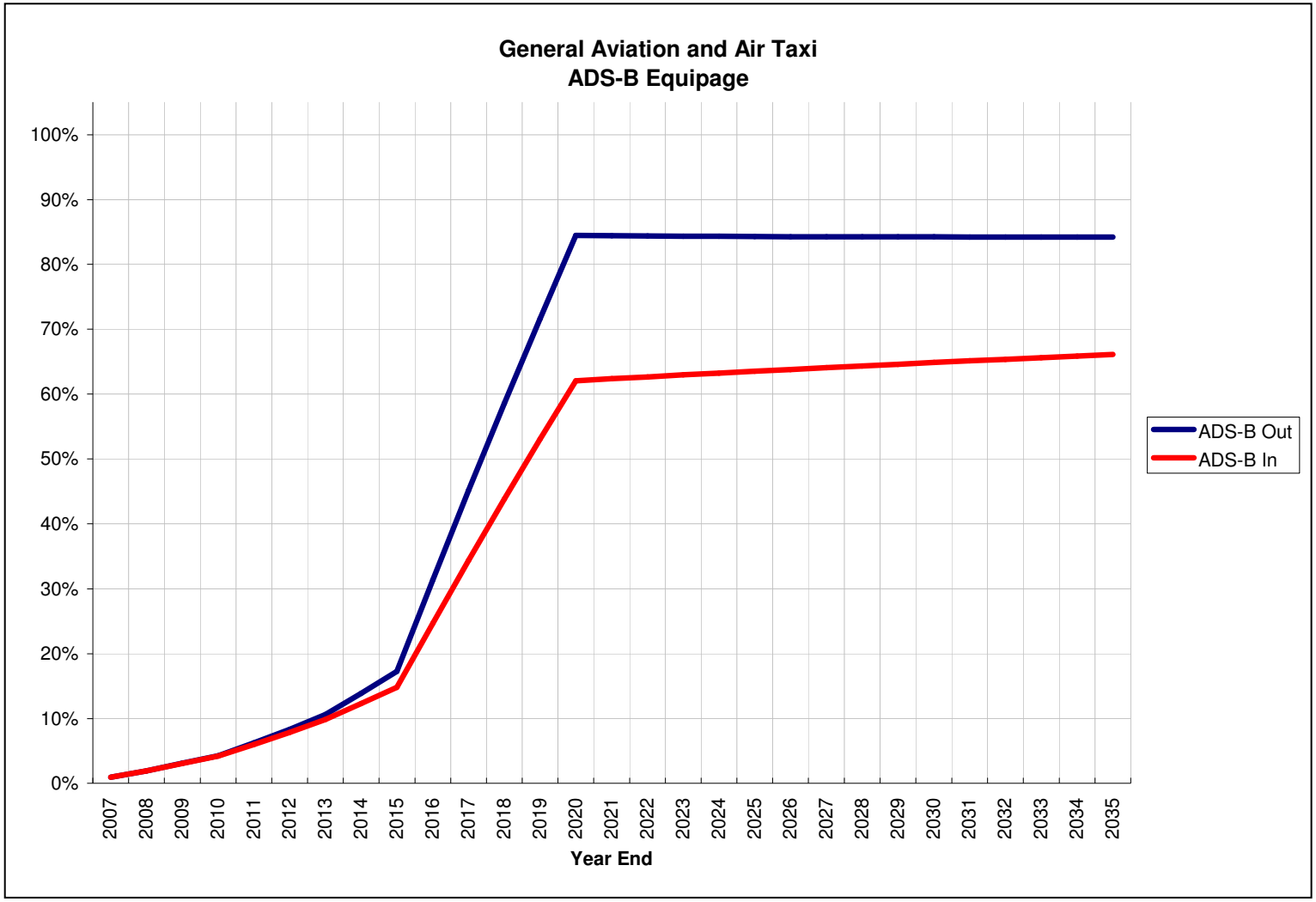
Benefits Summary

Location	Application	Outcome	Risk-Adjusted PV $M
CONUS, Hawaii, and Caribbean Surveillance	Radar Airspace ATC Surveillance	Surveillance cost avoidance	$371.1
		Reduction and more efficient maneuvers in response to URET	$801.8
		More efficient metering based on improved TMA accuracy	$417.0
		Increased safety on the surface by controllers	$3.2
		More efficient ATC management of surface movement	$26.9
		Reduction in FAA subscription charges due to value added services	$80.6
CONUS, Hawaii, and Caribbean Broadcast Services	Enhanced Visual Acquisition and Conflict Detection	Fewer aircraft-to-aircraft conflicts	$203.6
	Weather and NAS Status Situational Awareness	Fewer encounters with hazardous weather	$232.5
		More efficient routes in adverse weather	$4.9
		Reduction in user costs to obtain weather info	$26.1
		Fewer aircraft-to-terrain conflicts	$284.3
CONUS, Hawaii, and Caribbean Aircraft Applications	Enhanced Visual Approach - Initial Application	More efficient spacing on approach in VMC	$300.4
	Enhanced Visual Approach - CAVS	Continuation of Visual Approaches in marginal conditions	$196.4
	Enhanced Visual Approach - Merging and Spacing	Increased ability to perform continuous descent approaches	$796.0
	ADS-B ATC Automation Integration		
	Airport Surface Situational Awareness	Increased safety on the surface by pilots	$70.5
	Final Approach and Runway Occupancy Awareness		
Gulf of Mexico Surveillance	Non-Radar Airspace ATC Surveillance (includes weather and comm as needed)	High Altitude - Increased Capacity	$459.3
		High Altitude - Optimal Routing	$86.5
		Low Altitude - Increased Capacity	$84.2
		Low Altitude - Reduction in Weather Related Accidents	$5.0
Alaska Surveillance and Broadcast Services	Weather and NAS Status Situational Awareness Enhanced Visual Acquisition and Conflict Detection	Fewer aviation accidents in Alaska	$300.1
	Non-Radar Airspace ATC Surveillance	Access to lower altitude routes in Alaska	$19.5
		Increased IFR capacity (JNU)	$1.1
		Fewer aircraft-to-aircraft conflicts (JNU)	$0.0
		Improved search and rescue services in Alaska	$7.0
Alaska Airport IFR Upgrade Services	Weather Automation upgrade and IFR Approach Development	Increased access to remote villages in Alaska	$90.0
		Increased Medevac access to remote villages in Alaska	$175.4
		Total	**$5,043.2**

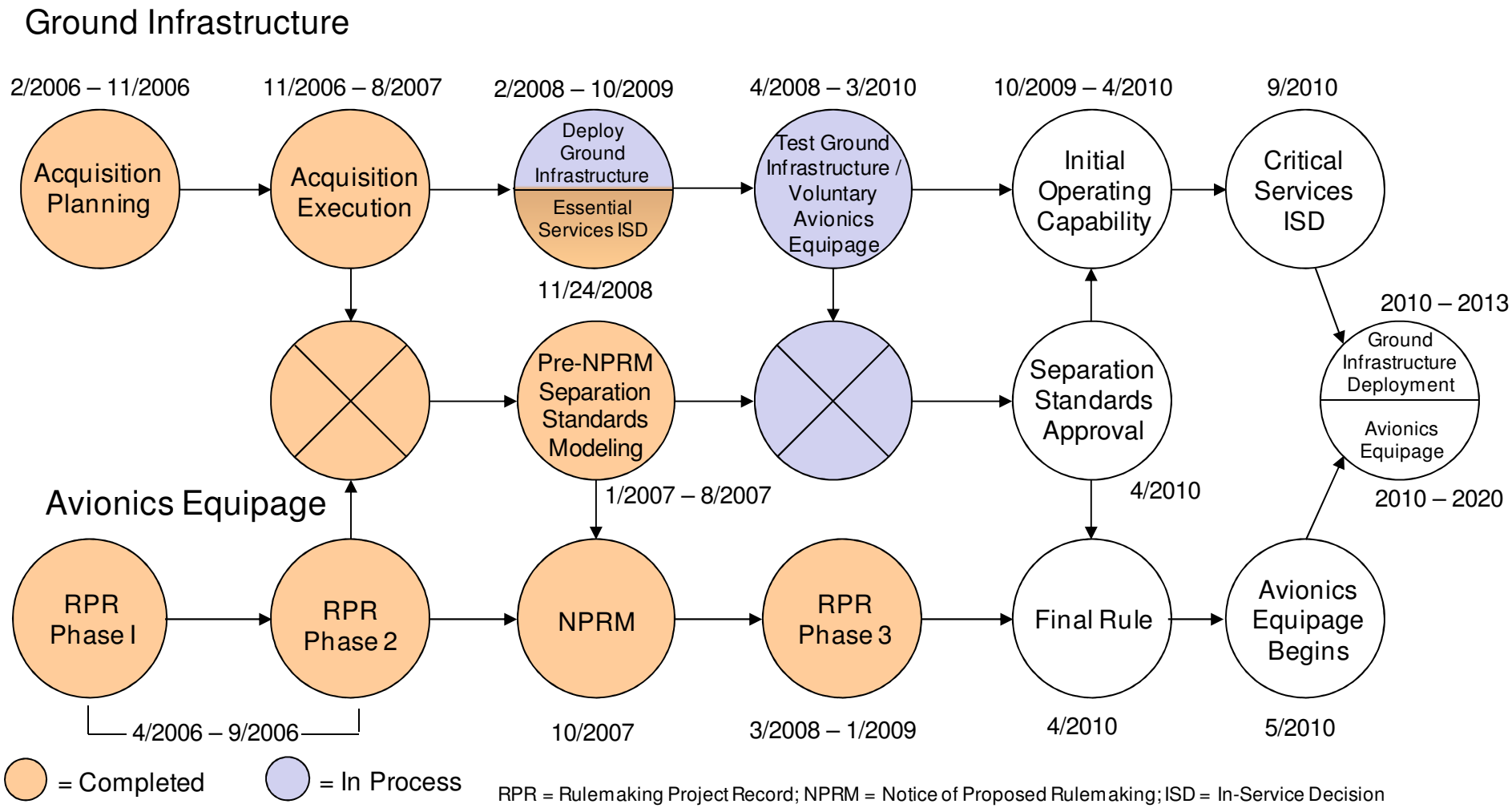
Air Transport Equipage



GA and Air Taxi ADS-B Equipage



Strategy


Ground Infrastructure
2/2006 – 11/2006
Acquisition Planning
11/2006 – 8/2007
Acquisition Execution
2/2008 – 10/2009
Deploy Ground Infrastructure
Essential Services ISD
11/24/2008
4/2008 – 3/2010
Test Ground Infrastructure / Voluntary Avionics Equipage
10/2009 – 4/2010
Initial Operating Capability
9/2010
Critical Services ISD
2010 – 2013
Ground Infrastructure Deployment
Avionics Equipage
2010 – 2020
Pre-NPRM Separation Standards Modeling
1/2007 – 8/2007
Separation Standards Approval
4/2010
Avionics Equipage
RPR Phase I
RPR Phase 2
4/2006 – 9/2006
NPRM
10/2007
RPR Phase 3
3/2008 – 1/2009
Final Rule
4/2010
Avionics Equipage Begins
5/2010
= Completed
= In Process
RPR = Rulemaking Project Record; NPRM = Notice of Proposed Rulemaking; ISD = In-Service Decision

Next Steps: FY2009 / FY2010 Schedule

Milestone	Planned Date of Completion / Status
FY2009	
Louisville Service Acceptance Test (SAT)	April 2009 / Complete
Gulf of Mexico Service Acceptance Test (SAT)	June 2009 / Complete
Philadelphia Service Acceptance Test (SAT)	August 2009 / Complete
Gulf of Mexico VHF Communications Initial Operating Capability (IOC)	September 2009 / On track
FY2010	
Juneau Service Acceptance Test (SAT)	October 2009
Louisville IOC of Surveillance Services	October 2009
Gulf of Mexico IOC of Surveillance Services	December 2009
Philadelphia IOC of Surveillance Services	February 2010
Juneau IOC of Surveillance Services	April 2010
Final Rule Published	April 2010
Critical Surveillance Services ISD for ADS-B	September 2010

U.S Rulemaking: Notice of Proposed Rulemaking (NPRM) Summary

- **All aircraft operating in the following airspace would have to meet the proposed performance requirements for ADS-B Out:**
  - Class A, B and C airspace
  - All airspace at and above 10,000 feet MSL over the 48 contiguous United States and the District of Columbia
  - Within 30 nautical miles of airports listed in 41 CFR Part 91, Appendix D, from the surface up to 10,000 feet MSL
  - Class E airspace over the Gulf of Mexico from the coastline of the United States out to 12 nautical miles, at and above 3,000 feet MSL

Final Rule for ADS-B Out will be issued in 2010 with a compliance date of 2020

Rulemaking Next Steps: Schedule to Final Rule

Milestone	Planned Date of Completion	Status / Comments
FAA Rulemaking Team finalizes RPR Phase 3	**January 14, 2009**	**Complete**
RPR Phase 3 Submitted to Office of Rulemaking	**January 21, 2009**	**Complete**
Rulemaking Council Approval of RPR	**January 27, 2009**	**Complete**
Rulemaking Team Drafts Final Rule	**May 2009**	**Complete**
Final Rule Economic Assessment	**August 2009**	**Complete**
Final Rule Concurrence through Directors	**October 2009**	
Final Rule Concurrence through Associates	**November 2009**	
Final Rule Concurrence through Administrator	**December 2009**	
Final Rule Approved through OST	**January 2010**	
Final Rule Approved through OMB	**April 2010**	
Final Rule Published in Federal Register	**April 2010**	

•RPR = Rulemaking Project Record

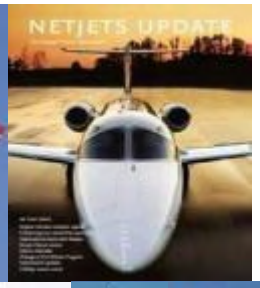
SBS External Agreements

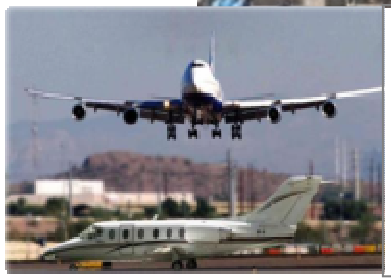
Delta MOA
Underway

United MOA
April 2009

U.S. Airways/ACSS MOA
January 2009

NetJets MOU
December 2008





Honeywell
October 2008

Aviation Communication and Surveillance Systems
October 2008

Alaskan Aviation Community & State Representative MOA
February 2007

UPS MOA
November 2006

HAI & Gulf of Mexico Helicopter/Platform Owners MOA
May 2006

International Harmonization

- **International Civil Aviation Organization (ICAO)**
  - Aeronautical Surveillance Panel (ASP)
  - Caribbean and South American Regional Planning and Implementation Group (GREPECAS)
  - Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG)
- **Eurocontrol**
  - CASCADE: ADS-B is main focus of CASCADE, standardization, trials, and implementation activities. It is the largest Eurocontrol partner in terms of budget and staff.
  - Action Plan 23: exchange information and ideas for the future
- **Airborne Separation Assistance Systems (ASAS)**
  - Joint FAA and Eurocontrol forum
- **Requirements Focus Group (RFG)**
  - Joint RTCA / EUROCAE Working Group
- **Recurring Coordination Meetings**
  - Service Providers: AirServices Australia, Eurocontrol, FAA, and NAV CANADA
  - Regulators: EASA, Civil Aviation Safety Authority, FAA, and Transport Canada

SBS Next Steps

- **Continue to Work Collaboratively with Aviation Community**
  - ICAO
  - RTCA
    - Air Traffic Management Advisory Committee (ATMAC)
    - Special Committee 186 (SC186)
    - Requirements Focus Group (RFG)
  - Aviation Rulemaking Committee (ARC)
  - Customer MOU's
  - Outreach at Association Forums
- **Continue to Meet Major Program Milestones**
  - Integrity / Discipline
  - Transparency
  - Measured Risk Taking
- **Monitor Quality of Service and Adjust Investments**