NextGen

Next Generation Air Transportation System

Federal Aviation Administration

ENRI International Workshop on ATM/CNS

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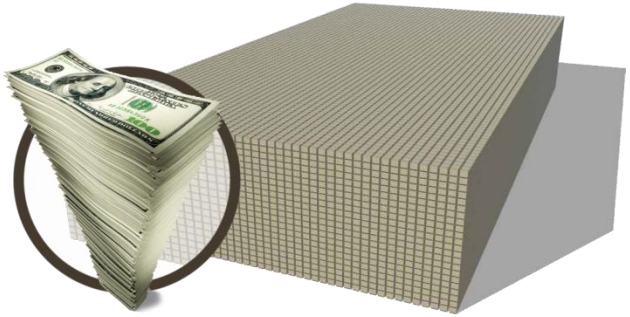
Manager, System Engineering Integration, NextGen and Operations Planning

Date: 12 November 2010

Aviation's Impact on the U.S. Economy Drives the Importance of NextGen

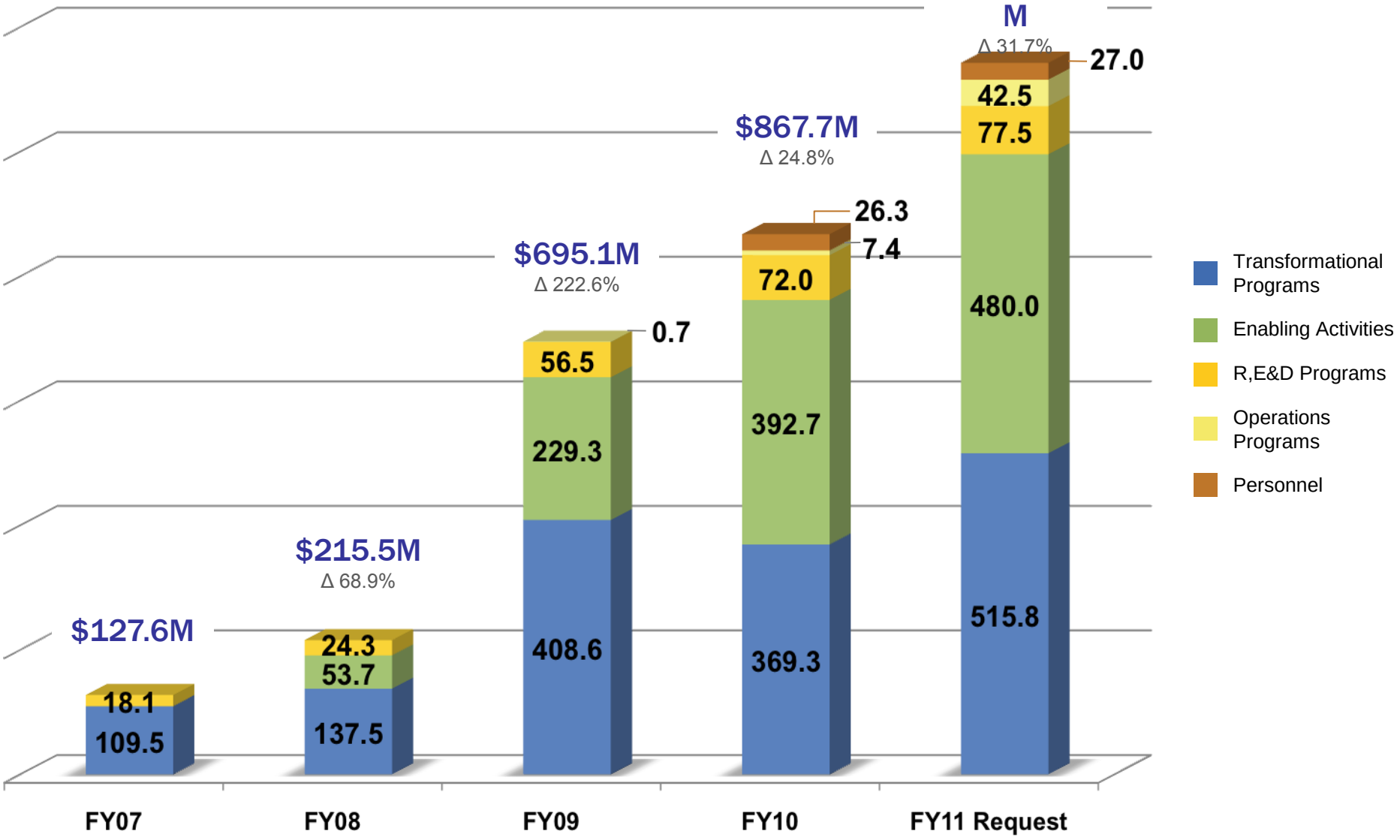
- **12 Million Jobs**

- **$1.3 Trillion in Economic Activity**

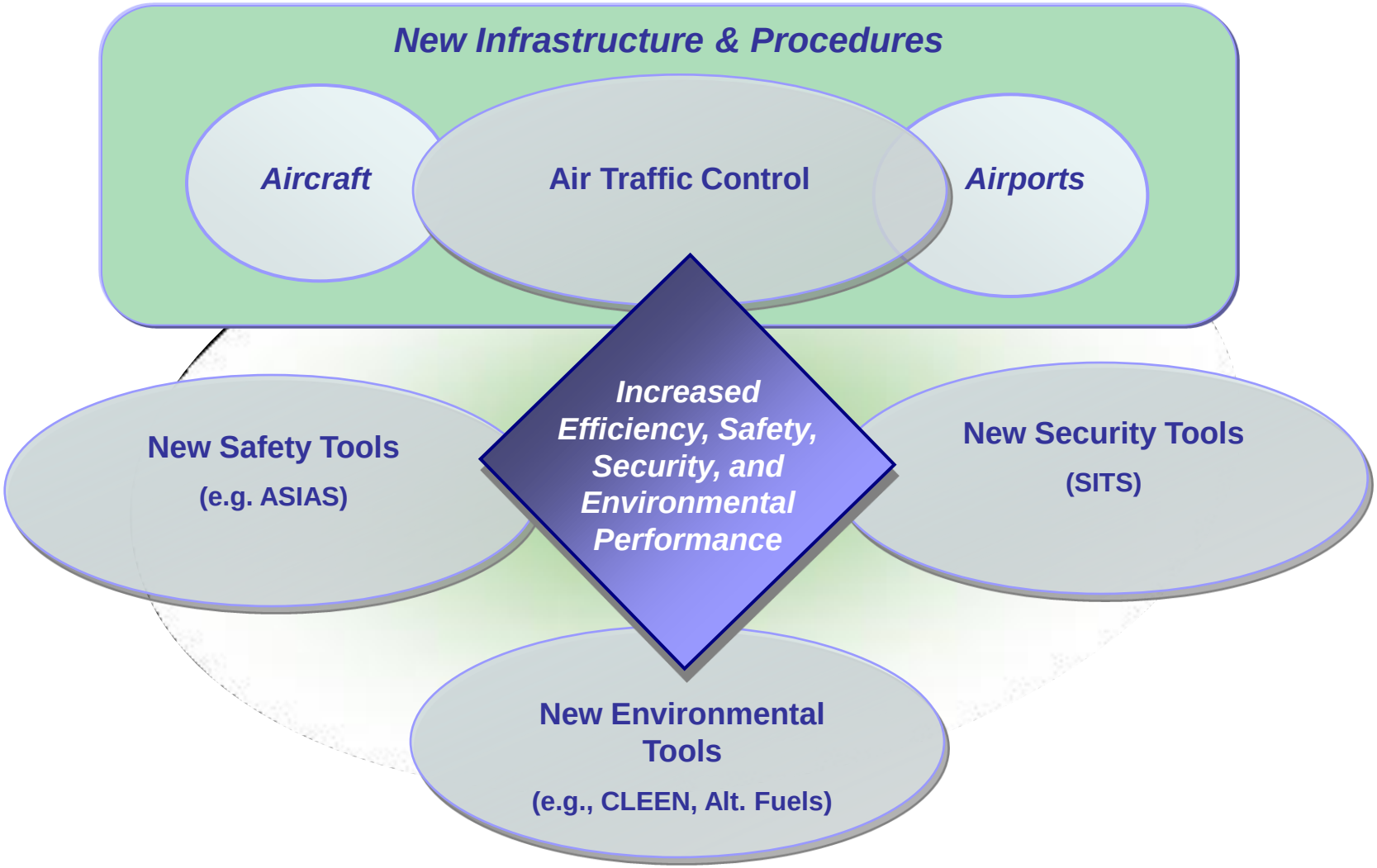


- **5.6% of GDP**

NextGen Budget Growth Highlights Strong Support

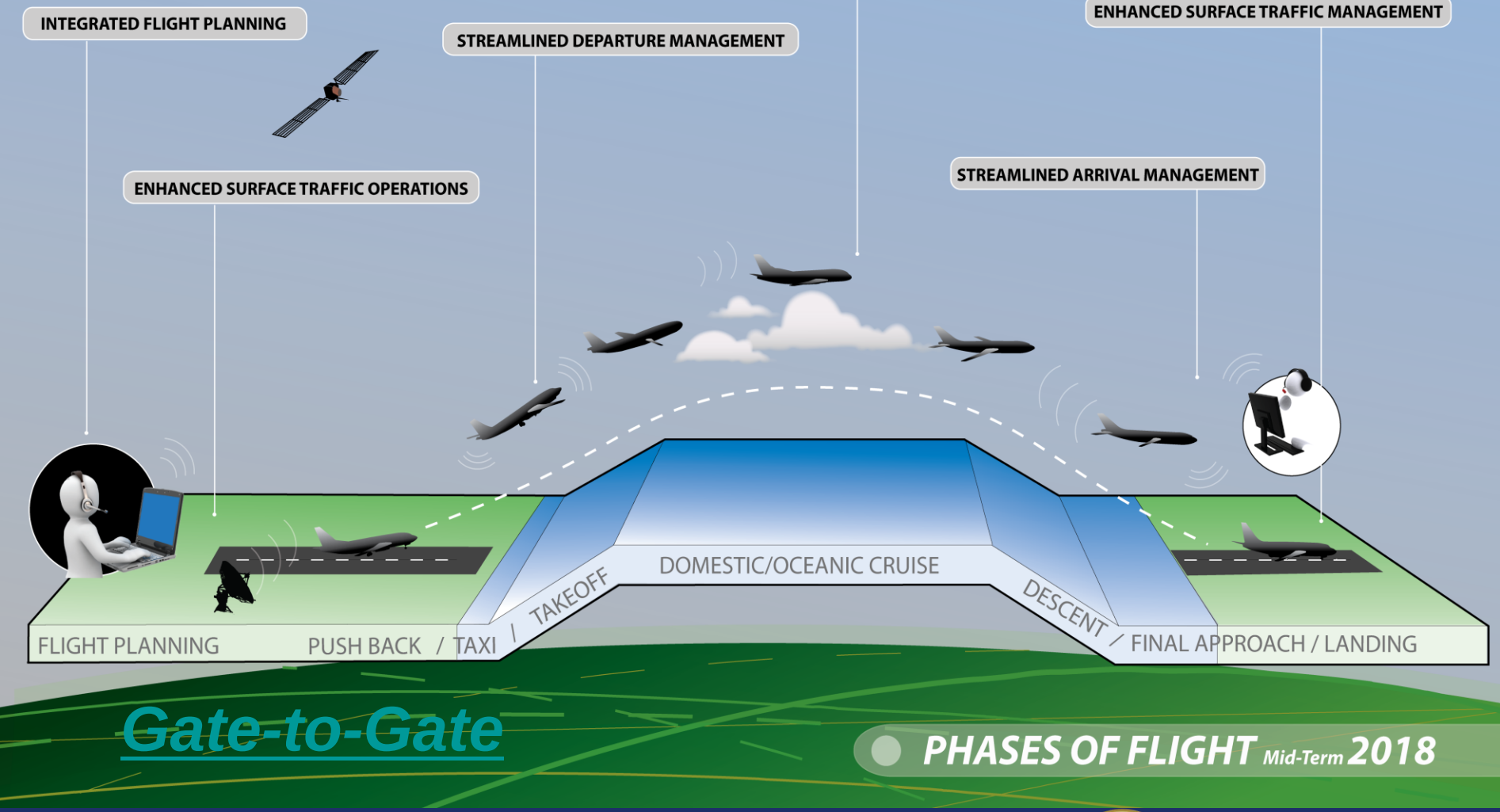


NextGen Capabilities – Broad Ranging for Broad Benefits



What Does The System Look Like in 2018?

Federal Aviation Administration

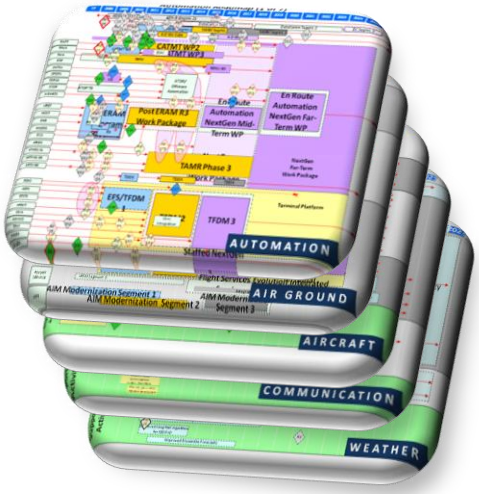


Gate-to-Gate

PHASES OF FLIGHT Mid-Term 2018

Keys to Implementing NextGen

Technical Strategy (Enterprise Architecture & Roadmaps)

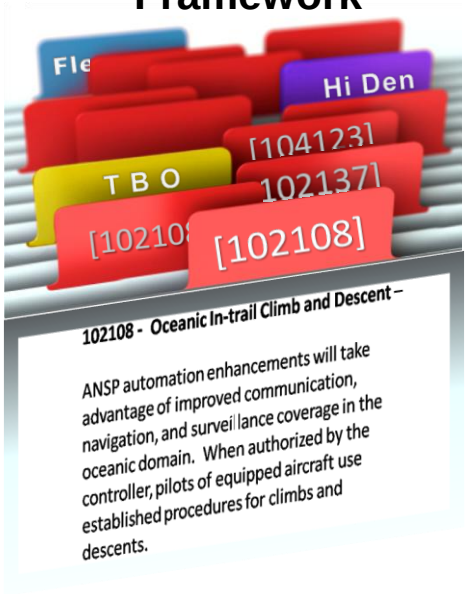


Operational Capabilities/Benefits

NEXTGEN Portfolio		Transformational Programs				
		ADS-B	SWIM	DATA-COM	NNEW	NVS
Enabling Activities	TBO	X	X	X	X	X
	HIGH DEN	X	X	X	X	X
	FLEX	X	X	X	X	X
	CATM	X	X	X	X	
	RWI	X	X	X	X	
	SSE	X	X	X	X	
	NET FAC		X	X	X	X

Stakeholder Partnership

Integrated Management Framework



Incremental Approach to Implementing NextGen

Produces Benefits and Builds a Foundation

Wake Turbulence

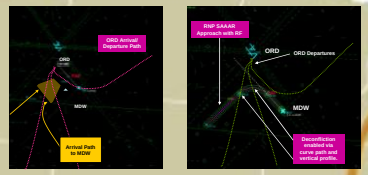
ASDE-X
Airport Surface Detection Equipment-Model X

RNP
Required Navigation Performance

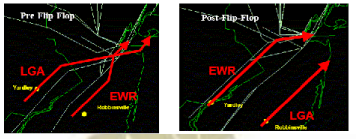
RNAV
Area Navigation

TMA
Traffic Management Advisor

RNAV/RNP Deconflict

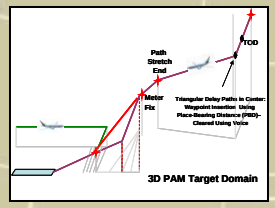


RNAV/RNP Deconflict



Surface Management

3D PAM



Focus on Integrated

Tailored Arrivals

Surface Management

RNAV/RNP Deconflict

4-D FMS

Staffed NextGen Tower

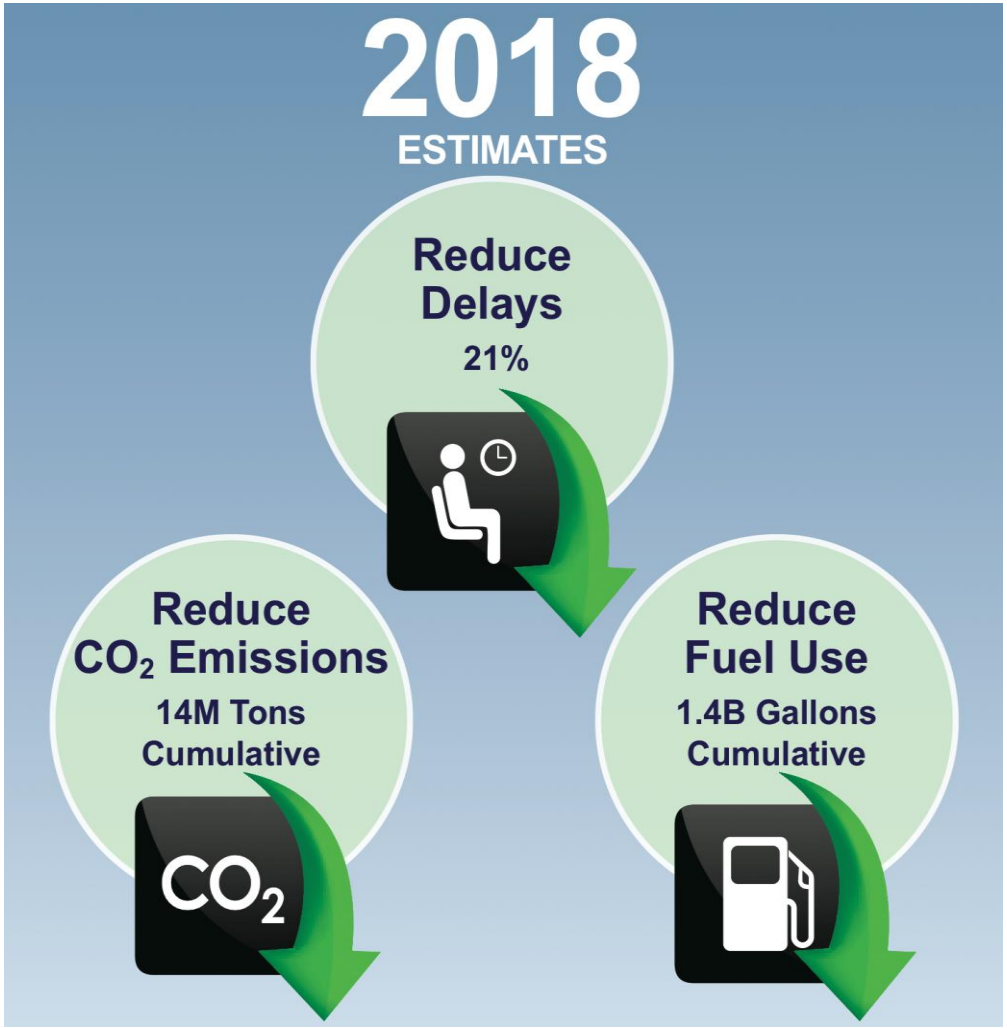
ADS-B in the Gulf

Surface Management

UAS

Tailored Arrivals

Delivering Benefits Today & Tomorrow

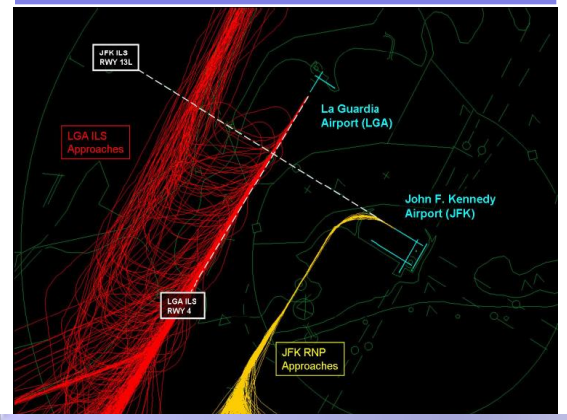


$22B in benefits

NextGen Equipage: *Critical to Success*

Avionics needed to obtain full NextGen capabilities

Performance Based Navigation



ADS-B

Data Communications

FAA & operator investment required to realize NextGen benefits

Data Communications

Data Comm will replace radio-voice communications for most routine exchanges between controllers and pilots

Benefit:

- More efficient communications
- Reduced aircraft gate and taxi delay by eliminating time-consuming delivery of clearances

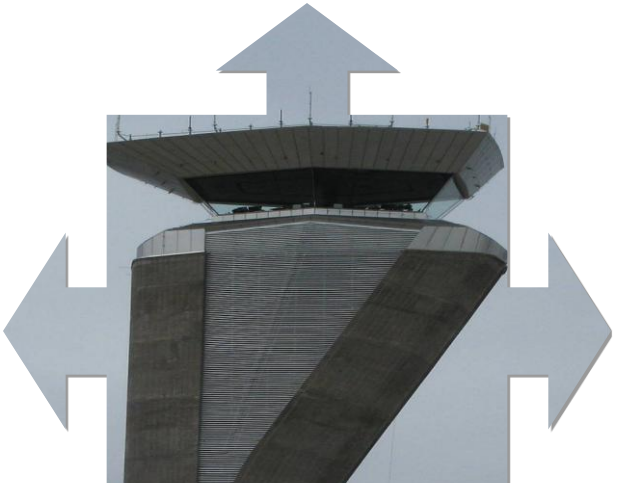
Strategy:

- **Near Term**: Leverage latent capabilities (i.e., FANS 1/A+) of many of today's jetliners for immediate benefit
  - Delivery of taxi clearances - 2014
- **Mid Term:** Expand to delivery of en route data communications services - 2016

Near-term NextGen Applications

Automatic Dependent Surveillance – Broadcast (ADS-B)

Performance Based Navigation

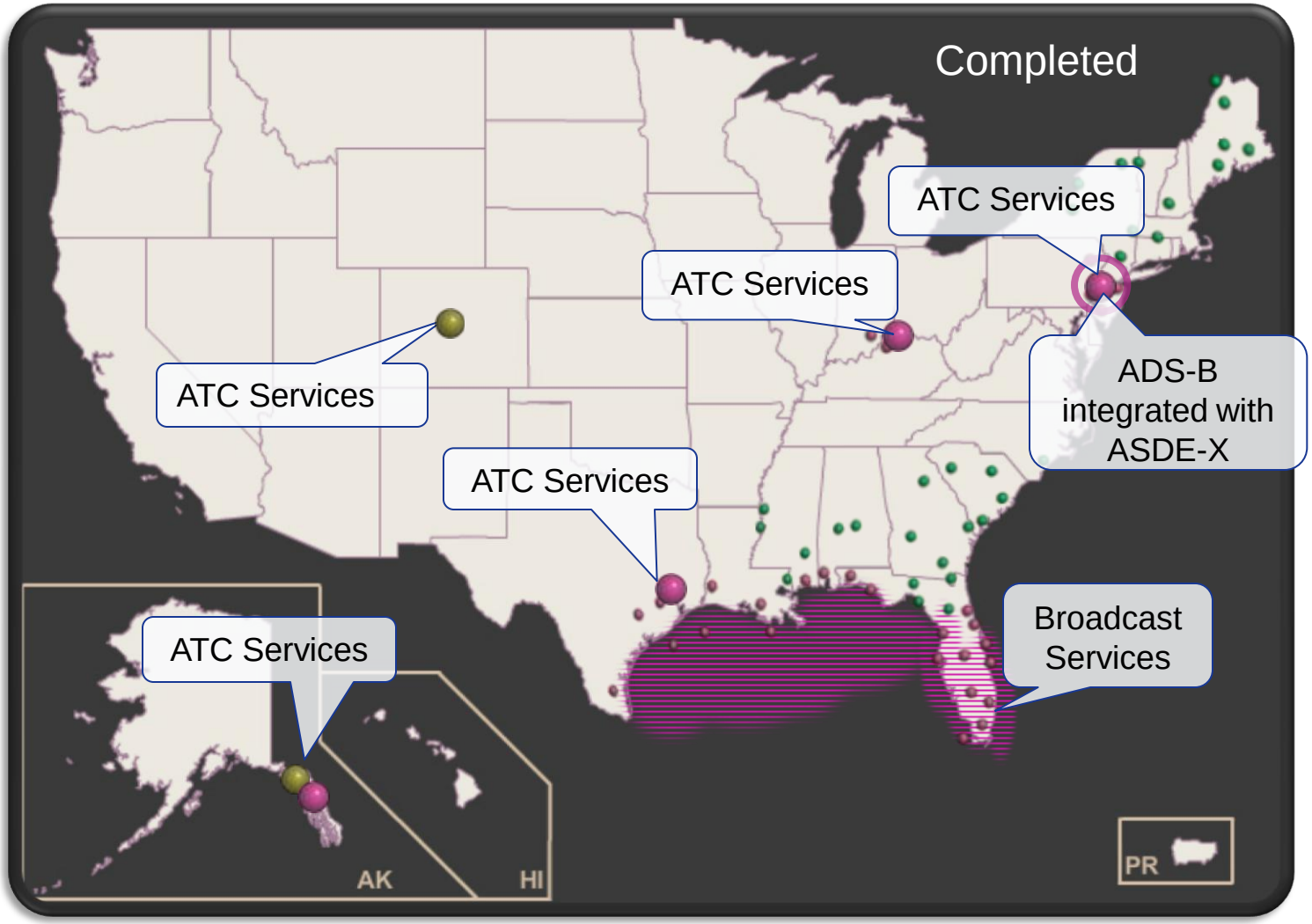


Airfield and Surface Improvements

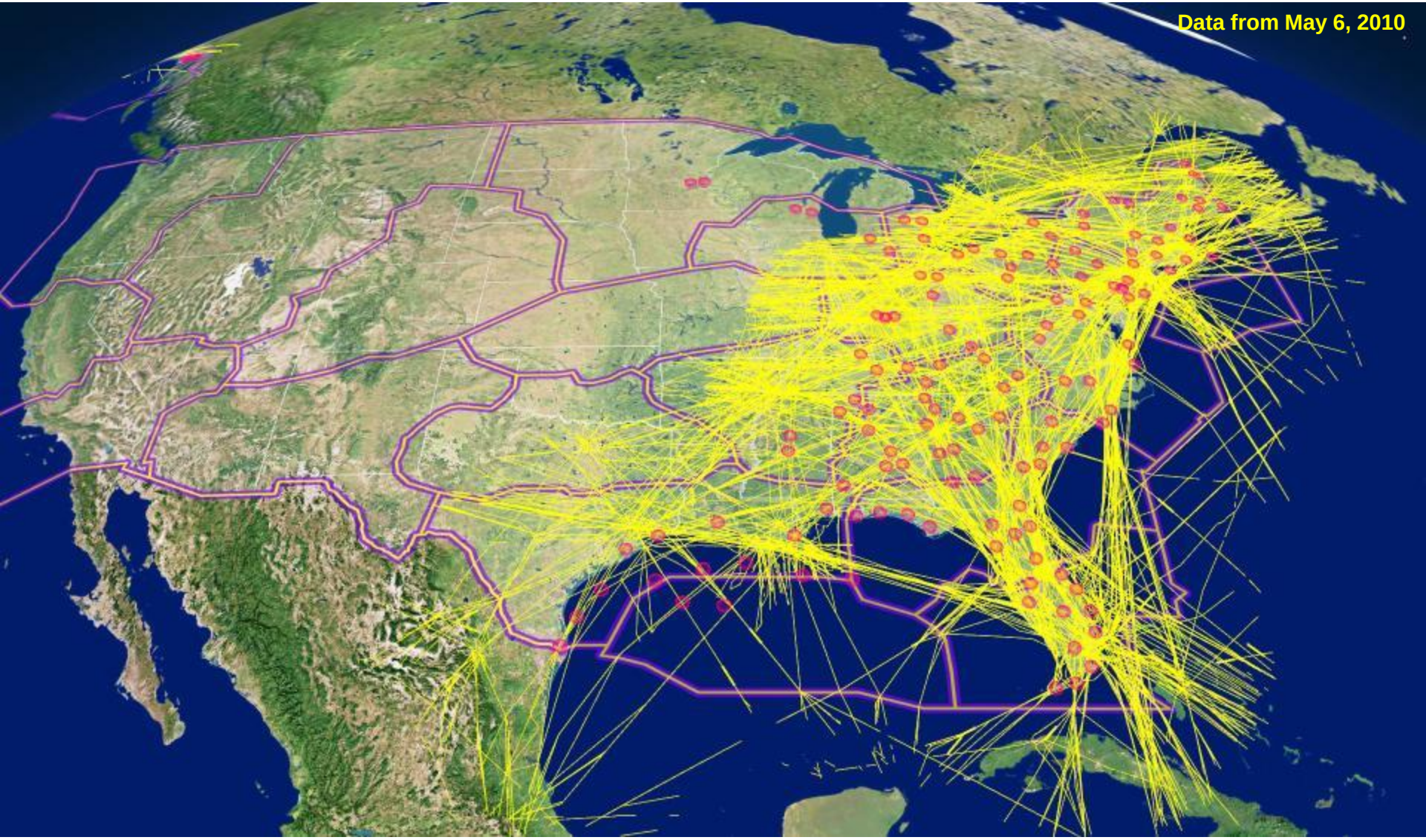
NextGen Initiatives

Surveillance:

Automatic Dependent Surveillance-Broadcast (ADS-B) & Wide Area Multilateration (WAM)



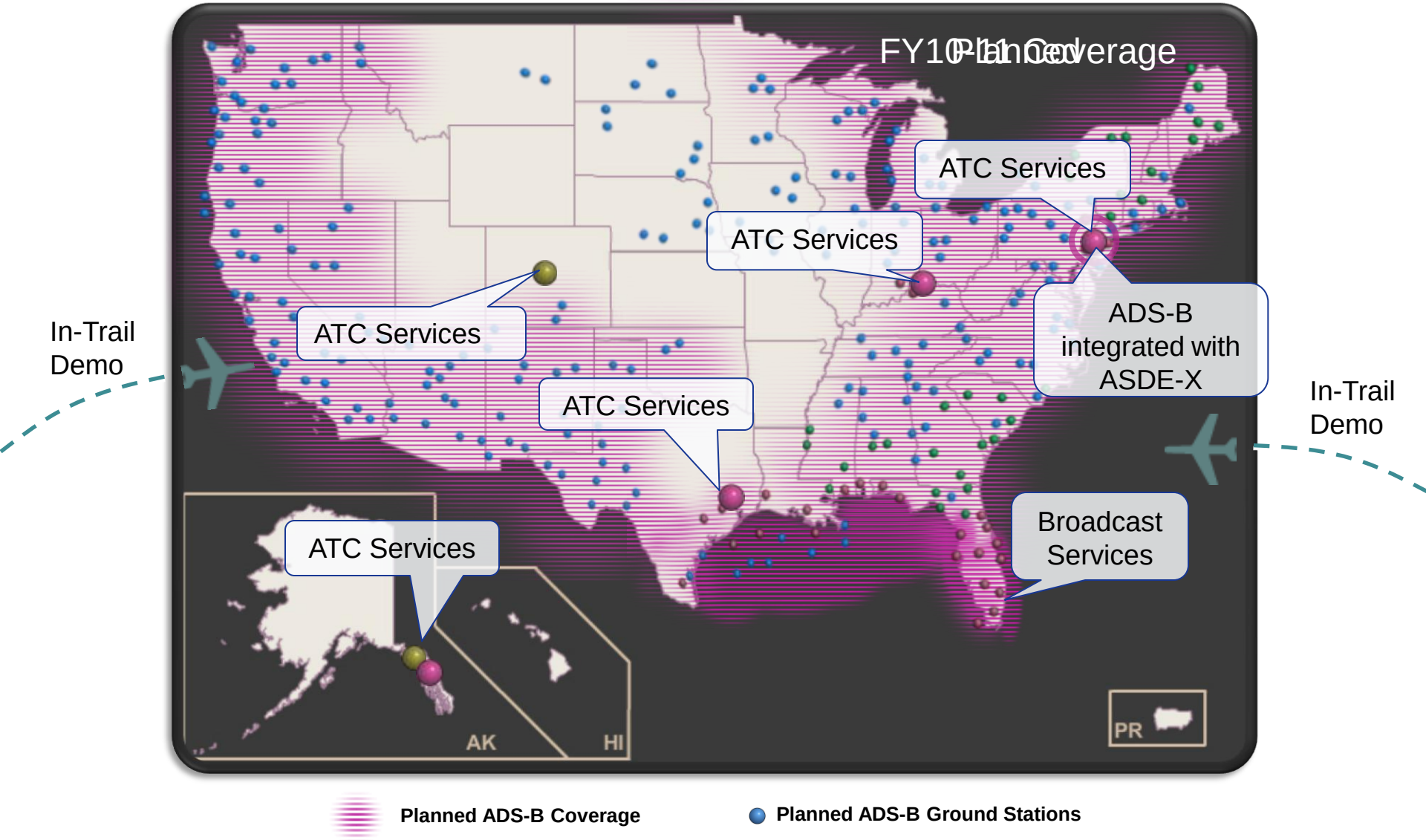
Current Coverage from Radio Stations



Today: 120 radio stations collecting data on the East Coast and in Alaska

Surveillance:

Automatic Dependent Surveillance-Broadcast (ADS-B) & Wide Area Multilateration (WAM)

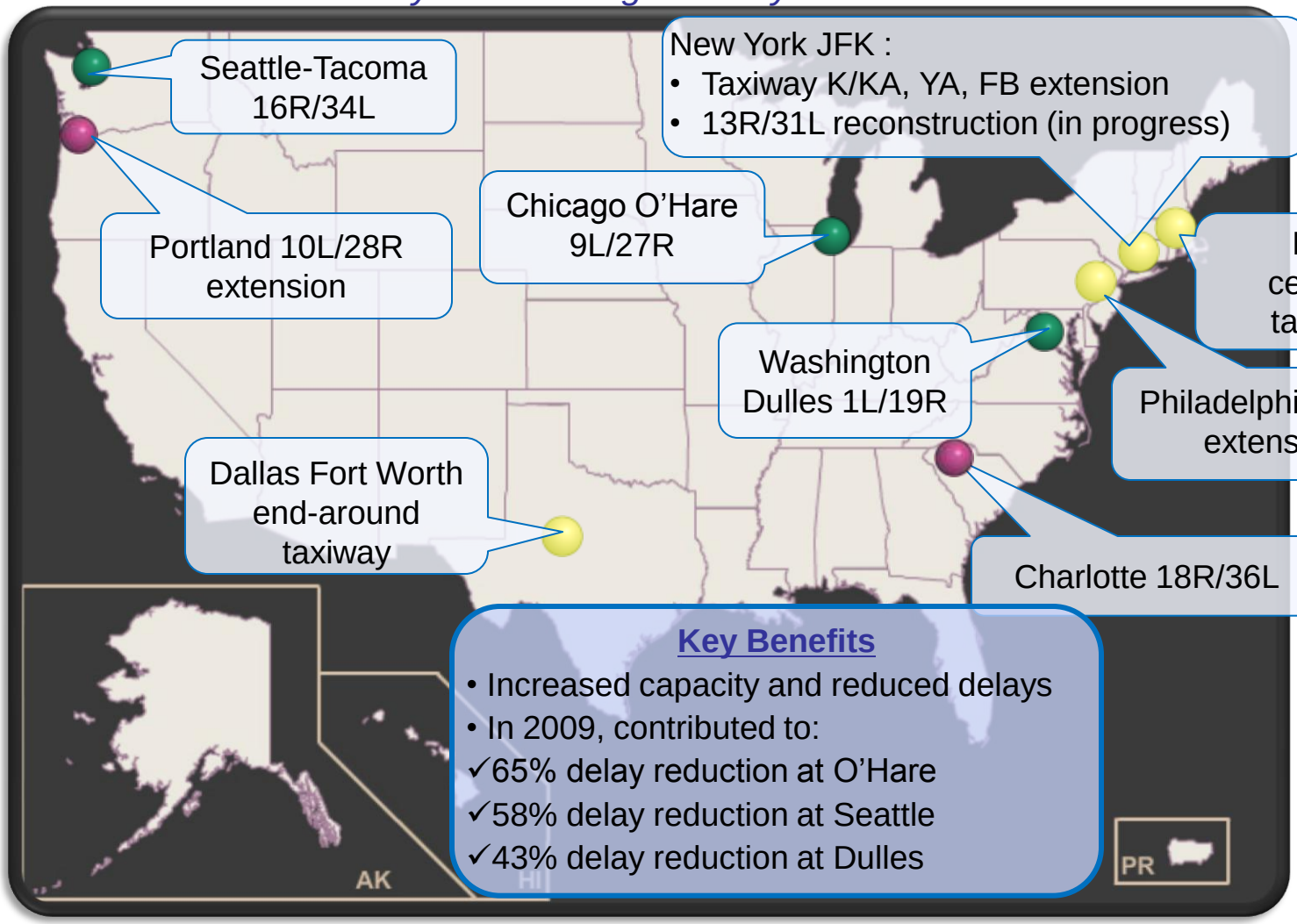


ADS-B Out Final Rule

- **Published May 27, 2010**
  - FAA adjudicated comments responding to notice of proposed rulemaking, issued October 5, 2007
- **Establishes Equipage Requirement for Aircraft in Controlled Airspace**
  - Applies in Class A, B and C airspace, near busy airports and above 10,000 feet
- **Sets Avionics Performance Standards**
  - Manufacturers can design to broadcast-signal requirements for accuracy, integrity, power and response time
- **Compliance Deadline is January 1, 2020**

Airport Improvements (FY09-FY10)

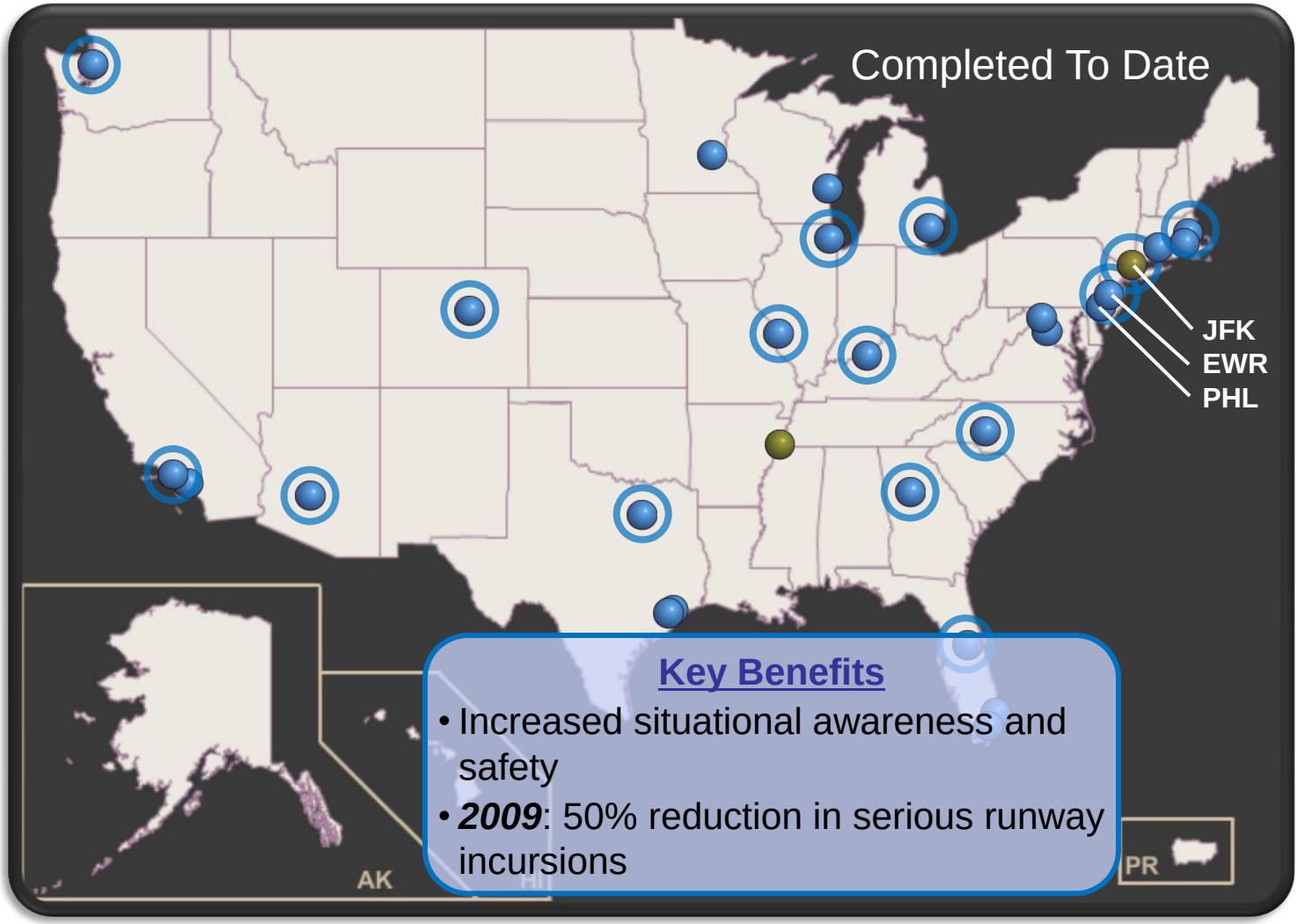
Already Contributing to Delay Reduction



Completed New Runway **Completed Airfield Improvements** **Planned Runway Improvements**

Surface Management

Leverage Safety Infrastructure for Efficiency



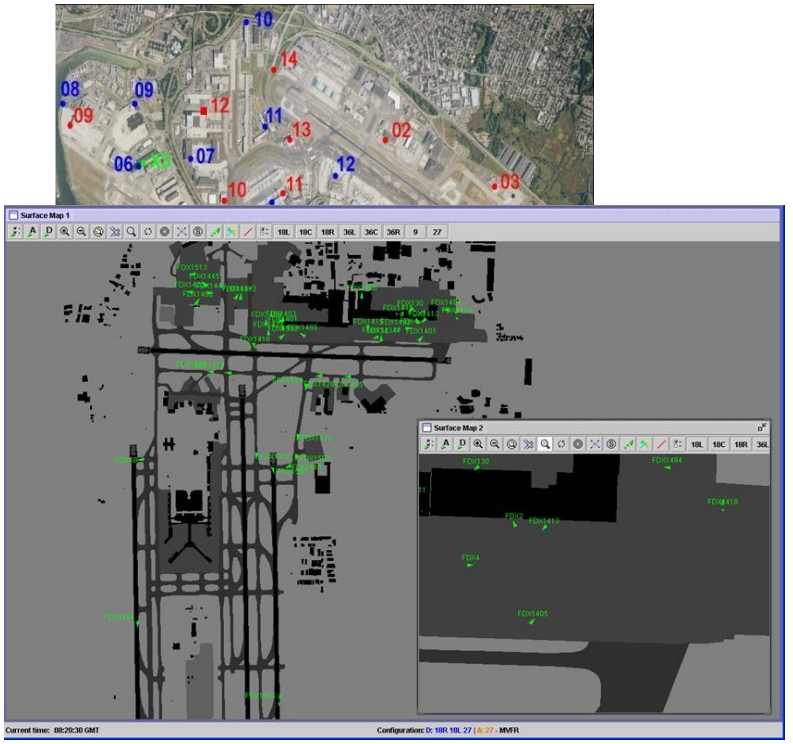
Surface Surveillance and Data Sharing

Surface data sharing for ASDE-X infrastructure under way for 2010

- Leverage installed ASDE-X infrastructure
- Will provide surface traffic data sharing
- Stepping stone for more robust collaborative decision support tools

Benefits

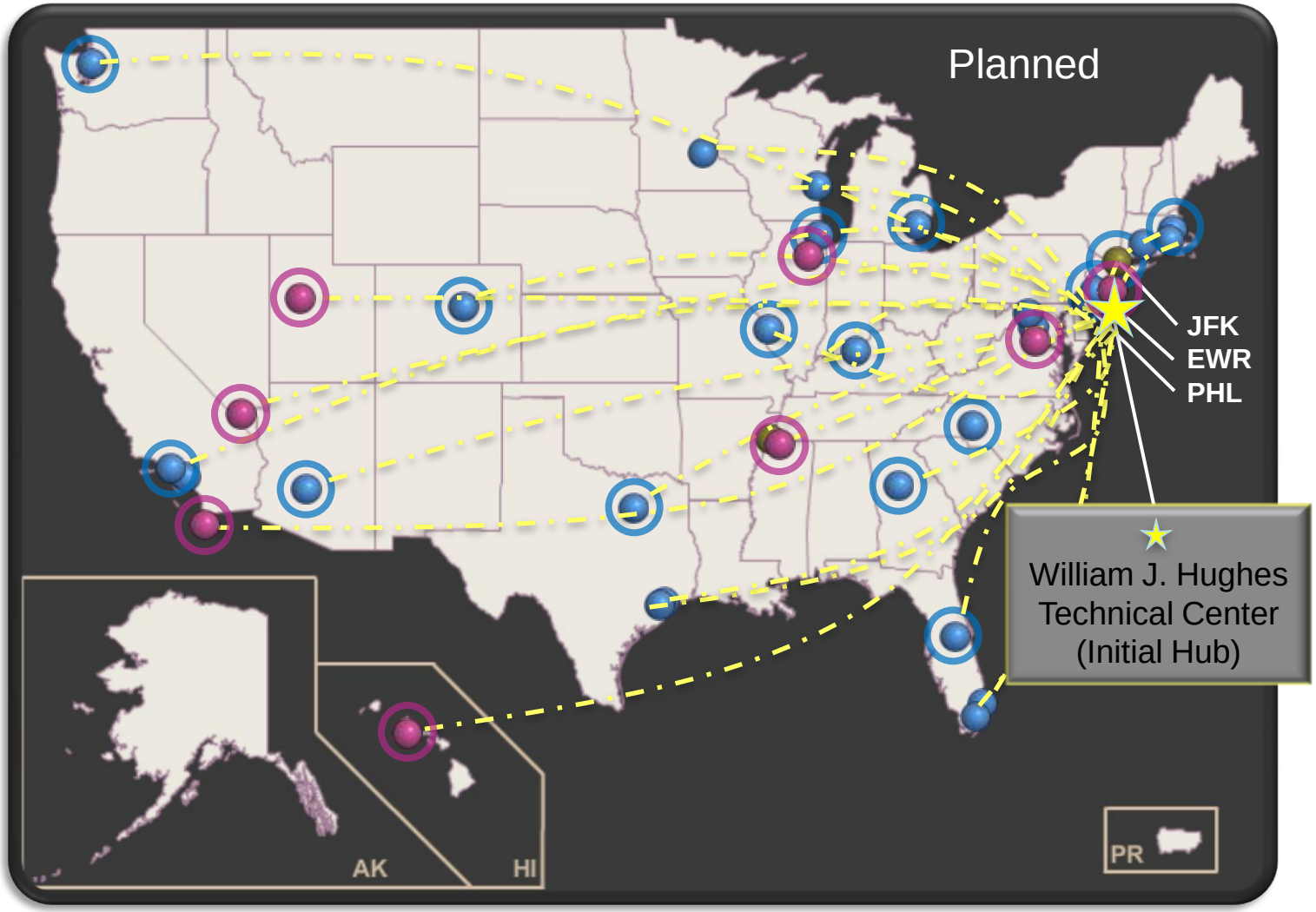
- Delay reduction
- Reduced fuel burn and environmental footprint
- Improved situational awareness and decision making
- Collaborative planning at airport



Leveraging demos at JFK and MEM

Surface Management

Leverage Safety Infrastructure for Efficiency



ASDE-X Installed | Data Distribution Unit | Surface Demo | Planned ASDE-X

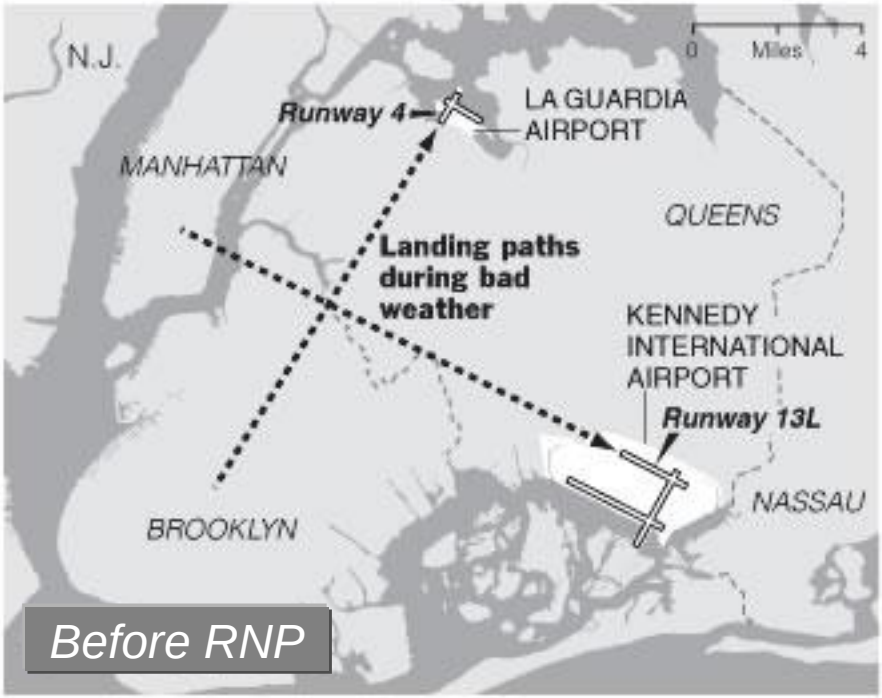
Collaborative Departure Management During JFK's Runway Closure – A Success Story

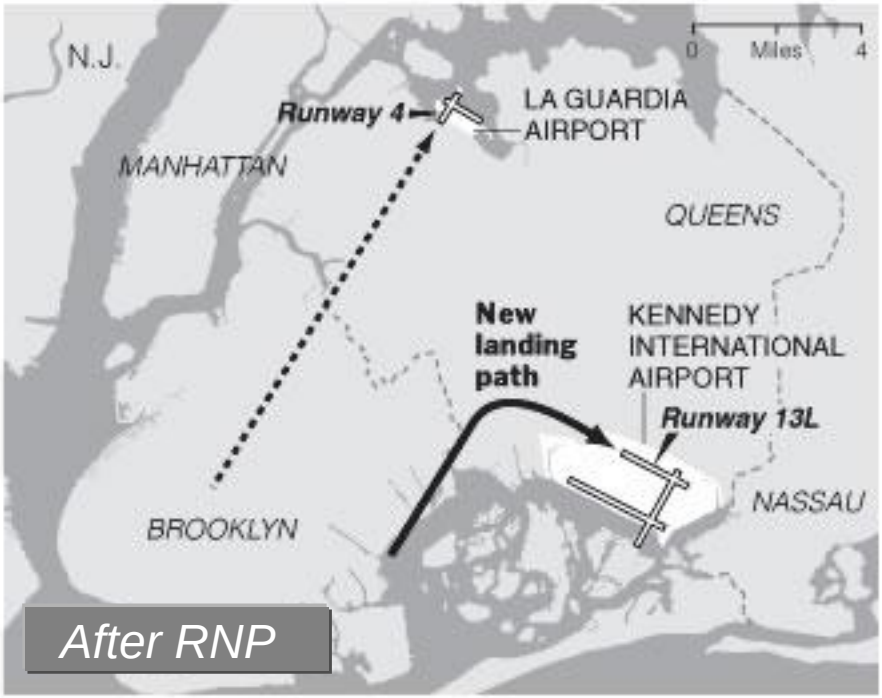
- JFK Runway 31L/13R closed for reconstruction March 1
- FAA, PANYNJ, airlines collaborate to allocate takeoff slots. Airline with *x* percent of scheduled departures gets *x* percent of available slots

- In place of first-come-first-served, a 'reservation' system divides one hour of departures into four 15-minute buckets
- Aircraft stay at the gate until their bucket arrives.
- Taxi delays, fuel consumption, CO_2 emissions are reduced

Performance Based Navigation (PBN)

Enables Greater Efficiency and Access





RNAV: **General purpose satellite navigation**

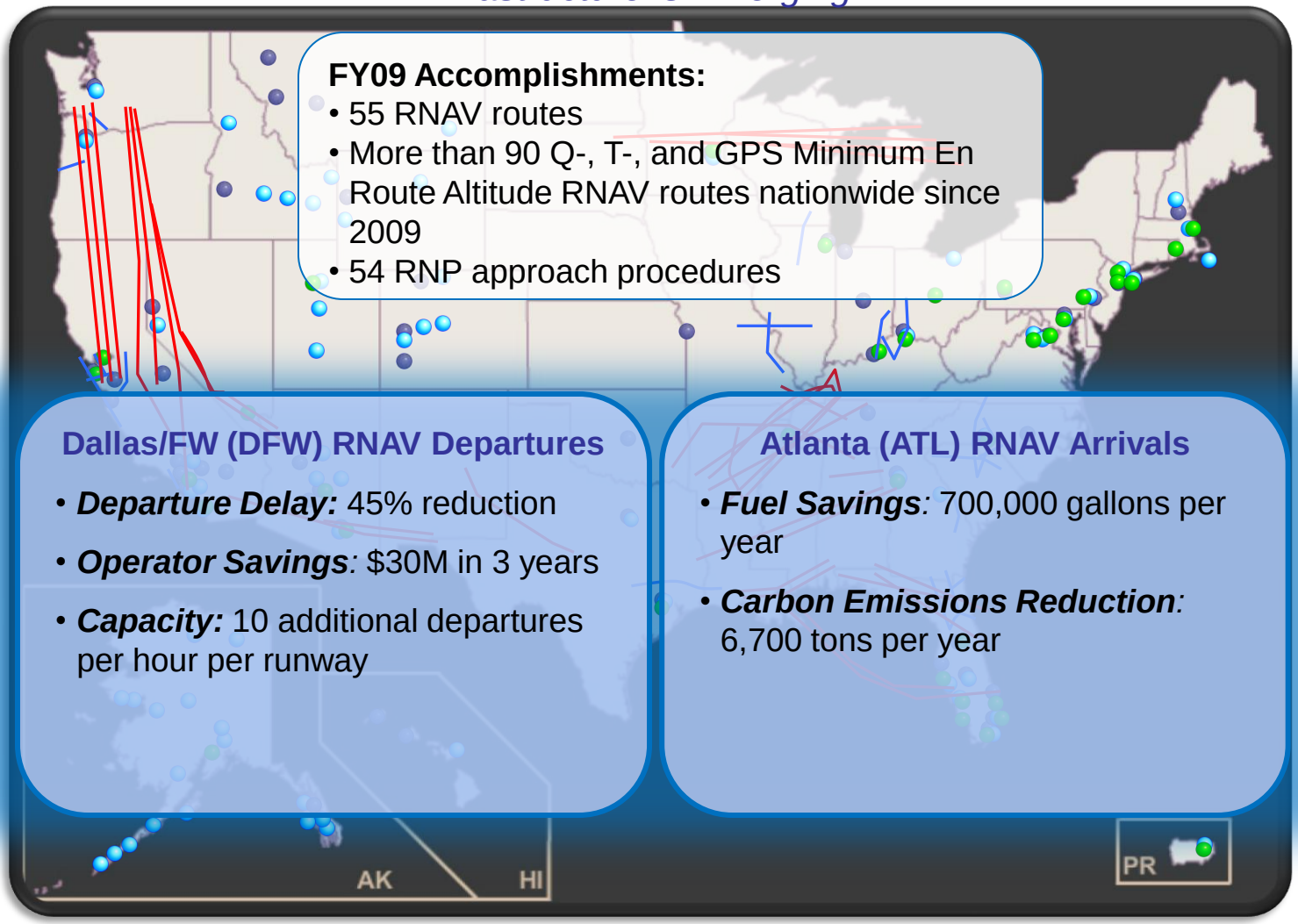
RNP: **High-precision satellite navigation for congested airspace**

- **Provides aircraft with the ability to fly shorter, more efficient flight paths**
- **Increases capacity of runways and in the airspace – ability to "de-conflict" airports, avoid sensitive areas**
- **Reduces delays, fuel burn, and aircraft noise**

LPV: **Provides ILS-like capability without ILS infrastructure costs**

Performance Based Navigation (PBN)

Infrastructure is Emerging



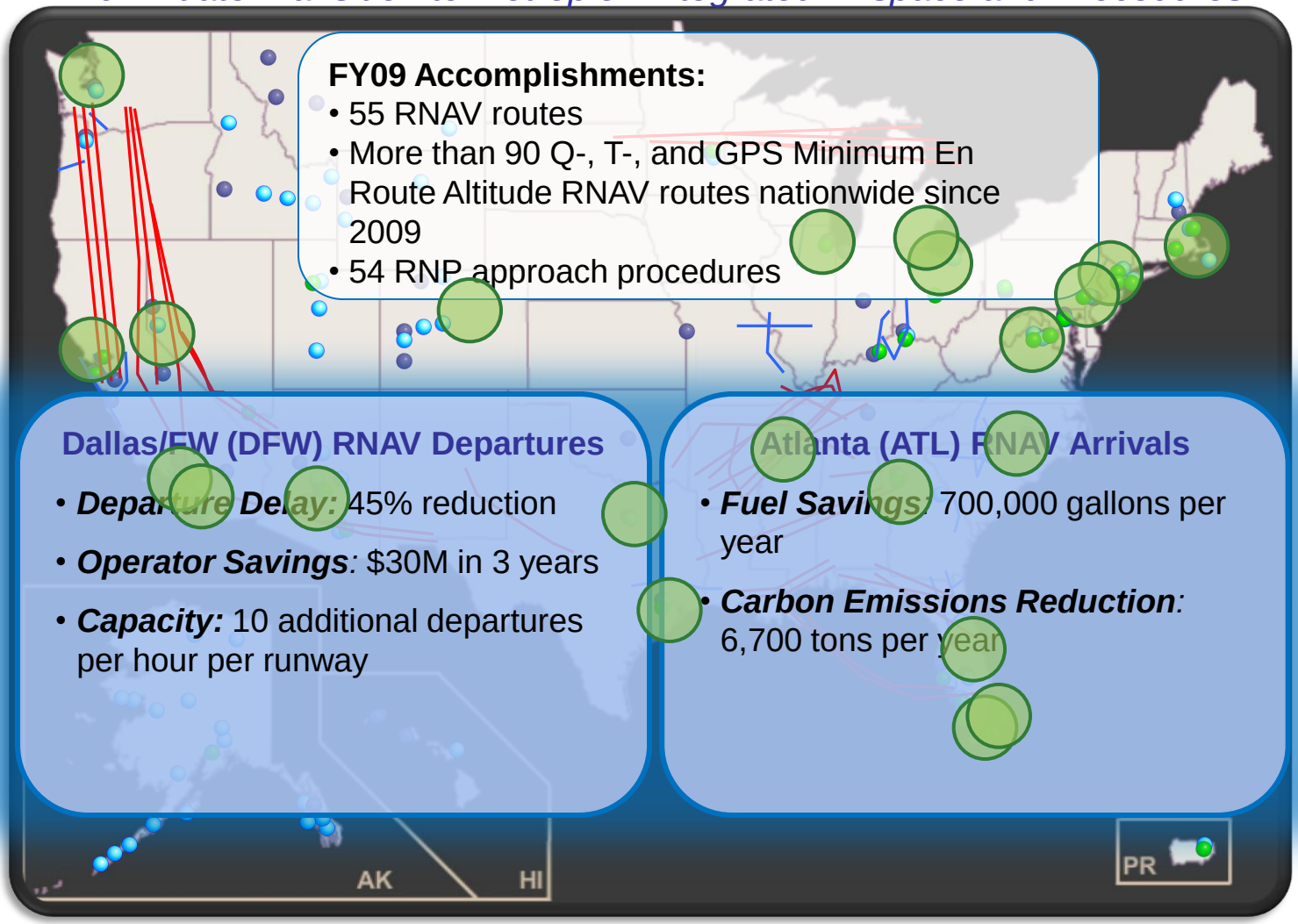
Examples

Examples

RNP · RNAV SiD · RNAV STAR · RNAV T Routes · RNAV Q Routes

Performance Based Navigation (PBN)

FY10: Initiate Transition to Metroplex Integrated Airspace and Procedures



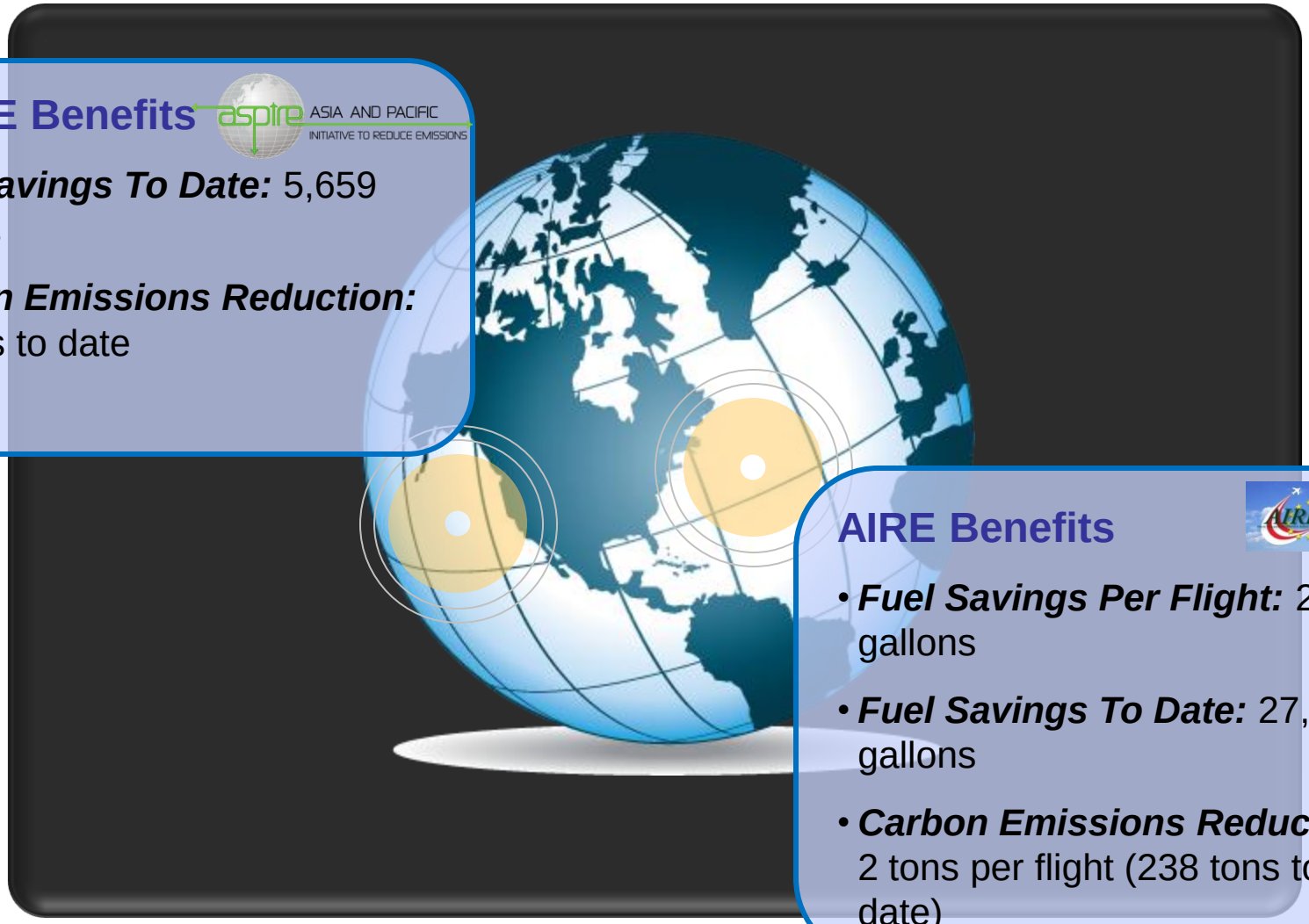
Examples

Examples

RNP · RNAV SiD · RNAV STAR · RNAV T Routes · RNAV Q Routes · Metroplex Areas

Gate-to-Gate Oceanic Demonstrations Illustrate NextGen Value

Average Fuel Savings of 3% - 5% per Flight



ASPIRE Benefits

aspire ASIA AND PACIFIC INITIATIVE TO REDUCE EMISSIONS

- ***Fuel Savings To Date:*** 5,659 gallons
- ***Carbon Emissions Reduction:*** 19 tons to date

AIRE Benefits

AIRE

- ***Fuel Savings Per Flight:*** 230 gallons
- ***Fuel Savings To Date:*** 27,000 gallons
- ***Carbon Emissions Reduction:*** 2 tons per flight (238 tons to date)

Tailored Arrivals (TAs) and Optimized Profile Descents (OPDs)

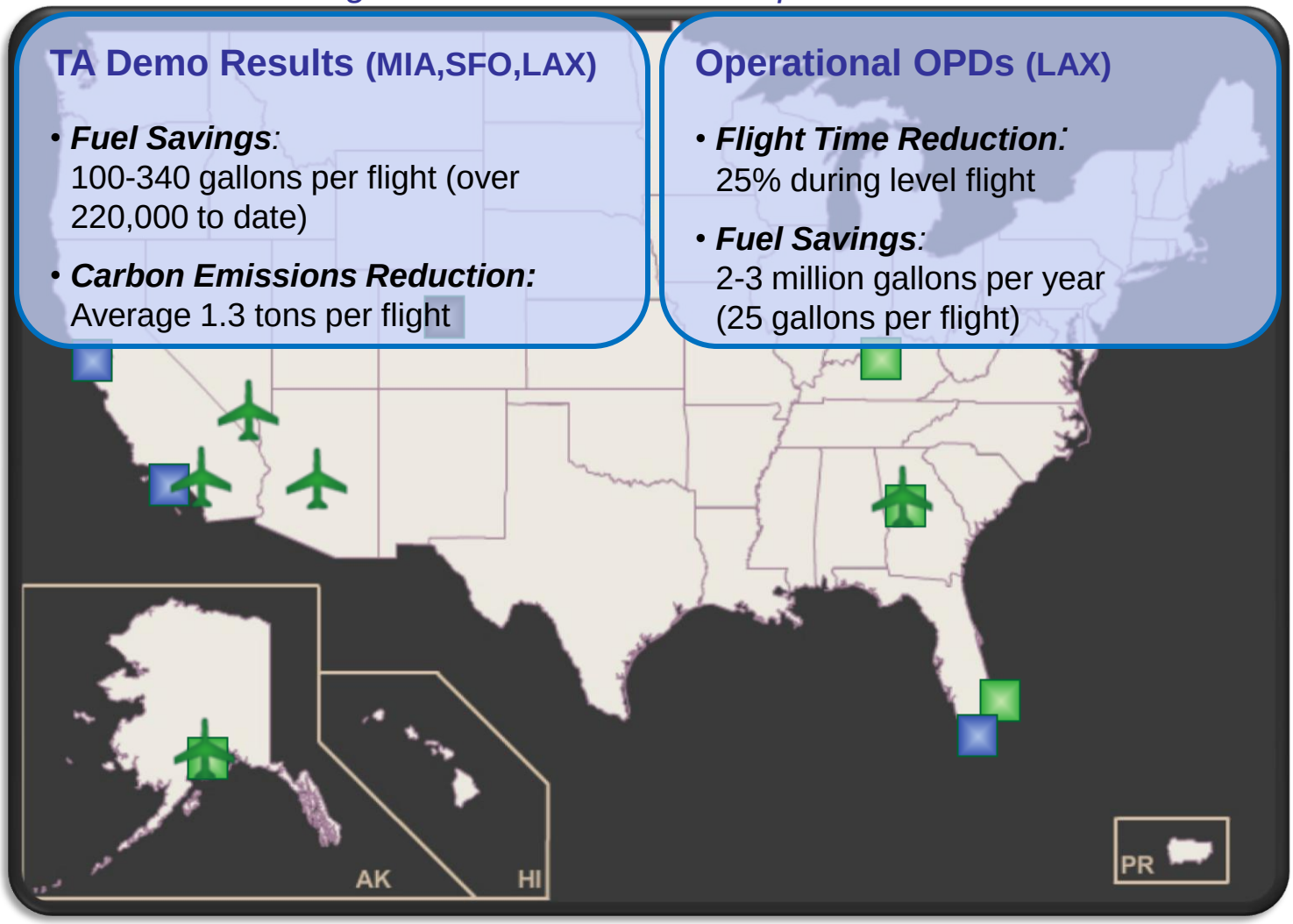
Will Result in Significant Benefits When Operationalized Nationwide

TA Demo Results (MIA,SFO,LAX)

- ***Fuel Savings***:
  100-340 gallons per flight (over 220,000 to date)
- ***Carbon Emissions Reduction:***
  Average 1.3 tons per flight

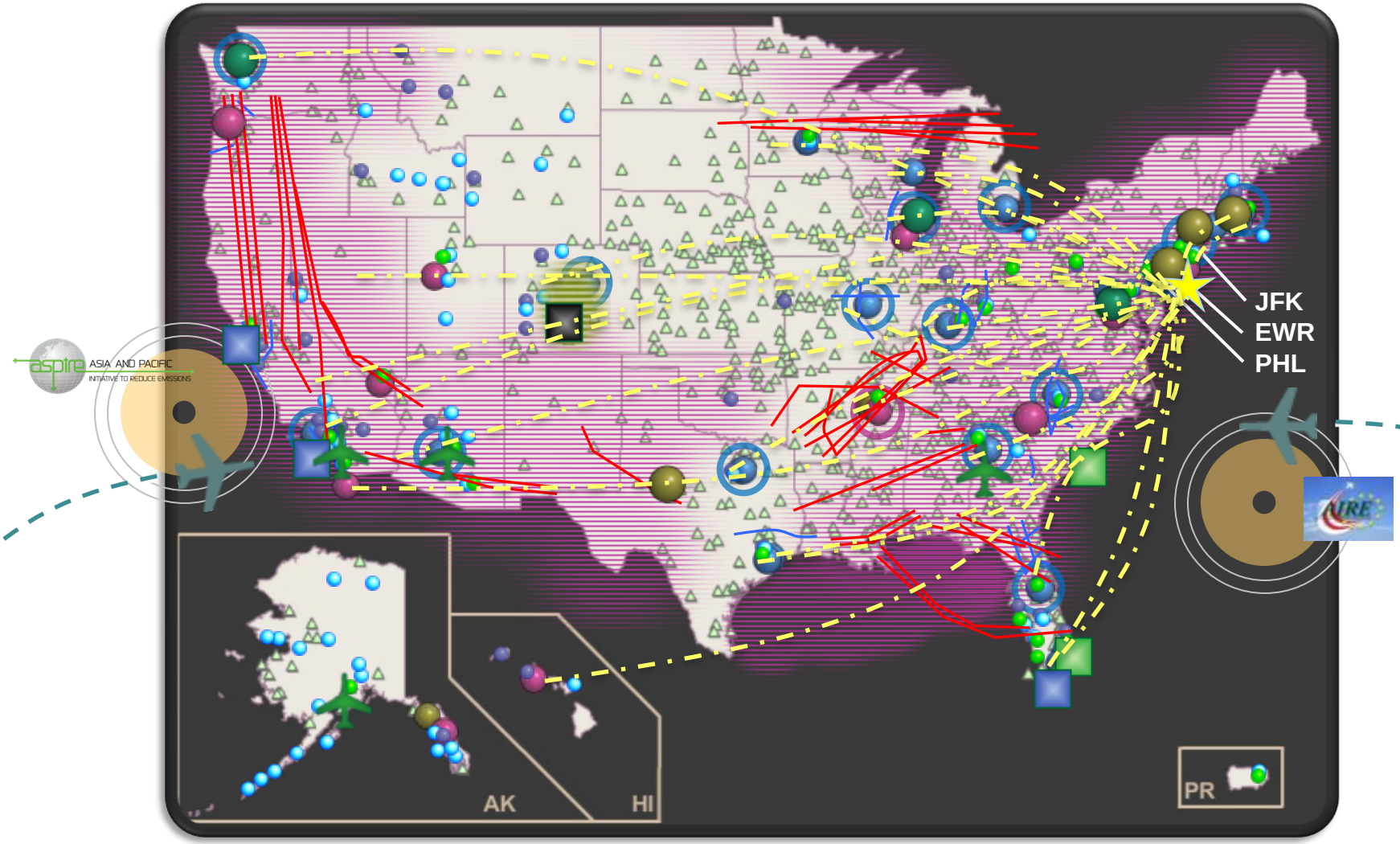
Operational OPDs (LAX)

- ***Flight Time Reduction***:
  25% during level flight
- ***Fuel Savings***:
  2-3 million gallons per year (25 gallons per flight)

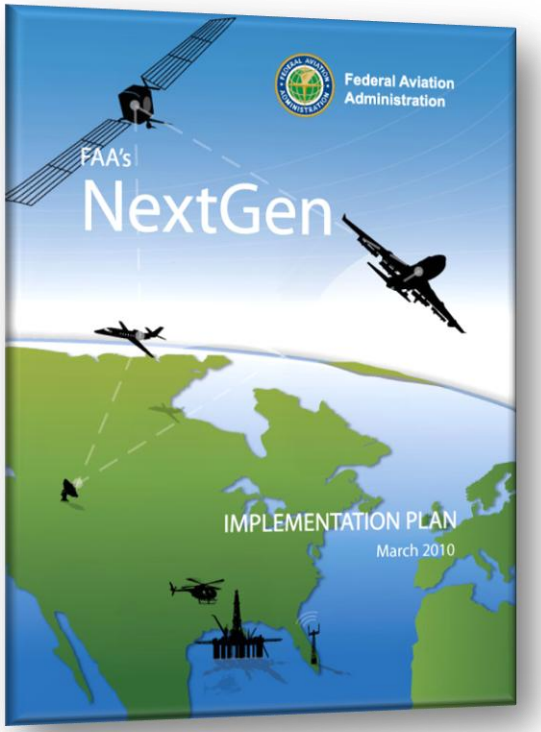


3D PAM Demos | OPD Demos | TA Demos | Operational OPD

NextGen Implementation is Advancing



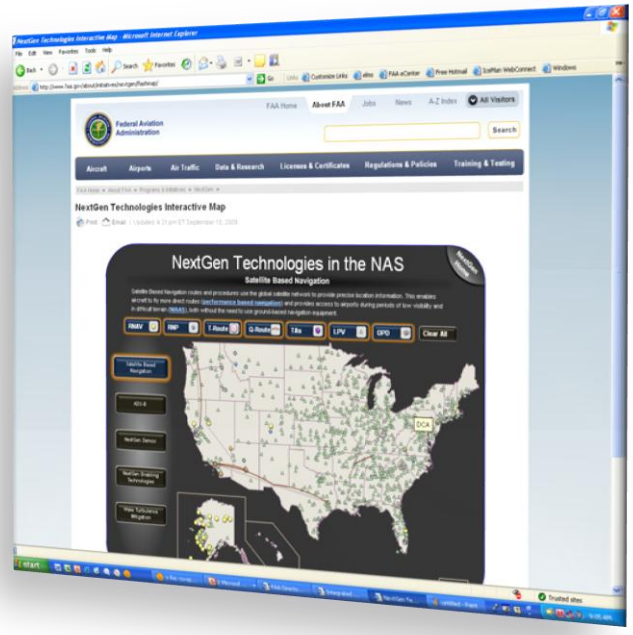
Resources Available to Stay Informed



NextGen Implementation Plan Summarizes:

- Target for NextGen - 2018
- Work accomplished
- NextGen benefits
- FAA's work plan through 2015

www.faa.gov/nextgen



Overviews
News
Videos
Interactive Map
And more…


NextGen
Next Generation Air Transportation System
Discussion

ADS-B In: Traffic Information Service – Broadcast (TIS-B)

TIS-B provides traffic information to ADS-B In equipped aircraft

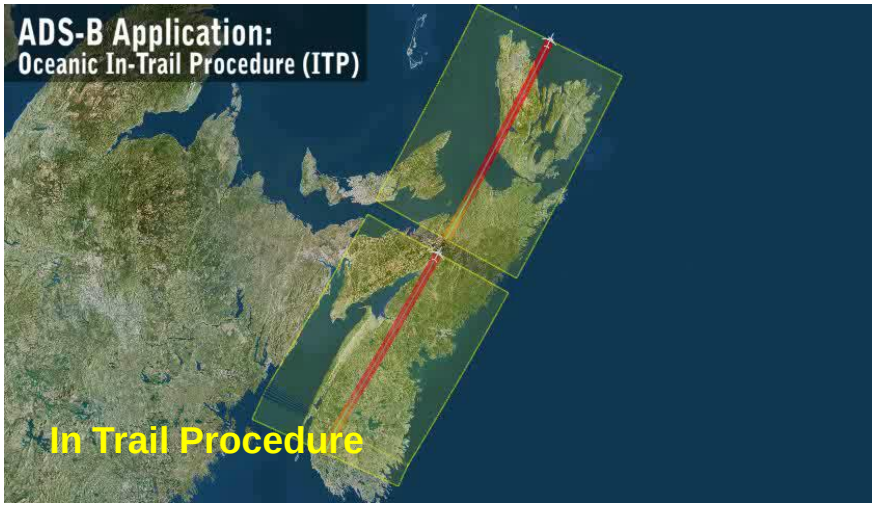
ADS-B In: Flight Information Service – Broadcast (FIS-B)

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

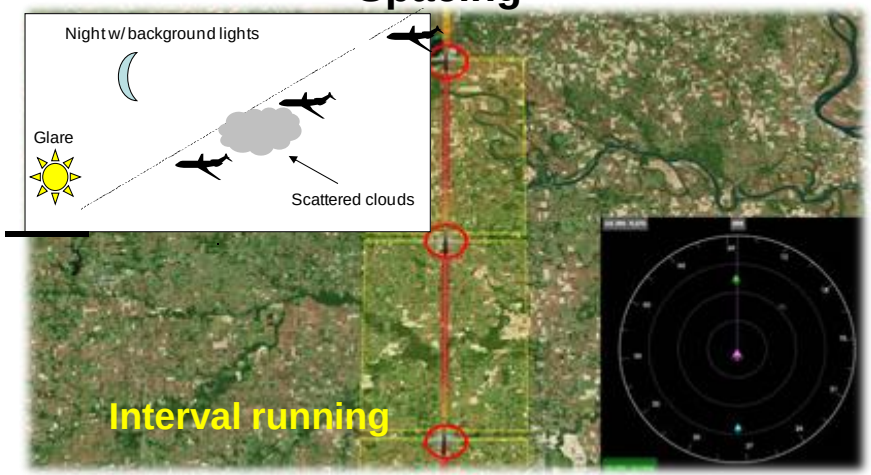
ADS-B: Building Block for Advanced NextGen Applications

Indications and Alerts

Situational Awareness



Spacing



Situational Awareness