

Delivering

# NextGen

Next Generation Air Transportation System



Federal Aviation  
Administration

## An Airport Perspective



**Monday, March 16, 2009**

**Ken Kepchar,**  
*Chief System Engineer*  
*Air Traffic Organization (ATO)*

# NAS Today



NextGen *An Airport Perspective*  
Visit Us at [www.faa.gov/nextgen](http://www.faa.gov/nextgen)



Federal Aviation  
Administration

# NextGen is the Answer

**The Next Generation Air Transportation system, or NextGen, is a complete transformation of the National Airspace System**

- **Enhanced Safety**
- **Increased Capacity and Efficiency**
- **Reduced Aviation's Environmental Impact**

**It is the biggest change in the history of aviation and it will touch every element of the aviation community**

*Transportation Secretary Ray LaHood has established NextGen as a priority, describing the transformation of the national airspace system as “important for the flying public.”*



# What is NextGen?

## NextGen is a complete transformation of the National Airspace System:

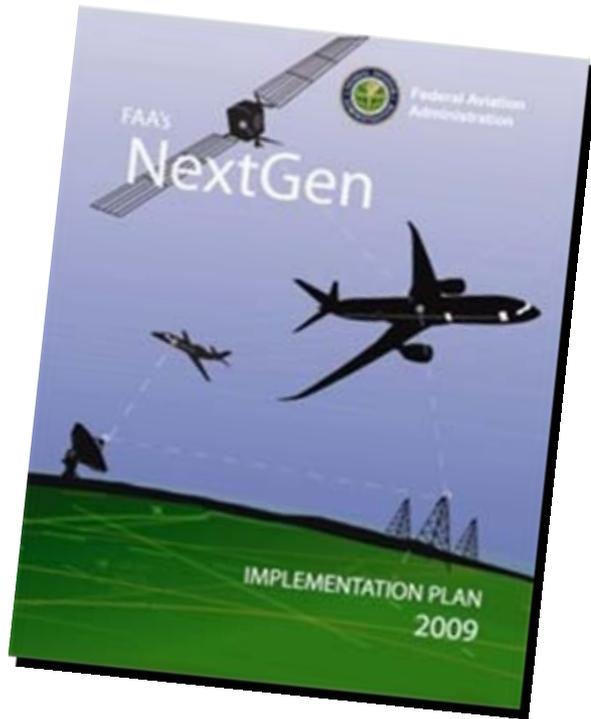
- **New Surface Elements**
  - Runways
  - Taxiways
  - Ramp Technologies
  - Lighting Systems
  - Navigation Systems, to Name a Few
- **Re-configured Airspace**
- **New Air Traffic Procedures**

## NextGen Transformational Programs

- ADS-B
- SWIM
- Data Communications
- Network Enable Weather
- NAS Voice Switch
- RNAV/RNP



# NGIP: Answers Fundamental Questions



1. What does NextGen look like in 2018?
2. What benefits will NextGen deliver in the mid-term, 2012-2018?
3. What are the aircraft avionics equipage needs through 2018?
4. What is the FAA specifically committed to deploy in the near-term that makes the most of existing resources?
5. What activities are underway to support future capabilities?

# NextGen Implementation Plan

The FAA's Implementation Plan is the result of cross-agency development

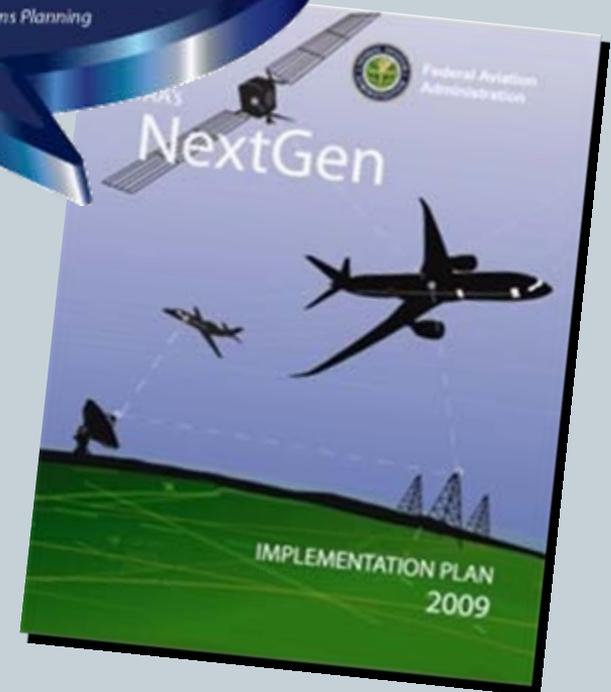
It was developed by teams comprised from all FAA lines of business

It was vetted through the NextGen Management Board whose members represent all FAA lines of business

It was also vetted through RTCA to ensure aviation community input

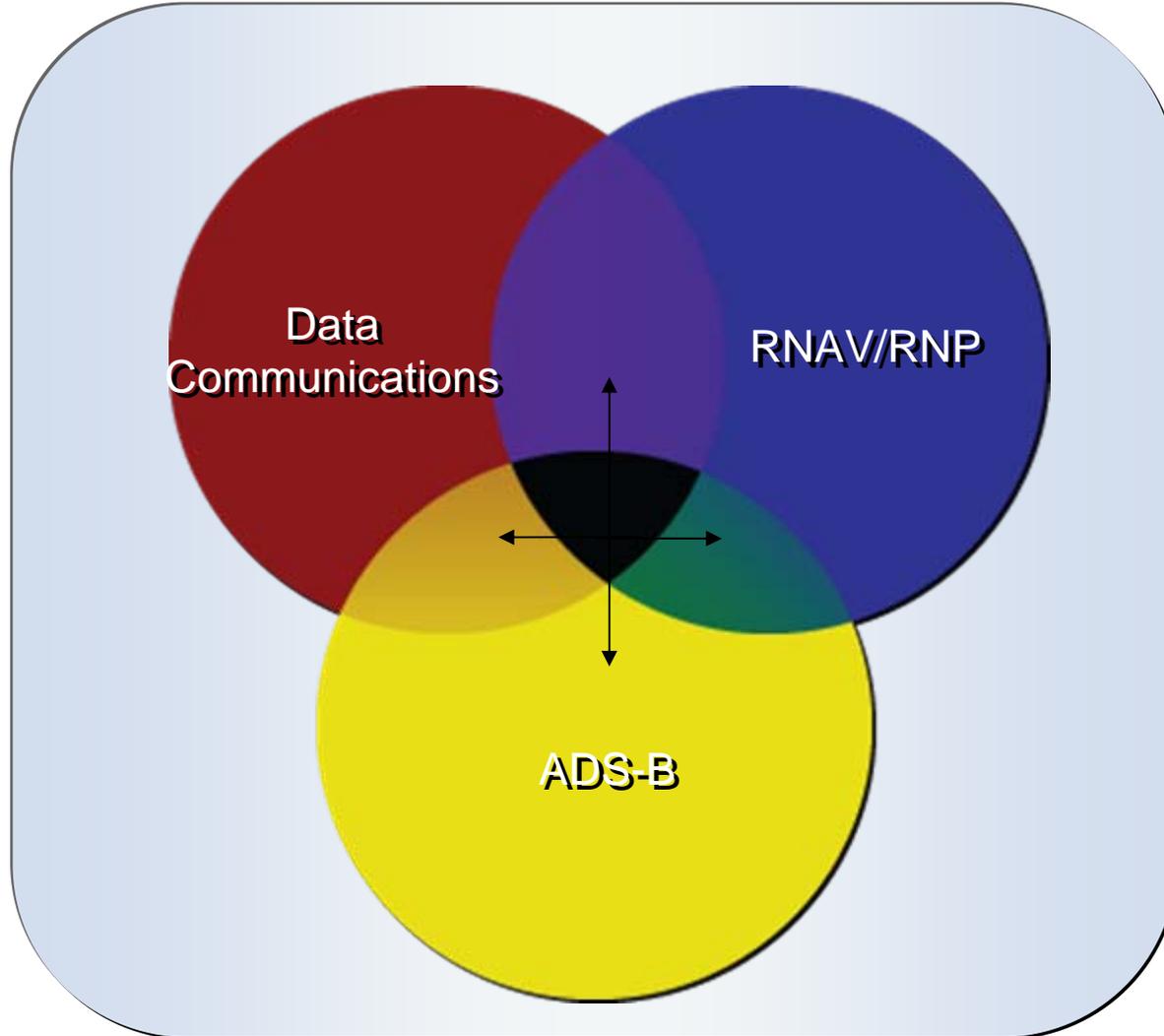
The new plan puts "a stake in the ground regarding the operational capabilities we believe we can deliver within the next 10 years."

Victoria Cox,  
Senior Vice President  
NextGen and Operations Planning

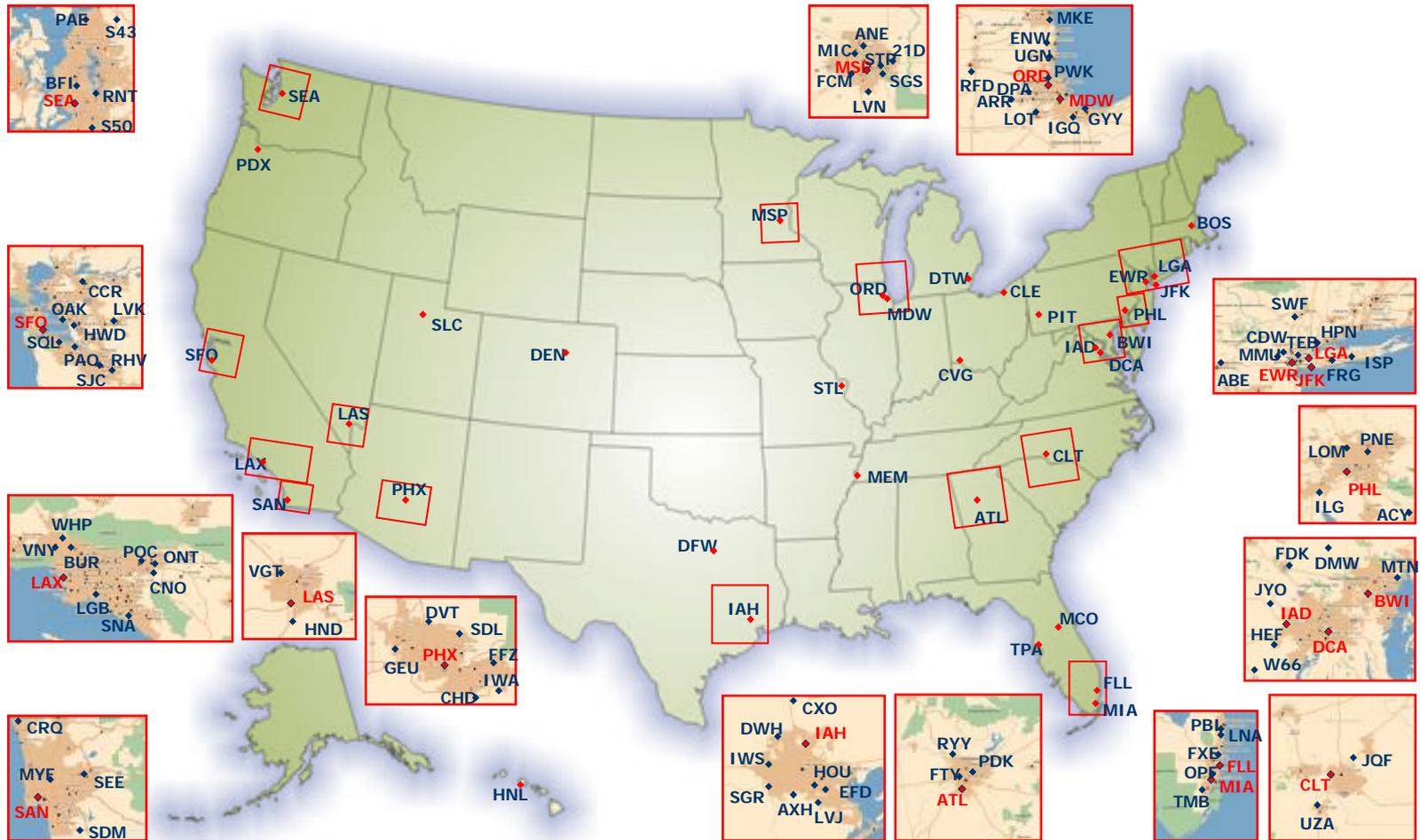


[www.faa.gov/nextgen](http://www.faa.gov/nextgen)

# Mid-Term Technologies



# NextGen Airport Development



# How Will NextGen Benefit Airports?

- Increased Safety
- Increased Capacity
- Greater Design Flexibility
- Improved Environmental Performance



# How Will NextGen Benefit Airports?

## Increased Safety

NextGen will provide a safer operational environment on the airfield.

Greater situational awareness for pilots, controllers, and airport ground personnel = fewer runway incursions.

Enhanced surface management and evolving technologies:

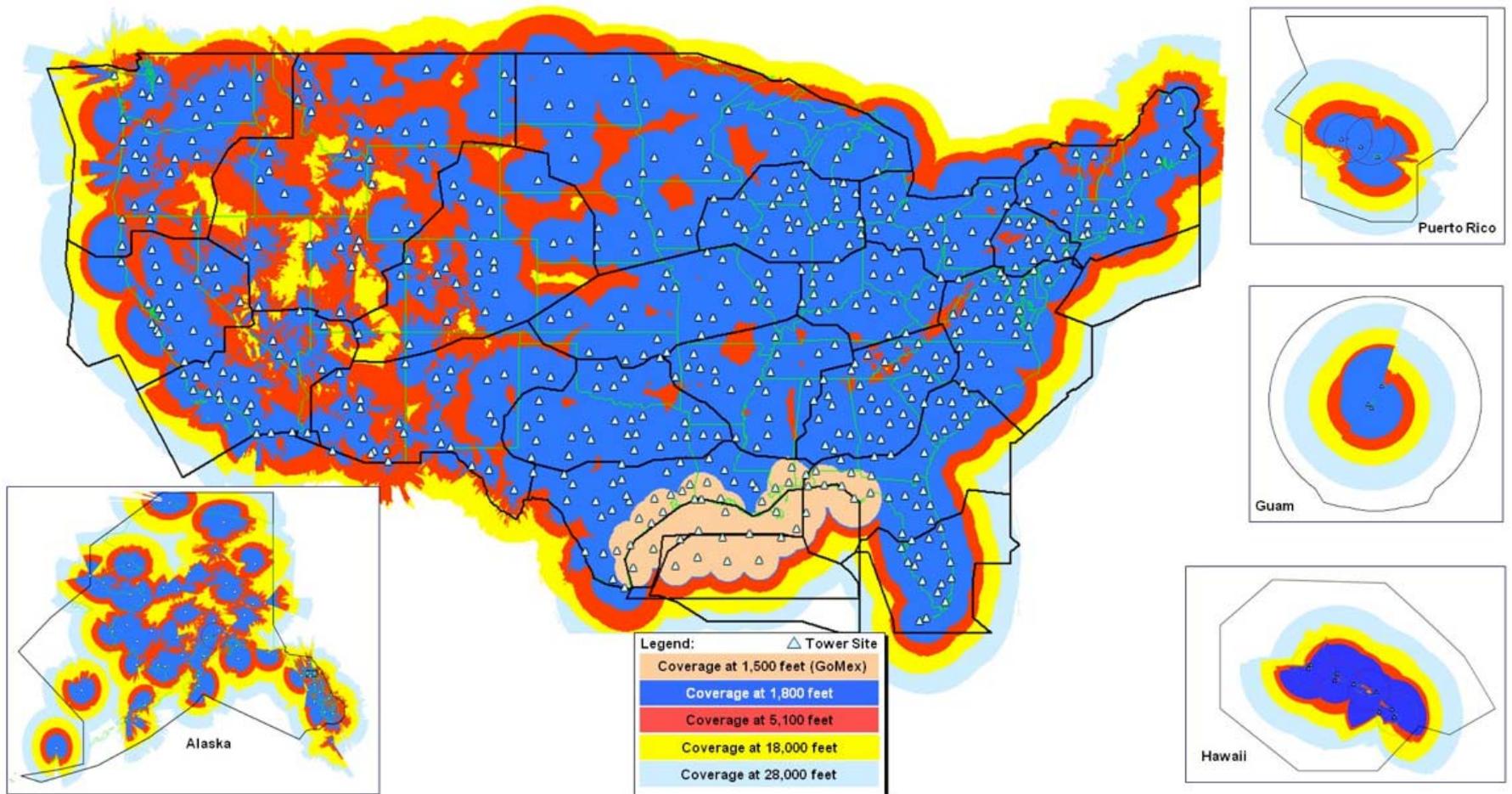
- Airport Surface Detection Equipment, Model X (ASDE-X)
- Automatic Dependent Surveillance-Broadcast (ADS-B)
- Runway Status Lights (RWSL)



# ASDE-X

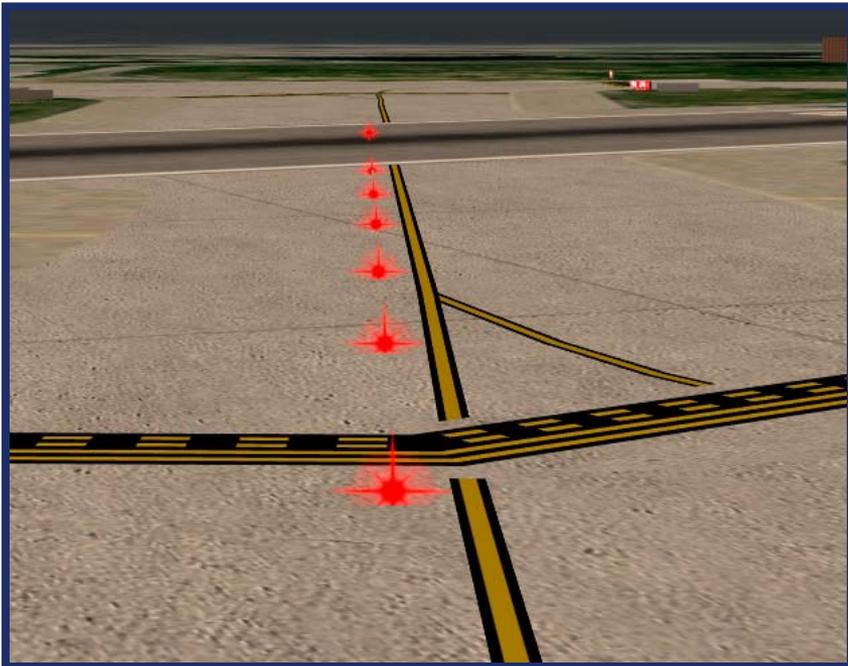


# ADS-B NAS-wide deployment by 2013



# Runway Status Lights

- Warn pilots when it is unsafe to cross or enter a runway
- Successful evaluations at Dallas Fort-Worth and San Diego
- Program expanded to 22 additional airports



**Runway Entrance Lights (RELs)**



**Takeoff Hold Lights (THLs)**

# How Will NextGen Benefit Airports?

## Increased Capacity

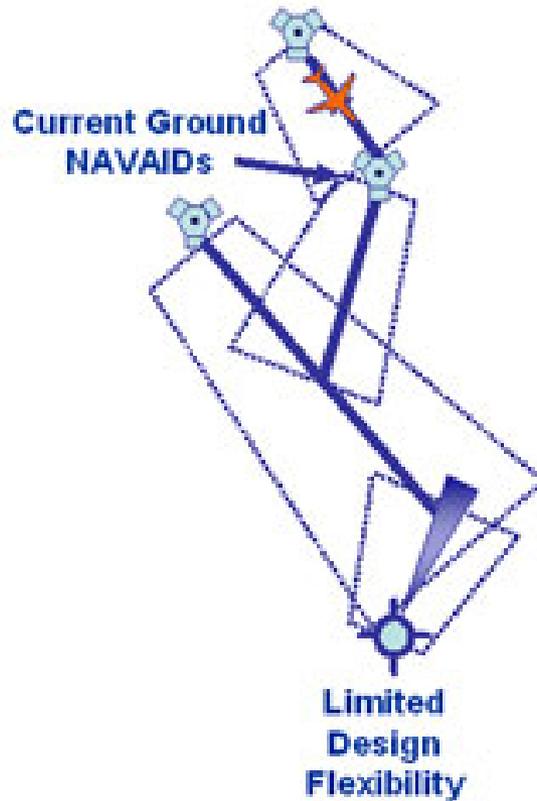
More efficient use of existing infrastructure and increased throughput of existing airport layouts:

- Precision-based navigation (RNAV and RNP)
- Reduced lateral and in-trail separation standards for approaching aircraft, especially during bad weather
- Simultaneous operations on closely-spaced parallel runways

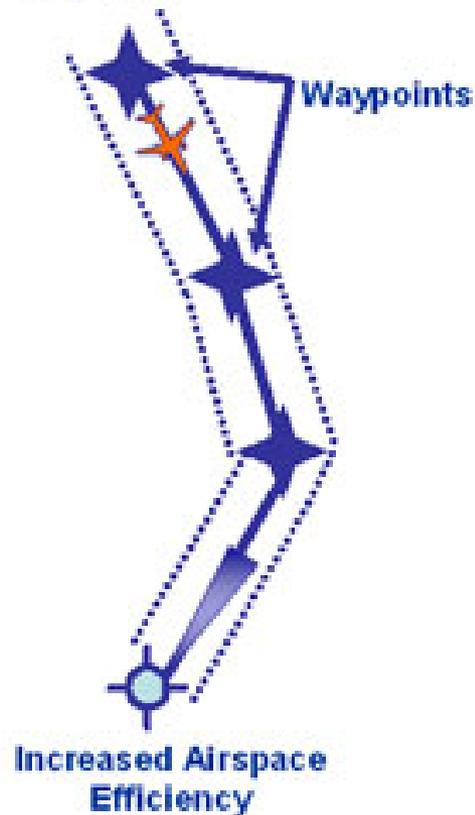


# RNAV and RNP

## Conventional Routes



## RNAV



## RNP



# WAAS/LAAS



# How Will NextGen Benefit Airports?

## Greater Design Flexibility

Design standards for runway separations will change:

- Reduced Separation Standards
- Independent Operations on closely-spaced parallel runways

Increased flexibility in terminal designs and access will allow landside facilities to adequately keep pace with airside capacity improvements



# How Will NextGen Benefit Airports?

## Improved Environmental Performance

NextGen technology and procedures will reduce fuel, emissions, noise, and need for additional land use:

- Optimal Profile Descent Arrivals/Continuous Descent Arrivals (CDA)
- RNAV/RNP approaches
- Closely-spaced parallel runway operations = less land use
- Improved aircraft airframe and engine technology
- Development of sustainable alternative fuels
- Comprehensive green airport plans



# Optimal Profile Descent Arrivals

Also known as Continuous Descent Arrivals (CDA), these approaches allow aircraft to descend with the shortest route at a minimum power setting:

- Reduce noise impact on residential communities surrounding airports
  - Reduce fuel burn
  - Decrease carbon emissions
- 
- Recent demonstrations of oceanic tailored arrival procedures into San Francisco, 1,000+ flights collectively:
    - reduced CO<sup>2</sup> emissions by 6.3 million lbs.
    - reduced fuel use by 2 million lbs.

**The demonstrations support the developing of procedures to support wide range deployment of optimized arrival concepts.**

# Fundamental NextGen Change

## Today

**Ground-based navigation and surveillance**

**Air Traffic Control communications by voice**

**Disconnected information systems**

**Air traffic “control”**

**Fragmented weather forecasts**

**Airport operations limited by visibility conditions**



## NextGen

**Satellite-based navigation and surveillance**

**Routine information sent digitally**

**Networked Information systems**

**Air traffic “management”**

**Forecasts embedded into decisions**

**Operations continue into lower visibility conditions**



**Questions?**

**Email:  
nextgen@faa.gov**

**For more details visit [www.faa.gov/nextgen](http://www.faa.gov/nextgen)**

