

# Managing NextGen Expectations

Presented to: 2009 NEXTOR NAS Performance  
Workshop

By: Daniel Murphy

Date: April 15, 2009



Federal Aviation  
Administration



# Huge Fuel Savings!

The New York Times



A total revamp of the current infrastructure could **cut greenhouse gases from planes by 10 to 15 percent**, according to Nancy Young, vice president of environmental affairs at the Air Transport Association. “If we had a full satellite system, planes would be able to fly point-to-point and reduce emissions from circling,” Young said.

-“Climate Lobbyists Look Beyond Cap and Trade”, the New York Times, March 24, 2009.

# Huge Fuel Savings!

***Current system is 40% inefficient.***

-John Hansman, April 14, 2009.



# Triple the Capacity!

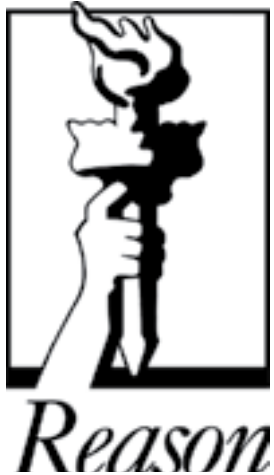


Moving from a ground-based to a satellite-based system will enable more flights to occupy the same airspace, meaning that the on-time performance improvements we are seeing today would still be a reality even with **triple the capacity.**

-“Remarks to the Phoenix Aviation Symposium”, Glenn Tilton, March 27, 2009.



# Increases Capacity Everywhere!



“The result of all this work effort is an inefficient flow of aircraft with **planes spaced farther apart than necessary** if the controller had perfect information, thereby reducing the number of aircraft that can reach the runway each hour.”

“After complete integration of the NextGen technologies, **all runways will have increased capacity....**”

-“Increasing Airport Capacity Without Increasing Airport Size”, Reason Foundation, 2008.

# Following the Bonfires!

## BusinessWeek

“Pilots fly FAA-determined routes that are based largely on **where bonfires and electric beacons were built** in the early days of aviation, the better to guide the air mail pilots of the 1920s as they crisscrossed the country, navigating by sight.”

-” Fear & Loathing At The Airport “, September 10, 2007



Federal Aviation  
Administration



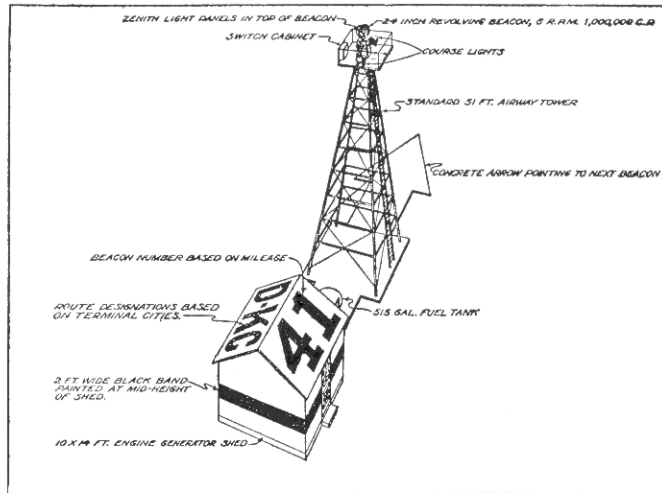
"Those way points were established when they flew the mail. At night **they'd put bonfires out in farmers fields**, and they would fly from one spot to another to be able to get where they were going.“

- Marion Blakey, “Air Traffic Control System Gets Overhaul”, NPR Morning Edition, August 30, 2007



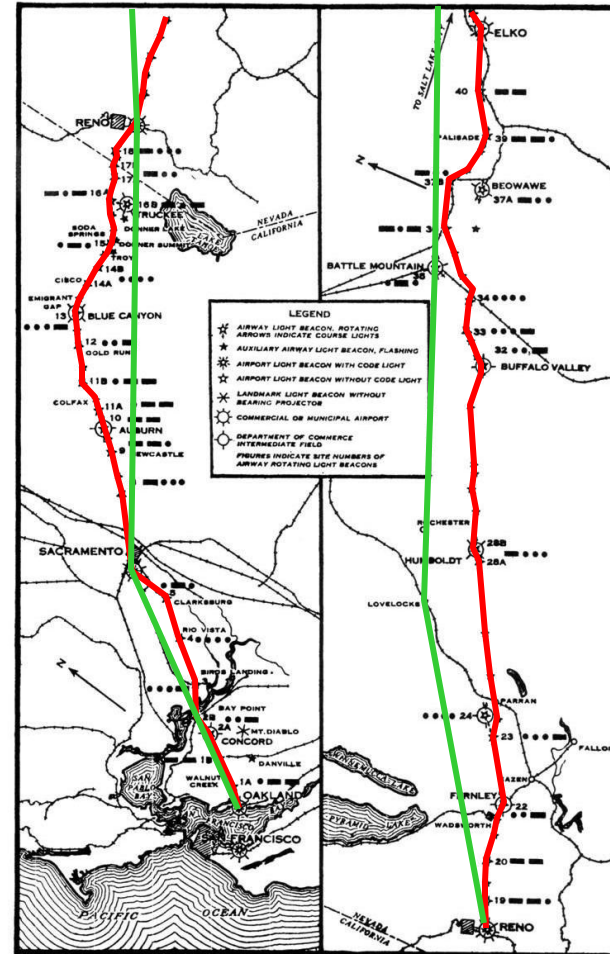
# Following the Bonfires?

Reading a Light Line  
continued from page 53

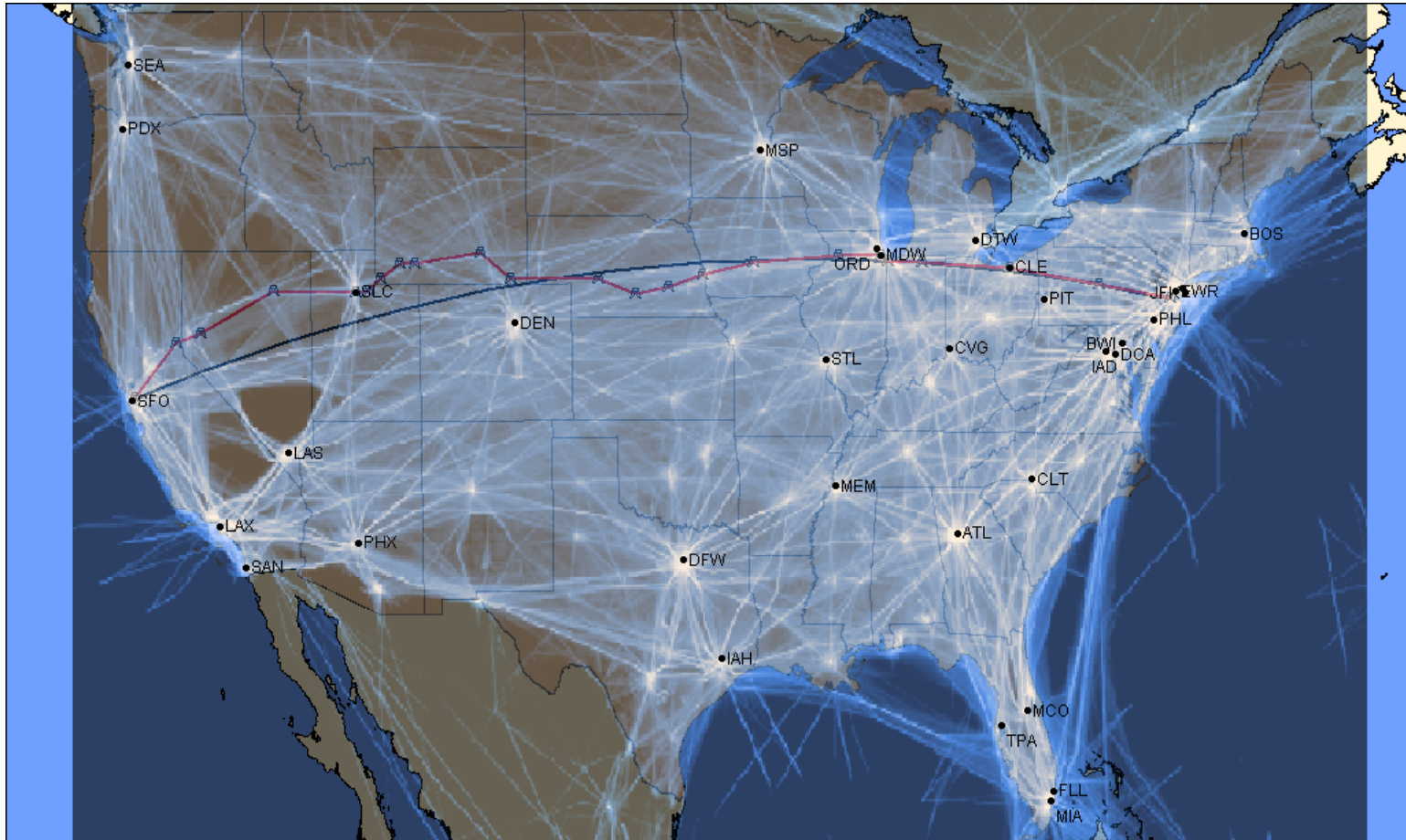


Standard Airway Beacon Installation (1931)

## SAN FRANCISCO-SALT LAKE CITY AIRWAY SAN FRANCISCO-RENO SECTION      RENO-ELKO SECTION



# Following the Bonfires?



# Huge Fuel Savings?



# Huge Fuel Savings from CDAs!



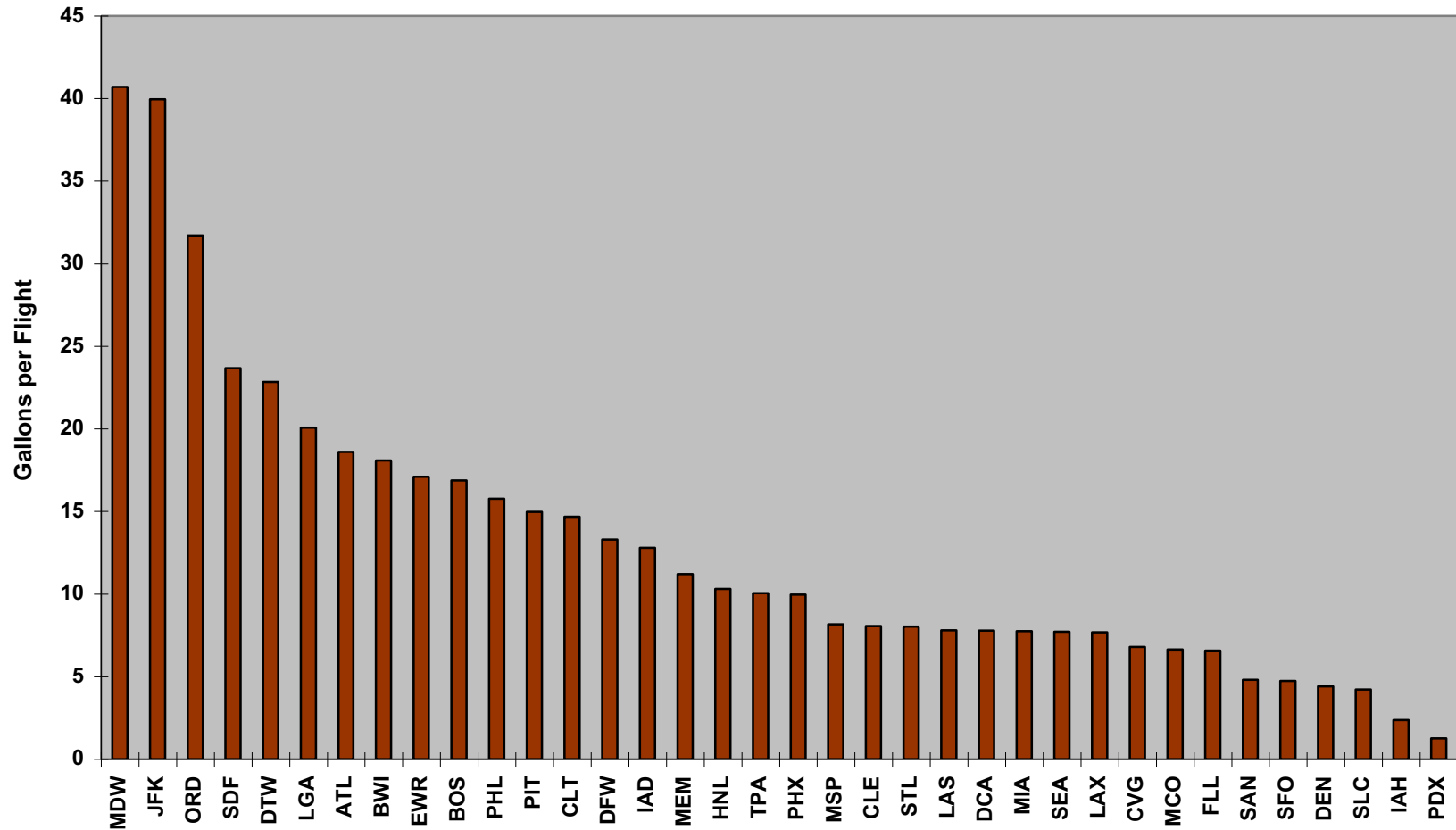
“By 2013 some 100 European airports will allow planes to descend all the way from cruising altitude to the runway in one smooth glide, **saving up to 450 kilograms (992 pounds) of CO2 per landing**, the International Air Transport Association said.”

-“New plan to reduce planes' CO2 emissions”, AP, March 31, 2009.



# CDA Benefit Pool

Potential Fuel Savings per Arrival



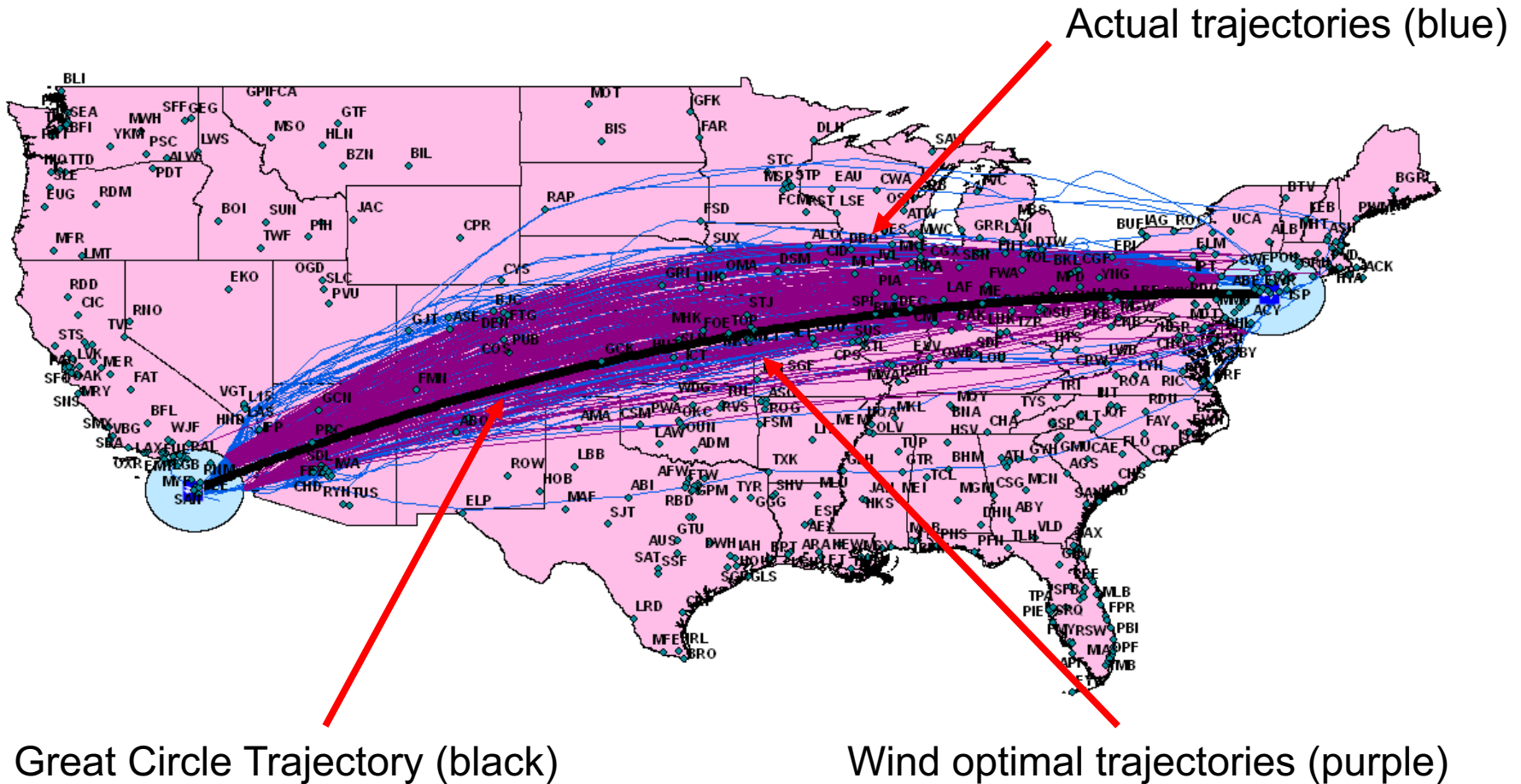
# Fuel Efficiency Benefit Pool

|  |                    |
|--|--------------------|
| <b>Enroute Horizontal Inefficiency</b> | <b>1.6% - 3.0%</b> |
| <b>Terminal Inefficiency</b>           | <b>3.3%</b>        |
| <b>Taxi Delay</b>                      | <b>1.6% - 1.9%</b> |
| <b>Total</b>                           | <b>6.5% - 8.2%</b> |

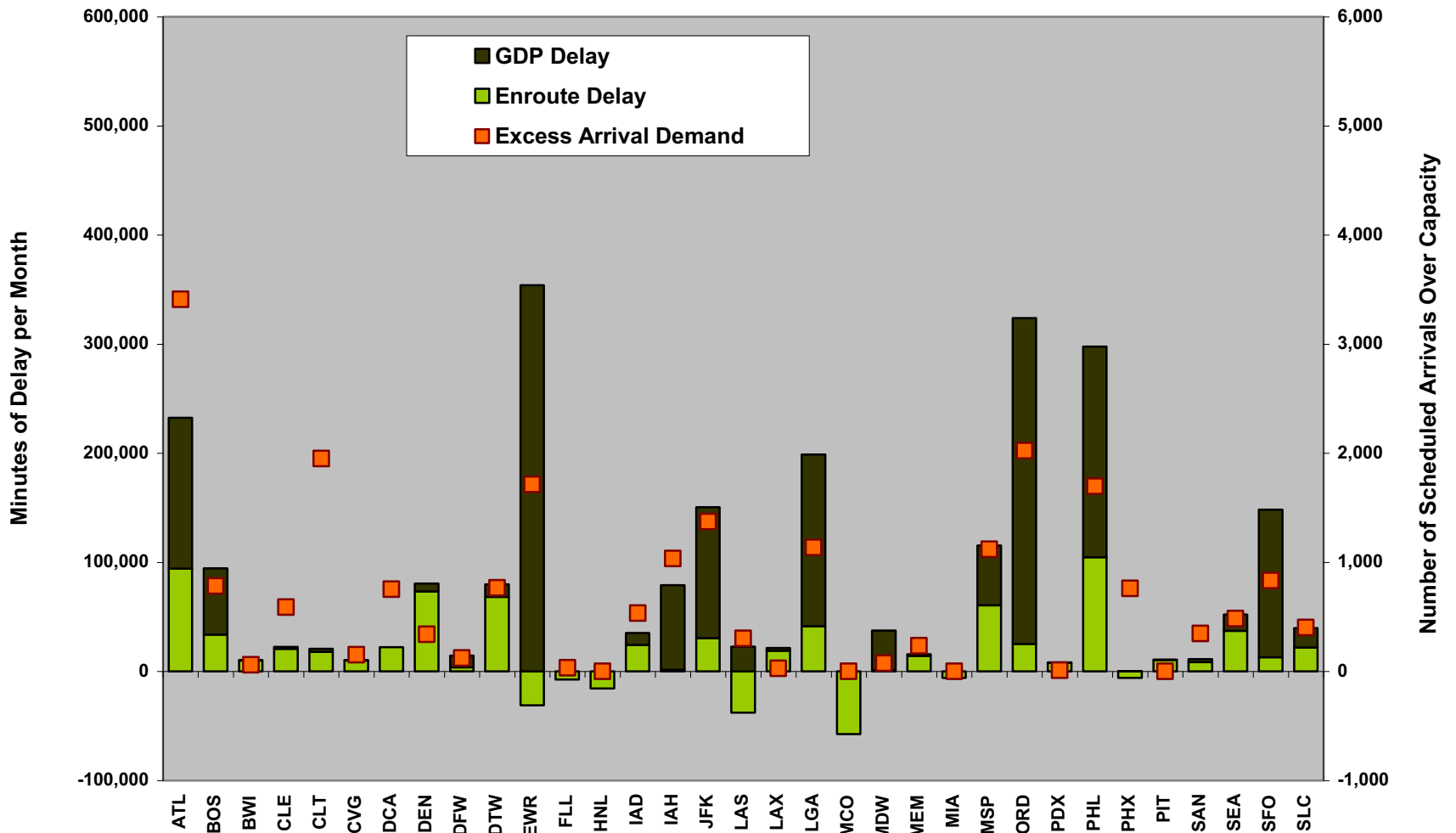
FY2007 Data



# SAN to JFK: Actuals July 2007



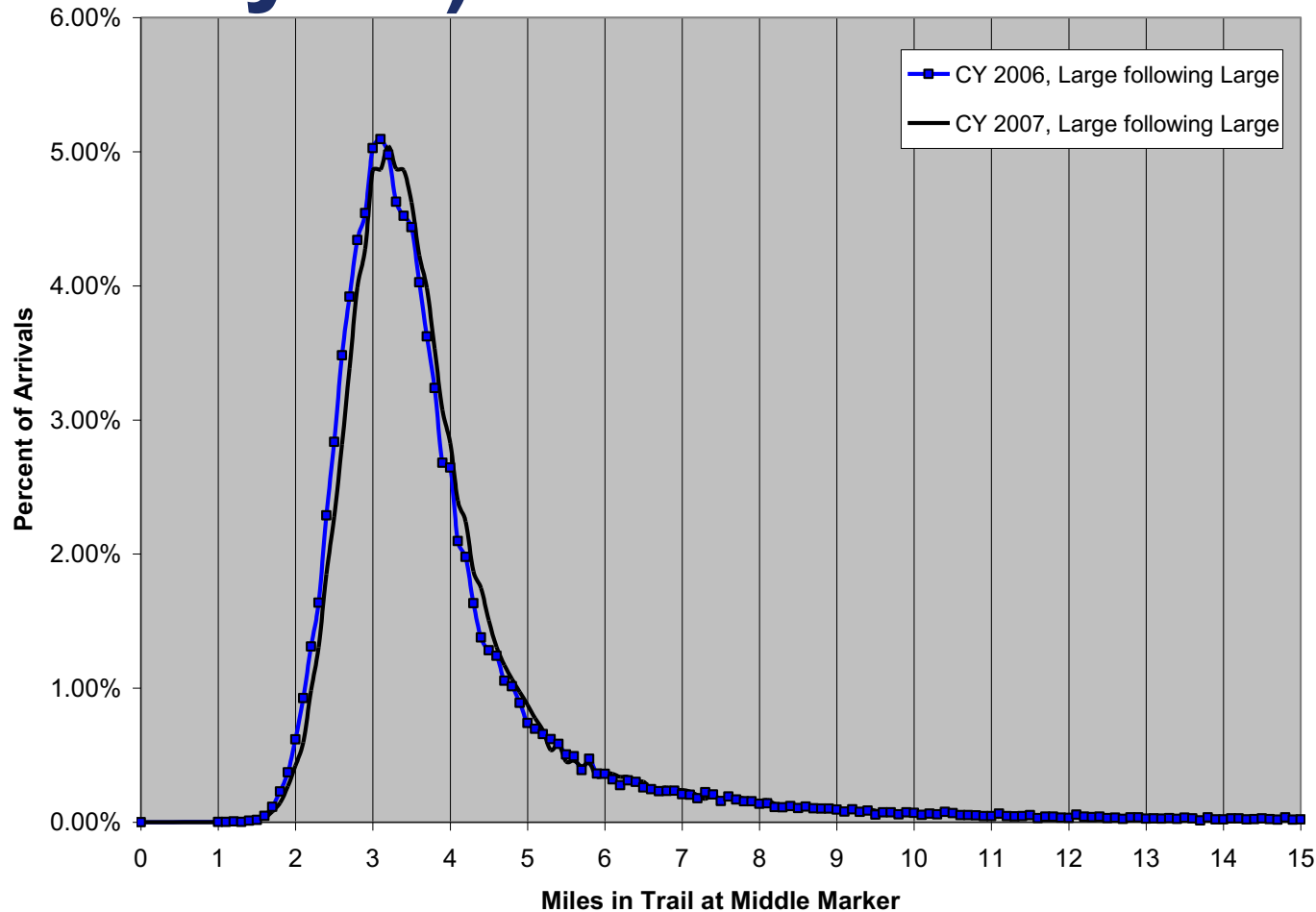
# Circling Aircraft?



# More Capacity Everywhere?

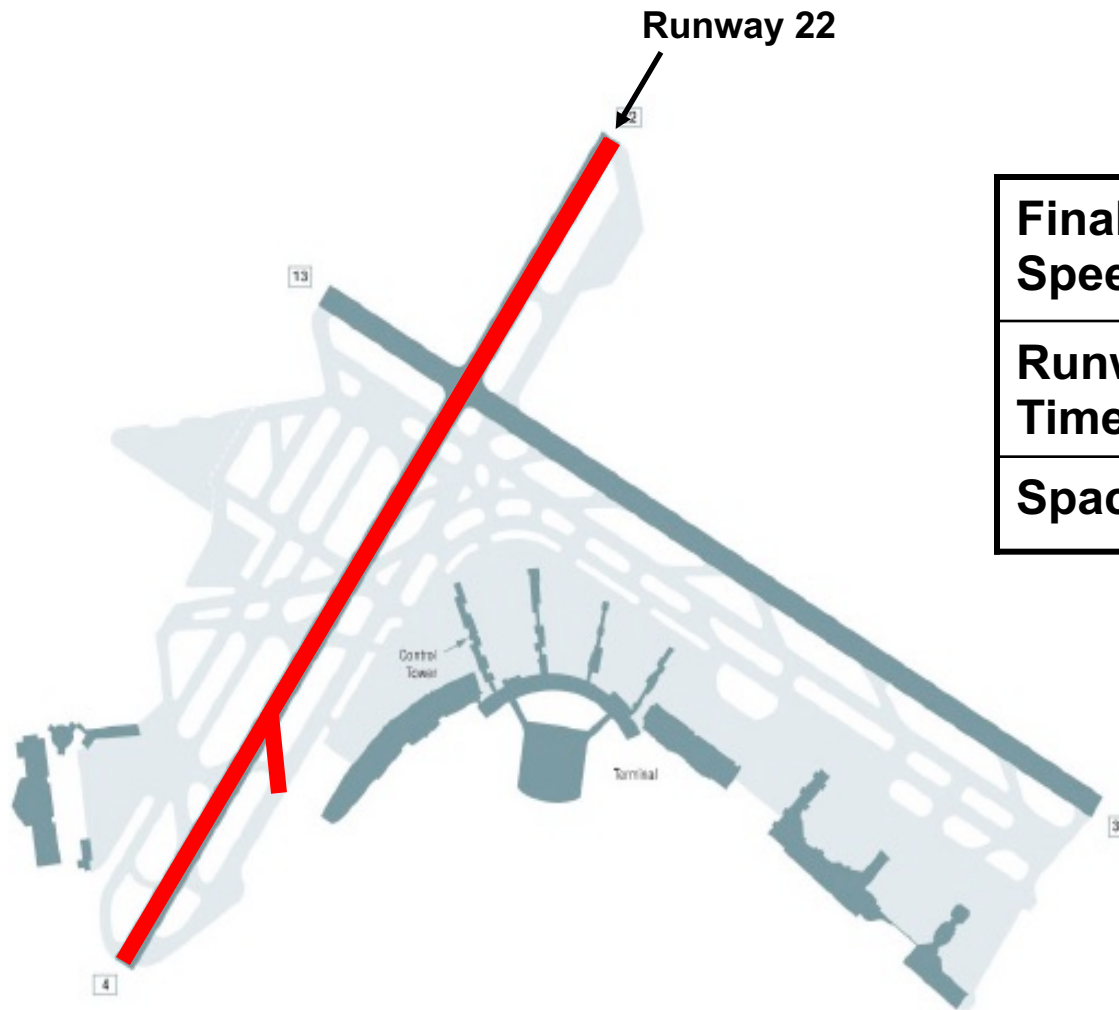


# La Guardia Arrival Separation (Runway 22)



Source: Performance Data Analysis and Reporting System (PDARS), February 14 – December 31.

# La Guardia Arrival Separation

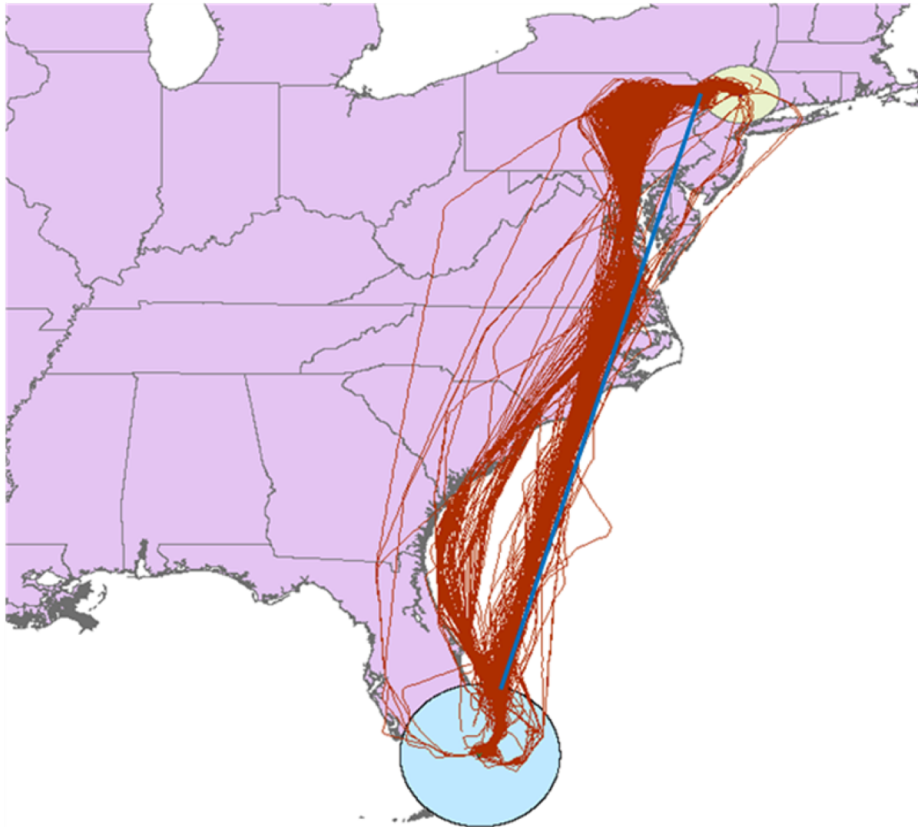


|                                    |             |             |
|------------------------------------|-------------|-------------|
| <b>Final Approach Speed (kias)</b> | <b>130</b>  | <b>150</b>  |
| <b>Runway Occupancy Time (s)</b>   | <b>44</b>   | <b>44</b>   |
| <b>Spacing (nmi)</b>               | <b>1.59</b> | <b>1.83</b> |

# NextGen's Real Benefits

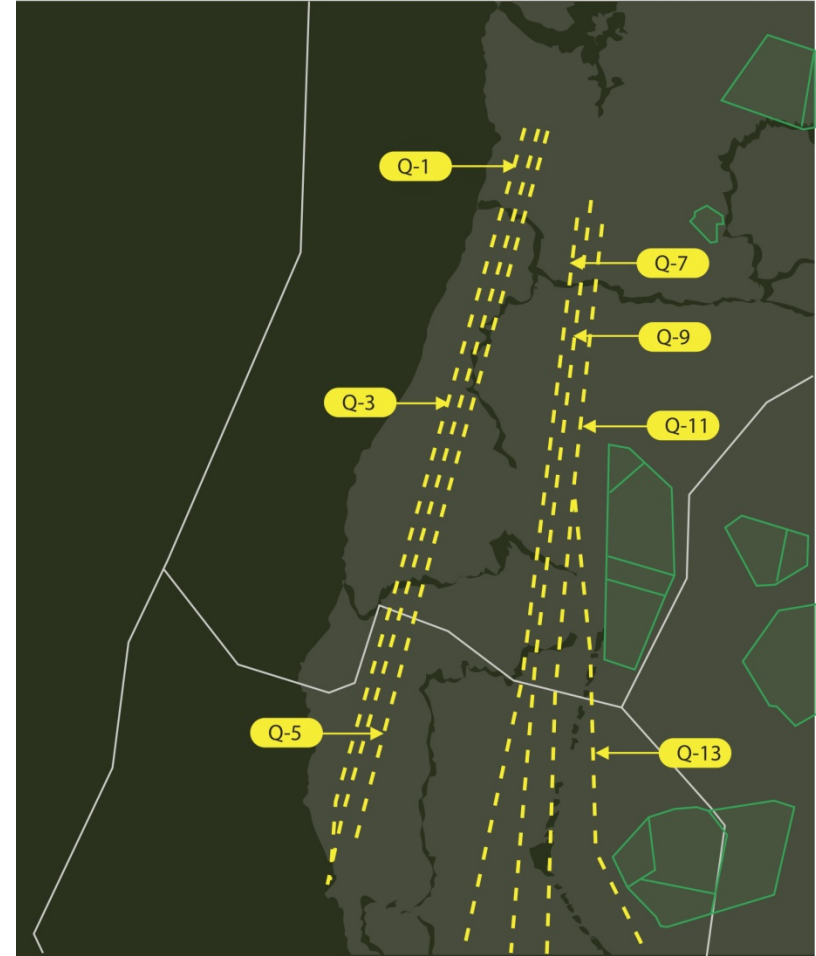
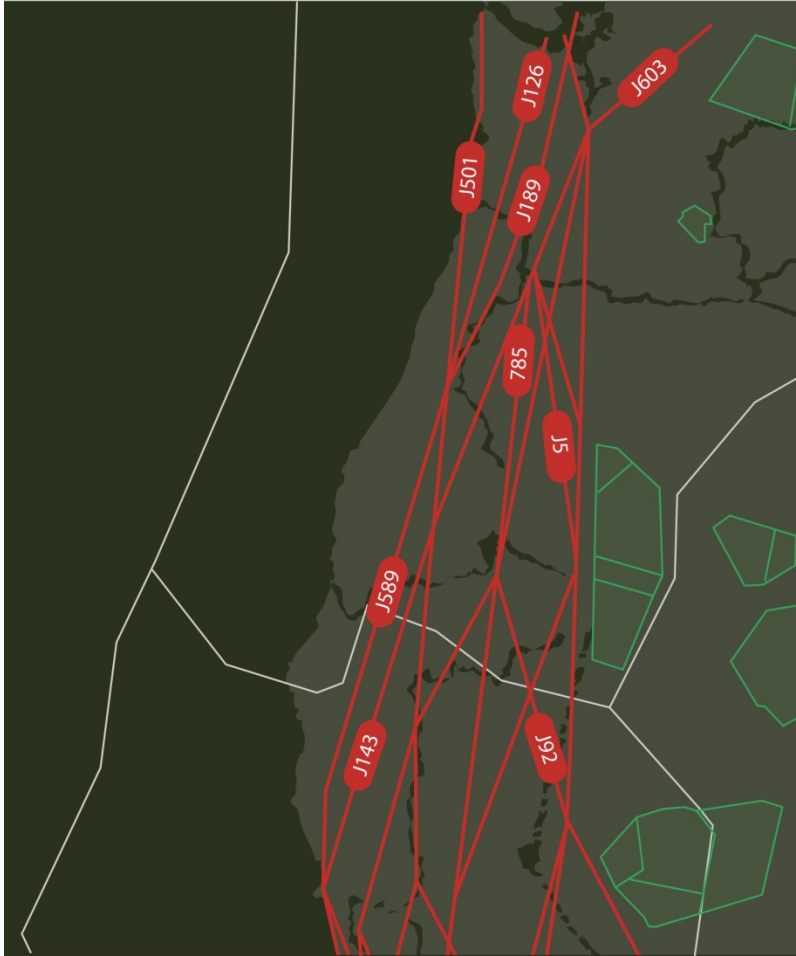


# Excess Distance



SWF to FLL

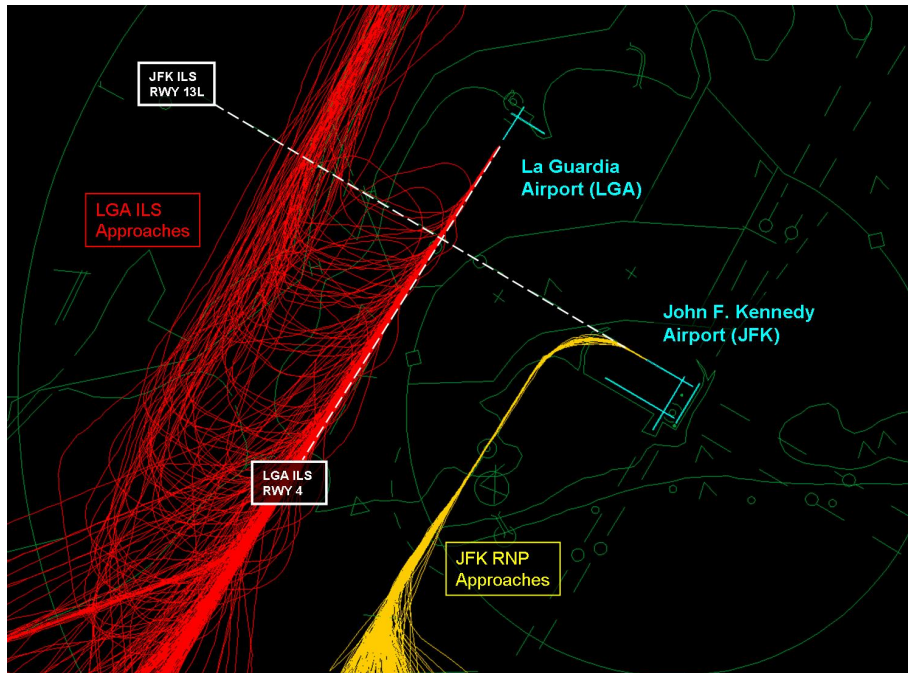
# RNAV and Q-Routes



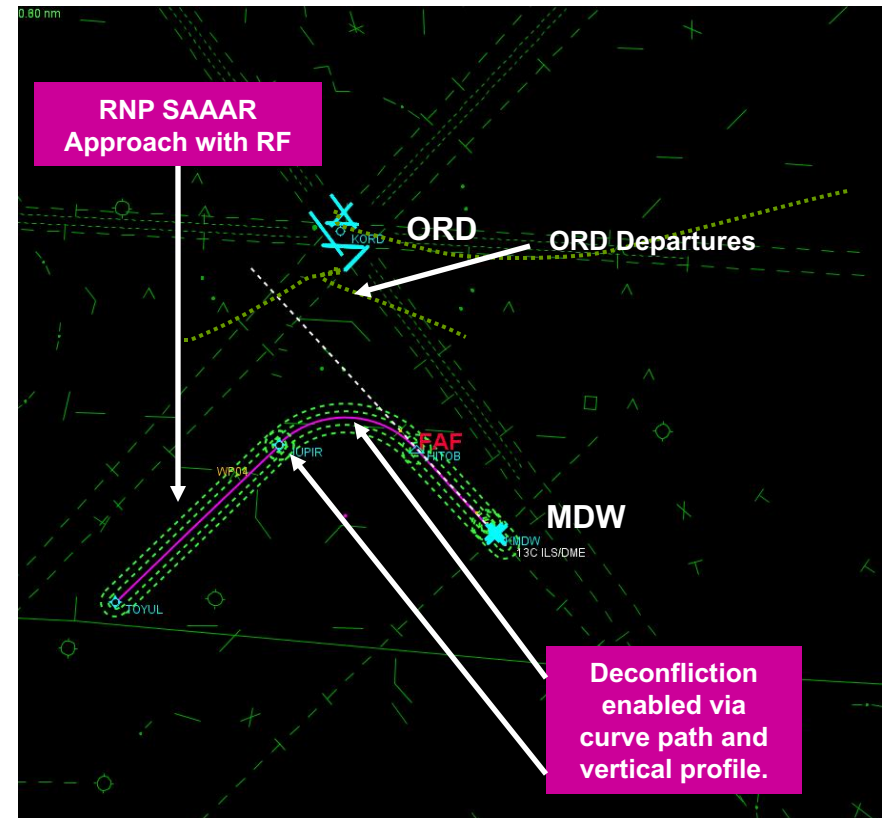


# Airport Deconfliction with RNP

## RNP SAAAR at JFK

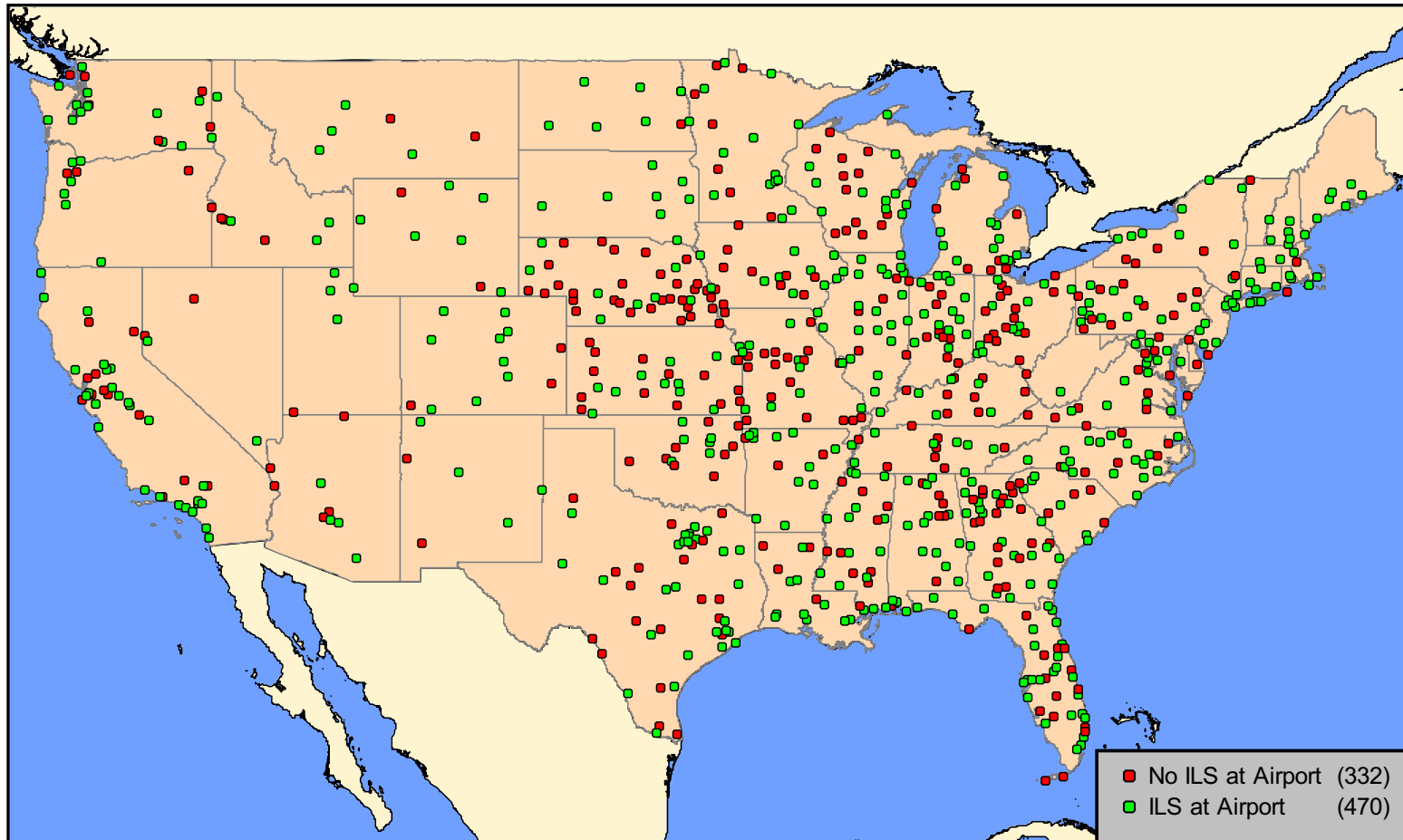


## RNP SAAAR at MDW



# GA and Safety

## RNAV LPVs



# Benefits for FAA

## TRANSITION TO 21st CENTURY TOOLS



**CURRENT MANUAL TASKS**



**NEW AUTOMATED TOOLS**

|                             |                               |
|-----------------------------|-------------------------------|
| Voice Communications        | Data Communications           |
| Problem Recognition         | Scan & Detection              |
| Problem Resolution          | Assisted Resolution           |
| Routine Overhead Tasks      | Automatically Handled         |
| Separate, Dependent Systems | Integrated Systems & Displays |

51st Annual ATCA Conference  
November 1, 2006

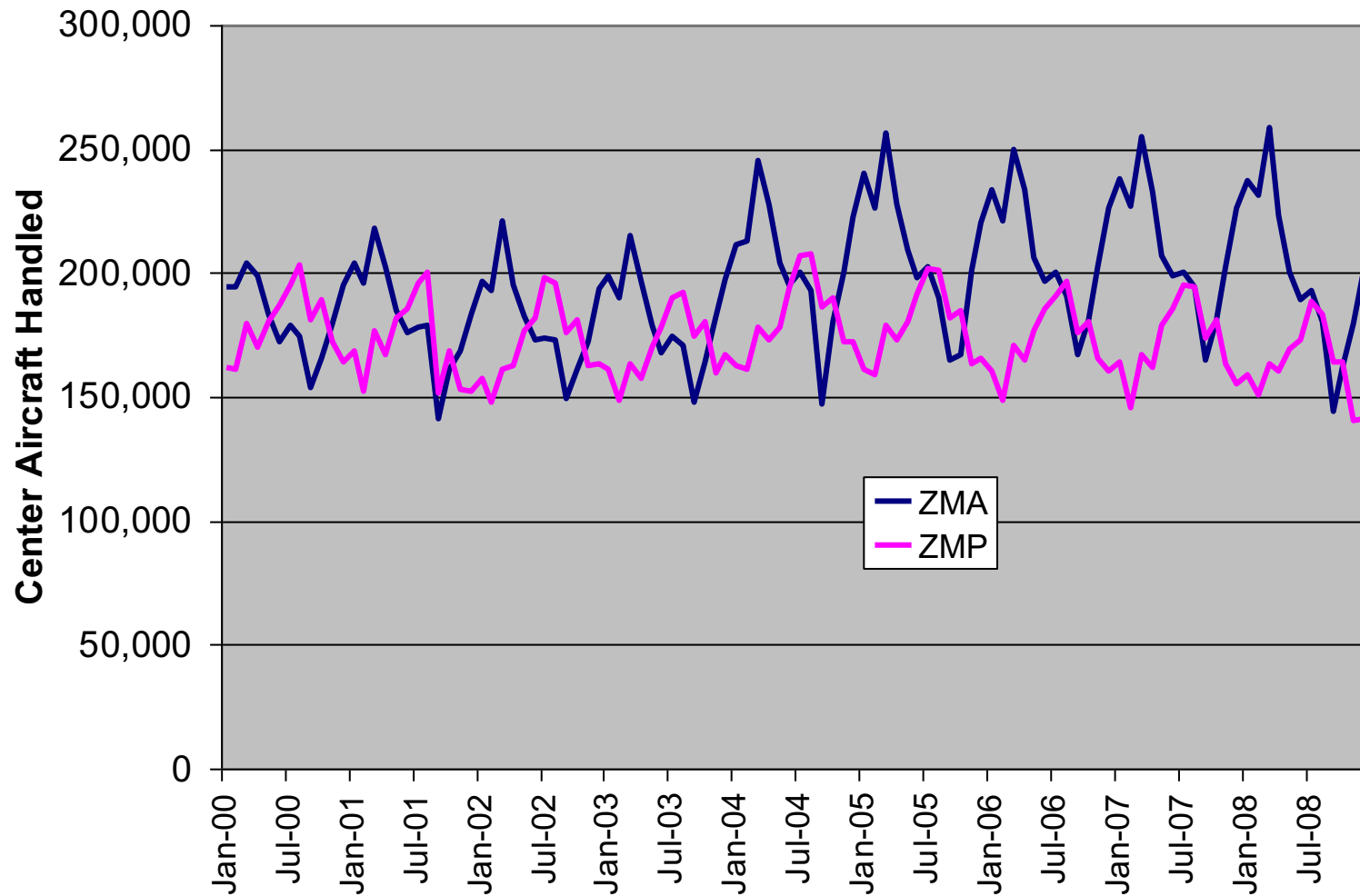


Federal Aviation  
Administration

BIZ-933b



# Flexibility



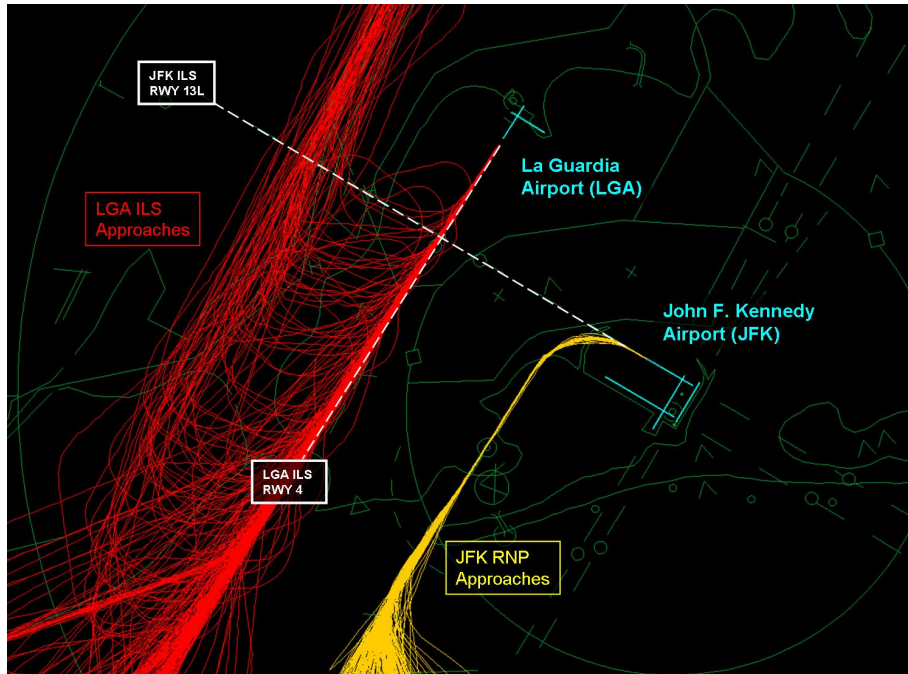
# Conclusion

- **NextGen's benefits must be realistic**
- **Traditional benefit/cost analysis may miss important NextGen benefits**
- **Safety the reason for ATM**



# Airport Deconfliction with RNP

## RNP SAAAR at JFK

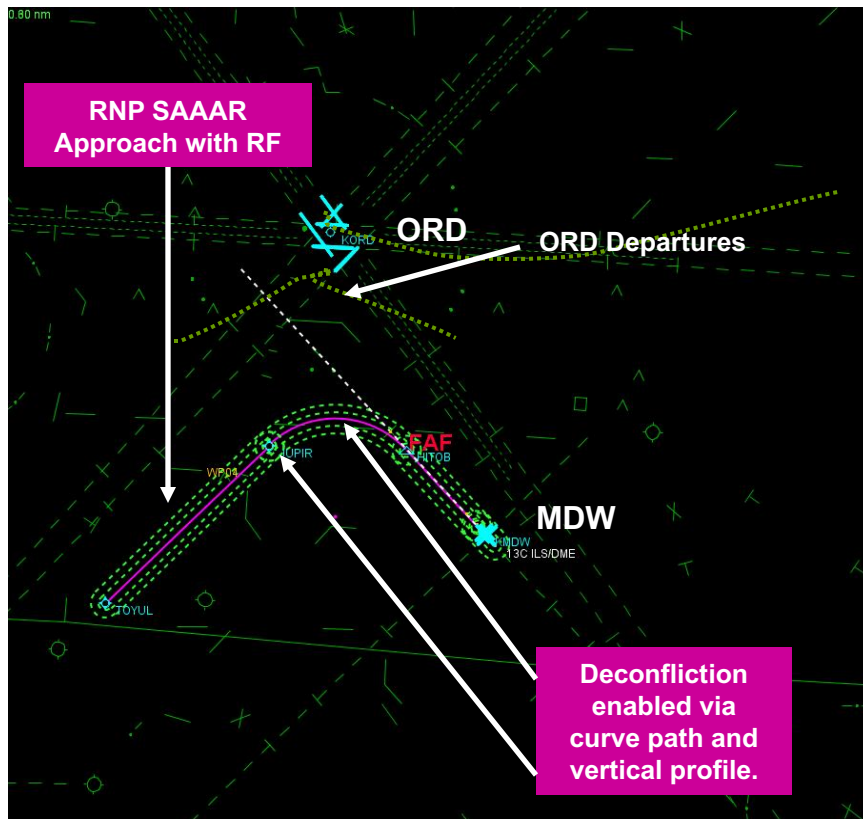


- **Concept**
  - LaGuardia and JFK flights interfere with each other, limiting capacity
  - Use precision-based navigation approach procedure to reduce interference
- **Benefits**
  - Improved access to runway 13L during bad weather
  - More optimal trajectories
- **Status**
  - Special procedures for jetBlue published in December 2006
  - Operational trials conducted in good weather
- **Value**
  - Increased capacity in bad weather at JFK and LGA
  - Optimized trajectories save 5 gallons of fuel per flight, reducing CO<sub>2</sub> emissions by 106 pounds per flight



# Airport Deconfliction with RNP

## RNP SAAAR at Midway Airport (MDW)



- **Concept**
  - O'Hare and Midway flights interfere with each other, limiting capacity
  - Use precision-based navigation approach procedure to separate flows at airports
- **Benefits**
  - Improved access to runway 13C during bad weather
  - O'Hare 22L departures and 14R arrivals continue when MDW using 13C
- **Status**
  - MDW: RNP SAAAR approach published to 13C
  - ORD: assess benefit potential for 22L RNAV/RNP departure
- **Value**
  - Reduce departure and arrival delays by 2000 hours per year
  - \$4.5M in savings per year



“...the FAA and trade groups estimate that NextGen could reduce fuel consumption by more than 10 percent....”

-“New Landings Save Airplane Fuel”, July 2, 2008

“In 2005, NextGen reduced the mandatory vertical separation between airplanes at cruise altitude to 1,000 feet from 2,000 feet, a change that saves fuel by allowing more planes to fly at higher altitudes and avoid winds.”

-“Fly the Eco-Friendly Skies”, Popular Science, Feb. 4, 2008



“grandiose vision of a huge air-taxi market.”

-Phil Friedman, CEO of Wichita-based Harlow Aerostructures, “Eclipse assets up for grabs”, Aviation International News, March 25, 2009.

