

# Wake Vortex R&D Status Briefing

**NBAA  
Convention**

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Date: September 2007



**Federal Aviation  
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# Topics for Today

- **Wake Turbulence Program Overview**
- **Near Term Achievements**
- **The Future**



# Wake Program Activities

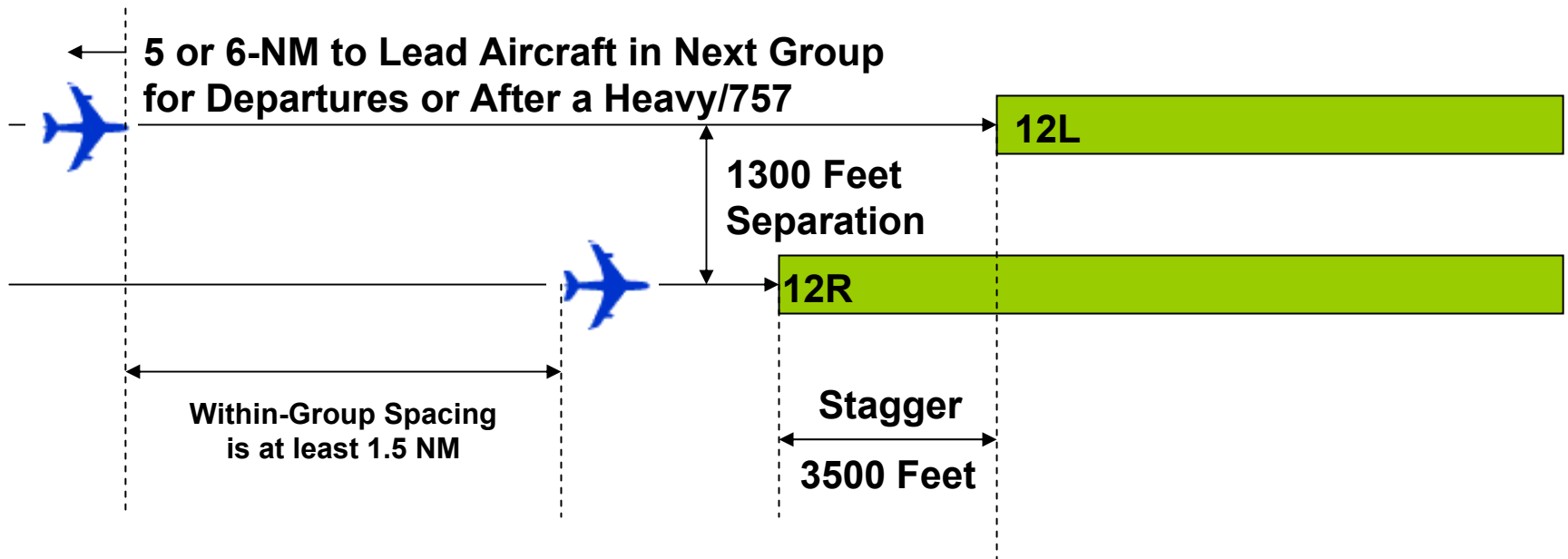
- **Near-Term (2007-2008)**
  - STL Variance for Dependent Parallel Approaches
  - National Rule Change to CSPR Approach Wake Turbulence Separation Standards
- **Mid-Term (2008-2012)**
  - Wind Dependent Concept Development and Systems Acquisitions for CSPR Departures and Approaches
  - Wake Category Reclassification & New Aircraft Standards Setting
  - Wind and Wake Vortex behavior R&D for terminal area concepts
- **Far-Term (2012+)**
  - Wind Dependent Concept R & D for single runway Departures and Arrivals
  - NextGen capabilities dependent tailoring of procedures and systems to minimize wake separation standards' limitations on capacity while maintaining system safety
  - Separation Standards Setting (potentially dynamic pair-wise separation standards)



# STL CSPR Waiver

## Staggered CSPRs at STL

Proposed IMC  $\geq 1.5$ -NM Grouped Arrivals



# STL Waiver Update

- **Safety Regulator approval of Waiver for use of STL 12 R/L and 30R/L CSPR in IFR conditions**
- **Coordinating with STL facilities for implementation of Procedure**
  - Training
- **Establishment of wake turbulence incident data collection process for the STL airport area**

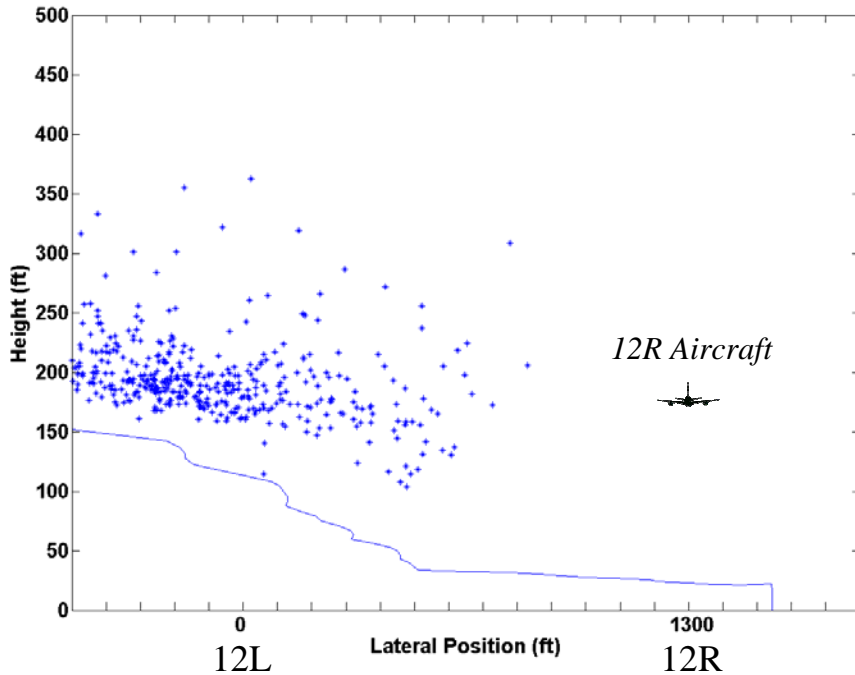


*Lidar data. L+ Jets Only*

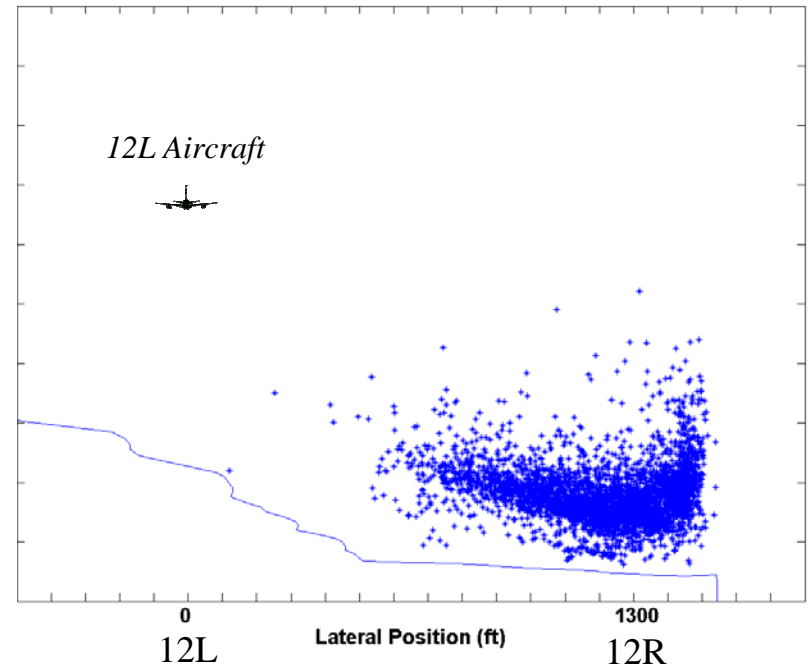
*31 Degree Scan*

*1.5 NM Diagonal Separation*

Wake Transport from 12L



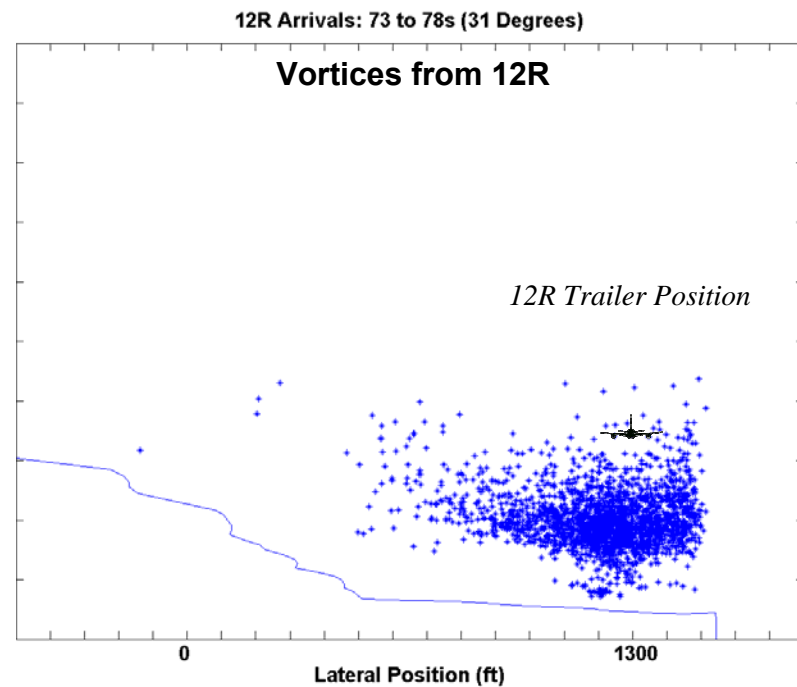
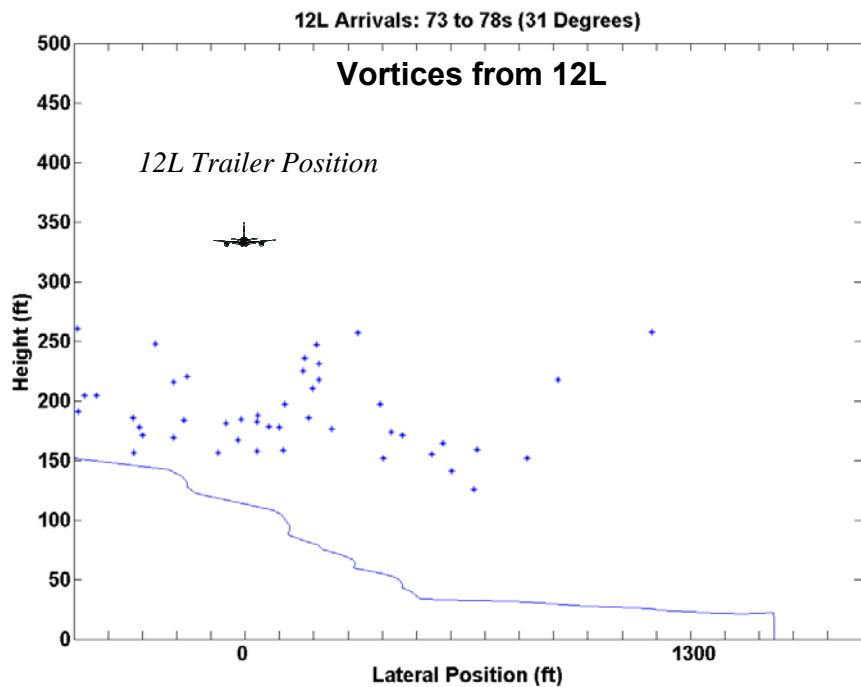
Wake Transport from 12R

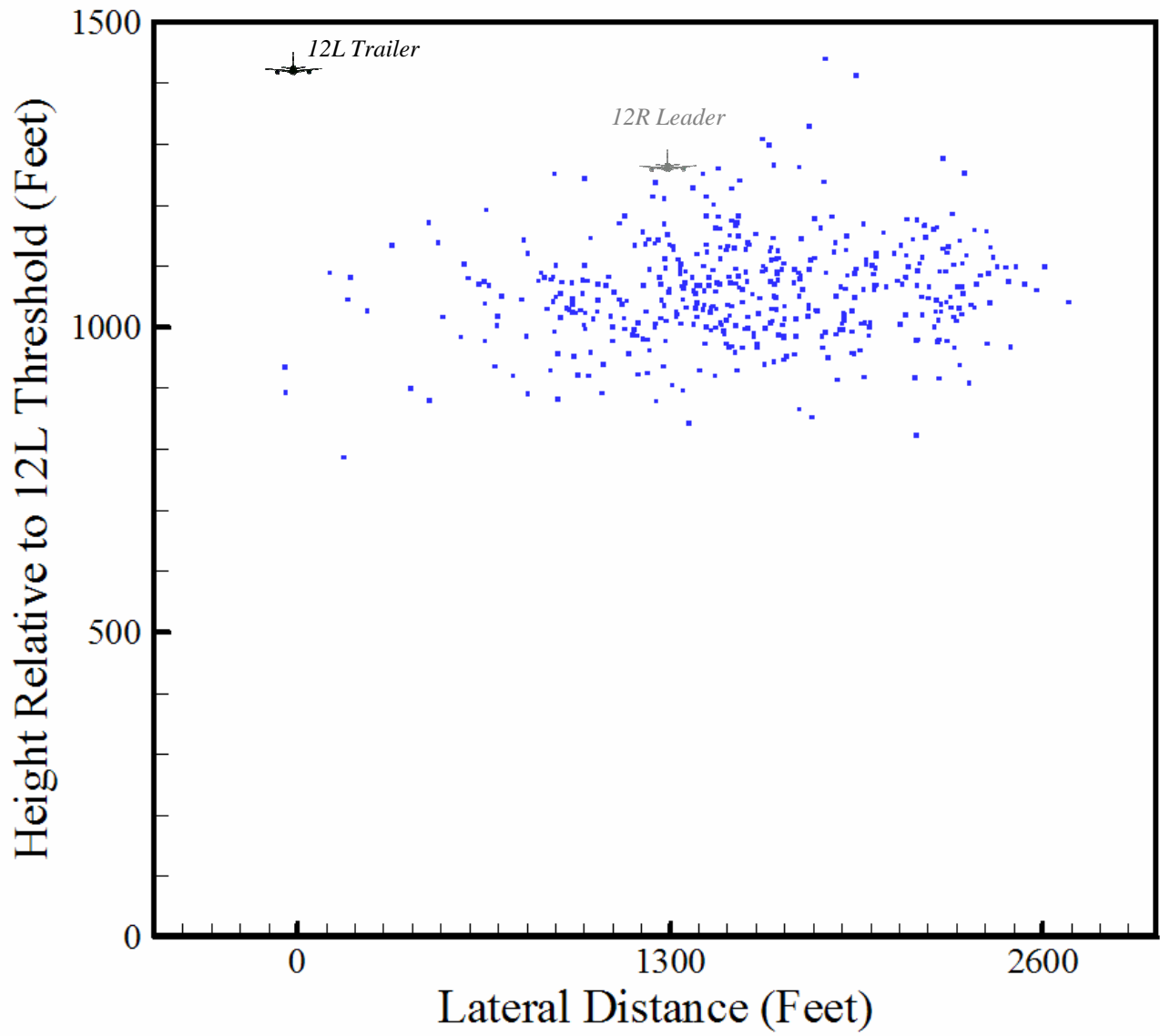


*Lidar data. L+ Jets Only*

*31 Degree Scan*

*2.5 NM In Trail Separation*



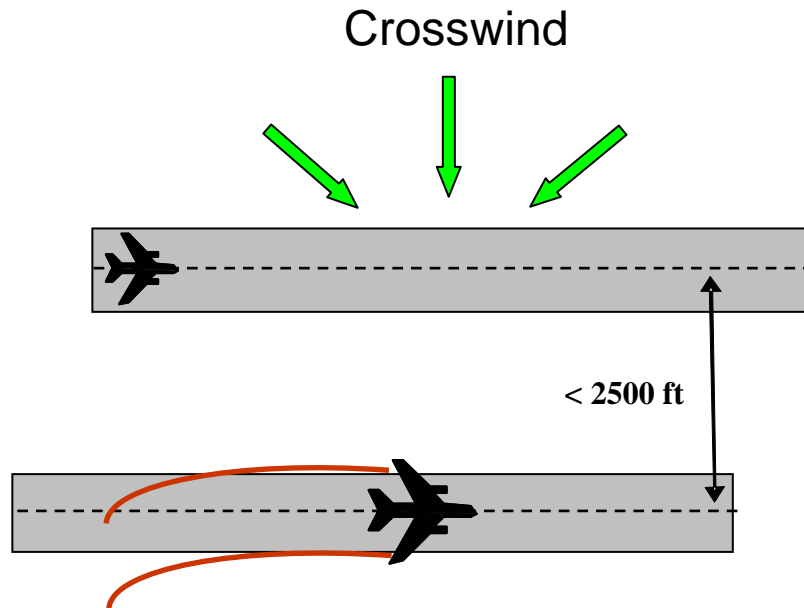


# 1.5 NM CSPR – 12R Towards 12L



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# Wake Turbulence Mitigation for Departures (WTMD)



## Crosswind concept requires

- wind from limited range of directions  
AND
- $\geq 3$  kts total wind strength

## Weather Minima:

- Sufficient to visually observe divergent paths after departure

## Controller Display Concept

- Red Light, Green Light provides prediction and safety monitoring of when the wind is appropriate

**Benefit/Cost Ratio (range): 2.9 to 4.3**

- 20 year benefit estimate: \$400M to \$600M in delay reduction (ADOC)



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# WTMD Overview

- **10 of 35 OEP Airports have Closely Spaced Parallel Runways (CSPR) and would be able to increase departure capacity using WTMD**
- **Benefit**
  - Able to provide increased capacity and efficiency without new runway construction
    - 2 to 6 Departures per Hour Increase
- **Strategic Performance Mapping**
  - Supports multiple NextGen Operational Improvements
  - Part of Operational Evolution Partnership (OEP)
  - Identified in the FAA Flight Plan

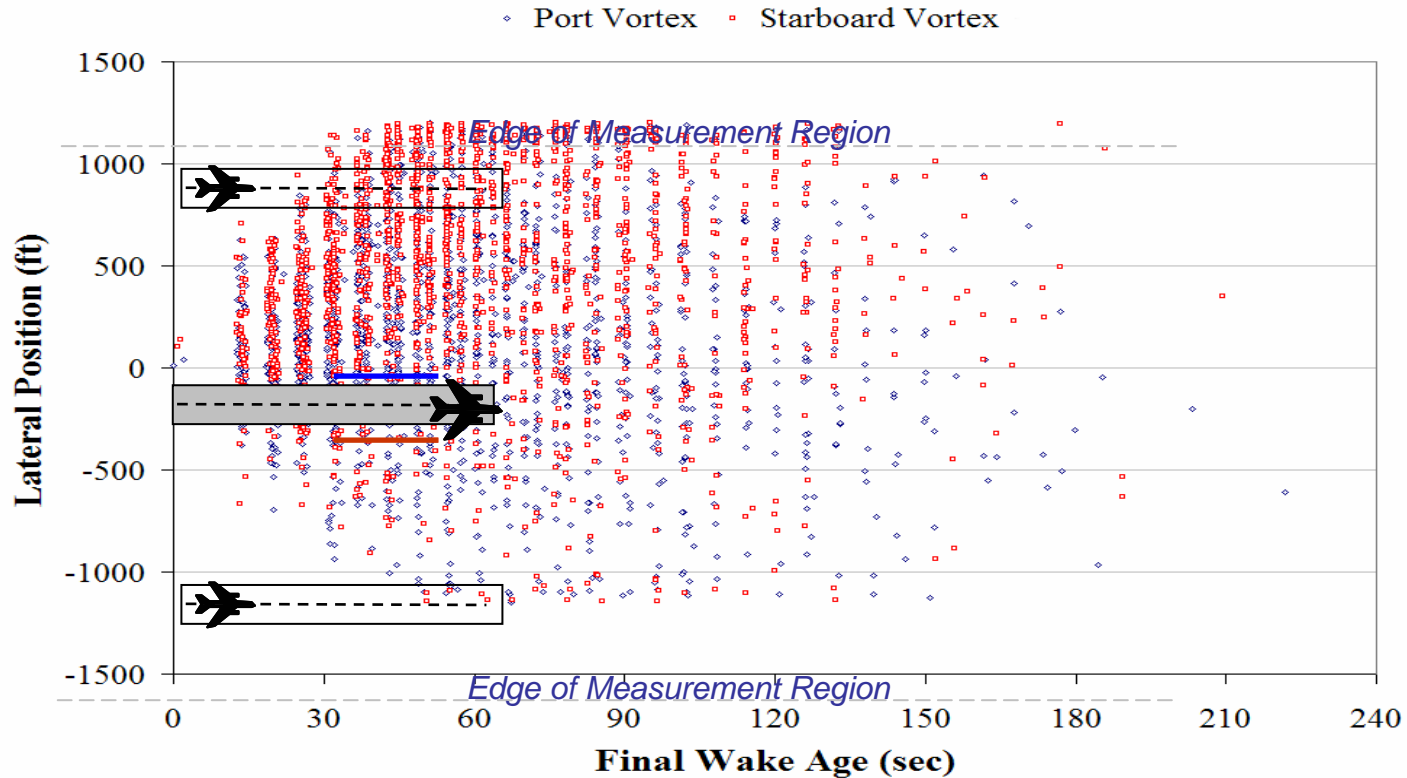
Airport	Additional Departures Per Hour
BOS	11
DTW	4
EWR	5
IAH	9
MEM	*
MIA	*
PHL	8
SEA	*
SFO	7
STL	2

\* Benefits Analysis Ongoing

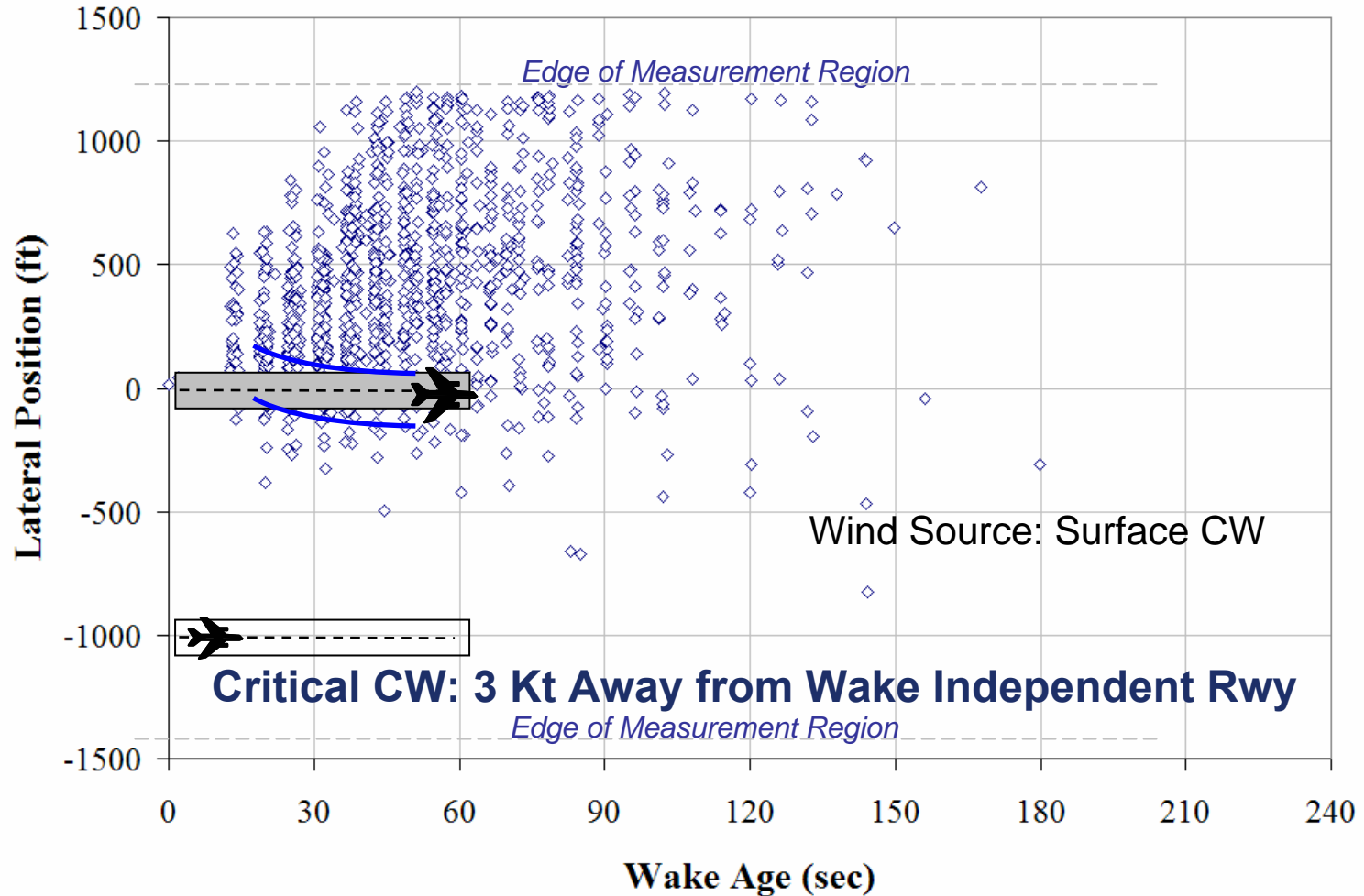


# Crosswind Wake Behavior

## Final Lateral Wake Vortex Positions: Heavy and B757 Wake Generators



# Crosswind Concept Safety





# CREDOS

- **Joint Program with European Community**
- **Single Runway Wind Dependent Departure Solution**
  
- **Stakeholders Meeting Planned for the week of the 26<sup>th</sup> of November in Paris.**



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# EDDF\_2 Frankfurt Data

