Wake Vortex R&D Status Briefing

NBAA Convention

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Topics for Today

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

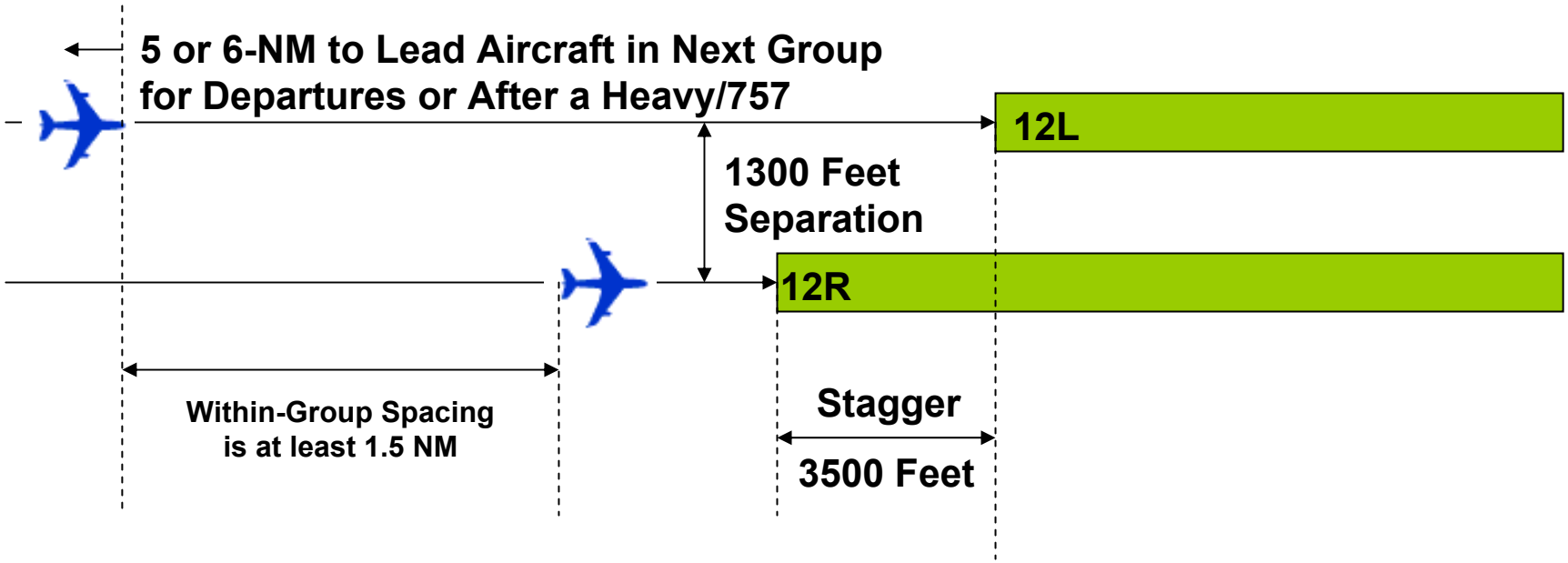
Wake Program Activities

- **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 ≥ 1.5-NM Grouped Arrivals



STL Waiver Update

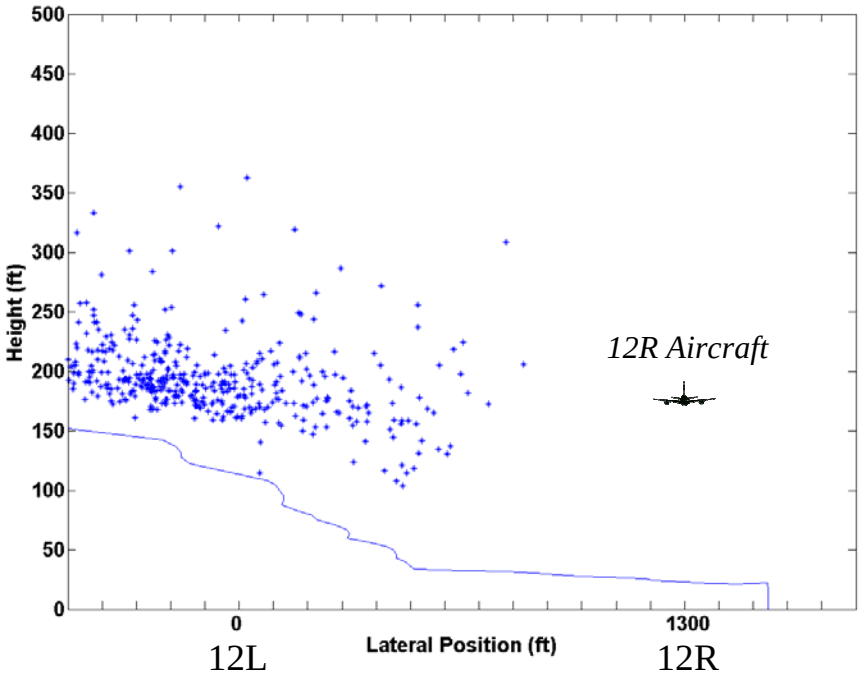
- **Safety Regulator approval of Waiver for use of STL 12 R/L and 30R/L CSPR in IFR conditions**
- **Coordinating with STL facilities for implementation of Procedure**
  - Training
- **Establishment of wake turbulence incident data collection process for the STL airport area**

Lidar data. L+ Jets Only

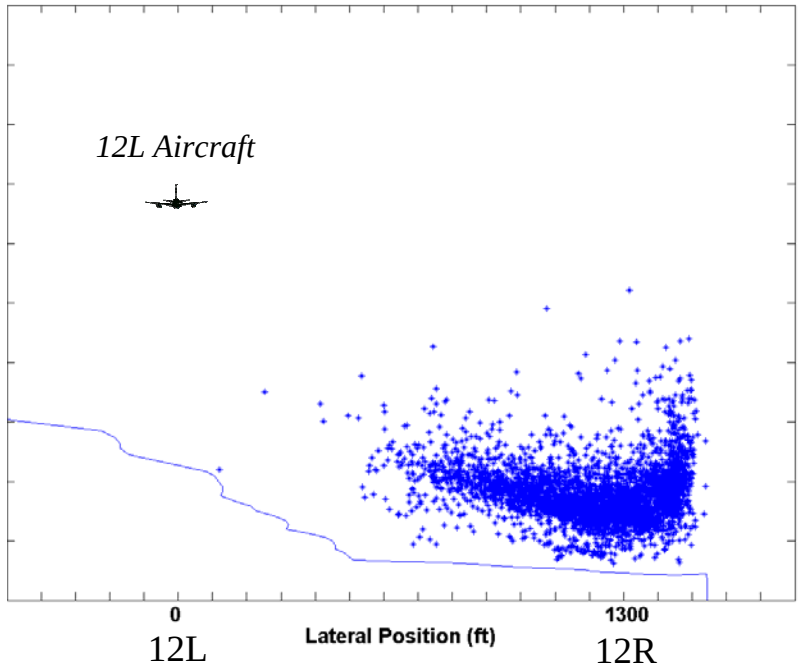
31 Degree Scan

1.5 NM Diagonal Separation

Wake Transport from 12L



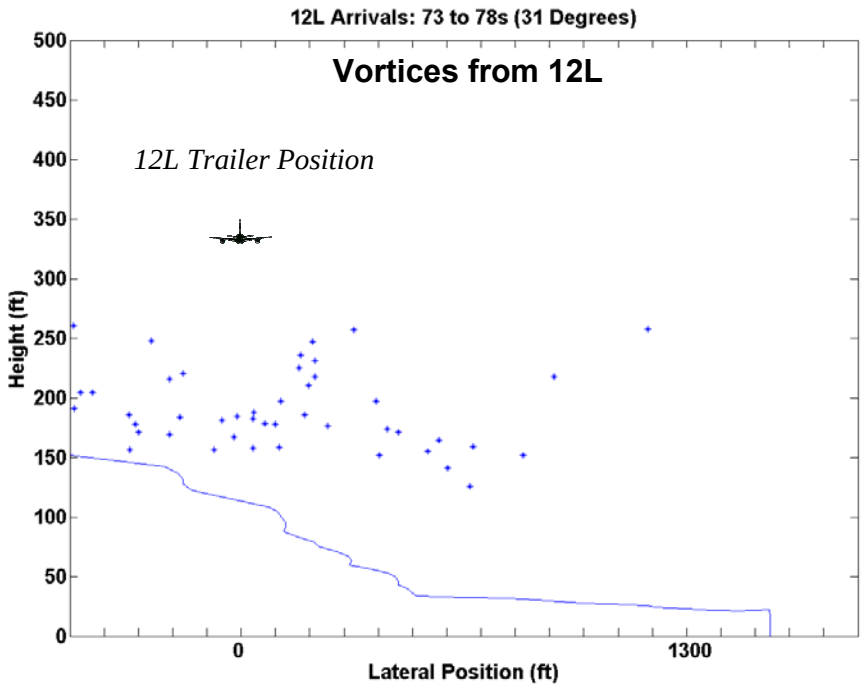
Wake Transport from 12R

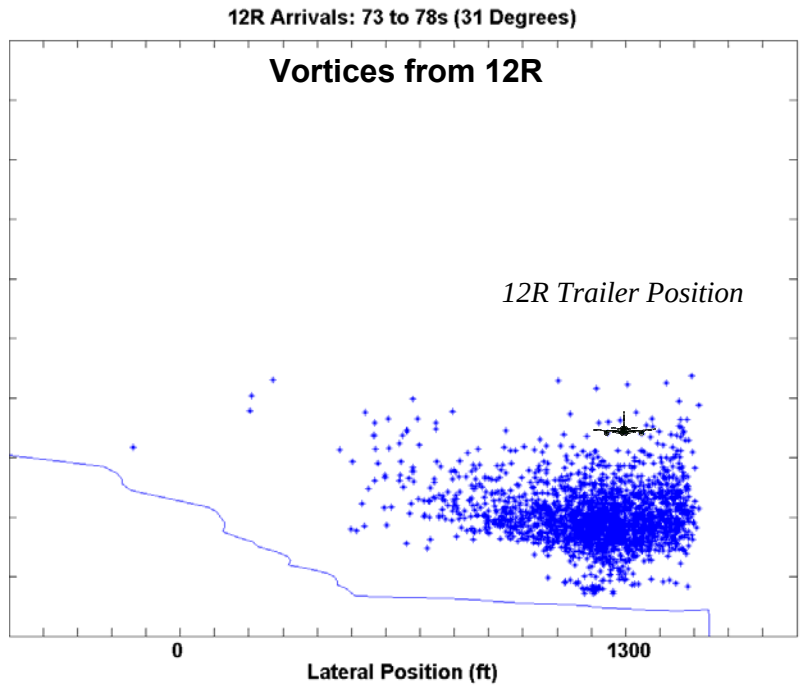


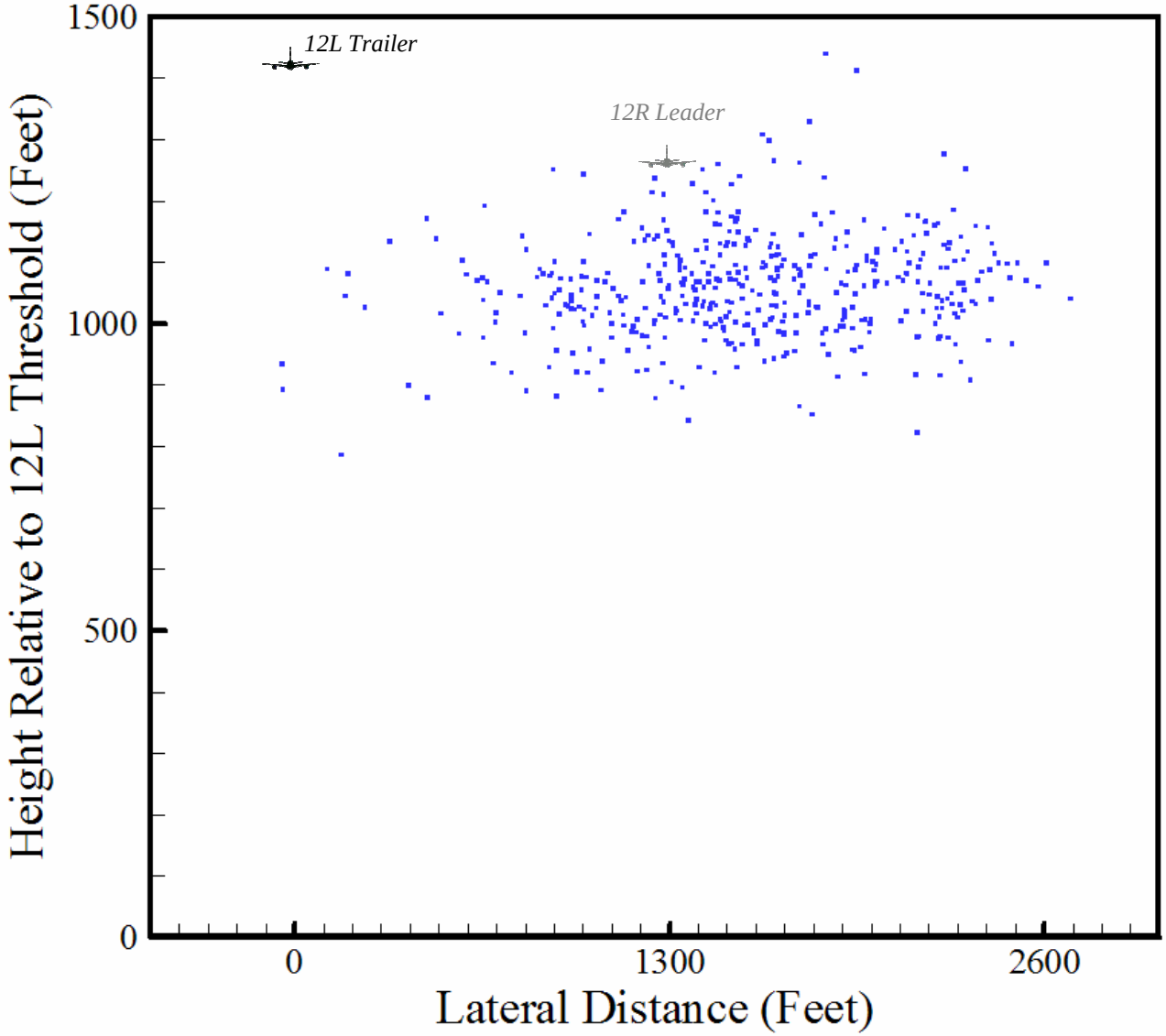
Lidar data. L+ Jets Only

31 Degree Scan

2.5 NM In Trail Separation

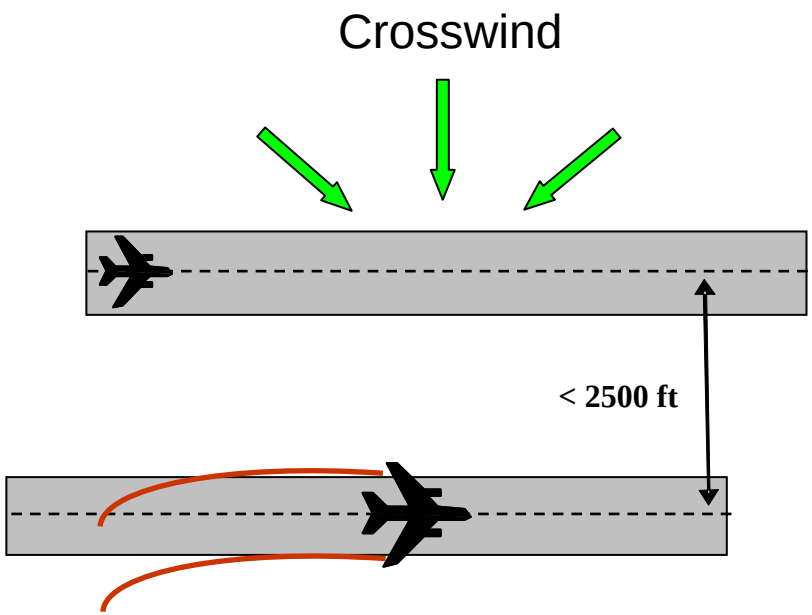






1.5 NM CSPR – 12R Towards 12L

Wake Turbulence Mitigation for Departures (WTMD)



Crosswind concept requires

- wind from limited range of directions AND
- ≥ 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)

WTMD Overview

- **10 of 35 OEP Airports have Closely Spaced Parallel Runways (CSPR) and would be able to increase departure capacity using WTMD**

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

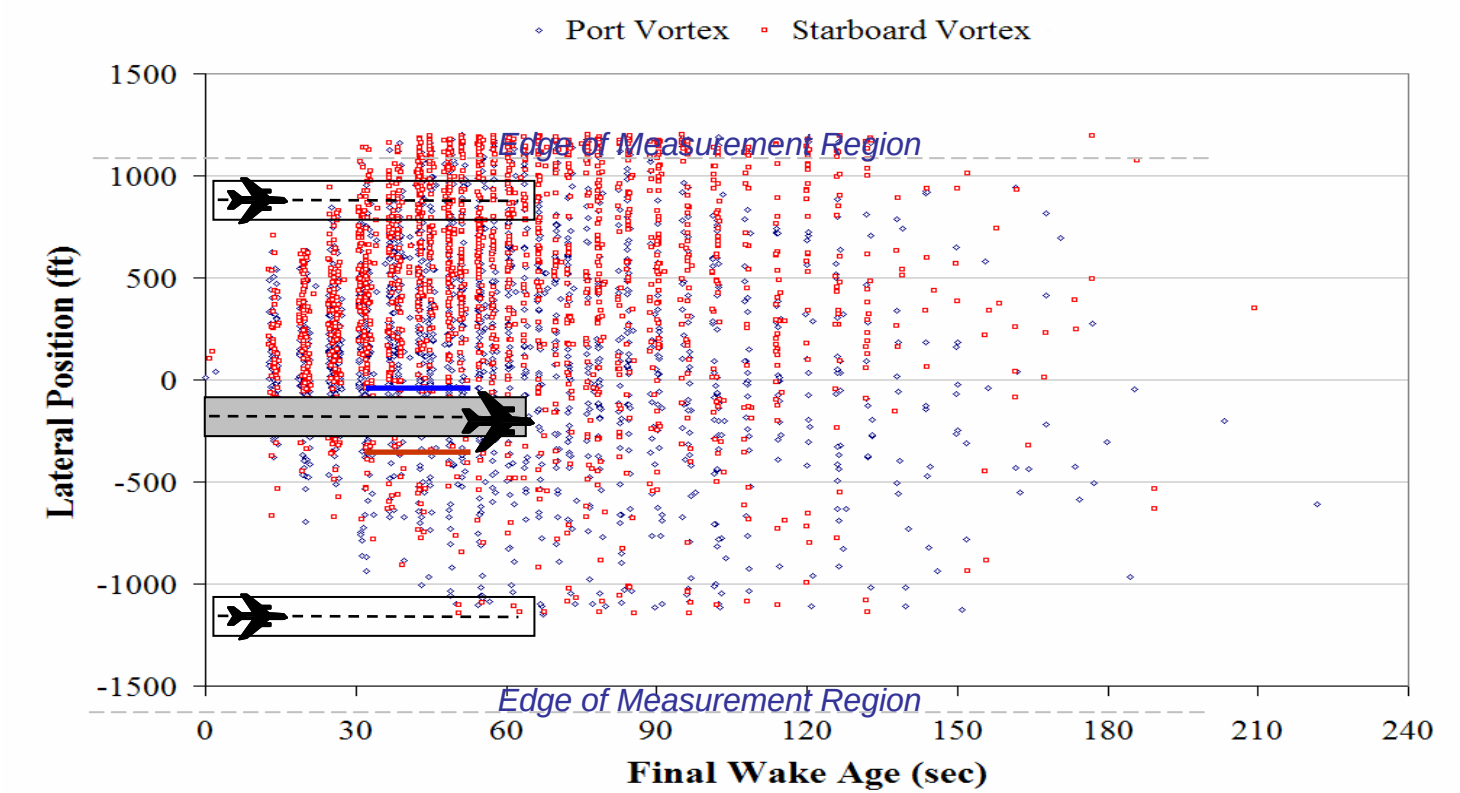
* Benefits Analysis Ongoing

- **Benefit**
  - Able to provide increased capacity and efficiency without new runway construction
    - 2 to 6 Departures per Hour Increase

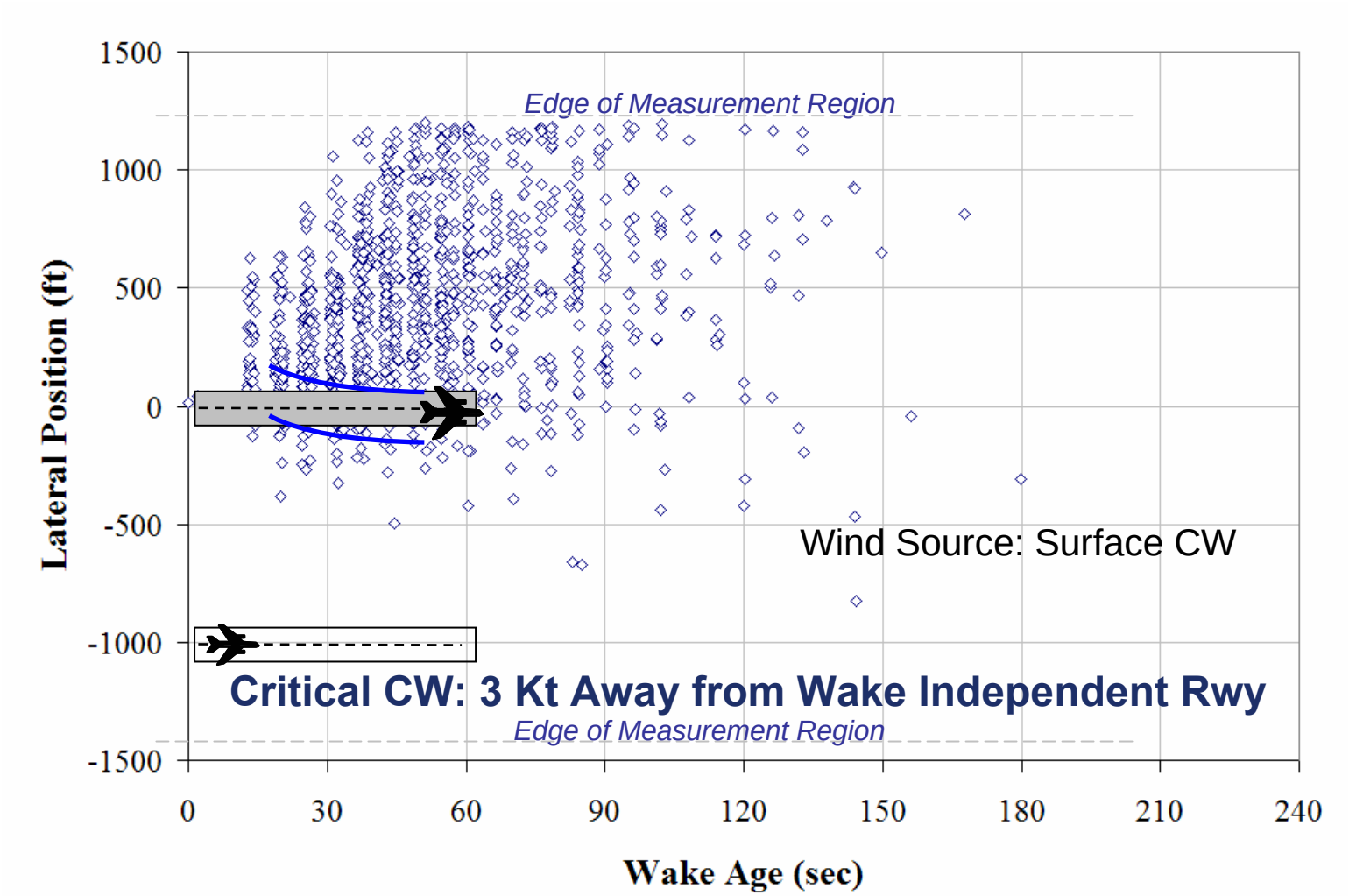
- **Strategic Performance Mapping**
  - Supports multiple NextGen Operational Improvements
  - Part of Operational Evolution Partnership (OEP)
  - Identified in the FAA Flight Plan

Crosswind Wake Behavior

Final Lateral Wake Vortex Positions: Heavy and B757 Wake Generators



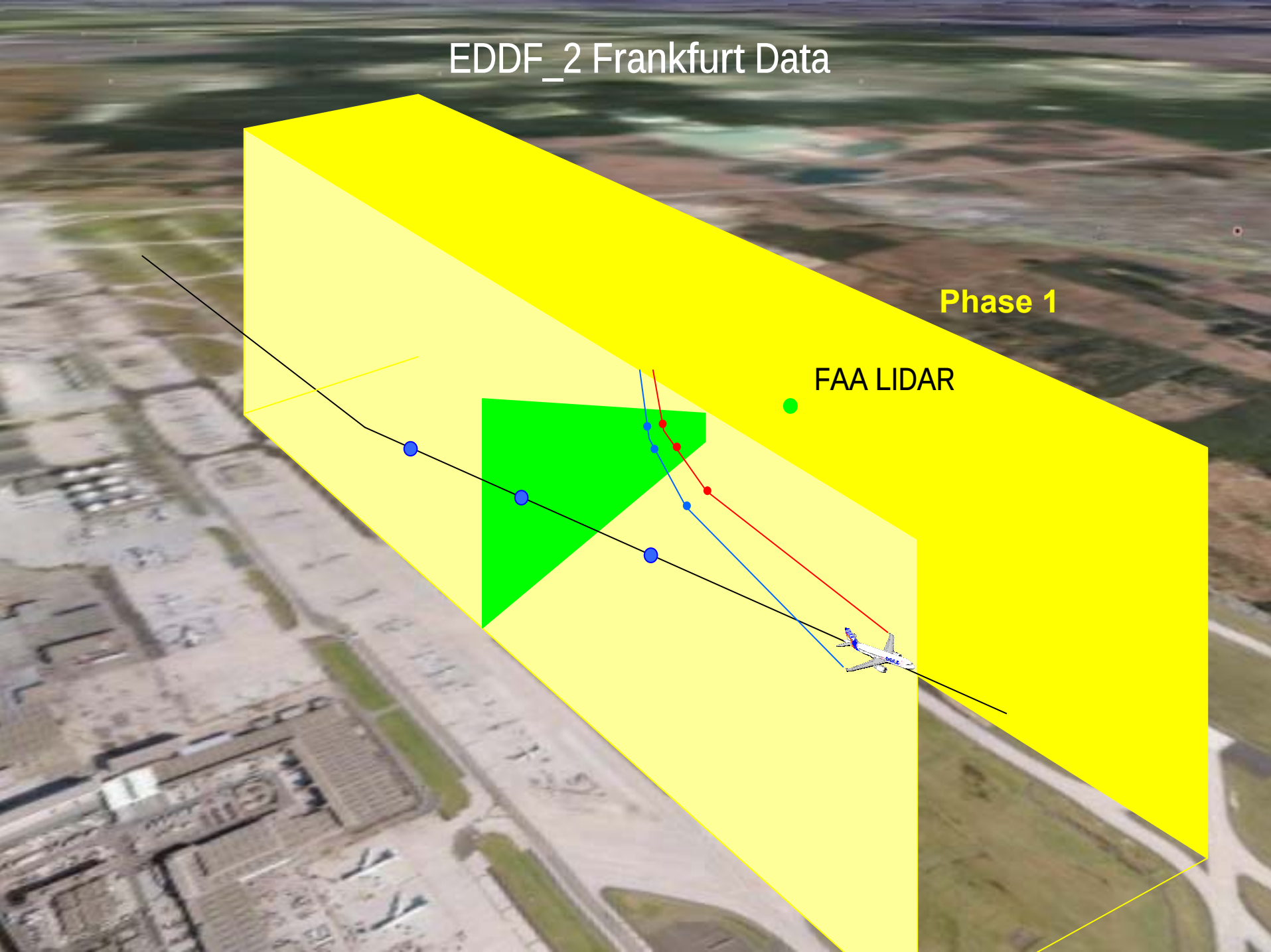
Crosswind Concept Safety



CREDOS

- Joint Program with European Community
- Single Runway Wind Dependent Departure Solution

- Stakeholders Meeting Planned for the week of the 26th of November in Paris.


EDDF_2 Frankfurt Data
Phase 1
FAA LIDAR