FAA Air Traffic Organization (ATO)
Weather and Operational Performance

Date:
2 August 2016

Presented to:
FPAW 2016 Summer Meeting

Presented by:
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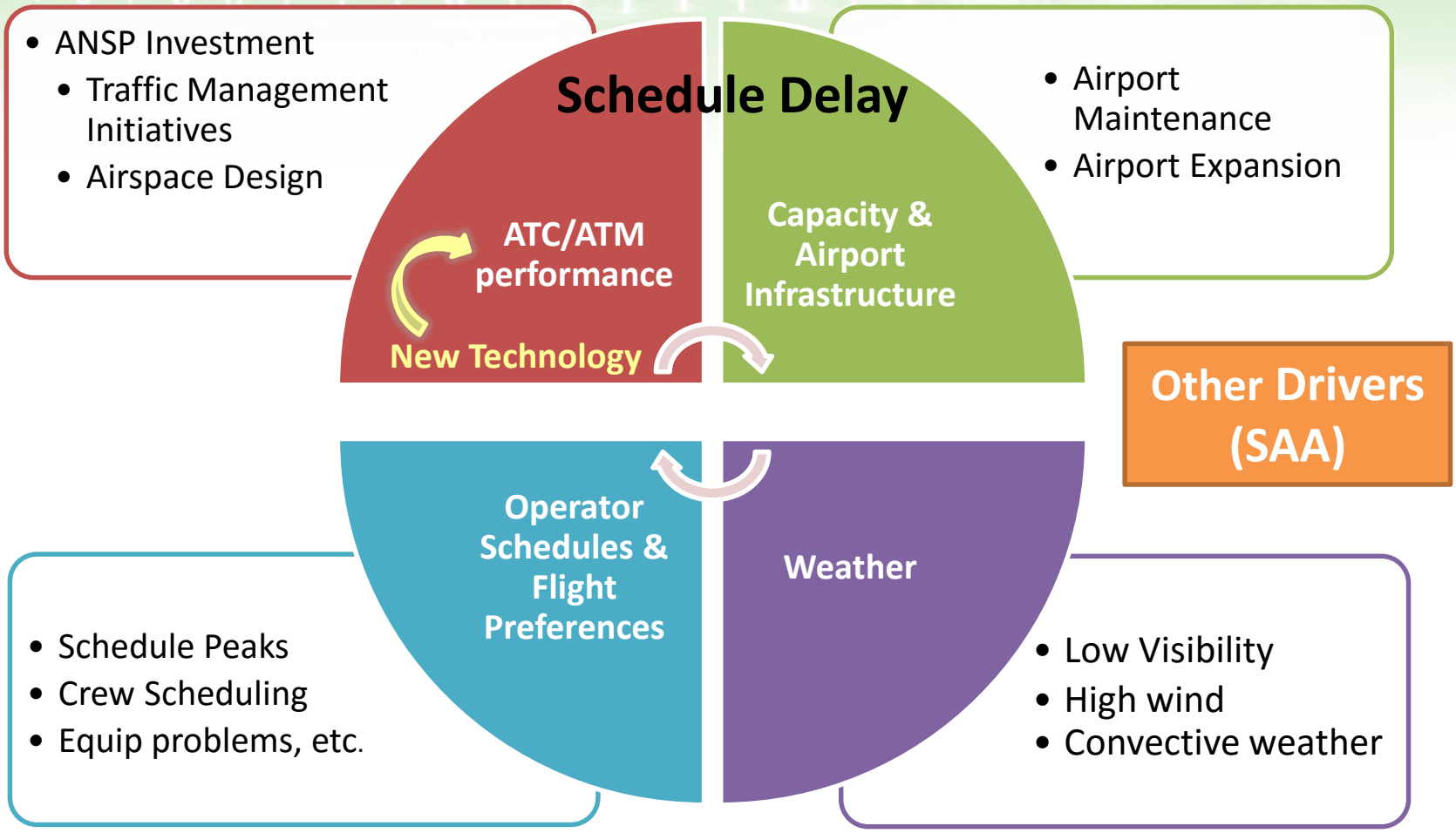
FAA
Air Traffic Organization

Management Objectives

- Can FAA identify/prioritize the constraints in the system?
  - ***Air Traffic Flow Management Delay, Taxi-Out Delay***
- Is FAA making the most efficient use of capacity?
  - ***Capacity, Throughput, Capacity Efficiency***
- Is FAA providing efficient flight trajectories to operators?
  - ***En-Route Additional Distance, Level Flight***
- How will FAA respond to questions of Airline schedule delay, on-time performance?
  - ***On Time Performance, Change in Block Time***

Metric Inter-Dependencies



PerformanceAnalysis ATOSysOps

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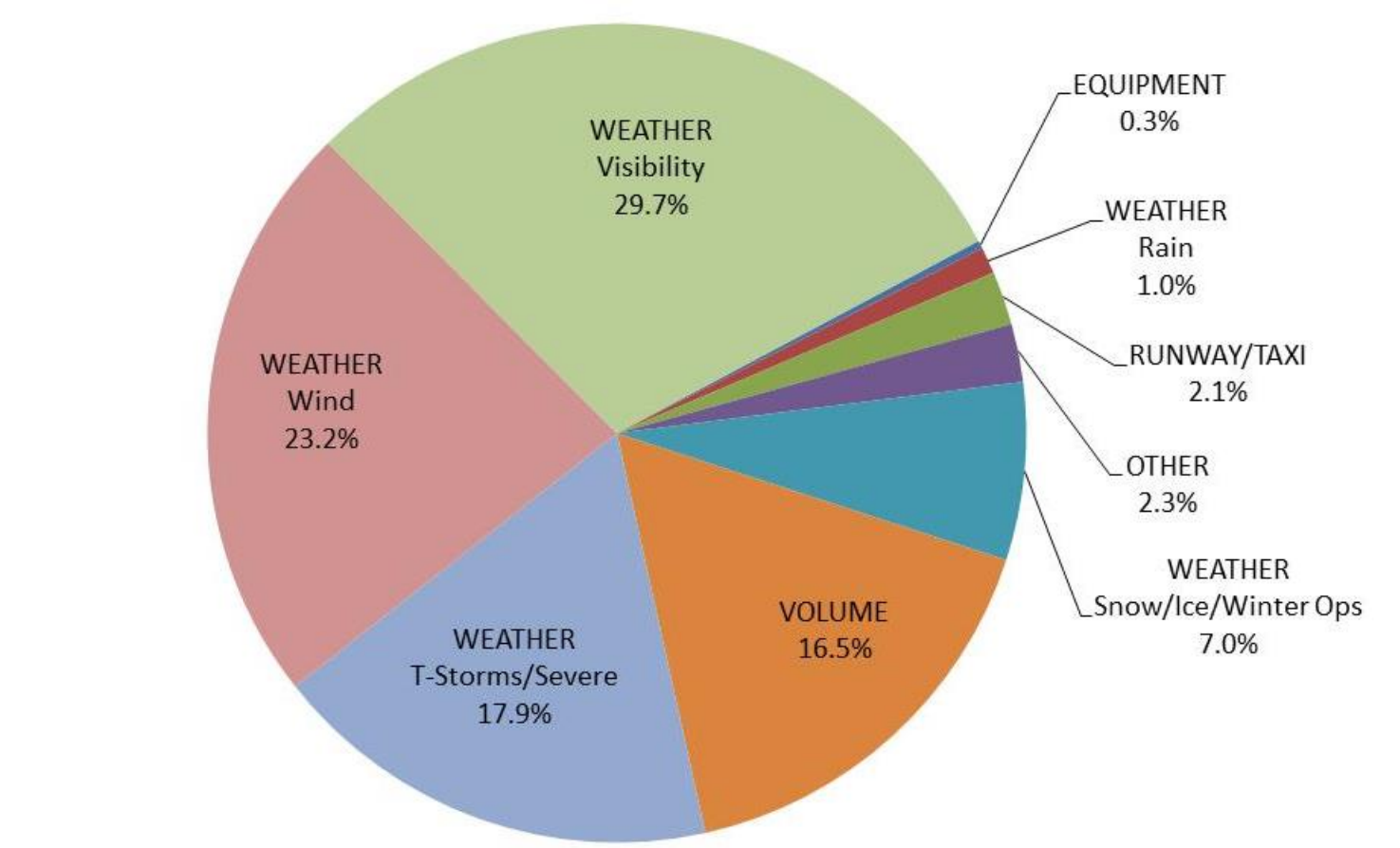
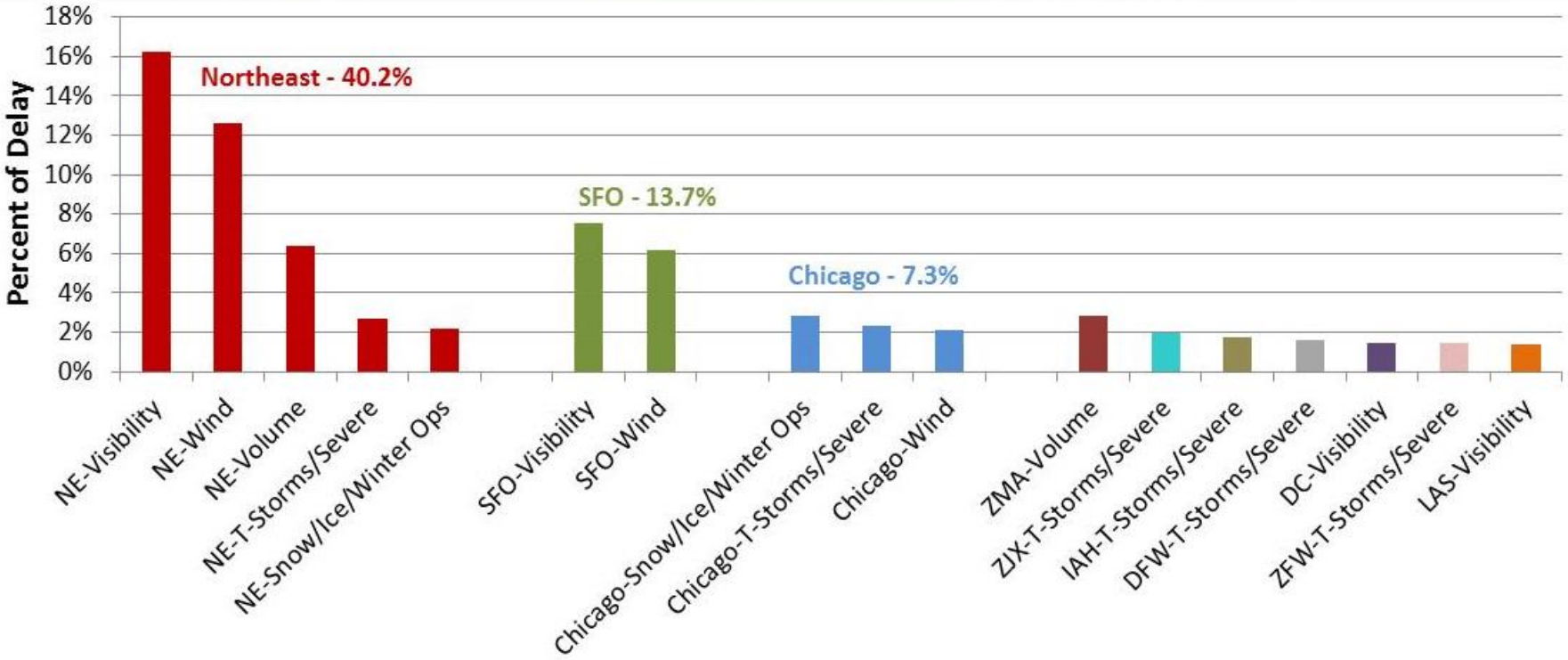
Data Sources

- Archived Trajectory and Flight Plan Data
- Aviation System Performance Metrics (ASPM)
  - Key Event Times: Scheduled Filed Actual,
  - Basic METAR
- Air Traffic Flow Management Delay (OPSNET)
- National Traffic Management Log (NTML)
- Weather Sources
  - METAR
  - NCAR Wind Data at 6-hour intervals

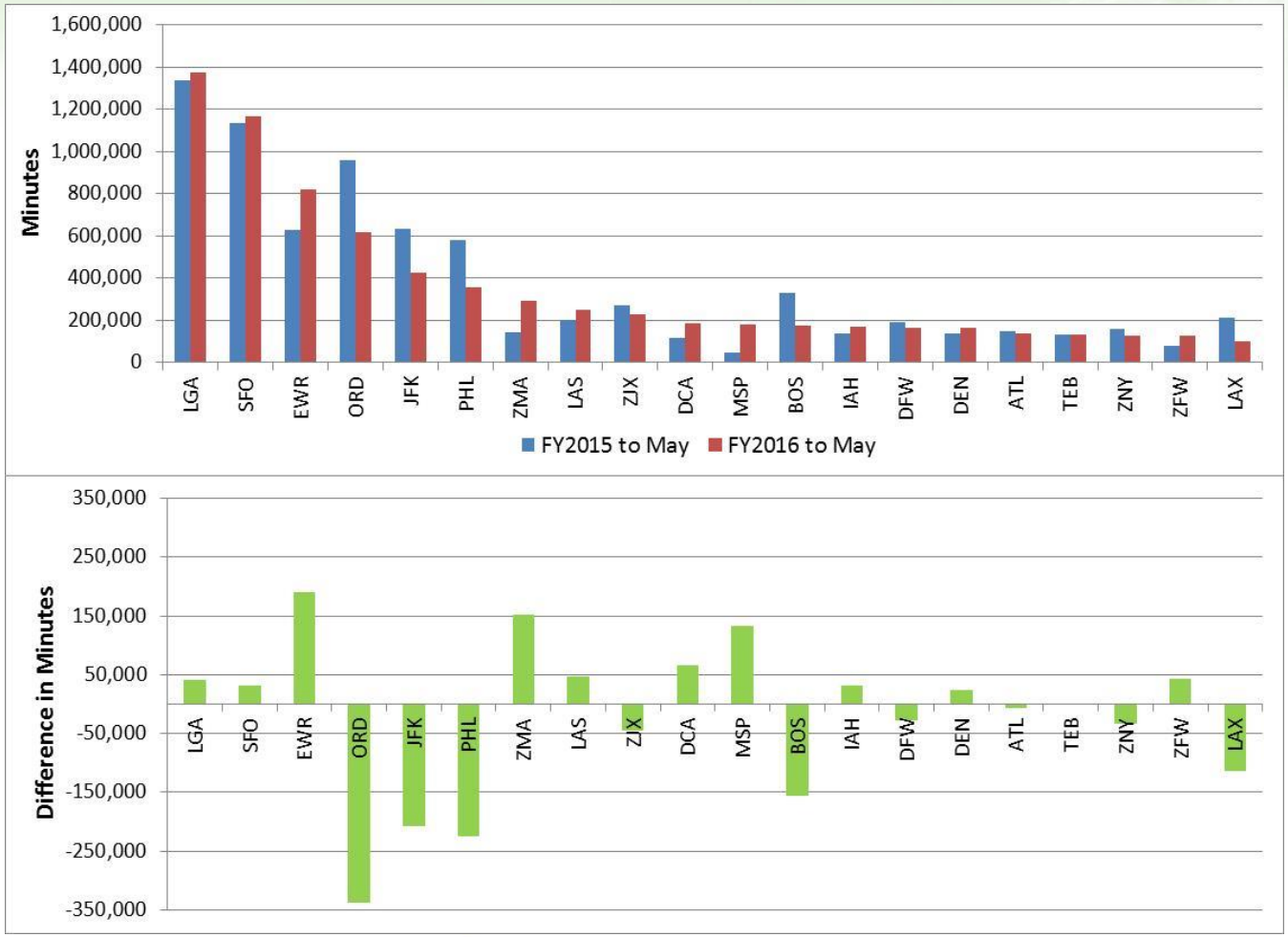
ATFM Delay by Category - FY2016



ATFM Delay by Region - FY2016



ATFM Delay by Facility- FY2016



Largest Increases in Delay

EWR-Wind & Visibility
ZMA-Volume
MSP-Visibility & Wind
DCA-Visibility

Largest Decreases in Delay

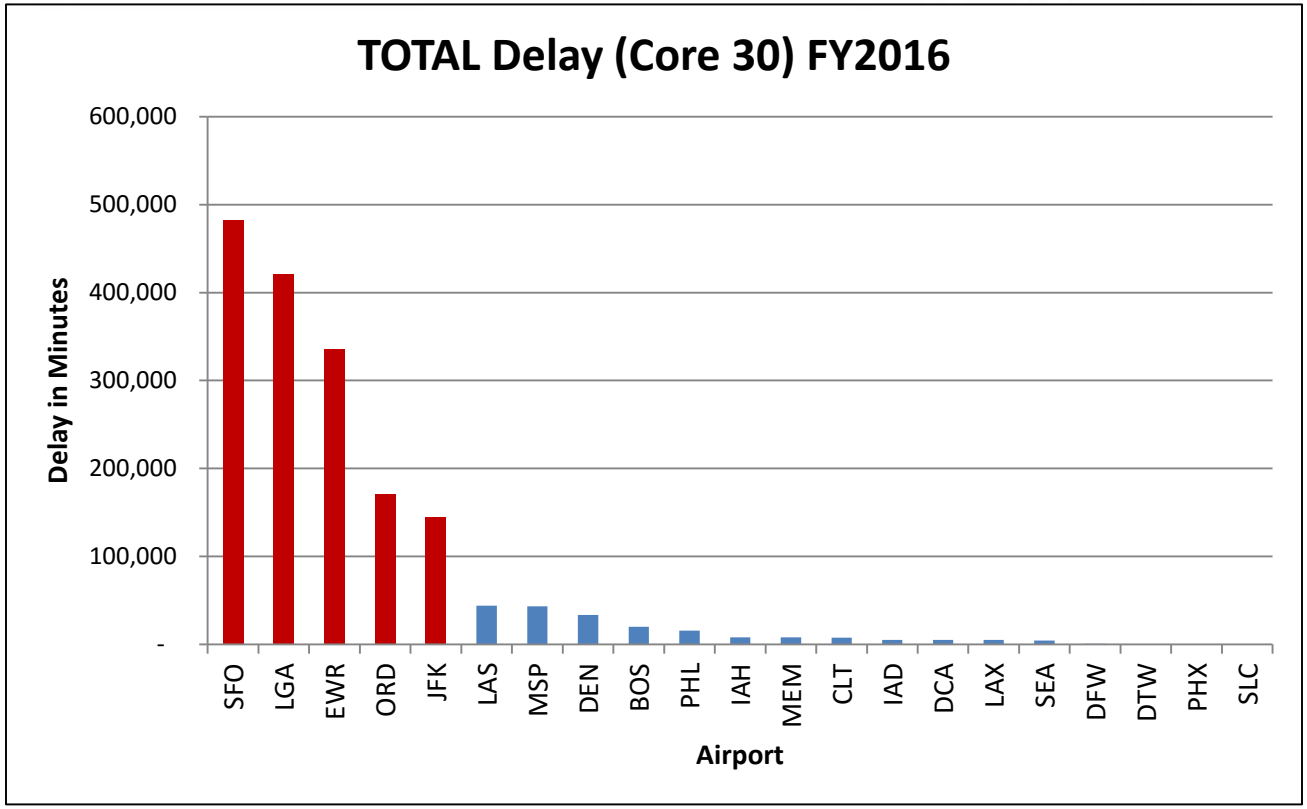
ORD-Equipment
PHL-Visibility & Snow/Ice
JFK-Runway/Taxi
BOS-Wind & Visibility

Other Important Changes

SFO
-Increase in Wind delay
-Decrease in Visibility delay

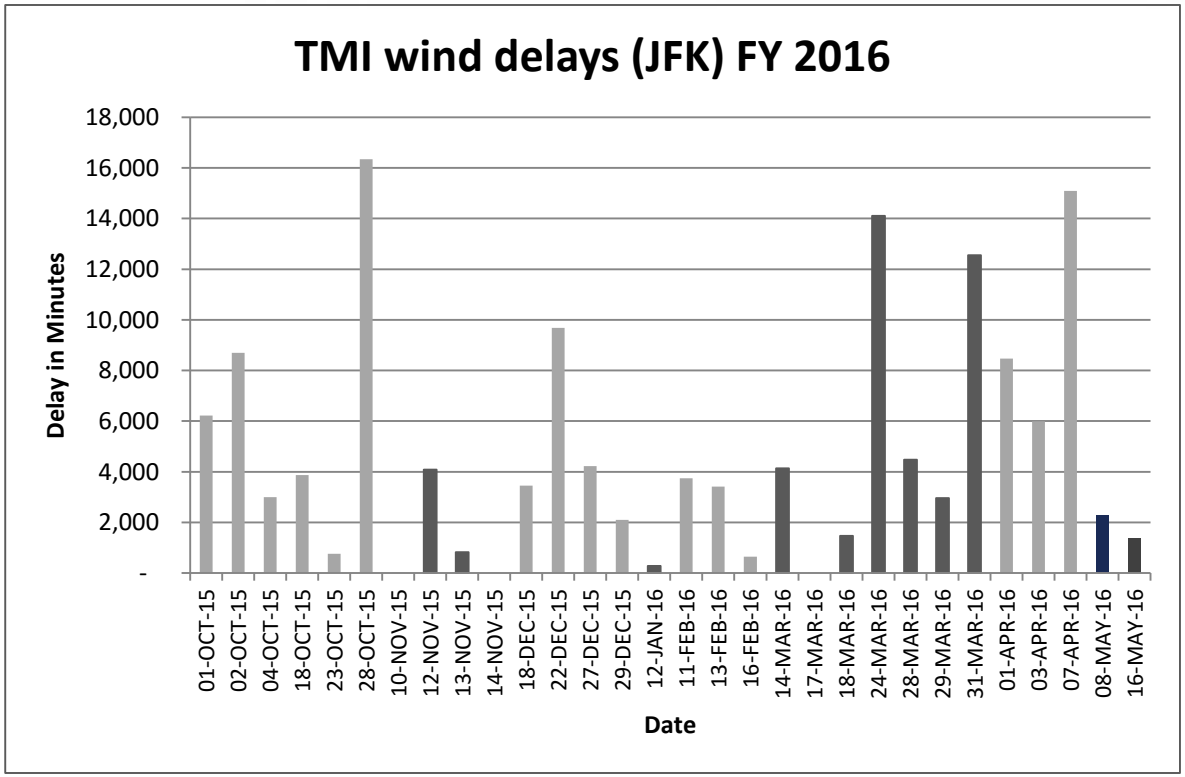
Total TMI Wind Delays FY2016

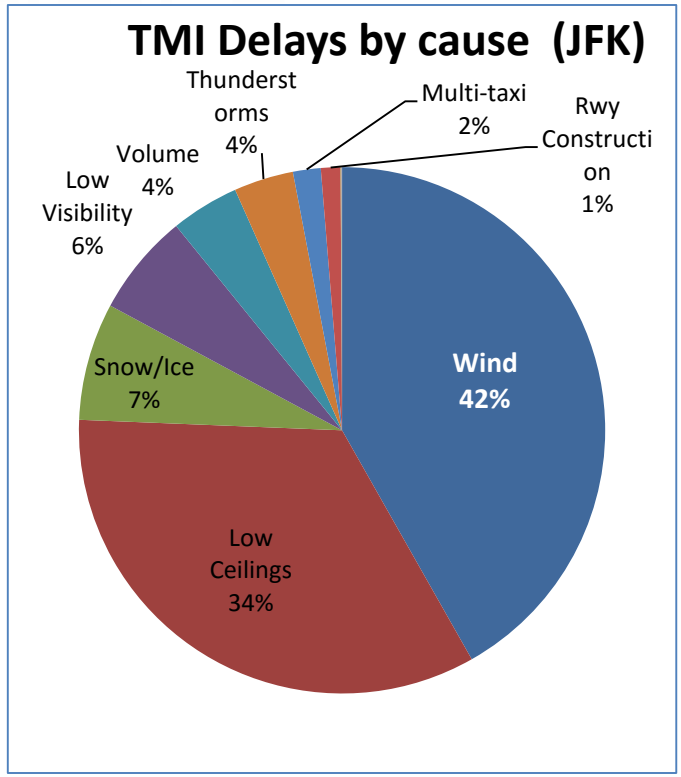
The top 5 airports highlighted in red constitute 89% of total TMI wind delays.



TMI Wind Delays - JFK

Most wind delays occurred in October, December, March, and April

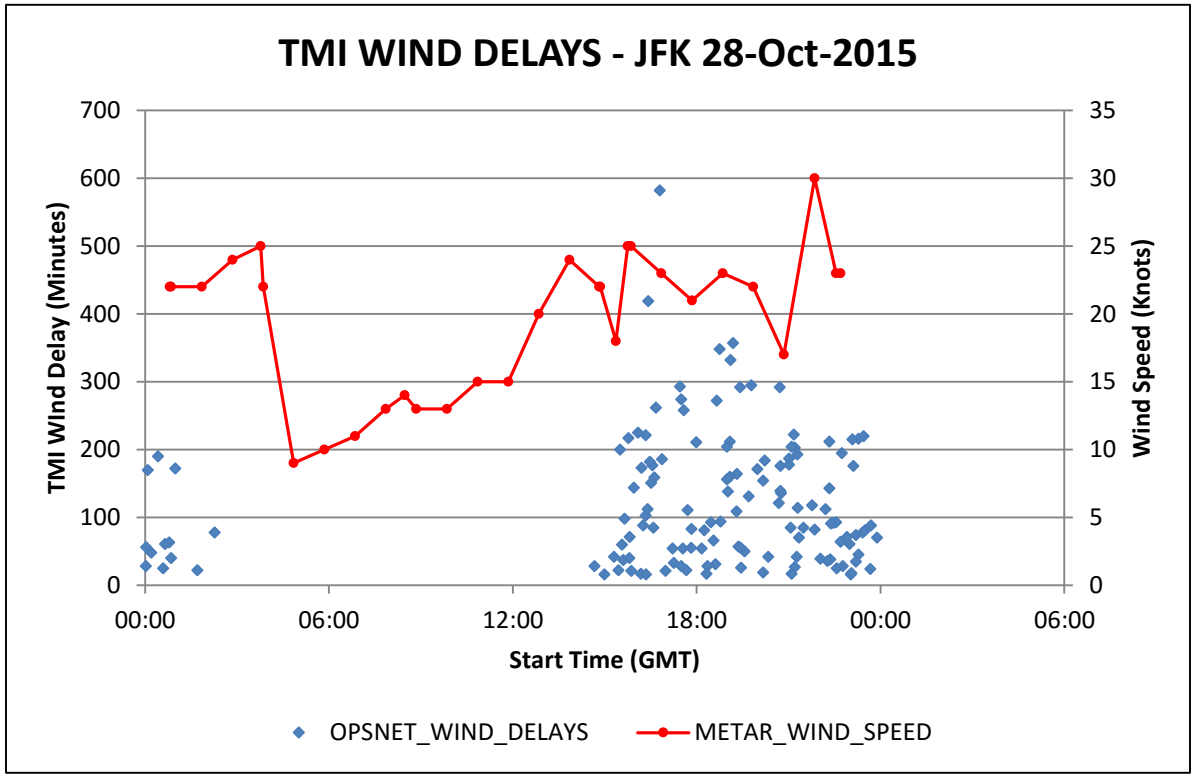




Linking Wind Conditions to Delay

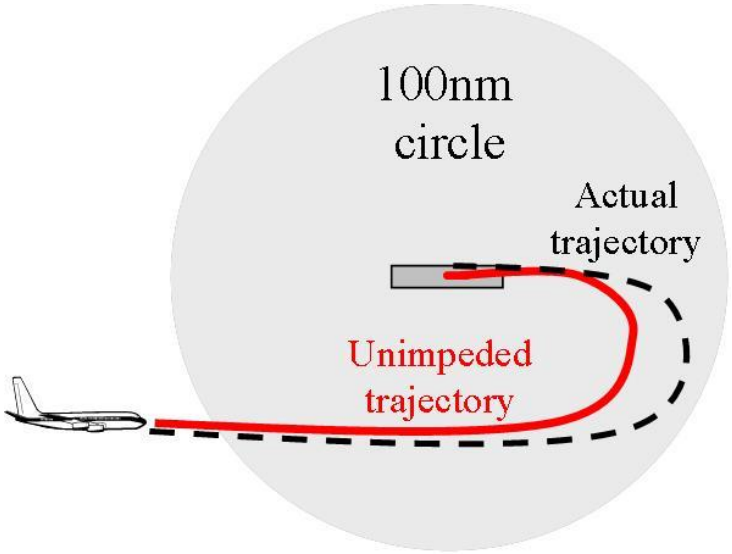
OPSNET and METAR data are showing similar patterns. However, not exactly matching. To be further examined by looking at

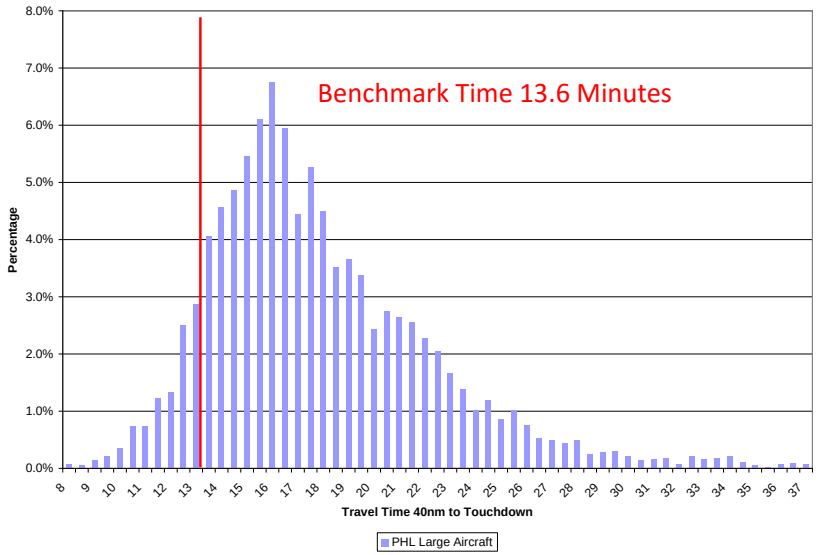
- different days
- Trajectory characteristics, arrival fix, runway used… etc.



Capacity Efficiency
Calculating Demand

- Demand based on Filed Times or Empirically by a Best Achieved Trajectory





- Flight Demand is from Benchmark Arrival Time (un-impeded time) until Actual Arrival Time

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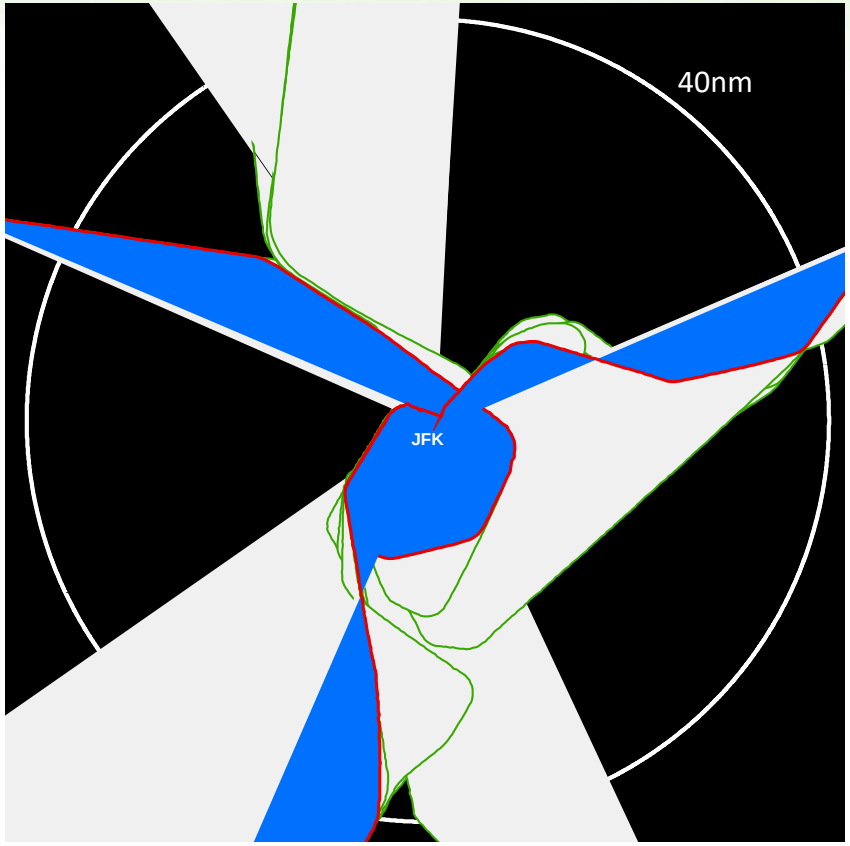
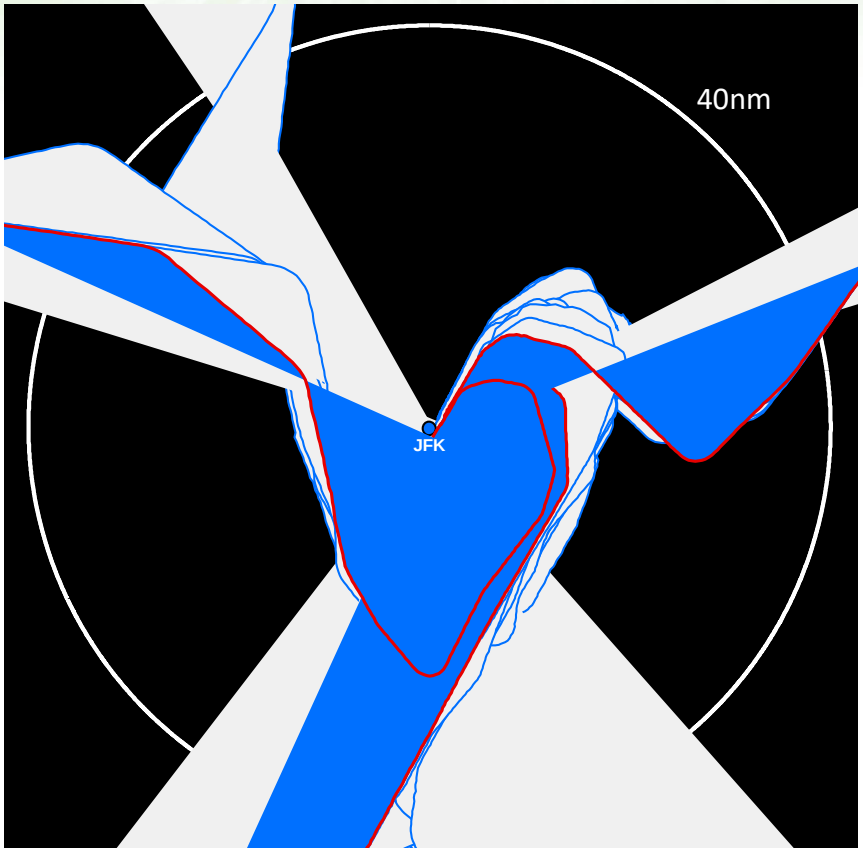
Arrivals into JFK

April 30, 2016 HR 12:00 -1259



13L, 22L - 30 Arrivals, TAER 100

April 15, 2016 HR 19:00 -1959

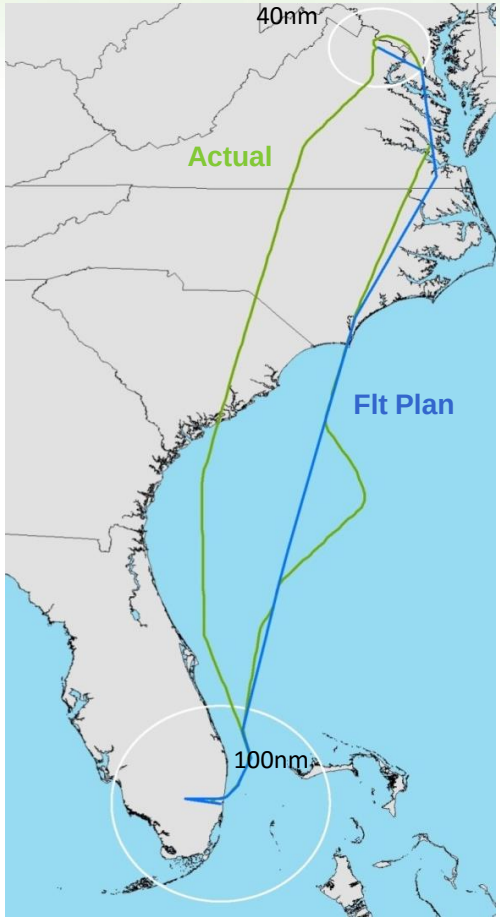


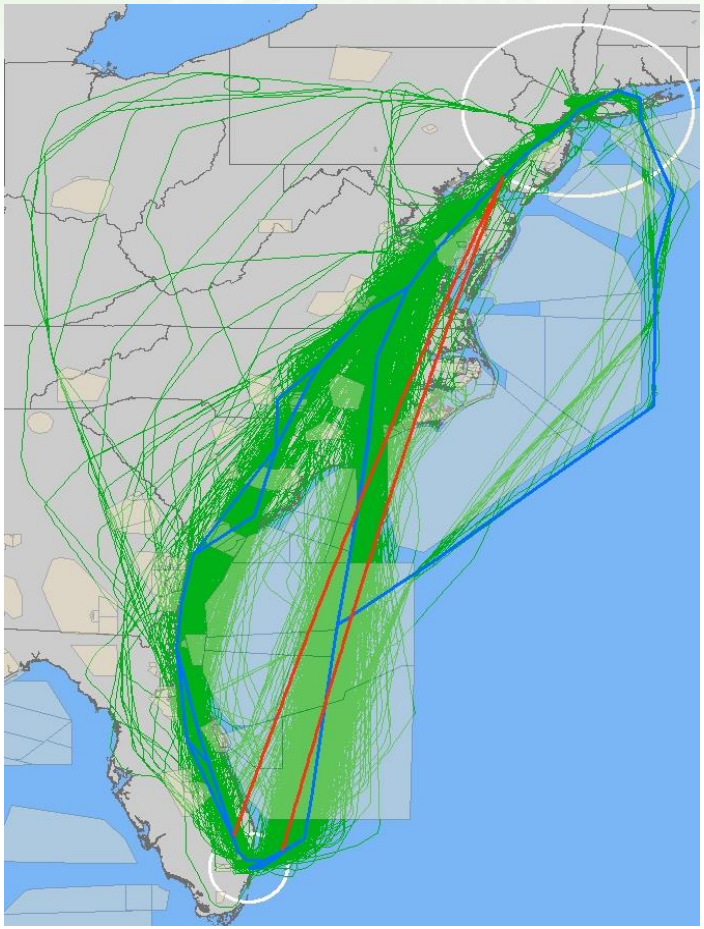
22L, 22R - 39 Arrivals, TAER 88.64

Flight Efficiency KPI – EnRoute

Actual vs. Flight Plan vs. Great Circle

vs Best Achieved vs. Wind Optimal





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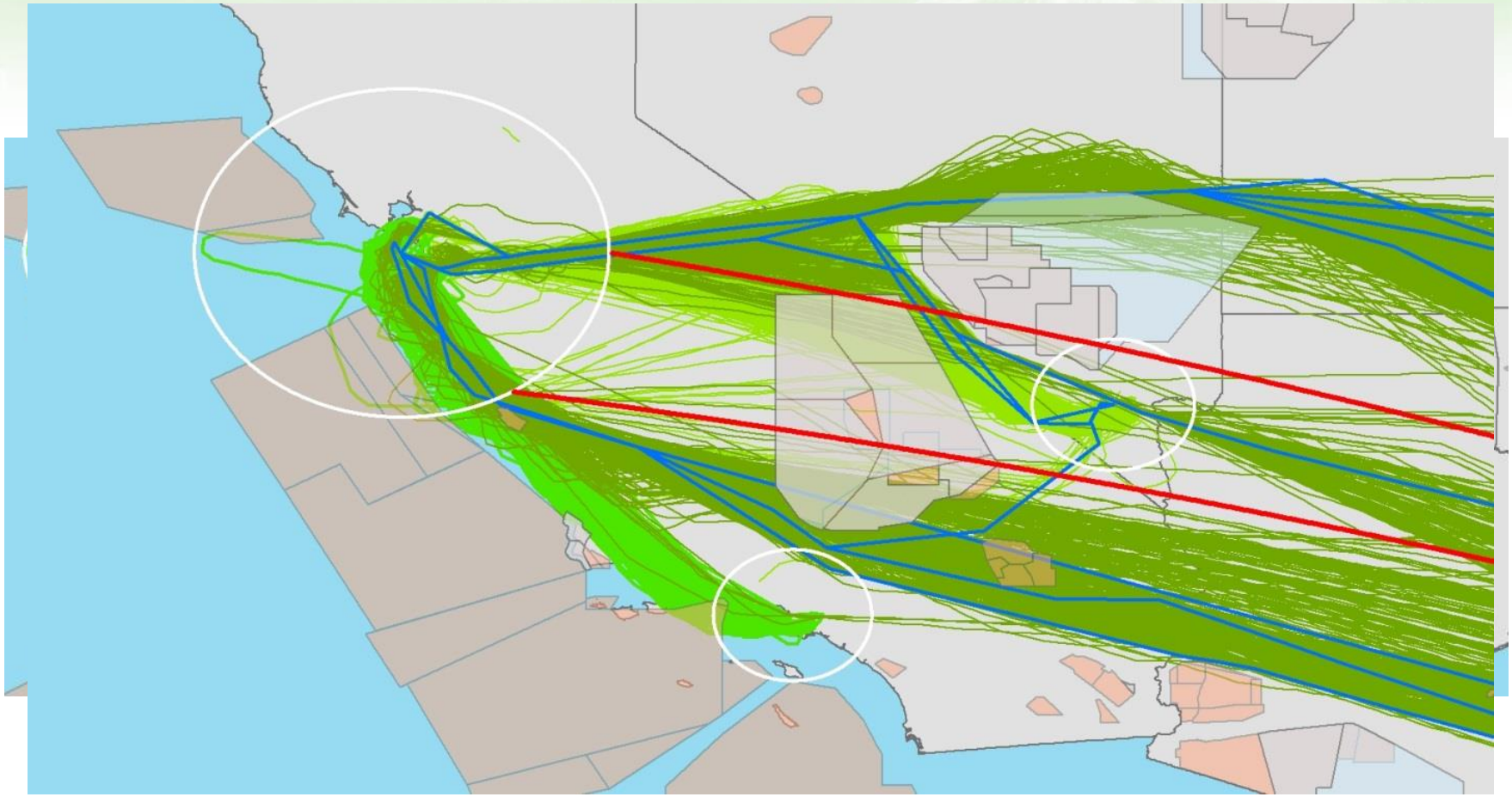
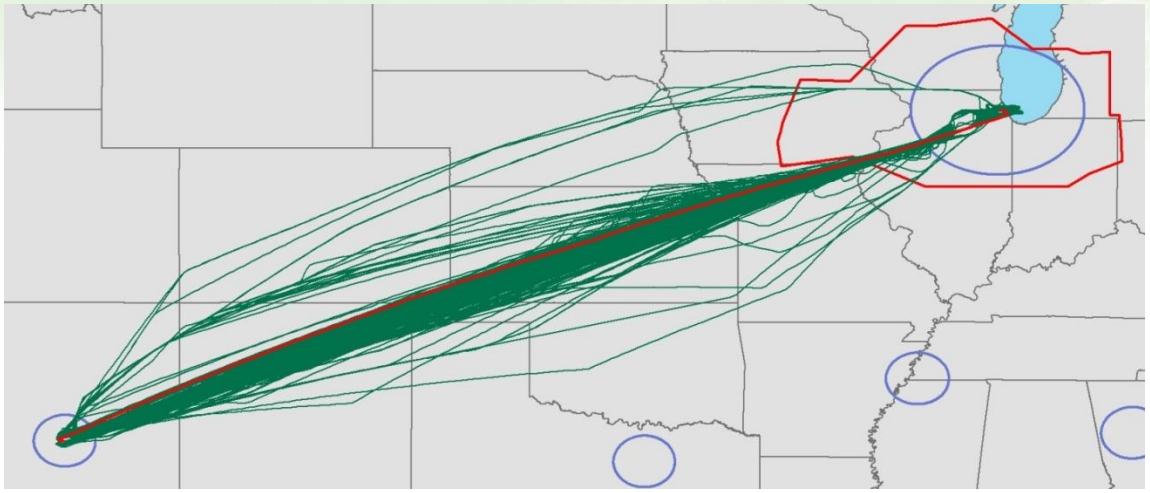
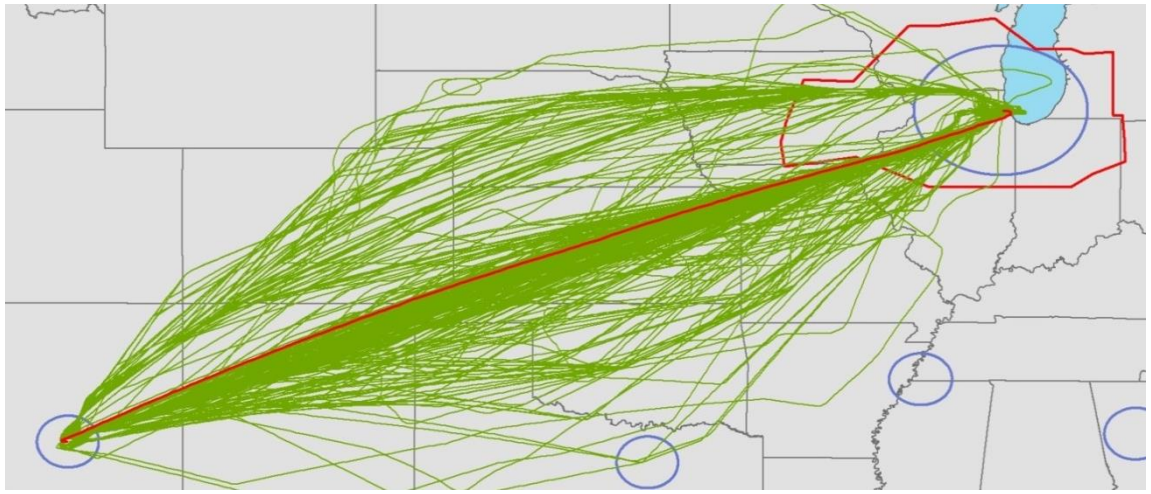
Impact of Special Activity Airspace



Impact of Weather



March – 481 Flights
8.3 nm Excess Dist.



June – 363 Flights
32.6 nm Excess Dist.

Performance Metrics Reporting

Is the metric/process useful?

- Does it lead to improvements in the system?
  - Data mining identifies specific scenarios for mitigation.
- Will decision makers trust what is presented?
  - Weather, Airline Schedules, Airport Capacity
  - What are similar days?
- Capabilities beyond local METAR
  - ASPM like tables for Terminal/EnRoute
  - ASPM like tables for Forecast Weather