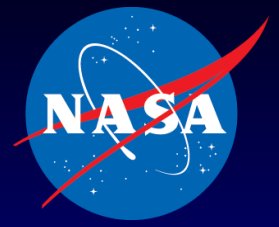
NWRA

NorthWest Research Associates, Inc.

Redmond, WA



Status of NASA Field Measurements

Dr. Fred Proctor
NASA Langley Research Center

Drs. Matthew J. Pruis and Donald P. Delisi
NorthWest Research Associates

3 December 2012

Acknowledgements

This project is sponsored by the NASA Airspace Systems Program under the Super Density Operations Concepts and Technology Project of the Aeronautics Research Mission Directorate

- Project name: Wake vortex data collection for robust modeling validation to enable advanced, NextGen, wake-conscious, capacity-enhancing concepts
- Four year contract awarded 29 September 2011. NWRA is a contractor to NASA
- Neil O'Connor, Brad Perry, and Dr. Fred Proctor are the program and technical monitors

Summary

- Successful field test of meteorological tower and temperature profiler accomplished at Summit, NY, in Aug. – Oct., 2011 (non-airport location)
- Successful partial field deployment at JFK International Airport from Aug. 4th, 2012, to present
- In planning stages for full deployment at Memphis International Airport in early 2013

Purpose of Data Collection

- NASA plans to collect meteorological and wake data to enhance our fundamental understanding of wake vortex evolution and to use this knowledge in the development of fast-time, numerical, wake vortex models and in the development of NextGen concepts
  - This knowledge and these models will, when mature, be used in advanced NASA concepts and studies and will be passed on to the FAA for use in their advanced operational scenarios

FAA is focused on near-term.
NASA is working on longer term goals that have the potential to benefit NAS 5-15 years from now

Data Sharing With On-going FAA Data Collection Campaign

NASA sensors

- Temperature Profiler (1)
- Sonic Anemometer (1), Temperature and Relative Humidity (3)
- Rain Gauge (1)
- Barometer (1)
- Mode-S Receivers (2)
- GPS for Time Sync (2)
- Many Engineering Data Products

JFK



Next Proposed Deployment Location

NASA sensors

- Temperature Profiler
- Wind Profiler
- Pulsed Lidar (1+)
- Mode-S Receivers (2)

- 106’ Meteorological Tower:
  - Sonic Anemometer (3)
  - Temperature and Relative Humidity (3)
  - Rain Gauge
  - Barometer

MEM

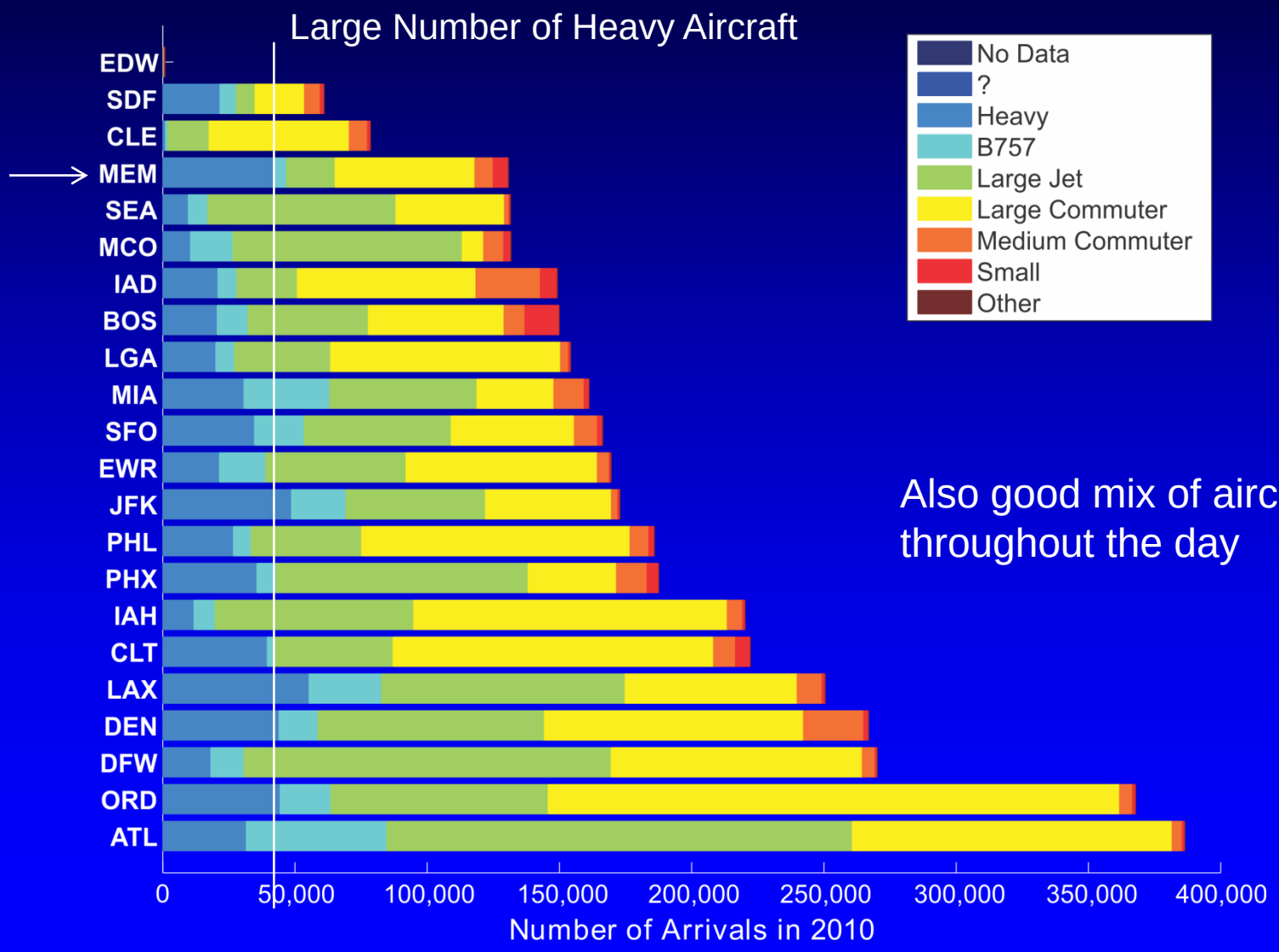


Proposed Sites for Lidars and Meteorological Instruments

Why Memphis?

- Good Aircraft mix
- Good Siting Locations for Lidars and Meteorological Sensors
- Interested Airport Authority
- Interested Airline

Good Aircraft Mix

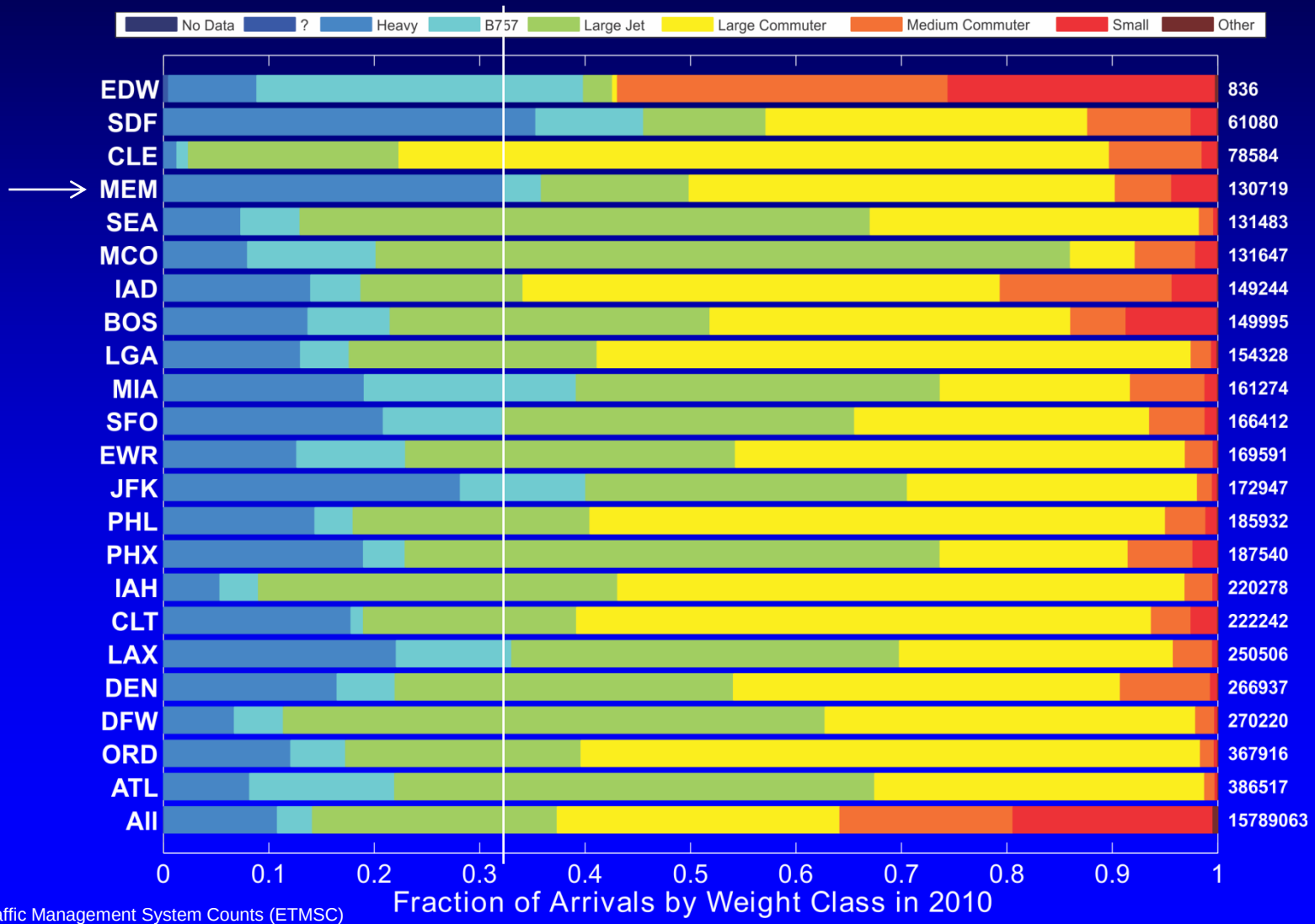


Also good mix of aircraft throughout the day

Enhanced Traffic Management System Counts (ETMSC)

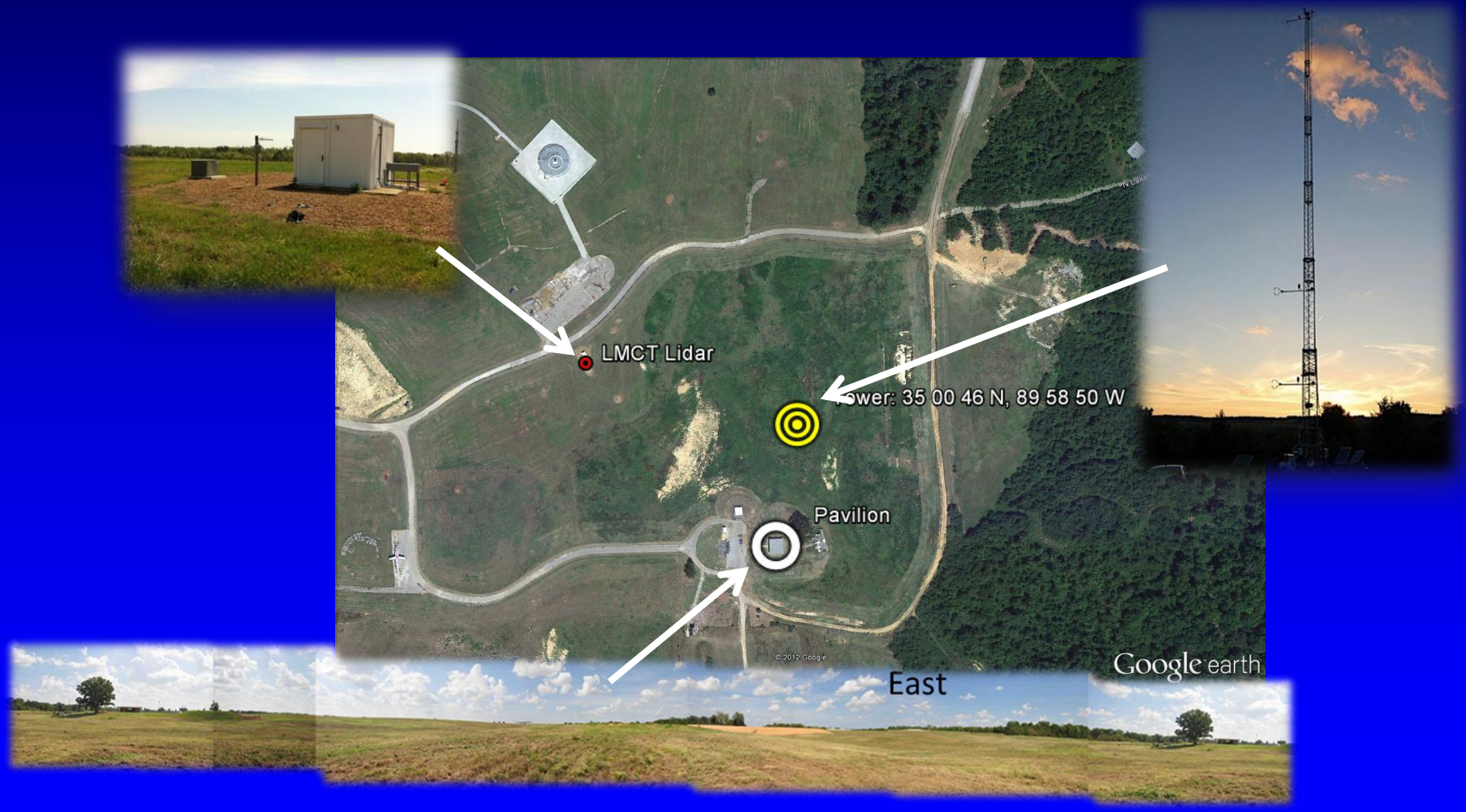
Approximately 1 out of 3
Landings are Heavies

Good Aircraft Mix



Enhanced Traffic Management System Counts (ETMSC)

Good Sites for Lidar and Meteorological Instruments



Outstanding Support from Airport Authority and Airline

MEMPHIS INTERNATIONAL AIRPORT

Memphis-Shelby County
Airport Authority



Problem-solvers, efficient, and communicative

Timeline for Deployment at MEM

- Received FAA approval for tower installation 15 Nov 2012
- Staged deployment – Tower and temperature profiler first, Lidars later
- Hope to have some data by the next WakeNet USA meeting (in Memphis)