



Findings From Air Quality Studies at Santa Monica Airport

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Airport Air Quality Issues

- **Expanding airports and increasing operations**
- **Proximity to surrounding communities**
- **Lead content of general aviation fuel**
- **Emissions of black carbon and ultrafine particles**
- **Airport includes multiple sources of air pollution**
 - **Aircraft, ground equipment, terminal, traffic**

Previous Airport Air Monitoring Studies

- **John Wayne Airport Study by AQMD (1991-1992)**
 - Focused on particulate fallout, no increase in PM10 or particulates observed
- **LAX by AQMD (1997 – 1998)**
 - Ambient air quality near passenger terminals and community
 - Some CO, PM10 and VOC concentrations slightly higher than AQMD Network (but below standards), I-405 a potential source for the community monitoring
- **Chicago O'Hare (2000)**
 - Impact of airport on adjacent communities found for some species but measured levels still typical of urban environments
- **TF Green Airport, Warwick, RI (2005-2006)**
 - VOCs and PM mass comparable to other urban sites
 - Continuous black carbon measurements suggest an aircraft influence near runway
- **Teterboro Airport, New Jersey (2006)**
- **LAX Study by UCLA/CARB (2005-2006)**

AQMD Project Overview

- Part of a U.S. EPA Community-Scale Air Toxics Grant
- Characterize air toxics levels by monitoring in communities around general aviation airports (Santa Monica and Van Nuys)
- MATES III – type sampling (long-term exposures)
- Two three month sampling periods
- Determine potential impact of airport emissions on measured pollutant levels



Van Nuys Airport

- Largest Number of General Aviation Operations in the Country (2006)

VOR Site #2

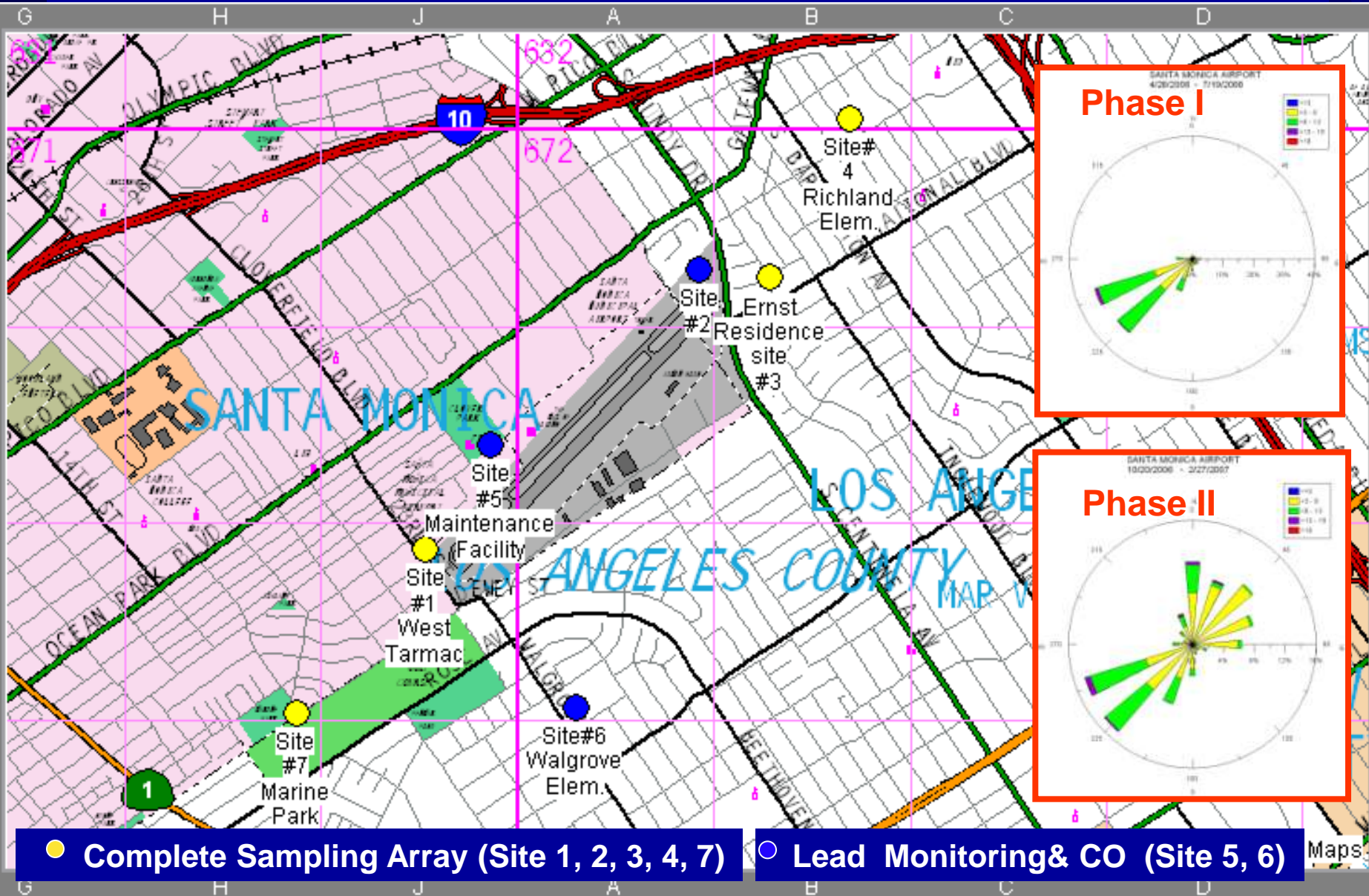


Santa Monica Airport

- Runways adjacent to neighborhoods
- Increased Number of Private Jet Traffic



Santa Monica Airport Sampling Sites



Santa Monica Airport Sampling Sites



Measurements

- TSP Lead and Hexavalent Chromium
- PM10 Mass and Carbon
- PM2.5 Mass & Components
- Continuous Particle Count (ultrafine)
- Volatile Organic Compounds (3 x 8 hour periods)
- Carbonyls (acetaldehyde, etc.)
- Continuous Carbon Monoxide
- Study occurred between November 2005 and March 2007
- Nominal three months at each airport in two different seasons

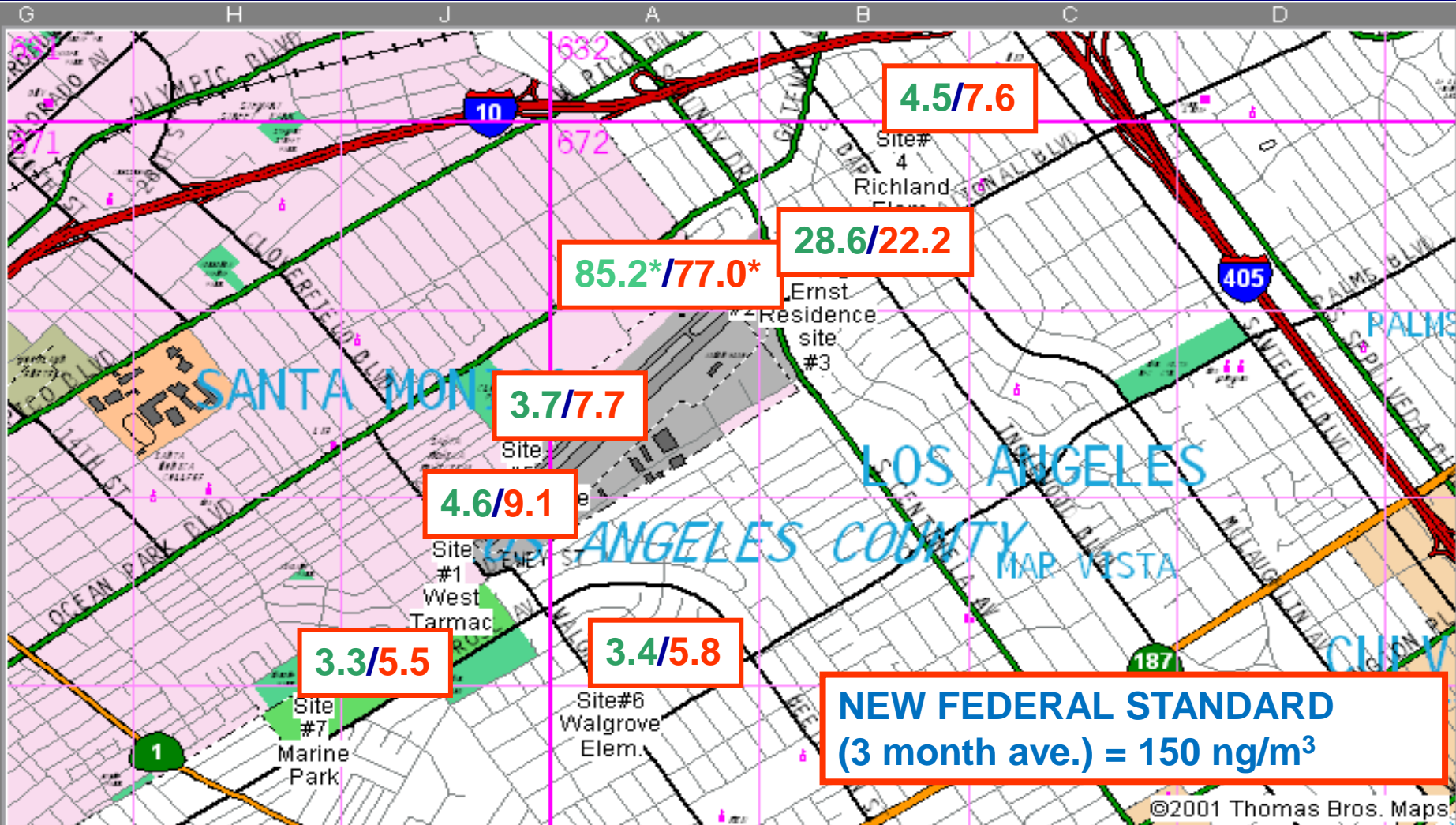


AQMD SM Airport Findings

- **Lead levels in communities and near runways below new federal standards, but elevated at near runway sites**
- **Airport influence on CO, PM2.5, VOC, and carbonyl levels were not distinguishable, but appears to be minor for long term exposure**
- **Ultrafine particles (measured by number concentration) significantly elevated near runways during aircraft operations**

Santa Monica Airport TSP Lead (ng/m³)

Phase I - Apr 06 - Jul 06, Phase II - Oct 06 - Feb 07



Downtown LA – Average

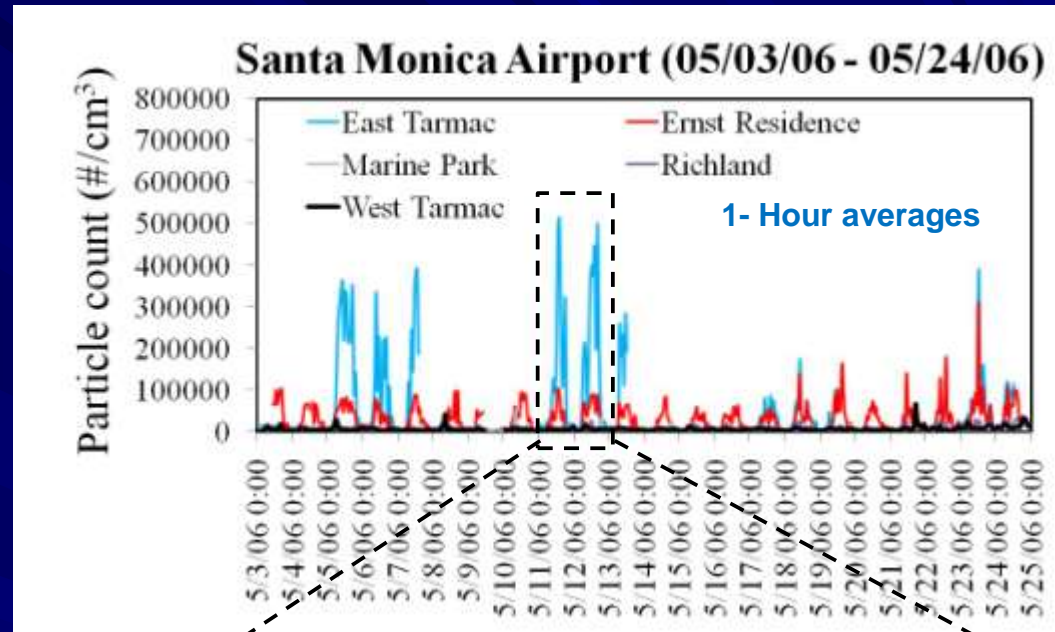
9.5/13.1

Annual Basin Average

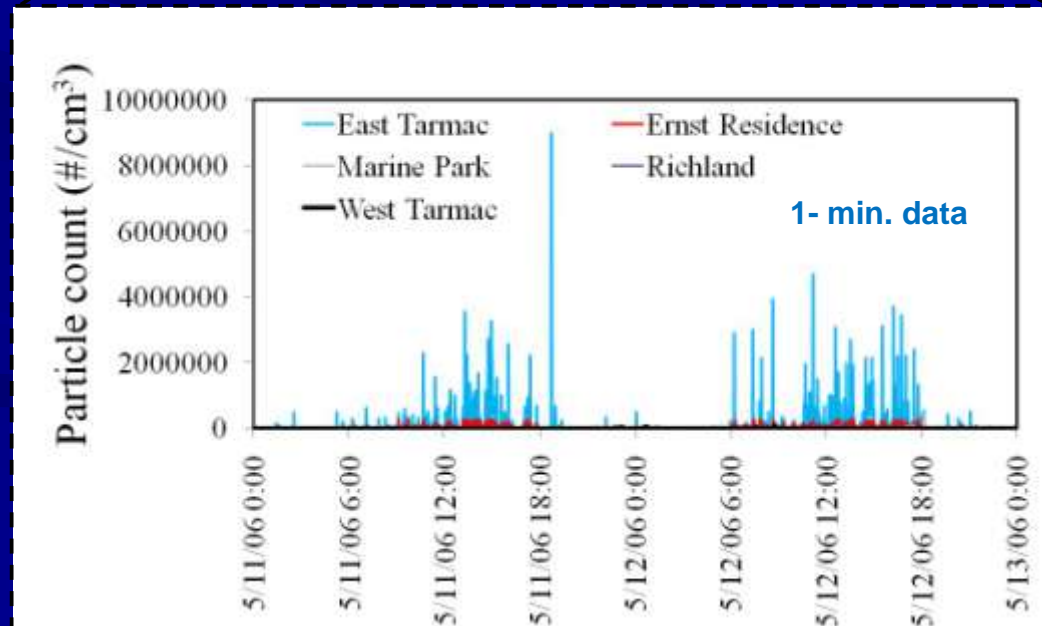
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Santa Monica Continuous Number Concentrations

May, 2006



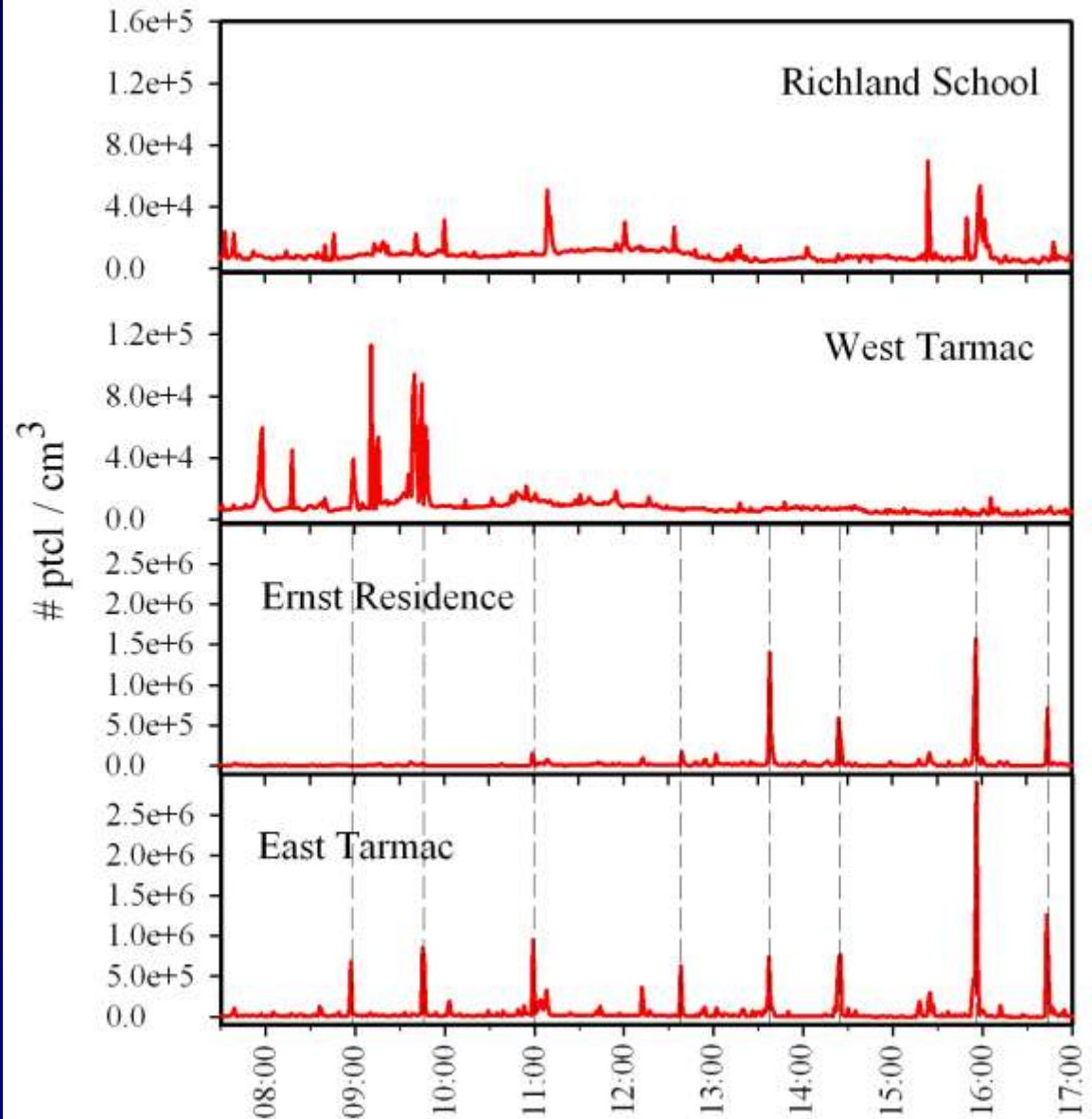
Peaks in UF
number
concentration
correspond to
aircraft take-offs



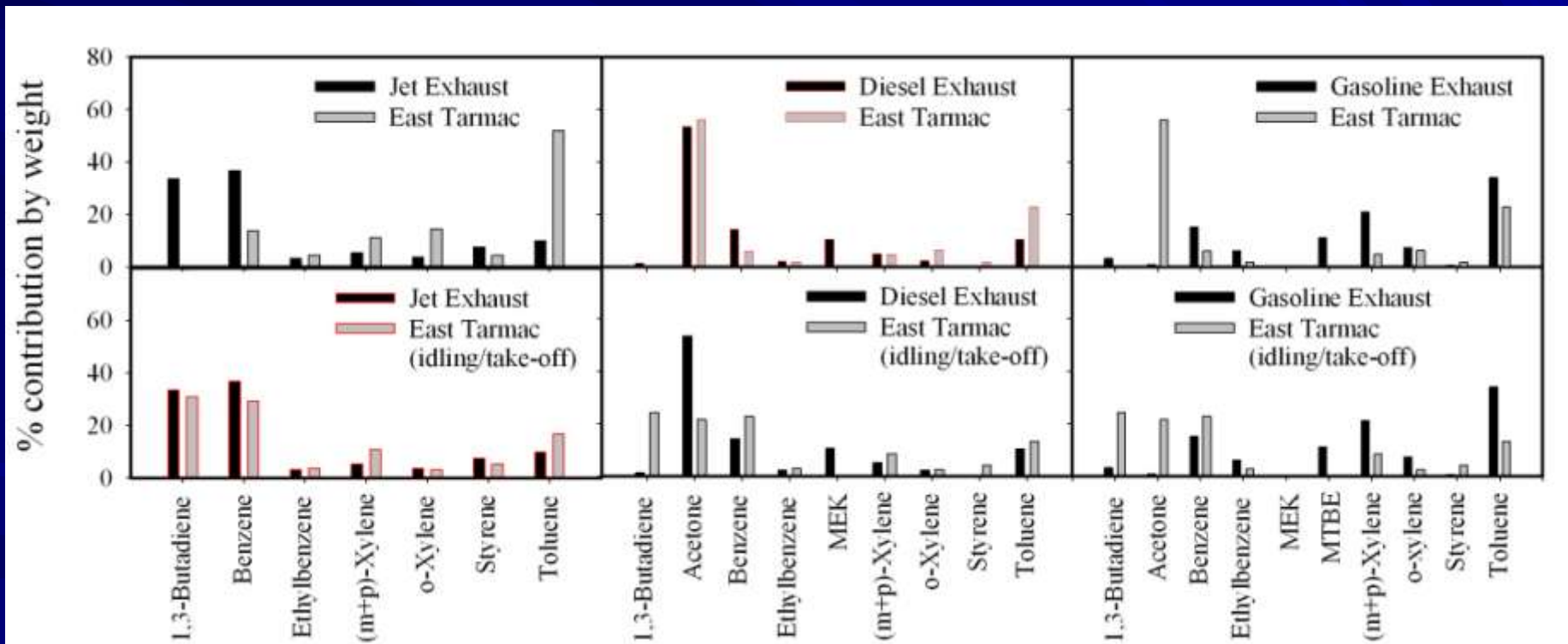
Santa Monica Continuous Number Concentrations

July 07, 2006

Peaks in UF
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Instantaneous Canister Samples vs. CARB VOC Emission Profiles



Samples taken May 12, 2006

UCLA Study

Aircraft Emission Impacts in a Neighborhood Adjacent to a General Aviation Airport in Southern California

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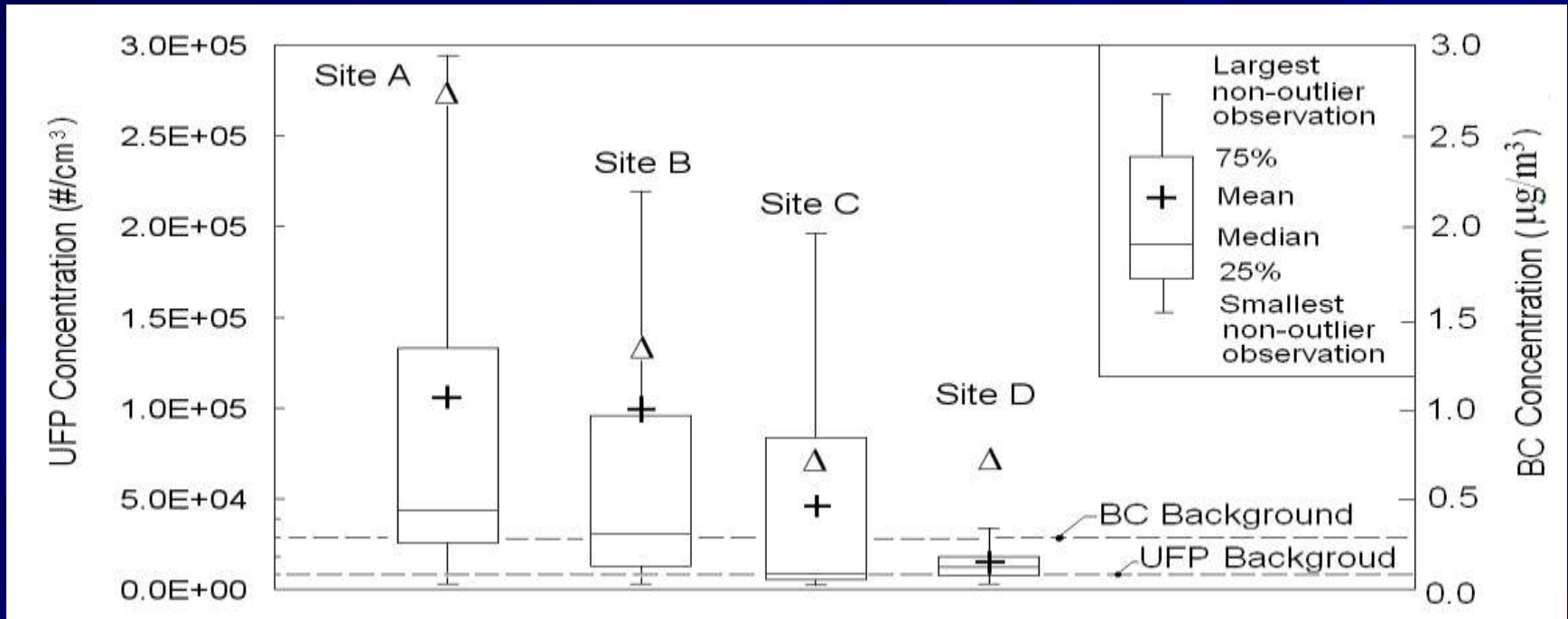
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- Mobile platform driven along fixed routes
- Real time instruments for high temporal resolution (short-term exposures)



UCLA Study

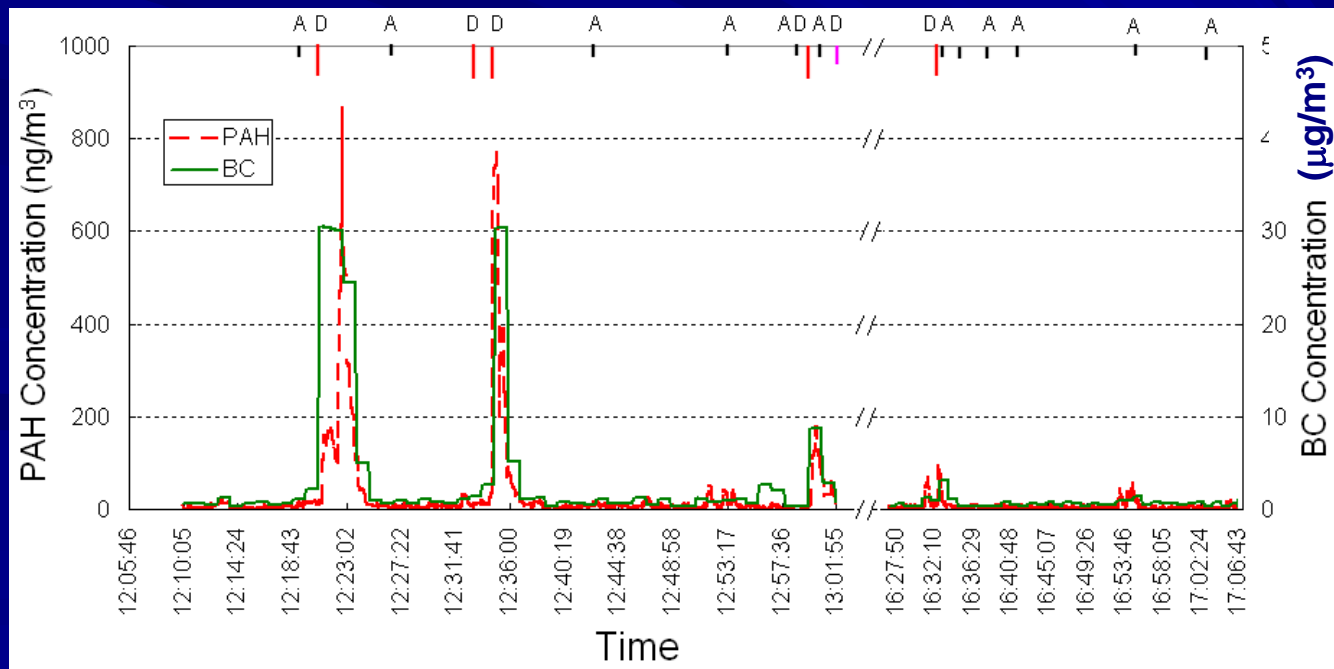
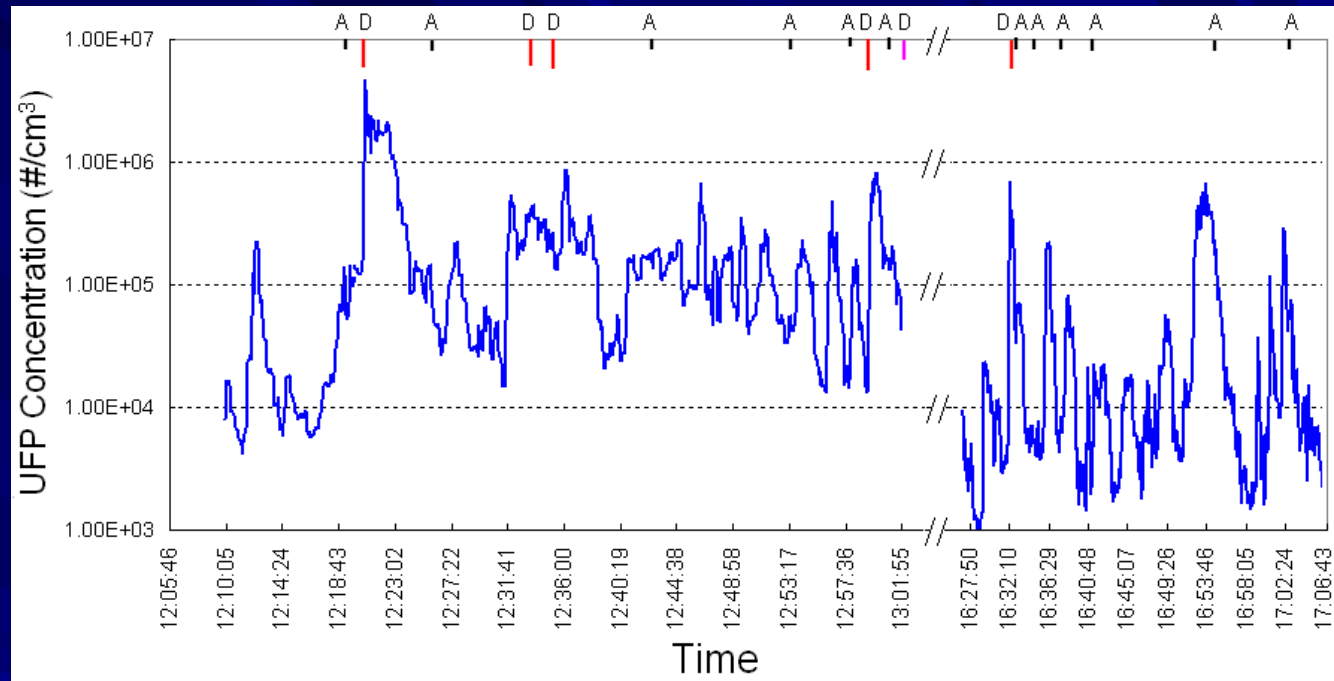


“We were unable to detect a signature from the airport on the South, West or North sides of the airport. The signature east of the airport was very clear.”

UCLA Study

July 20, 2008

Large peaks
correspond
to departures



Potential Mitigation Measures

- **Increase size of blast fence**
- **Reduce idling times**
- **Additional barriers such as sound walls or tree lines**
- **Active or passive flow diversion**
- **High-efficiency filtration in residences**
- **Additional studies on emissions from different jet sizes and alternative fuels**
- **Limit jet traffic at Santa Monica Airport**