



# General Aviation Airport Air Quality Monitoring Project Results

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**Faster Freight / Cleaner Air**  
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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

- **Chicago O'Hare (2000)**
  - Impact of airport on adjacent communities found for species such as acetaldehyde, benzene, formaldehyde, polycyclic organics, toluene and lead, but measured levels still typical of urban environments
- **TF Green Airport, Warwick, RI (2005-2006)**
  - VOCs and PM mass comparable to other urban sites, aircraft emissions not distinguishable from other sources
  - Higher formaldehyde near runway may be due to other local sources (off-gassing)
  - Continuous black carbon measurements suggest an aircraft influence near runway
- **Teterboro Airport, New Jersey (2006)**
  - Focuses on air toxics and PM near airport
  - Results not yet finalized or available
- **LAX Study by UCLA/CARB (2005-2006)**

## Previous SCAQMD Airport Monitoring Studies

- **John Wayne Airport Study (1991-1992)**
  - Focused on particulate fallout
  - No increase in PM10 or settling particulates observed
- **LAX**
  - Ambient air quality near passenger terminals (May 1998) focusing on worker/public exposure
  - Community monitoring (1997 – 1998)
  - Both studies found some CO, PM10 and VOC concentrations slightly higher than AQMD Network sites (but still below standards)
  - I-405 a potential source for the community monitoring

## General Aviation Airports Study Objectives

- Part of a U.S. EPA Community-Scale Air Toxics Grant
- Characterize air toxics levels in the communities around two GA airports
- Compare data to other air toxics studies such as SCAQMD's Multiple Air Toxics Exposure Study (MATES-III)
- Determine potential impact of airport emissions on measured pollutant levels
- Provide baseline data for future studies



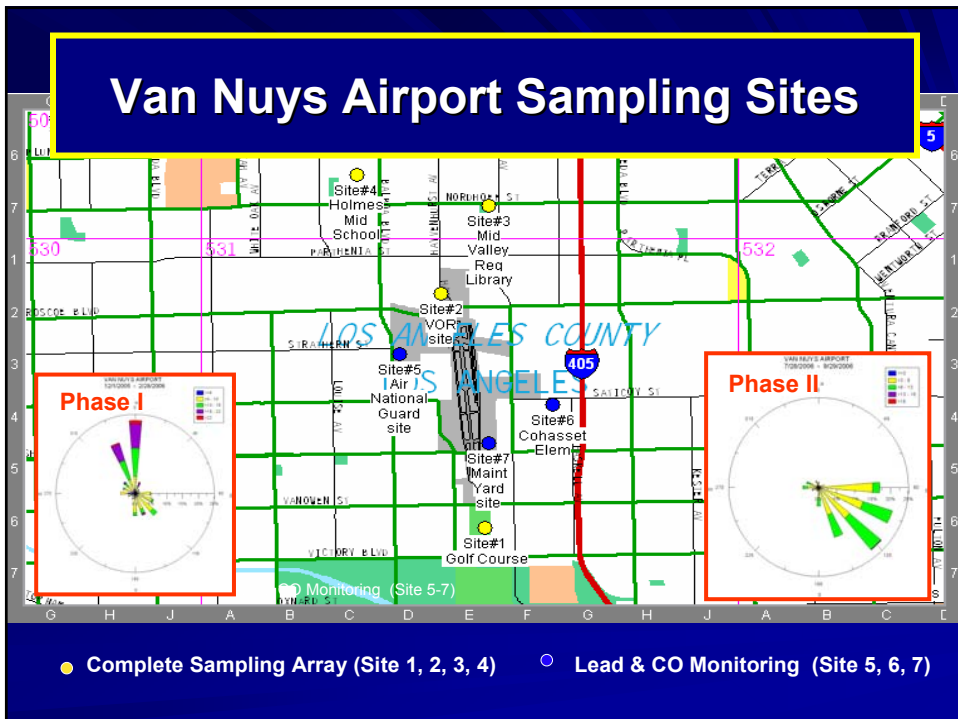
## Measurements

- 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



# Van Nuys Airport

- Largest Number of General Aviation Operations in the Country

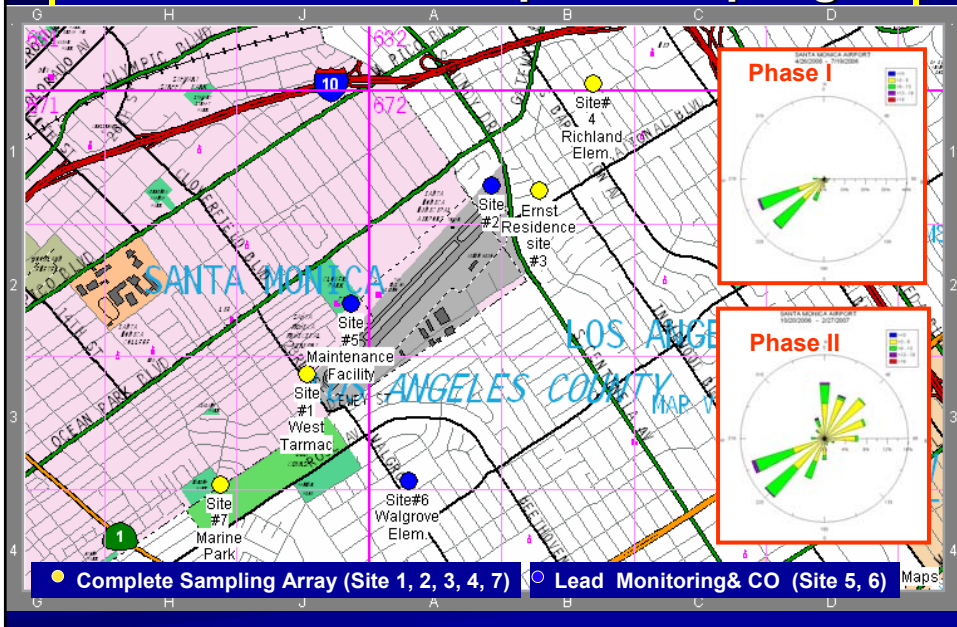


# Santa Monica Airport

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



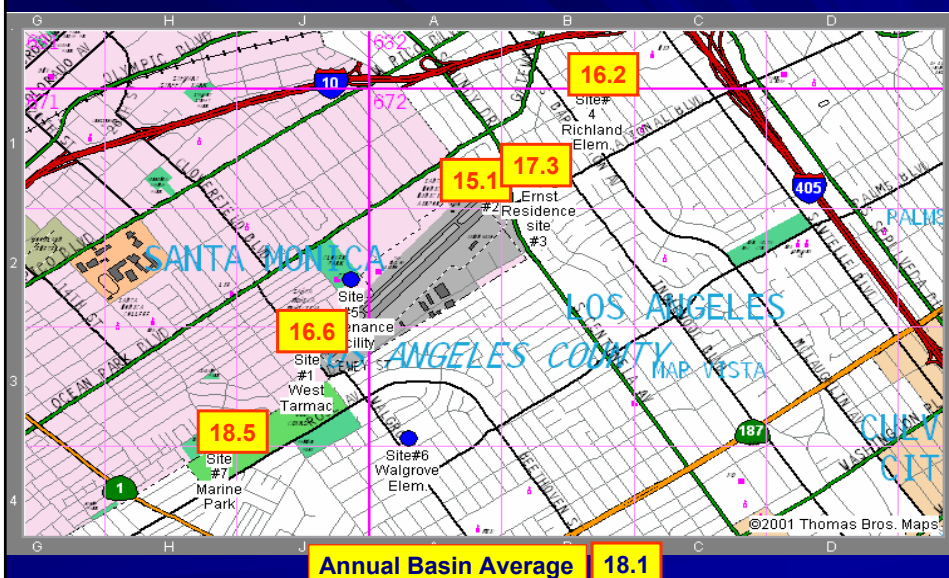
## Santa Monica Airport Sampling



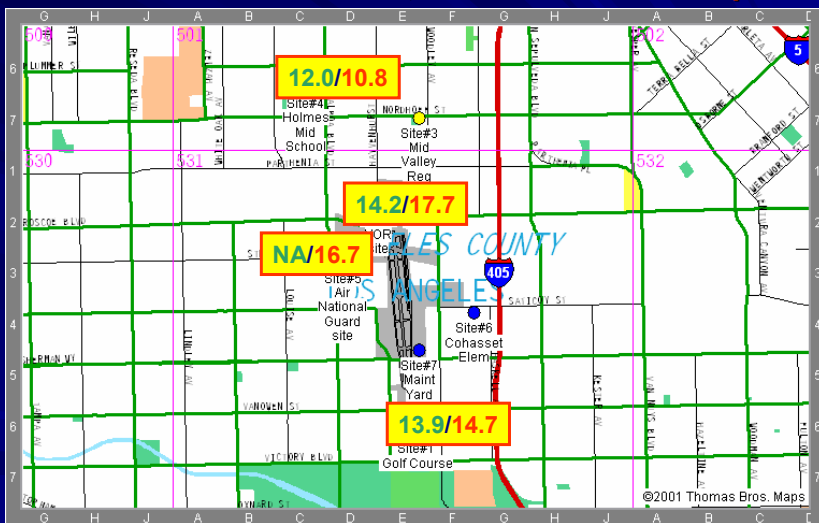
# Santa Monica Airport Sampling Sites



## Preliminary Santa Monica Airport PM<sub>2.5</sub> Mass ( $\mu\text{g}/\text{m}^3$ ) Phase II - Oct 06 - Feb 07



**Preliminary Van Nuys Airport PM2.5 Mass ( $\mu\text{g}/\text{m}^3$ )**  
**Phase I - Nov 05 - Feb 06, Phase II - Jul 06 - Sep 06**



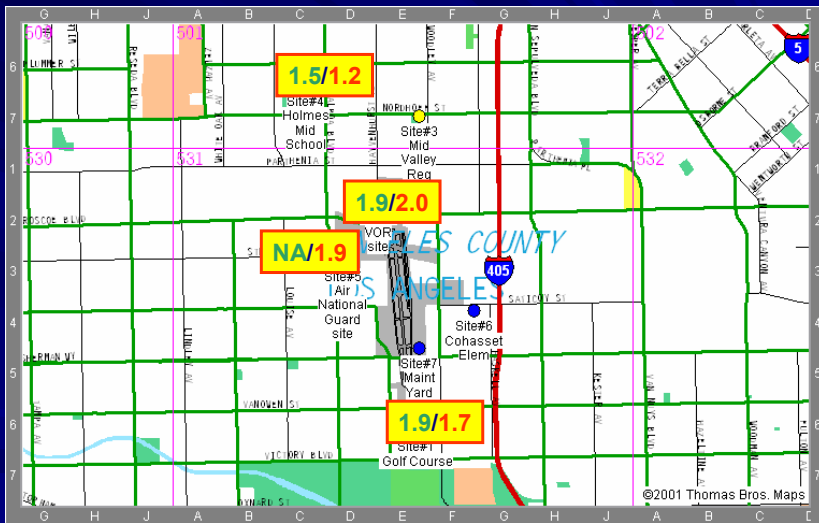
**Annual Basin Average 18.1**

**Preliminary Santa Monica Airport PM2.5 Elemental Carbon ( $\mu\text{g}/\text{m}^3$ )**  
**Phase I - Apr 06 - Jul 06, Phase II - Oct 06 - Feb 07**



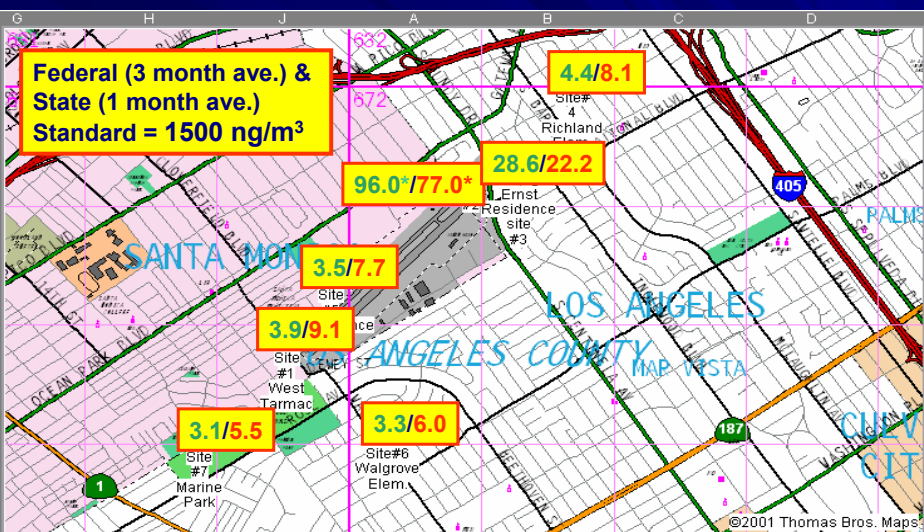
**Annual Basin Average 2.2**

**Preliminary Van Nuys Airport PM2.5 Elemental Carbon ( $\mu\text{g}/\text{m}^3$ )**  
**Phase I - Nov 05 - Feb 06, Phase II - Jul 06 - Sep 06**



**Annual Basin Average 2.2**

**Preliminary Santa Monica Airport TSP Lead ( $\text{ng}/\text{m}^3$ )**  
**Phase I - Apr 06 - Jul 06, Phase II - Oct 06 - Feb 07**

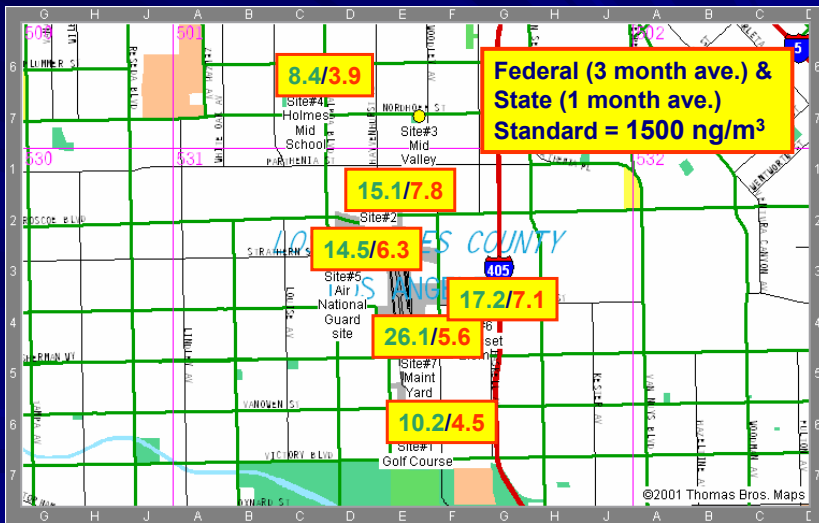


**Downtown LA – Average 13.1**

**Annual Basin Average 8.6**

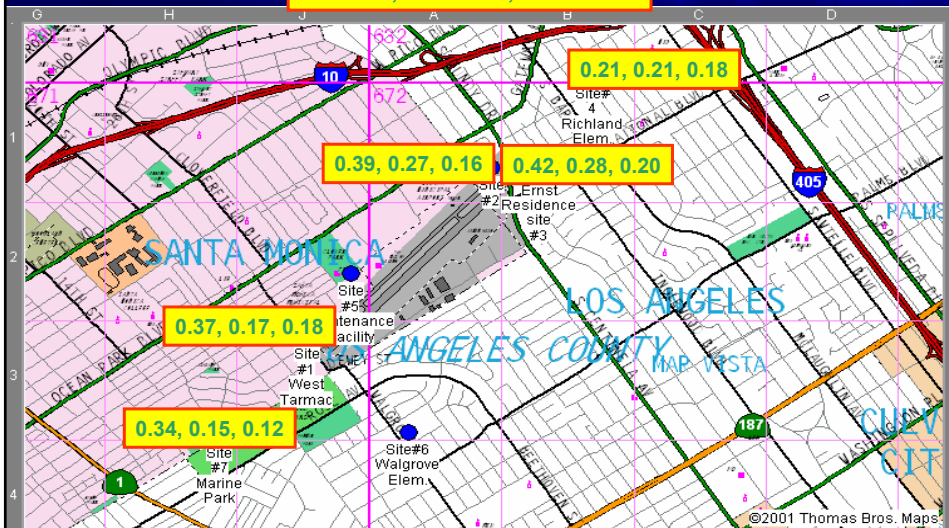


**Preliminary Van Nuys Airport TSP Lead (ng/m<sup>3</sup>)**  
**Phase I - Nov 05 - Feb 06, Phase II - Jul 06 - Sep 06**



**Preliminary Santa Monica Airport Benzene (ppb)**  
**Phase I - Apr 06 - Jul 06**

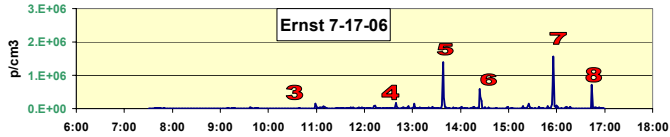
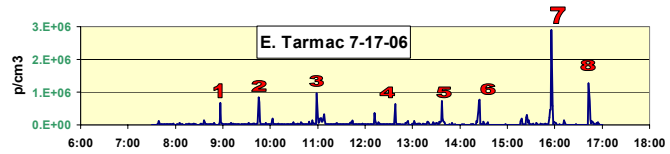
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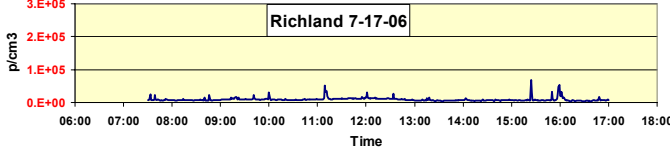
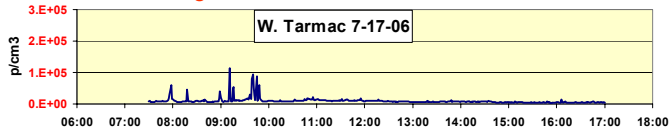
# Santa Monica Continuous Number Concentrations

July 17, 2006

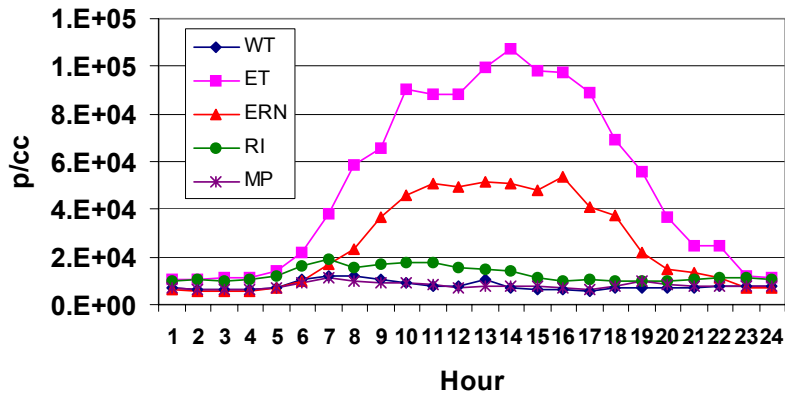
Red numbers  
correspond to  
aircraft take-offs



Note Scale Change



## CPC Hourly Avg Santa Monica Phase I Apr 06 - Jul 06



## GA Airport Results

- Ultrafine particles (measured by number concentration) significantly elevated near runways during aircraft operations
- Lead levels in communities and near runways below federal and state standards, but elevated at near runway sites
- Elemental carbon levels slightly elevated near runways, but still comparable to basin averages
- Airport's influence on PM<sub>2.5</sub> and benzene concentrations not conclusive, but may be higher than basin-wide averages during certain seasons or times of day

## Planned LAX Study

- To be conducted by Los Angeles World Airports (LAWA), 2008-2009
- Comprehensive, state-of-the-art measurement and source apportionment study
- AQMD staff participation in Technical Working Group
- SCAQMD will receive a new U.S. EPA Community-Scale Air Toxics to supplement LAWA study with more continuous instrumentation on mobile sampling platforms