



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



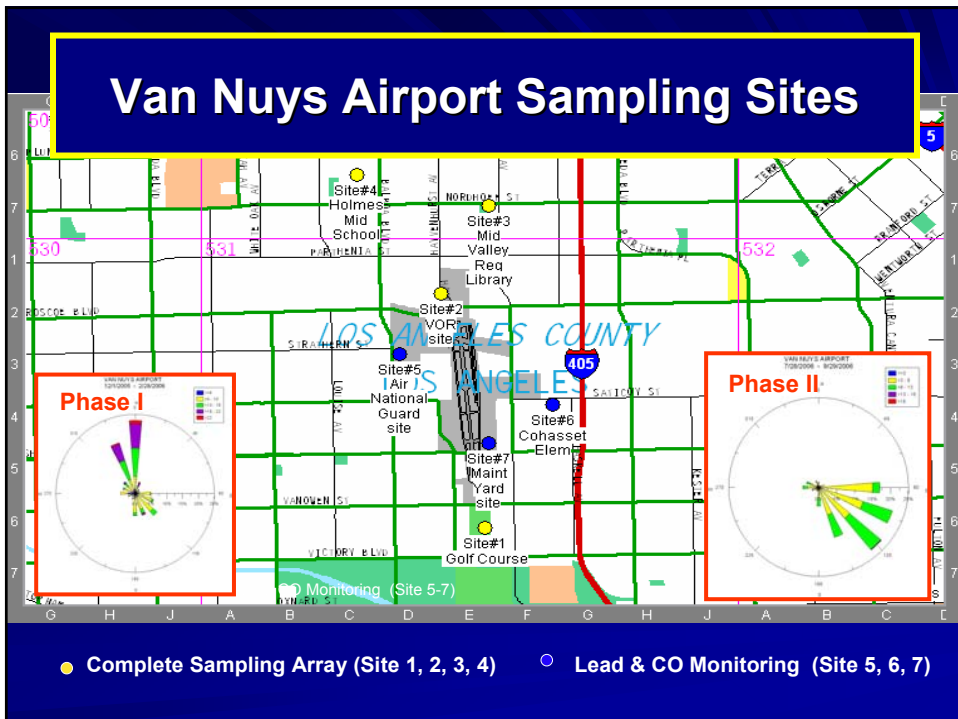
Measurements

- 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

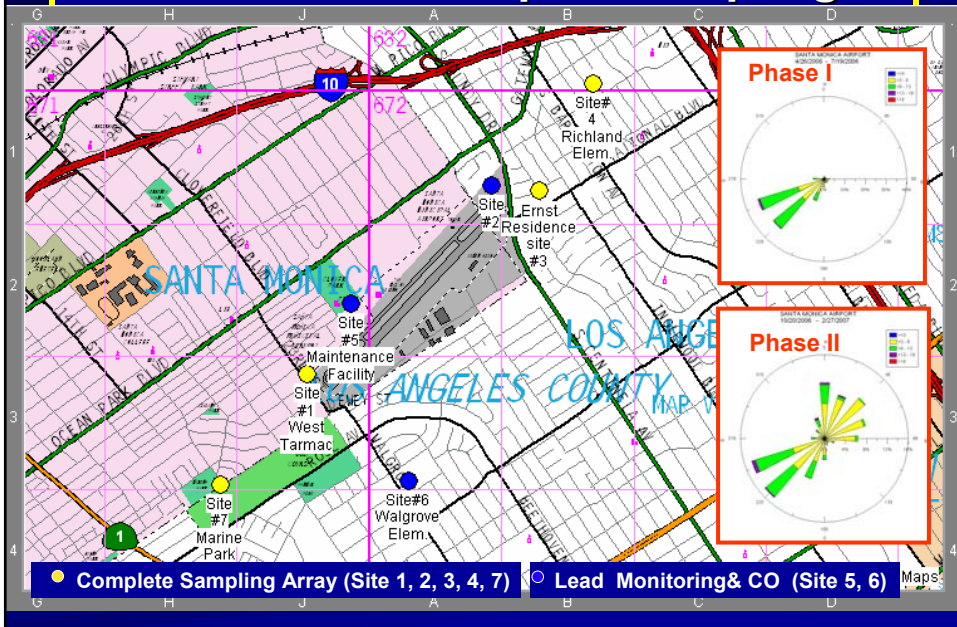


Santa Monica Airport

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



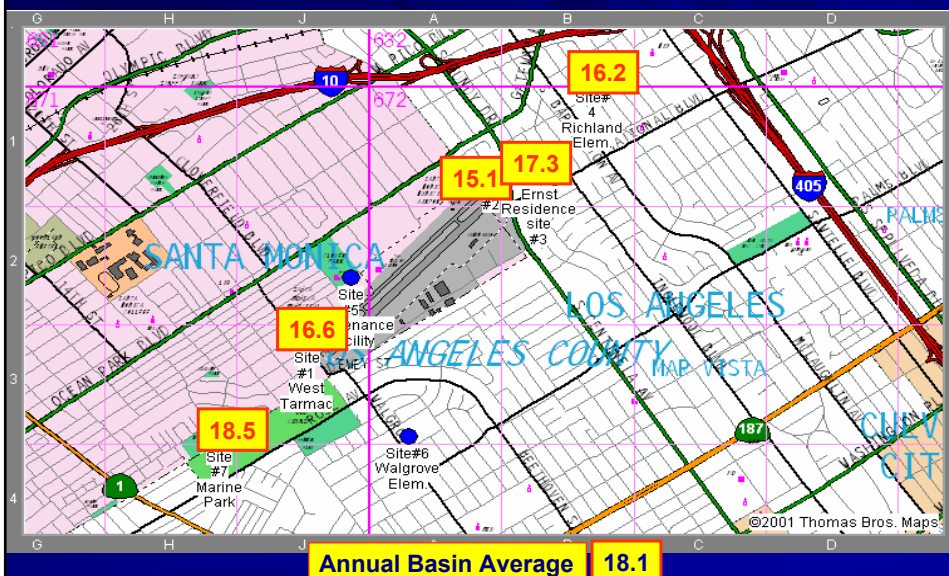
Santa Monica Airport Sampling



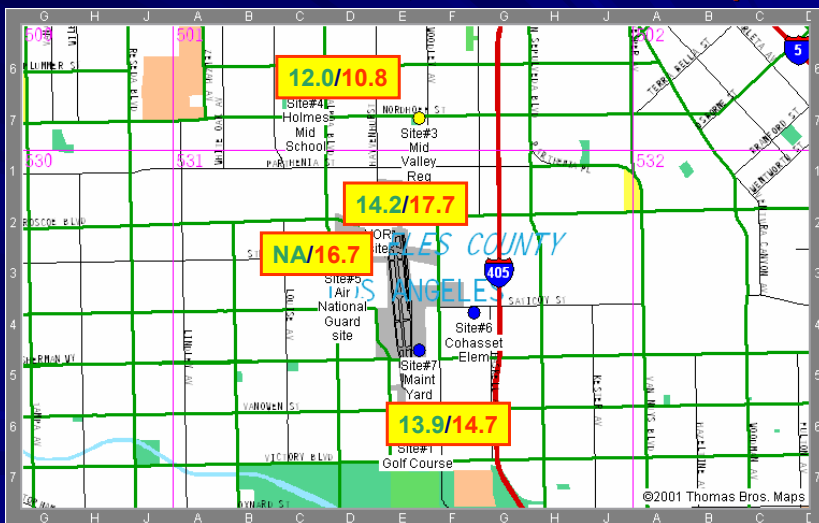
Santa Monica Airport Sampling Sites



Preliminary Santa Monica Airport PM2.5 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



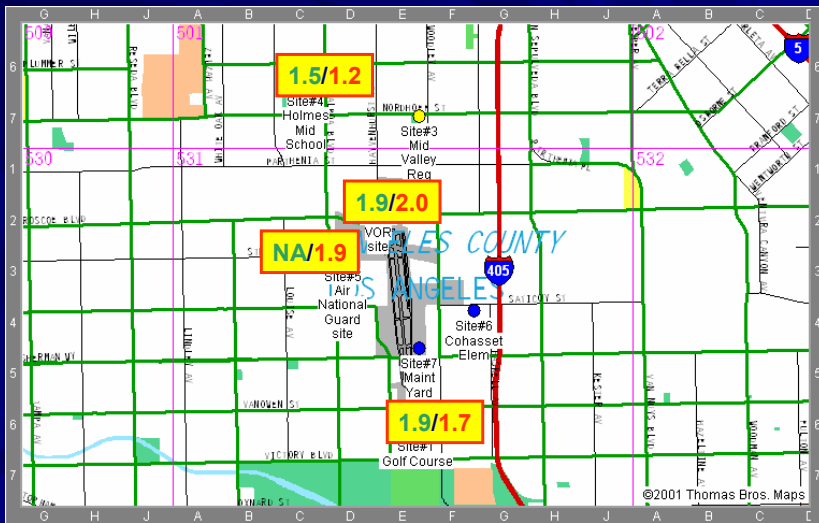
Annual Basin Average 18.1

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



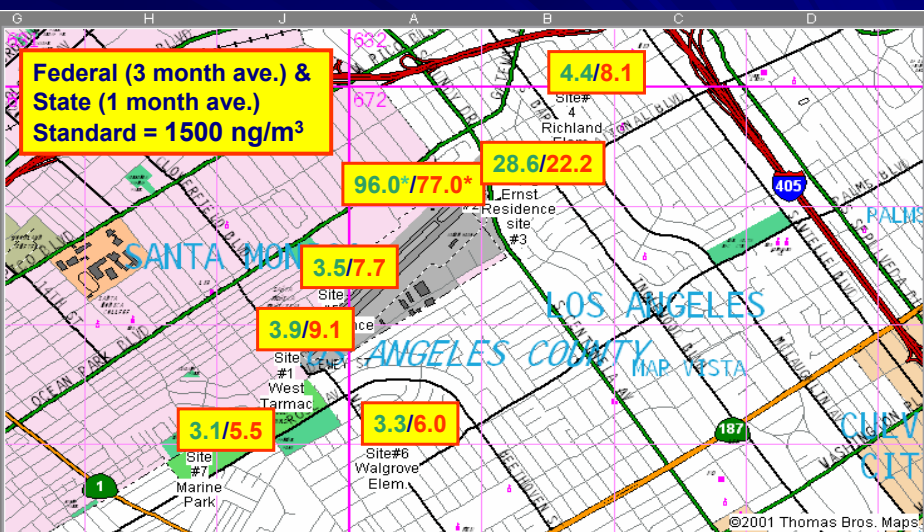
Annual Basin Average 2.2

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 (ng/m^3)
Phase I - Apr 06 - Jul 06, Phase II - Oct 06 - Feb 07

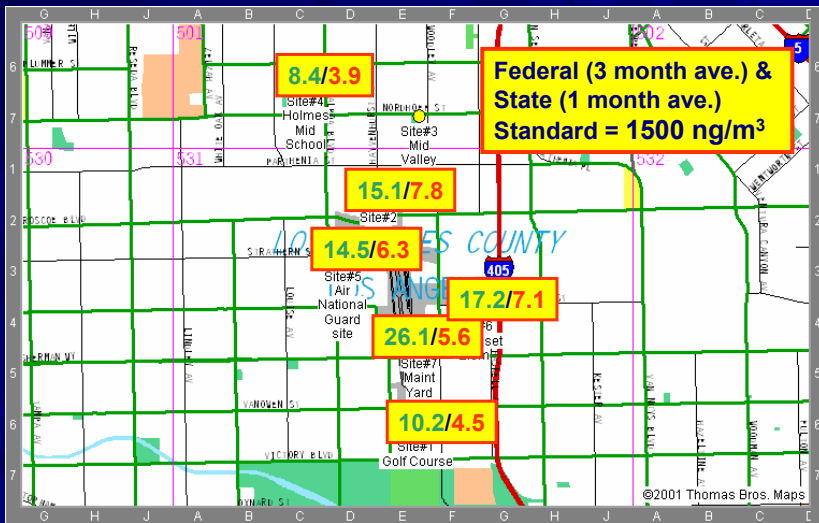


Downtown LA – Average 13.1

Annual Basin Average 8.6

Federal (3 month ave.) & State (1 month ave.) Standard = 1500 ng/m^3

Preliminary Van Nuys Airport TSP Lead (ng/m³)
Phase I - Nov 05 - Feb 06, Phase II - Jul 06 - Sep 06



Annual Basin Average 8.6

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

0:00-8:00, 8:00-16:00, 16:00-24:00

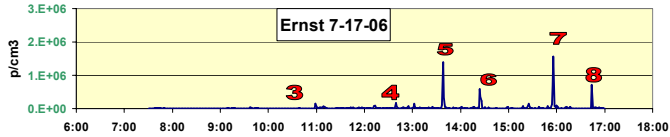
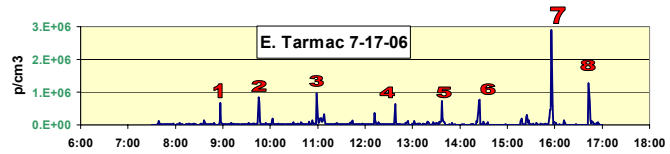


Annual Basin Average 0.42

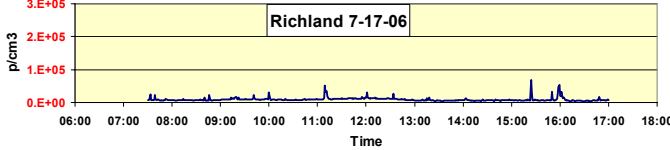
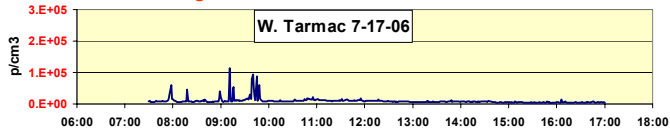
Santa Monica Continuous Number Concentrations

July 17, 2006

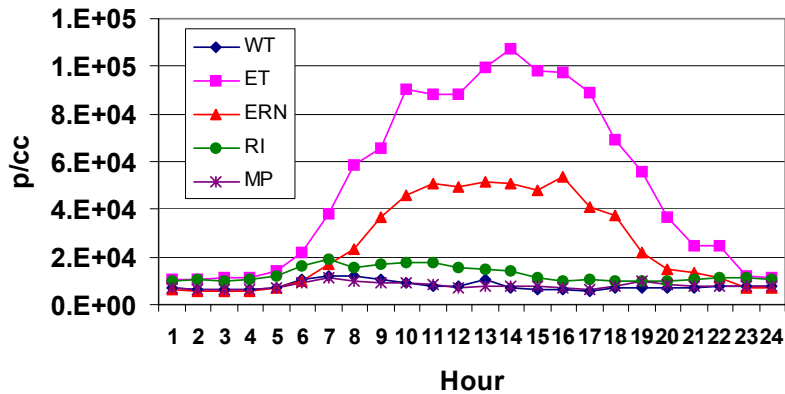
Red numbers
correspond to
aircraft take-offs



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_{2.5} 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