LAX AIR QUALITY and SOURCE APPORTIONMENT STUDY (AQSAS) PHASE III

Board of Airport Commissioners

Los Angeles World Airports

June 18, 2013

Los Angeles World Airports
Facilities Management Group

AQSAS Requirement

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Facilities Management Group

LAWA is required to:

"….. conduct an air quality source apportionment study to evaluate the contribution of on-airport aircraft emissions to off-airport pollutant concentrations.…."

- **Commenced:** **2008**
- **Spent:** **$5,150,000**
- **Report completed:** **June 2013**

Phase III completes AQSAS Study and fulfills LAWA's commitments

Landmark Study

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- First apportionment study of its kind at an airport.
- Study was conducted by internationally recognized team of independent experts in the field of air quality and source apportionment.
- Met the objective of apportioning emissions.
- A supplemental study was performed to further investigate ultrafine particle (UFP) sources.
- Produced valuable new information that will support future research by the scientific community.

AQSAS Study Team

Los Angeles World Airports
Facilities Management Group

- **Salar Niku, Ph.D., Program Manager, Charng-Ching Lin, Ph.D., Technical Project Manager, & Eddy Huang, Ph.D., QA/QC - Tetra Tech, Inc.**
- **Eric Fujita, Ph.D., Source Apportionment - Desert Research Institute**
- **Ronald Henry, Ph.D., Nonparametric Trajectory Analysis - USC**
- **Sarav Arunachalam, Ph.D., Dispersion modeling - UNC, Chapel Hill**
- **Charles Blanchard, Ph.D. & Ivar Tombach, Ph.D., Technical Advisors**
- **Paul Schafer, Field Measurements - SCS Tracer Environmental**
- **Robert Baxter, Field/Data Quality Assurance - T&B Systems, Inc.**
- **Michael Ratte, Emissions Inventory - K&B Environmental Sciences, Inc.**
- **Robert Freeman, Airport Environmental Manager – LAWA**
- **Norene Hastings, Project Manager - LAWA, Environmental Services Div.**
- **CDM Smith – LAWA's Scientific Advisor**
- **Technical Working Group - U.S. Environmental Protection Agency, California Air Resources Board, South Coast Air Quality Management District , Federal Aviation Administration, and California Office of Environmental Health Hazard Assessment, & community organizations**

Complexity of Apportionment Modeling

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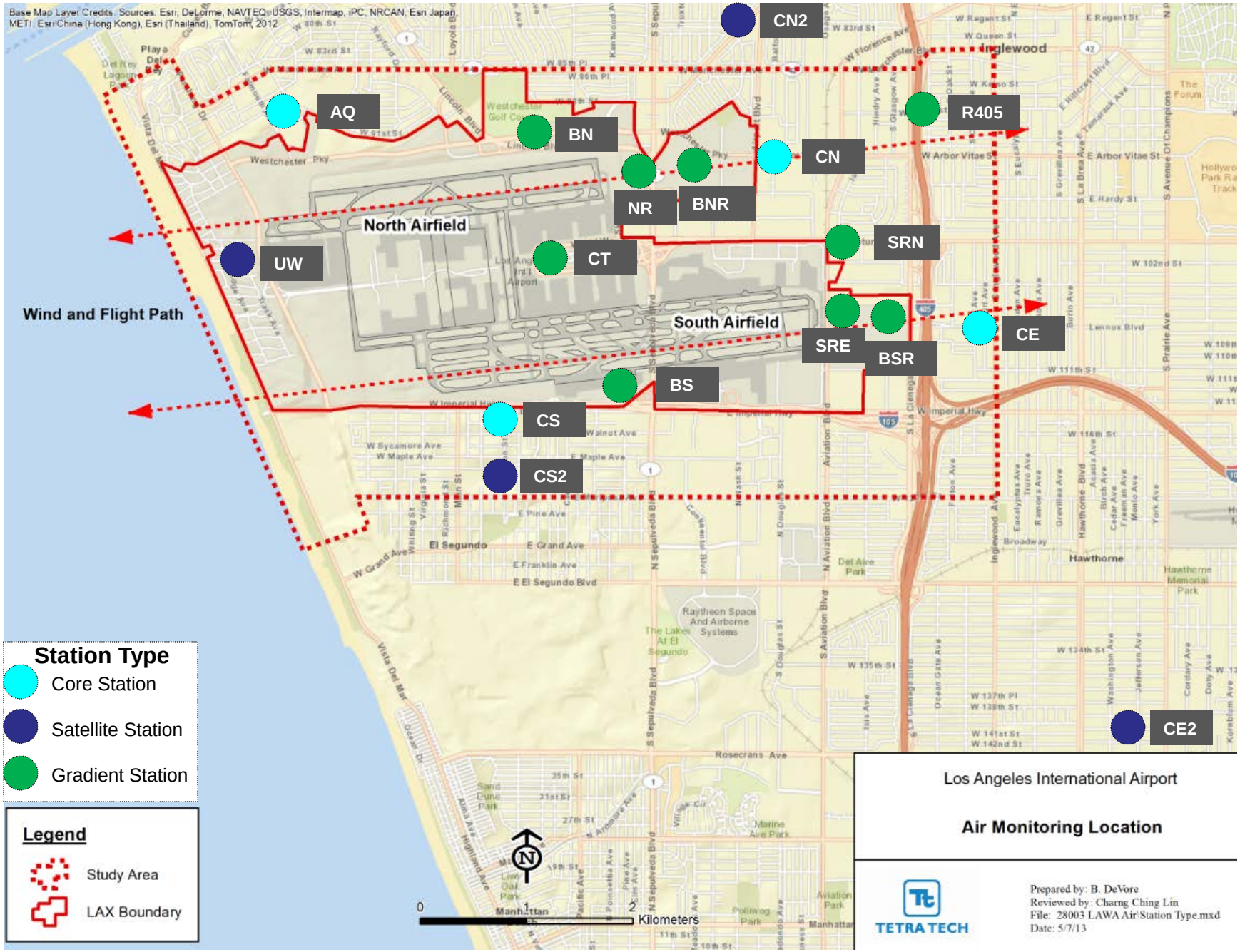
- **Not possible to assign one single percentage for airport-related contributions, or any other sources because:**
  - Airport is not a single stationary emission source, but a collection of stationary and mobile source activity that rise and fall all day.
  - Meteorological variables (wind speed, wind direction, ambient temperature, and others).
  - Air quality varies by hour of the day, day of the week, and by season.
  - Different models have different limitations and generate different results.
  - When concentrations are low, a small change in value results in a major change in percentage.


Base Map Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012
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Satellite Station
Gradient Station
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Los Angeles International Airport
Air Monitoring Location
TETRA TECH
Prepared by: B. DeVore
Reviewed by: Charng Ching Lin
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Key Findings & Conclusions

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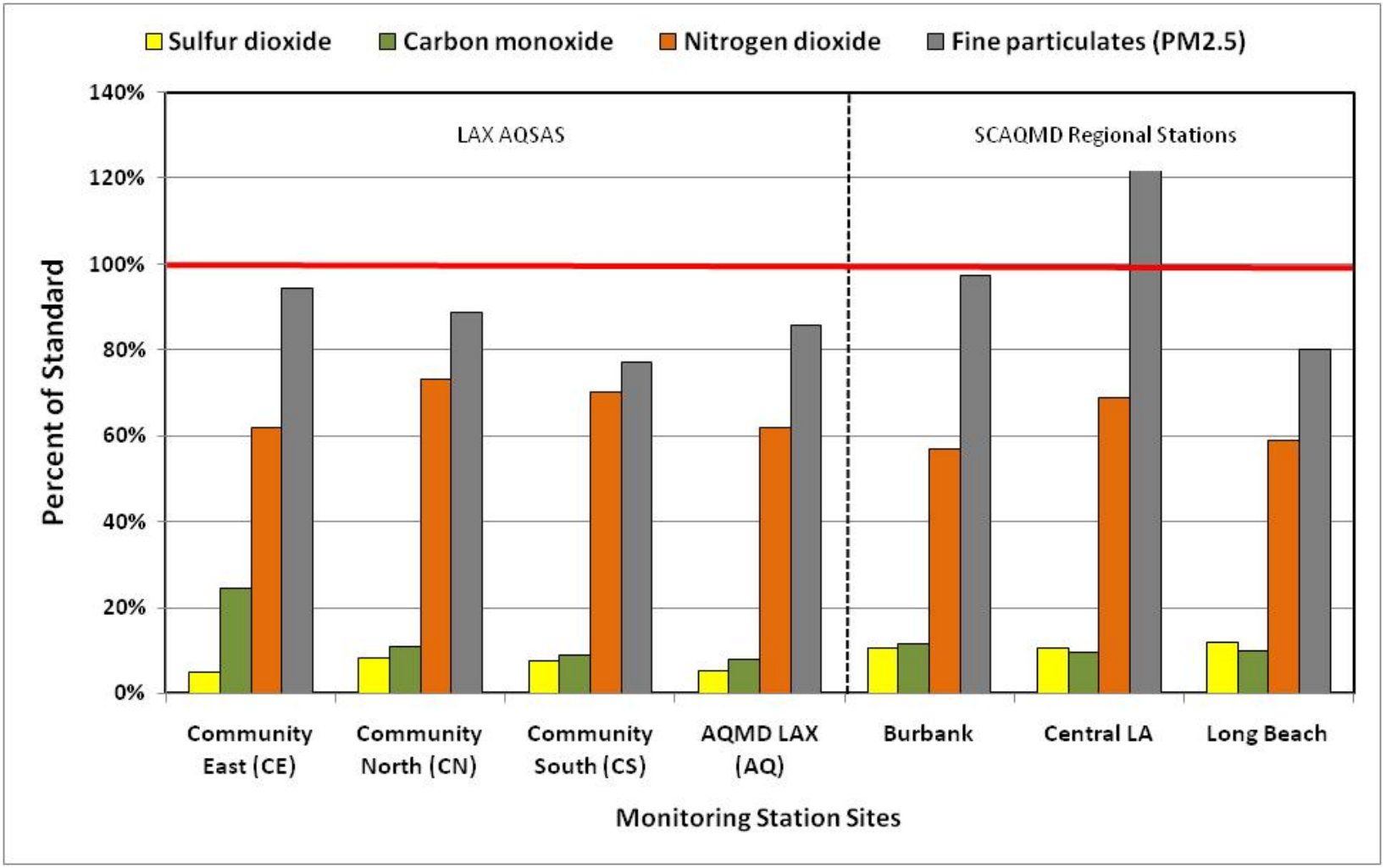
All major pollutants were below National Ambient Air Quality Standards & California Ambient Air Quality Standards



Key Findings & Conclusions (cont.)

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- **Air Toxics are comparable or lower than elsewhere in the South Coast Air Basin.**
- **Air pollutant concentrations show sharp decreases as distance from the source of emissions increases.**
- **Main sources of Oxides of Nitrogen (NOx), Carbon Monoxide (CO), and Black Carbon (BC) in the Study Area were local traffic on or near the I-105 and I-405 freeways.**
- **90 percent of the ambient Particulate Matter 2.5 µm ($PM_{2.5}$) concentration in the Study Area is from non-airport related sources and regional background including secondary aerosols.**
- **Main source areas for Sulfur Dioxide (SO_2) are the Central Terminal Area (CTA), and the North and South Airfields.**

Apportionment Modeling Findings

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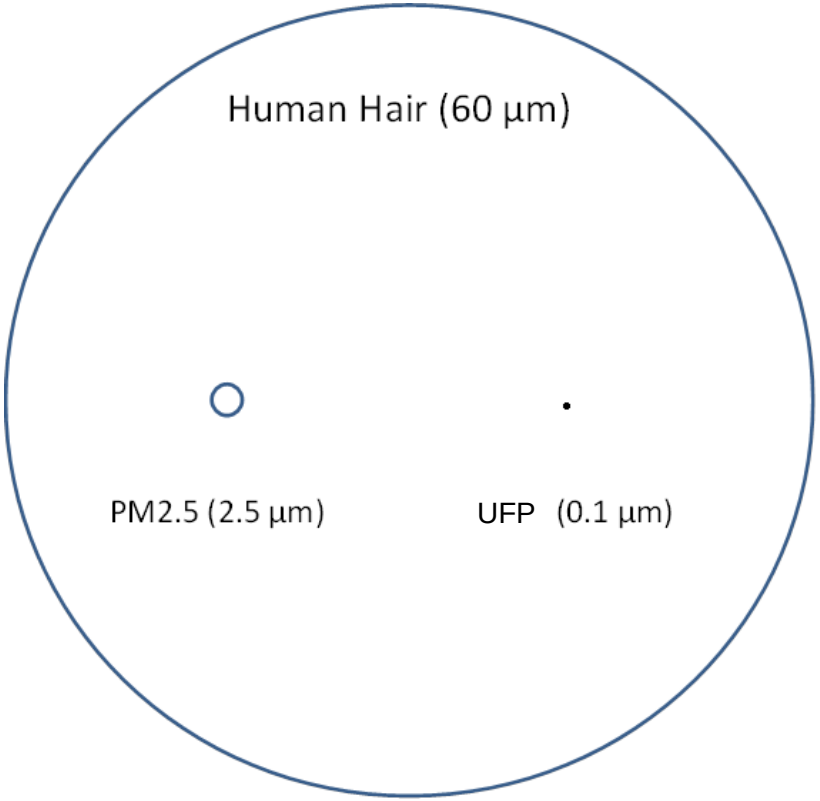
- $PM_{2.5}$: 10% airport-related contribution
- CO: 11 to 51%
- NO_x: 16 to 76%
- BC: 17 to 70%
- SO_2: 9 to 84%
- UFP: 52 to 94%

Comparison of $PM_{2.5}$ and Ultrafine PM



AQSAS UFP Supplemental Study

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- **Based on data analysis from first season sampling, a supplemental study was conducted to further investigate UFP sources.**
- **Larger UFP particles indicated an association with vehicle emissions.**
- **Smaller UFP particles indicated an association with jet exhaust and possibly secondary particles.**
- **Currently no regulatory standard for UFP.**

Next Steps

- **June 18, 2013 – Report posted to project website/printed copies to be provided to local libraries by end of June 2013**
- **June to October 2013 - Public review period**
- **September 2013 - Public information meeting**
- **Late 2013 - An appendix noting public feedback received will be posted on the project website.**

http://www.lawa.org/airqualitystudy