Air Monitoring in the Boyle Heights Area

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Clean Communities Plan Meeting
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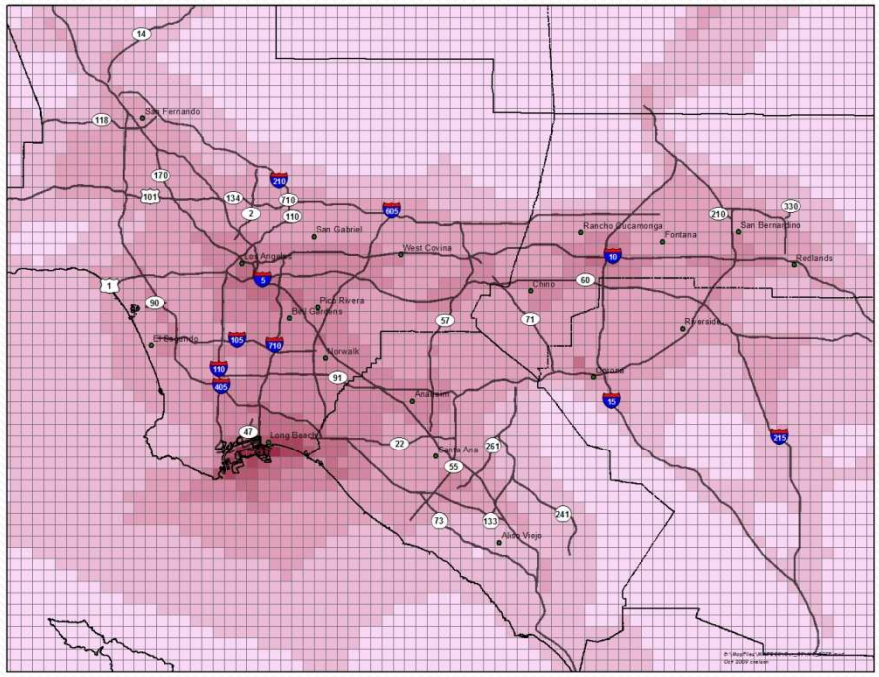
Boyle Heights

Background

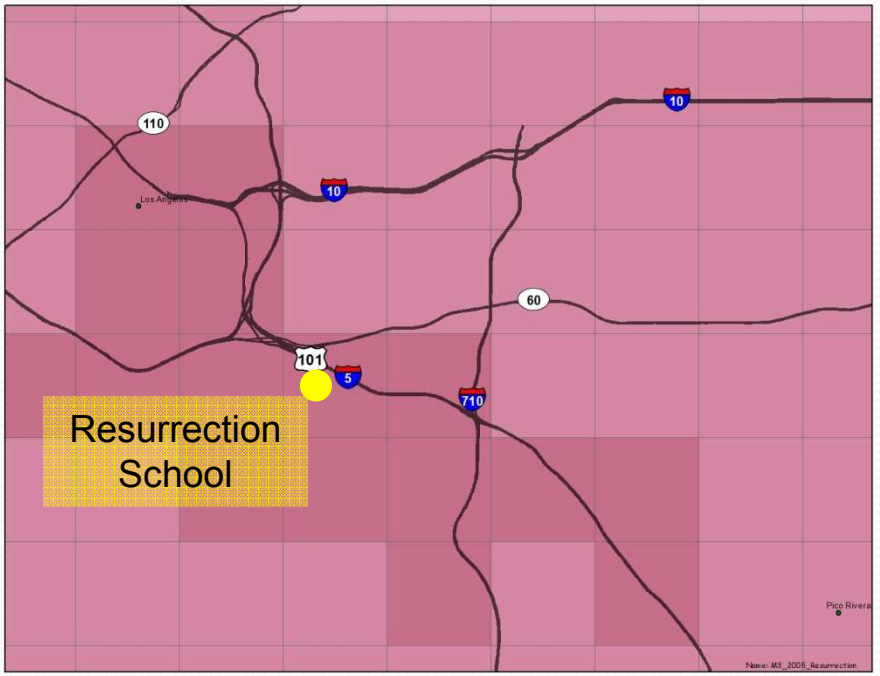
- Boyle Heights is an area surrounded by busy freeways, dense surface streets, and goods movement activities
- Bordered by heavy industrial areas such as the city of Vernon, where Exide Technologies and several rendering plants are located
- Concern among local residents and community groups about increased levels of pollution from vehicles and industrial sources

Background – MATES III



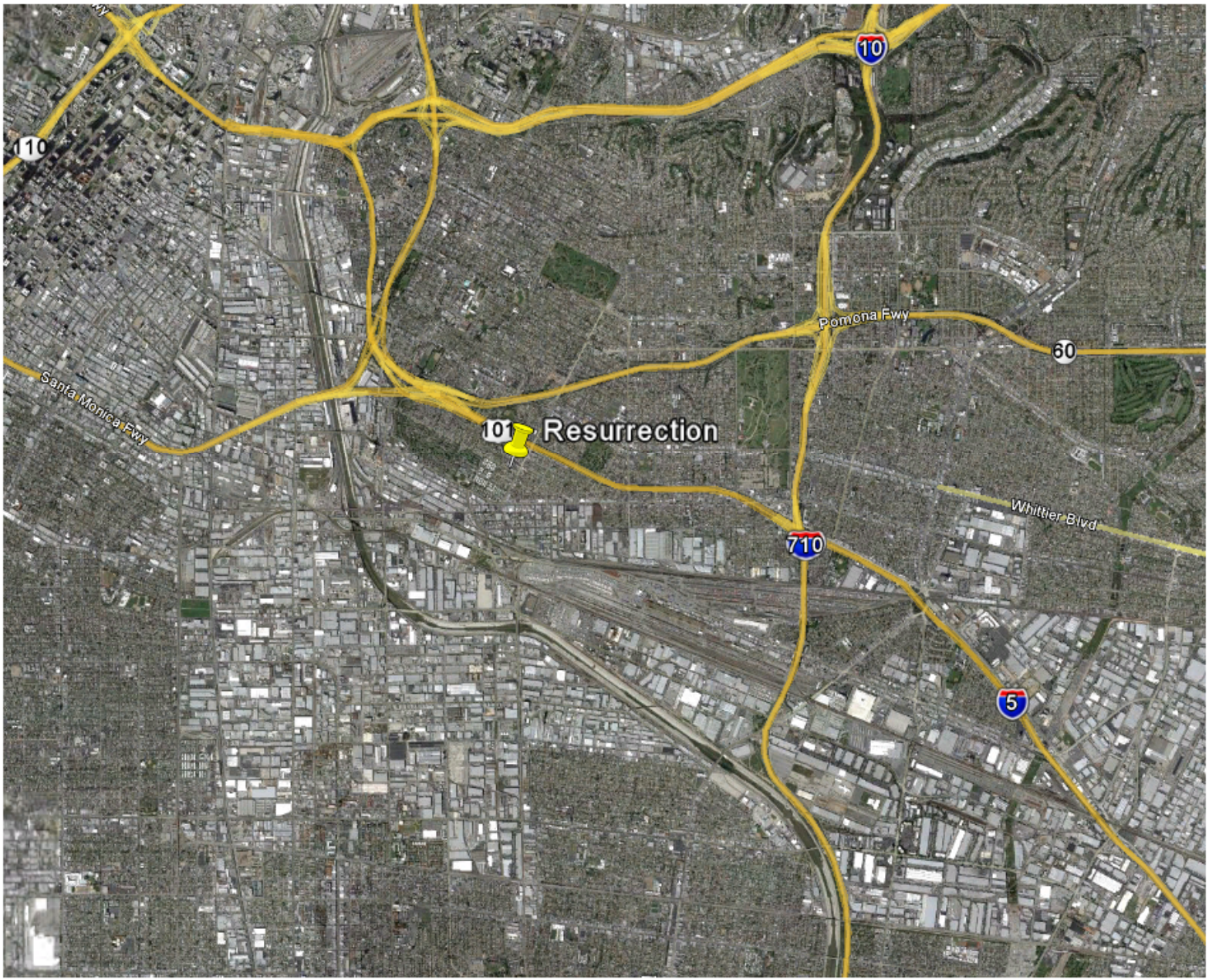
Model Estimated Carcinogenic Risk (risk/million)

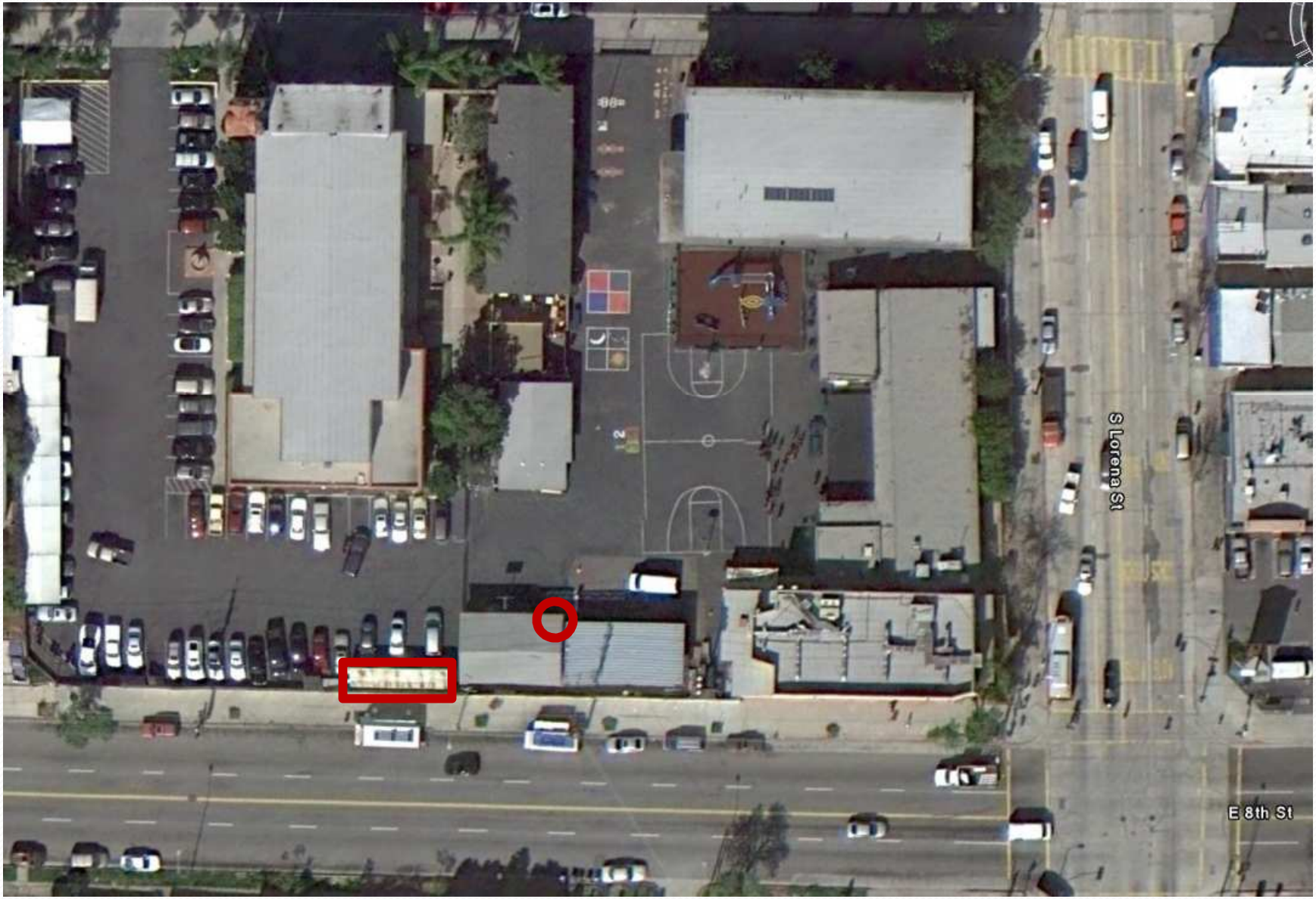
- Resurrection School: 1713
- Los Angeles (N Main Street): 1404
- Rubidoux (Mission Blvd): 927



AQMD Study

- Air toxics monitoring at Resurrection Catholic School between April 2009 and May 2010
- Data compared to Central Los Angeles and Rubidoux monitoring stations during the same time period
- Long-term exposure study
- Final Report is being prepared

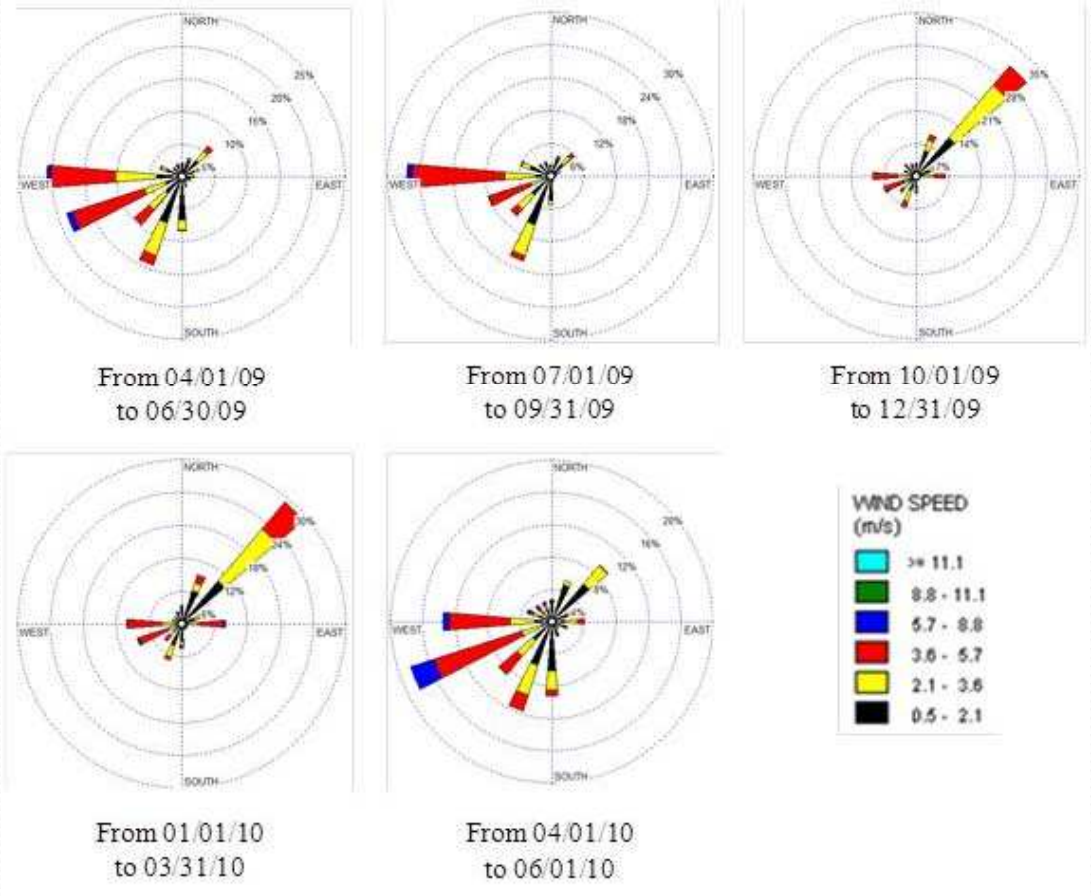

10
110
Pomona Fwy
60
Santa Monica Fwy
101
Resurrection
Whittier Blvd
710
5


S Lorena St
E 8th St

Pollutants Measured

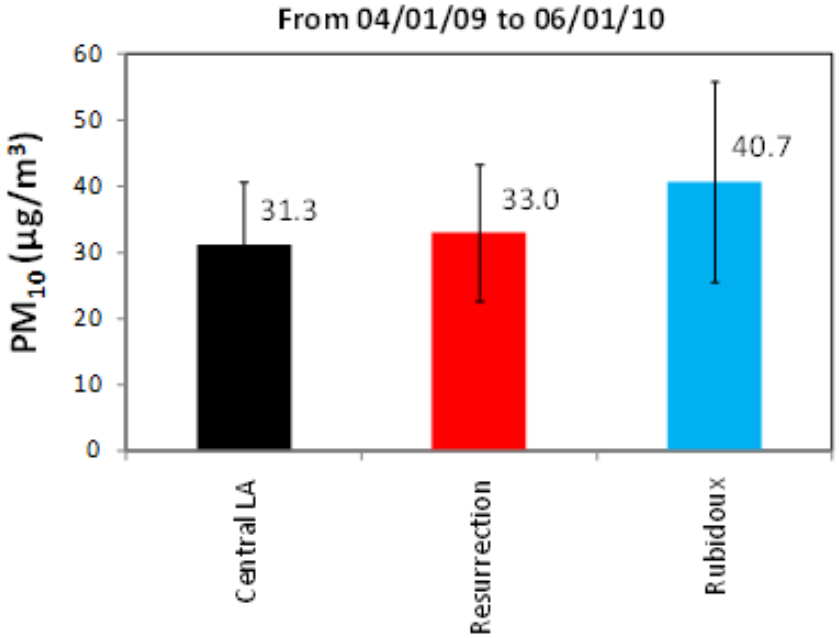
- "MATES" – type monitoring at all three stations included:
  - PM_{10} mass
  - $PM_{2.5}$ mass
  - $PM_{2.5}$ Elemental Carbon (Indicator of diesel PM)
  - Hexavalent Chromium (Cr6+)
  - Lead and other trace metals
  - Air toxic gases (VOCs and Carbonyls)
  - Continuous Black Carbon (BC)
  - Wind Direction and Speed
- All integrated samples were collected on a 1-in-6 day schedule

Wind Patterns



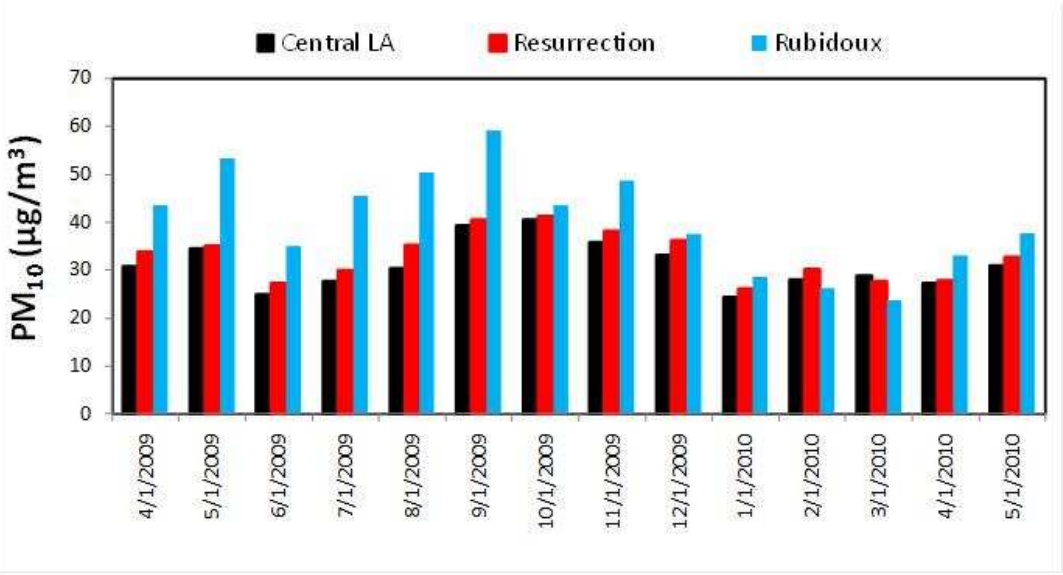
- The warmer months showed a typical onshore winds
- Colder fall and winter conditions showed fairly strong “Santa Ana” winds coming from north-east

Results: PM_{10}

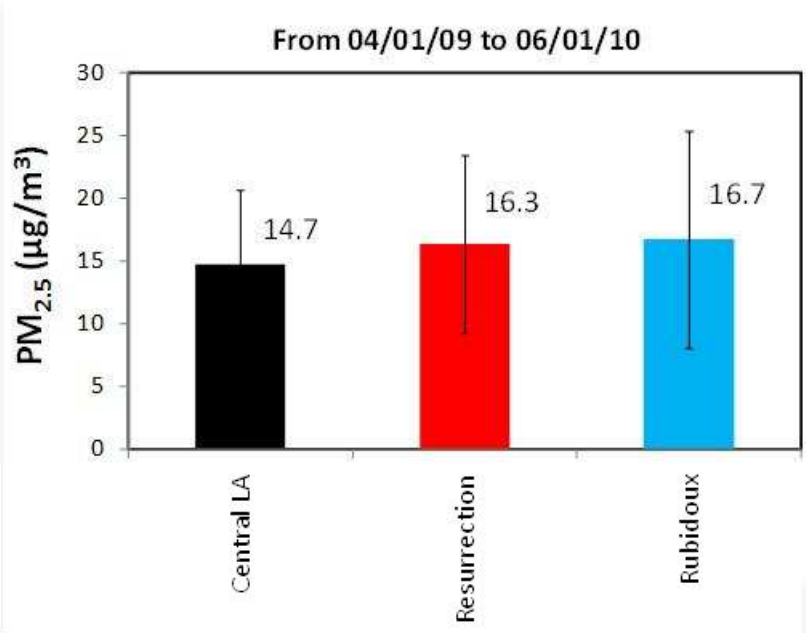


- Resurrection very similar to Central LA, and less than Rubidoux
- Monthly patterns very similar at Resurrection and Central LA

- PM_{10} levels never exceeded the Federal standard PM_{10} (150 µg/m^3) at Resurrection or other sites

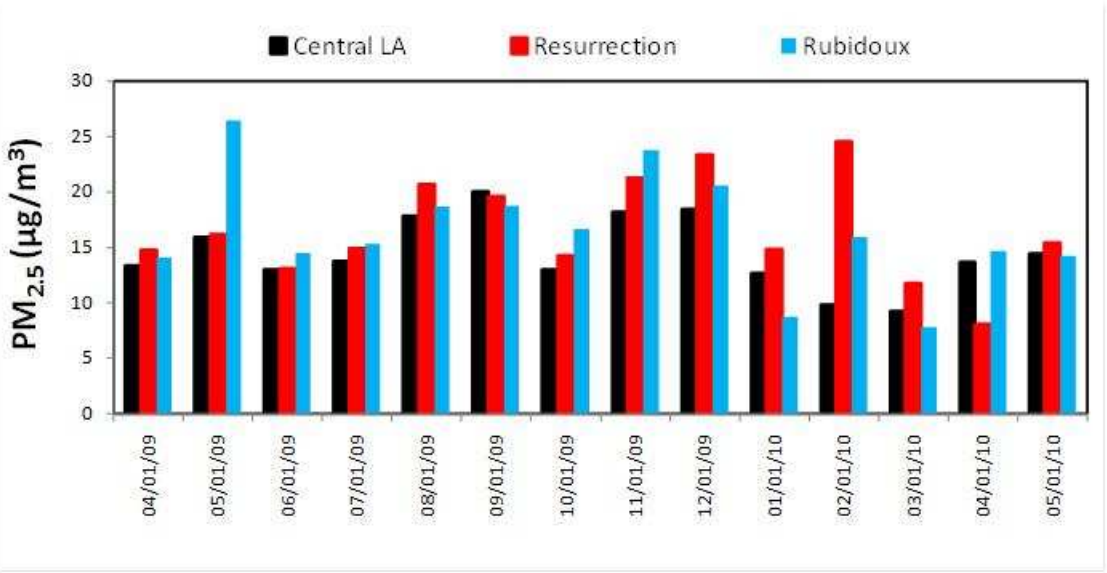


Results: $PM_{2.5}$

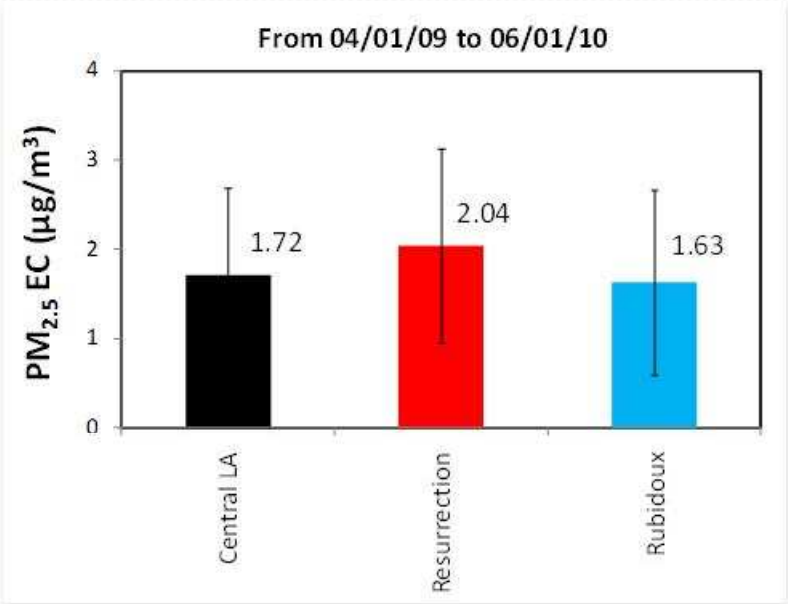


- Resurrection higher than Central LA, lower than Rubidoux. Emissions from motor vehicles, industrial facilities, and other local sources can contribute
- Different sampling method at Resurrection known to read higher

- Average $PM_{2.5}$ concentrations are slightly above the annual Federal standard (15 µg/m^3) at Resurrection
- Daily $PM_{2.5}$ levels at Resurrection exceeded the daily Federal standard (35 µg/m^3) on two days

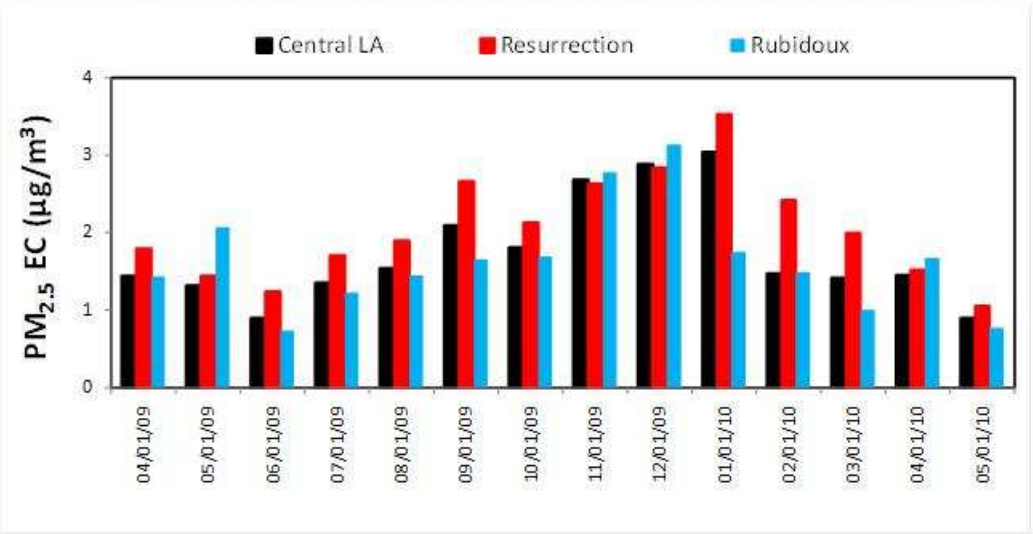


Results: Elemental Carbon (Diesel PM)

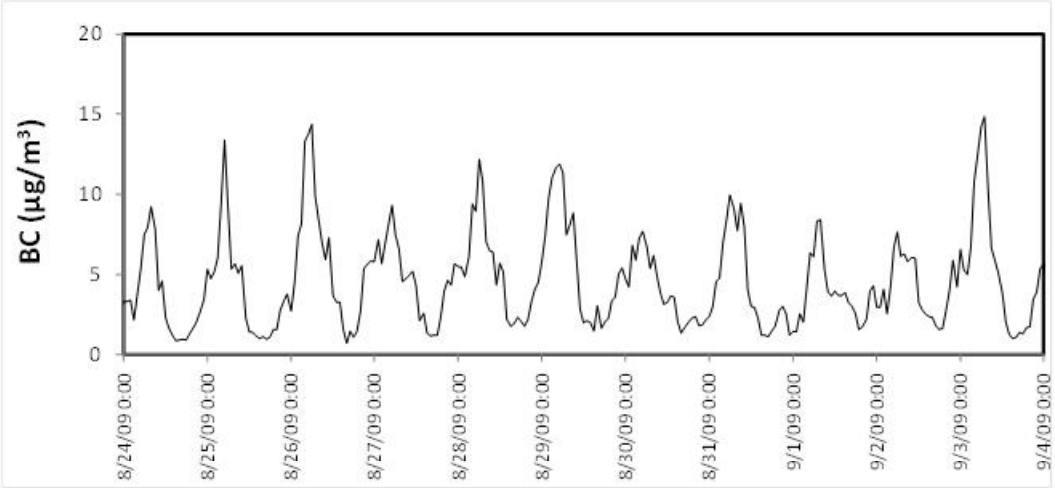


- Higher EC concentrations were measured at the Resurrection School
- May reflect the close proximity to the nearby road and the I-5 (about 5% diesel trucks)
- Levels are not unusual for urban areas in Los Angeles (MATES III)

- EC is currently not a regulated pollutant
- Diesel PM is considered to be an air toxic with associated cancer risk

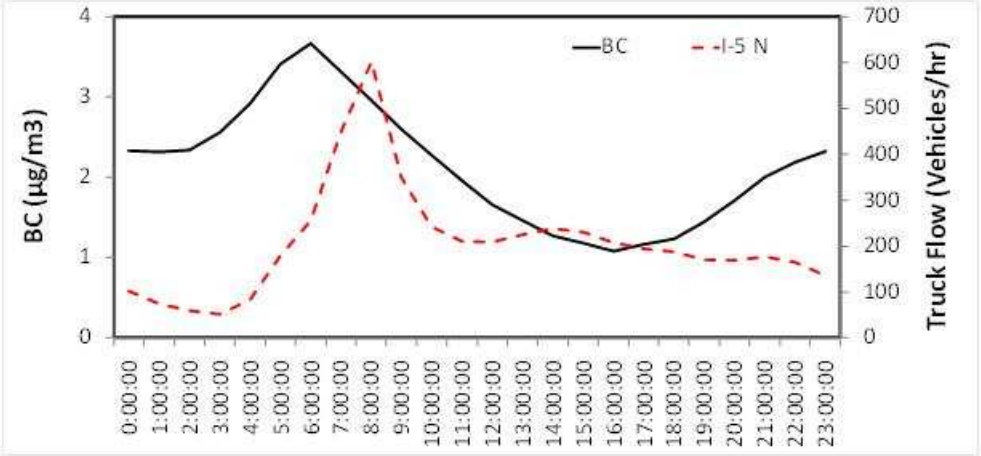


Results: Black Carbon (Diesel PM)

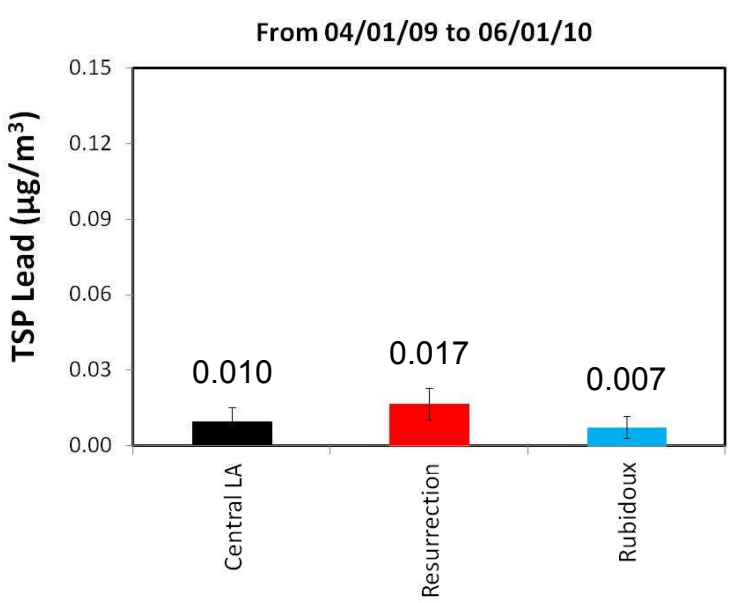


- Black Carbon is similar to Elemental Carbon and is another indicator of diesel PM
- Daily pattern shows morning peaks when air is calm and traffic is high

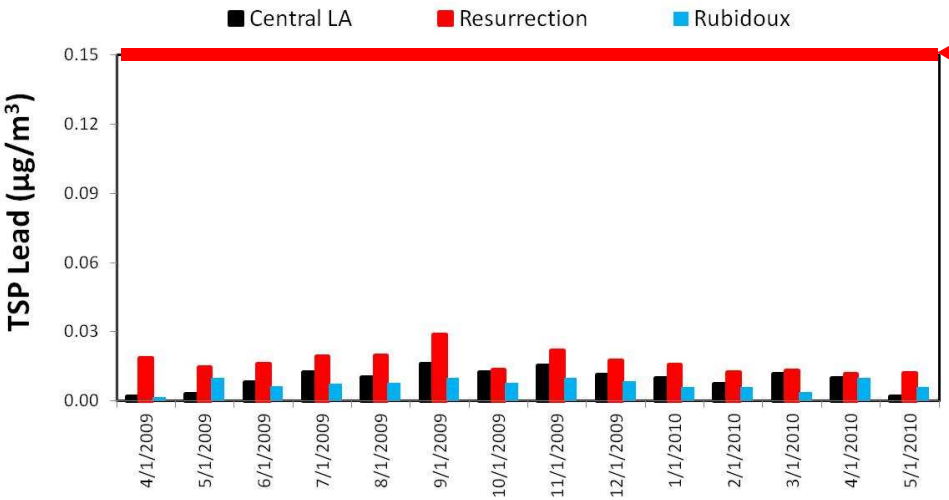
- Black Carbon is also not currently a regulated pollutant



Results: Lead



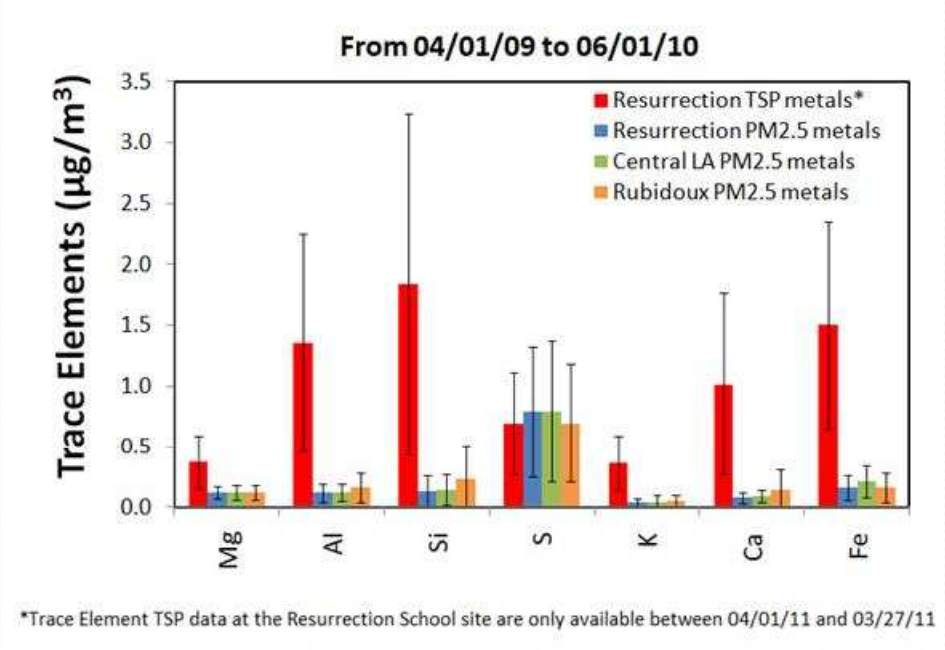
- Highest lead levels measured at Resurrection
- Possibly an influence from Exide Technologies, but wind rarely blows in that direction
- Could be direct emissions or re-suspension of historically deposited particles
- Higher days do not correspond to higher days at Exide



Federal std (3 month average)

- All concentrations measured at the three monitoring sites were well below the current Federal standard for lead (0.15 µg/m^3 over 3-months)

Results: Trace Elements

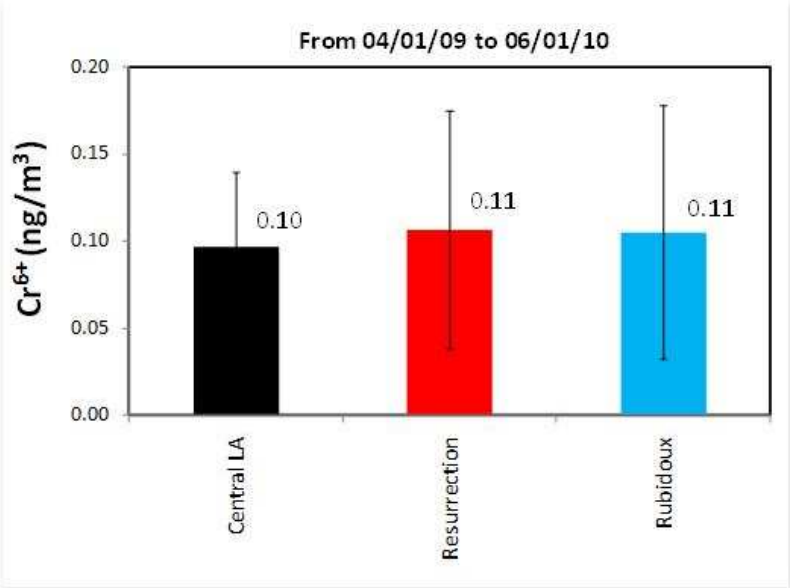


• The spatial distribution of each trace element was quite uniform across all sampling stations

• Sulfur was the most abundant metal in the collected $PM_{2.5}$ samples

• Overall, the temporal profile of the trace elements measured during this study is variable (not shown)

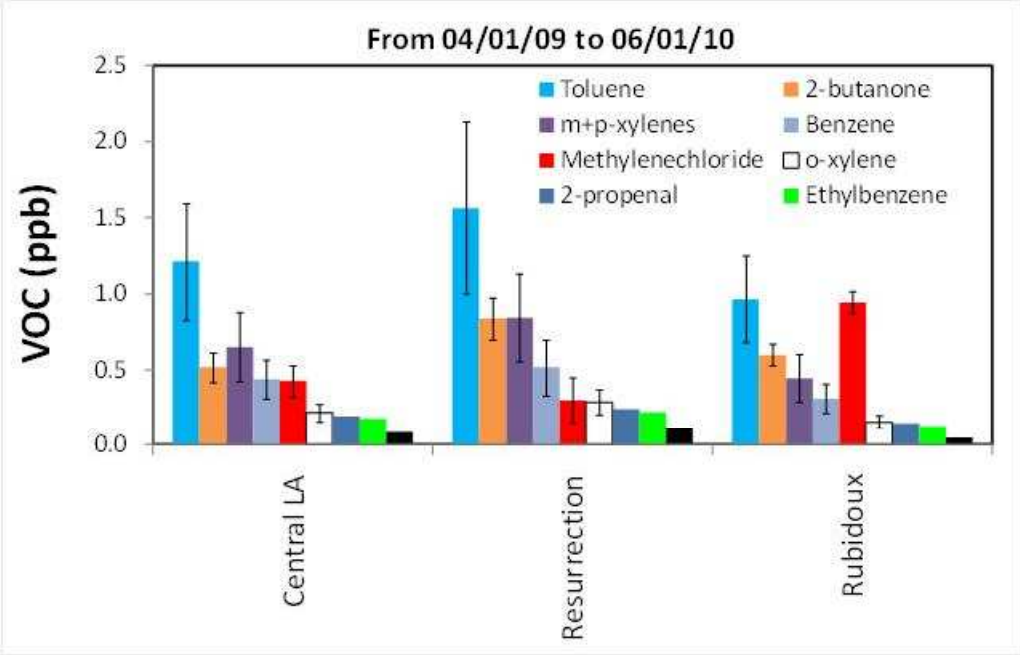
Results: Hexavalent Chromium



- Similar study average Cr6+ concentrations at all three sites
- Equivalent to urban background
- Highly variable temporal pattern

- All Cr6+ concentrations measured during this study are similar or below those observed by AQMD during other measurement studies conducted in the South Coast Air Basin (e.g. MATES III)

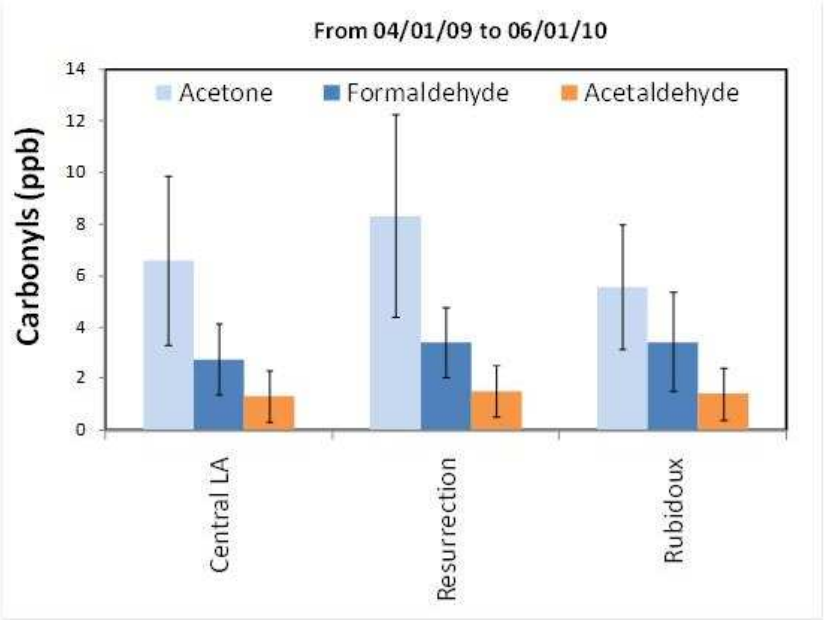
Results: VOCs



- Gaseous emissions from motor-vehicles is likely to be the predominant source of these VOCs
- Slightly higher levels of some VOCs at Resurrection may be due to the close proximity of this site to the I-5 and other highly trafficked surface streets
- The potential contribution of emissions from nearby industrial facilities cannot be excluded

•The VOC concentration was generally higher during the colder months, consistent with typical seasonal changes in meteorological conditions

Results: Carbonyls



• The average concentrations of these carbonyl compounds at Resurrection were comparable to those recorded at the Central Los Angeles and Rubidoux stations and followed a similar seasonal pattern

• Mostly affected by motor-vehicle emissions and proximity to local streets

Conclusions

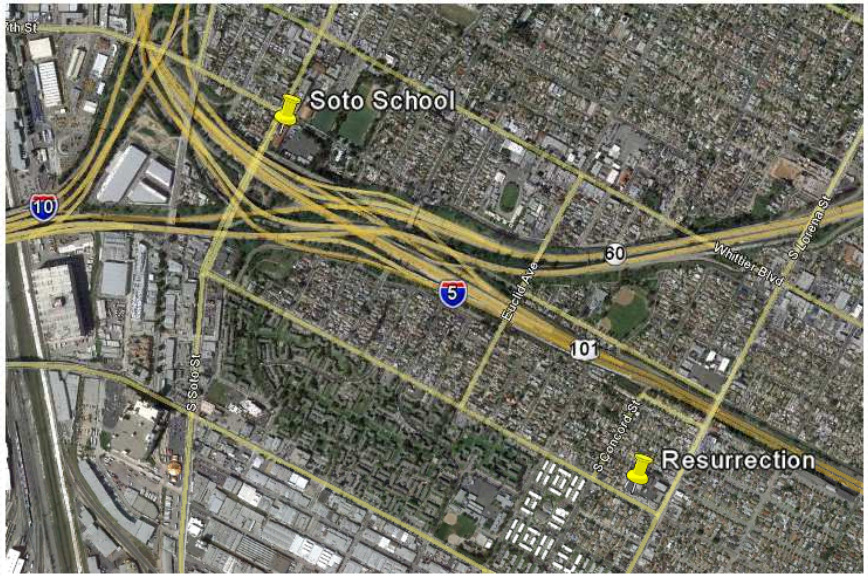
- The Resurrection School site experiences air pollutant concentrations that are typical of other urban areas of Los Angeles dominated by mobile source emissions
- Atmospheric concentrations of mobile source pollutants are slightly higher due to very close proximity of roadways (i.e diesel trucks, gasoline vehicles)
- Lead concentrations were higher at Resurrection than in Central Los Angeles and Rubidoux, but well below the Federal standard (0.15 $\mu g/m^3$). Cannot rule out an influence from Exide Technologies, but other historical sources are more likely

Other Boyle Heights Monitoring Studies

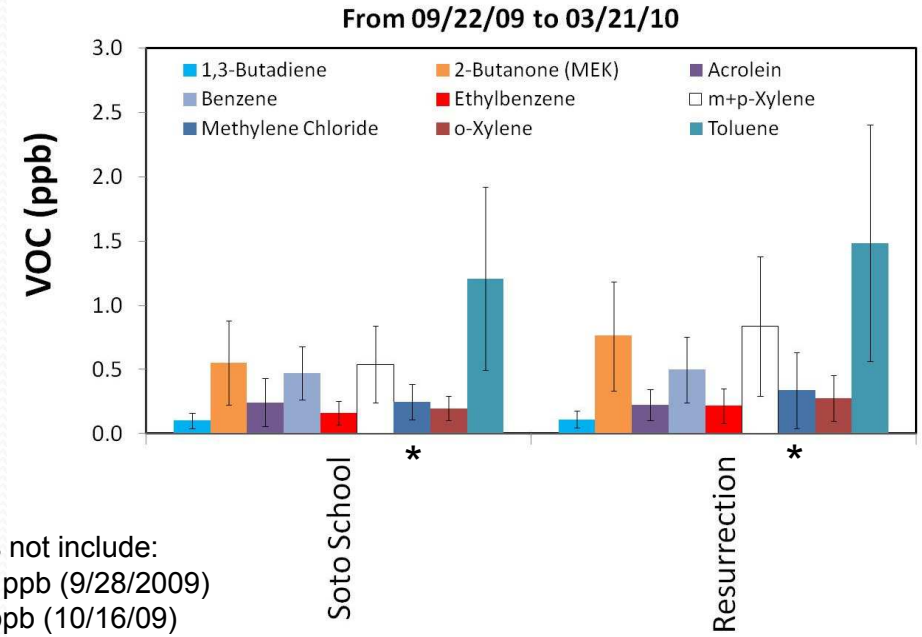
- U.S. EPA School Air Toxics Study
  - •EPA study design, laboratory analyses, data assessment, and reporting
  - •AQMD assisted with site set-up and sample deployment
  - •Three schools in South Coast Basin
    - •Felton Elementary (Lennox)
    - •Santa Anita Christian Academy (El Monte)
    - •Soto Street Elementary (Boyle Heights)
  - •Summer 2009 to Early 2010, minimum of ten samples
  - •Limited sampling for targeted air toxics, did not include diesel PM
  - •Findings consistent with AQMD studies for the pollutants measured
  - •Results and reports can be found at:

http://www.epa.gov/schoolair/

Results: VOCs



1000 m



*Does not include:
22.09 ppb (9/28/2009)
5.97 ppb (10/16/09)

Other Boyle Heights Monitoring Studies

- AQMD MATES II Microscale site
  - Location at 1100 Spence St.
  - One month of sampling in October 1998
  - Results were similar to companion fixed site in Huntington Park
- CARB SB25 Community Air Toxics Monitoring
  - Hollenbeck Middle School
  - Satellite sites at East Los Angeles Mathematics, Science, and Technology Center and Soto Street Elementary School for PM10 and PAH
  - February 2001 to May 2002
  - Mobile source influence found, results similar to companion sites at Burbank and Downtown LA
  - Final report can be found at: http://www.arb.ca.gov/ch/reports/boyle_hts_SB25_Report.pdf

Other Boyle Heights Monitoring Studies

- USC/UCLA Studies
  - Mobile platform measurements
  - March – July 2008
  - Found higher ultrafine levels
  - Not yet published
- CARB
  - “Chase” experiments
  - June 2010
  - Looking for high emitting vehicles
  - Not yet published