

Health Effects Update

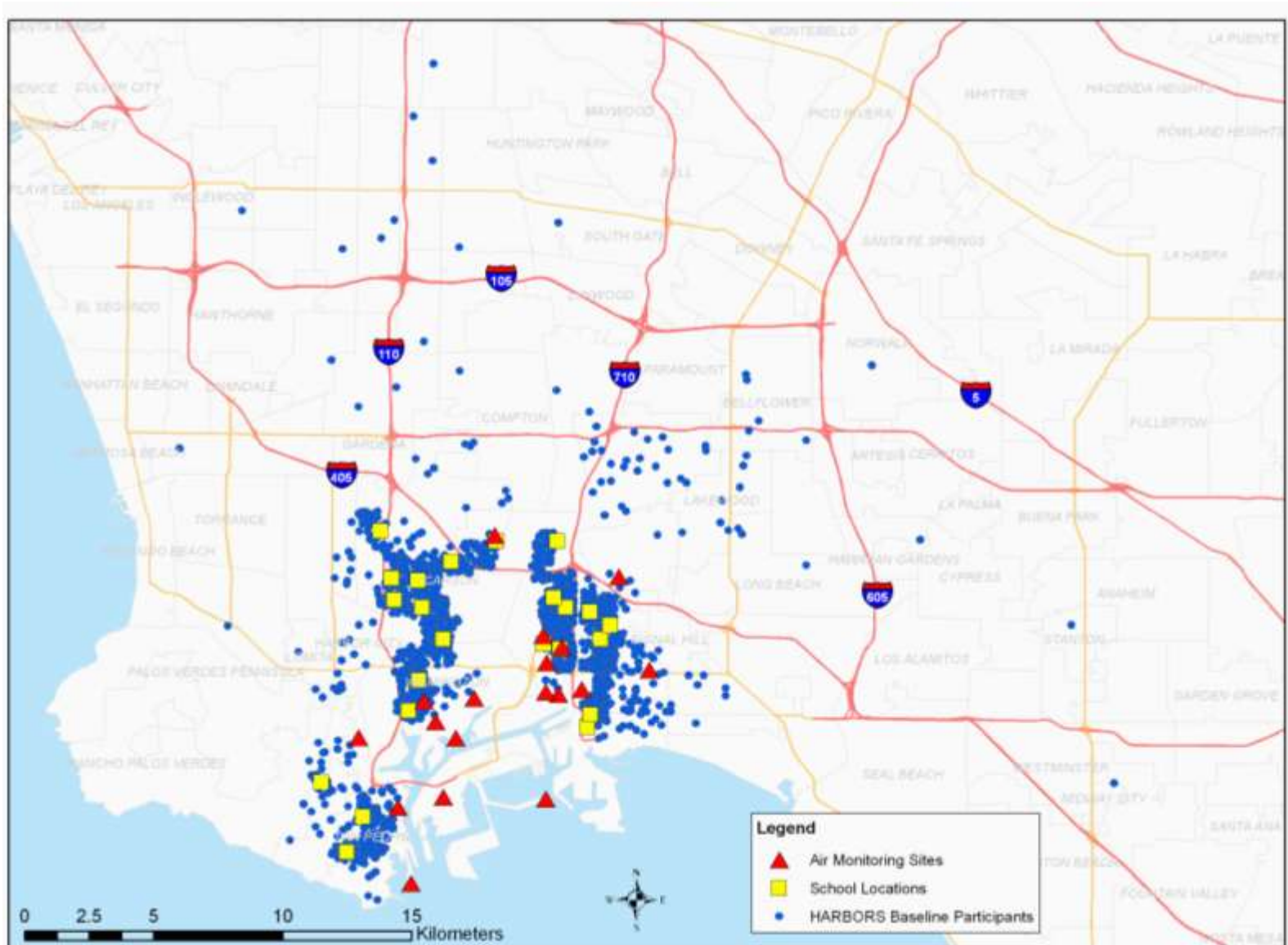
**Clean Fuels Program Advisory
Group**

February 3, 2010

Combustion Exhaust and the Respiratory Health of Port Community Children

- USC School of Medicine
- AQMD - \$489,300: NIEHS ~\$50,000
- Objective
 - Asses combustion related pollutants and traffic on asthma symptoms
 - K & 5th graders in schools near Ports of Los Angeles and Long Beach

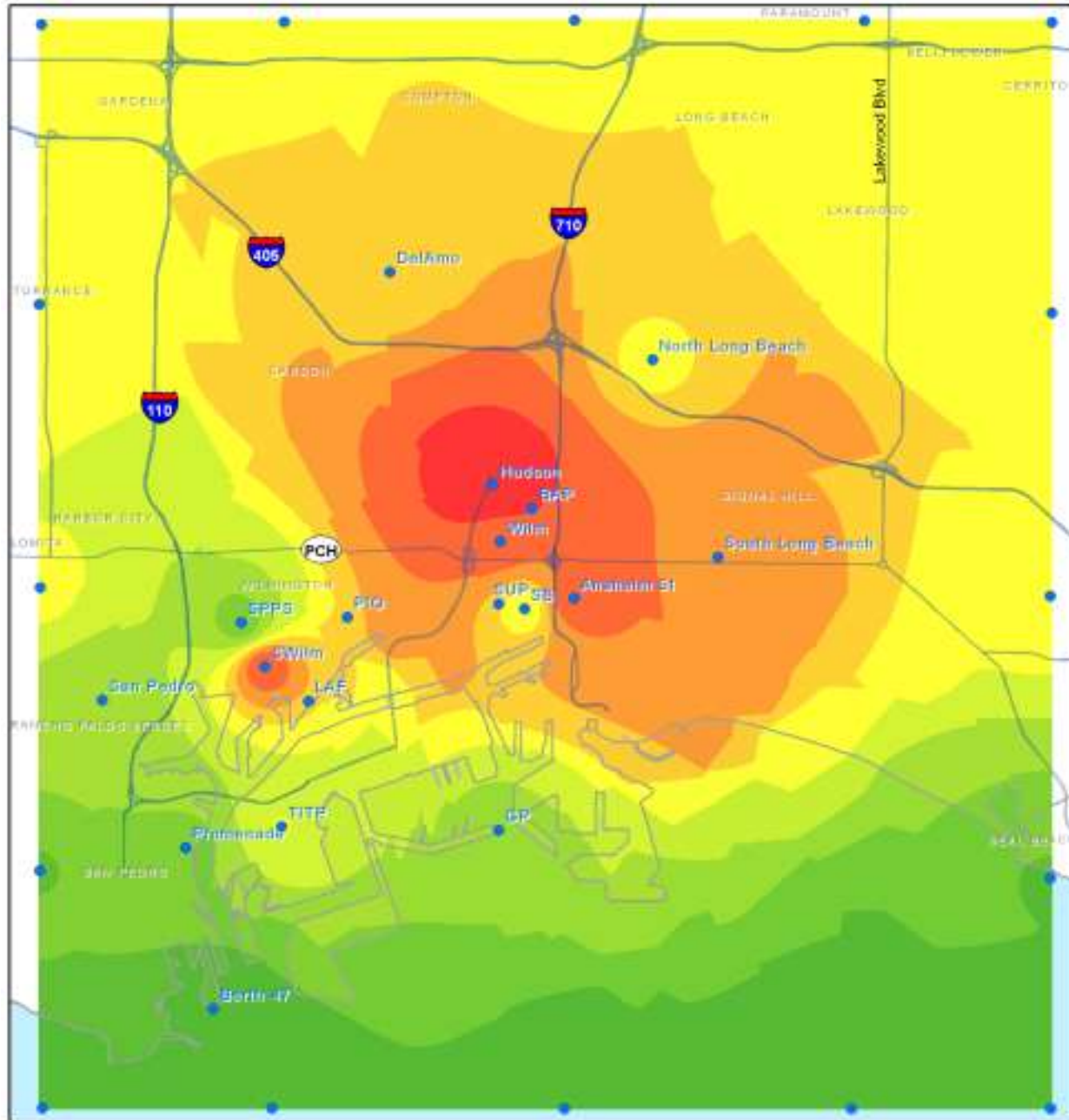
Study Area



Air Monitoring Station Sites

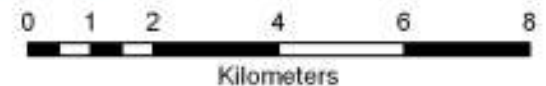


Elemental Carbon Estimates from Monitoring

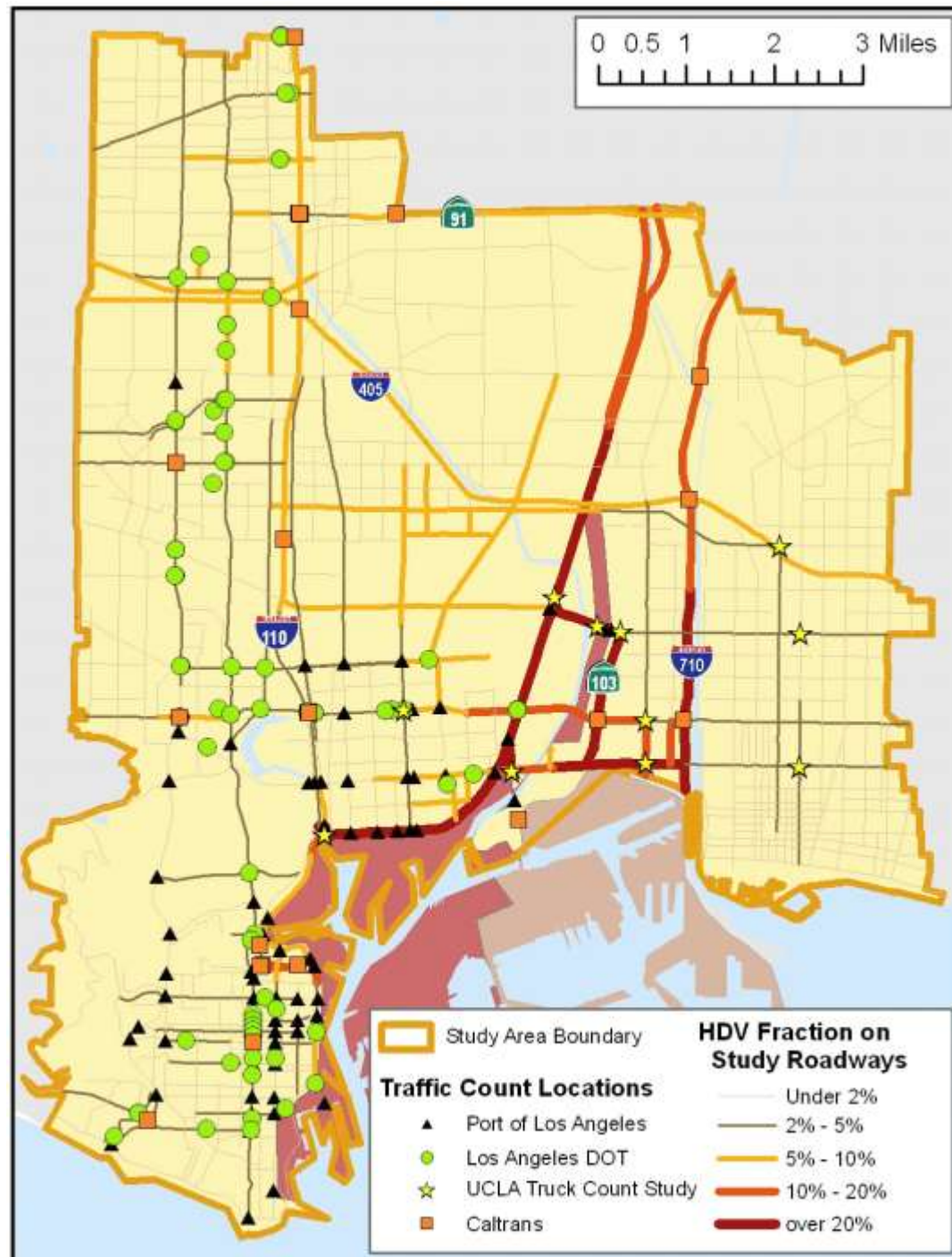


LEGEND

• HARBORS AQ Site Locations
6 Month-Avg EC Concentrations
IDW2; sample points:6; cell size:30m



Study Area Traffic



Results

- Asthma rates (~17%) elevated but within range of previous children study cohorts in SoCal
- EC associated with increased respiratory symptoms (bronchitis, cough, and phlegm)
- No consistent response observed with road proximity
- Combustion exhaust (from a wider range of combustion processes than on-road traffic alone) measurably affects the respiratory health

National Ambient Air Quality Standards

- Clean Air Act requires EPA set primary and secondary NAAQS common air pollutants:
 - Ground-level ozone (smog)
 - Carbon monoxide
 - Nitrogen dioxide
 - Particulate matter
 - Lead
 - Sulfur dioxide
- EPA review every five years
- Clean Air Scientific Advisory Committee (CASAC) advice
- Setting NAAQS
 - Consider health (primary) and welfare (secondary) effects
- Achieving NAAQS
 - Cost, technical feasibility, time needed to attain.

EPA Revised Ozone Standard in 2008

- Previous: 0.08 ppm
 - With rounding: 0.084 ppm
 - 79 days exceeded in 2007
- Revised: 0.075 ppm
 - 108 days exceeded in 2007
 - 37% increase in days over standard
- Highest 2007 value: 0.137 ppm
- CASAC recommended
 - 0.060 – 0.070 ppm
- AQMD Staff concurred with CASAC recommendation



AIR-QUALITY STANDARDS

EPA Adjusts a Smog Standard to White House Preference

In December 2005, Stephen Johnson dunked himself in hot water. Johnson, the administrator of the U.S. Environmental Protection Agency (EPA), decided to discard advice from a scientific advisory committee when he set a major air-quality standard for soot. Scientists and environmental groups were outraged (*Science*, 6 January 2006, p. 27). Last week, Johnson did it again with ozone, the main component of smog. And this time, the hand of the White House was plain to see. The Administration is “flouting the law” by not protecting public health adequately, says epidemiologist Lynn Goldman of Johns Hopkins University Bloomberg School of Public Health in Baltimore, Maryland, who was assistant administrator for the EPA’s Office of Prevention, Pesti-

cides, and Toxic Substances during the Clinton Administration. “It’s tragic.”

The Clean Air Act requires EPA to review the standards for six major pollutants, including soot, also known as particulate matter, and ozone, every 5 years. The agency last did this for ozone in 1997, so the American Lung Association (ALA) and other groups sued and won a deadline of 12 March for the agency to issue a new standard. These standards influence the regulation of power plants, vehicles, and other sources of the chemicals that react with sunlight to become ozone.

The lobbying leading up to the decision was heavy. Industry groups told Johnson to leave the primary ozone standard, which is designed to protect public health with a margin of safety

EPA Actions

Federal Ambient Air Quality Standards

January 12, 2010

MEMORANDUM

From: Lisa P. Jackson, Administrator

To: All EPA Employees



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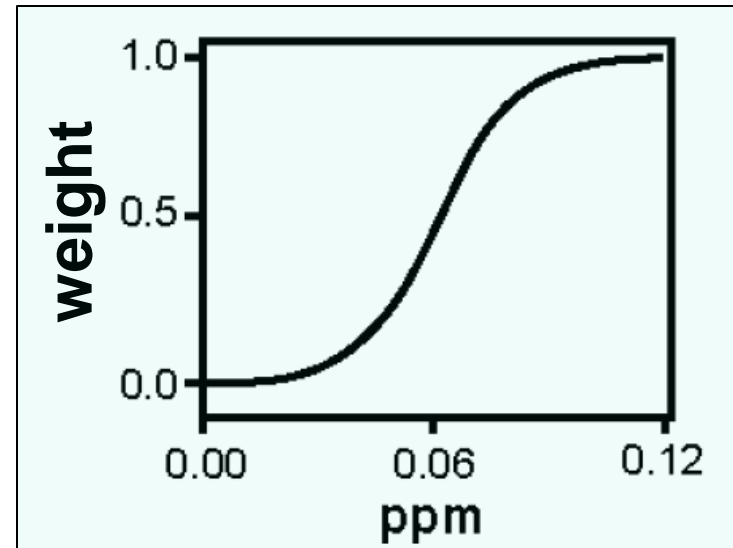
Improving Air Quality: ... We have already proposed stronger ambient air quality standards for ozone, which will help millions of Americans breathe easier and live healthier. ...

... We will strengthen our ambient air quality standards for pollutants such as PM, SO₂ and NO₂

...

EPA 2010 Ozone Standard Reconsideration

- Proposed Primary
 - 0.060 – 0.070 ppm 8-hr average; annual 4th highest daily maximum; 3-yr average
 - Additional health benefits, consistent with CASAC recommendation
- Proposed Secondary
 - Protect vegetation
 - Seasonal cumulative form based on weighted hourly values
 - Sum 12 hr values daily over 3 months
 - Between 7 – 15 ppm-hours
- Final rule due August 31, 2010
- Estimated attainment dates 2014 - 2031



EPA Estimated Avoided Health Effects in 2020

	Standard	
	0.070 ppm	0.060 ppm
Chronic bronchitis	880	2,200
Nonfatal heart attacks	2,200	5,300
Hospital and emergency room visits	6,700	21,000
Upper and lower respiratory symptoms	44,000	111,000
Aggravated asthma	23,000	58,000
Days missed work or school	770,000	2.5 million
Days restricted activities	2.6 million	8.1 million
Avoided premature mortality	1,500 to 4,300	4,000 to 12,000

- Includes benefits of reduced fine particle concentrations associated with illustrative ozone controls applied to meet proposed primary ozone standard
- Analysis does not include South Coast or San Joaquin Valley

EPA Regulatory Impact Analysis Supplement

Illustrative analysis - information regarding example control strategies, air quality impacts and public health improvements in 2020 assuming standards met

Estimated Health Benefits

- At 0.070 ppm
 - \$13 to \$37 billion
- At 0.060 ppm,
 - \$35 to \$100 billion.

Estimated Costs

- At 0.070 ppm
 - \$19 to \$25 billion
- At 0.060 ppm,
 - \$52 to \$90 billion

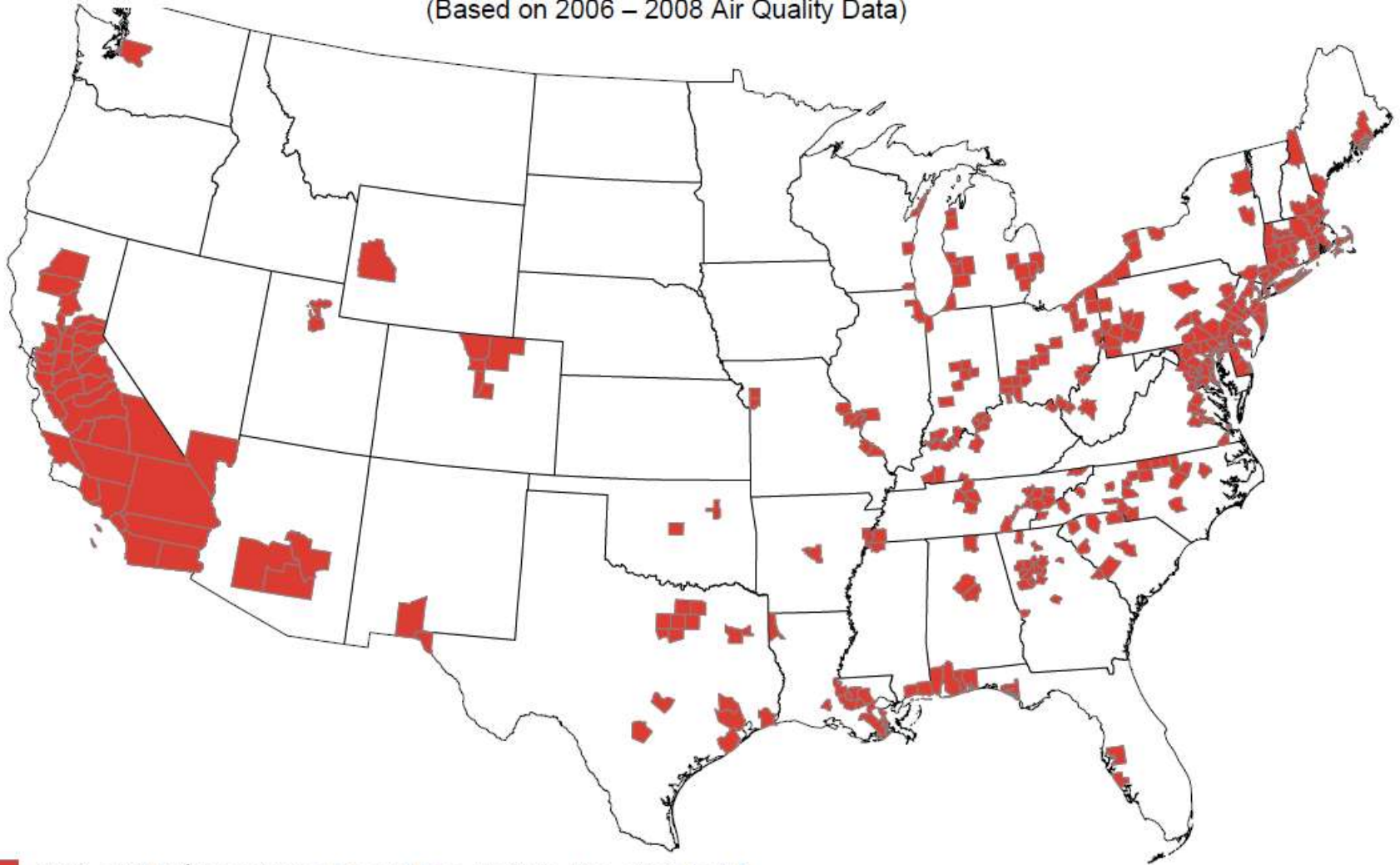
Note: Analysis does not include South Coast or San Joaquin Valley

Ozone Environmental Effects

- Reduced vegetation growth, biomass production and yields
- Increase susceptibility of vegetation to diseases, insects, harsh weather, other pollutants
- Visibly injure the leaves of plants
- Affect appearance of vegetation in national parks, recreation areas and cities



Counties With Monitors Violating the March 2008 Ground-Level Ozone Standards 0.075 parts per million (Based on 2006 – 2008 Air Quality Data)



322 of 675¹ monitored counties violate the standard

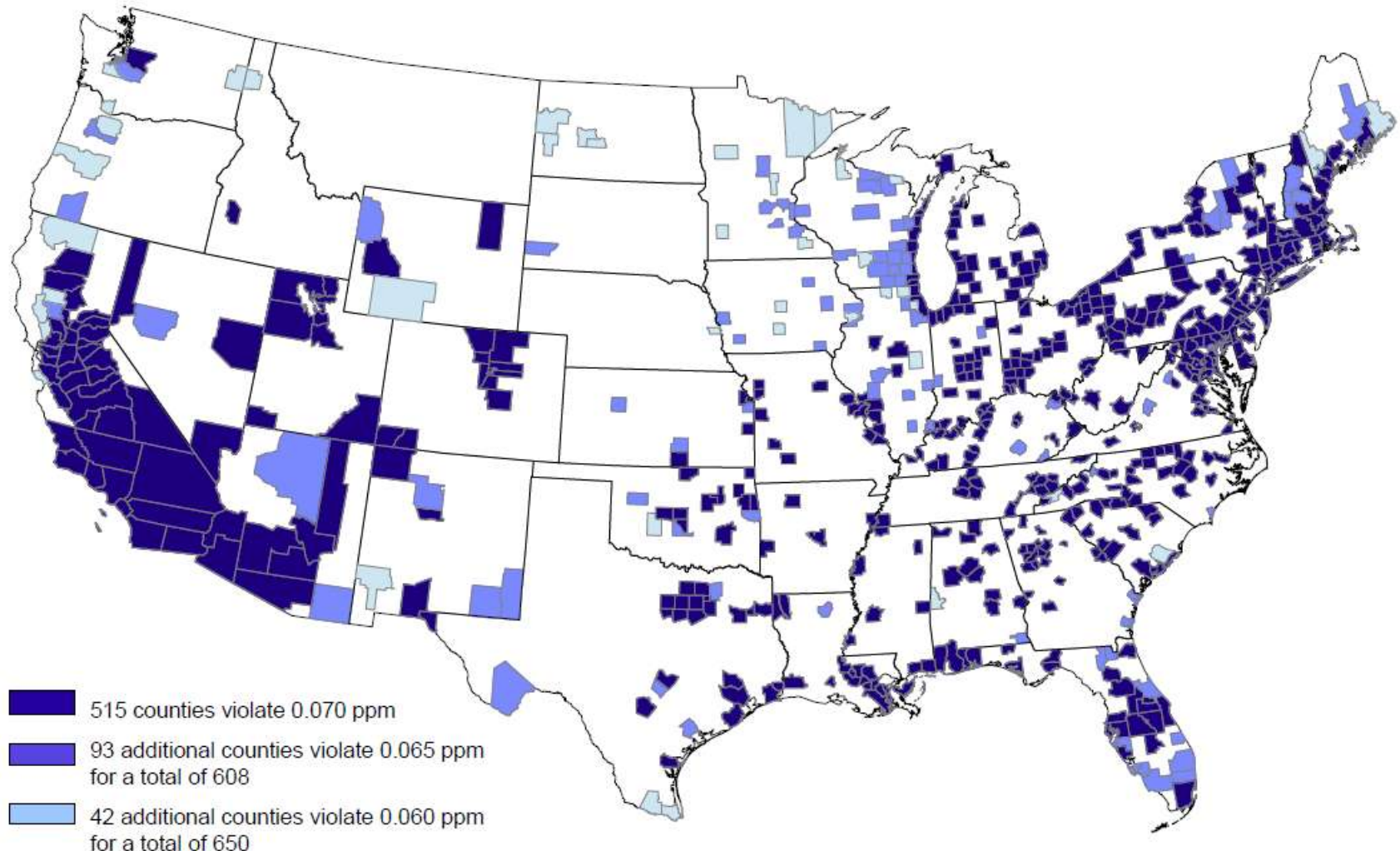
Notes:

1. Counties with at least one monitor with complete data for 2006 – 2008
2. To determine compliance with the March 2008 ozone standards, the 3-year average is truncated to three decimal places.

Counties With Monitors Violating Primary 8-hour Ground-level Ozone Standards 0.060 - 0.070 parts per million

(Based on 2006 – 2008 Air Quality Data)

EPA will not designate areas as nonattainment on these data, but likely on 2008 – 2010 data which are expected to show improved air quality.

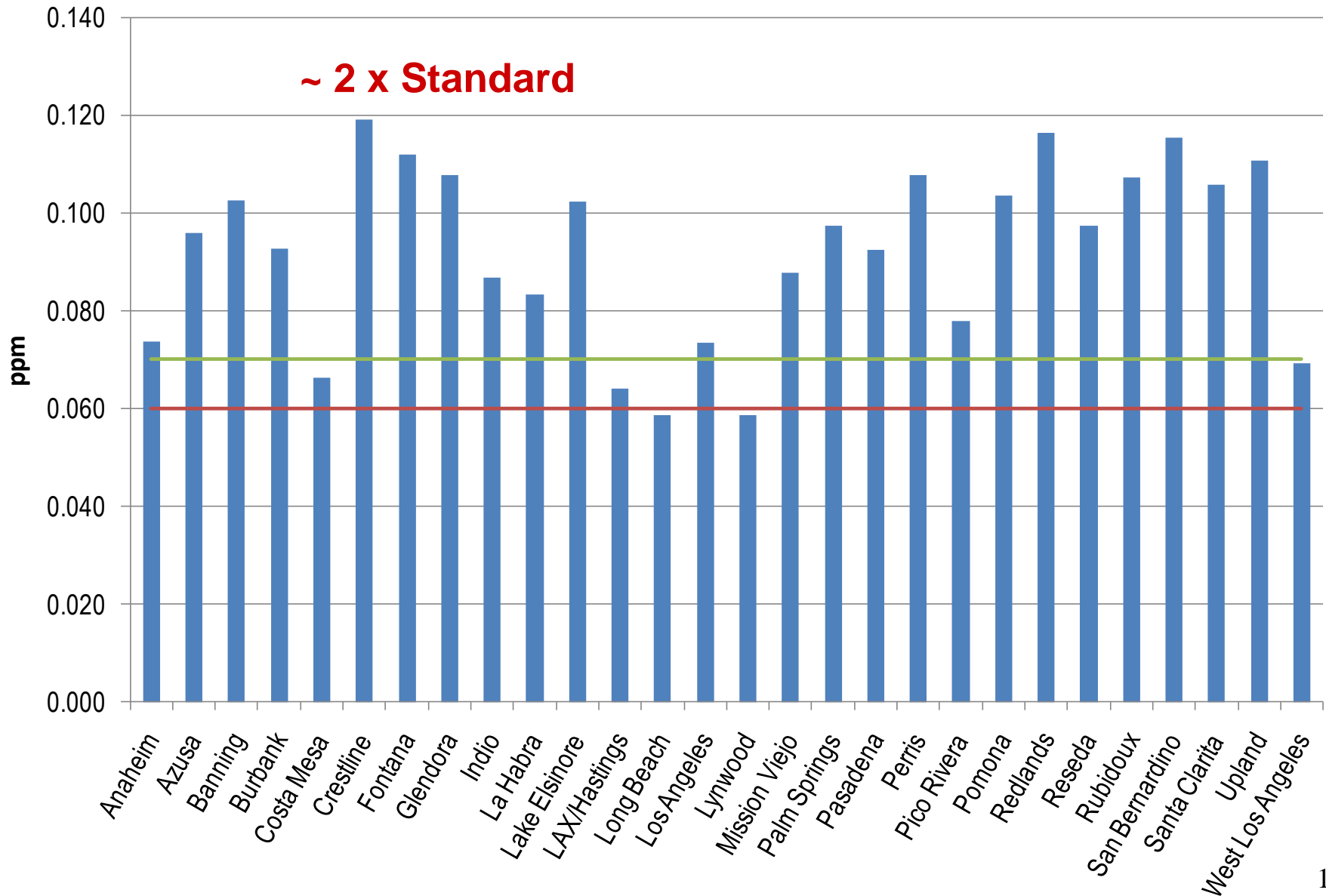


Notes:

1. No monitored counties outside the continental U.S. violate.
2. EPA is proposing to determine compliance with a revised primary ozone standard by rounding the 3-year average to three decimal places.

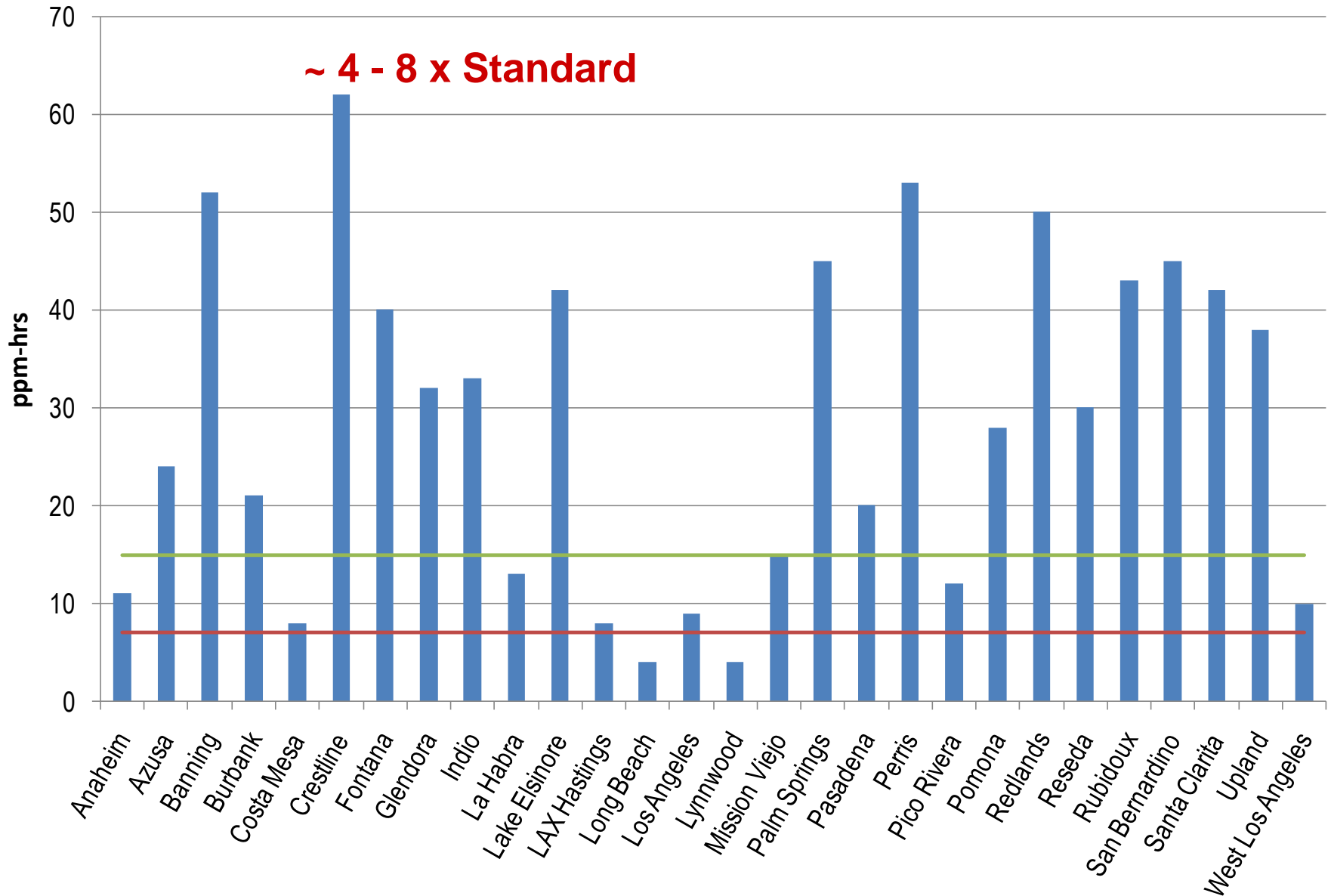
Primary Standard and Recent Air Quality

4th Max 8-hr Ozone (2006-2008 3-year average)



Secondary Standard and Recent Air Quality

Seasonal (W126) Ozone (2006-2008)



Projected Timeline

Public Hearings	February 2 & 4, 2010
Comments Due	March 22, 2010
Final Rule Promulgation	August 31, 2010
Attainment Designations	August, 2011
SIPS Due	December, 2013
Attainment Dates:	
Primary Standard	2014 – 2031 (severity dependent)
Secondary Standard	As expeditiously as practicable

Staff Sensitivity Analyses

- Simulated Average Ozone Background: 45 PPB
- Estimated Percentage NO_x Emissions Reductions Needed to Attain Targeted Ozone Standards:
 - 2007 AQMP (2023 Attainment: 80 PPB) – 75 %
 - 2030 (Current O₃ Standard: 75 PPB) – 80%
 - 2030 (Upper O₃ Proposed Standard: 70 PPB) – 85%
 - 2030 (Lower O₃ Proposed Standard: 60 PPB) – 90 %

EPA New Primary NO₂ NAAQS

- Retained annual standard at 53 ppb
- Established new short-term standard
 - One-hour daily maximum 100 ppb
 - 3-year average of 98th percentile of daily max
 - Include monitors within 50 m of major roads
- SCAQMD recent NO₂ levels
 - Design value from current network 2006 – 2008: 84 ppb
 - Near roadway levels likely higher
 - PM traps can emit additional NO₂ fraction
- Estimated attainment deadline Jan. 2021/22
- Secondary NAAQS review to be completed 2012²¹

EPA Proposed SO₂ NAAQS

- Replace annual & 24-hour primary standards
- One-hour daily maximum between 50 – 100 ppb
 - 3-year average of 99th percentile (or 4th highest)
 - Monitors near sources to capture short term peaks
- SCAB recent SO₂ levels
 - Design value 2006 – 2008: 22 ppb based on current monitoring network
 - Near source monitor picture may be different
- Final rule due June 2, 2010
- Estimated attainment deadline 2017
- Secondary NAAQS review to be completed 2012

EPA Particulate Matter NAAQS

- Last revision 2006
 - Lowered 24-hour $PM_{2.5}$ to 35 ug/m^3
 - Retained annual $PM_{2.5}$ at 15 ug/m^3
 - CASAC recommended annual $PM_{2.5}$ at 13-14 ug/m^3
- EPA likely to propose lower annual standard
 - Recent assessments indicate mortality impacts larger than previously estimated
- Proposed rule target July, 2010
- Final rule target April, 2011

EPA Carbon Monoxide NAAQS

- Currently under review
- Exposure and risk assessment due May, 2010
- Proposed rule due Oct 28, 2010
- Final rule due May 13, 2011