

Recent Ozone/Exposure Trends and Air Quality Modeling

(Presentation Updated – November 1, 2006)



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Overview

- Ozone Air Quality Trends
- Key Primary Pollutant Trends
(Hydrocarbons, Oxides of Nitrogen)
- Ozone Exposure Trends
- Ozone Air Modeling Analysis

Key Criteria Pollutants

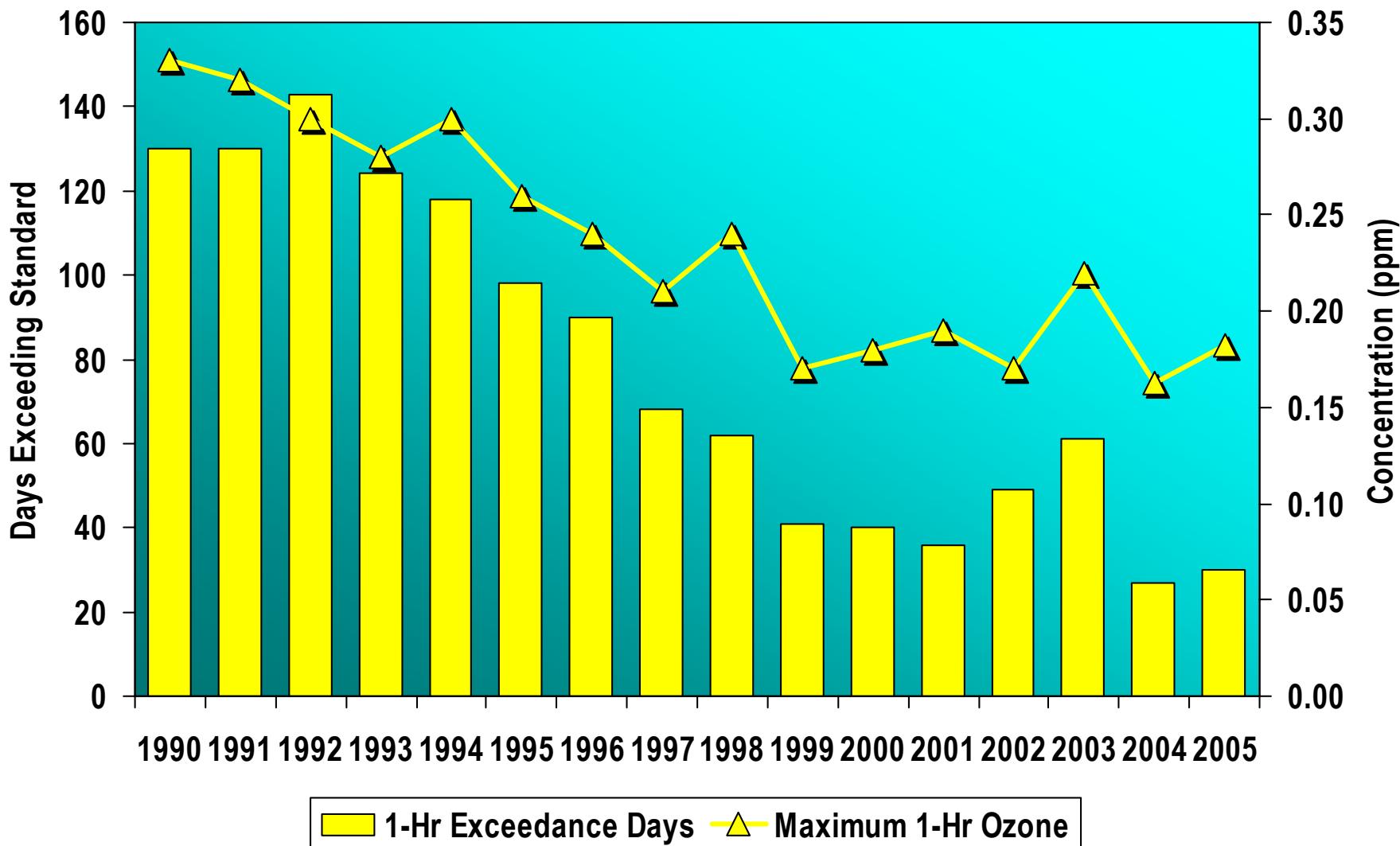
- ✓ Carbon Monoxide
- ✓ Nitrogen Dioxide
- ✓ Sulfur Dioxide
- ✓ Lead
- Ozone
- Particulate Matter (PM10, PM2.5)

Federal Ozone Air Quality Standard

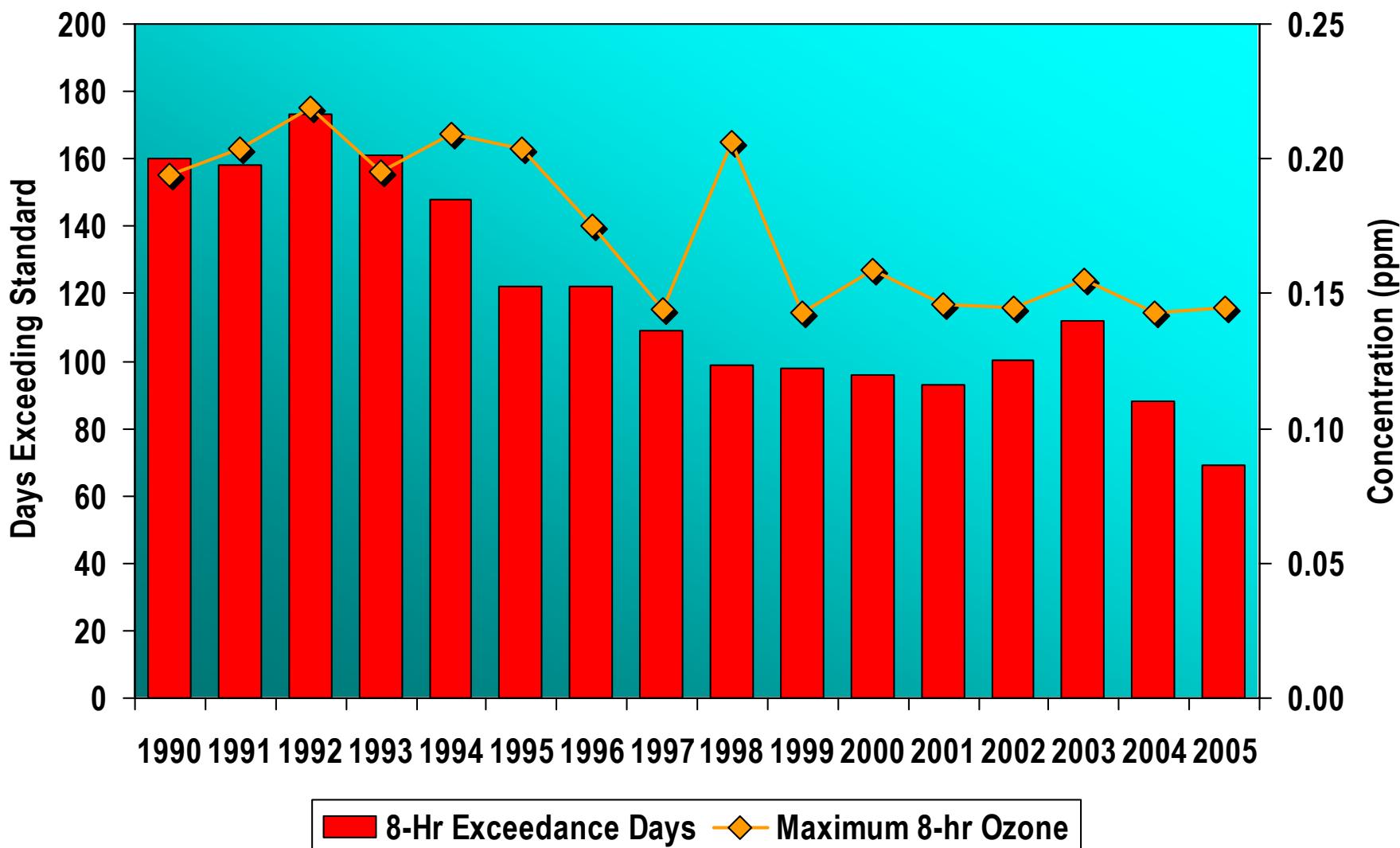
	1-hour Standard (No Longer in Effect)	8-hour Standard
Standard	0.12 ppm	0.08 ppm
Form	4 th highest value over 3 years not to exceed 0.124 ppm	3-yr average of the 4 th highest not to exceed 0.085 ppm
Design Value	0.33 ppm	0.131 ppm
Basin Classification	Extreme (attainment by 2010)	Severe-17 (attainment by 2021)

Ozone Air Quality Trends

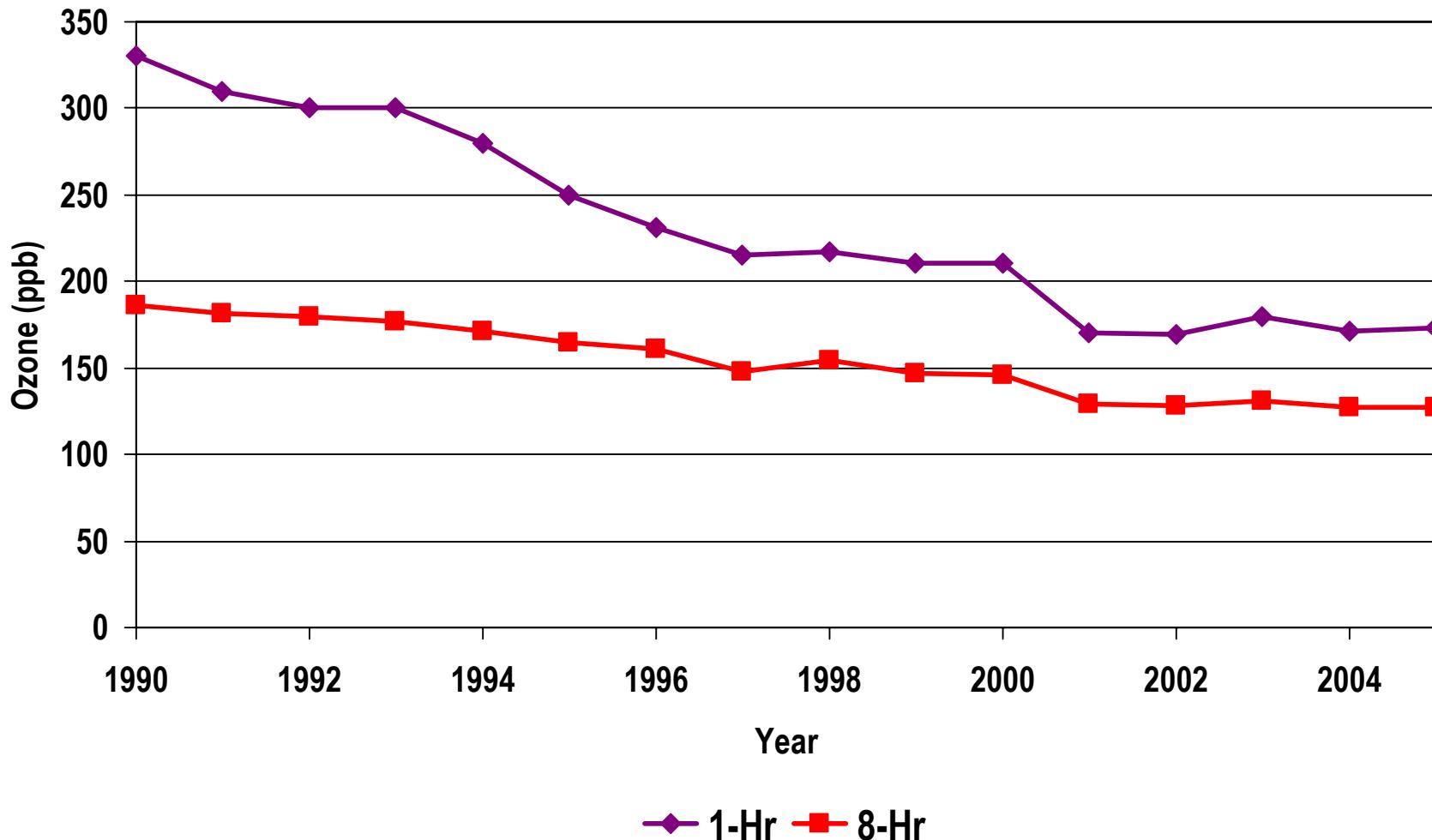
1-Hr Ozone Air Quality Trends



8-hr Ozone Air Quality Trends

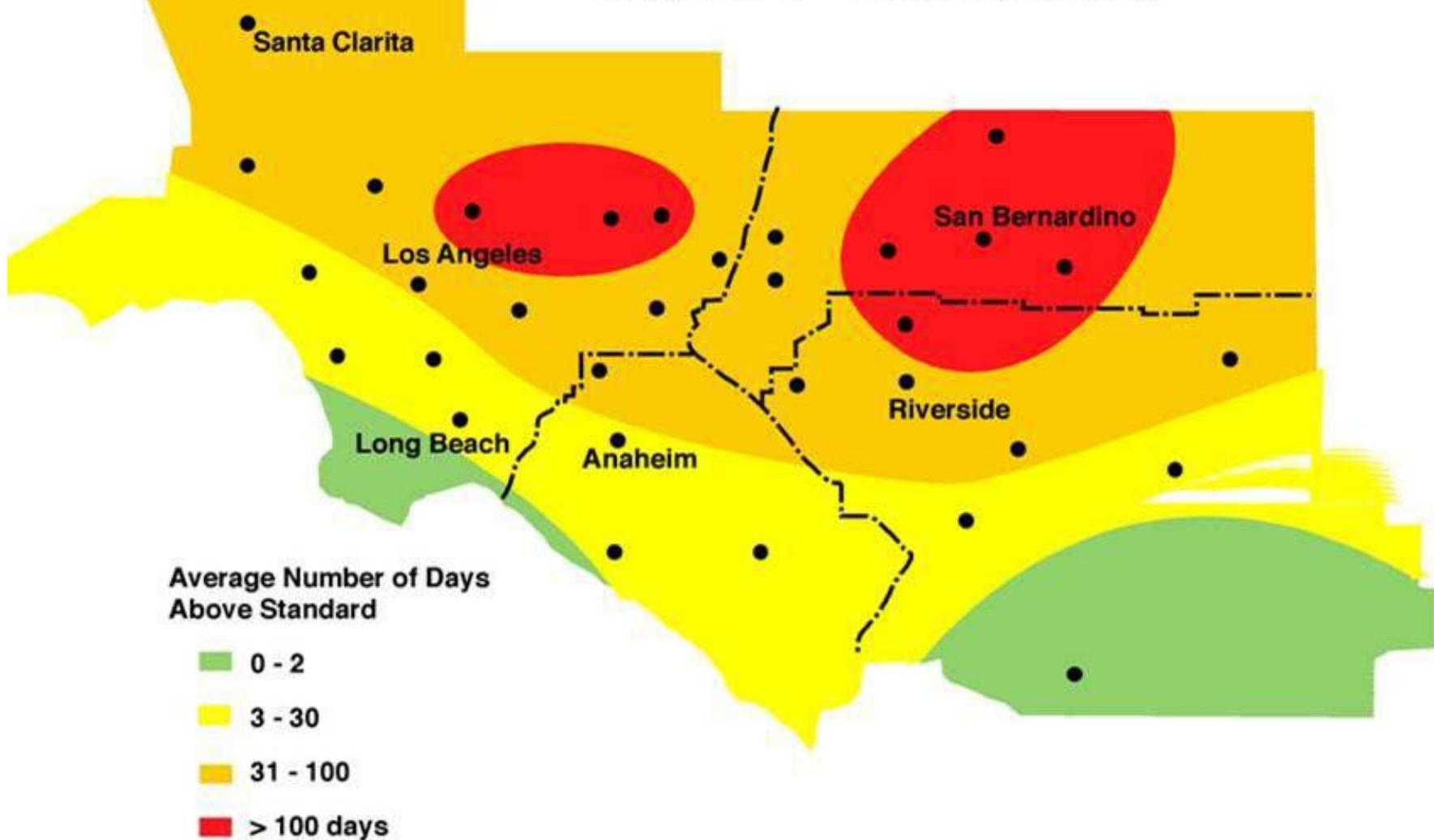


Trend in Ozone Design Values



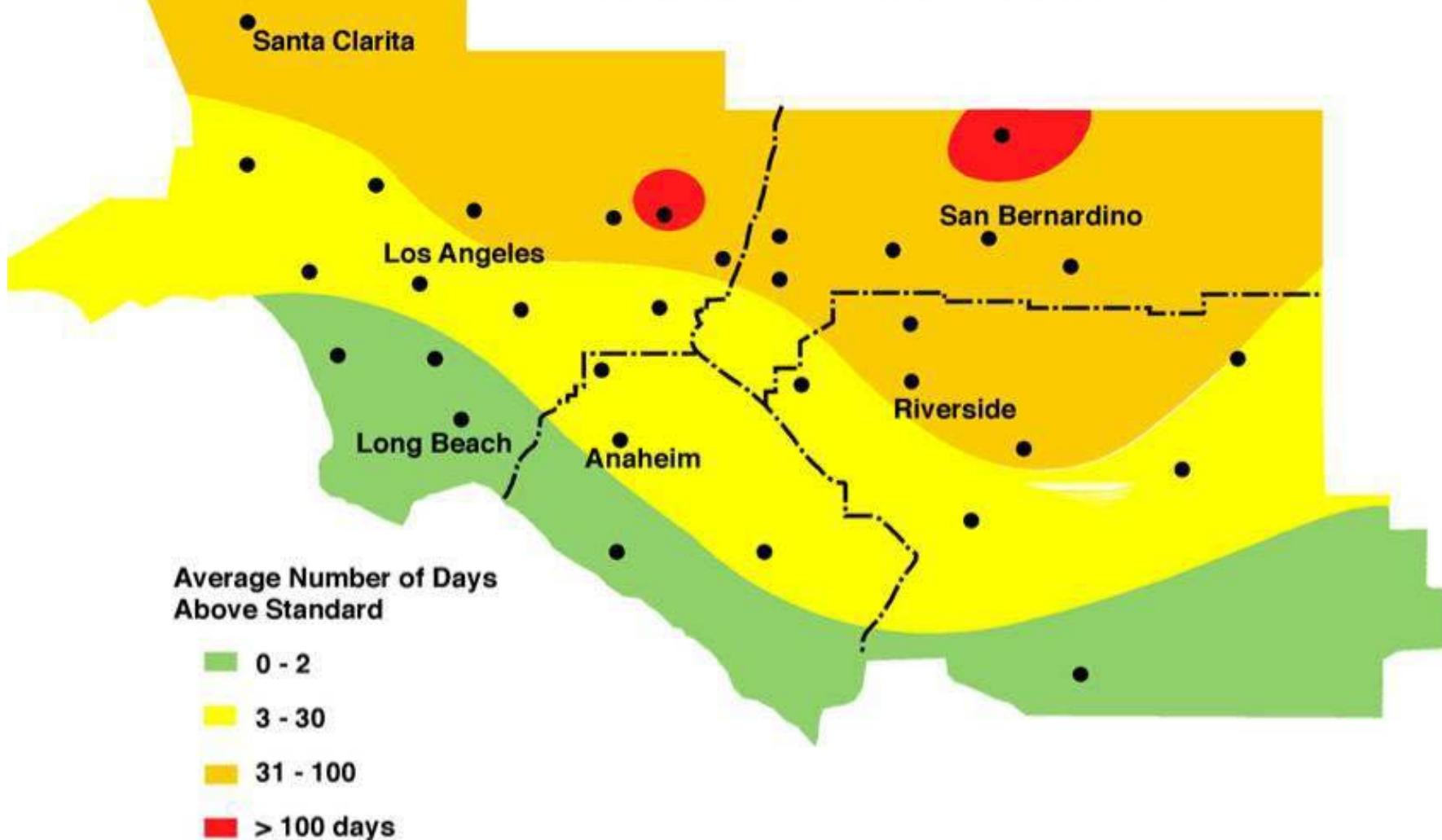
OZONE, 1982-1984

Average Number of Days Exceeding Federal 1 - Hour Standard



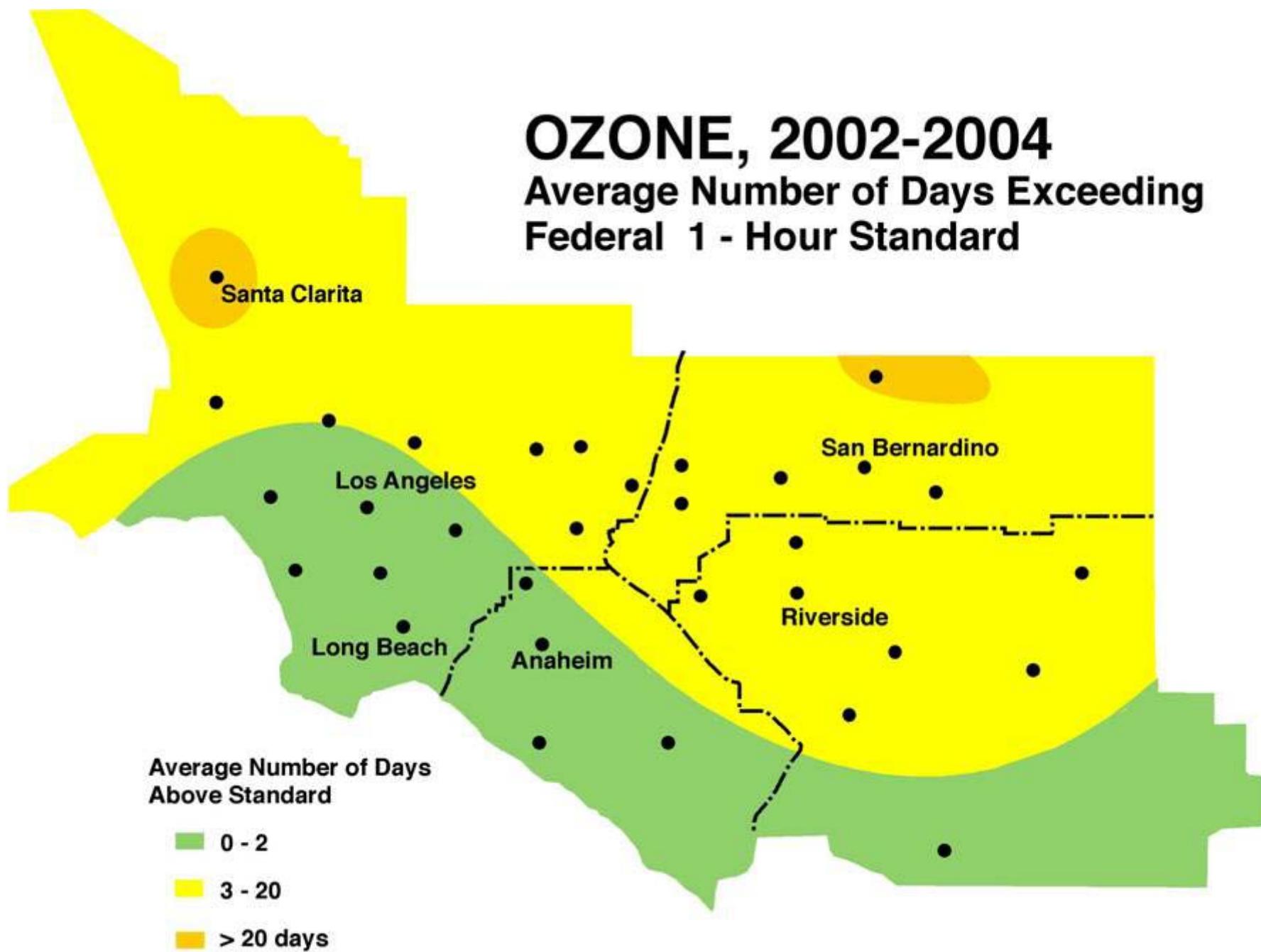
OZONE, 1992-1994

Average Number of Days Exceeding Federal 1 - Hour Standard



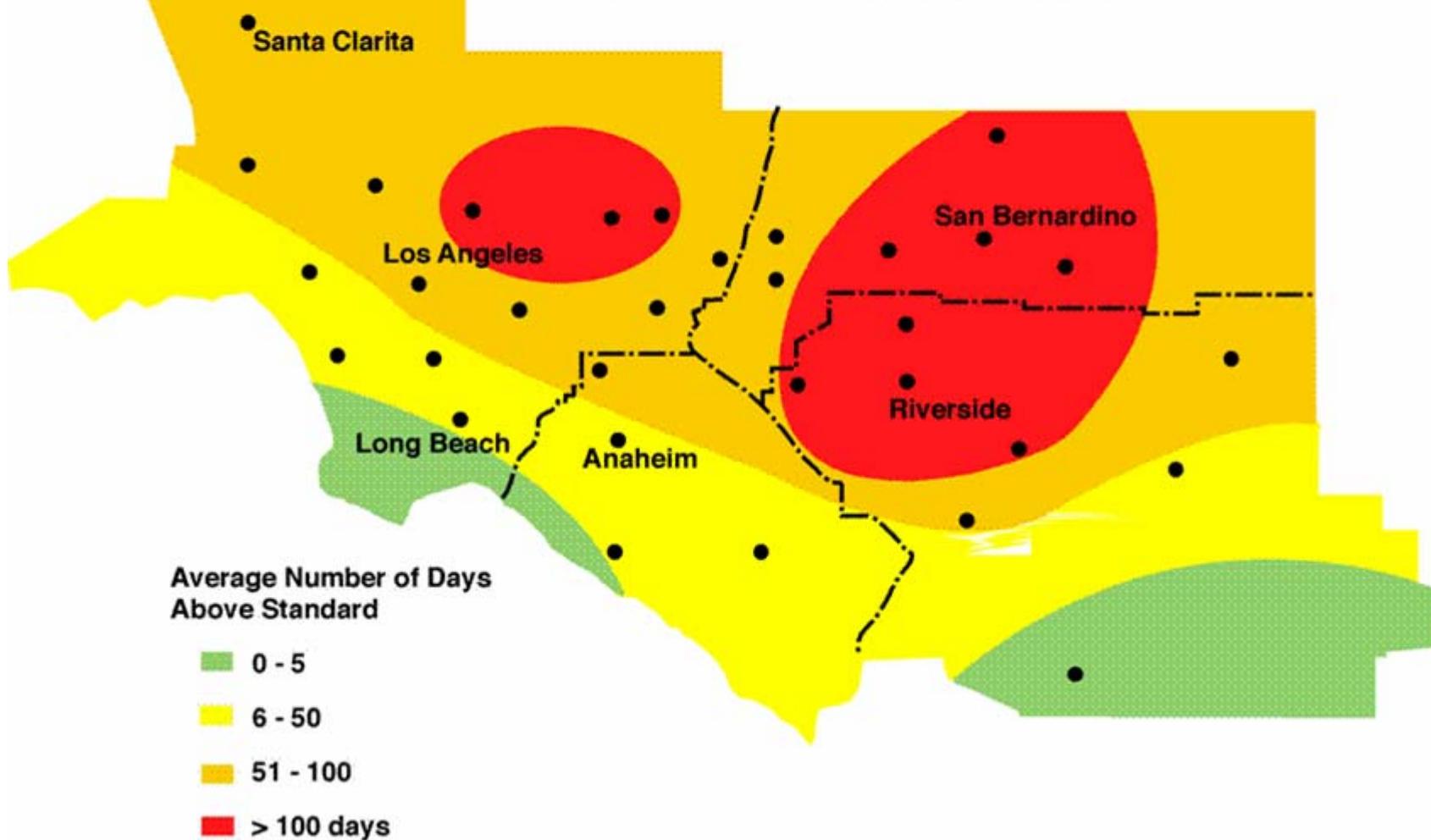
OZONE, 2002-2004

Average Number of Days Exceeding
Federal 1 - Hour Standard



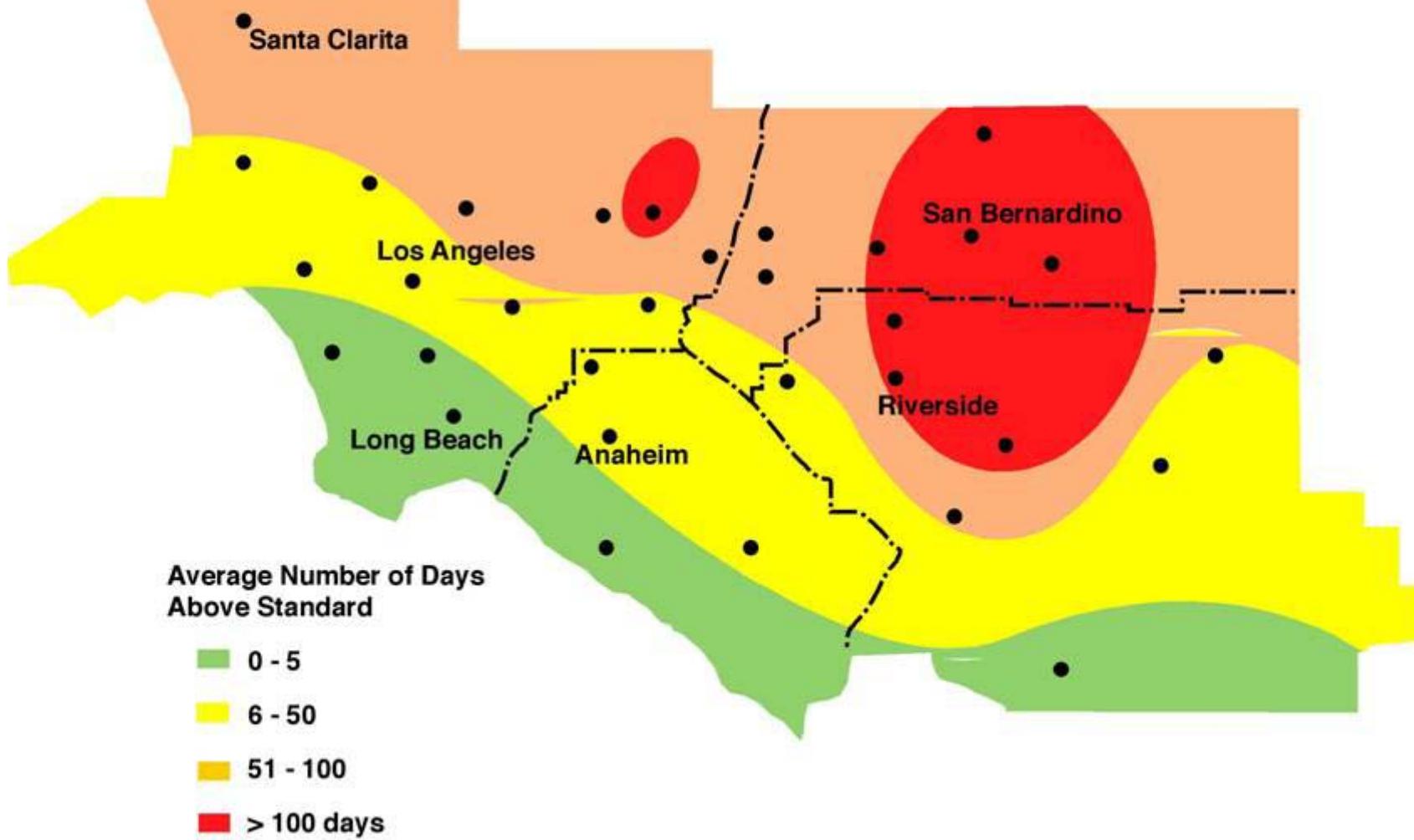
OZONE, 1982-1984

Average Number of Days Exceeding Federal 8 - Hour Standard



OZONE, 1992-1994

Average Number of Days Exceeding Federal 8 - Hour Standard



OZONE, 2002-2004

Average Number of Days Exceeding Federal 8 - Hour Standard

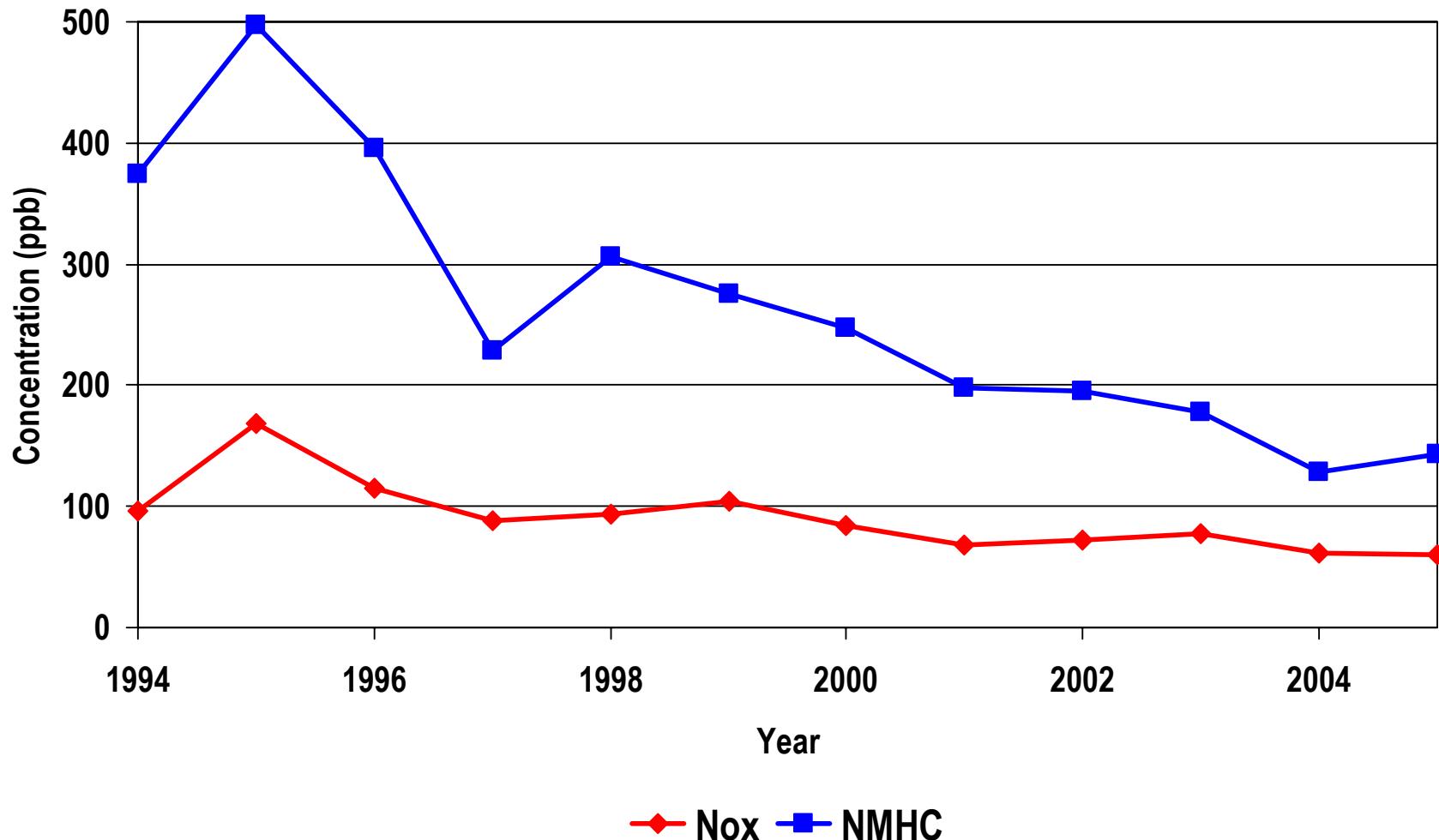


8-Hr Ozone Formation

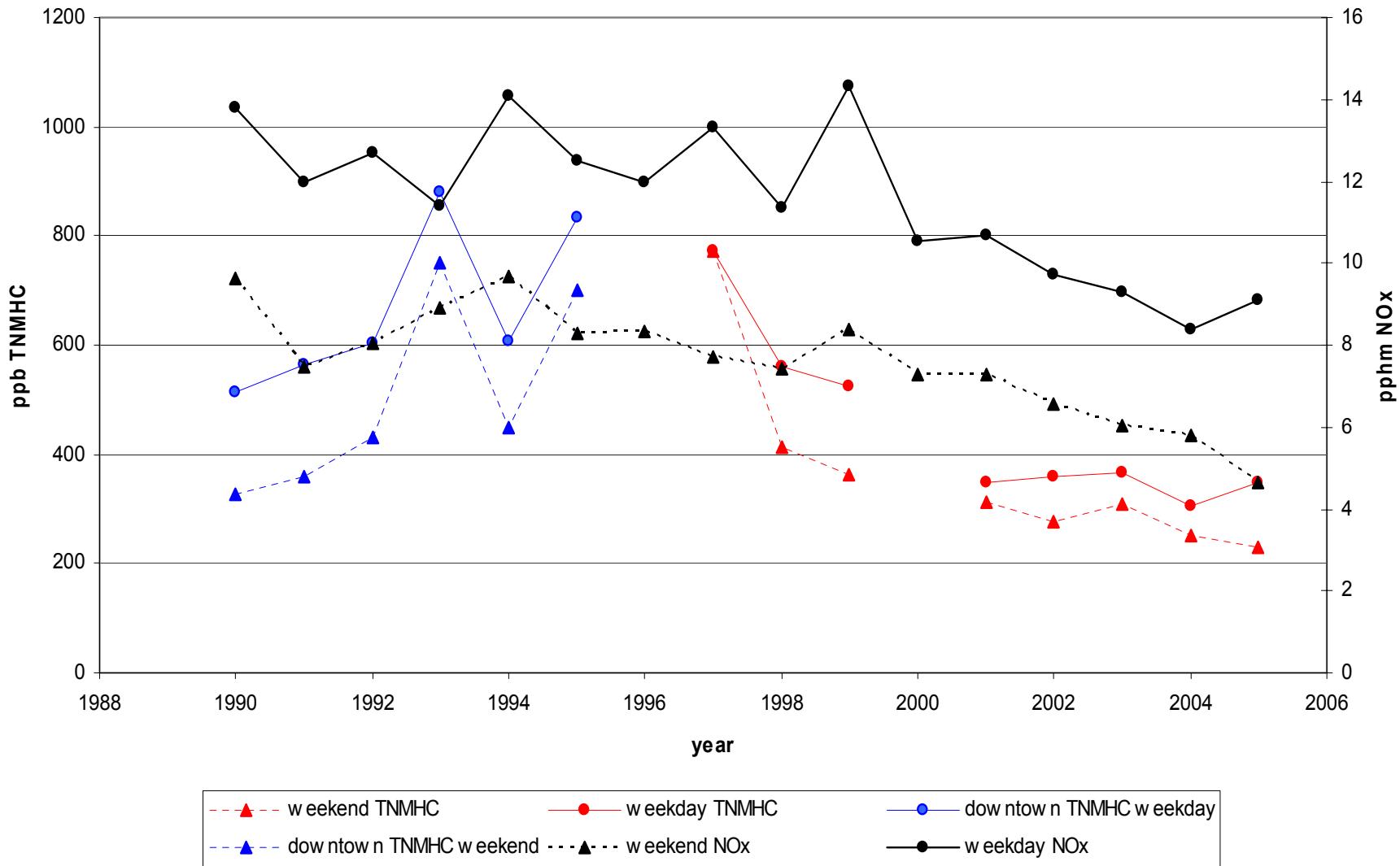


Hydrocarbon/ Oxides of Nitrogen Trends

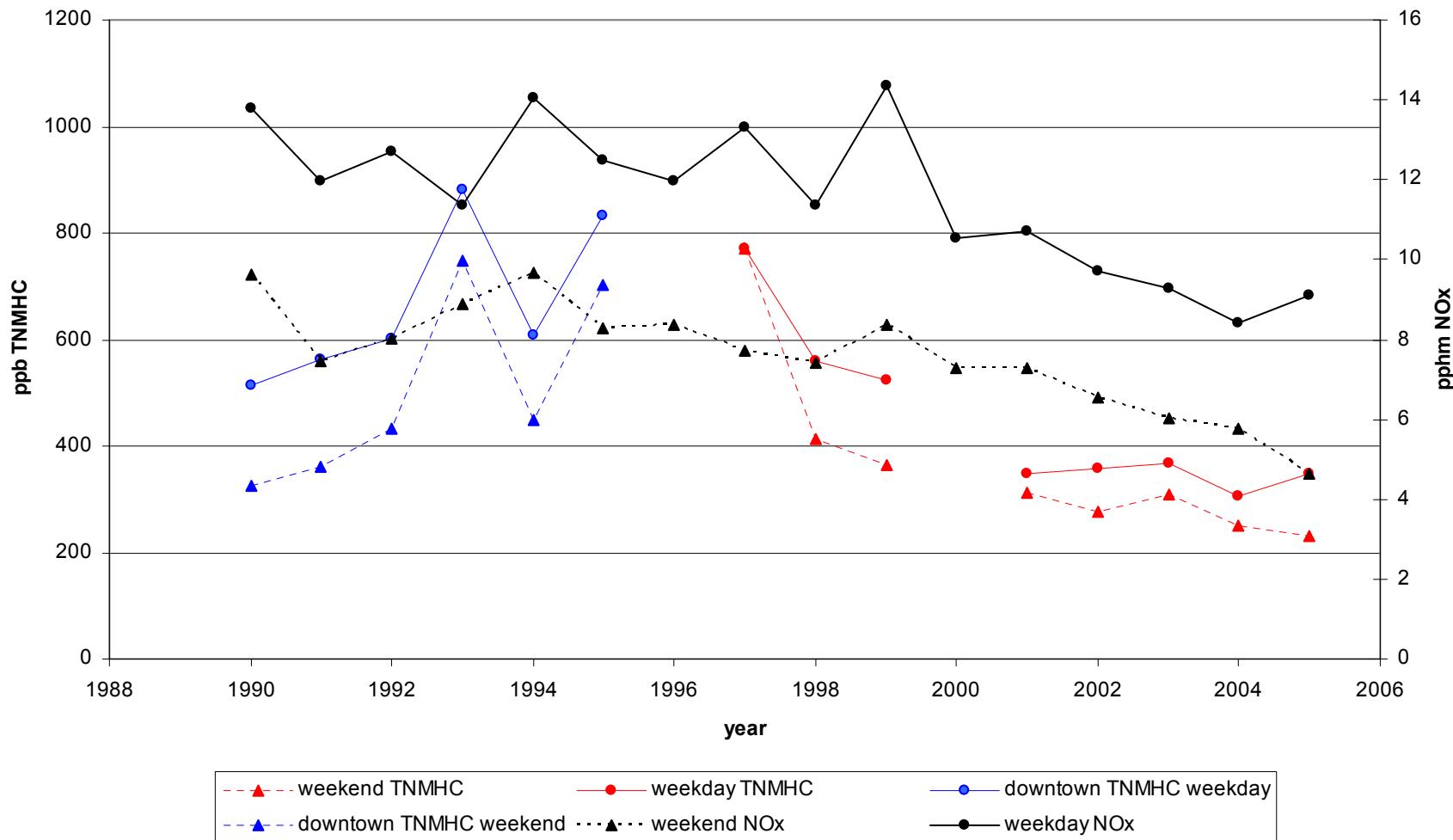
Average NMHC and NOx Concentrations



Comparison of 6-9 am NMHC and NOx Concentrations at Burbank

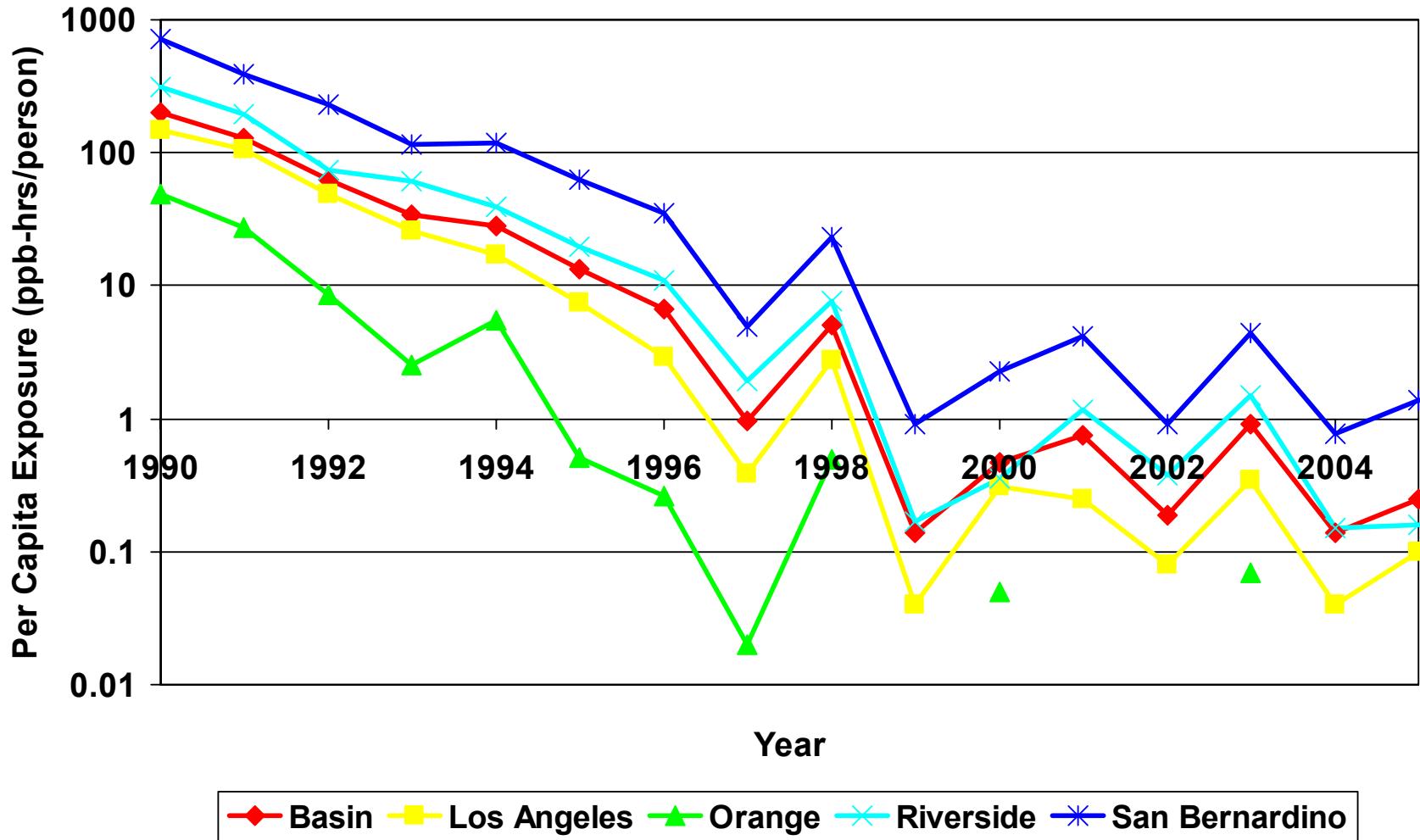


Comparison of 6-9 am NMHC and NOx Concentrations at Pico Rivera

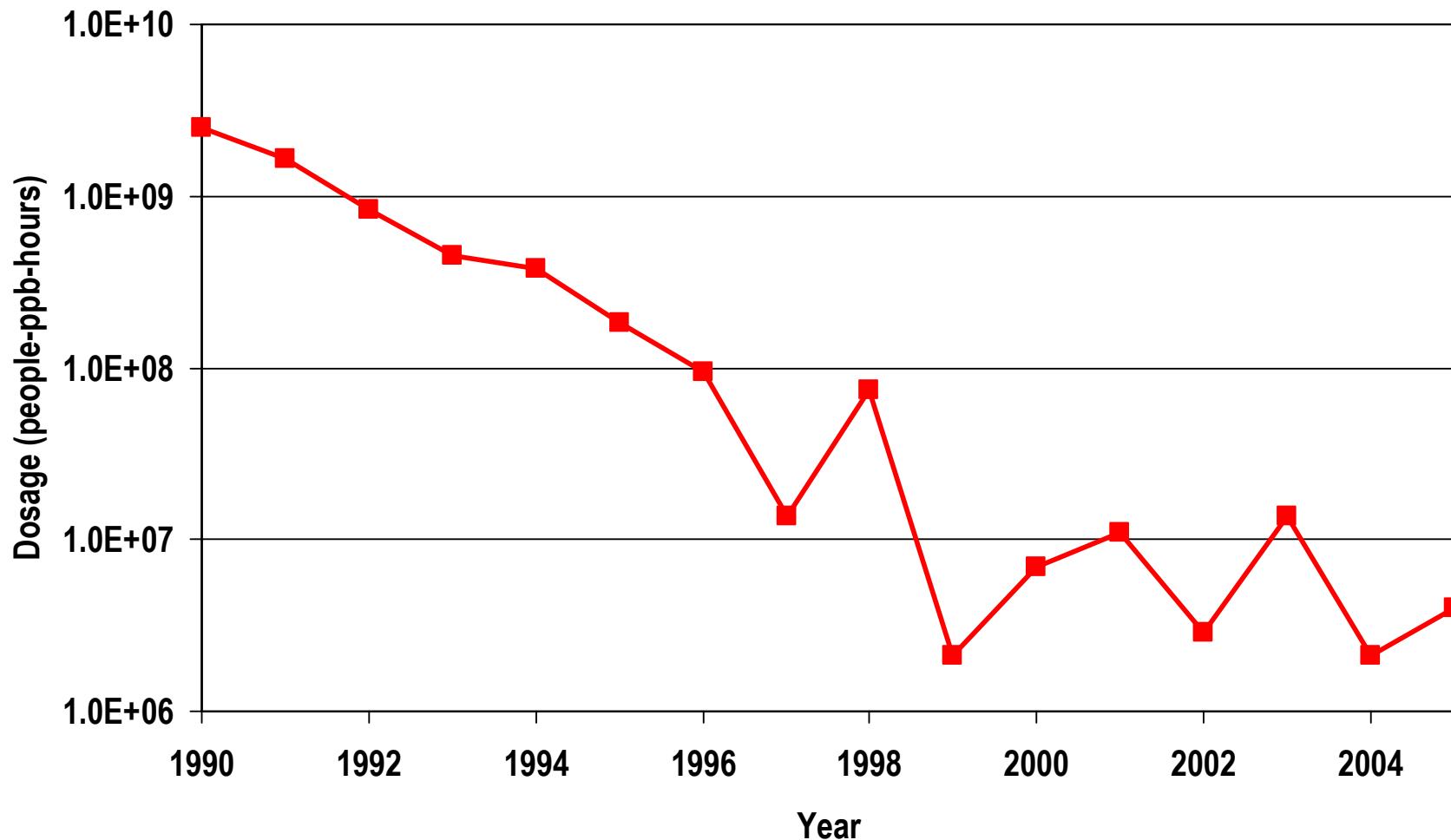


Ozone Exposure/ Dosage Trends

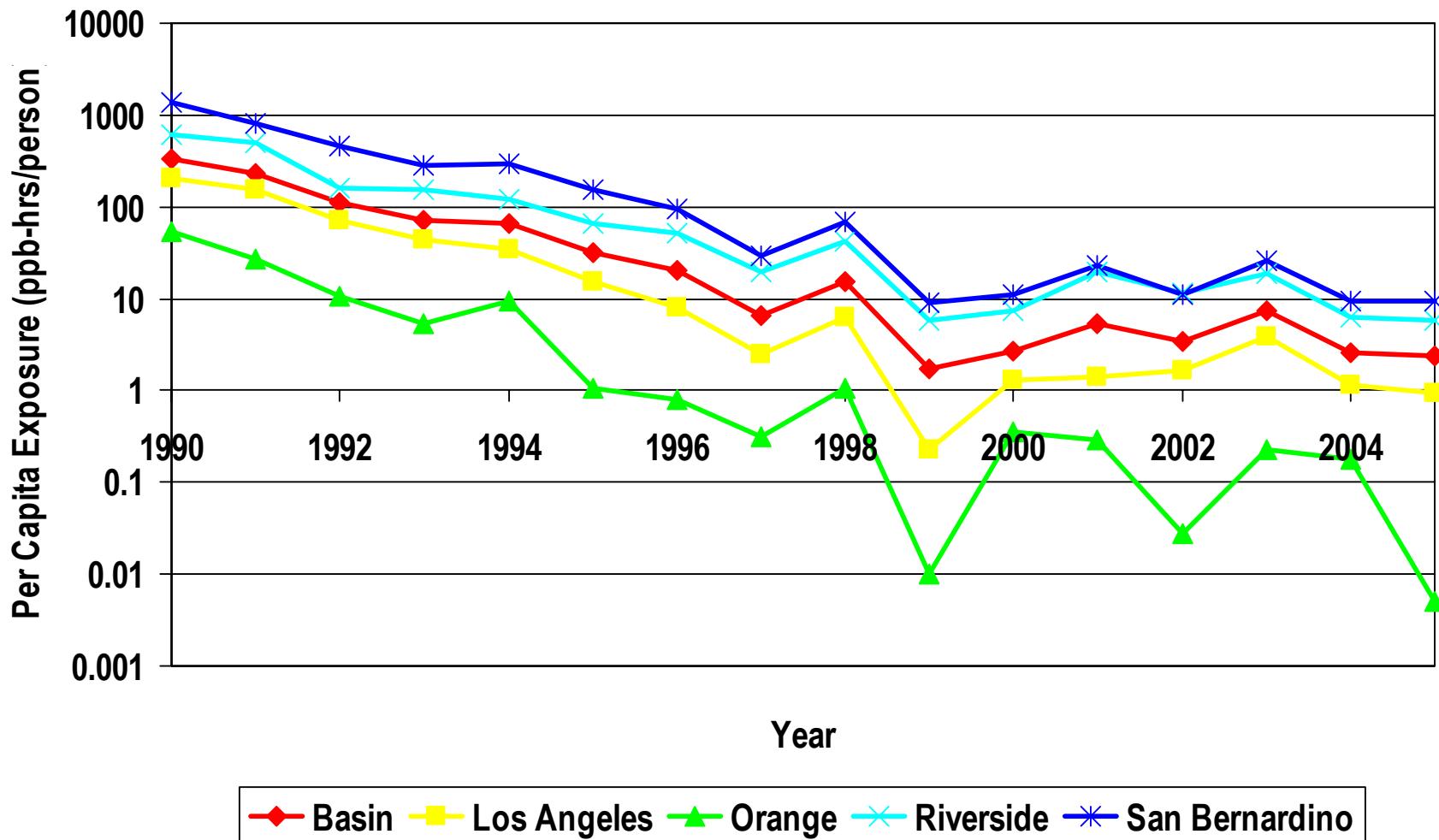
Per Capita Ozone Exposure Above the Federal 1-Hour Standard



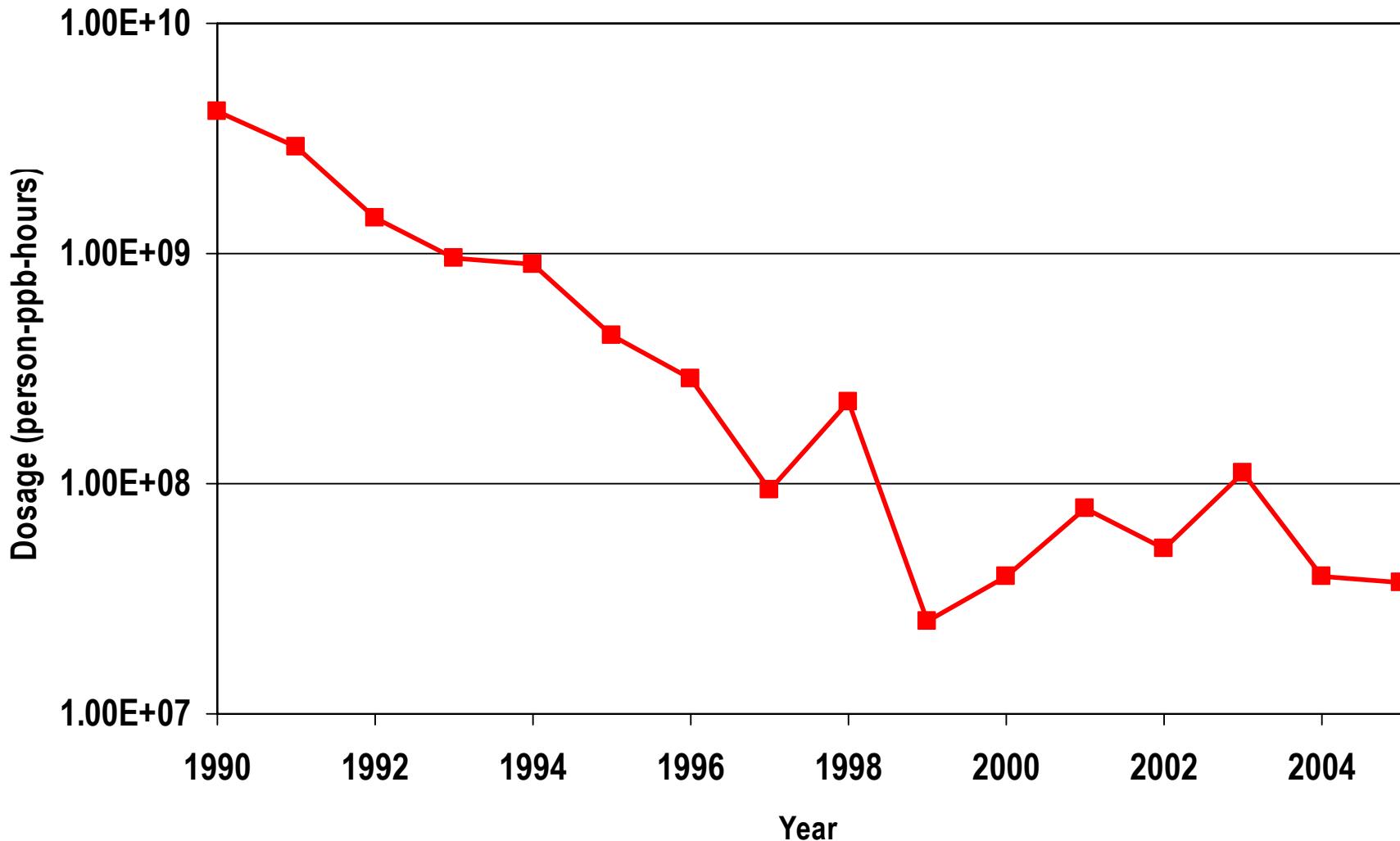
Population Dosage to 1-Hour Ozone



Per Capita Ozone Exposure Above the Federal 8-Hour Standard



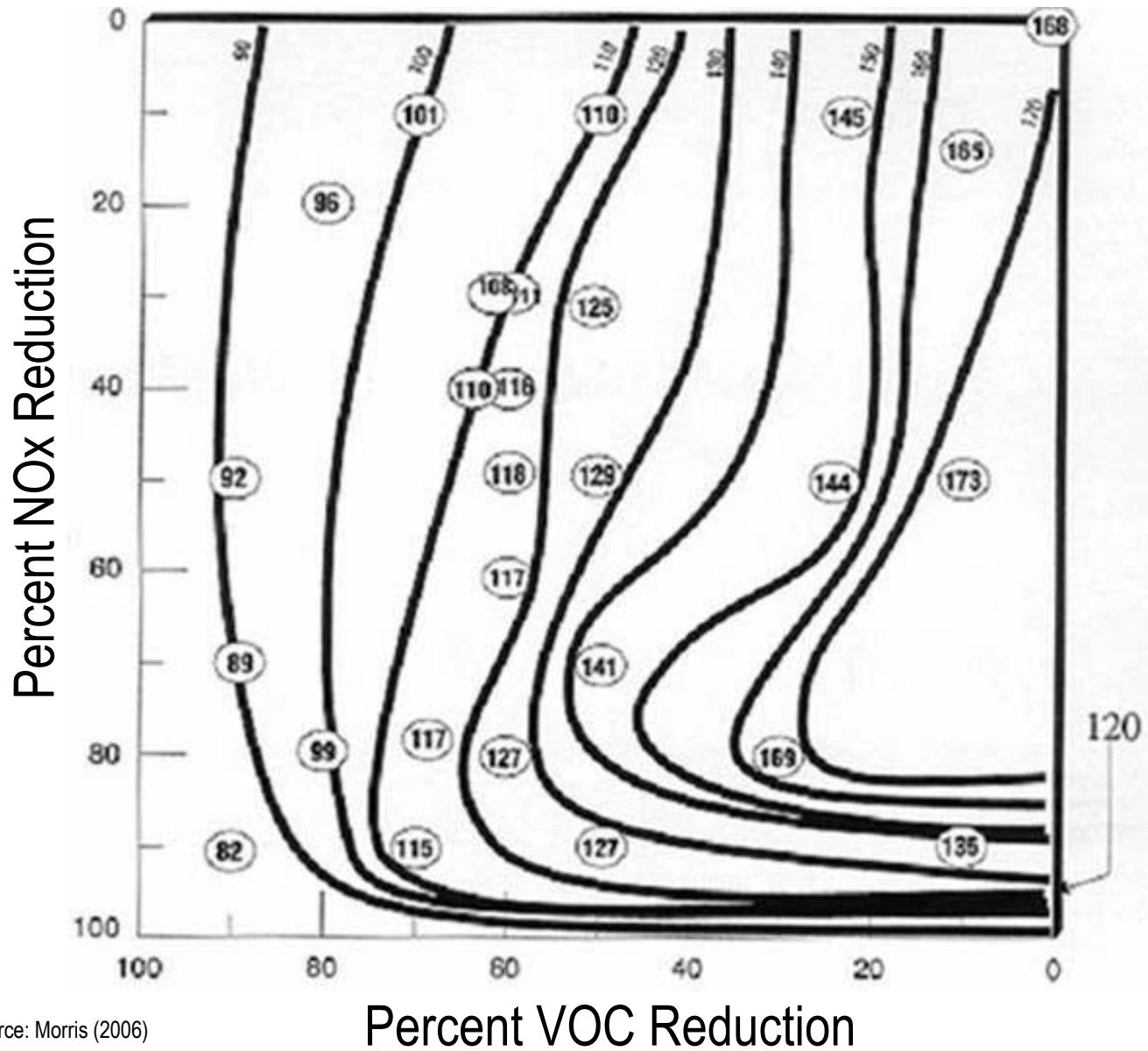
Population Dosage to 8-Hour Ozone



Ozone Air Quality Modeling

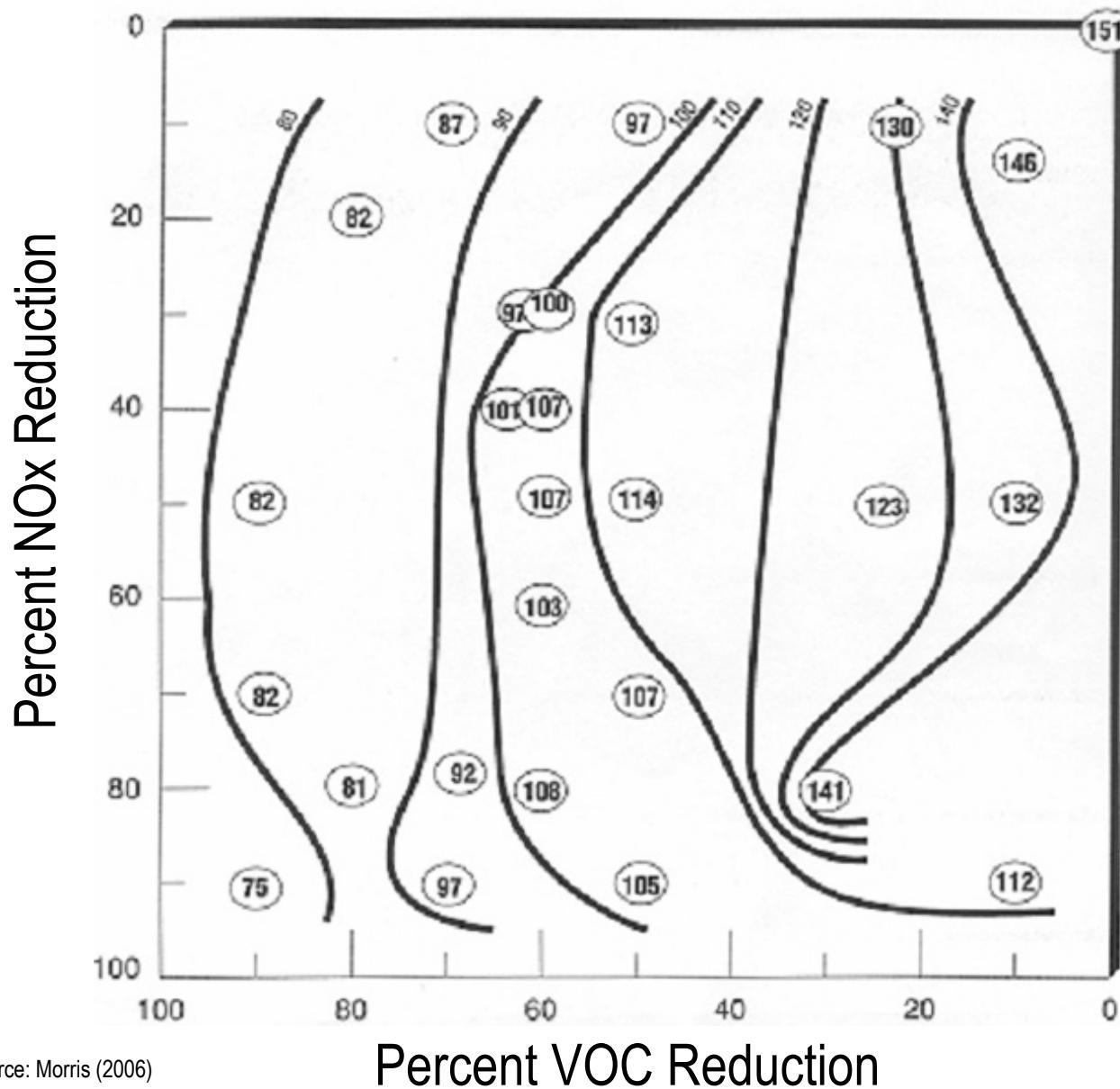
- Used for Attainment Demonstration
- Provides Guidance on Levels and Direction of Controls

Example 1-Hr Ozone Isopleth



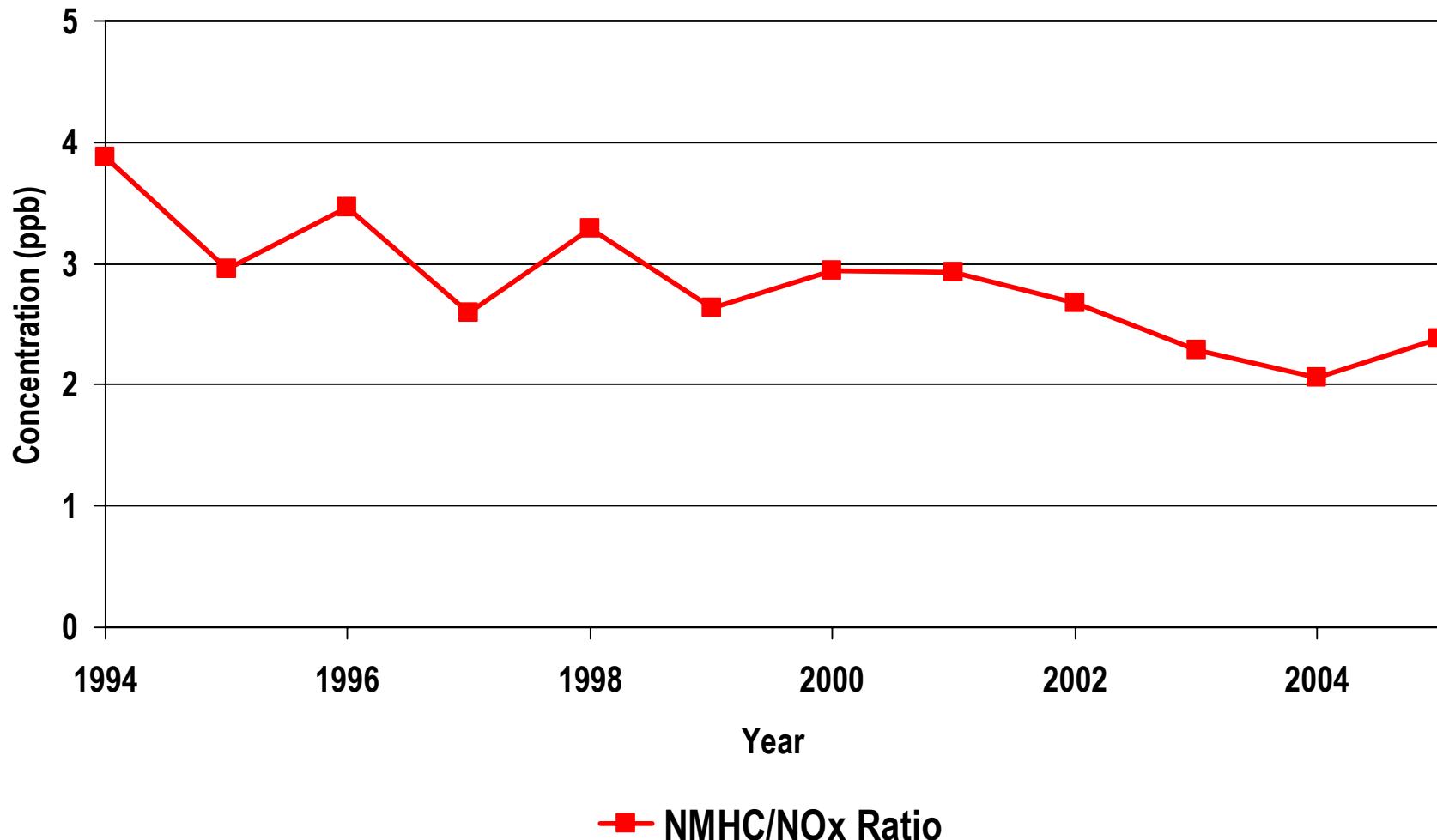
Source: Morris (2006)

Example 8-Hr Ozone Isopleth



Source: Morris (2006)

Trend in Measured NMHC/NOx Ratios



Summary

- Peak Ozone Concentrations Appear to be Leveling in Recent Years
- Hydrocarbon Concentrations Decreasing Slower in Recent Years
- Population Exposure and Dosage Decreasing (Year-to-Year Variation Larger as Exposure/Dosage Decrease)

Parameters Influencing Ozone Levels

- Chemistry
- Meteorology
- Emissions
- Socioeconomic Growth Patterns
- Control Program Effectiveness