Background Surface Ozone and How it Affects Recommendations in the Policy Assessment Document

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Comments to the U.S. EPA
CASAC Ozone Review Panel

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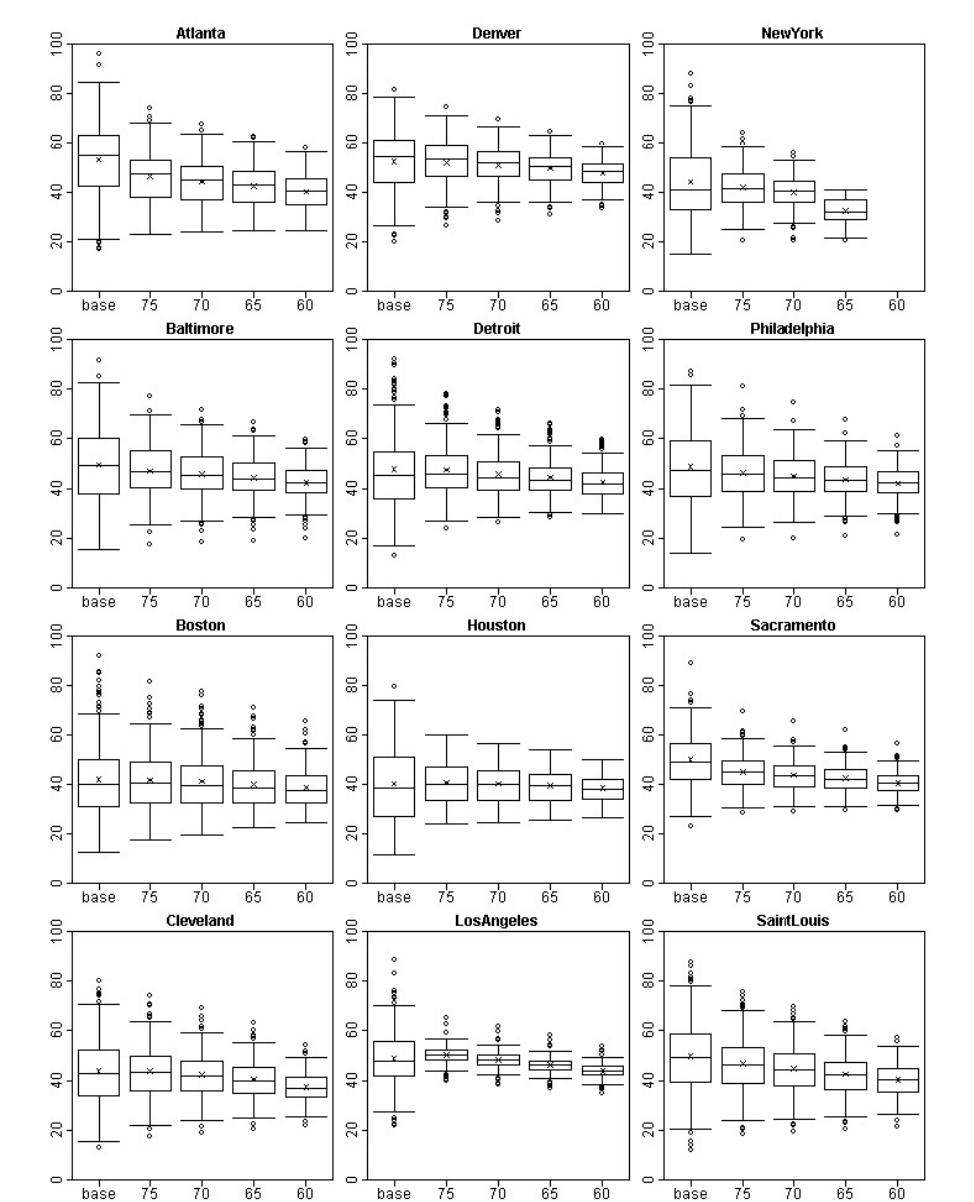
Important Finding from the REA

- With respect to the changes in the distribution of O_3 concentrations as a function of emission reductions, the risk metrics used in the REA were influenced by how the distribution of O_3 concentrations change (REA, page 9-32).

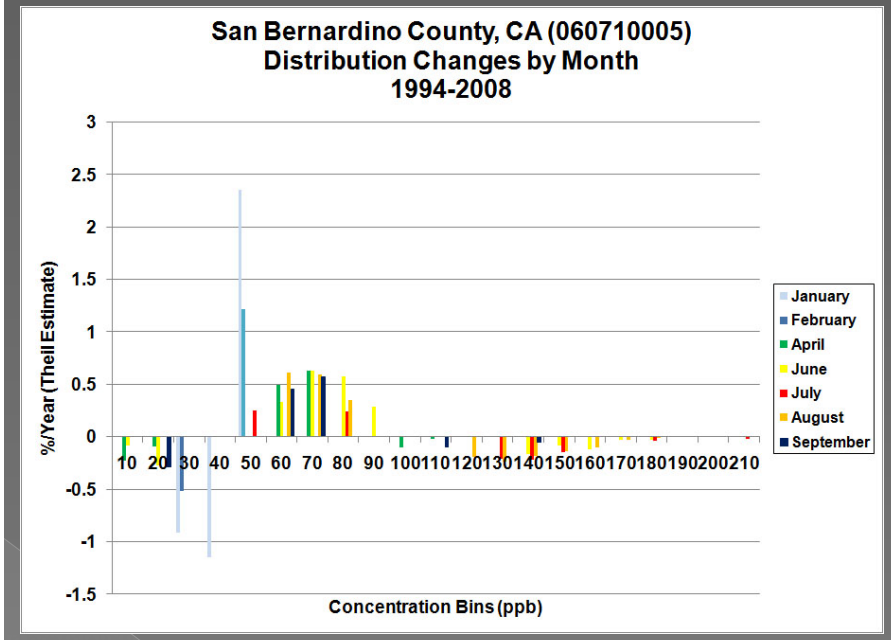
Conclusions from Comments from Lefohn and Oltmans

- The epidemiological risk estimates for attaining the existing and alternative standards show a large percentage of risk is associated with 8-hour average concentrations in the 25-55 ppb range. It is anticipated that the same would be true for the lung function risk estimates.
- Background O_3 concentrations are in the 25-55 ppb range and these concentrations are not controllable.

Distribution Changes in the 8-Hour Daily Maximum Values

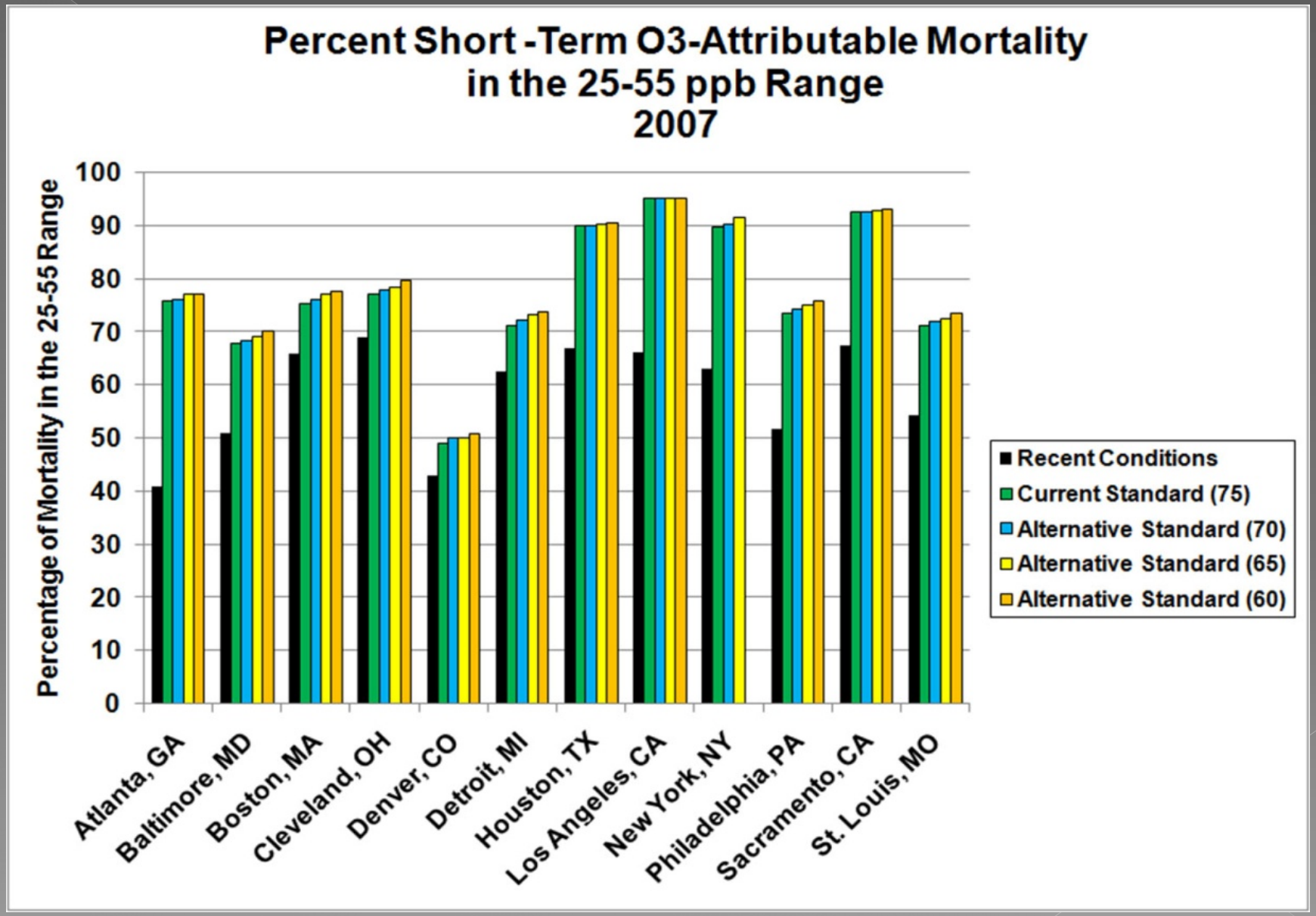


Source: REA Page 4-25)

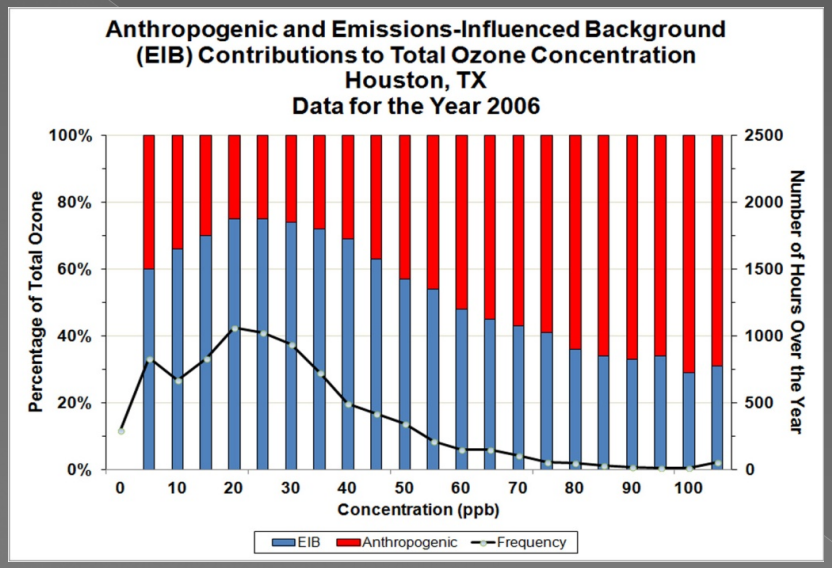


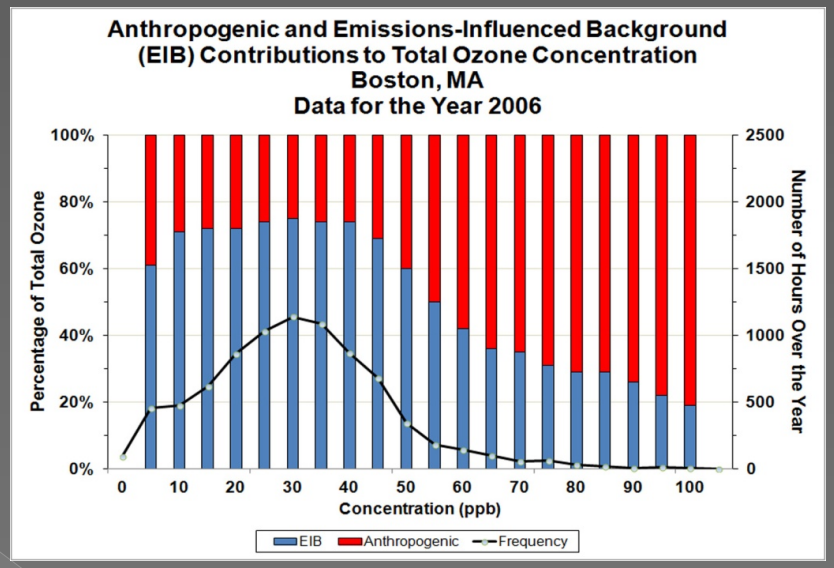
Source: Lefohn et al. (2010)

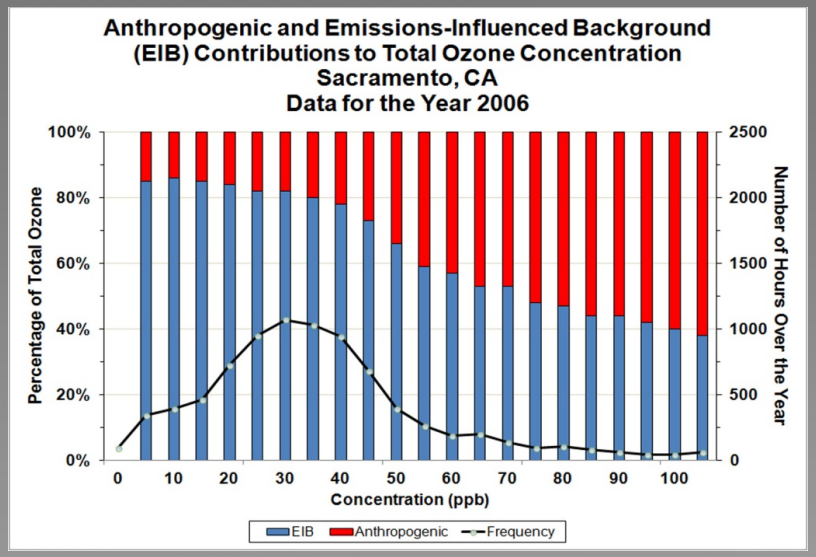
In the modeled distributions, there are a large number of 8-hour average ambient concentrations in the 25-55 ppb range.


Percent Short -Term O3-Attributable Mortality
in the 25-55 ppb Range
2007
Percentage of Mortality in the 25-55 Range
100
90
80
70
60
50
40
30
20
10
0
Atlanta, GA
Baltimore, MD
Boston, MA
Cleveland, OH
Denver, CO
Detroit, MI
Houston, TX
Los Angeles, CA
New York, NY
Philadelphia, PA
Sacramento, CA
St. Louis, MO
Recent Conditions
Current Standard (75)
Alternative Standard (70)
Alternative Standard (65)
Alternative Standard (60)

Relative Contribution of Anthropogenic and Background O_3

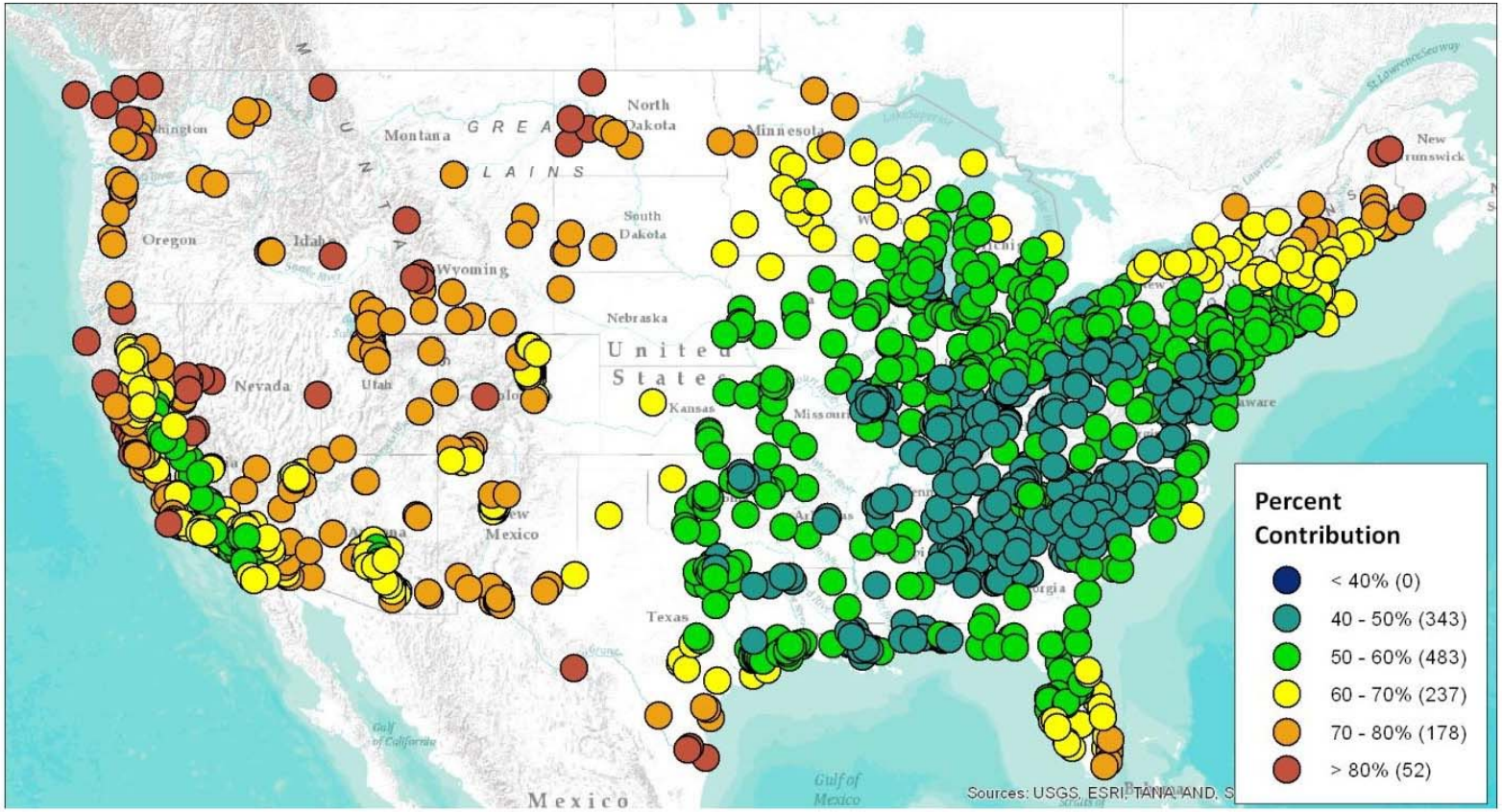






Using GEOS-Chem/CAMx, the contribution of background O_3 to total observed O_3 in the 25-55 ppb range is large (>50%).

Source: Lefohn et al. (2014a)



Map of apportionment-based U.S. background percent contribution to seasonal mean O_3 based on 2007 CAMx source apportionment modeling. (Source: page 2-18 of PA).

Important Conclusion Drawn from the PA Air Quality Analysis

- Background O_3 concentrations have an important influence on the REA risk outcomes for estimating risks associated with base conditions, attaining the current standard, and attaining alternative standard levels.

Conclusions from Comments from Lefohn and Oltmans

- The cumulative risk estimates are used to advise the EPA Administrator on the level of the O_3 standard.
- Background O_3 and the cumulative risk estimates are tightly linked together.
- When considering the level of the NAAQS, the Administrator will have to take into consideration the range of background O_3 concentrations that affect cumulative risk.