Sources and Consequences of Minnesota's Air Pollution

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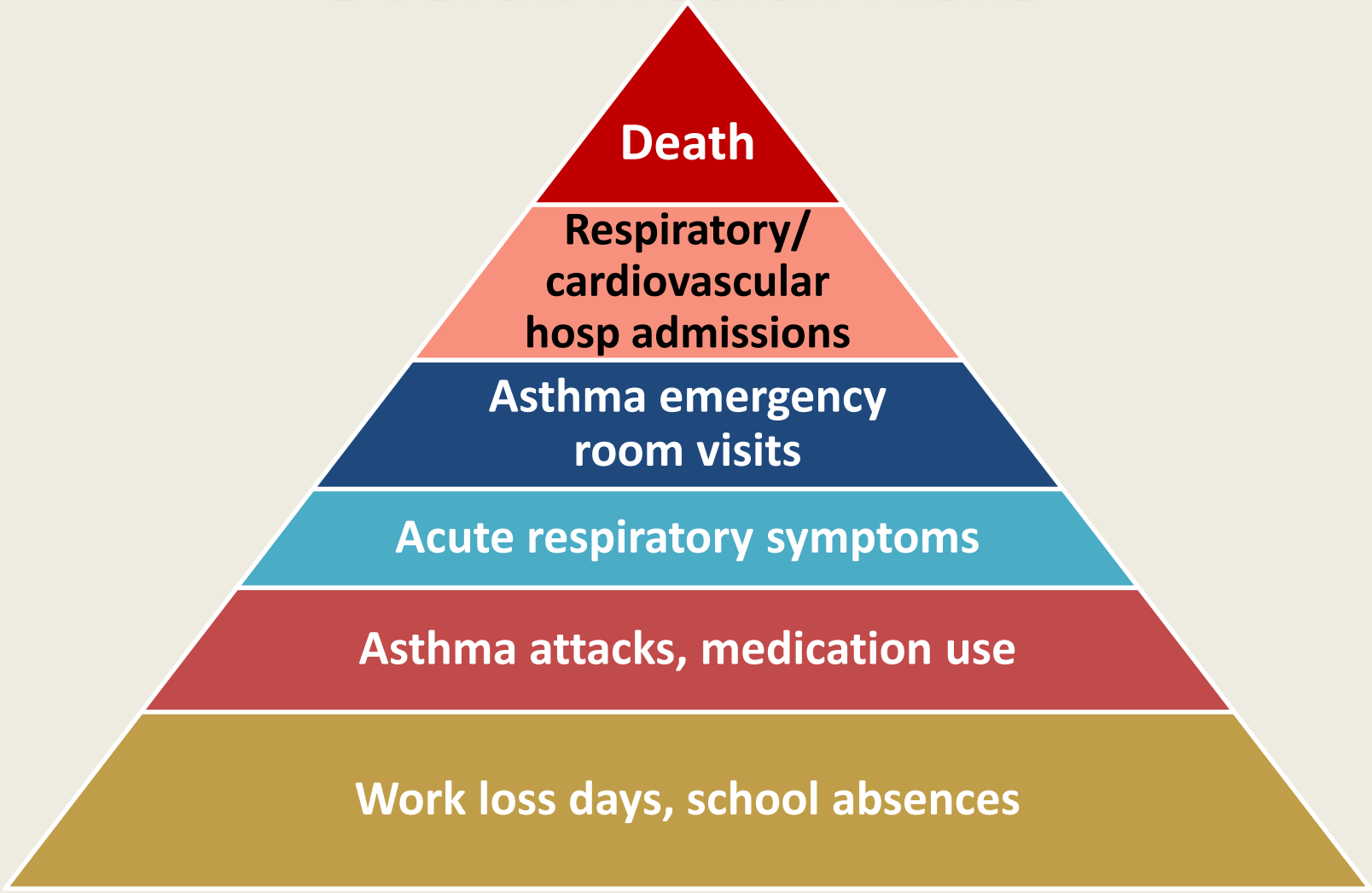
Key Messages

- Standards becoming more stringent as we learn of health effects at lower concentrations
- Urban air is of particular concern
- Main sources are combustion & non-point
- Our ability to do anything about it is limited using our existing regulatory structure
- We need to work differently – engage new partners, and leverage current relationships

Air Pollution in Minnesota

- Consequences of air pollution
  - Health & Environmental
  - Economic
- Trends and sources of air pollution
- Actions

Particulates and Ozone: Pyramid of Overall Health Risks

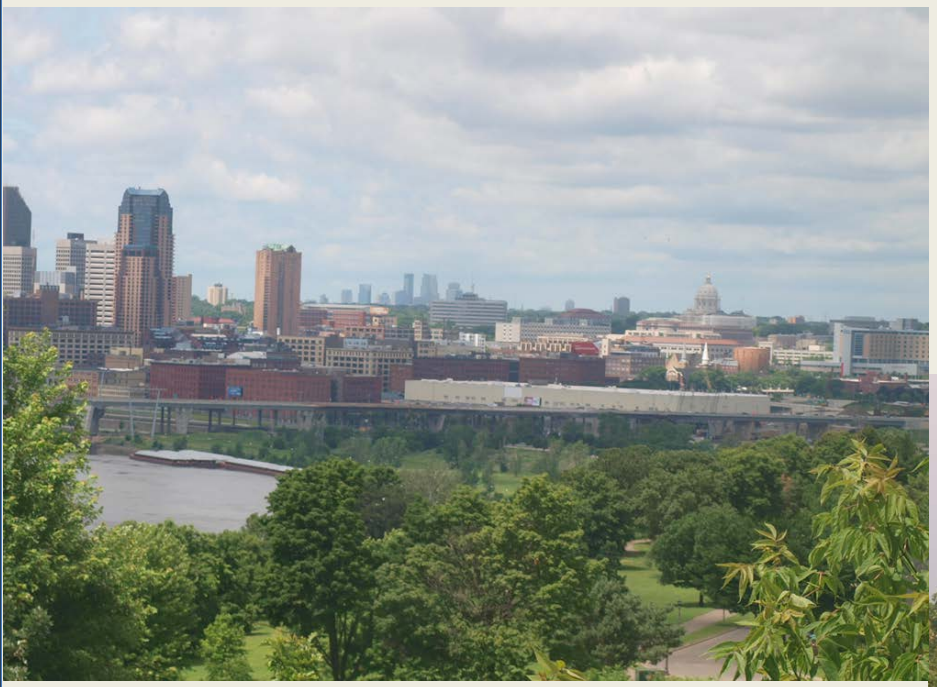


Examples of Localized Risks

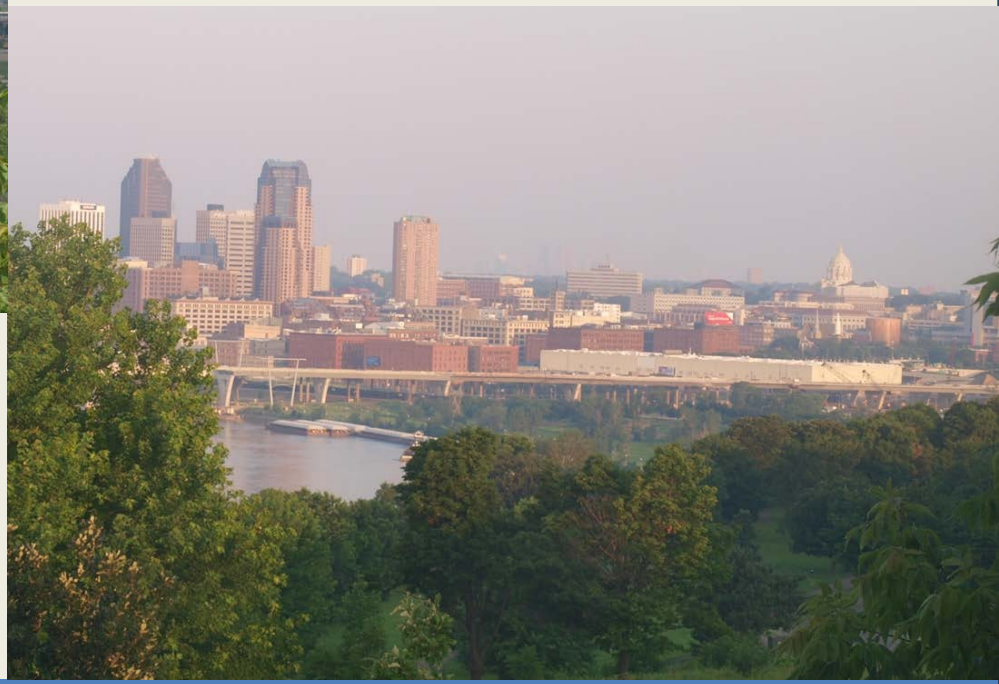
Residential
Wood Smoke

Near
Roadway

Other Air Pollution Concerns



- Air Alerts
- Visibility

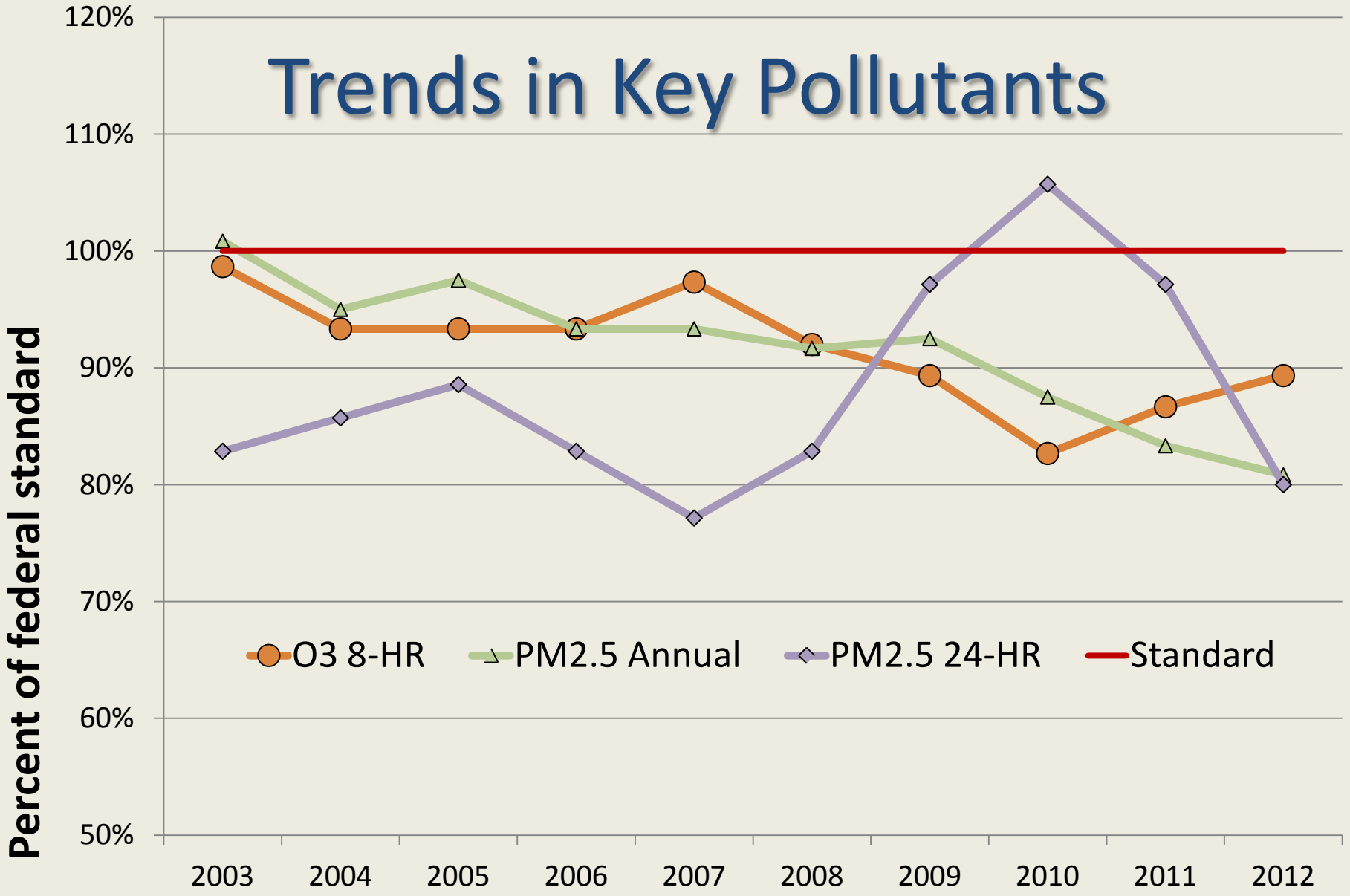


- Deposition
- Other Environmental Concerns

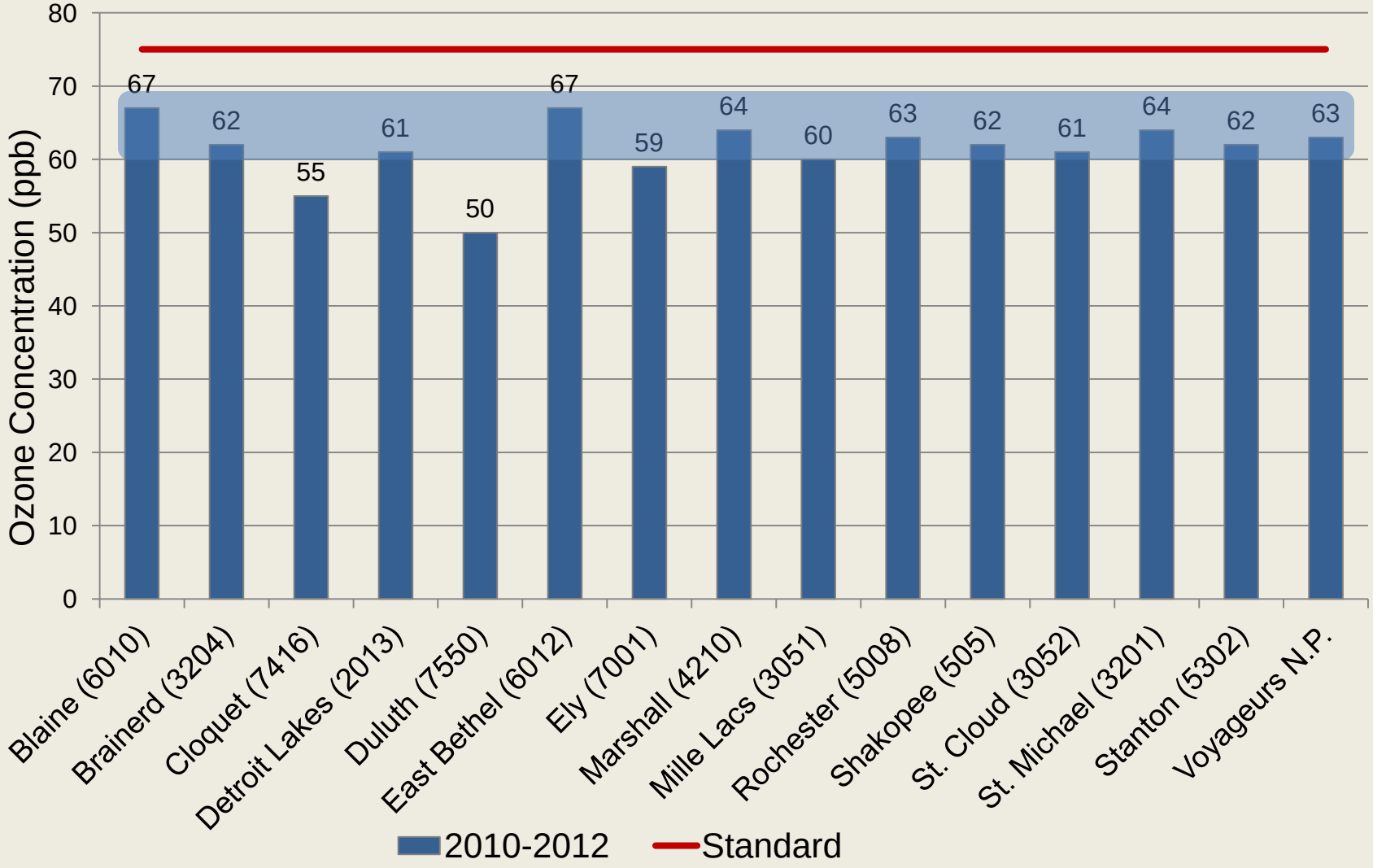
Air Quality Standards

- EPA uses its Clean Air Act authority to set National Ambient Air Quality Standards (NAAQS)
- NAAQS set for six pollutants
  - Carbon monoxide, lead, NOX, SO2, ozone and particulate matter (PM2.5)
- NAAQS reviewed for health protection - on five year schedule
- Attainment refers to meeting the standards

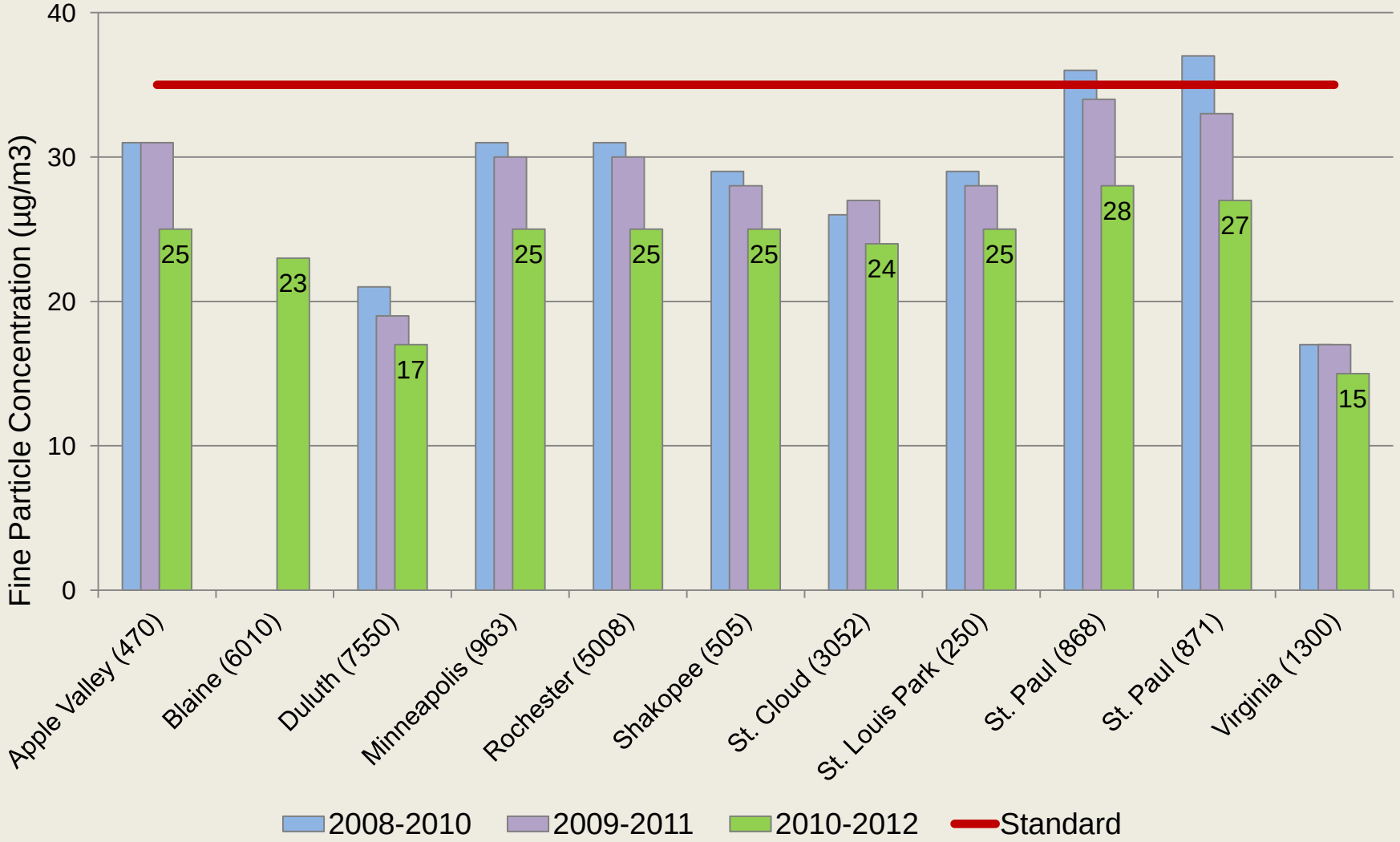
Trends in Key Pollutants



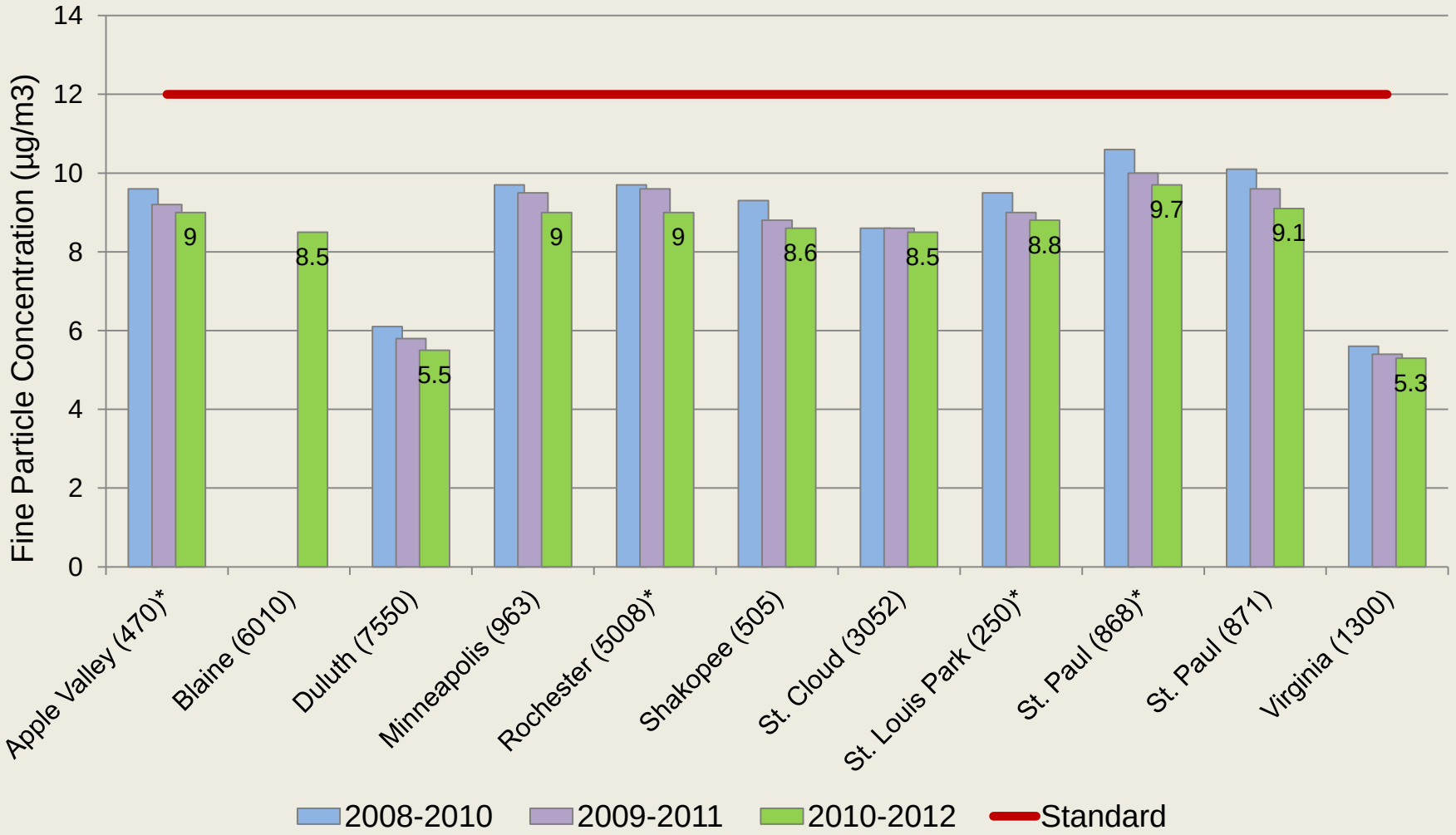
Ozone Compared to Standard



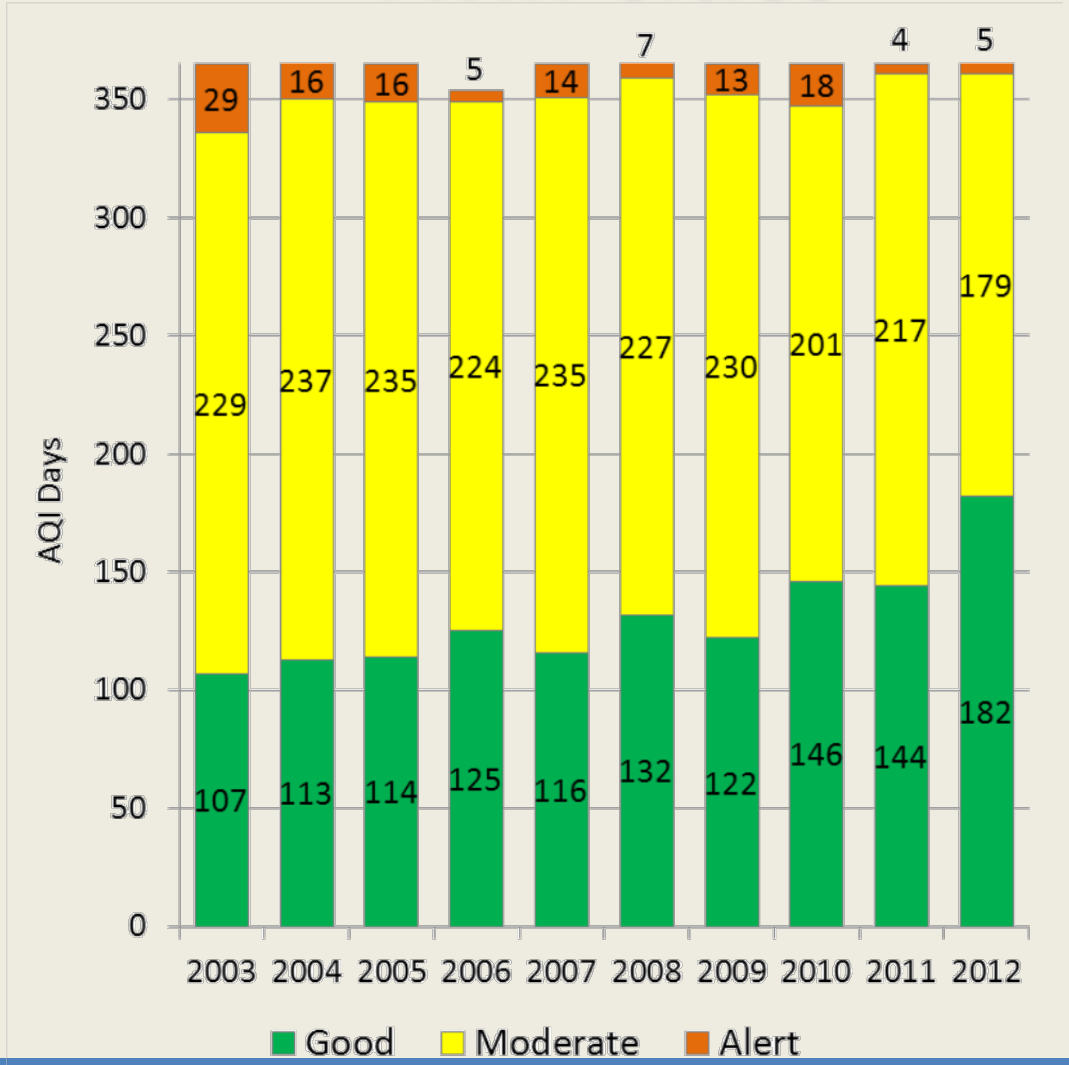
Daily PM2.5 Compared to Standard



Annual PM2.5 Compared to Standard



AQI and Air Quality Alert Days in the Twin Cities

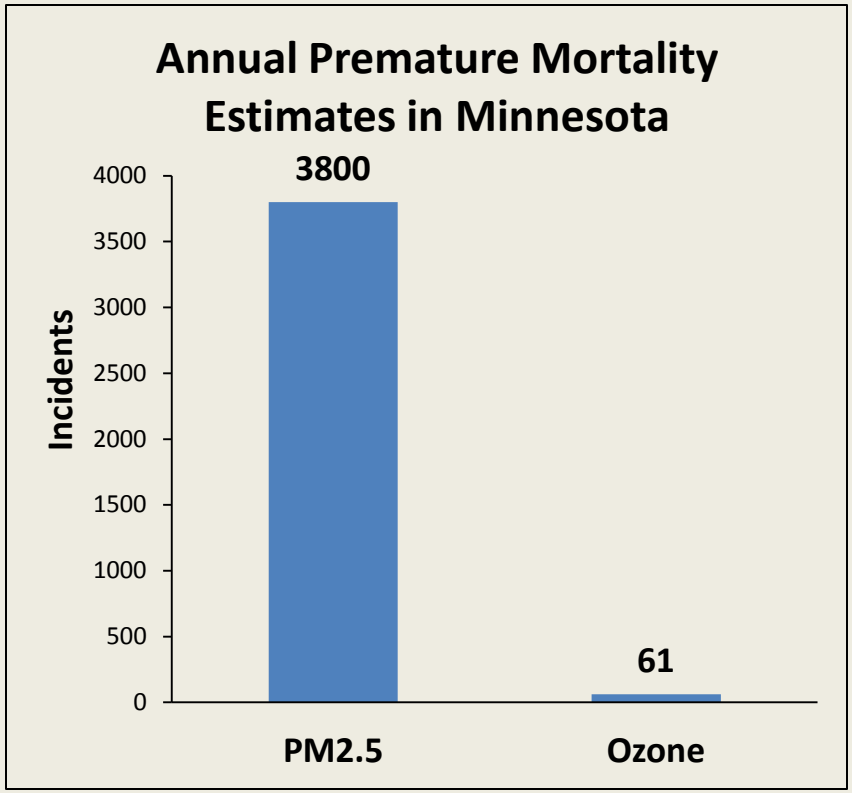


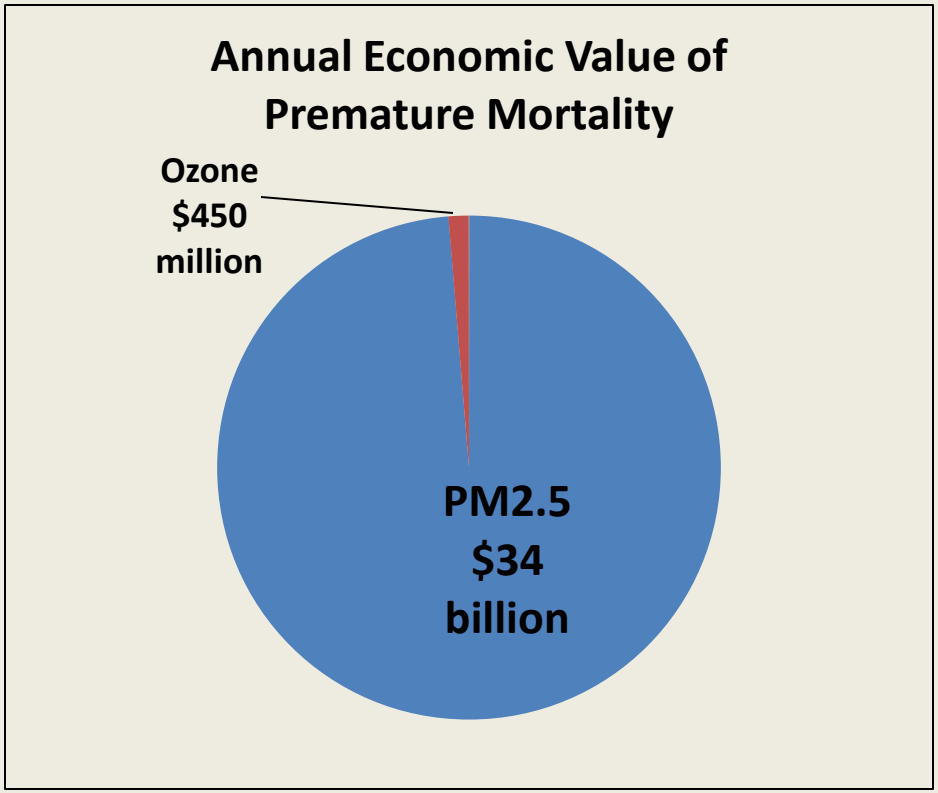
Consequences of Nonattainment

- More permitting requirements, more monitoring and modeling, State Implementation Plan
- More red tape
- Adverse health impacts (ozone, PM)
- Economic consequences – up to $240 million/yr

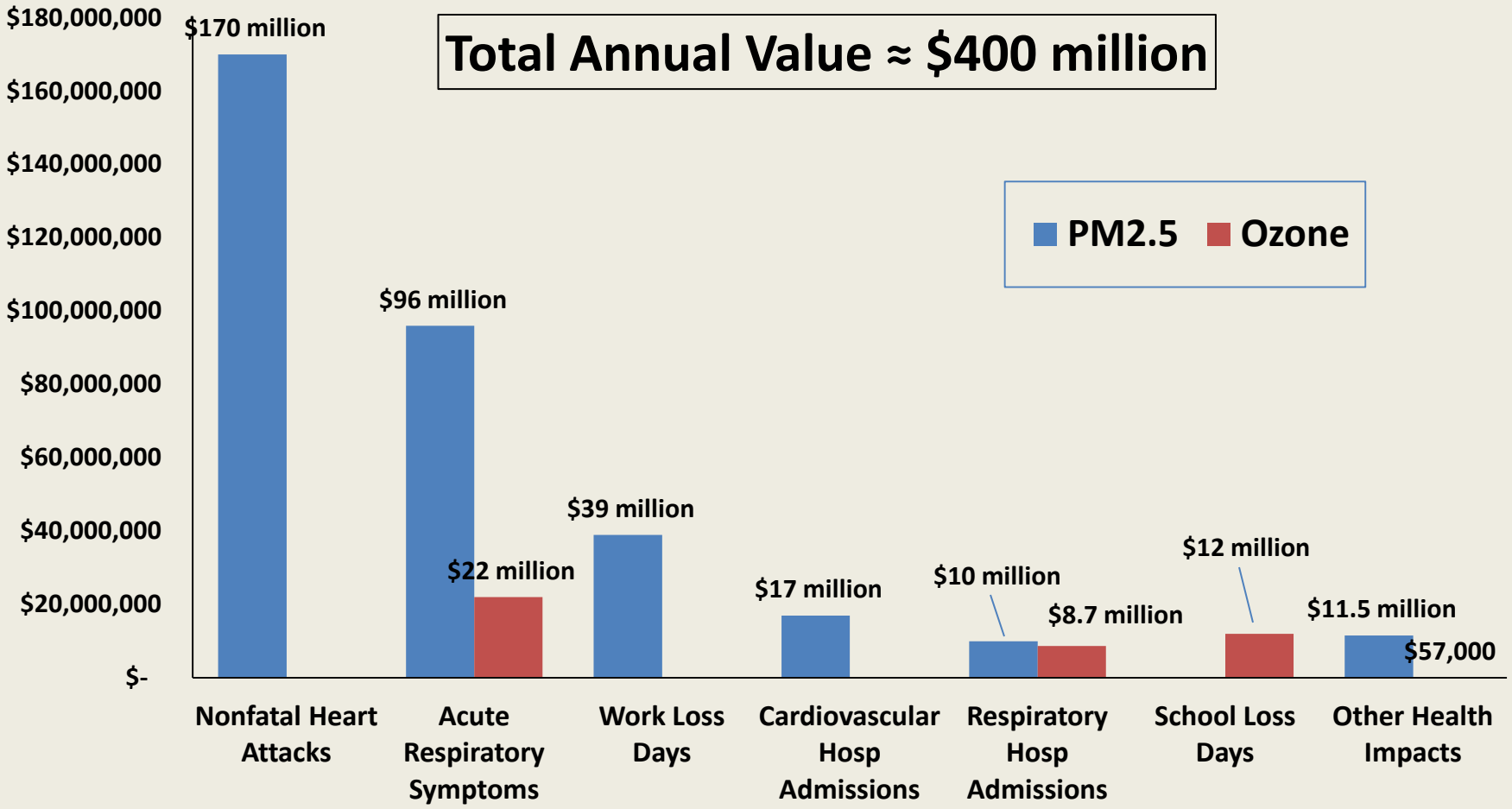



Health Impacts of Current Pollution in Minnesota: Premature Mortality





Current Pollution in Minnesota: Nonfatal Health Impacts



Where Do Fine Particles Come From?

Indirect particle sources

Ammonia

NO_X

Natural gases

SO_2 NO_X

Vapors

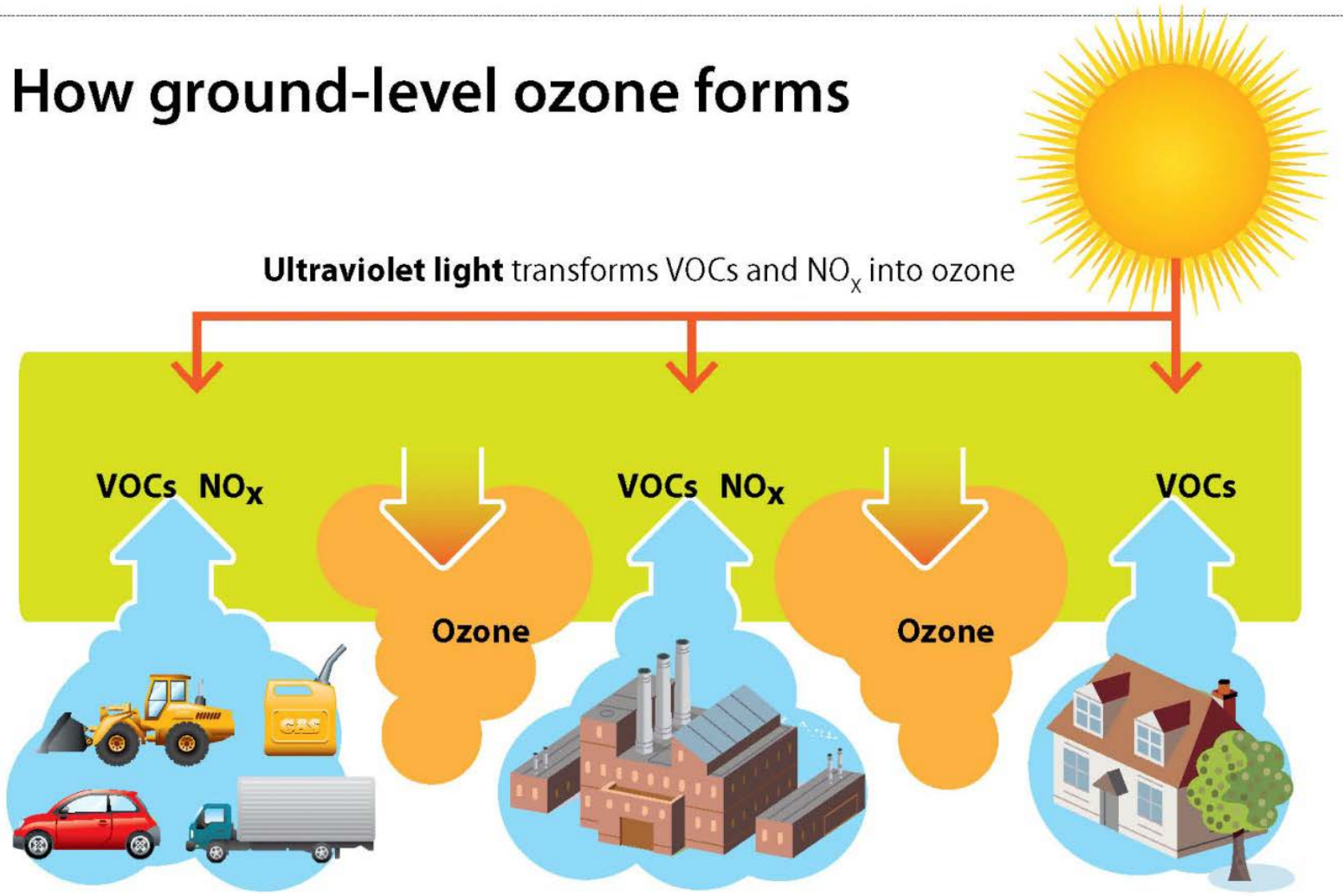
Indirect particle formation
(chemical and condensation process)

Direct particle sources

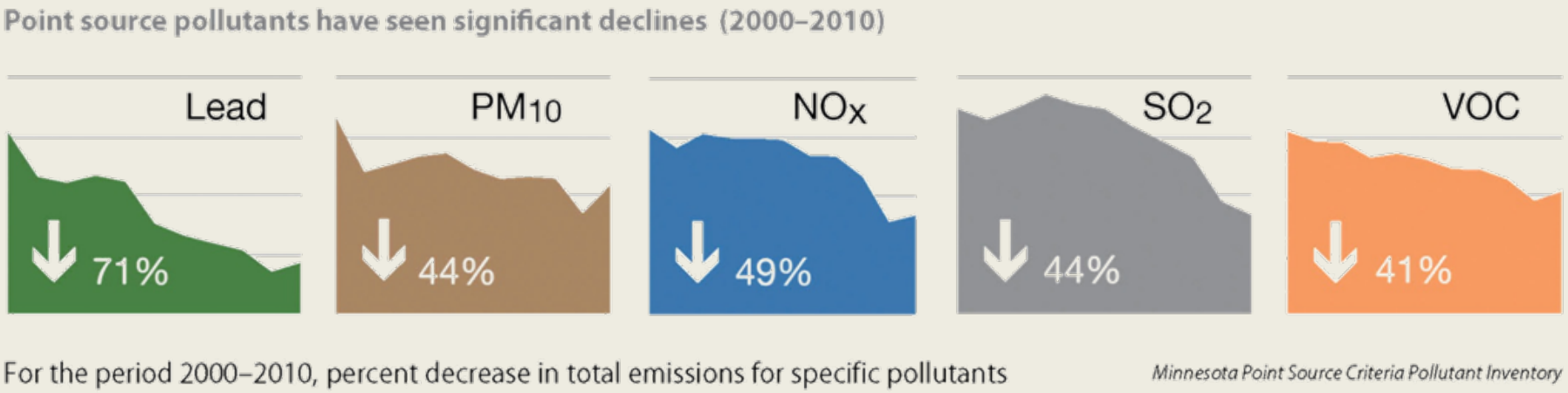
Diesel, gasoline, industry and wood burning

Fine particle pollution

How ground-level ozone forms



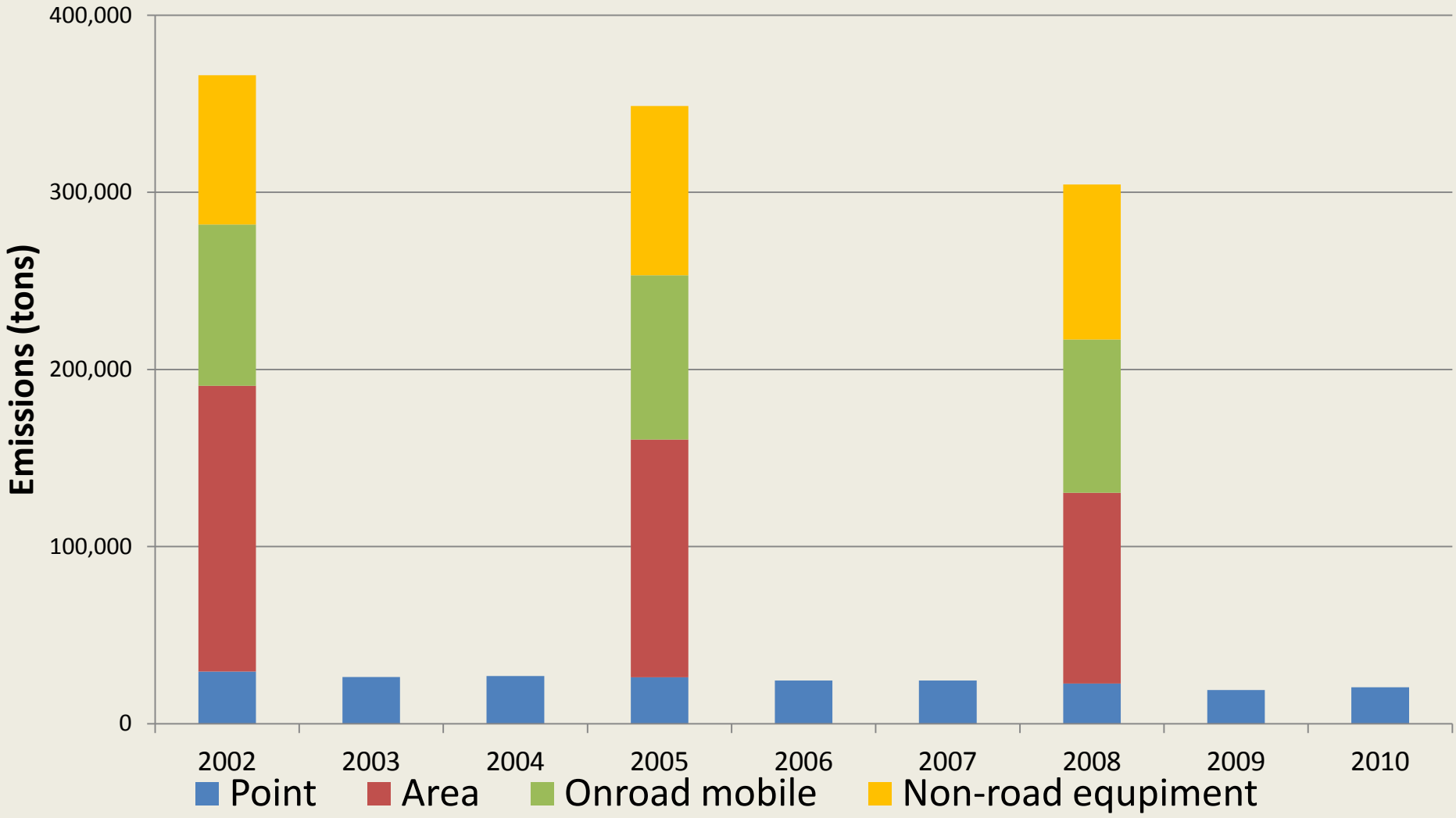
Point Source Pollutants have seen Significant Declines



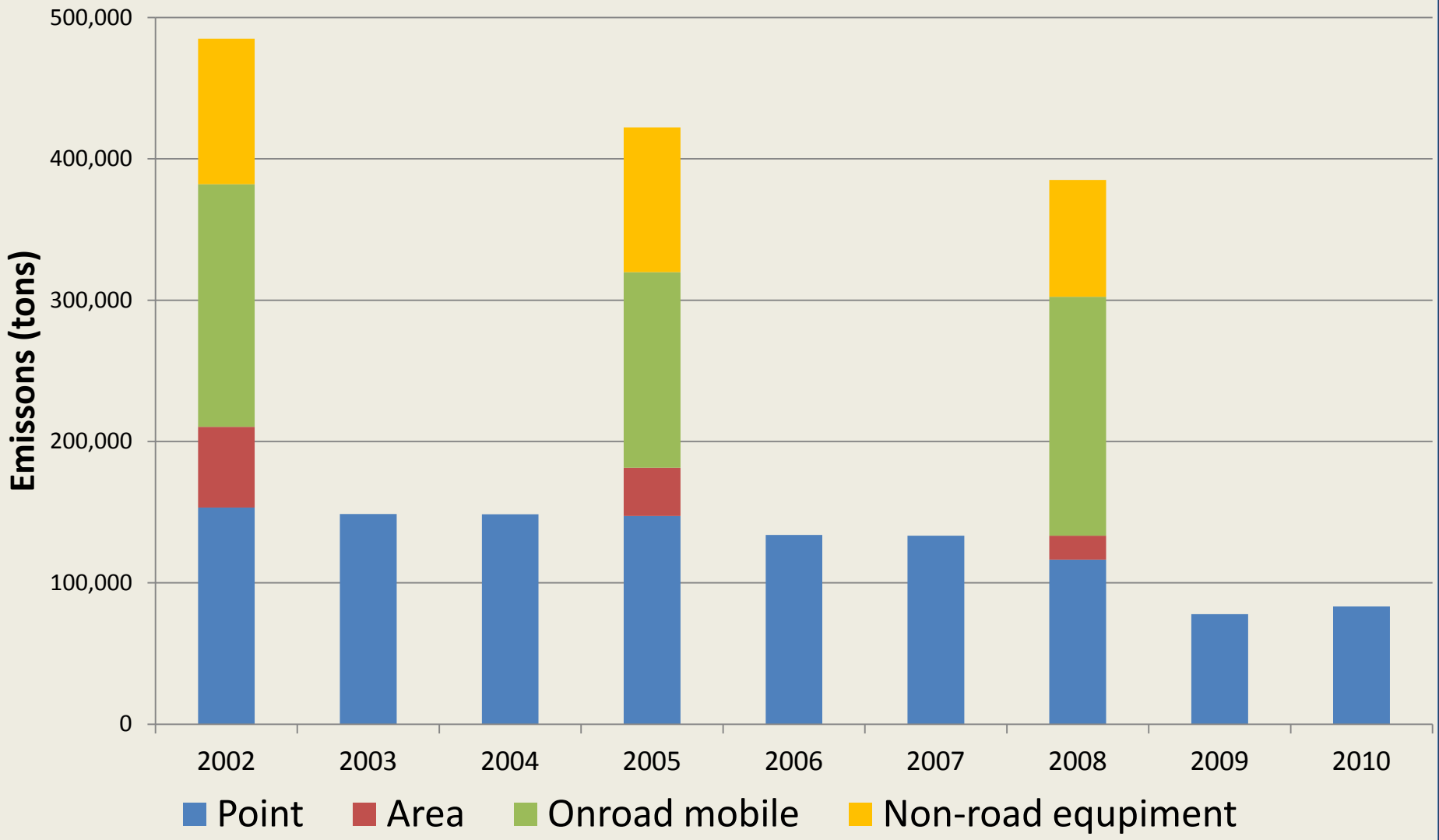
For the period 2000–2010, percent decrease in total emissions for specific pollutants

Minnesota Point Source Criteria Pollutant Inventory

VOC Emission Trends



NOx Emission Trends



Statewide Residential Wood Burned

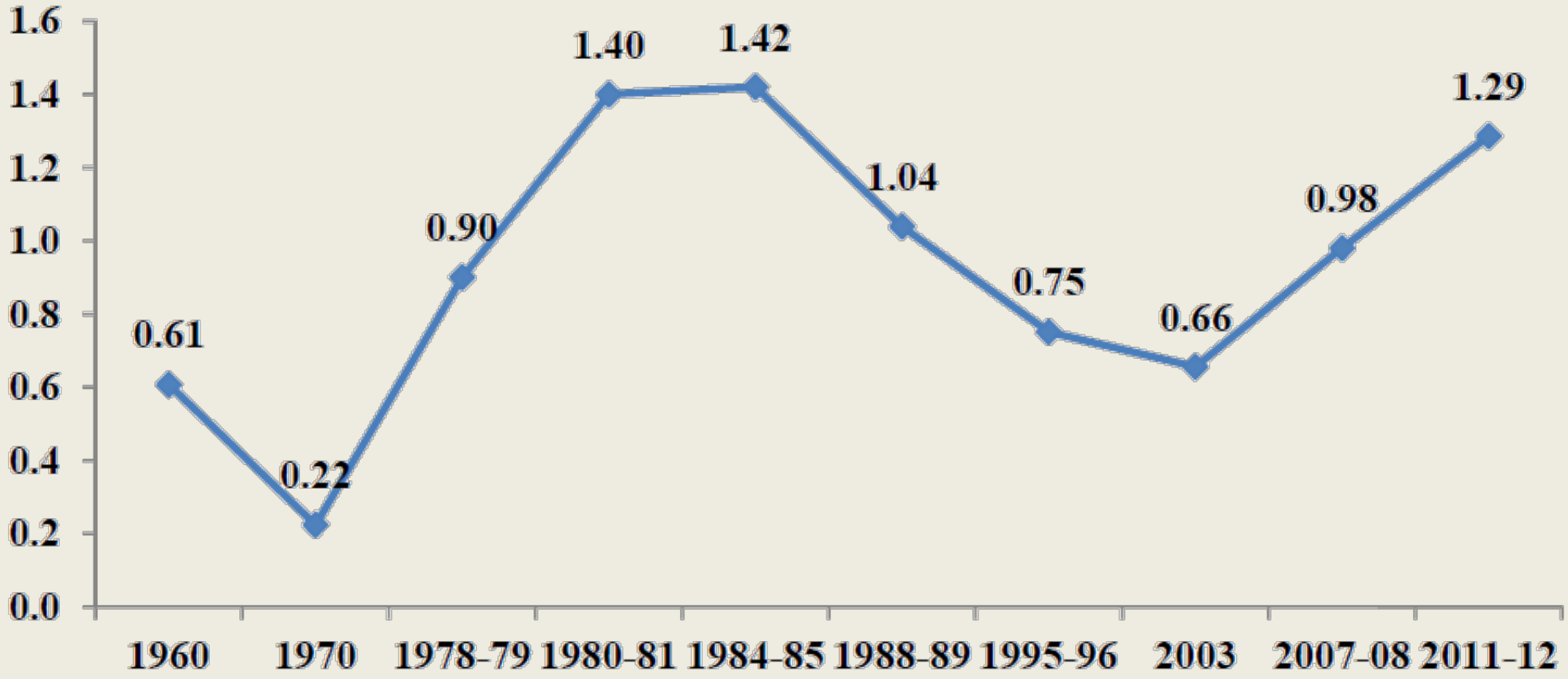


Figure 2. Wood fuel consumption in Minnesota by survey year (Millions of Cords)

Statewide Residential Wood Burned

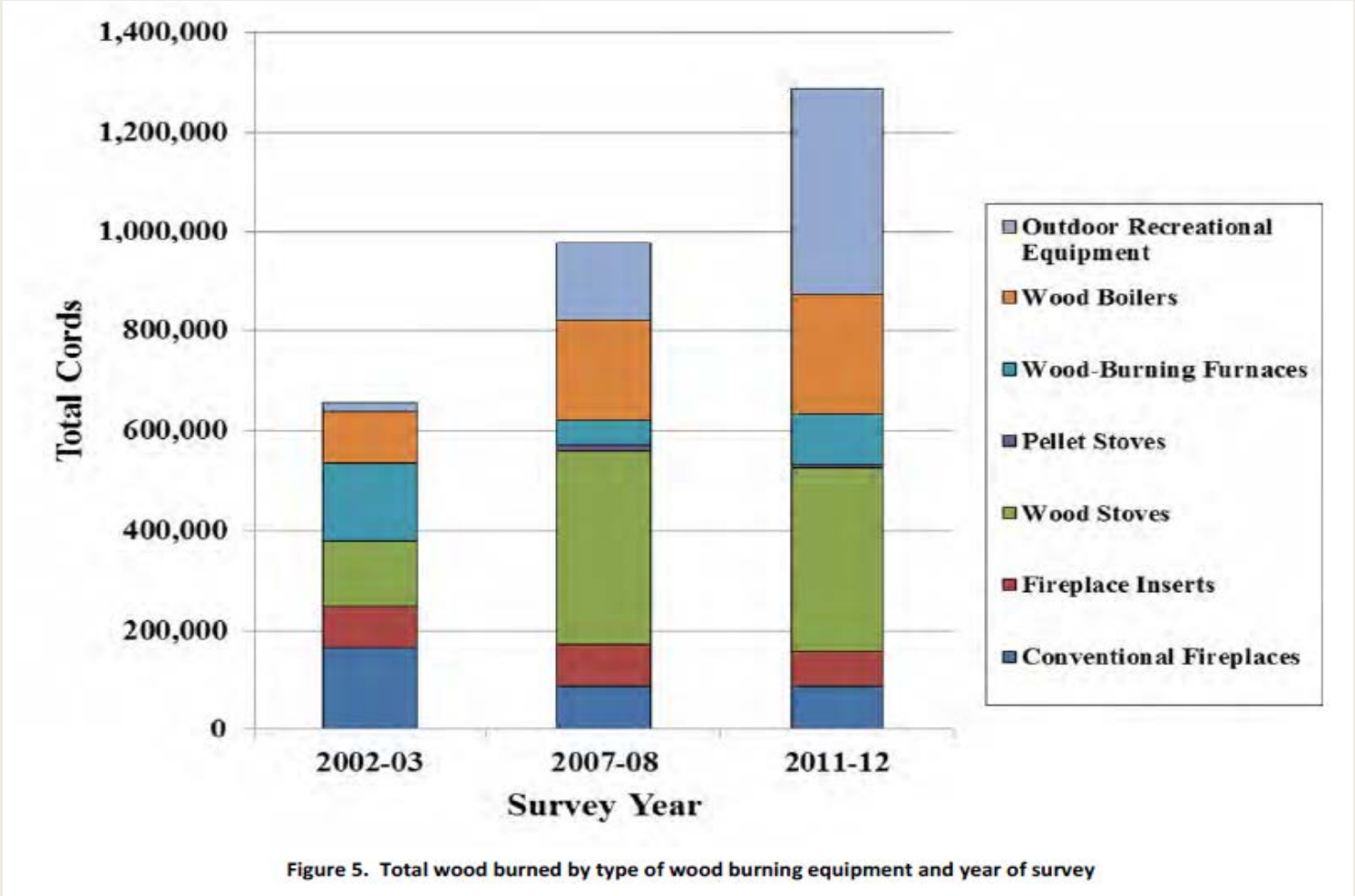
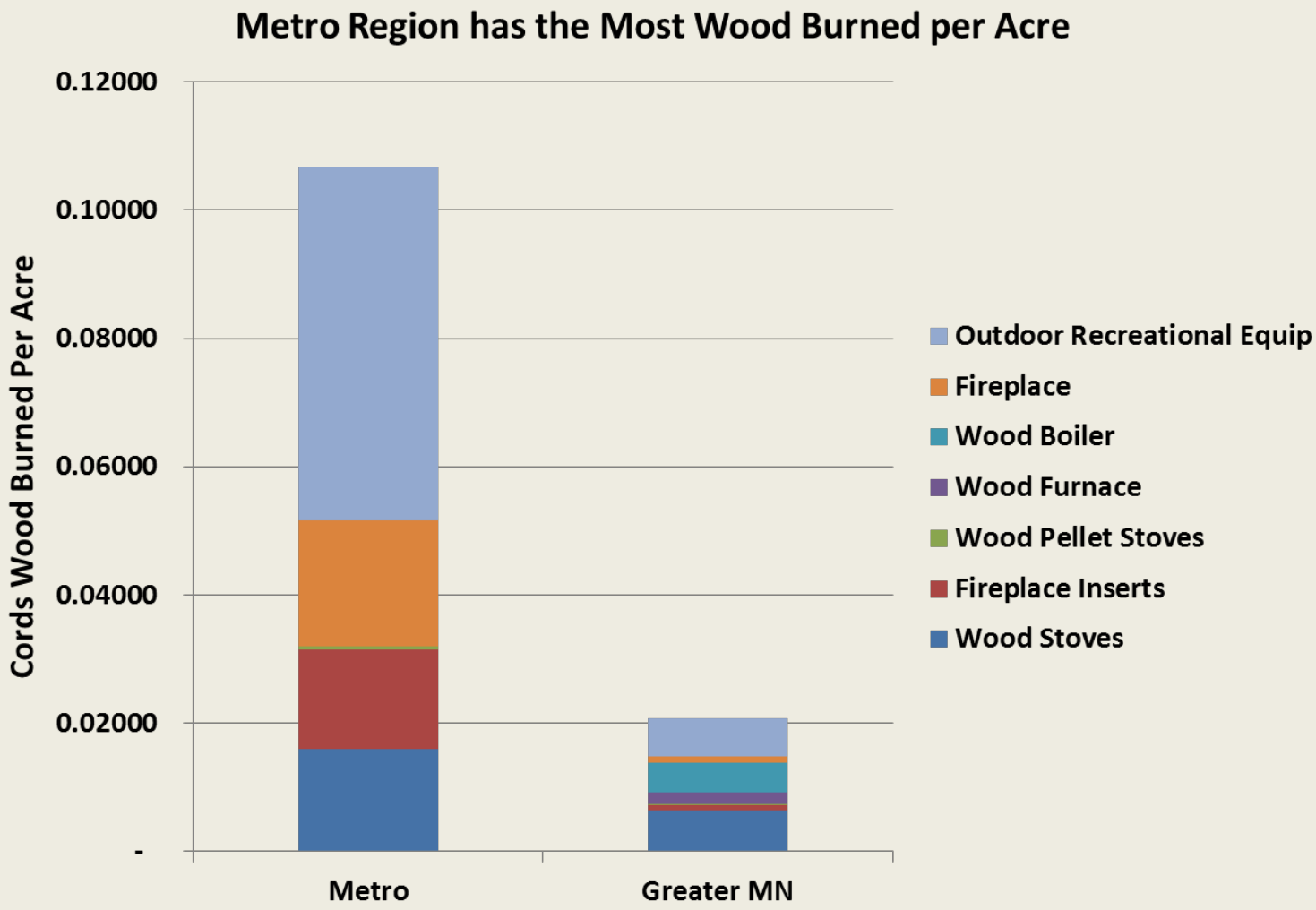


Figure 5. Total wood burned by type of wood burning equipment and year of survey

Residential Wood in the Metro



Actions

- Clean Air Dialogue
  - Stakeholder process to clarify the challenge and recommend actions
- Clean Air Minnesota v. 2.0
  - Reactivate this public private partnership to reduce air emissions
- PM and Ozone Advance
  - Join EPA program to credit early actions to avoid nonattainment

Clean Air Dialogue Recommendations

- Reduce Particulate levels by 20%
- Reduce Ozone levels by 10%

- Avoid nonattainment
- Provide margin of safety
- Reduce health impacts
- Target reductions in most impacted communities

Public Private Partnership Commitments to date

- $1,380,000 – MPCA Budget
- $1,000,000 - Flint Hills Resources
- City of Minneapolis
- Just getting started

Summary & Challenges

- Standards more stringent & harder to meet
  - Focus: NOx, VOCs and direct PM2.5 emission reductions
- Voluntary reduction efforts
  - avoid high costs of nonattainment
  - reap health benefits of cleaner air now
- We'll continue to reduce permitted smokestack emissions
- Need to work differently to address small sources