

Draft 2012 PM2.5 Plan

Public Workshop #2

June 27, 2012

webcast@valleyair.org

Email Notifications

- PM Plans email sign up available at <http://www.valleyair.org/lists/list.htm>
- Receive email updates on the development of this plan and future PM plans

Continued Public Process

- Public input is important and encouraged
- Plan is still in draft form, analysis is preliminary and will continue to be revised/updated throughout the public process

Agenda

- Overview of PM2.5 and *2012 PM2.5 Plan*
- Air Quality Trends
- Risk-based Strategy
- Control Measure Evaluation
- Incentives and Technology Advancement
- Emissions Inventory and Modeling Analysis
- Next Steps
- Public Comment

Overview of PM2.5 and the *2012 PM2.5 Plan*

Background

- EPA established new PM_{2.5} standard in 2006
- Lowered 24-hr standard from 65 to 35 $\mu\text{g}/\text{m}^3$
- New State Implementation Plan (SIP) is due to EPA in December 2012
- **Goal**: Adopt plan that attains the new standard as expeditiously as possible
- Attainment must be achieved no later than December 2019
- EPA recently proposed new PM_{2.5} standard; same 24-hr, annual 12-13 $\mu\text{g}/\text{m}^3$

Guiding Principles

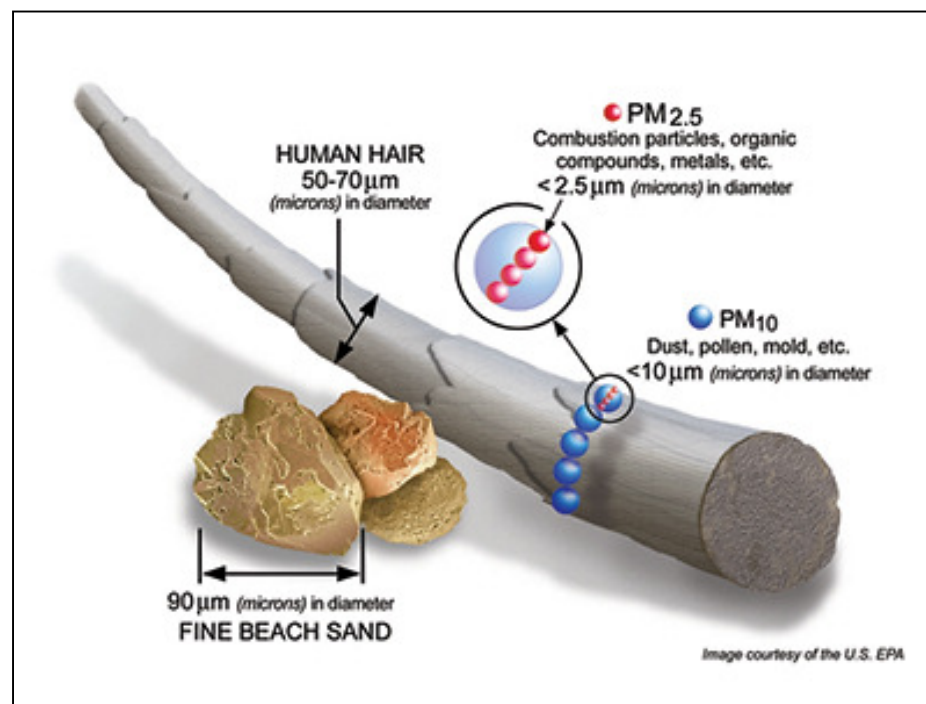
1. Public health #1; expeditious attainment
2. Sound science as the plan's foundation
3. Develop cost-effective strategies
4. Consider all opportunities for cost-effective emission reductions
5. Balanced approach: mobile and stationary reductions
6. Involve the public in reducing emissions
7. Prioritize Risk-based Strategy
8. Progress towards multiple standards
9. Every sector must continue to reduce emissions
10. Compel State and Federal action
11. Address pollutant transport with neighboring air districts
12. Public participation in the plan process
13. Technology advancement

Federal Plan Requirements

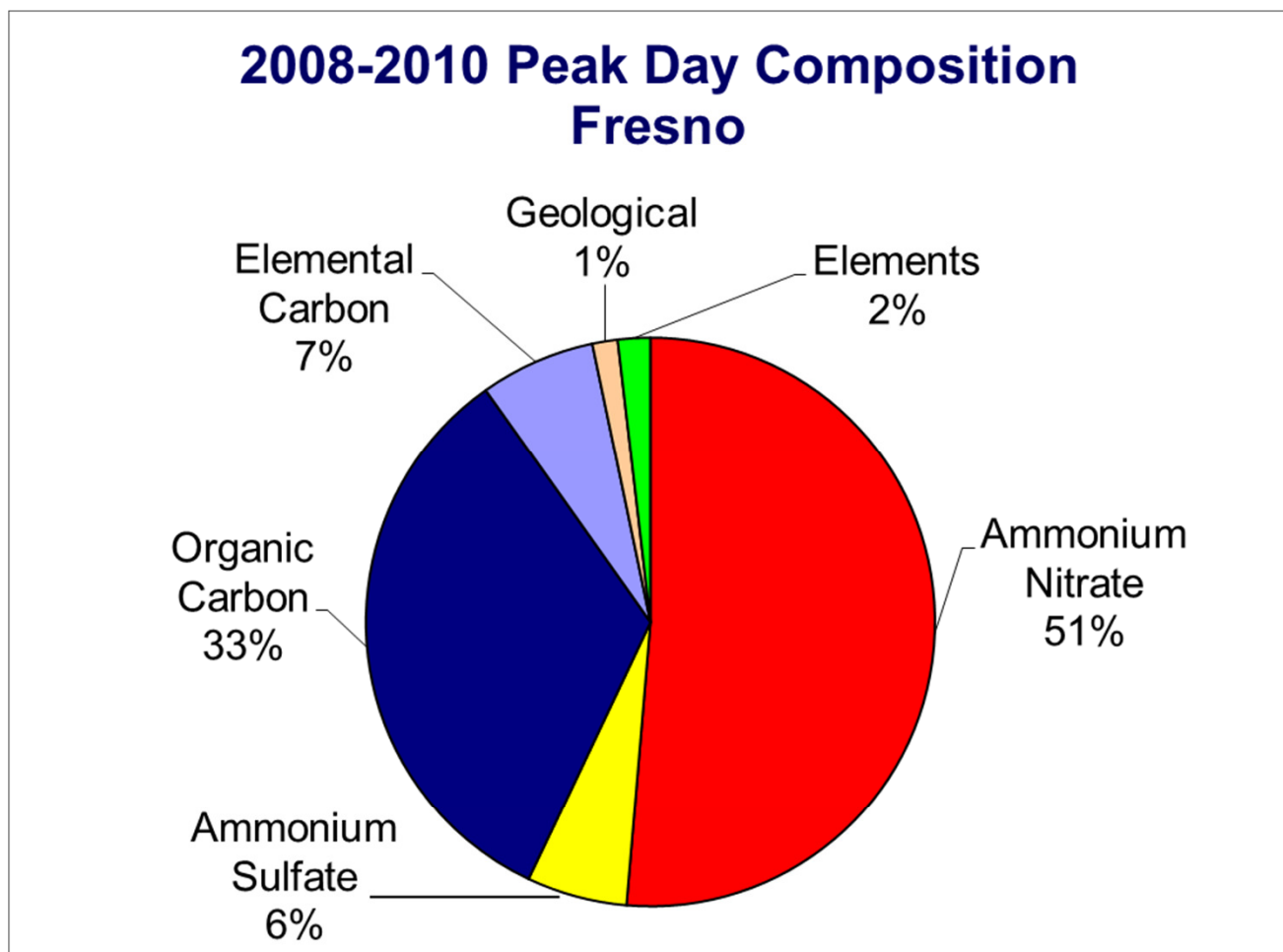
- Analysis of PM_{2.5} Concentrations
- Emissions Inventories
- Photochemical Modeling and Weight of Evidence to Identify Emission Reductions for Attainment
- Emission Control Strategies
- Transportation Conformity Budgets
- Reasonable Further Progress Demonstration
- Contingency Measures

PM2.5: solid particles and liquid droplets

- Emitted directly or formed indirectly through chemical reactions
- Types, or species:
 - Ammonium nitrate
 - Ammonium sulfate
 - Organic carbon
 - Elemental carbon
 - Trace metals
 - Geologic materials
 - Sea salt



PM2.5 Composition

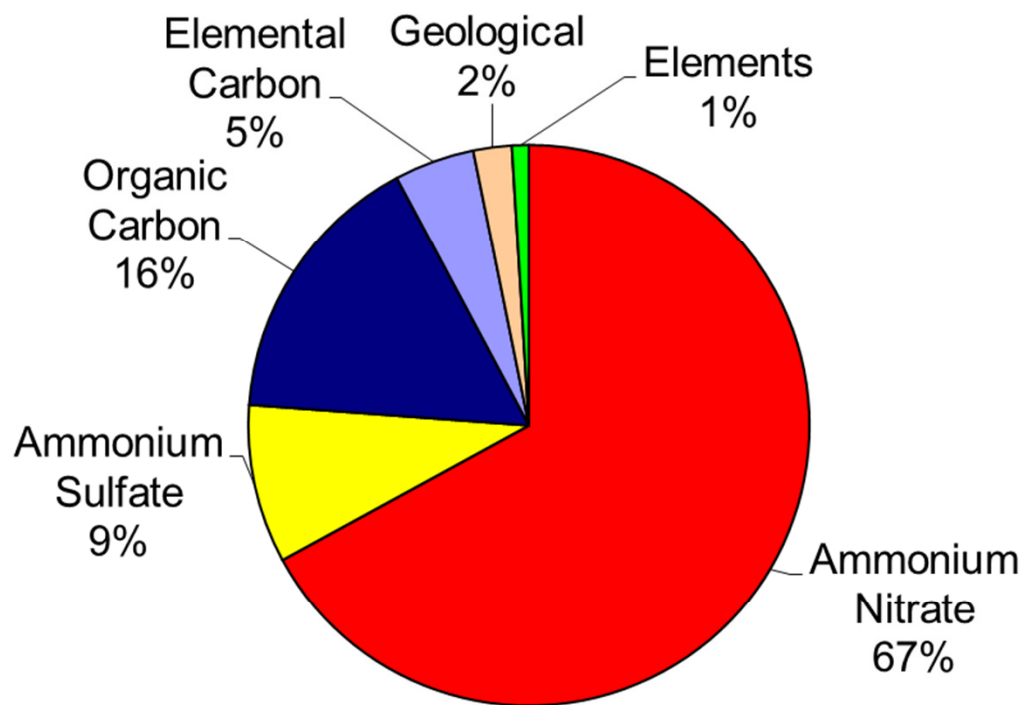


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PM2.5 Composition

2008-2010 Peak Day Composition Bakersfield

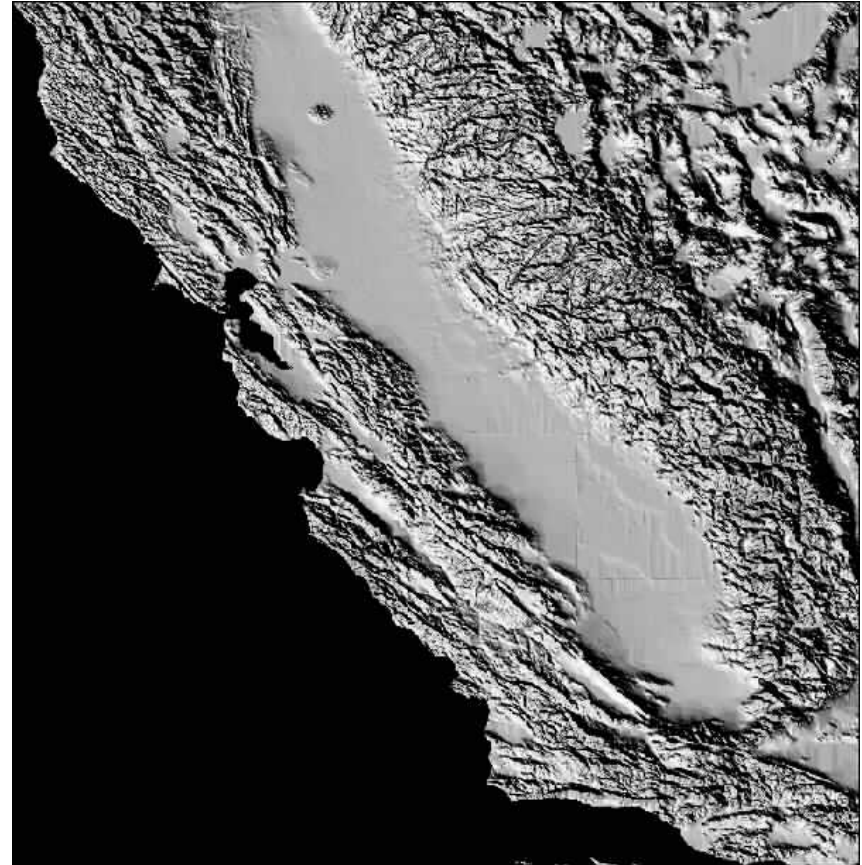


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Valley PM2.5 Challenges

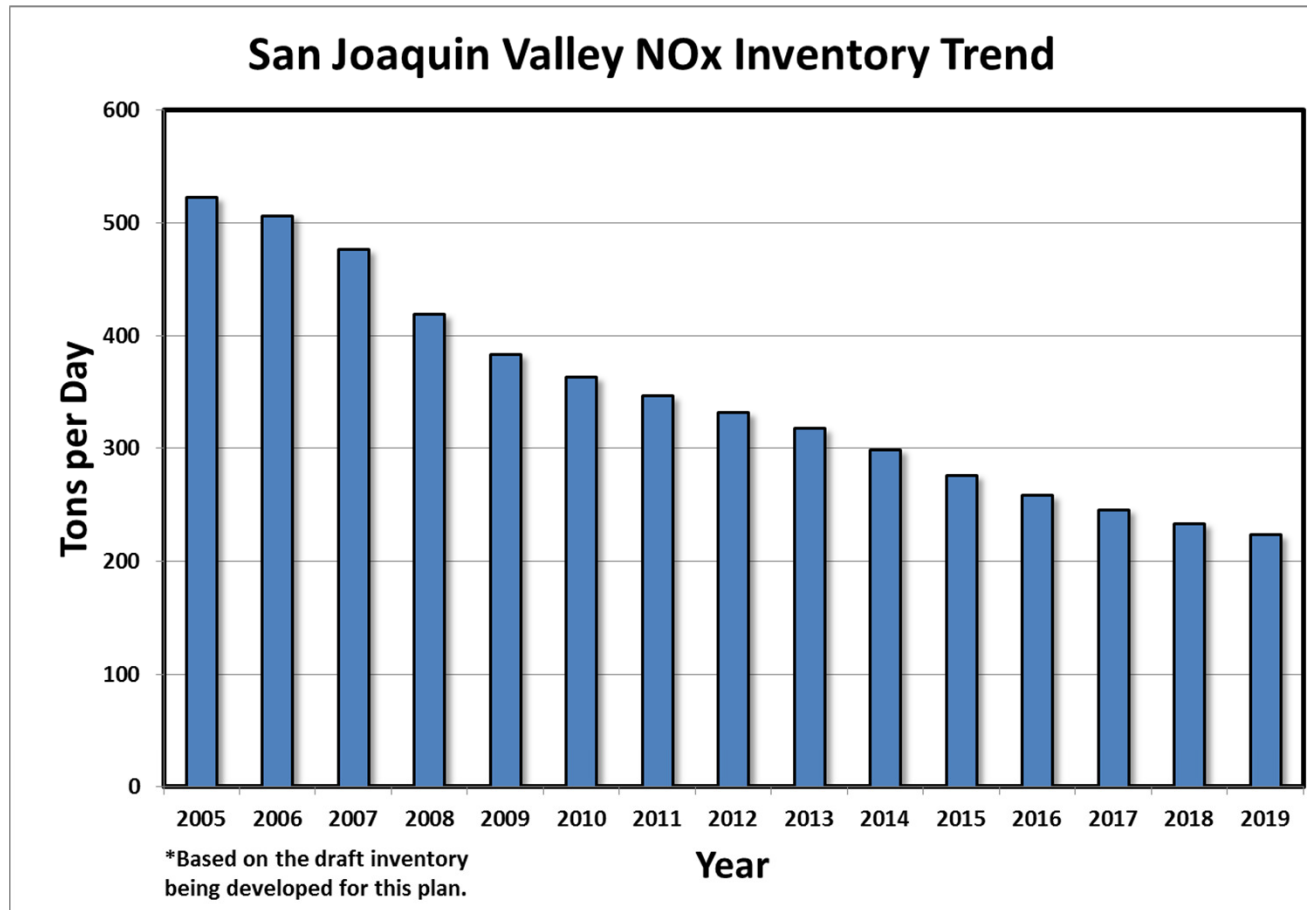
- Geography and meteorology
- Temperature inversions
- Biogenic emissions
- Air pollution transport
- Population increases



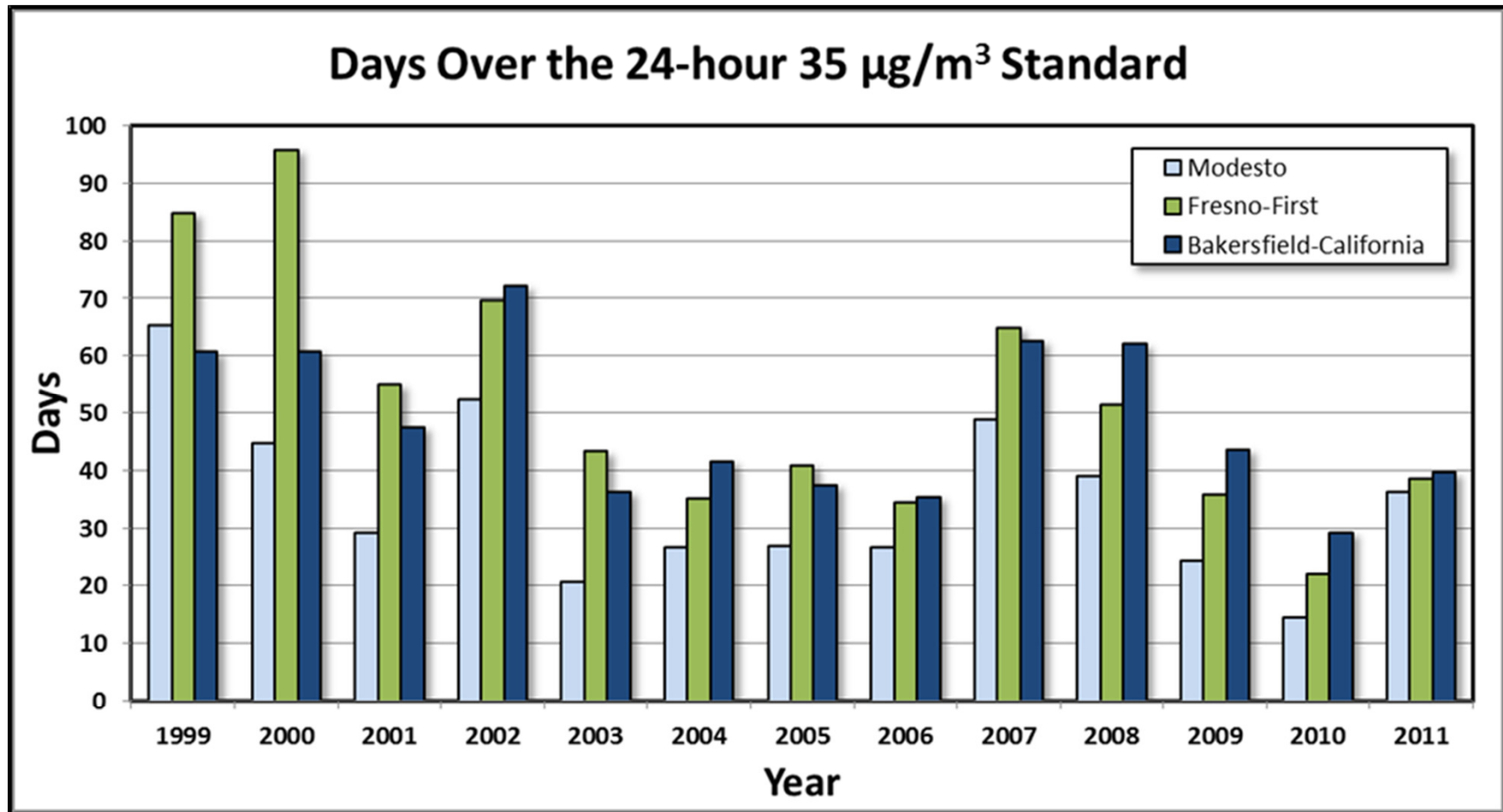
PM2.5 Reductions

- Through significant investments by industry and the general public, progress has been made in reducing PM2.5, but further improvement is needed
- Peak concentrations are much lower now than in the past

NOx Reductions under Existing Controls



PM2.5 Trends



Risk-Based Strategy

Risk-Based Strategy

- Attaining federal PM_{2.5} standards will result in clear and significant health benefits. Within this strategy, we can prioritize measures that will achieve the greatest health benefits
- Integrating Risk-based Strategy into *2012 PM_{2.5} Plan* in the following areas:
 - Health research discussion
 - Ambient data analysis
 - Emissions, modeling, and weight-of-evidence analysis
 - Population exposure analysis
 - Control measure prioritization

Overview of PM2.5 Health Effects

- Potential health impacts related to the size, chemical composition, surface area
- Health effects include aggravated asthma, increased respiratory symptoms, decreased lung function in children, lung cancer, and premature death
- Not attaining the 2006 PM2.5 standard: \$5.6 billion total costs (Hall, 2008)

PM species-specific health impacts

Organic carbon (OC)	• Includes PAH (Polycyclic aromatic hydrocarbons) and quinones • Evidence of high toxicity, esp. combined with metals • Drives inflammation, disrupts immune system, drives pulmonary oxidative stress, generates reactive oxygen species
Elemental carbon (EC)	• Often occurs with OC and metals • Evidence of low toxicity, relative to OC and metals
Metals	• Cardiovascular effects and hospitalizations • Respiratory effects, esp. combined with OC
Ammonium nitrate	• Very low oral toxicity. Evidence limited to epi studies
Ammonium sulfate	• Very low oral toxicity. Modest respiratory impacts observed at very high experimental exposures
Geological	• Generally low toxicity with some exceptions, e.g. silica

Five factor exposure assessment methodology

- **Relevance to attainment:** effectiveness of control measures for attainment of health-based EPA standards
- **Toxicity of chemical species:** toxicity of individual chemicals and health risk of unique combinations of chemicals
- **Particle size and deposition:** health impacts vary by size of the particle, even within PM_{2.5} range
- **Proximity to ultrafines:** elevated exposure to freshly-emitted ultrafine particles produced by combustion
- **Population intake fraction:** pollutant mass inhaled (depending on population proximity) divided by pollutant mass emitted



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Stationary and Area Source Control Strategy Evaluation

Control Strategy Source Categories

- Stationary and Area Sources:
 - Includes industrial/manufacturing, lawn care, commercial cooking, residential wood burning, agricultural sources, etc.
 - Account for 15% of NO_x emissions in the Valley
- Mobile Sources:
 - Mobile sources account for over 80% of NO_x emissions in the Valley and a significant portion of direct PM_{2.5}
 - District lacks regulatory authority (under ARB and EPA authority)

Stringent Rules In Place

- Sources under District's regulatory authority have already been required to reduce emissions at or beyond Reasonably Available Control Technology (RACT)
 - Stationary source NO_x emissions reduced by 80%
- ARB has recently adopted numerous regulations to reduce emissions from mobile sources
- These strategies will continue to reduce emissions through 2019

Evaluation of Control Strategies

- Evaluate all PM2.5 and PM2.5 precursor sources for potential emission reduction strategies – “No stone left unturned”
 - Focus on NOx and direct PM2.5 rules
- Will build upon strong regulations recently adopted by the District and ARB under current ozone and PM2.5 plans

Factors to Consider when Evaluating Control Strategies

- Technological Feasibility
- Reasonably Available Control Technology (RACT)
- Cost Effectiveness
- Risk-Based Strategy



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Types of Control Strategies

- Regulatory
- Incentive programs
- Technology advancement programs
- Policy Initiatives
- Public outreach and education

Importance of Public Input

- Evaluation in progress
 - Not many options remain for “traditional” stationary source rules (boilers, engines, etc.)
 - Preliminary indications show promise for reductions from charbroiling, lawn care, residential wood combustion
- District is seeking input from all stakeholders

Incentives and Technology Advancement

Importance of Incentives

- Accelerate emission reductions
- Accelerate technology development
- District's Incentive Program:
 - \$432 million incentive funding
 - \$487 million leveraged match funding
 - 93,000 tons emission reductions

Seeking SIP Creditability

- Surplus
 - Not required by local, state or federal regulations
- Quantifiable
 - Transparency through reporting mechanisms
- Enforceable
 - Mechanisms to ensure project completion

Technology Advancement

- Developed in response to the *2007 Ozone Plan* “Black Box”
- Address the long term need for zero- and near-zero-emission transport of goods and people
- 11 Projects in progress
- Collaborations with other agencies

Technology Advancement

- \$8 million budgeted in in upcoming year
- Current Technology Focus Areas
 - I: Renewable Energy
 - II: Waste Solutions
 - III: Mobile Sources
- Emphasize involvement of local colleges and universities
 - Developing local capacity

ARB Presentation

*Presented by John DaMassa,
California Air Resources Board
(Slides are in a separate presentation)*

Next Steps in the Planning Process

Next Steps

- Subsequent drafts of this plan will include preliminary analysis and discussion on:
 - Regulatory control strategies
 - Incentive programs
 - Technology advancement
 - Public outreach
 - Legislative efforts
- Additional opportunities for public comments

Proposed Timeline for 2012 PM2.5 Plan

Ongoing	Outreach on plan process and findings: presentations/discussions at various meetings
April 27 th and 30 th 2012	Public workshops and commenting period
June 27, 2012	Public workshops and public commenting on revised plan draft. Written comments due July 11.
July 2012	ARB modeling workshop
August 2012	Public workshops and public commenting on revised plan draft
September 2012	Post proposed draft of the plan
October 18, 2012	District Governing Board hearing to adopt
November 15-16, 2012	ARB hearing to adopt the SJV plan and the state strategy
December 14, 2012	Plan due to EPA



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Public Comments

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To ensure consideration prior to next workshop,
comments due by 5:00 PM on July 11, 2012

Open Discussion

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