Proposed Research Plan Fiscal Year 2012-2013

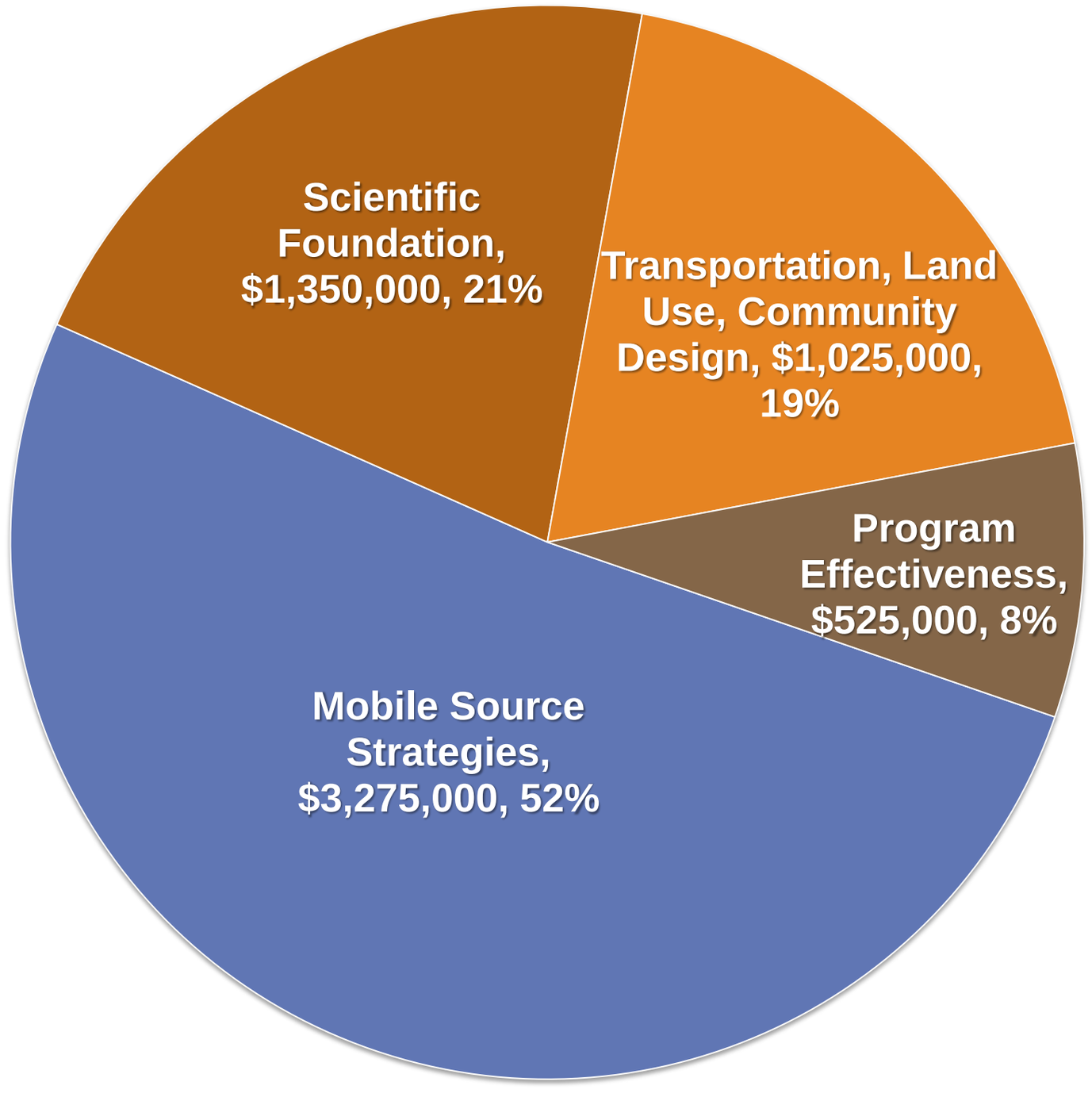
California Environmental Protection Agency

Air Resources Board

Today's Proposed Action

- Approve Fiscal Year 2012-2013 Research Plan
- Allocate $6 million in four research areas
- Consider 13 research concepts
- Approve actual research proposals in late 2012

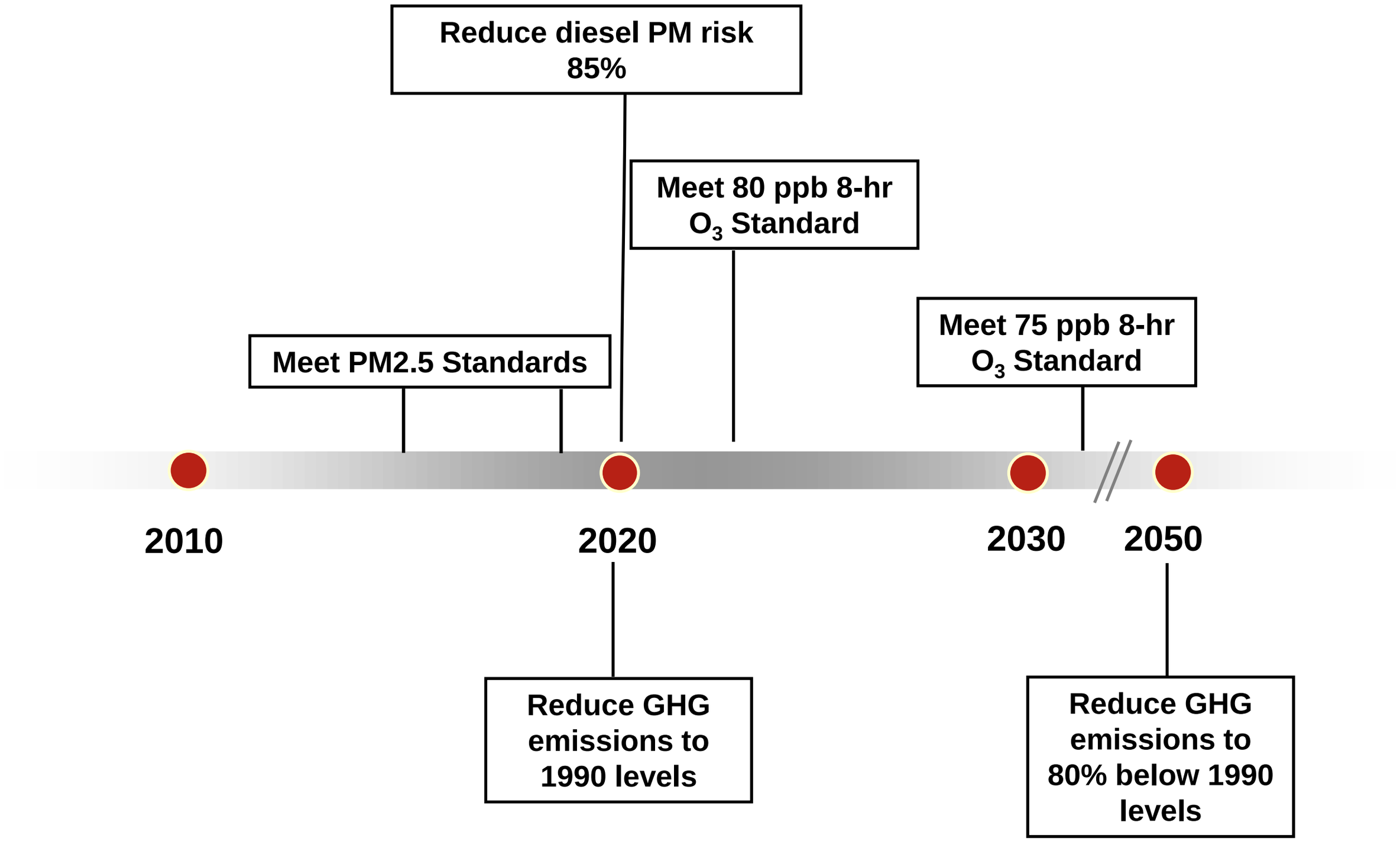
Proposed 2012-2013 Funding Allocations



Developing the Research Plan

- Solicited research concepts from public
- Prioritized based on ARB program needs
- Developed additional concepts in-house
- Identified potential research partners
- Avoided duplicative research

Planning Considerations



Mobile Source Strategies

- Five proposed research projects
- $3,275,000 total funding

Technologies and Methods to Lower NO_X Emissions from Heavy-Duty Vehicles

- Assess technical feasibility of reducing current truck NO_X emissions standard
- Optimize current diesel and natural gas engine and aftertreatment technologies
- Results will identify cost-effective strategies for needed future NO_X reductions
- Proposed funding: $2 million (co-funded)

Economic and Operational Considerations for Transitioning to a Zero or Near-Zero Emission Rail System in California

- Examine changes needed for a zero or near-zero rail system in California
- Focus on economics and operational issues
- Results will complement in-house assessment of technology and energy aspects
- Proposed funding: $400,000

Advanced Plug-in Electric Vehicle Travel and Charging Behavior

- Evaluate usage and charging behavior of plug-in vehicle owners
- Analyze share of miles driven using only grid-based electricity
- Results will quantify emissions benefits and inform grid management and charging infrastructure design
- Proposed funding: $650,000

Technical Analysis of Vehicle Load-Reduction Potential

- Analyze characteristics of current vehicle models with best load-reduction technologies
- Quantify potential greenhouse gas benefits if applied to future car fleet
- Results will inform ARB's Advanced Clean Cars midterm review in 2018
- Proposed funding: $150,000

Improving Detection of PM Emissions for Certification of Advanced Clean Cars

- Improve measurement of PM emissions
- Augment proposed Coordinating Research Council project
- Results will assess feasibility of lower PM emissions standards for future cars
- Proposed funding: $75,000

Scientific Foundation

- Three proposed research projects
- $1,350,000 total funding

Improving Controls and Measurement Methods for PM Precursors from Cars

- Identify most cost-effective methods for measuring PM precursor emissions
- Determine technical feasibility and potential emissions reductions
- Results will improve certification testing and identify potential new emission reductions
- Proposed funding: $500,000

Improving Chemical Mechanisms in Air Quality Models

- Update chemical mechanisms for predicting ozone and particulate matter formation
- Improve ozone formation potential estimates
- Results will improve predictive models used in developing air quality plans
- Proposed funding: $450,000

Characterizing the Climate Impacts of Brown Organic Carbon

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- Quantify chemical and optical characteristics of California brown carbon sources
- Investigate formation pathways
- Results will improve climate projections for California
- Proposed funding: $400,000

Transportation, Land Use, and Community Design

- Three proposed research projects
- $1,025,000 total funding

Urban Designs and Traffic Management Strategies that Reduce Air Pollution Exposure

- Refine existing air pollution model to better represent California urban landscapes

- Validate model with street-level emissions and meteorological data from multiple Los Angeles street environments

- Results will help planners design communities to reduce air pollution exposure

- Proposed funding: $375,000

Evaluating Benefits for New Light Rail Transit Lines

- Collect travel data for 250 households following completion of Los Angeles Expo Line
- Builds upon similar study conducted prior to construction of Expo Line
- Results will help planners better account for shifts in transportation mode choice related to construction of future light rail lines
- Proposed funding: $200,000

Life Cycle Assessment and Co-Benefits of Cool Pavements

Image courtesy of LBNL Heat Island Group

Life Cycle Assessment and Co-Benefits of Cool Pavements

- Measure emissions of air pollutants from cool and conventional pavements
- Estimate greenhouse gas life cycle impacts of cool pavements
- Results will inform the development of regionally appropriate pavement guidelines
- Proposed funding: $450,000

Program Effectiveness

- Two proposed research projects
- $525,000 total funding

Real-World Emissions from On-Road Heavy-Duty Trucks

- Measure emissions from trucks traveling through SF Bay Area Caldecott Tunnel
- Develop emissions profile of Northern CA truck fleet in 2014, 2015, and 2017
- Results will quantify the benefits of the ARB Truck and Bus Rule
- Proposed funding: $450,000

Real-World Emissions from On-Road Passenger Cars

- Conduct roadside measurements of car emissions in Los Angeles in 2013 and 2015
- Build on similar studies at same site since 1999
- Measure evaporative emissions using new method
- Results will improve emissions inventory and quantify benefits of ARB control programs
- Proposed funding: $75,000

Leveraging Other Research

- Collaborating with federal and state agencies
- More than $5 million of related research
- Relevant new research by others
  - Transport of air pollution from Asia (NASA)
  - Greenhouse gas emissions sources in Los Angeles (NIST)
  - Implementing the Advanced Clean Cars Regulation (U.S. EPA and CRC)

Recommended Board Action

- Approve Fiscal Year 2012-2013 Research Plan