Fiscal Year 2021-2022 Research Solicitation Workshop

April 8, 2021

CARB Research Program

- Legislatively mandated research program

- Sound science to support CARB programs

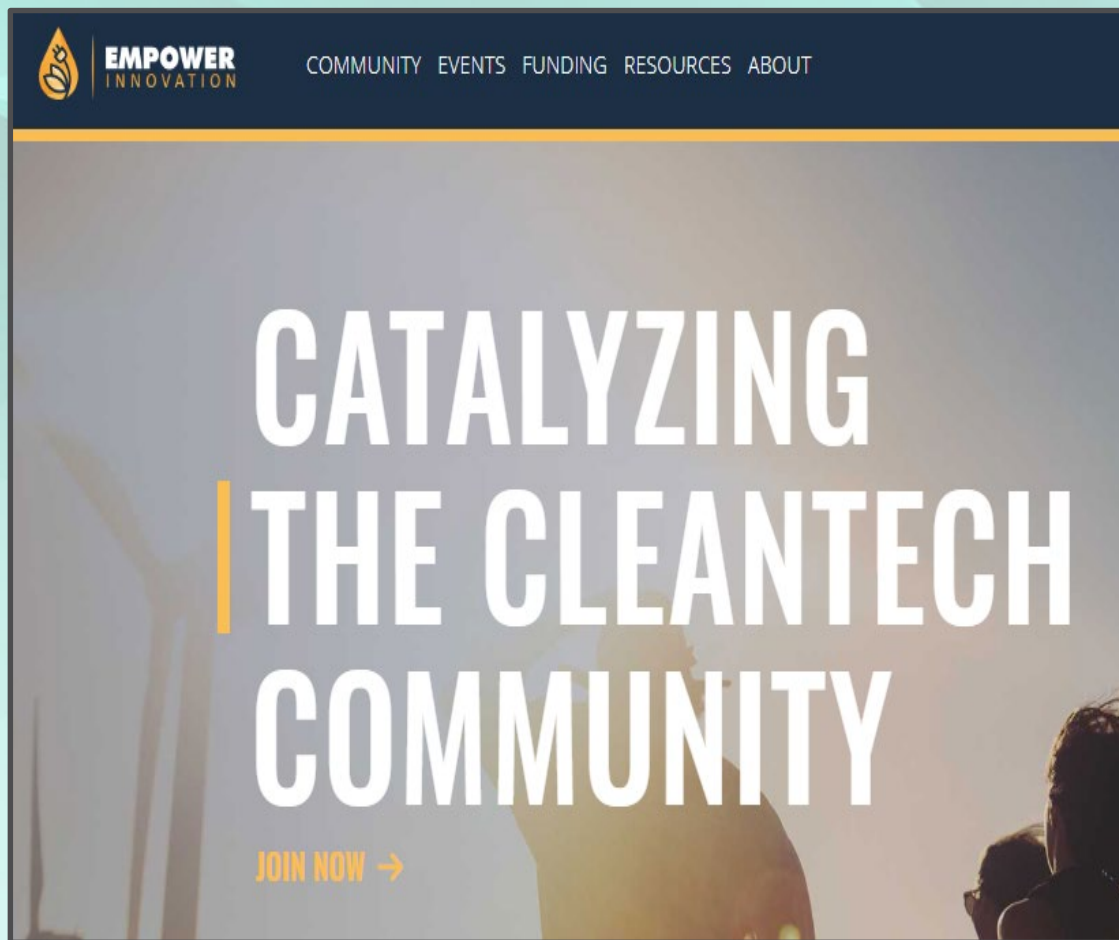- Oversee in-house, contracted, and collaborative research efforts

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Strategic Guidance: Priorities

- Triennial Strategic Research Plan
  - Developed with public input
  - Provides roadmap
  - Aids in research planning and outreach
  - Guides annual project selection
  - Identifies strategies to operationalizing racial equity in CARB research
    - Greater transparency in project selection
    - Fostering multidisciplinary teams through Empower Innovation
    - Seeking new research partners

Proposed Triennial Strategic Research Plan for Fiscal Years 2021-2024

March 8, 2021

CALIFORNIA
AIR RESOURCES BOARD

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Connect With the Commission

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EMPOWER INNOVATION

CATALYZING THE CLEANTECH COMMUNITY

EMPOWER INNOVATION BY THE NUMBERS

625 ORGANIZATIONS

2,135 MEMBERS

170 OPPORTUNITIES

$1.7B AVAILABLE FUNDING

Find a Partner on EmpowerInnovation.net

Empower Innovation accelerates your clean tech journey with easy access to funding opportunities from the CEC and other providers, curated resources, events, and connections to people and organizations.

FIND A PARTNER
Announce your interest in this funding opportunity and message other interested parties to find potential partners.

RESOURCES & TOOLS
Browse the collection of resources for clean tech innovators including Resource Libraries, Funding Sources, Tools, and Databases.

Questions: https://www.empowerinnovation.net/en/contact_us

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EmpowerInnovation.net

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Why are we focusing on racial equity at CARB and in the Research Program?

- Environmental justice is at the core of CARB's mission (See Resolution 20-33)
  - Historic racist policies are likely the cause of today's environmental justice disparities
- Research and science have been used as a tool to justify racist policies in the past and can be harmful to communities today
- We need to better engage with communities and elevate their voices and expertise to develop transformative strategies

CES 3 Score
- 20 to 30
- 30 to 40
- 40 to 50
- 50 to 60
- 60 to 70
- 70 to 80
- 80 to 90
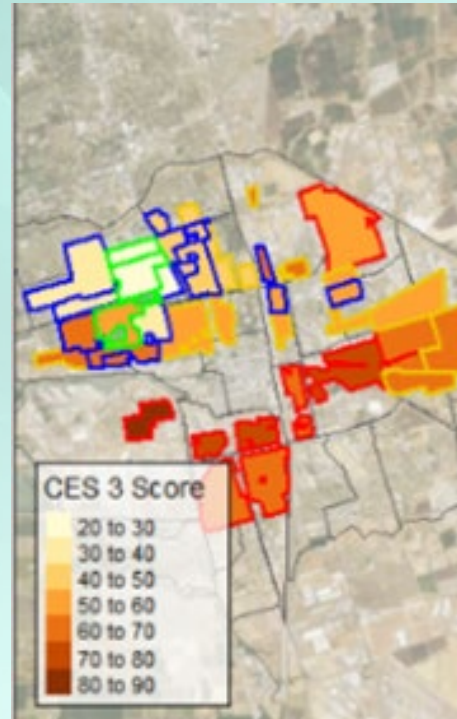
Redlining Example: Pollution and Prejudice
- "Combining 1930s HOLC maps with contemporary data on demographics, socioeconomic and environmental conditions shows how embedded, systemic racism in government actions likely contributed to the segregated neighborhoods and environmental injustices we see today. It counters the notion that environmental injustice is due only to income or class. Using a racial equity lens requires the reliance on data-driven approaches."
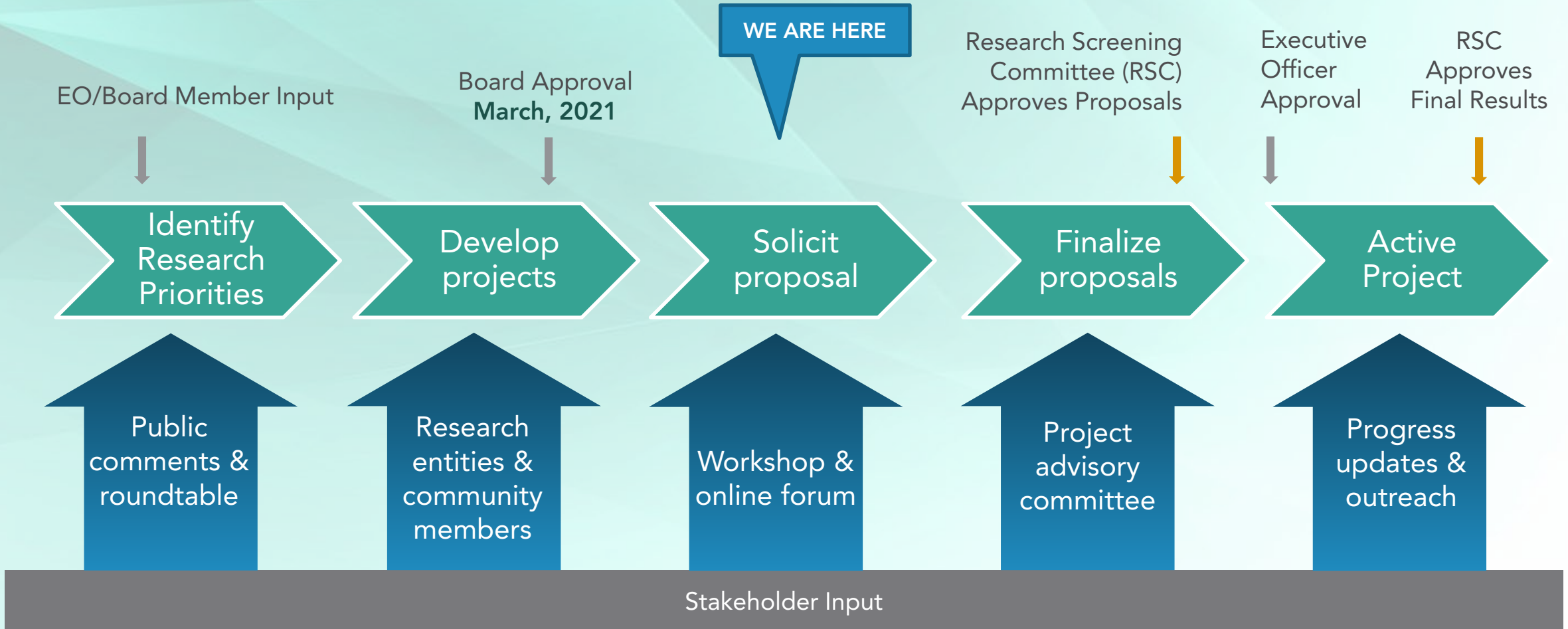
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Strategic Guidance: Research

- Triennial Strategic Research Plan
  - 26 Research initiatives

- Guides Annual Research
  - FY21-22: 11 Proposed Projects
  - FY22-23: To be developed
  - FY23-24: To be developed

Proposed Triennial Strategic Research Plan for Fiscal Years 2021-2024

March 8, 2021

CALIFORNIA
AIR RESOURCES BOARD

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Annual Research Planning Process

WE ARE HERE

EO/Board Member Input

Board Approval
March, 2021

Research Screening Committee (RSC) Approves Proposals

Executive Officer Approval

RSC Approves Final Results

Identify Research Priorities → Develop projects → Solicit proposal → Finalize proposals → Active Project

Public comments & roundtable

Research entities & community members

Workshop & online forum

Project advisory committee

Progress updates & outreach

Stakeholder Input

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10

Summary of Proposed FY21-22 Projects

1. Expanding Health Analysis $1M
2. Short-term Exposure $500k
3. Tracking Health Impacts $500k
4. Imperial Valley Research Priorities $50k
5. Time Activity Patterns (TAPS) White Paper $25k
6. Sensor Technology Demonstration $750k
7. PM$_{2.5}$ Satellite Data Dashboard $300k
8. PM$_{2.5}$ Sources and Formation Regimes $500k
9. Address Past Inequity $300k
10. Align Investments with Climate and Equity Goals $200k
11. Freight Efficiency White Paper $25k

Total - $4.2M

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Important Dates

- May 7, 5pm
  - Pre-proposals due – email to research@arb.ca.gov
  - For Imperial Valley Research Priorities – Pre-proposals due 6 weeks after release date (stay tuned for release of SOW and Scoring Criteria)
- May 28
  - Winners notified – can begin preparing full proposal
- June 18, 5pm
  - Full proposals due

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Pre-Proposal Requirements

- Pre-proposal
  - Not to exceed 5 pages
  - Include approach for conducting research
  - Tip: check scoring criteria
  - Tip: Do not copy solicitation text
- CV or Statement of Qualifications for entire project team
- Describe relevant experience
- Preliminary Budget
- Equity components
  - Differs by project

Direct Costs		
1.	Labor & Employee Fringe Benefits	$0
2.	Subcontractor(s)/Consultant(s)	$0
3.	Equipment	$0
4.	Travel & Subsistence	$0
5.	Electronic Data Processing	$0
6.	Photocopying & Printing	$0
7.	Mail, Telephone, and Fax	$0
8.	Materials & Supplies	$0
9.	Analyses	$0
10.	Miscellaneous	$0
	Total Direct Cost	$0
Indirect Costs		$0
11.	Overhead (Rate: 25%)	$0
	Total Indirect Cost	$0
	Total Direct and Indirect Cost	$0

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Equity Components

PROJECT	Front end efforts				During project period			Final deliverables	
	Cultural Competency Statement	Implicit Bias Training	Demonstrate experience with community engagement	Multidisciplinary teams; new partners encouraged	Compensation for engaged partners	Community engagement; community meetings/ outreach	Community peer review	Equity implications in final report	Outreach material for public
P1: Health Analysis				X		X		X	X
P2: Short term exposure	X	X	X	X		X		X	X
P3: Tracking health impacts	X	X	X	X		X	X	X	X
P4: Imperial Valley Research Priorities	X	X	X	X	X	X	X	X	X
P5: TAPS White Paper				X				X	X
P6: Sensor Technology Demonstration				X					X
P7: PM2.5 Satellite Data Dashboard				X				X	X
P8: PM2.5 Sources and Formation Regimes	X	X		X				X	X
P9: Address Past Inequity	X	X	X	X	X	X		X	X
P10: Align Investments with Climate and Equity Goals	X	X	X	X	X	X		X	X
P11: Freight Efficiency White Paper				X				X	X

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Cultural Competency

- What it is, and isn't
  - Cultural competence is a stance taken toward culture, not a discrete status or simple mastery of particular knowledge and skills.* Cultural and linguistic competence is a set of congruent behaviors, attitudes, and policies that come together in a system, agency, or among professionals that enables effective work in cross-cultural situations.**
  - A culturally competent researcher is prepared to engage with diverse segments of communities to include cultural and contextual dimensions important to community engagement, project development, project implementation and interpretation of results*
  - A lack of cultural competency can result in biases informing the interpretation of results, ignoring the knowledge and expertise of community members, and possibly harming a community that is part of a research project***

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Cultural Competency Statements

- The Cultural Competency Statement
  - 1-page
  - Discuss prior engagement efforts and lessons learned from those experiences;
  - In the context of the proposal:
    - What differences in cultural background and socioeconomic status exist between the researcher and communities being engaged with?
    - What language barriers may exist?
    - What power dynamics exist that could influence the interaction between the researcher and community members?
    - Acknowledge these differences and discuss how the project team will ensure community members are heard and how their expertise and priorities will be centered throughout the project.

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Discussion

- Open discussion

- Ask about any project

- Brief guidelines for discussion:

  - State name and affiliation

  - Project interested in

  - Expertise

  - Partnership needs

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Health Analysis Project

- Objective
  - Expand assessment of air pollution-related adverse health outcomes
  - Focus on brain and reproductive health
- Desired Outcome
  - Identification of concentration-response functions for health endpoints
  - Include race, ethnicity, socioeconomic status (SES)
  - Used to calculate the effects of regulatory interventions
- Contact for questions:
  - Hye-Youn Park: hye-youn.park@arb.ca.gov

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Examining the health impacts of short-term repeated exposure to wildfire smoke

- Objectives
  - Estimate the health effects of short-term exposures repeated over days to weeks to wildfire-specific air pollution
  - Create information usable for communities to mitigate health risks in extreme events like wildfires
- Desired Outcomes
  - Direct health impacts of wildfire exposure examined by a large-scale and multi-year epidemiological study with:
    - State-of-the-art techniques for exposure assessment (e.g., smoke wave of PM2.5)
    - Multiple health endpoints (e.g., respiratory and cardiovascular diseases)
    - Advanced statistical approaches (e.g., confounding factor adjustment, sensitivity analysis, statistical validity)
  - Analyses for sub-groups, including disadvantaged communities and vulnerable groups
- Contact for Questions:
  - Barbara Weller: Barbara.weller@arb.ca.gov

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Improved Assessment and Tracking of Health Impacts for California Communities Most Burdened by Pollution

- Objectives:
  - Assess and track real-world health benefits of air pollution control measures
  - Focus on communities most burdened by pollution
- Desired Outcomes:
  - Compilation of desired health metrics for several communities
  - Determine meaningful metrics effective at tracking health progress
  - Develop health dashboard for public use
- Contact for questions:
  - Patrick Wong: Patrick.wong@arb.ca.gov

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Partnering on a Collaborative Community-Focused Research Path in the Imperial Valley

- Objectives:
  - Compile all known information on pollution sources, processes affecting Imperial Valley
  - Engage with communities to set future research priorities
- Desired Outcome:
  - Detailed literature review and resource document
  - Community based research project design – to be funded in future fiscal years
- Contact for questions:

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Summary and Update of Time Activity Pattern Data to Improve the Understanding of the Exposure to Air Pollution

- Objectives:
  - Review existing research on TAPs
  - Develop a next-generation framework for collecting and updating TAP data using modern technologies
- Desired Outcomes:
  - Summary of available information and data gaps on time activity profiles in California
  - Summary of new data systems and analytical approaches
  - Framework for bringing TAP studies into the modern age
- Contact for questions:
  - Abhilash Vijayan: abhilash.vijayan@arb.ca.gov

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Demonstration of Sensor Technologies for On-Road and Off-Road Heavy-Duty Diesel Vehicles

- Objectives:
  - Evaluate the feasibility of using state-of-the-art and innovative sensor technologies to assist in the successful implementation of existing and future regulatory programs
- Desired Outcomes:
  - Identify emerging technology sensors
  - Test in the laboratory
  - Deploy in real-world vehicles
  - Assess performance and characterize emissions reductions
- Contact for questions:
  - Seungju Yoon: seungju.yoon@arb.ca.gov

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Estimating Ambient Concentrations of $PM_{2.5}$ Composition Using Satellite Remote Sensing to Refine Mitigation Strategies

- Objectives and outcomes:
  - Quantify California's local and regional daily ambient particulate matter ($PM_{2.5}$) composition (e.g. nitrate, sulfate, organic carbon, elemental carbon, and dust) using satellite remote sensing data collected over the last two decades
  - Track the long-term progress of $PM_{2.5}$ reductions in regions underrepresented by ground-level air quality monitors
  - Evaluate the spatial disparities in these regions
  - Recommend pathways that refine existing $PM_{2.5}$ mitigation strategies with considerations for social equity.
- Contact for questions:
  - Toshihiro Kuwayama: toshihiro.kuwayama@arb.ca.gov

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Understanding the Sources and Formation Regimes of Present-Day PM$_{2.5}$ to Mitigate Particulate Pollution in California

- Objectives:
    - Understand opportunities for additional emission control strategies on PM$_{2.5}$ reduction
    - Identify current sources and formation regimes of PM$_{2.5}$
    - Optimize future mitigation strategies to jointly reduce PM$_{2.5}$ and O$_3$ levels in California
- Desired Outcomes:
    - Evaluate long-term trends
    - Perform field measurements
    - Provide observational constraints on the present-day sources and production mechanisms of PM2.5
    - Results should enable refinement of the modeling framework for SIPs
- Contact for questions:
    - Toshihiro Kuwayama: toshihiro.kuwayama@arb.ca.gov

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Opportunities to Address Past Inequity to Build Healthier, More Sustainable Communities

- Objectives:
  - Examine public investment policies, along with systemic precedents contributing to the inequitable distribution of resources and resulting disparities across California communities
  - Identify opportunities and potential resources to address these inequities in public infrastructure investment policies and practices
- Desired Outcomes:
  - Develop screening methods, tools, or other processes for identifying existing transportation, housing, land use policies, and funding practices that are perpetuating inequity in under-served communities
- Contact for questions:
  - Sarah Pittiglio: sarah.pittiglio@arb.ca.gov

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Strategies to Improve the Alignment of Planned Transportation Investments with Climate and Equity Goals

- Objectives:
  - Develop a deep understanding of how Metropolitan Planning Organizations (MPOs) select the projects that appear in their Regional Transportation Plans (RTP)
  - Examine how selection processes have evolved over time and identify how project performance is tracked after implementation
- Desired Outcomes:
  - Recommendations to assess future transportation projects and identify sources to obtain metric information from regions to inform future SB 150 Reports
- Contact for questions:
  - Sarah Pittiglio: sarah.pittiglio@arb.ca.gov

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Pathways to Increasing California Freight System Efficiency – White Paper

- Objectives:
  - Inventory research needs, operational adaptations and regulatory policies with the greatest potential to improve freight system efficiency (FSE) in California, especially related to e-commerce

- Desired Outcomes:
  - Identify FSE research needs and summarize the implications of recommended FSE strategies for extant and future state regulatory and incentive programs

- Contact for questions:
  - Sarah Pittiglio: sarah.pittiglio@arb.ca.gov

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