



GUIDE TO THE PARTICULATE MATTER REDUCTION STRATEGY REPORT

PARTICULATE MATTER REDUCTION STRATEGY REPORT

This main section of the report contains the Advisory Council's findings and recommendations on reducing exposure to particulate matter (PM) in the Bay Area, preceded by a statement from the Air District's Executive Officer and a brief introduction describing the purpose and timeline of the PM Symposium Series. The Advisory Council's report is organized into three sets of messages:

- **Particulate Matter Reduction Statements** reflects the Advisory Council's findings upon review of the presentations and public comments received during the PM Symposium Series.
- **Framework for Evaluating Particulate Matter Reduction Strategies** reflects the Advisory Council's suggested guiding principles for PM projects and rule development.
- **Recommended Actions** contains specific recommended actions for the Air District.

An Annotated Bibliography specifies the scientific evidence and policy basis for the Particulate Matter Reduction Statements and Framework for Evaluating Particulate Matter Reduction Strategies.

APPENDIX A: ANNOTATED BIBLIOGRAPHY FOR PARTICULATE MATTER REDUCTION STATEMENTS AND FRAMEWORK

The Annotated Bibliography is also provided as a list of references with citations specified in table form.

APPENDIX B: SUMMARY OF ADVISORY COUNCIL DELIBERATIONS

Appendix B contains summaries of the Advisory Council's deliberations concerning the Particulate Matter Reduction Statements, Framework for Evaluating Particulate Matter Reduction Strategies, and Recommended Actions during its meetings in July, October, and November of 2020.

APPENDIX C: SYMPOSIUM SUMMARIES AND PRESENTATIONS

Appendix C contains records of the PM symposia that took place from October 2019 through July 2020. Summaries are provided for the events that were held in-person (prior to meeting restrictions due to the coronavirus pandemic). Presentation slides are provided for presenters, who included scientific and policy experts, Air District staff, industry representatives, and community organization leaders.

APPENDIX D: ADVISORY COUNCIL INFORMATION

In addition to biographies of the Advisory Council members who contributed to this report, Appendix D provides information on accessing webcast recordings, meeting minutes, and presentations from all meetings of the Advisory Council and in the PM Symposium Series.



BAY AREA
AIR QUALITY
MANAGEMENT
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AGENDA: 2B

Advisory Council Particulate Matter (PM) Reduction Strategy Report

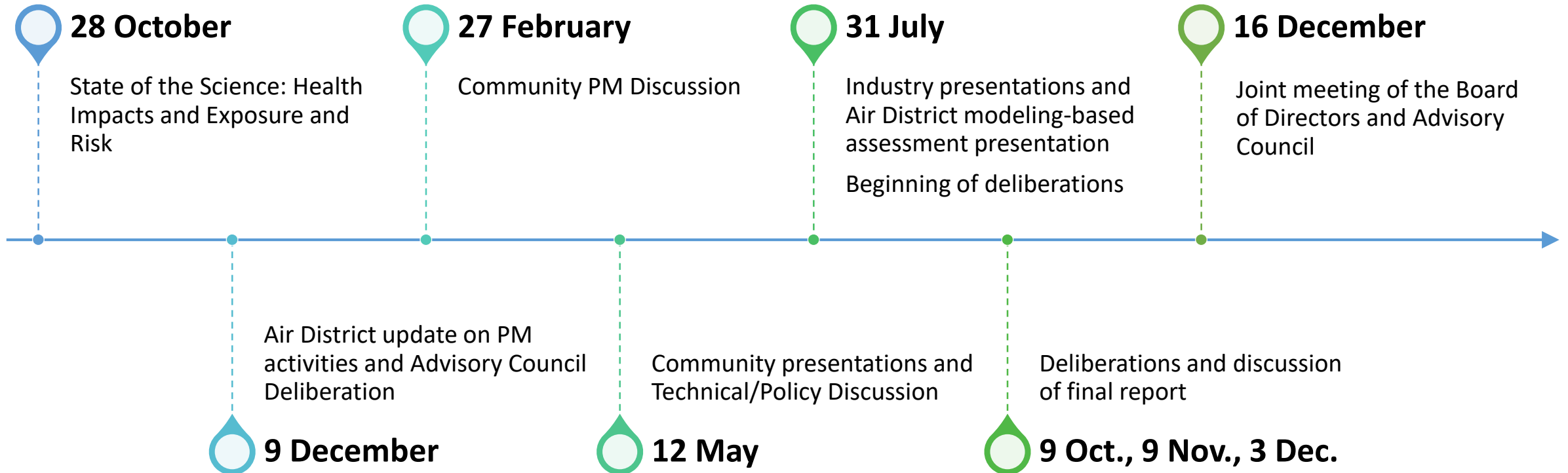
**Joint Meeting of the Board of Directors
and Advisory Council
December 16, 2020**

**Stan Hayes
Advisory Council Chair**



Particulate Matter Symposium Series

TIMELINE





Particulate Matter Symposium Series (cont.)

OCTOBER 28, 2019 SYMPOSIUM



- **300+ registrants; many participated online**
- **Two panels:**
 - **PM Health Effects**
 - **PM Exposure & Risk**
- **9 leading experts**



Particulate Matter Symposium Series (cont.)

PM COMMUNITY DESIGN TEAM MEMBERS

Ms. Pat Dodson, South Vallejo Resident

Katherine Funes, New Voices Are Rising/Rose Foundation

Richard Gray, 350 Bay Area

Jed Holtzman, 350 Bay Area

Dr. Ashley McClure, California Climate Health Now

Steve Nadel, Sunflower Alliance

Ken Szutu, Vallejo Citizen Air Monitoring Network

Dr. Raymond Tompkins, Bay View Hunters Point Resident

LaDonna Williams, All Positives Possible



Particulate Matter Symposium Series (cont.)

FEBRUARY 27, 2020 COMMUNITY PARTICULATE MATTER DISCUSSION

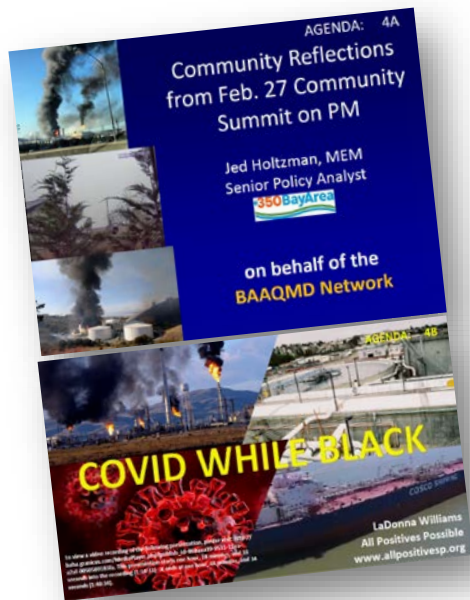
- Air District and PM Design Team co-led Community PM Discussion
- 30 attendees from local organizations
- Presentations on PM sources, emissions and policy approaches to reducing PM
- Community members shared concerns regarding PM and its health effects



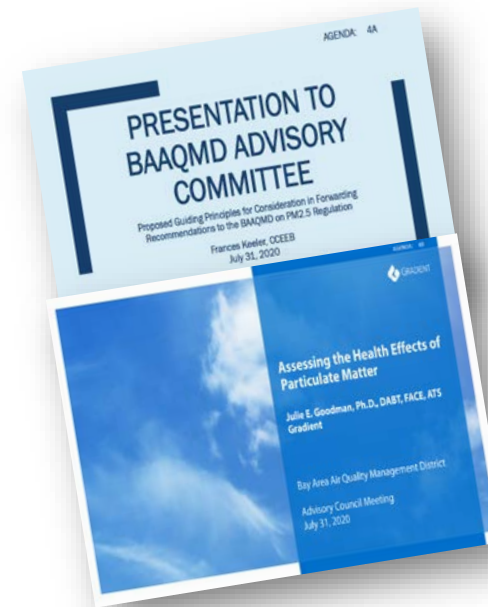


Particulate Matter Symposium Series (cont.)

COMMUNITY AND INDUSTRY PRESENTATIONS TO THE COUNCIL



May 12, 2020
Community presentations from Jed Holtzman, MEM, 350 Bay Area and LaDonna Williams, All Positives Possible



July 31, 2020
Regulated Industry presentations from Frances Keeler, CCEEB and Dr. Julie E. Goodman on behalf of WSPA



PM Reduction Strategy Report

OVERVIEW OF THE CONTENTS

- **PM Reduction Statements**
- **Framework for Evaluating PM Reduction Strategies**
- **Recommended Actions to Reduce PM**
- **Annotated Bibliography**
- ***Extensive appendices***



Particulate Matter:
Spotlight on Health Protection

Advisory Council Particulate Matter
Reduction Strategy Report

*submitted to the Air District Board of Directors for
review and consideration*

December 16, 2020

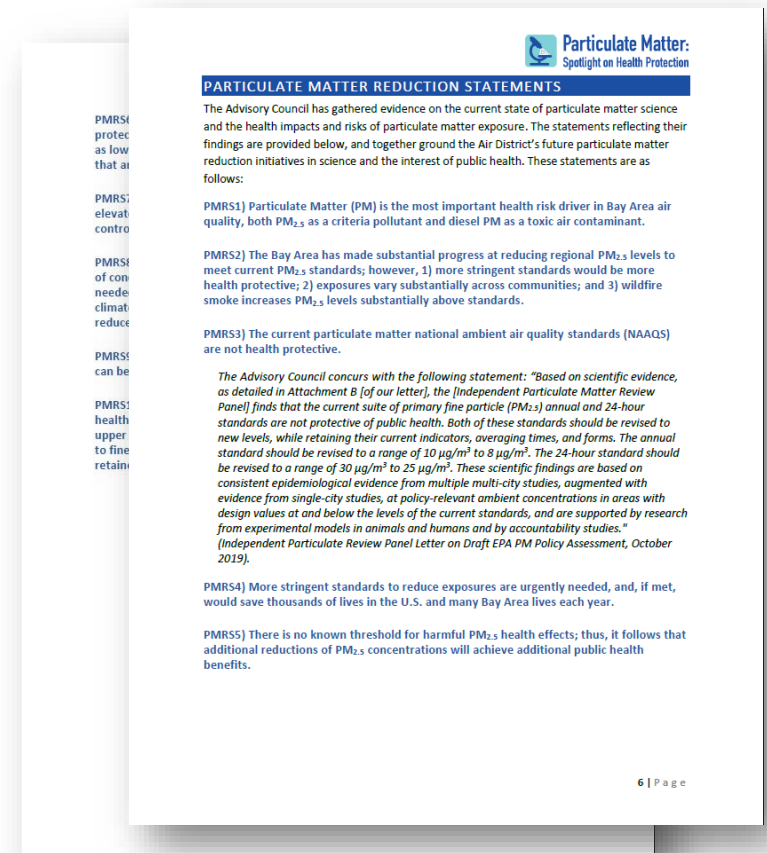
Chair Stan Hayes
Dr. Severin Borenstein
Dr. Michael Kleinman
Dr. Tim Lipman
Dr. Jane Long
Dr. Linda Rudolph
Dr. Gina Solomon



PM Reduction Statements

ADVISORY COUNCIL FINDINGS

- Council gathered evidence on current state of science on health impacts and risks from PM exposure
- Ten (10) statements
- Together, ground future PM reduction initiatives in science and interest of public health





PM Reduction Statements (cont.)

ADVISORY COUNCIL FINDINGS

- **Overview:**

- PM is most important health risk driver in Bay Area air quality
- Current PM standards not health protective
- More stringent standards urgently needed; could save many lives in U.S. and Bay Area each year
- No known threshold for harmful PM_{2.5} health effects; so, further PM_{2.5} reductions will have public health benefits
- Air District guideline “target” below current PM_{2.5} standards warranted to protect public health



PM Reduction Statements (cont.)

ADVISORY COUNCIL FINDINGS

- **Overview (cont.):**
 - **Wildfire PM is serious contributor** to PM health risk, and will increase due to climate change
 - Some PM species may be **more dangerous than others**, but none exonerated
 - **Ultrafine particles** pose health risk



Framework for Evaluation

GUIDING PRINCIPLES

- Evaluate PM reduction strategies using framework
- Seven (7) elements
- Particular priority for most heavily impacted communities
- Especially recognizing Board's Resolution 2020-08 affirming commitment to diversity, equity, access and inclusion

FRAMEWORK FOR EVALUATING PARTICULATE MATTER REDUCTION STRATEGIES

As the Air District approaches the task of reducing particulate matter in the Bay Area, strategies under consideration should be evaluated using the following framework with particular priority given to PM reductions in communities that are most heavily impacted, and especially recognizing the Board's unanimous adoption of Resolution 2020-08, "Condemning Racism and Injustice and Affirming Commitment to Diversity, Equity, Access and Inclusion."

F1) The Air District should move as quickly as possible to take maximal feasible action within its authority to reduce emissions from PM sources, prioritizing the most impacted areas.

F2) PM reduction strategies should prioritize those measures that are most effective in reducing exposure and improving public health and health equity in the most impacted areas.

F3) Local strategies should account for the fact that the most effective exposure reduction measures may differ across communities, due to varying source mix and size, ambient PM concentration levels, physical circumstances (e.g., meteorology, terrain), and other relevant factors.

F4) The Air District should focus PM reduction in areas with elevated exposures, health vulnerability, and those areas with increased impacts and sensitive populations (e.g., U.S. EPA identifies children, non-white, low socioeconomic status, elderly).

F5) PM reduction strategies for highly-impacted communities must include control of the cumulative impact of regional (Bay Area-wide), local (community-level), and localized hot-spot (block-level) sources.

F6) PM reduction strategies should include emission reduction measures for both primary PM and secondary PM formed in the air (e.g., emissions of precursor ROG, NOx, NH₃, and SO₂).

F7) PM reduction strategies will need to address multiple source categories with a wide range of emission reduction measures, and may vary with location; there are no single, universal solutions.



Framework for Evaluation (cont.)

GUIDING PRINCIPLES

- **Overview:**

- **Move as quickly as possible** to take maximal feasible action
- Prioritize those methods that are most effective in **reducing exposure and improving public health and health equity** in most impacted areas
- Focus PM reduction in areas with **elevated exposures, health vulnerability, increased impacts and sensitive populations**
- Address multiple source categories with wide range of emission reduction measures; **no single universal solution**



Framework for Evaluation (cont.)

GUIDING PRINCIPLES

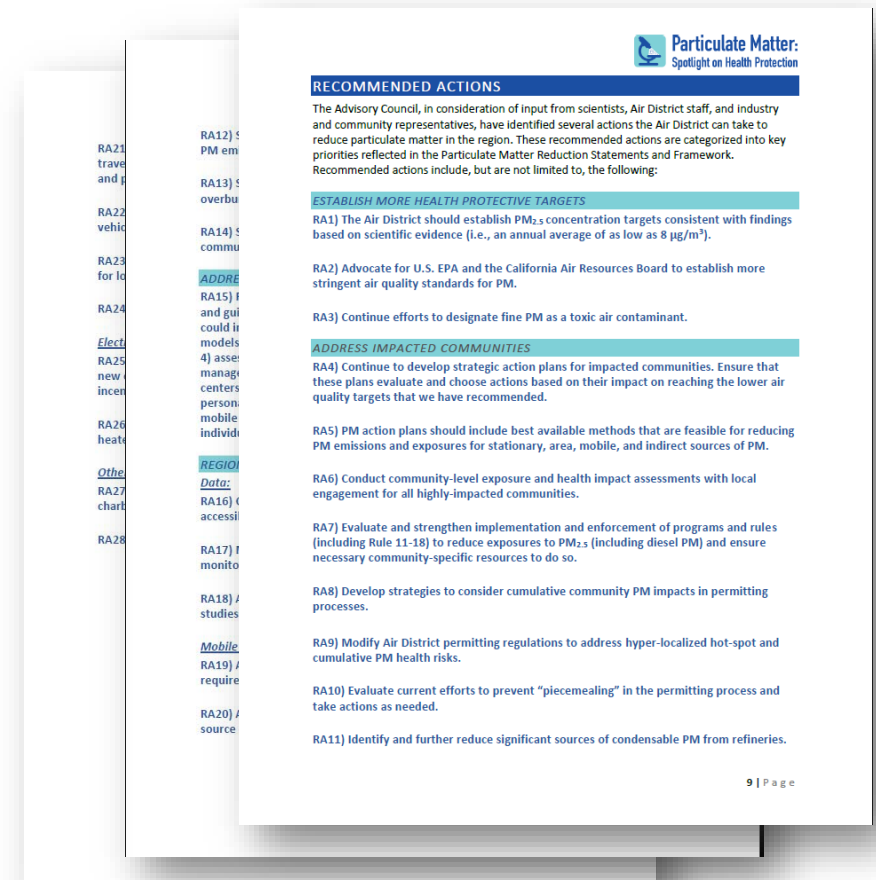
- Overview (cont.):
 - Consider that most effective PM reduction measures may differ across highly-impacted communities
 - Address cumulative impact of regional (Bay Area-wide), local (community-level), and localized hot-spot (block-level) sources in highly-impacted communities
 - Include both emission reduction measures for primary PM (directly emitted) and secondary PM (formed in air)



Recommended Actions

POTENTIAL NEXT STEPS TO REDUCE PM IN THE REGION

- 28 recommended actions
 - ✓ Establish More Health Protective Targets
 - ✓ Address Impacted Communities
 - ✓ Address Wildfires
 - ✓ Regional Recommendations
 - Data
 - Mobile Source
 - Electrification
 - Other





Recommended Actions (cont.)

POTENTIAL NEXT STEPS TO REDUCE PM IN THE REGION

- **Examples:**

- ✓ **More Protective Targets**

- More stringent air quality standards
- Air District PM_{2.5} targets

- ✓ **Impacted Communities**

- PM strategic action plans
- Best available methods
- Expanded community exposure assessments
- Strengthened implementation and enforcement
- Cumulative PM impacts in permitting



Recommended Actions (cont.)

POTENTIAL NEXT STEPS TO REDUCE PM IN THE REGION

✓ Wildfires

- Strategies to protect health during wildfire episodes
- Health studies of smoke impacts
- Clean air shelters, PPE, HEPA filters for high risk individuals

✓ Regional

- Accessible PM air quality data
- Reduce vehicle miles traveled
- Active transportation, transit, land use, and telework
- All electric utilities in new construction
- Existing built environment to all electric



Discussion

ADVISORY COUNCIL MEMBERS

Chair Stan Hayes
Dr. Severin Borenstein
Dr. Michael Kleinman
Dr. Tim Lipman
Dr. Jane Long
Dr. Linda Rudolph
Dr. Gina Solomon



BAY AREA
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AGENDA: 2C

Advisory Council Particulate Matter (PM) Reduction Strategy Report: Next Steps

Joint Meeting of the Board of Directors
and Advisory Council
December 16, 2020

Greg Nudd
Deputy Air Pollution Control Officer

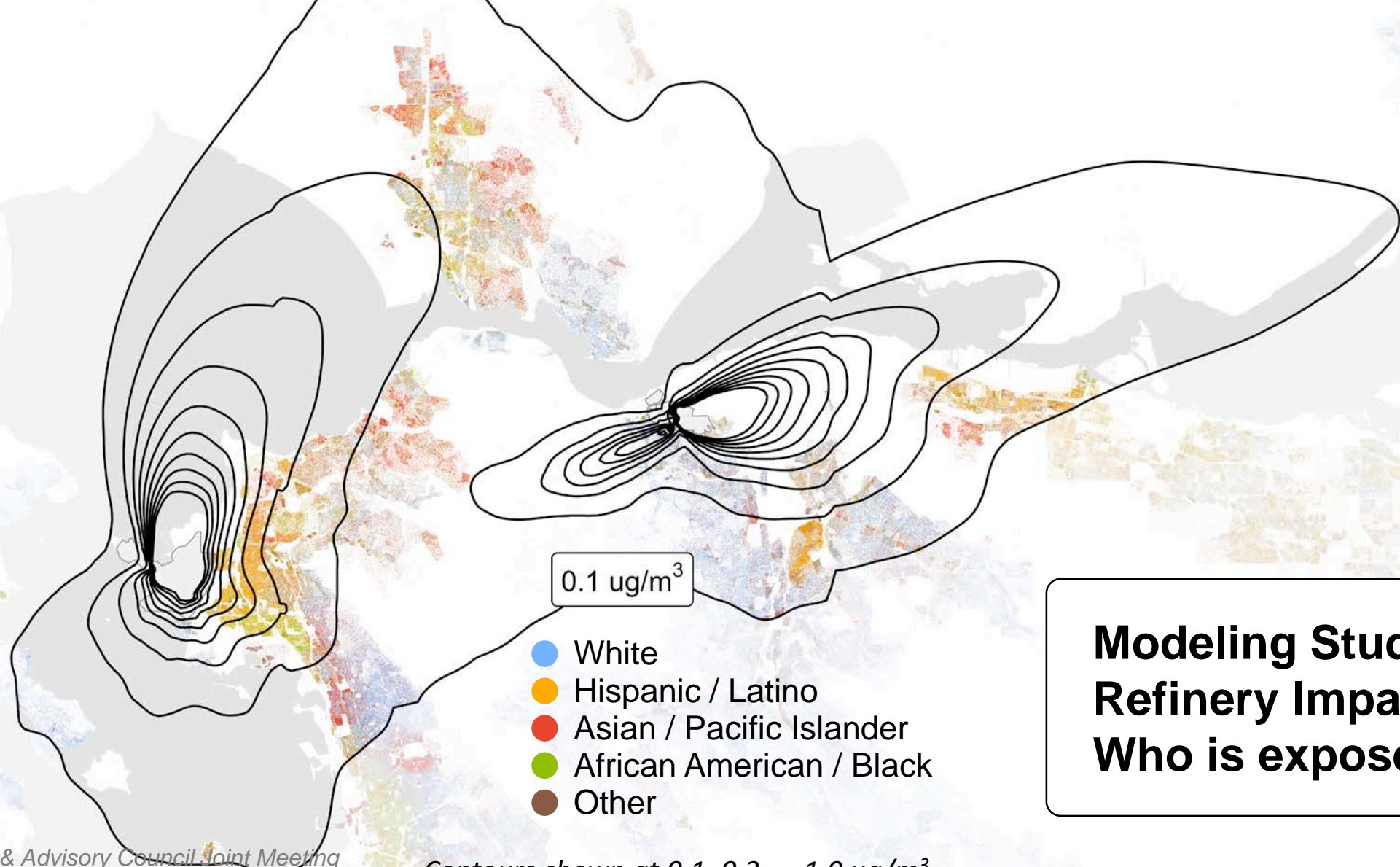


PM Reduction Strategy Report

IMPORTANCE OF THE PM REDUCTION STRATEGY REPORT

- **Advisory Council report provides scientific guidance and framework to utilize into the future**
 - Current Federal standards are not adequately health protective
 - No known safe level of exposure
 - All species of PM are a health concern
- **Helps shape and guide our current work**
 - Health impacts and equity analysis for amendments to Rule 6-5
- **Organizes agency future initiatives**
 - Focus on inequitably impacted communities
 - Maximum feasible actions possible for stationary sources
 - Reduce both directly PM and PM precursors (like NO_x)

Example: Developing an Equity Framework



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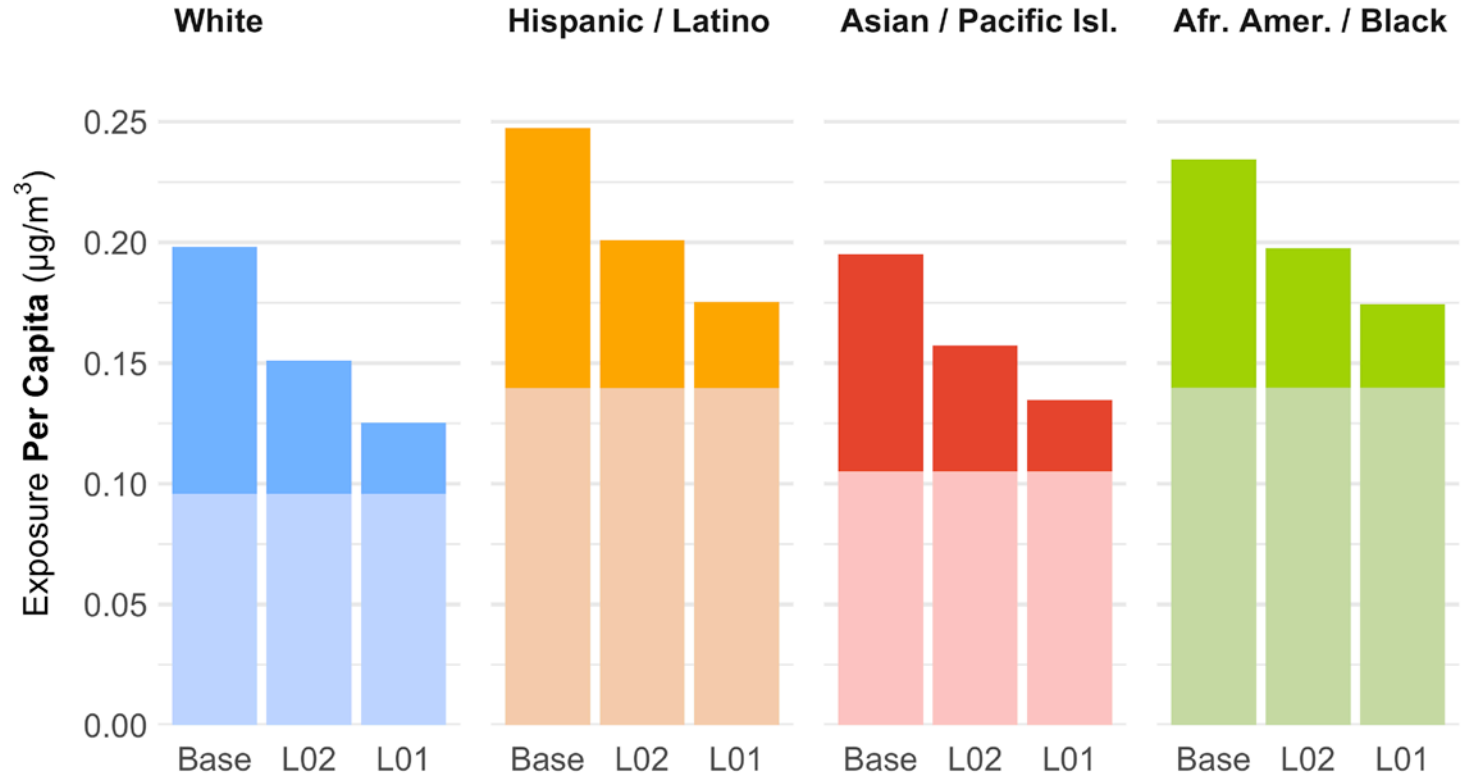
- White
- Hispanic / Latino
- Asian / Pacific Islander
- African American / Black
- Other

**Modeling Study of Refinery Impacts:
Who is exposed?**

Exposure Per Capita Assessed to Supplement Rulemaking



Per capita,
Hispanic/Latino and
African American/Black
residents exposed to
more PM_{2.5} from Chevron
and PBF refineries



Fluidized Catalytic Cracking Unit (FCCU) impacts shown in darker colors

Bar heights = totals (FCCU + Other)

L02 and L01 represent proposed controls for Rule 6-5



PM Proposed Response

NEW/FUTURE INITIATIVES

- **Implement an equity and public health framework for prioritizing actions**
- **Annual air quality analysis and report:**
 - Summary and trends
 - Potential drivers of air quality
- **Advocate for new source categories for incentive funding**
- **Annual report on implementation or recommended actions (accountability)**



PM Proposed Response (cont.)

PLANNED INITIATIVES

- **Rule 6-5: PM from Fluid Catalytic Cracking Units (*Under development*)**
- **Incentives to clean up diesel backup generators in impacted communities**
- **New regulation for large concentrations of diesel backup generators (e.g. data centers)**
- **Cleaner furnaces/water heaters to reduce secondary PM**
- **Pursue programs to fund more indoor air filtration**



PM Proposed Response (cont.)

NEXT STEPS

- **Stakeholder Partnerships**
 - Community Advocates
 - Equity analysis
 - Prioritization
 - Alignment with AB 617
 - Industry/Industry Associations
 - Confirm technical details
 - Keep updated on progress
 - Government & Academic Partners
 - Peer review of science
 - Addressing mobile sources and land use
- **Board Involvement**
 - Air quality racial equity presentation
 - Redlining, racial inequity in baseline mortality, racial differences in susceptibility to PM
 - Resolution formalizing Board direction to staff in response to Advisory Council report
 - Annual updates to Board on implementation of recommendations and PM ambient concentrations
 - More details on proposed staff response will be provided at the Board Retreat in January