Community Emission Reduction Plan (CERP)
Community Steering Committee Meeting #13
April 25, 2022
Welcome
Today’s Agenda

1. Roll Call
2. Welcome and Timeline Review
3. Approval of March 21, 2022, Meeting Minutes
4. Updates from Ad Hoc Groups
5. Air Pollution and Health Risks
6. Next Steps for Strategy Development
7. Environmental Justice Updates
8. Public Comment on Non-agenda Items and Next Steps
Timeline: Where are We Today?

SCOPE AND ORGANIZE
- Steering Committee
- Plan Process
- Vision and Principles
- Plan Boundary

ASSESS
- Community Description
- Technical Assessment

PLAN
- Key Issues
- Goals and Targets
- Strategies

REVIEW & ADOPTION
- Environmental Assessment
- Plan Adoption – Steering Committee
- Plan Adoption – BAAQMD
- Plan Adoption – CARB

IMPLEMENT
- Implementation Plan
- Enforcement Plan
- Metrics to Track Progress
- Ongoing Reporting

INTRODUCTION TO THE STEERING COMMITTEE
DECISION MADE
Approval of March 21, 2022
Meeting Minutes
Updates from Community Description and Technical Assessment Ad Hocs

Community Description Ad Hoc co-leads: Nancy Aguirre

Technical Assessment Ad Hoc co-leads: Jeff Kilbreth
Public Comment
Air Pollution and Health Risks:
Partnering with Community: A multi-level approach to considering air pollution and health

Dr. Neeta Thakur, UC San Francisco
Neeta.Thakur@ucsf.edu
Partnering with Community: A multi-level approach to considering air pollution and health

Environmental Justice in Richmond, CA

Neeta Thakur, MD MPH
Neeta.thakur@ucsf.edu
@nthakurMD
Agenda

Health in Richmond

Social Determinants & Air Pollution

Air Pollution Health Effects

Partnering with Community
Adults in Richmond are more likely to die from cardiovascular disease and stroke compared to other adults living in Contra Costa County.
Richmond/San Pablo: 1 in every 4 person has asthma
California: Only 1 in every 8 people have asthma

Vulnerable Populations

Visits to the Emergency Department for Asthma

Source: UC Berkeley Othering and Belonging Institute, 2015
Source: City of Richmond Health in All Policies Report, 2020
Structural and Social Determinants of Health

A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES
BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE

SOCIAL INEQUITIES

- Class
- Race/Ethnicity
- Immigration Status
- Gender
- Sexual Orientation

UPSTREAM

Emerging Public Health Practice

Current Public Health Practice

DOWNSTREAM

Structural and Social Determinants of Health

A Public Health Framework for Reducing Health Inequities
Bay Area Regional Health Inequities Initiative

Upstream

Social Inequities
- Class
- Race/Ethnicity
- Immigration Status
- Gender
- Sexual Orientation

Institutional Inequities
- Corporations & Businesses
- Government Agencies
- Schools
- Laws & Regulations
- Not-for-Profit Organizations

Living Conditions
- Physical Environment
  - Land Use
  - Transportation
  - Housing
  - Residential Segregation
  - Exposure to Toxins
- Economic & Work Environment
  - Employment
  - Income
  - Retail Businesses
  - Occupational Hazards
- Social Environment
  - Experience of Class, Racism, Gender, Immigration
  - Culture - Ads - Media - Violence
- Service Environment
  - Health Care
  - Education
  - Social Services

Emerging Public Health Practice

Current Public Health Practice

A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES
BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE

UPSTREAM

SOCIAL INEQUITIES
Class
Race/Ethnicity
Immigration Status
Gender
Sexual Orientation

INSTITUTIONAL INEQUITIES
Corporations & Businesses
Government Agencies
Schools
Laws & Regulations
Not-for-Profit Organizations

LIVING CONDITIONS
Physical Environment
Land Use
Transportation
Housing
Residential Segregation
Exposure to Toxins
Economic & Work Environment
Employment
Income
Retail Businesses
Occupational Hazards
Social Environment
Experience of Class, Racism, Gender, Immigration
Culture - Ads - Media Violence
Service Environment
Health Care
Education
Social Services

RISK BEHAVIORS
Smoking
Poor Nutrition
Low Physical Activity
Violence
Alcohol & Other Drugs
Sexual Behavior

DISEASE & INJURY
Communicable Disease
Chronic Disease
Intentional & Unintentional

MORTALITY
Infant Mortality
Life Expectancy

DOWNSTREAM

Emerging Public Health Practice
Current Public Health Practice
Current asthma prevalence, by age group, sex, race and ethnicity, poverty status, geographic region, and urbanicity: United States, average annual 2008-2010
A closer look....

% Non-White Population

Visits to the Emergency Department for Asthma
Asthma in Richmond, CA

A closer look….

% Low SES Population

Visits to the Emergency Department for Asthma
A closer look….

Environmental Hazards (CES4.0)

Pollution Hazard (summative)

Visits to the Emergency Department for Asthma

Diesel PM$_{2.5}$
Social Disparities and Pollution Hazards occur in tandem…coincidence?
Historical Lens to How Neighbourhoods are Shaped
## Connection between redlining and exposures, including air pollution

<table>
<thead>
<tr>
<th></th>
<th>Grade A (n=64)</th>
<th>Grade B (n=241)</th>
<th>Grade C (n=719)</th>
<th>Grade D (n=407)</th>
<th>P-trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>10.9% (8.8)</td>
<td>27.6% (27.3)</td>
<td>46.5% (28.1)</td>
<td>55.5% (30)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Non-Hispanic Asian</td>
<td>12.2% (12.2)</td>
<td>15.8% (17.4)</td>
<td>14.9% (17.0)</td>
<td>12.9% (14.9)</td>
<td>0.070</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>6.2% (16.1)</td>
<td>8.5% (16.2)</td>
<td>10.1% (12.5)</td>
<td>10.9% (13.7)</td>
<td>0.021</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>67.1% (22.6)</td>
<td>44.8% (28.4)</td>
<td>25.9% (26.6)</td>
<td>18.3% (21.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Percentage other</td>
<td>3.5% (1.0)</td>
<td>3.1% (1.5)</td>
<td>2.4% (1.5)</td>
<td>2.2% (1.6)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Percentage of poverty*</td>
<td>15.6% (9.4)</td>
<td>29.7% (17.2)</td>
<td>47.3% (19.9)</td>
<td>51.9% (19.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Mean PM$_{2.5}$ (μg/m$^3$)</td>
<td>11.1 (1.6)</td>
<td>11.0 (1.6)</td>
<td>11.5 (1.4)</td>
<td>11.4 (1.6)</td>
<td>0.0003</td>
</tr>
<tr>
<td>Mean diesel PM (kg/day)</td>
<td>22.6 (14.3)</td>
<td>27.8 (16.2)</td>
<td>29.8 (15.9)</td>
<td>39.7 (23.5)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Proximity to roads with heavy traffic may contribute to:

- New onset (in children and adults)
- Exacerbation (in children and adults)
- Increased risk of ED visits and hospitalizations due to asthma (in children)
- Black carbon (particulates), organic compounds and heavy metals from traffic pollution all contribute to asthma risk and severity

HEALTH IMPACTS OF AIR POLLUTION

- Impaired lung growth in children
- Increased asthma, coughs and bronchitis
- Impairment of brain development in babies and small children
- Low birth weight and adverse birth outcomes
- Heart attack and stroke
- Upper respiratory track irritation and infection
- Worsening of existing health problems in people with chronic disease

PEOPLE MOST SUSCEPTIBLE

- Children
- Pregnant women and unborn children
- Elderly people
- People with chronic disease
- Communities of color
Richmond Environment and Asthma Community Health (REACH Study)

- Partnering with community to co-identify problems and co-develop interventions
70 children (half with and half without asthma)

GPS trackers for 2 weeks at two time points in the year (in and out of school)

54 with good data (i.e., held tracker for enough days)
How were community resources determined?

Went to our youth....
"Young people are trained to conduct systematic research to improve their lives, their communities, and the institutions intended to serve them."

- YPAR Hub UC Berkeley
Social Pinpoint Results: #OurVoice

167 community members of Richmond and San Pablo surveyed by Youth Researchers (total n=344)

Work completed by: Hector, Mario, Jocy, Manuel, Michelle
## Child & Youth Resilience Measure (CYRM)

To what extent do the sentences below describe you? Circle one answer for each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at All</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have people I look up to</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Getting an education is important to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. My parent(s)/caregiver(s) know a lot about me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I try to finish what I start</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I am able to solve problems without harming myself or others (for example by using drugs and/or being violent)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I know where to go in my community to get help</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I feel I belong at my school</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. My family stands by me during difficult times</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. My friends stand by me during difficult times</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I am treated fairly in my community</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I have opportunities to develop skills that will be useful later in life (like job skills and skills to care for others)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I enjoy my community's traditions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Results: Resources and Pollutants

Community Identified Pollution Sites and Strengths/Resources from “Path to Clean Air Project”

Work led by: Carlos Vera, 2022 YPAR Led, MPH candidate
# Results: Where did youth spend time?

<table>
<thead>
<tr>
<th>Time Spent</th>
<th>Community Resource</th>
<th>Resource Type</th>
<th>Pollution Site</th>
<th>Pollution Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LifeLong William Jenkins</td>
<td>Clinic</td>
<td>A</td>
<td>Vehicle</td>
</tr>
<tr>
<td>2</td>
<td>Dover Elementary School</td>
<td>School</td>
<td>B</td>
<td>Gas leak</td>
</tr>
<tr>
<td>3</td>
<td>Richmond High School</td>
<td>School</td>
<td>C</td>
<td>Missing</td>
</tr>
<tr>
<td>4</td>
<td>Richmond Point</td>
<td>Park</td>
<td>D</td>
<td>Car smoke</td>
</tr>
<tr>
<td>5</td>
<td>St Mark's Catholic Church</td>
<td>Church</td>
<td>E</td>
<td>Pollution</td>
</tr>
<tr>
<td>6</td>
<td>Veterans Memorial Park</td>
<td>Park</td>
<td>F</td>
<td>Chevron</td>
</tr>
<tr>
<td>7</td>
<td>Prime Time Nutrition Grocery Store</td>
<td>Grocery Store</td>
<td>G</td>
<td>Trash/litter</td>
</tr>
</tbody>
</table>

Work led by: Carlos Vera, 2022 YPAR Led, MPH candidate
Youth spent significantly more time at community resources vs. perceived hazards in the community (~3% of their time vs. <1% of their time).

Spending more time at these community resources was associated with higher measured resilience.

**Excluding Outliers +/- 3 SD (N= 50)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient ()</th>
<th>SE</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop. Time at Community Resource</td>
<td>0.061</td>
<td>0.029</td>
<td>0.044*</td>
</tr>
</tbody>
</table>

R^2 = 0.082, F= 4.288, p < .05
A Public Health Framework for Reducing Health Inequities
Bay Area Regional Health Inequities Initiative

**Upstream**

**Social Inequities**
- Class
- Race/Ethnicity
- Immigration Status
- Gender
- Sexual Orientation

**Institutional Inequities**
- Corporations & Businesses
- Government Agencies
- Schools
- Laws & Regulations
- Not-for-Profit Organizations

**Living Conditions**
- Physical Environment
- Land Use
- Transportation
- Housing
- Residential Segregation
- Exposure to Toxins
- Economic & Work Environment
- Employment
- Income
- Retail Businesses
- Occupational Hazards

**Risk Behaviors**
- Smoking
- Poor Nutrition
- Low Physical Activity
- Violence
- Alcohol & Other Drugs
- Sexual Behavior

**Disease & Injury**
- Communicable Disease
- Chronic Disease
- Injury (Intentional & Unintentional)

**Mortality**
- Infant Mortality
- Life Expectancy

**Downstream**

**Community Capacity Building**
- Community Organizing
- Civic Engagement

**Policy**
- Strategic Partnerships
- Advocacy

Emerging Public Health Practice

Current Public Health Practice

POLLUTION DOWN, LUNG HEALTH UP

Air quality in the Los Angeles basin, as measured in five cities by USC researchers, improved over two decades. That provided a more healthful environment for children’s growing lungs.

AIR POLLUTION

<table>
<thead>
<tr>
<th>Nitrogen dioxide</th>
<th>Fine particles</th>
</tr>
</thead>
<tbody>
<tr>
<td>33%</td>
<td>47%</td>
</tr>
</tbody>
</table>

Source: USC Children’s Health Study

CHILDREN’S LUNGS

In 1998, nearly eight of 100 15-year-olds had significant lung deficits.

By 2011, only about 3 1/2 of 100 15-year-olds had significant lung deficits.

USC Graphic by Molly Zisk
Questions
Air Pollution and Health Risk:
Increasing Our Understanding

Lily Wu, Office of Environmental Health Hazard Assessment,
lily.wu@oehha.ca.gov
What we are going to cover in this presentation:

• What is the Office of Environmental Health Hazard Assessment (OEHHA)?
• The relationship between air pollution and health
• Improve understanding with community-specific concerns
  • Emissions ≠ Exposure ≠ Health (effect)
Office of Environmental Health Hazard Assessment (OEHHA)

Support other agencies by evaluating potential health risks of environmental hazards

- OEHHA collaborates with CARB to identify, address, and make progress on community health concerns
  - Industrial sources of air pollution
    - Stationary sources
      - Oil/refinery-related, waste/recycling/metal scraps facilities, landfill, Port
    - Mobile sources
OEHHA's role in AB 617
Addressing/assessing health benefits of emission reduction practices in community emission reduction plans

Input on health risks from different chemical exposures

Input on health benefits from reducing pollution

Develop Health Guidance Values (HGVs) for chemicals of concern

Pollution

Safe

Not Safe
Health Effects

OEHHA develops Health Guidance Values (HGVs) for chemicals of concern.

For Example, OEHHA developed HGVs for Diesel Exhaust Particulate.

OEHHA has health guidance values (HGVs) for some chemicals.

To prevent health effects.
General Considerations for Assessing Public Health Risk

- Factors considered by risk assessors to identify potential health effects from release of chemicals in the environment.

**Emissions / Discharges** (sources and uses)

**Concentration**

**Exposure**

**Dose**

**Health Effects**
Community members are exposed to many different pollutants from different sources.

https://ww2.arb.ca.gov/introduction-community-air-quality
General Considerations for Assessing Public Health Risk

Emissions / Discharges (sources and uses)

Concentration

Exposure

Dose

Health Effects
Emissions: How are they organized?

**Source Sectors**
- **Stationary Point Sources w/Permits**
  - Refineries, power plants, gas stations, autobody shops
- **Stationary Area Sources**
  - Fireplaces, water heaters, consumer products
- **On-Road Mobile**
  - Cars, trucks, buses
- **Off-Road Mobile**
  - Ships, aircraft, rail, construction equipment

**Emission “Buckets”**
- Petroleum Refining
- On-road/Freeway
- Auto Body
- Port
- Rail
- Etc.
Informing Key Issues

Community-Identified Air Pollution Concerns

Monitoring Plan Development

Air Quality Complaints

Technical Assessment for a Key Issue

Information from Measurements

Information from Modeling

Air Pollution Issue of Concern

Insights on key air issues

Strategies to Reduce Pollution Emissions and Exposure

Setting targets and tracking progress
Steering Committee
Questions and Discussions
Panel Question and Answer

Dr. Ori Tzvieli, Public Health Officer | Contra Costa Health Services

Lily Wu, Toxicologist | Office of Environmental Health Hazard Assessment

Dr. Neeta Thakur, MD, MPH | UCSF

Dr. Omoniyi Omotoso, MD | Sutter Health
Public Comment
Next Steps for Strategy Development

Kelly Malinowski, Senior Environmental Planner
kmalinowski@baaqmd.gov
Outline

• Where we’ve been:
  • Gathering Community Concerns
  • Menu of Potential Air District Strategies
  • Technical Assessment Findings

• Where we’re going:
  • Remaining Technical Assessment Findings
  • Menu of Partner Strategies
  • Pivoting from Problems to Solutions
  • Defining our Key Issues
  • Developing Strategies

• Discuss next steps for Strategy Development
Where We’ve Been: Air District Strategies

- Menu of potential Air District Strategies (February 2022):
  - Regulations
  - Permitting
  - Enforcement
  - Incentives
  - Further Study
  - Education and Outreach
Where We’ve Been: Technical Assessment Findings

• How Measurements and Modeling Help Develop a CERP (Jan 2022)
• Insights from Modeling and Measurements, Part I (March 2022)
• Compliance and Enforcement Findings 2019-2021 (March 2022)

Where we’re going:
• Insights from Modeling and Measurements, Part II (May 2022)
Where We’re Going: Partner Strategies

• Menu of potential Partner Strategies (May 2022)
  • City of Richmond Planning
  • City of San Pablo Planning
  • Contra Costa County Planning
  • Contra Costa County Health Services
  • California Air Resources Board (CARB)
Where We’re Going: Pivoting from Problems to Solutions

• In May, we’ll finish hearing about insights about our problems from measurements and modeling, and

• We’ve heard about the Compliance and Enforcement findings,

• We are pivoting from learning about problems, to developing solutions to problems, and

• We are focusing on our main community concerns
Where We’re Going: Developing Strategies

• Resources to support Strategy Development
• Specific potential strategies for Air District and Partner Implementation, for example:
  • Rules
  • Enforcement actions
  • Incentives
  • Further Study
  • Education and Outreach
  • General plan and zoning updates
Where We’re Going: Next Steps?

• Now that we have this additional information, what should we do next?
  • 2nd presentation on strategies (with detail)?
  • Longer meetings/workshops with entire CSC?
  • Break into 2-3 groups to take up 1-2 community concerns each to develop strategies?
Steering Committee
Questions and Discussions
Standing Environmental Justice Updates
Public Comment
Next Meeting

• Our next Steering Committee meeting will be on Monday, May 16th, 2022 from 5:30 p.m. to 8:00 p.m. Agenda topics will include:
  • Insights from Modeling and Measurements, Part II
• Path to Clean Air - Steering Committee Meeting Format Survey
  • https://www.surveymonkey.com/r/SGP2WFK
Public Comment on Non-Agenda Matters
Outdoor Air Pollution & Health

Particulate air pollution, including smoking, wild fires and point source or motor vehicle exhaust, lead to impairment of lung function, an effect that occurs in a few minutes.

1. Stressed Lung triggers the brain and heart raising blood pressure
2. Inflammation triggers vessel damage and clotting
3. Air Sac (alveoli) damage decreases lung function and increases risk of heart/lung disease and infections

Sources: CDPH 2019
Air Pollution & Adverse Birth Outcomes

1. Low Birth Weight
2. Pre-term Birth
3. Small for Gestational Age

Meta-analysis showed very mild effect size (CO, NO2, NOx, O3, PM2.5, PM10, or SO2)

Still controversial

Sources: Shah and Balkhair, 2011; Nieuwenhuijsen et al., 2013; Pedersen et al., 2013. Guo et al 2019)
Outdoor Air Pollution and Asthma

- Proximity to roads with heavy traffic may contribute to:
  - New onset (in children and adults)
  - Exacerbation (in children and adults)
  - Increased risk of ED visits and hospitalizations due to asthma (in children)
  - Black carbon (particulates), organic compounds and heavy metals from traffic pollution all contribute to asthma risk and severity

Outdoor Air Pollution and Asthma

• Proximity to point sources of pollution may contribute to asthma severity:
  • Risk of asthma attack is associated with residing near a grain mill (odds ratio (OR) = 1.35), petroleum refinery (OR = 1.44), asphalt plant (OR = 1.23), or power plant (OR = 1.28) (all p's < 0.05).
  • Residence near major air emissions sources (>100 tons/year) increased asthma attack risk by 108% (p < 0.05).