Street-level air pollution, health disparities, and advocacy

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• Three major freeways
• Port of Oakland (5th largest in US)
• Daily truck volume = 7,200 on surface streets. More than 50% port trucks.
• Railyard
• Industrial land uses related to goods movement in close proximity to residences
Air pollution is a key public health concern
West Oakland has worse health outcomes than region

Higher rates of stroke and congestive heart failure

Life expectancy 7 years shorter than more affluent neighborhoods in nearby Oakland hills

Child asthma hospitalization rate ~2x higher than Alameda County (ACPHD, 2015)

• 10:1 ratio for asthma hospitalization rate of black versus white children in Oakland (2018 Oakland Equity Indicators Report)
West Oakland Environmental Indicators Project

Our Mission

- Increase environmental justice, public health, air quality and land-use awareness
- Encourage environmental justice education and solutions to problems facing West Oakland residents who bear the brunt of disproportionate exposure
- Provide motivational leadership development to West Oakland residents
- Inform the neighborhood of advocacy tools, help set priorities, foster political education, and make research and data available
Air Quality

Common Sense Project-
with
Intel Labs Berkeley

Provides opportunity to:

• Engage citizens in air quality monitoring and management practices

• Fill in the gaps in state monitoring networks, and

• Use new data sources for scientific research.
Collaborative Model

Sharing the process and the power

Everyone is welcome at the table:
- Community residents
- City of Oakland
- Port of Oakland
- Local Businesses
- Other NGOs
- Regulatory Agencies:
  - Federal – US EPA
  - Regional – Bay Area Air Quality Management District
  - Local – Alameda County Department of Public Health
Mapping hyperlocal air pollution & health risks

Regulatory air pollution monitoring for West Oakland, CA: 1 stationary site

Data: 1 year of air pollution measurements (BC, NO, NO₂) using fast response sensors on Google Street View cars.

Finding: Within West Oakland, some areas had 5-8 times higher median pollution levels than others. Many parts of the neighborhood had higher air pollution than levels measured at the central regulatory monitor.
Black carbon
micrograms per m³
Mapping hyperlocal air pollution & health risks

**Finding:** Within West Oakland, some areas had **5-8 times** higher median pollution levels than others. Many parts of the neighborhood had higher air pollution than levels measured at the central regulatory monitor.

**Data:** 1 year of air pollution measurements (BC, NO, NO₂) using fast response sensors on Google Street View cars.

**Data:** Electronic medical records of 41K people insured by Kaiser Permanente health care, linked with air pollution at residential address.

**Finding:** Elderly residents (age 65+) living in areas of West Oakland with the highest concentrations of NO₂ would have **>40% greater risk** of a cardiovascular disease event than those in less polluted areas of the neighborhood.

**Regulatory air pollution monitoring for West Oakland, CA:** 1 stationary site

**Black carbon (BC), micrograms per m³:**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>Low</td>
</tr>
<tr>
<td>0.02</td>
<td>5-20% higher</td>
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<tr>
<td>0.15</td>
<td>20-40% higher</td>
</tr>
<tr>
<td>0.19</td>
<td>40-60% higher</td>
</tr>
<tr>
<td>0.3</td>
<td>60-80% higher</td>
</tr>
<tr>
<td>0.4</td>
<td>80-100% higher</td>
</tr>
</tbody>
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Air pollution's impact on the heart in the elderly (65+):

- Air pollution exposure is linked to cardiovascular disease.
- Higher levels of air pollution are associated with increased risk of cardiovascular events.
- Elderly residents with higher exposure levels have a greater risk of cardiovascular disease.
How do we enable translation of hyperlocal air pollution data to action?
Trust-based partnership between researchers and community advocates

IV. Principles for Partnership

To achieve the goals of the Partnership, Partners are expected to:

- Share data and information about their own mission and activities in order to assist each other and the Collaborative as a whole in meeting its goals.
- Keep each other informed of actions, initiatives and legislation/regulation that may contribute to or detract from the goals.
- Coordinate activities that have the potential to complement or conflict with each other.
- Identify existing and additional technical/scientific resources that could be applied to the goals, and assist each other in obtaining or utilizing those resources.
- Identify and participate in joint activities that could benefit the goals.
- Identify obstacles to achieving the goals and develop solutions to overcoming them.
- Think creatively about how Partners can work together to utilize scientific evidence to make a difference in the wellbeing of the West Oakland community.
- Respect each other’s individual roles and contributions and any limitations a Collaborator may have with regard to resources.
Long term commitment and investment

Phase 1: Research
Phase 2: Communications
Phase 3: Advocacy

Researchers

Community advocates
Long term commitment and investment

Phase 1: Research
- Study Design
- Data Collection
- Analysis
- Interpretation

Phase 2: Communications
- General public
- Policymakers
- Local residents

Researchers

Community advocates
Compelling and accessible communications

Interactive online maps

Information sessions for residents

Educational events at local schools

Briefings for legislators and policymakers (local, regional, and state)
Long term commitment and investment

Phase 1: Research
- Study Design
- Data Collection
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Phase 2: Communications
- General public
- Policymakers
- Local residents

Phase 3: Advocacy

WOEIP focus:
- Land use and exposure
- Electrification of goods movement infrastructure
West Oakland selected as first Bay Area community to develop a community air plan under California’s new air quality management legislation, AB617, which calls for exposure reductions in communities most impacted by air pollution.

WOEIP leading steering committee to develop plan incorporating learnings from hyperlocal pollution and health studies.
Thank you

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Additional Slides
Port of Oakland
- Reduce emissions from existing technologies
- Adopt cleaner technologies; invest in zero emission equipment & infrastructure

Truck Management
- More enforcement officers; training
- Truck signage; truck driver education
- Improved truck routes

City Planning
- Conditional Use Permits: sunset industrial uses near residential areas
- Provide incentives/support for relocation
- Exposure mitigation (pollution barriers, air filtration etc.)

Point Source Permitting
- Address cumulative impacts as a factor in local emissions permitting
- Limit permits near residential areas and in areas with already elevated air pollution

West Oakland Community Air Plan