AGENDA: 5

Rule Development Update

Regulation 11, Rule 18; Regulation 12, Rule 16; Regulation 13, Rule 1

Advisory Council Meeting
April 3, 2017

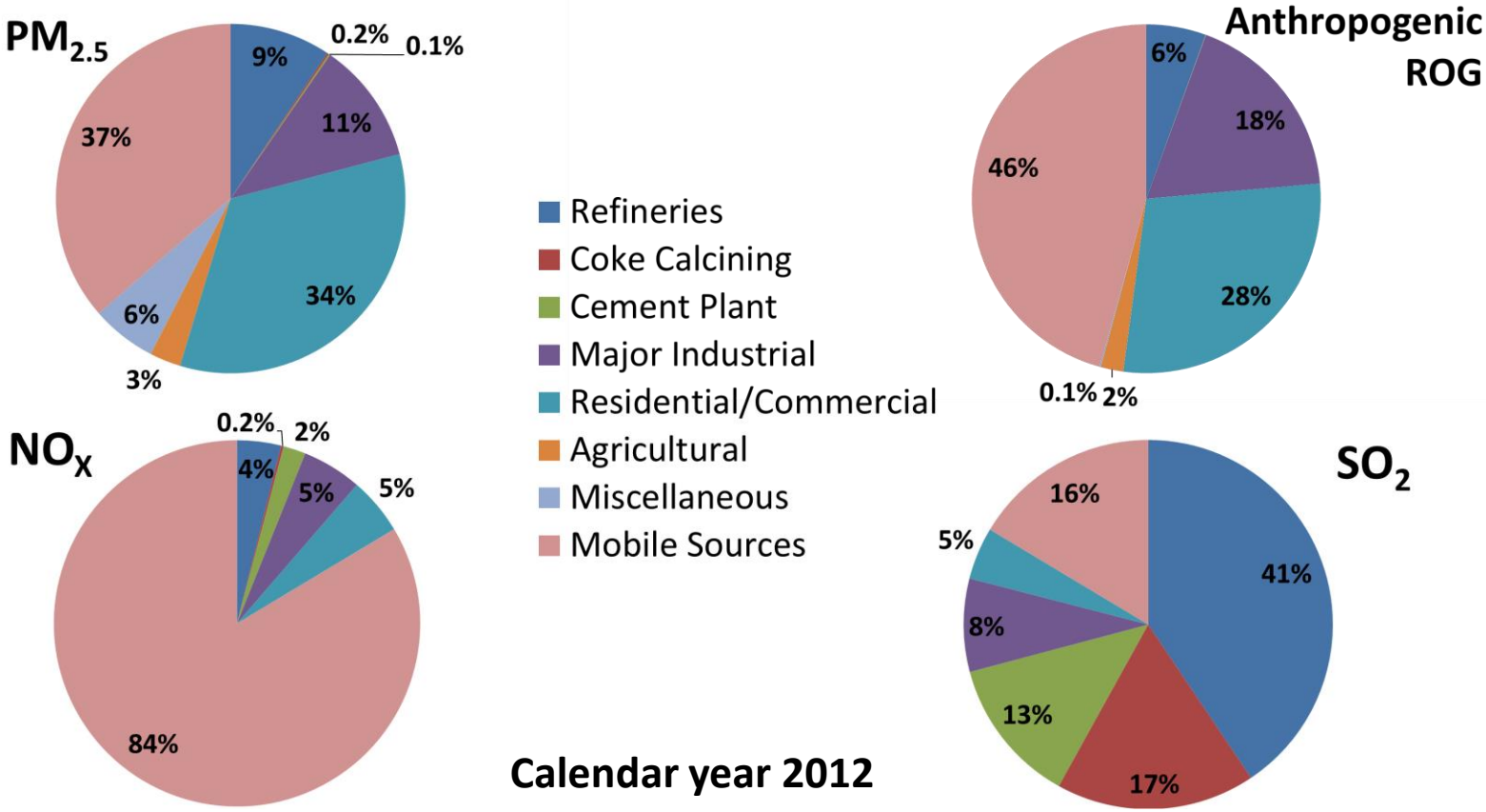
Eric Stevenson, Director
Meteorology, Measurement, and Rules

Overview

- Background
- Overview of Draft Rule 11-18
- Overview of Proposed Rule 12-16
- Overview of Draft Rule 13-1
- Summary
- Next Steps
- Q & A

Bay Area Emissions
Criteria Air Pollutants

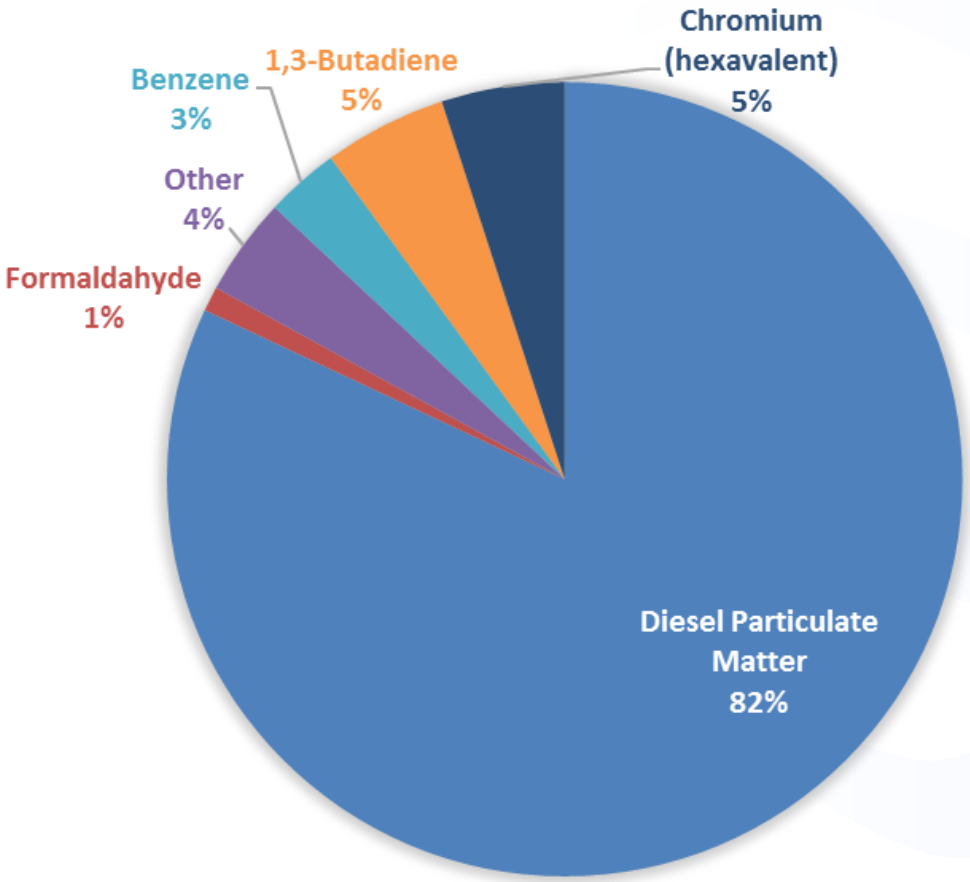
Refineries are a major source of ozone precursor pollutants (ROG, NO_X), directly emitted $PM_{2.5}$, and $PM_{2.5}$ precursor pollutants (SO_2).



Calendar year 2012

Bay Area Emissions
Toxic Air Contaminants (TAC)

Cancer-Risk Weighted Emissions Estimates by TAC

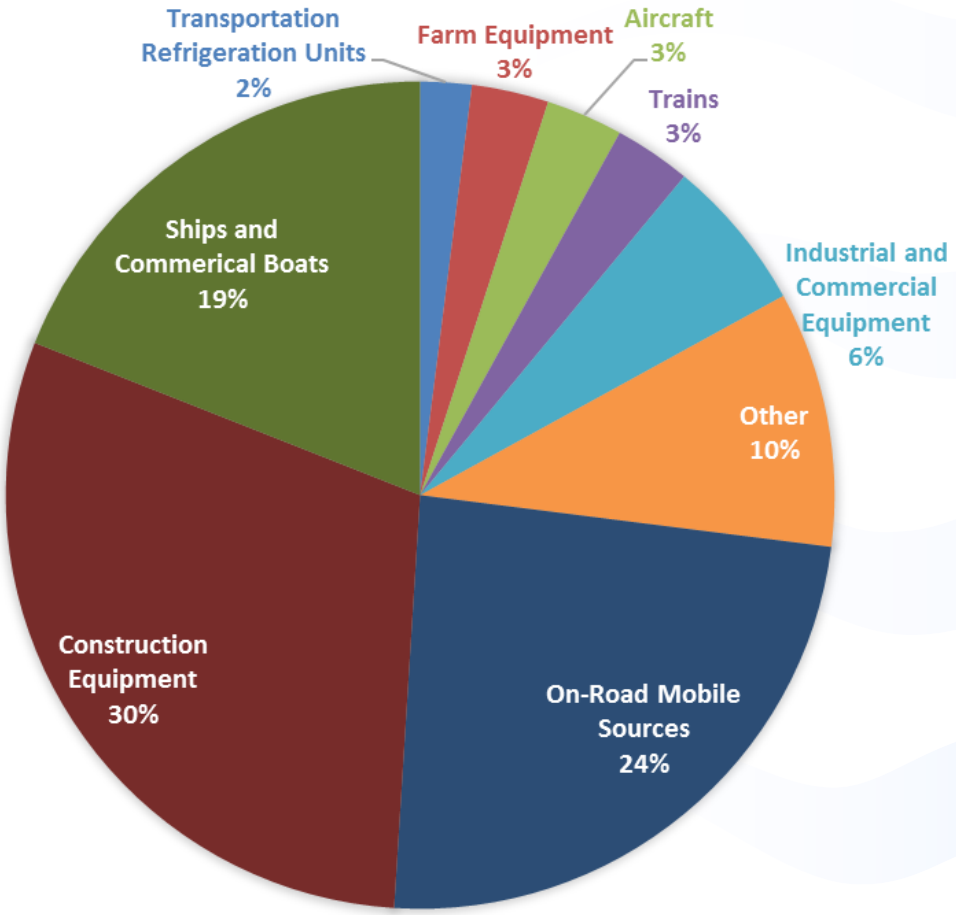


Diesel PM accounts for the vast majority of cancer risk from TAC emissions

Calendar year 2014

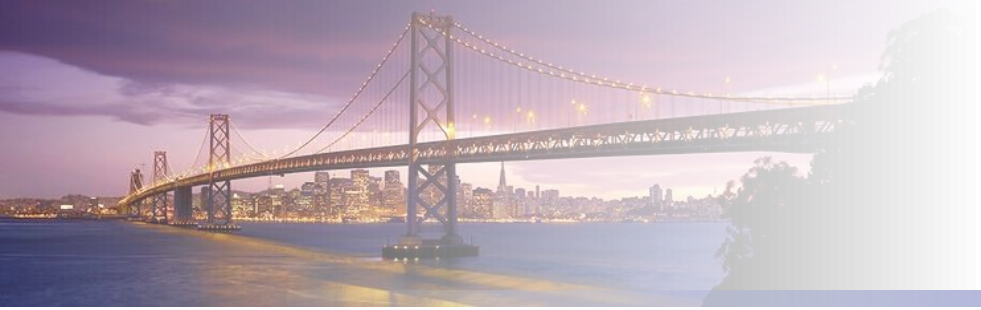
Bay Area Emissions
Toxic Air Contaminants (TAC)

Cancer-Risk Weighted Emissions Estimates by TAC



Calendar year 2014

Industrial sources (including refineries) account for 16% of these emissions



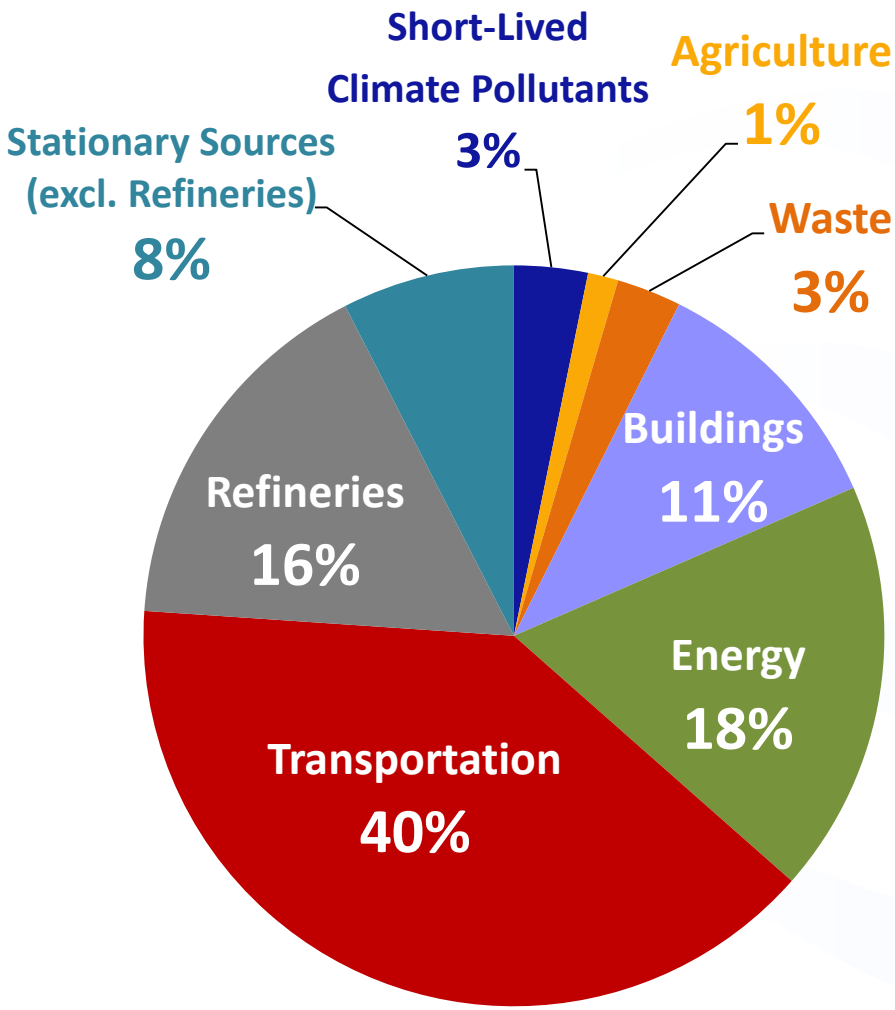
Refinery Strategy *Progress*

On track toward goal of 20% emissions reduction by 2020

Rule	Purpose	Adoption Date
6-5	Reduces PM from fluid catalytic cracking units (FCCUs)	Dec. 2015 ✓
8-18	Reduces VOC from equipment leaks	
11-10	Reduces VOC and toxics from cooling towers	
9-14	Reduces SO_2 from coke calcining operations	Apr. 2016 ✓
12-15	Tracks crude slate changes and emissions	
2-5	Latest statewide guidance into New Source Review for Toxics	Dec. 2016 ✓
9-9	Reduces NO_X from gas turbines	2018
TBD	Further reduces refinery SO_2 emissions	2018
6-5	Condensable PM and SO_2 reductions from FCCUs (Ph. 2)	2018

Total refinery criteria pollutant emissions reductions from adopted rules: 17%

Bay Area Emissions
Greenhouse Gases (GHG)



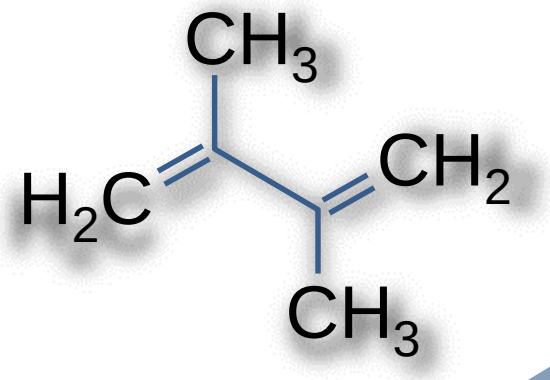
Calendar year 2014 = 89 MMT CO_2e

Refineries account for approximately 16% of Bay Area GHG emissions.

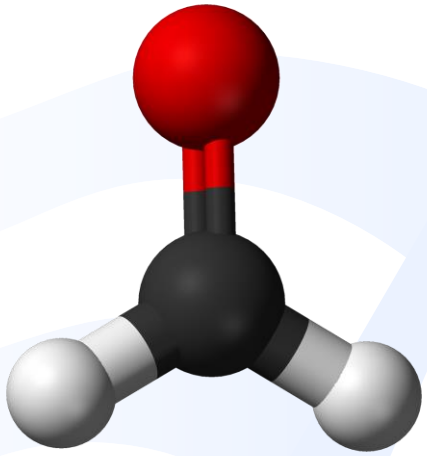
Refinery Strategy
Summary

- Improve understanding and monitoring of refinery emissions and feedstocks: **Rule 12-15**
- Direct regulation of criteria pollutant emissions
  - **Rules 6-5, 8-18, 11-10 and 9-14**
  - Upcoming rules
- Address health risk from toxic emissions from
  - New sources: **Rule 2-5**
  - Existing sources: **Rule 11-18**
- Prevent GHG increases: **Rules 12-16; 13-1**

Draft Rule 11-18



DPM



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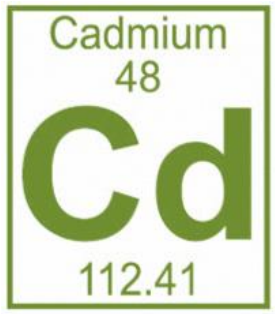
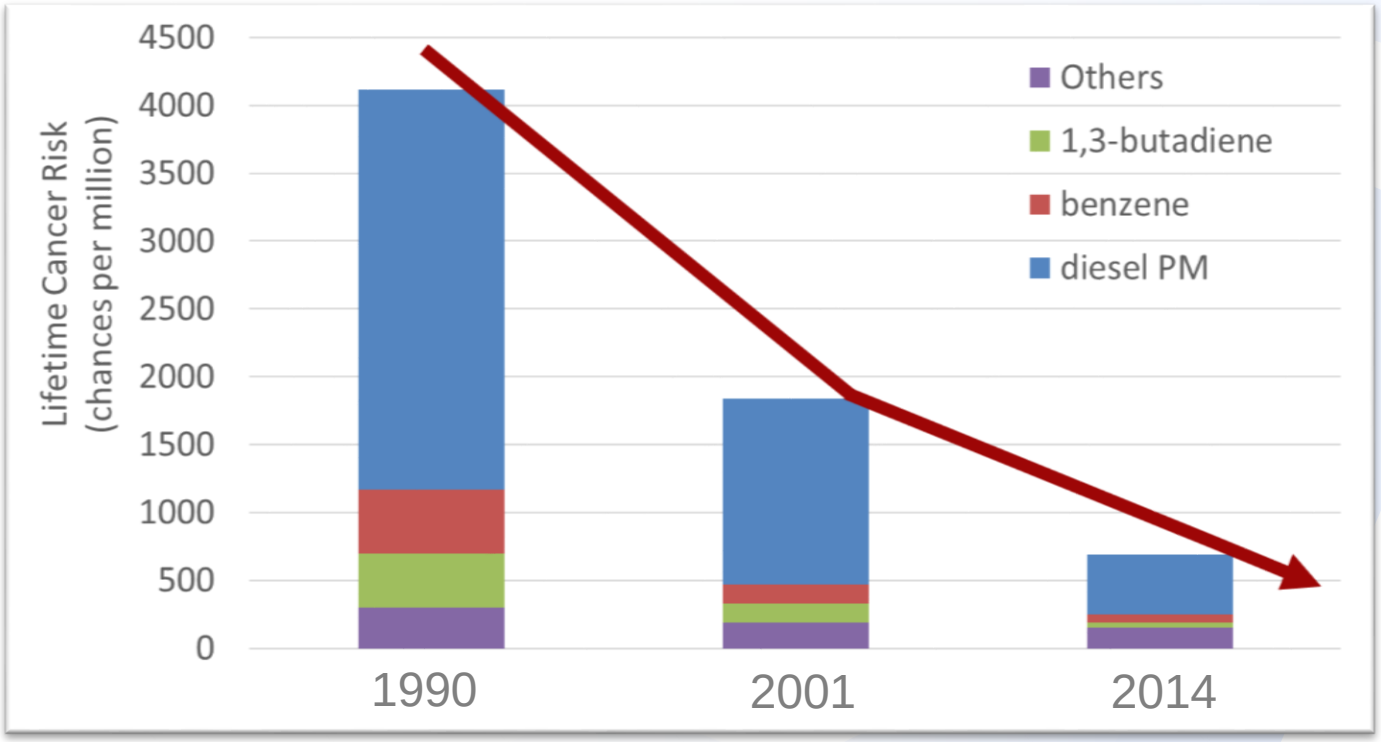


Reduction of Risk from Air Toxic Emissions at Existing Facilities

Draft Rule 11-18
Background

Bay Area risk levels have declined since 1990

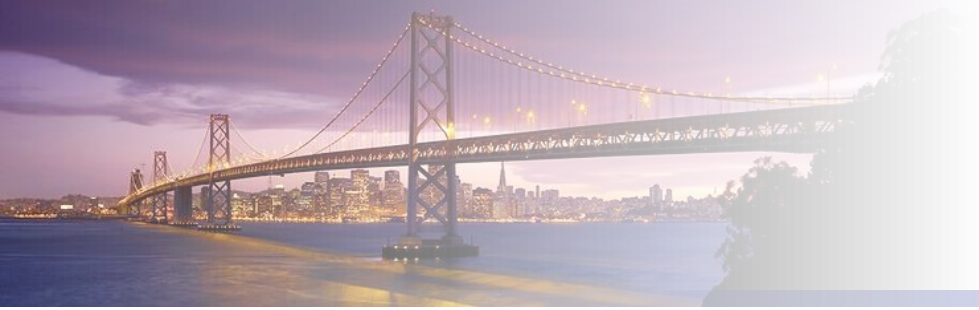


However, there are still high risk levels in several areas

Draft Rule 11-18
Purpose

Reduces health risks to lowest achievable levels

- Provides greater benefits to impacted areas
- Incorporates latest health risk methodologies
- Promotes continuous improvement
- Ensures public transparency
- Provides greater flexibility



Draft Rule 11-18
Basics

Reduces facility-wide health risks from existing sources

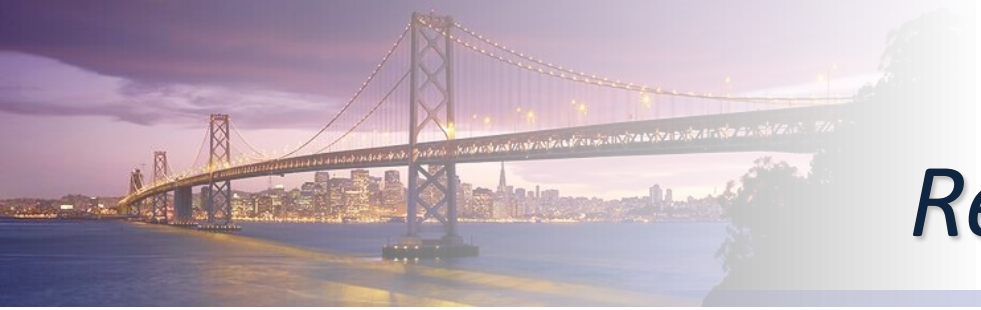
- Hundreds of facilities will be evaluated, including

  Refineries • Power Plants • Gas Stations • Hospitals • Foundries
  Military Facilities • Landfills • Chemical Plants • Data Centers
  Schools/Universities • Crematoria • Sewage Treatment

- Health Risk Assessments (HRAs) conducted by Air District staff using latest statewide guidelines
  - Refineries have among highest priority for HRAs, due to high emission levels

- Establishes a lower risk action level

  100 in a million → 10 in a million



Draft Rule 11-18
Reducing Health Risks

Facilities above risk action level (10 in a million) must

- Develop a risk reduction plan for Air District approval
- Execute plan according to plan schedule

Risk reduction measures include

- Installation of Best Available Retrofit Control Technologies for Toxics (TBARCT)
- Modification of operating hours and activity levels
- Modification of emissions point characteristics

Proposed Rule 12-16

Petroleum Refining Facility-Wide Emissions Limits

Proposed Rule 12-16
Basics

Caps each facility's *annual GHG and criteria pollutant emissions*

- Affects five refineries and three associated facilities
- Caps GHG and criteria (PM_{10}, $PM_{2.5}$, SO_2 and NO_X) emissions

Annual emissions limits

- Based on Air District and CARB emissions data for most recent five-year period available
- Set at 7% above each refinery's five-year max to provide operating flexibility and allow normal year-to-year variations

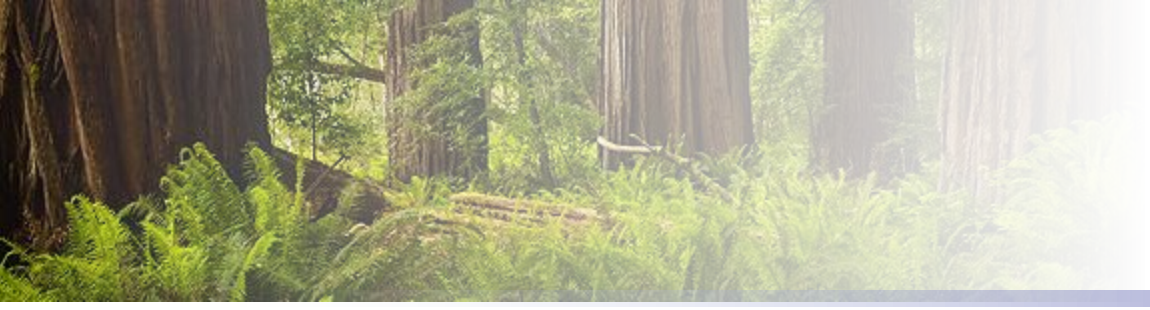
Proposed Rule 12-16
Potential Issues

Staff has identified significant issues

- May be beyond the Air District's authority
- Sets more restrictive permitting rules for refineries without scientific basis
- Limits production which may interfere with transportation fuels market if
  - Fuel consumption continues to increase
  - Overall refining capacity decreases due to accidents, outages, or refineries closing

Draft Rule 13-1

Petroleum Refinery Carbon Intensity Limits or Facility-Wide GHG Emission Limits



Draft Rule 13-1
Purpose

Addresses community concerns about GHG emissions increases from operational changes at refineries

- Complements State climate efforts, anticipated to require a 20% reduction in GHG emissions by 2020
- Allows production increases under certain circumstances, thus minimizes interference with the transportation fuel market
- Promotes energy efficiency improvement at refineries
- Consistent with Air District's authority and permitting process

Draft Rule 13-1

First Rule of Combustion Strategy

Caps each refinery's *carbon intensity* at a level consistent with current operations

- Defines carbon intensity on a simple barrel basis

$$\text{Carbon Intensity} = \frac{\text{Annual GHG Emissions (MT } CO_2e\text{)}}{\text{Annual Feedstock Volume (barrels)}}$$

- Accounts for GHG from all power, steam and hydrogen inputs
- Requires implementation of energy efficiency projects with simple payback of 10 years or less
- Provides an annual GHG mass emissions limit as an alternate compliance option

Schedule / Next Steps

Final steps for Draft Rules 12-16 and 11-18

- MAY 17, 2017 – Board hearing for Draft Rule 12-16
- JULY 2017 – Board hearing for Draft Rule 11-18

Proposed schedule for Draft Rule 13-1

- JUL 2017 – Hearing package published
- SEP 2017 – Board hearing

Summary

Criteria	Draft Rule 12-16	Draft Rule 13-1	Draft Rule 11-18
Reduces Toxic Emissions and Health Risks	✗	✗	✓
Prevents Significant GHG Emissions Increases	✓	✓	✗
Reduces GHG Emissions	✗	✓	?
Allows Refinery Production Increases / Avoids Statewide Economic Impacts	✗	✓	✓
Harmony with State's climate programs	?	✓	✓
Consistent with Air District's authority and permitting process	✗	✓	✓

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

AGENDA 6

Advisory Council Next Area of Focus

Advisory Council Meeting
April 3, 2017

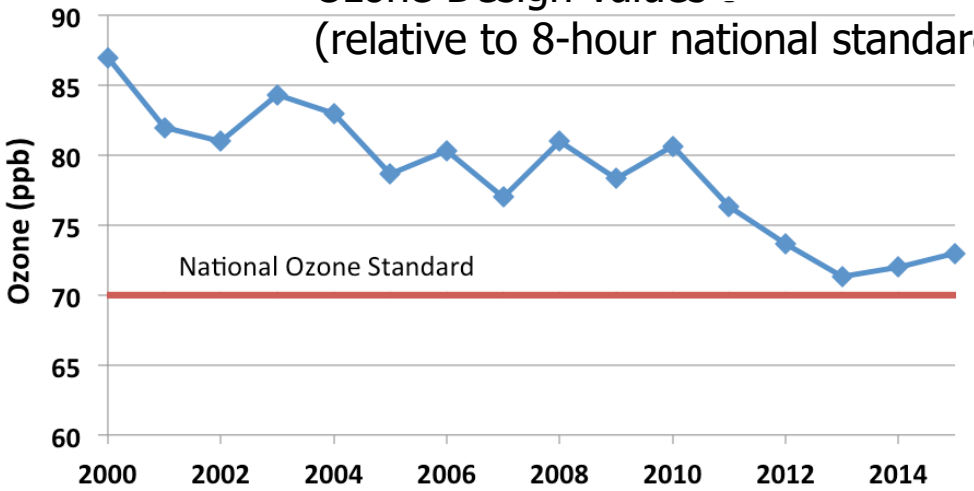
Henry Hilken, Director
Planning & Climate Protection

Community Air Risk Evaluation (CARE) Program - Introduction and Background

- CARE Program established in 2004
- Intended to complement the Air District's traditional AQ attainment programs
- Extensive stakeholder participation and community engagement
- CARE findings and maps support numerous Air District programs – plans, rules, grants & incentives, community engagement, research

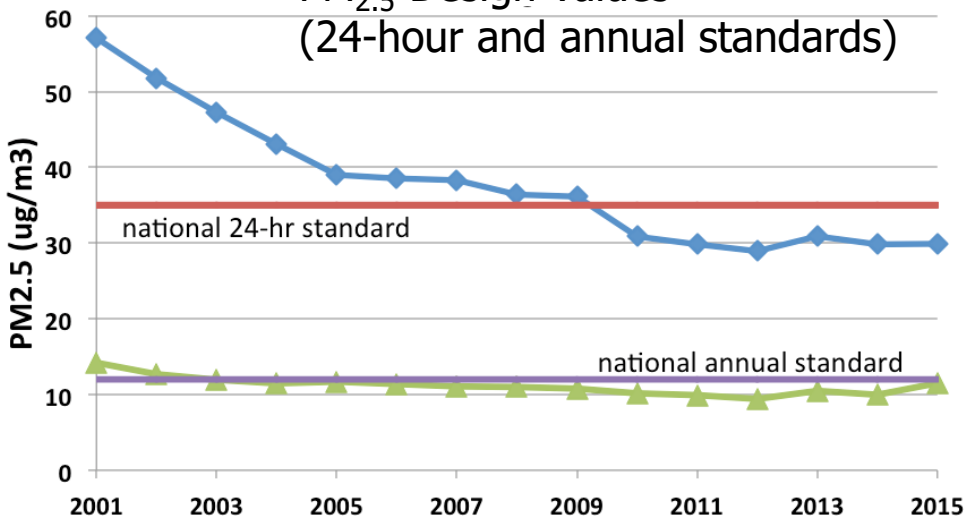
Bay Area Air Quality is Improving

Ozone Design Values*
(relative to 8-hour national standard)

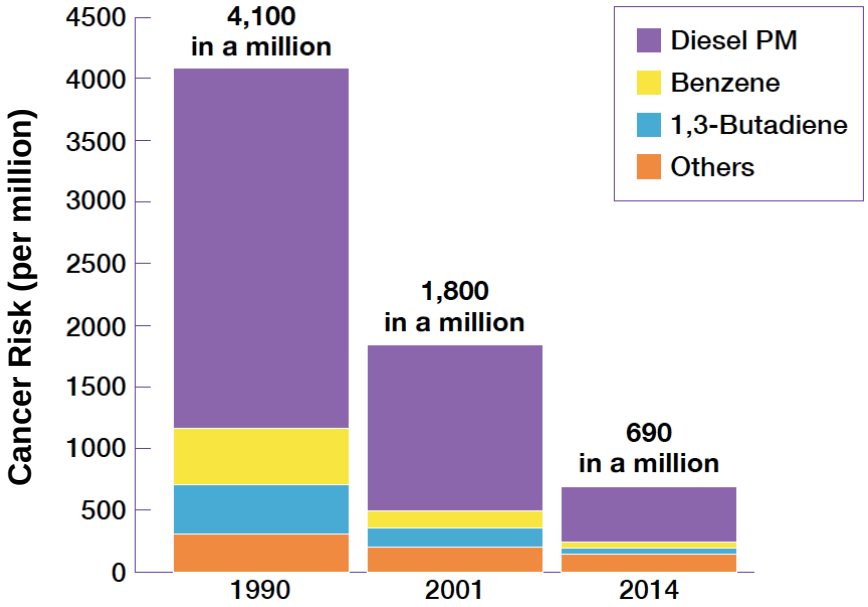


* Excludes Patterson Pass.

$PM_{2.5}$ Design Values
(24-hour and annual standards)

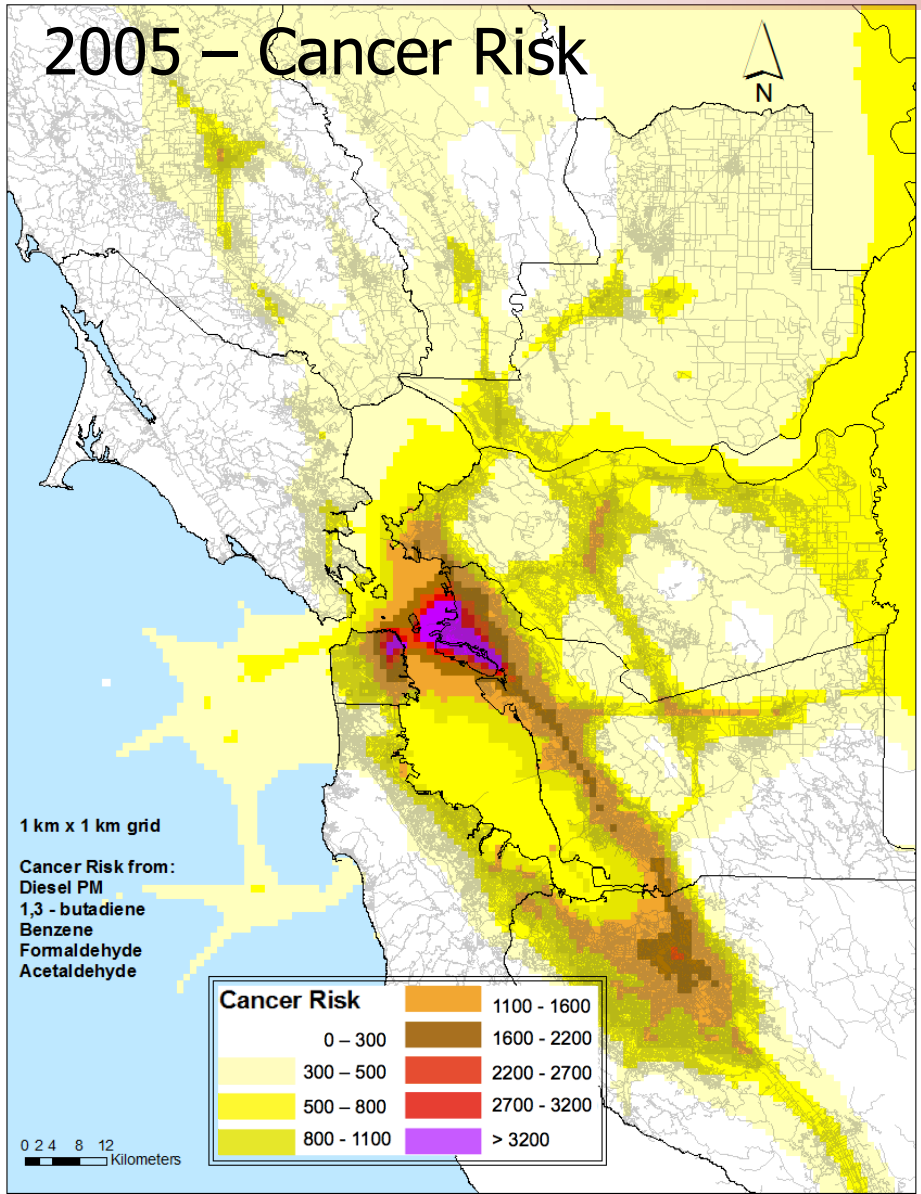


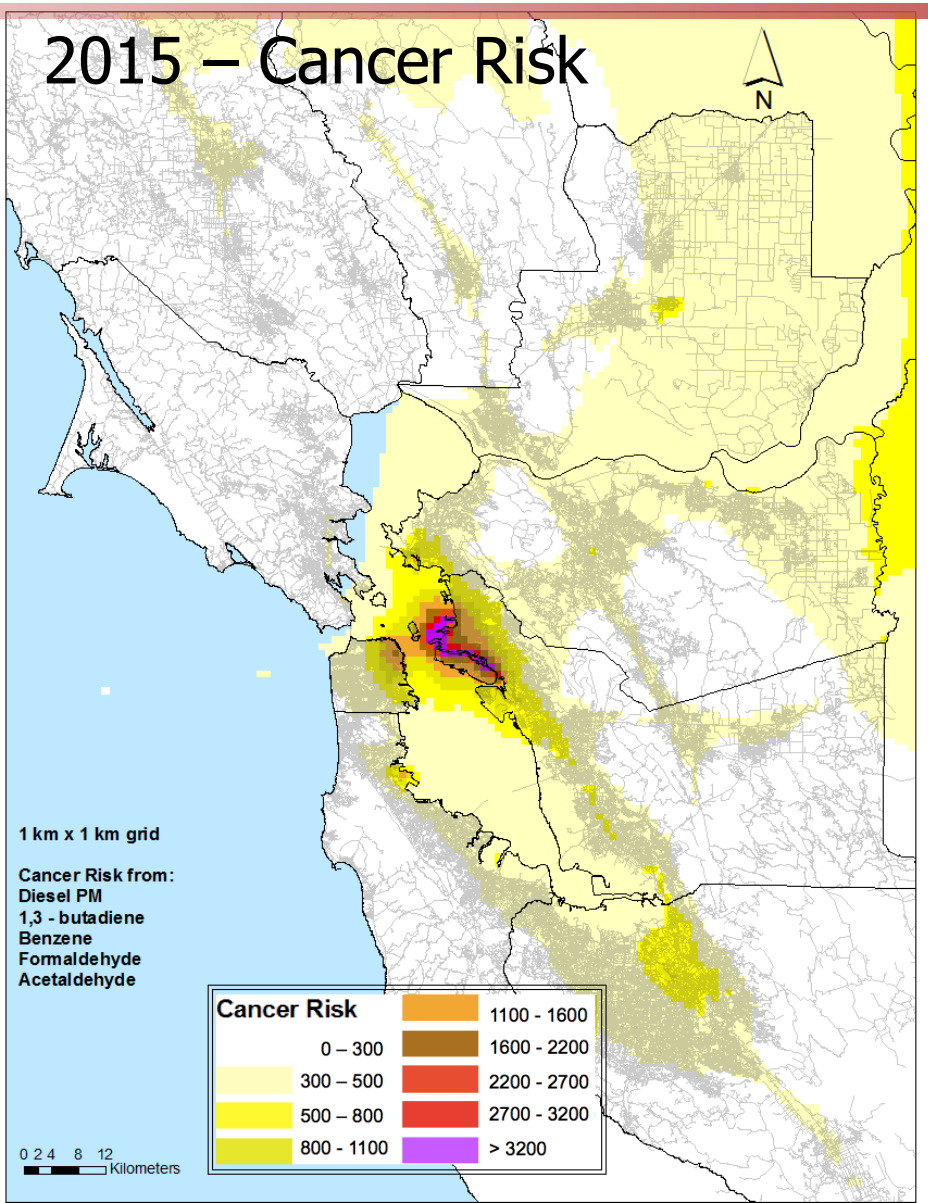
Lifetime Cancer Risk* from Air Pollutants
(70-year exposure)



* Applies new (Feb 2015) methodology from the Office of Environmental Health Hazard Assessment (OEHHA)

Overall Air Pollution Down, but Higher Risks in Some Communities





CARE Program Goals

- Map areas with relatively high air pollution levels
- Map areas with higher air pollution health impacts: intersection of
  - Air pollution
  - Existing adverse health outcomes
- Focus mitigation measures in areas with highest health impacts

CARE Program: Builds Upon Traditional Air Quality Attainment Programs

- Considers cumulative impacts from multiple air pollutants, both toxics and criteria pollutants
- Considers health vulnerabilities
- Begins to address the gap between
  - Facility-scale assessments (source-based, focused on toxics, HRAs)
  - Regional-scale assessments (receptor-based, focused on criteria pollutants, NAAQS)
- But questions remain on how to bridge this gap

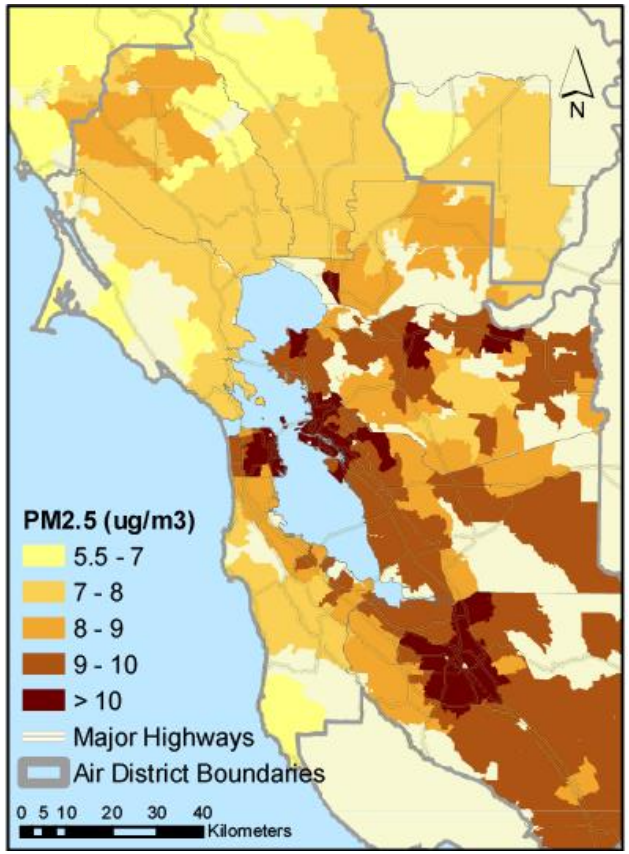
Community Engagement Integral to CARE Program

- Task Force with representatives from
  - community organizations
  - local health and planning departments
  - business and industry
  - research community

- Identify concerns and provide input
- Develop solutions and support efforts underway
- Community engagement programs growing

Air Pollution and Health Records Mapped to ZIP Code Areas

$PM_{2.5}$
Modeled annual average (2010)

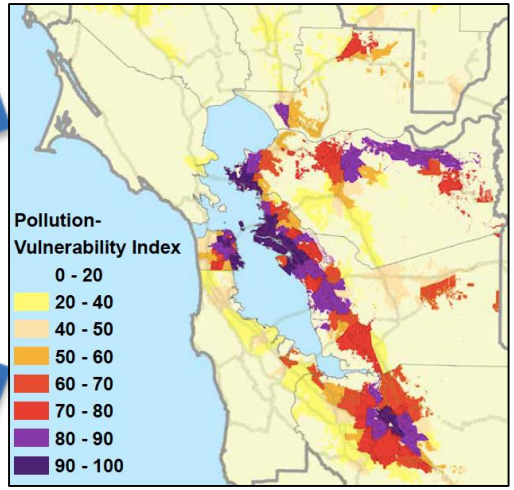


- Pollutant concentrations:
  - Toxic air contaminants (TAC)
  - Particulate matter (PM)
  - Ozone
- Heath records:
  - Death rates
  - Emergency room visits and hospital admission rates for
    - Heart attacks & other cardiovascular disease,
    - Asthma & other respiratory diseases

Map Areas with Highest Air Pollution Health Impacts

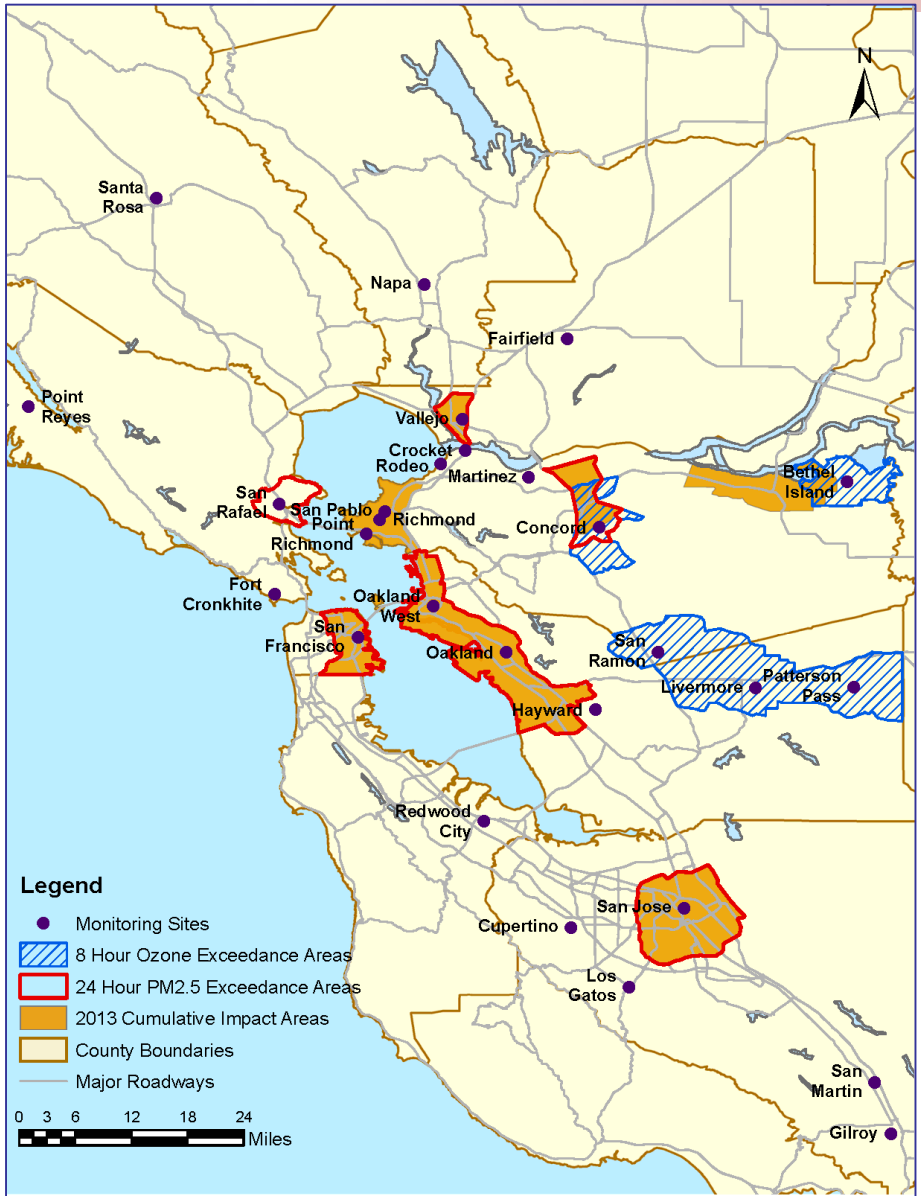
Inputs	Method	Health Impacts
Air Pollution • TAC	Risk Factors from Cal/EPA	• Increased cancer risk
Air Pollution • $PM_{2.5}$ • Ozone Health Records • Death rates • Hospital admissions • ER visits	Effect Estimates from US EPA's BenMAP	• Increased death rate • Increased costs from hospitalizations and ER visits

Mapping Metric



Pollution-Vulnerability Index

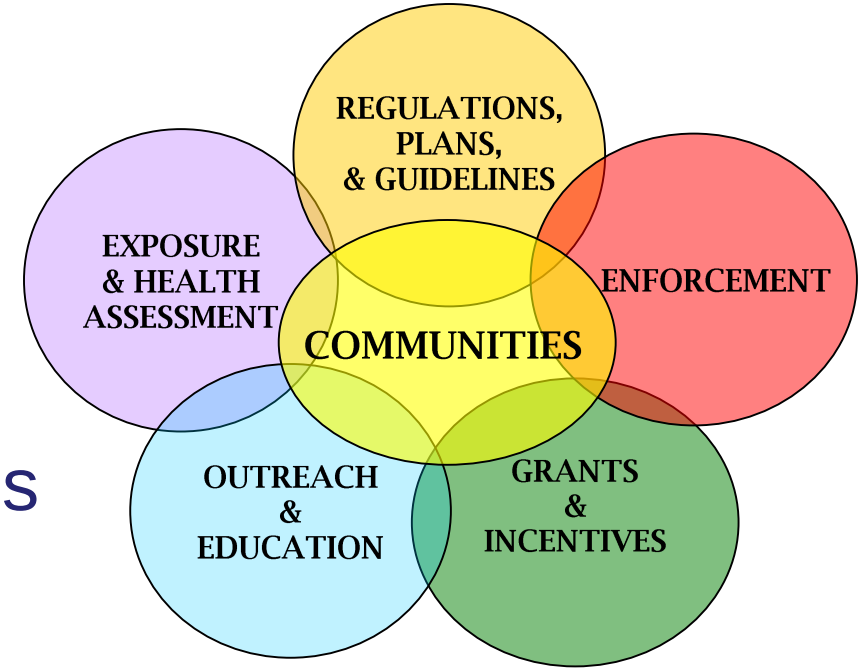
Bay Area Communities Most Impacted by Air Pollution



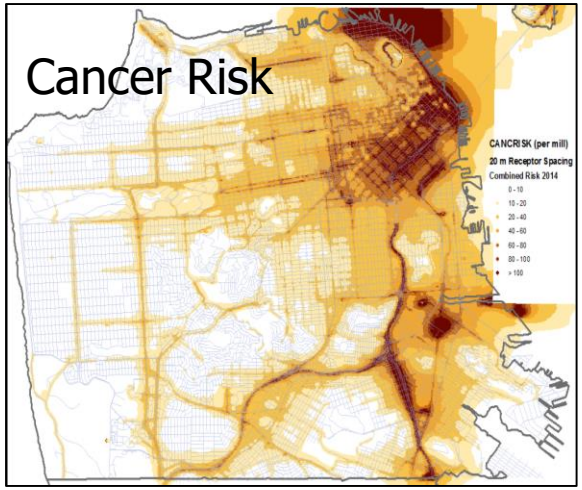
- Areas with higher health impacts from PM and ozone and with higher cancer risk from TAC
- Areas with episodes of higher PM
- Areas with episodes of higher ozone

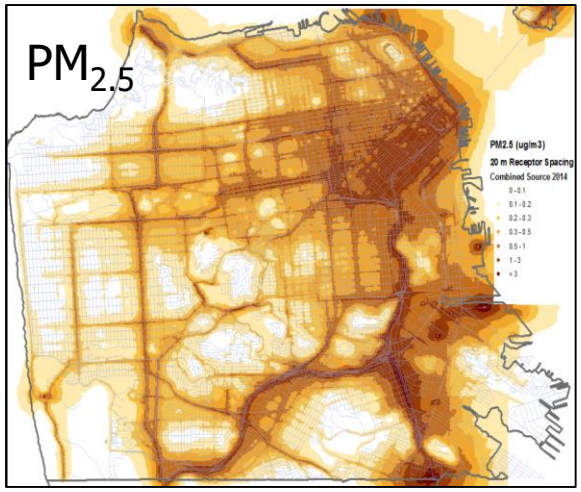
Framework for Reducing Community Health Impacts

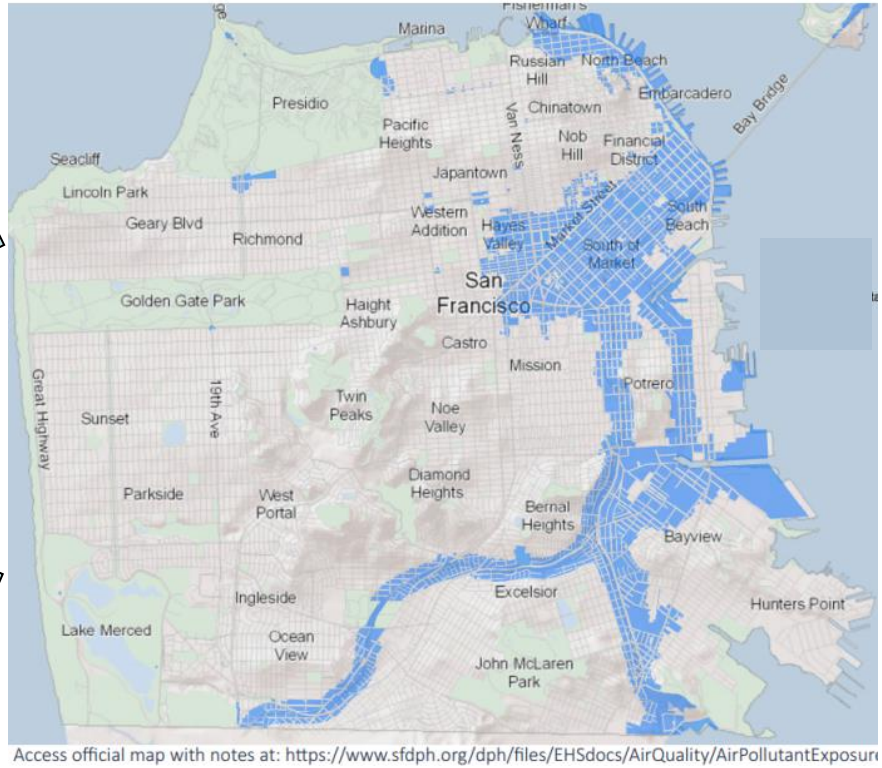
- Develop regulations targeted to source categories
- Prioritize grant funding
- Focus outreach and education
- Focus enforcement activities
- Coordinate planning efforts
- Prioritize local-scale measurement and modeling studies



Partnered with SF Planning, DPH on Community Risk Reduction Plan







Access official map with notes at: https://www.sfdph.org/dph/files/EHSdocs/AirQuality/AirPollutantExposure

City adopted thresholds for cancer risk and $PM_{2.5}$ to form **Air Pollutant Exposure Zones**

New Methods Needed for Community-scale Air Pollution Management

- We think near-source air pollution health impacts are driven by direct emissions of TAC and PM
- For TAC emissions, a risk assessment process has been established (facility-scale, modeling-based, source-oriented)
- For PM emissions, state and federal standards exist (regional-scale, measurement-based, receptor-oriented)
- How do we address cumulative, community-scale air quality impacts?

More Information

- http://baaqmd.gov/CARE