



**CENTRAL VALLEY  
AIR QUALITY  
COALITION**



# COMMUNITY AIR PROTECTION GUIDEBOOK

AVAILABLE ONLINE

The Community Air Protection Program is, in concept, a collaborative, community led process created to improve public health in impacted communities.

**SAN JOAQUIN VALLEY**  
COMMUNITY RESOURCE  
[CALCLEANAIR.ORG](http://CALCLEANAIR.ORG)

# Welcome



The goal of this Guidebook is to assist participants in that process by providing resources and information in a community friendly format. This work was itself a collaborative effort, and the result of lessons learned from working with partners in the San Joaquin Valley and across the state! Thank you to all of the Central Valley Air Quality Coalition’s (CVAQ) partners. Special thanks to Guidebook authors Genevieve Gale, Catherine Garoupa White, and Cynthia Pinto Cabrera.

## Clean air now!

Greetings! This Guidebook provides information about the Community Air Protection Program, which was created by the passage of California Assembly Bill 617 in 2017. The goal of the Community Air Protection Program is to improve public health in impacted communities. Despite some gains in addressing air pollution in California, neighborhoods across the state - mainly where Black and Indigenous peoples and people of color live - have severe air pollution problems

The disproportionate pollution burden borne by communities of color and low incomes is a result of decades of institutionalized racism and oppression. Unraveling these layers and transforming the built environment of environmental justice communities is a long, ongoing effort that requires centering community expertise. The Community Air Protection Program is, in concept, a collaborative, community led process to determine primary sources of concern and to generate a set of measures to address those concerns.



## Overview

The contents of this guidebook is created to provide information and provide resources for the affected communities.

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# What is AB - 617?

The state of California passed Assembly Bill (AB) 617 as a remedy. AB 617 was signed into law in July of 2017 in an effort to clean up local sources of pollution in highly impacted communities. The bill requires new community-focused and community-led actions to reduce air pollution and improve public health.

## OUR PRESENT



(Photo: David McNew/GettyImages)  
Sunrise at the Kern Oil and Refining Co. near the town of Lamont.

### **California has a pollution problem.**

The Los Angeles and San Joaquin Valley air basins are the two most polluted air basins in the United States. The city of Los Angeles repeatedly ranks #1 for most polluted metropolitan area for ozone. Bakersfield and Fresno rank #1 and #2 for the worst fine particulate matter pollution, a dangerous pollutant that is connected to heart and lung diseases.

### **Pollution is worse in environmental justice communities**

While Los Angeles, the Inland Empire and the San Joaquin Valley struggle with regional air pollution, low-income communities of color often face additional pollution burdens. Close proximity to railyards, highways, factories, distribution centers, refineries, oil wells, and other polluting sources

## OUR FUTURE



CVAQ Archive, 2011  
CVAQ Action Day, 2011

### **Real solutions require everyone**

The intent of AB 617 is honorable, however, the problems low income communities of color face are often the result of decades, if not centuries, of social and economic injustice. One state program cannot address all these problems. But the Community Air Protection Program, when well implemented, can foster mutual understanding and new partnerships to address local concerns. The program also includes millions of dollars in state funding for improvements.

# The Community Air Protection Program

## GOAL

California Assembly Bill 617 created the Community Air Protection Program. This program requires new, community-focused and community-led actions in select communities to reduce air pollution and improve public health. Selected communities create and implement:

### Community Emission Reduction Plan (CERP)

The emission reduction plan must include new actions that go beyond existing efforts to further reduce air pollution and/or protect from health impacts.

### Community Air Monitoring Plan (CAMP)

The air monitoring plan must complement existing air monitoring to enhance understanding of pollution impacts within a community.

## PROCESS

Community members must be active partners in envisioning, developing, and implementing actions to clean up the air in their community. AB 617 directs local air districts to develop and implement community emission reduction and/or community air monitoring plans in partnership with residents and community stakeholders. Once a community is selected, the air district convenes a Community Steering Committee and everyone will have one year to craft a tailored plan for their community.

## ELEMENTS

- Community Emission Reduction Plans
- Community Air Monitoring Plans
- New Pollution Controls on Facilities
- Better Pollution Reporting
- Higher Fines for Air Quality Violations
- Grants to Local Community Groups

## WHAT IS ENVIRONMENTAL JUSTICE?



Photo by Alicia Acevedo

Clear view of the High Sierra mountain range, seen from the floor of the San Joaquin Valley.

According to the United States Environmental Protection Agency, environmental justice is “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development and implementation of environmental laws and policies. Environmental justice will be achieved when everyone enjoys the same degree of protection from environmental health hazards and equal access to the decision-making process.” (U.S.E.P.A; [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice))



CVAQ Archive 2012

CVAQ, 2012



CVAQ Archive 2012

CVAQ, 2012

# Community Selection

The California Air Resources Board (CARB) draws from recommendations submitted from air districts and the public to annually select communities for development of a community emission reduction and/or community air monitoring plan. Factors that inform CARB’s decision include a community’s exposure to air pollution, the number of sensitive populations, socioeconomic factors, and public health data related to air pollution, such as asthma, heart disease and premature death.

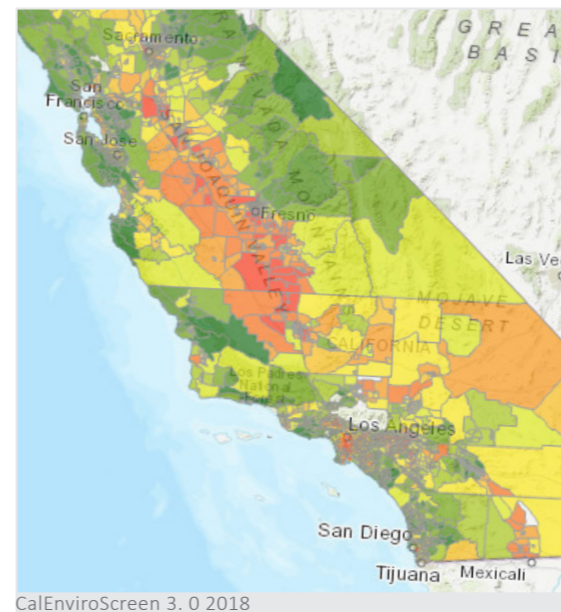
The geographic boundaries of the community chosen by CARB are preliminary, and Air Districts must work with the Community Steering Committee to finalize the boundaries.

## COMMUNITIES CHOSEN IN 2018

**COMMUNITY AIR MONITORING (CAM) ONLY**

**COMMUNITY EMISSION REDUCTION (CERP) ONLY**

**BOTH CAM & CERP**



CalEnviroScreen 3.0 2018

### CAM Only

- RICHMOND
- SOUTH SACRAMENTO
- PORTSIDE SAN DIEGO

### CERP Only

- WEST OAKLAND

### Both CAM & CERP

- SOUTH CENTRAL FRESNO
- SHAFTER
- SAN BERNARDINO, MUSCOY
- EAST LOS ANGELES, BOYLE HEIGHTS, WEST COMMERCE
- WILMINGTON, LONG BEACH, CARSON
- EL CENTRO, HERBER, CALEXICO

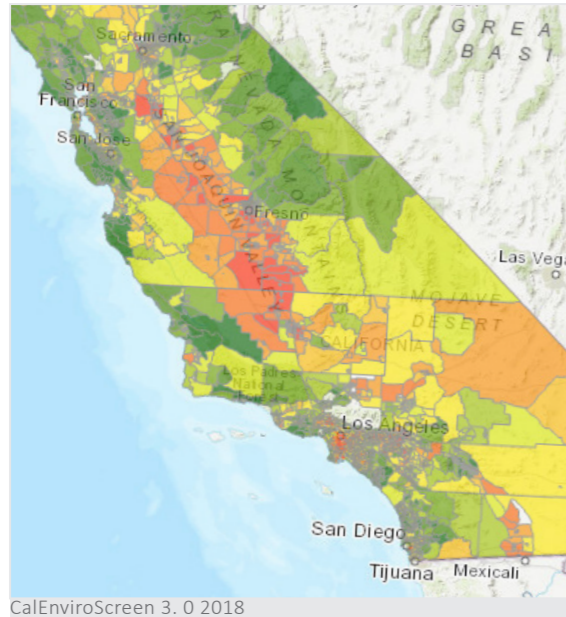


## COMMUNITIES CHOSEN IN 2019

**COMMUNITY AIR MONITORING (CAM) ONLY**

**COMMUNITY EMISSION REDUCTION (CERP) ONLY**

**BOTH CAM & CERP**



CalEnviroScreen 3.0 2018

### CAM Only

PORTSIDE  
SAN DIEGO

### Both CAM & CERP

SOUTHWEST  
STOCKTON

EASTERN  
COACHELLA VALLEY

SOUTHEAST  
LOS ANGELES

### How to Nominate Your Community:

Submit your nomination to: [communityair@arb.ca.gov](mailto:communityair@arb.ca.gov).

Include:

- the geographic boundaries of the proposed community
- a description of the community
- the pollution and/or health impacts of concerns

**TIP:** The more people and organizations that support your nomination, the more chance it has of being picked. Talk with non-profits, government officials and others in your community, and if possible, submit a letter together.



# Roles & Responsibilities

## COMMUNITY STEERING COMMITTEE

Air Districts are responsible for convening the Community Steering Committee. The steering committee includes community members who live, work, or own a business within the community. Additional members may include individuals from nonprofits, health agencies, local government, academia and labor organizations. The majority of the committee must be community residents and must reflect the diverse makeup of the community.

## COMMUNITY MEMBERS

Community members know their neighborhoods and what they want their communities to become. Therefore residents, as part of the Community Steering Committee, play a fundamental role in designing the goals and objectives of the plans. Local, regional and state governments can contribute technical and scientific expertise and the authority to implement effective solutions for clean air. Government should serve as partners with the community.

## GOVERNMENT PARTNERS

### Local Government

Local government representatives can be on the Steering Committee. They are responsible for land use and transportation decisions, such as the placement of a distribution center or the widening of a road. As one way of reducing emissions, local government could change their land use and transportation policies.

### San Joaquin Valley Air District

The San Joaquin Valley Air Pollution Control District, better known as "The Air District," is in charge of creating and implementing plans to clean the air in the San Joaquin Valley. They can directly regulate homes, facilities and farming operations. They will:



- Convene and facilitate community steering committees
- Work with committees to develop and implement plans
- Adopt and enforce local regulations to address committee concerns

## GOVERNMENT PARTNERS

### California CARB

The California Air Resources Board (CARB) is the state agency that oversees local air districts to ensure they are creating effective clean-air plans. CARB is also in charge of regulating cars and trucks and climate pollution. They:



- Set overall requirements for the Community Air Protection Program
- Provide expertise as observers in committee meetings
- Create statewide measures to reduce pollution from cars and trucks

# Community Emission Reduction Program

## GOAL

The Community Steering Committee works with the Air District to define a specific goal for the Community Emission Reduction Program (CERP). The default is often: "To reduce and mitigate exposure to air pollutants." However, one can get more detailed or specific.

*In West Oakland, the community-identified goal was "to protect and improve community health by eliminating disparities in exposure to local air pollution."*



CVAQ, 2019

### Other ideas include:

- To reduce community exposure to air pollution through investment in local homes, schools and small businesses.
- To prioritize reductions to the harmful air pollution that is also accelerating global climate change.
- To protect sensitive populations from the impacts of air pollution and climate change through investment in local homes and neighborhoods, schools, parks and small businesses.

## TARGETS

The Committee, in collaboration with the Air District, sets targets to ensure they are on track to meeting the overall goal. Air Districts calculate the emission reductions needed to meet the community-identified targets. Once numerical targets are assigned to the community-identified targets, strategies can be designed to reach the targets. The Air District works with the community to identify strategies to meet the targets. For instance, in West Oakland, the 2030 targets are to improve air pollution exposure so that all neighborhoods meet the exposure conditions of today's least polluted West Oakland neighborhood. It was determined that, by 2030, local emission sources can contribute to the average neighborhood concentrations of PM<sub>2.5</sub> of no more than 1.2 µg/m<sup>3</sup>, to the average neighborhood concentration of diesel PM of no more than 0.13 µg/m<sup>3</sup>, and that all neighborhoods must have a cancer risk of no more than 110 in a million. See Measures to Reduce Pollution.



# CERP Timeline

Communities have 1 year from community selection to Air District Approval to create a Community Emission Reduction Program (CERP). Below are the steps that must occur during that year.



# Community Air Monitoring Networks

## GOAL

To enhance understanding of pollution impacts within selected communities, and support implementation of Community Emission Reduction Plans.

## KEY STEPS

- 1**

Determine the reason for conducting community air monitoring:

  - Identify the pollution concerns and/or questions within the community.
  - Define what should be measured.
- 2**

Describe how the community air monitoring will be conducted:

  - Identify the type of equipment available and needed.
  - Review data and maps to identify best locations to place the monitors.
  - Describe how the data will be collected managed and stored.
- 3**

Identify how the data will support action to reduce air pollution within the community:

  - Design a procedure to follow the data, analyze and interpret the data, and share it publicly.
  - Utilize data to inform action.

## ROLES

CARB selects the communities to be monitored. The Air District, in partnership with the Community Steering Committee, designs the air monitoring plan. The Air District implements the plan with the community.

## EXAMPLES

- Providing real-time air pollution information to support public health notification systems for residents to inform their daily activities.
- Identifying sources and emission types contributing to air pollution within the community to support development of a community emissions reduction program.
- Improving air pollution data at the community level in order to track progress toward improving air quality and to measure the effectiveness of the community emissions reduction program.
- Providing air pollution information to support public health research at the community level.



### Air Monitoring Data

Air monitoring data from all selected communities is posted online:  
[ww2.arb.ca.gov/community-air-quality-portal](http://ww2.arb.ca.gov/community-air-quality-portal)

# Real World Examples

**Note:** The following are examples of community air monitoring networks in California. Not all were designed under the Community Air Protection Program. Some pre-date the passage of Assembly Bill 617, and some are the result of community air grants that were awarded to community groups to design their own air monitoring network outside of the local Air District-controlled process.

## SAN DIEGO

Historic data collected in Portside Communities of San Diego have not identified significant differences in pollutant levels as compared to other areas of the county or the state, even though affected community residents knew otherwise. Under AB 617, residents identified areas where there are disproportionate air pollution burdens and placed air monitors in these locations. The new air monitoring will provide a clearer picture of air pollutant levels, sources and locations in the Portside Communities and this new insight will dictate future actions to reduce emissions.

## WEST OAKLAND

West Oakland developed their own community air monitoring system before the passage of AB 617. The community group West Oakland Environmental Indicators Project (WOEIP) in partnership with outside researchers placed black carbon monitors on every street within their community. While regulatory data already noted that air pollution is higher in West Oakland than in other Bay Area communities, the community found that air pollution varied significantly within individual city blocks. This data led West Oakland to define their community goal for their community emission reduction plan (CERP) as “eliminating disparities in exposure to local air pollution,” and they designed specific measures in their CERP to address truck traffic in the identified city blocks.



Google Maps

Researchers equipped Google Street View vehicles with a fast-response air monitor and repeatedly sampled every street in a 30-km<sup>2</sup> area of Oakland, CA, developing the largest urban air quality data set of its type.



## SOUTH FRESNO

One part of the air monitoring plan for Fresno includes the placement of a toxics monitor on the southern boundary of the community. A petroleum terminal, which is a source usually associated with toxic emissions, is located in this area near homes and schools. Cancer rates are high in this area. However, the terminal reports no emissions of toxic chemicals. The monitor will be used to measure airborne toxics. Emissions data could verify community concern and lead to increased regulation of this facility.



CVAQ

*Petroleum terminal in South Fresno.*

# Community Charter

## CONSENSUS

### South Central Fresno

“In the absence of consensus, a majority vote (50%+1) of all community steering committee members will be taken.”

### Shafter

In the absence of consensus “reasonable efforts will be made to capture all of the perspectives.”

## MEETING AGENDAS

### South Central Fresno

“Agendas and agenda topics will be informed by committee input [and] developed by the Air District.”

### Shafter

Community groups will “serve as partnering co-leads for the development of the Community Steering Committee meetings.”

# Advocacy Tips

## ADVOCACY TIPS



CVAQ Archive

CVAQ Action Day 2018

### Focus

Focus on your charter. You may want to ensure that the Steering Committee has the right to vote on issues.

### Ensure

Ensure the community boundary is fair and includes those areas most impacted.

### Prepare

Prepare for meetings with other community members; it is one of the best ways to share the workload and contribute your expertise.

## ADVOCACY TIPS

### Educate

Educate all Steering Committee members on important issues.

### Use Your Voice

Use your voice. Don't let conversations end before you or other participants have voiced your opinion. Demand space, demand a vote, demand a voice.

### Take Note

Take note of important points in time. These include Steering Committee meetings, when there are updates to the District Board, CARB Board or Legislature, or when the community emission reduction plan is approved. These are times when you and other residents can demand certain actions, or get others not directly involved to demand action. Do your homework and prepare before the meetings.

### Understand

Understand power in your community. Strategically include stakeholders (residents, business owners, Legislators, CARB Board, city officials) in your plans.



# Health Impacts of Local Air Pollution

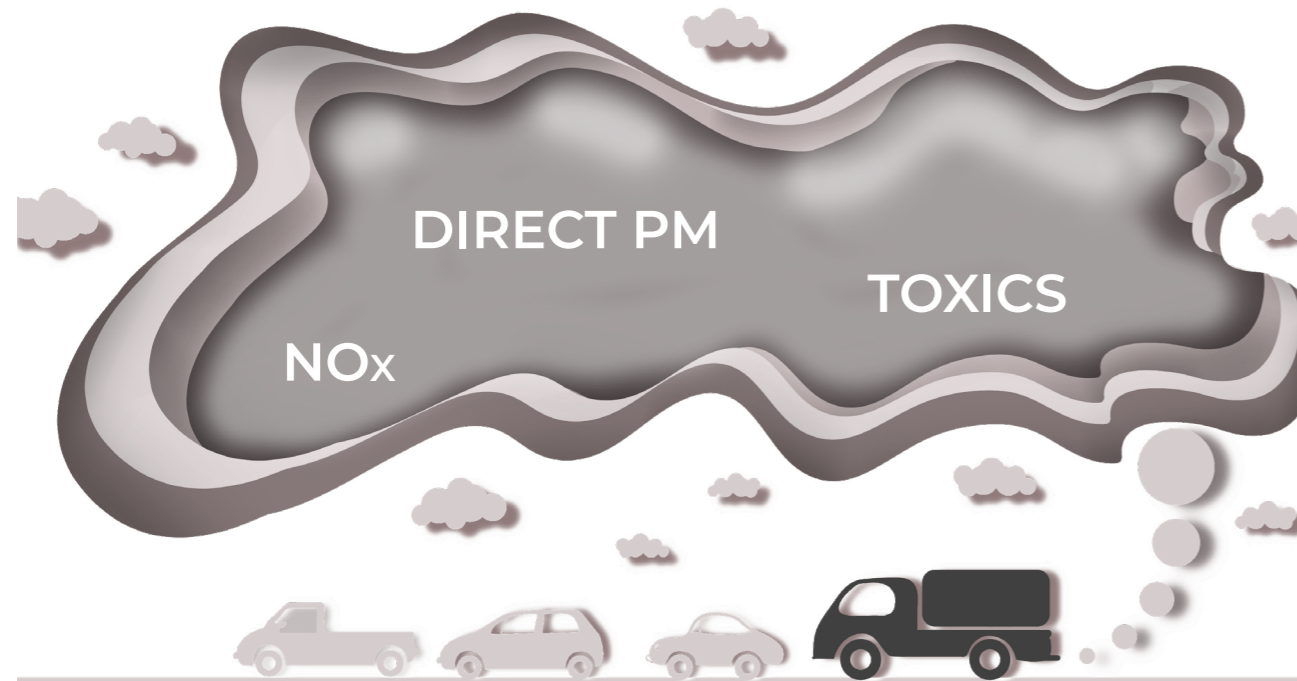
Air pollution is either:

- **Directly Emitted**

Pollution emitted directly from things like smokestacks, tailpipes, or waste piles. Has health impacts to those closest by. Includes Direct PM, NO<sub>x</sub>, and Toxics.

- **Formed in the Air**

Pollution created in the air from the mixing of different pollutants. Includes ozone and “secondarily formed” PM<sub>2.5</sub>. Pollution is created in the atmosphere and spreads over a large geographic area. Local reductions to the main ingredients do not ensure local health benefits.

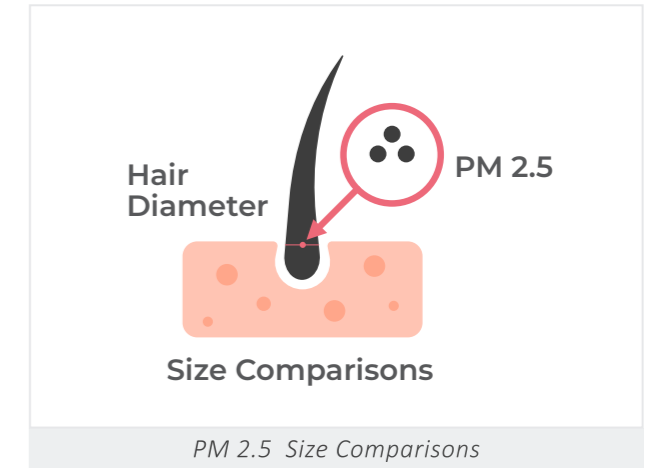


Particulate matter in diesel exhaust and some metal particles are both PM and Toxics.

## HEALTH IMPACTS

### Particulate Matter (PM)

PM is small particles in the air. PM<sub>10</sub> is the size of dust and can be a respiratory irritant. PM<sub>2.5</sub> are smaller, more dangerous particles that our bodies cannot filter out when inhaled. Exposure is associated with asthma attacks, heart attacks, strokes, lung and heart diseases, emergency room visits, and premature death.



### Toxics

The U.S. Environmental Protection Agency has classified 187 pollutants as toxic. This means they can cause cancer, birth defects, brain damage and/or other serious harms.

### NO<sub>x</sub>

Nitrous Oxides (NO<sub>x</sub>) is a gas formed when fossil fuels are burned. NO<sub>x</sub> can cause inflammation of the airways, asthmatic reactions, and worsening of allergies. New research has found exposure to NO<sub>x</sub> can cause asthma. NO<sub>x</sub> reacts with other pollutants in sunlight and heat to form ozone.

### Ozone

Ozone is a gas formed in the summer. It can cause immediate breathing problems and irreversible changes in lung structure that eventually lead to chronic respiratory illnesses. Ozone can also shorten your lifespan.

# Local Sources of Pollution

The most effective way to improve community health in your neighborhood is to reduce and mitigate the impacts of local sources of air pollution, especially directly emitted particulate matter (PM), toxic pollutants, and nitrous oxides (NOx).

Below are the most common sources of these pollutants.

## DIRECT PM 2.5

Direct PM2.5 are very small particles that come from the act of burning. Direct PM2.5 can come from burning in a fireplace, burning fuel in an engine, and burning in an industrial sized boiler or incinerator. Wildfires, trucks and other diesel equipment, biomass incinerators, glass manufacturing and oil and gas boilers make a lot of direct PM2.5.



### Cancer Risk

Diesel PM 2.5 represents 70% of the known cancer risk

## DIRECT PM 10

Direct PM10 is usually dust or large particles that come from milling, lumber operations, construction, or mining. Main sources are dry land and unpaved roads, granaries, concrete facilities, quarries, and animal food facilities.

## NOX

NOx is a gas created when fossil fuels, such as coal, wood, or gas, are burned. The biggest sources are big engines, like industrial boilers, incinerators, and furnaces, as well as trucks and tractors.

## TOXICS

There are many different pollutants that are toxic to the human body. The main ones connected to cancer in the San Joaquin Valley are diesel particulates (PM2.5 created from the burning of diesel fuel), petro-chemicals like benzene and formaldehyde that come from oil and gas operations, and some pesticides.



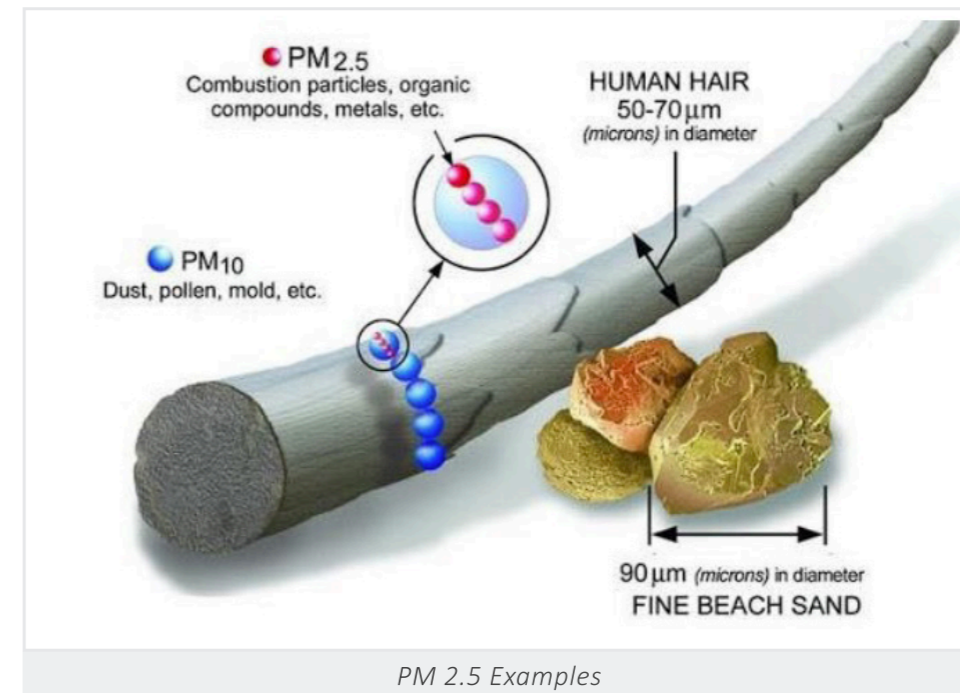
### Proximity Matters!

The closer you are to the directly emitted pollution, the worse the health effects.

# Air Pollution 101

## PARTICULATE MATTER (PM)

Particulate matter (PM) is a mixture of solid particles and liquid particle pollution in the air. These particles are too small to be seen by your eyes but when they all come together, they make the haze that can be seen covering the San Joaquin Valley. There are two sizes of this pollution. PM with a size of 10 micrometers,



## How and When Does PM Pollution Happen?

PM can be made in two ways, directly from sources, or indirectly by the particles mixing with the water in the air. Particle mixing mostly happens when there is a lot of water in the air making PM pollution the worst during the fall and winter. More PM pollution happens in the fall and winter because of activities such as burning fireplaces, burning of agricultural waste, and harvesting of crops that put a lot of dust in the air. These activities put particles directly into the air. Particle pollution is also growing during summer months because wildfires are happening more and more because of climate change. (See the section on greenhouse gas emissions for more information on connections between air pollution and climate change.) PM is also able to get trapped in the air the same way fog does.



## PARTICULATE MATTER

### What are the Health Impacts of PM?

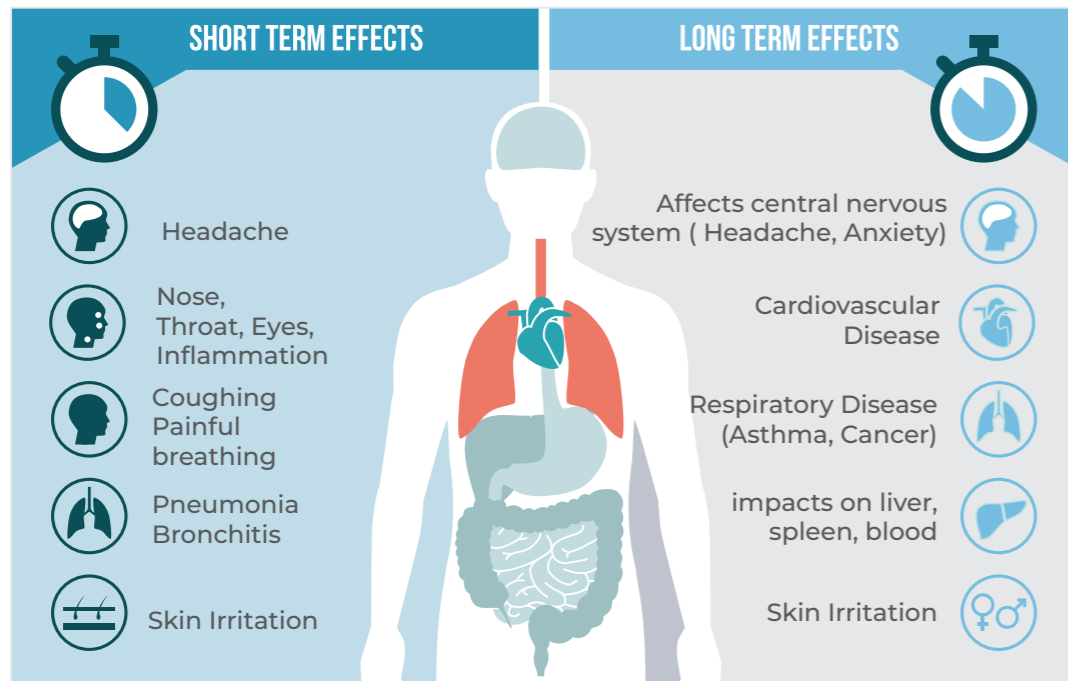
Because particulate matter is so small and levels in the Valley are so high, just breathing exposes everyone to PM pollution. PM can make its way to the lungs and blood, leading to short-term and long-term health impacts like:

- Short Term**

These include early death (on high-level pollution days), decline in lung function, negative heart effects, increase in absence from school, hospitalization, etc.

- Long Term**

These include shorter of lives (by approx. 3 years), lung cancer, hospitalization due to asthma attacks, decreased lung function in younger age groups and/or development of asthma at a young age, damage to the airways of the lungs, increased infant death, higher risk of developing diabetes, increase in negative effects on the nervous system.



# Ozone

## WHAT IS OZONE?

There are 2 kinds of ozone, both made up of three oxygen atoms. One is good for us and one can burn our lungs: Ozone in the upper atmosphere happens naturally and protects us from the ultraviolet rays of the sun. Ozone on the ground is a type of pollution, called “smog”.



Ozone in the upper atmosphere protects us from UV rays.



Ozone on the Freeway.

### Ozone or “Smog” is made

When chemicals called nitrogen oxides (NOx) and volatile organic compounds (VOCs) mix with sunlight and heat in the atmosphere. Because you need a lot of heat to be able to make smog, it is the worst in the summer. Ozone tends to reach unhealthy levels in cities during hot, sunny days. However, ozone can travel to other places by wind.

### What are the Health Impacts of Ozone?

There are several harmful health impacts from breathing in ozone. Breathing in ozone, even at low levels, can cause instant breathing problems, such as wheezing, coughing, asthma attacks, and increased risk of lung infection, and potential heart impacts. In the long-term, ozone exposure can increase the risk of early death from breathing diseases, the development of breathing diseases in children who are breathing in ozone, and potential damage to other systems in the body,

### Where does Smog Come From?

Emissions from cars, power plants, industrial sources, refineries, chemical plants, and other mechanical and natural sources create nitrogen oxides and volatile organic compounds.

# Toxins

## WHAT ARE HAZARDOUS AIR POLLUTANTS?

Hazardous Air Pollutants, also known as Toxic Air Contaminants or air toxics, are pollutants that are known or can possibly cause cancer and/or serious health problems.

**There are 187 toxic air pollutants identified by the US Environmental Protection.**

## WHAT ARE THE SOURCES OF HAZARDOUS AIR POLLUTANTS?

Most air toxics come from human-made sources, including mobile sources (cars, trucks, buses), stationary sources (factories, power plants), and indoor sources (building materials, cleaning supplies). Additionally, other air toxins are also released from natural sources (volcanic eruptions, forest fires).



## HOW ARE PEOPLE EXPOSED TO HAZARDOUS AIR POLLUTANTS?

Exposure can be from breathing in contaminated air, eating contaminated food that has been exposed to contaminated soil where toxins have been left, drinking contaminated water, and/or eating contaminated soil.

## WHAT ARE THE HEALTH IMPACTS OF HAZARDOUS AIR POLLUTANTS?

Exposure to these air toxics can have various health impacts such as a higher risk for cancer and damage to your body's defense system, affecting your brain, lungs and other important organs. Exposure can also lead to birth defects and nerve damage. The most persistent toxins can accumulate when they enter the body and magnify as they move up the food chain. Exposure to air toxins high enough concentrations and/or sufficient periods of time can increase the chance of experiencing the health effects listed above.

# Greenhouse Gases

## WHAT ARE GREENHOUSE GASES?

Greenhouse gases, also called GHGs are gases that trap heat in the atmosphere. There are several types of greenhouse gases that we are concerned with including:

- Carbon dioxide (CO<sub>2</sub>)
- Nitrous Oxide (N<sub>2</sub>O)
- Methane (CH<sub>4</sub>)
- Flourinated Gases

## WHERE DO GREENHOUSE GASES COME FROM?

Human activities are mostly responsible for greenhouse gas emissions. The main sources of greenhouse gases include:

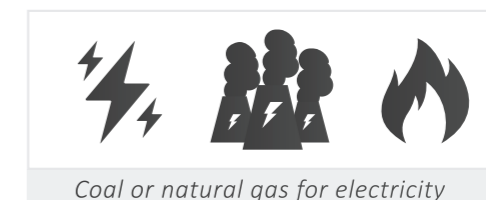
### Transportation

Mainly from burning fossil fuels for our cars, trucks, ships, trains, and planes.



### Electricity Production

Mainly from burning fossil fuels like coal or natural gas for electricity.



## WHERE DO GREENHOUSE GASES COME FROM?

### Industry

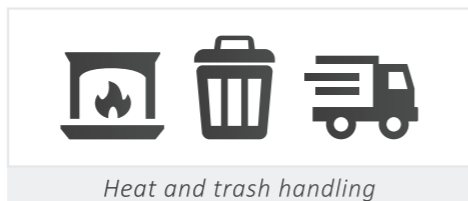
Mainly from burning fossil fuels for energy, and in some cases from chemical reactions that happen in certain industries.



Chemical reactions in certain industries

### Commercial and Residential

Mainly from burning fossil fuels for heat, and in some cases, how trash is handled.



Heat and trash handling

### Agriculture

Mainly from livestock, agricultural soils, and rice production.



Livestock and agriculture

### Land Use and Forestry

Forests and other lands have absorbed more CO2 from the atmosphere that they can emit.

# How to Protect Yourself From Air Pollution

## KNOW THE AIR AND ADJUST ACTIVITIES ACCORDINGLY

To protect yourself & your family, it is helpful to know what the air pollution levels are near you and then adjust your activities as needed.

Government agencies maintain a monitoring network across the San Joaquin Valley for both fine particle pollution (PM2.5) and ozone (smog).



### Text Alerts

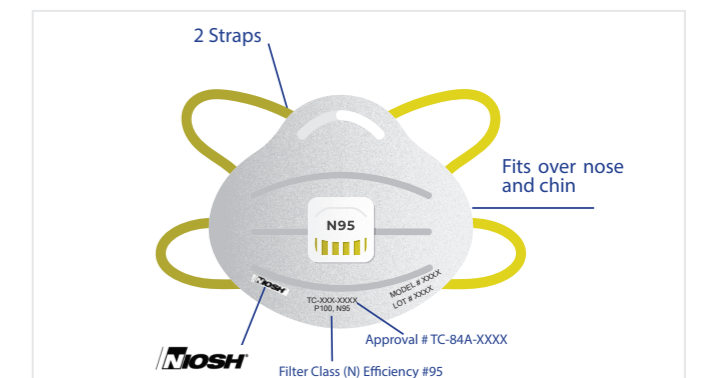
Sign up for text alerts from the Valley Air District:  
[www.valleyair.org/myraan/](http://www.valleyair.org/myraan/)  
 or  
 For access to community air monitors:  
<https://www.sjvair.com/>

## ON BAD AIR DAYS

Stay Indoors! Do not exert yourself outside. Keep children and sensitive individuals inside as much as possible!

### If you must go outside:

- A cotton handkerchief blocks about 30% of particles.
- A surgical mask block about 80%.
- Most effective are N95 masks that block around 98-99% of particles. You can find the N95 masks at a hardware store or buy in bulk.



Look for "NIOSH" certification, National Institute of Occupational Safety and Health (NIOSH). Serial numbers and other trademark markings.



## ON A REGULAR BASIS: CHECK AND REPLACE HVAC FILTERS

If you have central air, the system has an air filter that should be changed every few months (especially before the winter PM season, and after wildfire smoke and other high-pollution events). To capture the very fine particulates you'll need a filter with a rating of at least MERV 11. Filters can be found online or at your local stores, make sure you buy the right size for your system.



Clean Filter versus Dirty Filter.

## IF POSSIBLE

### HEPA is Best for Particle Pollution

(Winter-time pollution & wildfire smoke): Any filter that is of HEPA quality will capture the fine particles. Filters must be changed regularly.



BISSELL MYAir® Personal Air Purifier

### Activated Carbon is Good for Ozone

(Summer-time Pollution): Filters with an activated carbon layer can remove 60-70% of indoor ozone pollution. Avoid "ionizers," which can create ozone. Portable air cleaners can be used in a room when close air cleaning is needed. Investing in or making a device may be a solution, particularly during extreme air pollution events like wildfires, or if your home does not have filtered central air.

## ALWAYS

Do NOT Burn Wood! Not burning is one thing you can do to protect the air you and your neighbors breathe. One in five people in the San Joaquin Valley have asthma and one in four have high blood pressure. Wood smoke could trigger an asthma attack or stroke in someone on your street!

## HOW TO BUILD YOUR OWN FILTERED FAN

### Tools

- 20" Box Fan Tip: The best styles are square or rectangular shaped with a flat back.
- Merv 12 or 13 filter, available at your local home and garden store. Filters need to be the same size or slightly larger than the back of the fan.
- Duct tape
- Scissors

### Tools



Tom Frantz Twitter @airqualityguy

DIY Filtered Fan

The filter is taped to the back of the fan which draws the air through the filter and blows it into the room.

# Main Air Pollution Sources

There are 3 main categories of air pollution sources that affect the San Joaquin Valley:

- Mobile sources
- Stationary sources
- Area/ Area-Wide sources

## MOBILE SOURCES

“Sources of air pollution such as automobiles, motorcycles, trucks, off-road vehicles, boats, and airplanes.”



Transportation pollution



Transportation pollution

## STATIONARY SOURCES

“Non-mobile sources such as powerplants, refineries, and manufacturing facilities which emit air pollutants” Also can be called point sources.”



Non-mobile sources of pollution



Non-mobile sources of pollution

## AREA WIDE SOURCES

Sources of pollution where the emissions are spread over a wide area, such as consumer products, fireplaces, road dust, and farming operations. Area-wide sources do not include mobile sources or stationary sources.



Sources of pollution that are spread over a wide are.

## AREA SOURCES

Sources, which can include mobile sources, stationary sources, and area-wide sources, that are grouped together in a mathematical equation to estimate the amount of pollution. This source type is not reported, so their impact is also estimated.

# Who is in Charge of Cleaning Our Air

Cleaning the air in the San Joaquin Valley is a big job. From the Federal to the local level, there are many government agencies that play a major role in helping clean the air for the Valley. These agencies include:

- San Joaquin Valley Air Pollution Control District (SJVAPCD)
- California Air Resources Board (CARB)
- California Department of Pesticide Regulation
- United States Environmental Protection Agency (US EPA)

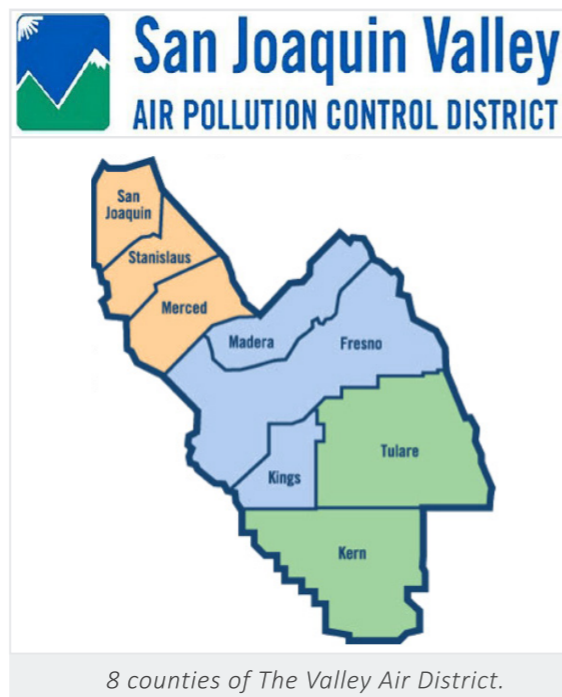
Each of these agencies takes on a specific role and work together to help clean the Valley's air.

## SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

### What is the San Joaquin Valley Air District?

The San Joaquin Valley Air District goes by many names. Officially, its name is the San Joaquin Valley Air Pollution Control District (SJVAPCD) or Valley Air District. Regardless of what you call them, they are the regional government agency in charge of protecting the health of people in the San Joaquin Valley by reducing air pollution. The Valley Air District covers the San Joaquin Valley's 8 counties and has three office locations.

- San Joaquin
- Stanislaus
- Merced
- Madera
- Fresno
- Kings
- Tulare
- Kern



## SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

### Northern Region:

**Merced, Stanislaus, San Joaquin Counties**

**Office:**

4480 Enterprise Way,  
Modesto, CA 95356

**Phone:** (209) 557-6400

### Central Region:

**Fresno, Madera, Kings Counties**

**Office:**

1990 E. Gettysburg Ave.  
Fresno, CA 93726

**Phone:** (559) 230-6000

### Southern Region:

**Tulare, Kern Counties**

**Office:**

34946 Flyover Ct,  
Bakersfield, CA 93308

**Phone:** (661) 392-5500

## HOW DOES SAN JOAQUIN VALLEY AIR DISTRICT WORK?

### Who is in charge at the Air?

The Air District works in a top-down manner through the Governing Board, the Air Pollution Control Officer, and the Air District Staff.

#### The Governing Board:

The Governing Board is the official political body of the Air District. It is currently made up of 15 members: eight county Supervisors from each of the eight Valley counties, five City Council members and two public members appointed by the Governor. The Air Board's role is to give leadership and direction of air pollution control activities in the Valley.

#### Air Pollution Control Officer (APCO):

The APCO is the top administrator of an Air District. They direct the day-by-day operations such as staff research and rulemaking. The APCO works for and reports to the Governing Board.

#### Staff:

There are hundreds of staff members at the Valley Air District. They hold many responsibilities that can range from public education and outreach to business inspections, rule and plan development, rule enforcement, and permit management.



## SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

### How Do Regulations Pass in the Air District?

In order for a regulation to pass, it must receive a majority vote at a public hearing of the Governing Board. The Governing Board holds meetings where regulations, policy, funding, programs and other things must get approved before the APCO and Air District Staff can begin working on them. During these meetings, the Air District Staff present information about anything that they are proposing. After the presentation, the Governing Board can ask questions to make sure they understand what is being proposed. After Governing Board questions, there is a public comment section, where members of the audience can speak, usually for up to 3 minutes. Once all comments from the public, the Governing Board discusses and then votes on what is being proposed. At least 8 of the 15 Governing Board members must vote “yes” for a proposal to pass. Proposals that are passed in these meetings can be amended or changed, but only if they go through another public meeting and another vote from the Governing Board. Rules and plans are legally binding; however, they can also be changed by another Governing Board vote, a change in law, or a lawsuit.

### Anyone can attend a Governing Board Meeting!

Governing Board Meetings are generally held on the 3rd Thursday of each month at 9:00 A.M. at the Central Region Office in Fresno. To encourage public participation, the Governing Board Meetings are held via the district’s video teleconferencing system and can be attended in either the Central Region Office in Fresno, the Northern Region Office in Modesto or the Southern Region Office in Bakersfield.



San Joaquin Valley Air Pollution Control District

## CALIFORNIA AIR RESOURCES BOARD

### Who is CARB?

The California Air Resources Board is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency. CARB is the state agency responsible for regulating mobile sources of air pollution, greenhouse gasses, and consumer products, which includes cars, trucks, and buses. CARB’s duty is to protect the public from the harmful effects of air pollution and creating programs and taking actions to combat climate change in California.

## CALIFORNIA AIR RESOURCES BOARD

### Located



CARB is located in Sacramento, CA, the state’s capital in the Environmental Protection Agency Building.

#### Office:

1001 I Street, Sacramento, CA 95814

#### Mailing address:

P.O. Box 2815, Sacramento, CA 95812

#### Website:

<https://ww2.arb.ca.gov/>

### What are CARB’s Roles and Responsibilities?

CARB has many roles and responsibilities they play which include:

- Set the state’s air quality standards at levels that protect those at greatest risk – children, older adults and people with lung and heart disease.
- Identify pollutants that pose the greatest health risks, such as diesel exhaust particles, benzene in gasoline and formaldehyde in consumer products.
- Measure progress in reducing pollutants utilizing the nation’s most extensive air monitoring network.
- Verify automakers’ emissions compliance
- Research the causes and effects of air pollution problems – and potential solutions – using the best available science and technology.
- Study the costs and benefits of pollution controls, paying particular attention to individuals and communities most at risk; and
- Lead California’s efforts to reduce climate-changing emissions through measures that promote a more energy-efficient and resilient economy.

In addition to these roles and responsibilities, CARB works with the San Joaquin Air Pollution Control District to implement regional air pollution control strategies.

## CALIFORNIA AIR RESOURCES BOARD

### Who is in charge at CARB?

The California Air Resources Board is made up of 16 members. 12 of those members are appointed by the Governor and confirmed by the state Senate. The 12 members include 5 who serve on local air districts, 4 experts in fields that shape air quality rules, 2 public members and 1 the Chair. The chair is the only full-time member. The Governor can choose any of the board members to serve as the Chair. The other 4 board members include 2 who represent environmental justice communities. One is appointed by the Senate and the other by the Assembly. The last 2 are non-voting members who are appointed for Legislative oversight, one each from the Senate and Assembly. The work of the Board is supported by a diverse professional staff of scientists, engineers, economists, lawyers and policy makers.

### How does CARB Engage in the Public?

CARB holds monthly public meetings to review progress and to consider new approaches to cleaning California's air. At these meetings, anyone can come and present public testimony on items being heard or can submit public comments electronically. These monthly meetings are also broadcasted live for those who are unable to attend in person. These meetings are held in CARB's headquarters. Agendas, links to their webcast meetings and materials can be found at the CARB Governing Board Homepage at: <https://ww2.arb.ca.gov/our-work/programs/board-meetings>

## CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION (DPR)

### Who is DPR?

The California Department of Pesticide Regulation is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency. DPR monitors and regulates the use of pesticides from farm fields to grocery shelves to assure the safety of workers and the public.

### Located



DPR is located in Sacramento, CA, the state's capital in the Environmental Protection Agency Building.

**Office:**  
1001 I Street, Sacramento, CA 95814

**Mailing address:**  
P.O. Box 2815, Sacramento, CA 95812

**Website:**  
[www.cdpr.ca.gov](http://www.cdpr.ca.gov)

## CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION (DPR)

### What are DPR's Roles and Responsibilities?

DPR's roles and responsibilities include:

- Evaluation and registration of pesticide products before sale or use in California to ensure the pesticide can be used safely.
- Statewide licensing of large pesticides users, sellers, consultants, and other pesticide professionals to make sure they are properly trained to use the pesticides safely.
- Evaluation of health impacts of pesticides.
- Finding practices that ensure safe pesticide use in the workplace.
- Monitoring potential health and environmental impacts of registered pesticides and finding ways to prevent future contamination.

## US ENVIRONMENTAL PROTECTION AGENCY

### Who is the US EPA?

The US EPA is the Federal Agency who sets and enforces national air quality standards. They are in charge of regulating interstate transportation such as trains, ships, and planes.



### What is the role of US EPA in the Valley?

Oversee the California Air Resources Board and the San Joaquin Air Pollution Control District.

## RESOURCES

### Resources Identifying Violations Affecting Neighborhoods (IVAN)

IVAN is a user friendly, community based monitoring system that puts community voices and concerns in front of environmental agencies. For those in Fresno, Kern, and Kings County, suspected violations of the pollutants listed here can be reported to an Environmental Justice Task Force consisting of residents representatives from environmental agencies, and local organizations who are working together to solve community identified environmental problems. Reports regarding violations take less than five minutes to complete and are available online and through the IVAN mobile app.

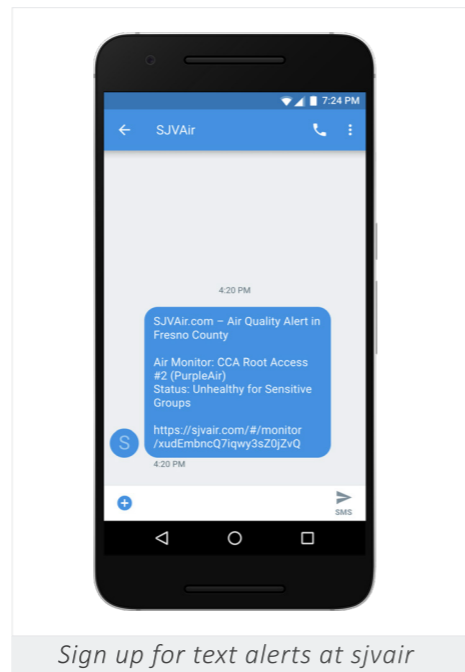
For more information visit <https://ivanonline.org/>

## US ENVIRONMENTAL PROTECTION AGENCY

### SJVAIR.com

SJVAir is a network of low-cost air quality monitors providing real-time PM2.5 data to disadvantaged communities across the San Joaquin Valley. SJVAir is operated by a collaborative of non-profit organizations from Bakersfield to Stockton. SJVAir uses PurpleAir Monitors that are calibrated in order to ensure more accurate air quality readings.

For more information visit <https://www.sjvair.com/>

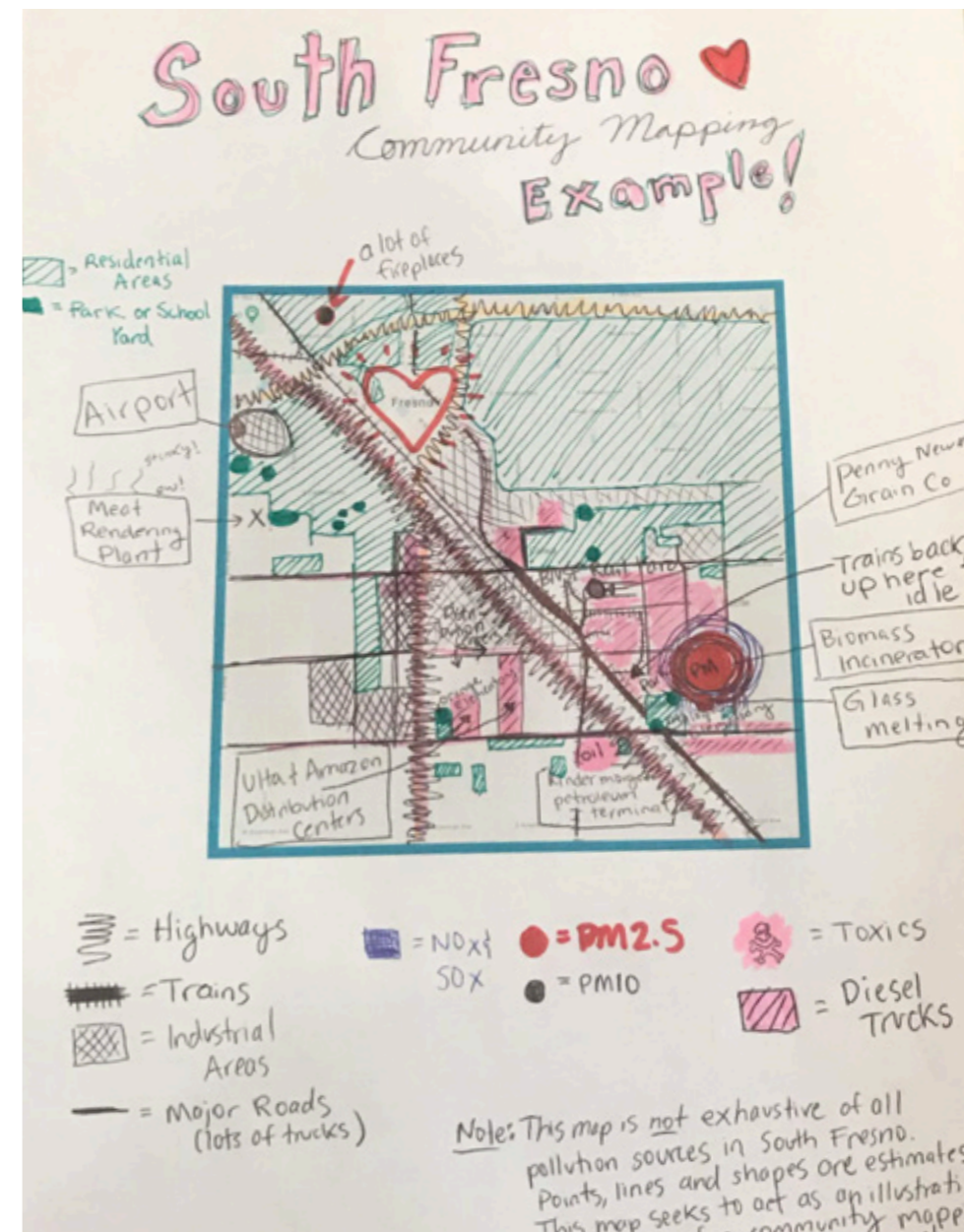


# Community Mapping Exercise

To reduce pollution, you need to know where it comes from. A first step to building this knowledge is to map sources of pollution in your community. Start with what you know, and then in the following pages learn about tools you can use to learn more. Add sources to your map as you go.

## SAMPLE MAP

Community Mapping exercise in South Fresno, South Fresno CSC





**THINGS TO NOTE**

- How close big sources of pollution are to homes, schools or parks

---

- How sources “collide” or stack up on top of each other

---

- How close or far away neighborhoods are from industrial activities

---

- Where you may want to put community air monitors: What would you want to monitor for, and why?

---

- Are any sources outside of the “community boundary” that look impactful?

**DRAW A MAP OF YOUR COMMUNITY HERE**

■ **Start with the main highways**

---

■ **Things to Map**

---

- |                            |                                     |
|----------------------------|-------------------------------------|
| • Residential              | • Refineries, Pipelines             |
| • Areas Schools            | • Places where pesticides are used  |
| • Parks                    | • Facilities that Attract Trucks    |
| • Highways                 | • Places where cars and trucks idle |
| • Heavily Trafficked Areas | • Train Tracks                      |
| • Railyards                | • Distribution                      |
| • Airports and Ports       | • Centers Ports                     |
| • Industrial Facilities    |                                     |
| • Oil and Gas Wells,       |                                     |

**DRAW A MAP OF YOUR COMMUNITY HERE**

# Tips for Pollution Mapping

## START WITH WHAT YOU KNOW

You already know some of the pollution issues in your community. Start there. Intersections with a lot of trucks? A factory that smells? A park next to a highway? Map it!

## OPEN GOOGLE MAPS SATELLITE VIEW

Next, look up your community on Google Maps using the satellite view, a good way to find large industrial facilities and areas where trucks congregate. Look for trucks parked in big lots. Look for businesses with names that include: “Distribution” “Drayage” “Logistics” “Delivery” “Distributors” “Transit” “Transportation” and “Trucking.”



**TIP:** Refrigerated trucks pollute even more than normal because of the additional energy needed to keep stored items cold. Make a note of facilities that use these special trucks. They often have names like: “Transport Refrigeration” or “Cold Storage.”



Google Maps 2020

*Semi Trucks waiting in a docking yard.*

## COUNT TRUCKS

Truck Counts are excellent ways to understand the flow of truck traffic in different parts of your community. Sit next to an intersection or traffic light and count how many trucks go by in 10 minutes. Move to a different location and count again for ten minutes.

Compare across your community and find hot spots. Notice if the hot spots are near sensitive locations, such as schools or homes.

## MOVE AROUND

Travel through your community. Take note of industrial areas that are near homes, schools, parks or daycare centers. Take note of intersections with heavy traffic. Notice smokestacks and places with strange odors. If you’re driving, pull over safely and jot down your observations. You can further investigate these areas when you get home.

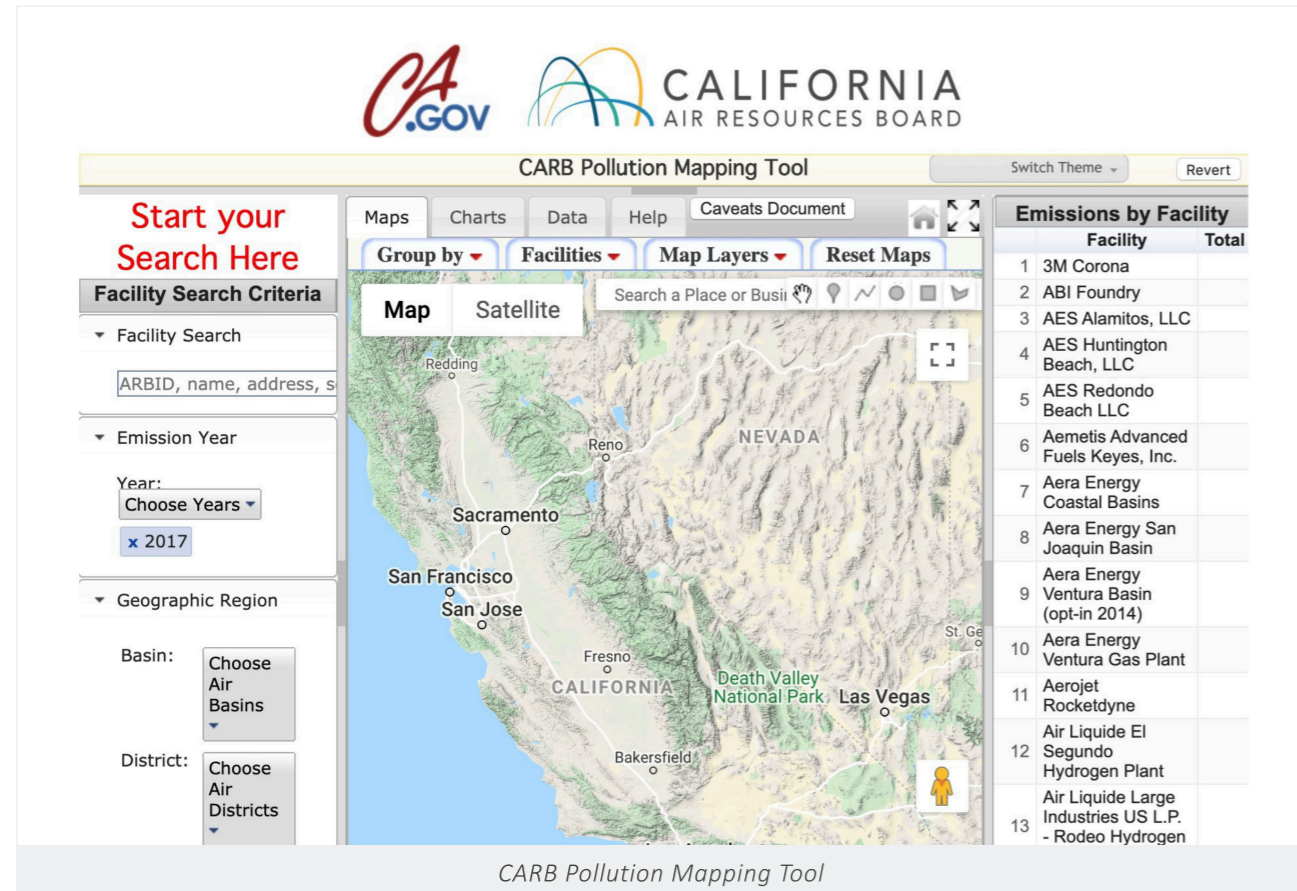
## TALK ABOUT IT!

Community members have intimate knowledge of their own neighborhood. Ask friends, families and neighbors about pollution sources. Different perspectives lend different observations! A stay-at-home mom may see a train idle in the neighborhood around the same time every afternoon while you’re at work; your friend who takes the bus may see trucks always idling off the freeway in the same spot. A school principal may notice a weird smell drifts over the playground on windy days. All of this information is incredibly useful; all you have to do is ask!

# Pollution Research (Direct PM 2.5, NOx & SOx)

## CARB'S POLLUTION MAPPING TOOL

CARB's Pollution Tool is useful for seeing most large stationary sources of pollution, like major factories, oil and gas operations, and manufacturing plants. Note that it does not include mobile sources, like cars and trucks, nor does it highlight facilities that attracts a lot of cars and trucks, like highways and distribution centers, or small sources of pollution like fireplaces or



CARB Pollution Mapping Tool

Start by visiting: [ww3.arb.ca.gov/ei/tools/pollution\\_map/](http://ww3.arb.ca.gov/ei/tools/pollution_map/)

## CARB'S POLLUTION MAPPING TOOL

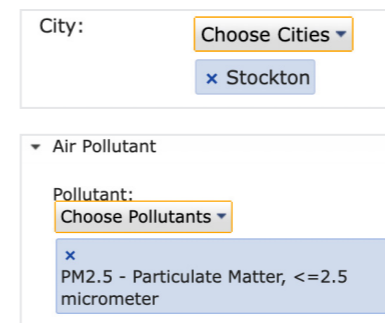
### Public Use

#### 1. Visit:

[ww3.arb.ca.gov/ei/tools/pollution\\_map/](http://ww3.arb.ca.gov/ei/tools/pollution_map/)

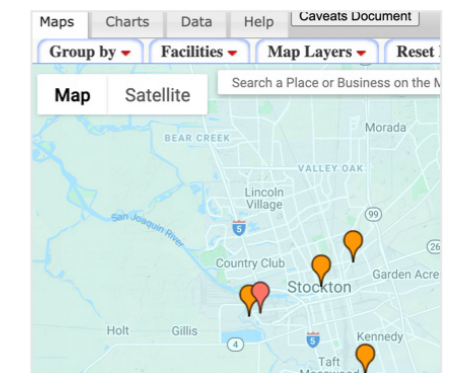
#### 2. Choose

Once you're on the website, on the side bar you'll see options to choose a location and chose the air pollutant of interest. Choose your community and then look at PM2.5. Read below about how to explore the map. Once you're done looking at PM2.5, check out NOx and then SOx.



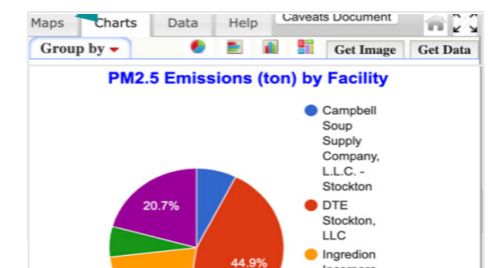
#### 3. Zoom

Zoom in on your community. Click the markers to see what the different facilities are.



#### 4. Play

Then, play around with the tabs. Up in the top left, change the view from Maps to Charts. This can help you understand what's producing what.





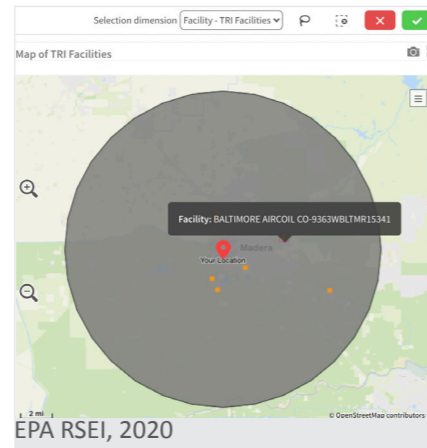
# Pollution Research (Toxics)

## EPA'S RISK-SCREENING ENVIRONMENTAL INDICATORS (RSEI) MODEL

EPA's Risk-Screening Environmental Indicators (RSEI) model allows you to explore data on releases of toxic pollutants from industrial facilities. RSEI incorporates information on the amount of toxic chemicals released, movement of the chemical through the environment, each chemical's level of toxicity, and the size and location of the human populations exposed. RSEI Scores are unit-less values that are only useful when compared to other scores. **Please note**, this federal data is not always reliable, so use it as a starting point to help establish priorities for further investigation. Local and state agencies and some nonprofits can help you learn more.

### Average RSEI Score

- Malibu, CA---- 0
- San Francisco, CA---- 655
- Elk Grove, CA----- 1,156
- Stockton, CA---- 44, 534
- Fresno, CA---- 138, 596
- Wilmington, CA---- 307,952



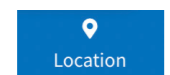
### Public Use

#### 1. Visit:

edap.epa.gov/public/extensions/EasyRSEI/EasyRSEI.html

#### 2. Click

On the left, blue sidebar click: Location



#### 3. Click

In the middle, click: Find TRI Facilities Near You. Type in your community and click search



#### 4. Click

Once the map is up, click a facility marker and then click the green check box above the map

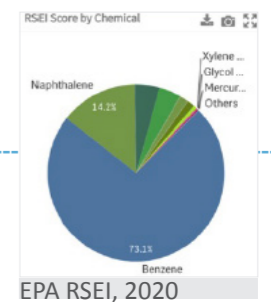
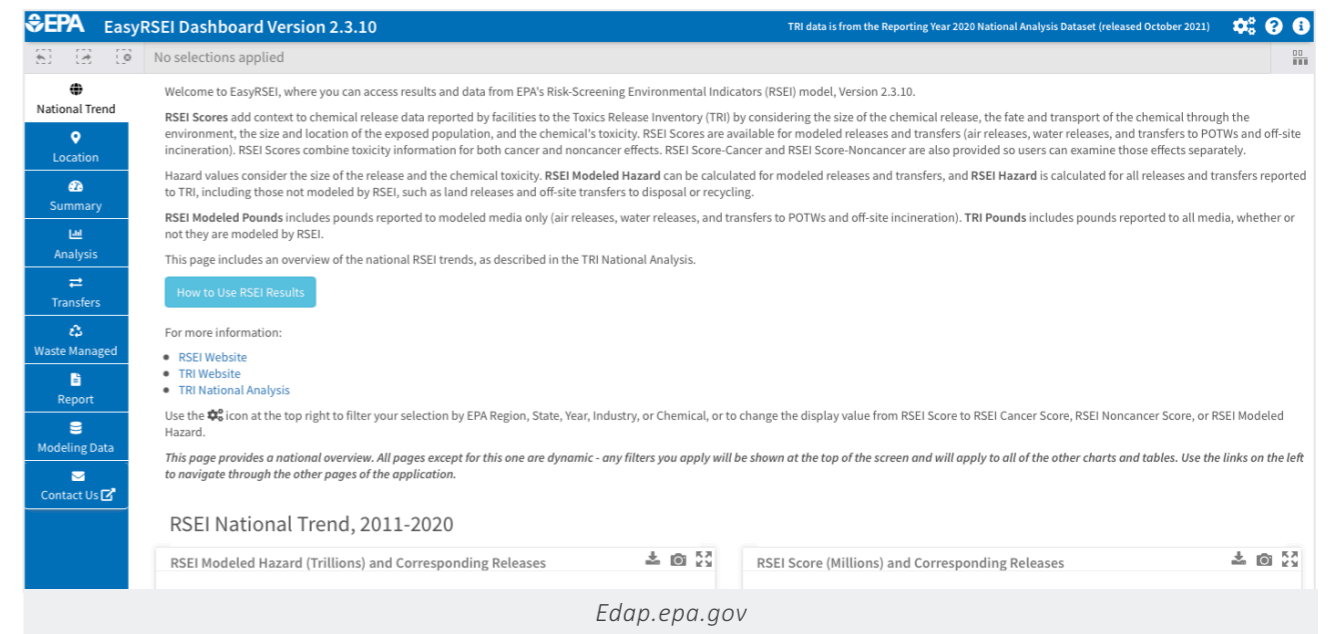
#### 5. Look

Look at the colored boxes at the top of the screen, read the total RSEI Score (yellow tab)



## EPA'S RISK-SCREENING ENVIRONMENTAL INDICATORS (RSEI) MODEL

### EDAP.EPA.GOV



#### 6. Play

Play around. Check out scores for multiple facilities and write them down. See how they compare

#### 7. Click

When interested in a facility, click the green check box and then click the compass icon on the sidebar.



#### 8. Look

Now look at the bottom right box on this screen. It shows the chemicals associated with the facility. For this oil and gas facility in Lamont, CA, benzene is the largest toxic pollutant. Google benzene and see what you can learn. Most sources will say benzene is a known carcinogen and there are no safe levels of benzene pollution, so this would be the type of facility you want to note on your map.

# CERP Measures to Reduce Pollution

Different agencies have different spheres of influence. Depending on the agency’s authority, the Steering Committee can have them use, enhance, or create new tools to clean the air and protect public health in your community.

## CARB

CARB generally has primary authority over:

- *Mobile sources ( vehicles & equipment unless preempted by Federal or Interanational entitites)*
- *Fuels*
- *Consumer products*
- *Emissions reporting*
- *Greenhouse gas sources*

Mechanisms:

- *Statewide regulations sugessted control mesures air quality incentives*

## AIR DISTRICTS

Air districts generally have primary authority over:

- *Stationary sources*
  - *Industrial*
  - *Commercial*
- *Area -wide / Residential emissions sources*
- *Indirect sources (mobile source traffic and congestion)*

Mechanisms:

- *Local regulations*
- *Air quality permits*
- *Air quality incentives*

## CITIES & COUNTIES

Cities & counties generally have primary authority over:

- *Land use*
- *Development standards (e.g. setbacks, buffers, barriers)*
- *Local traffic routes*
- *Urban greening*
- *Local infrastructure*

Mechanisms:

- *Statewide regulations sugessted control mesures air quality incentives*

## TRANSPORTATION AGENCIES

Transportation agencies generally have primary authority over:

- *Transportation planning and funding decisions*
- *Regional traffic and roadway infrastructure*
- *Regional transit development*

Mechanisms:

- *Regional transportation plans*
- *Sustainable community strategies*
- *Transportation programming*

Source: California Air Resources Board, 2020

## USE EXISTING TOOLS

### Targeted Outreach

Increase and target outreach to certain communities regarding a preexisting program, such as targeted outreach to the AB 617 community regarding air monitoring resources and information about how to protect one’s health.

### Targeted and / or Enhanced Enforcement

Target or enhance enforcement of a preexisting rule or regulation. Enhanced enforcement could include the deployment of advanced technologies to detect violations, or collaboration between local and state authorities. For instance, CARB is now using license plate readers in a program called Portable Emissions AcQquisition System (2019) to catch dirty trucks, and in the Shafter CERP (SJVAPCD, 2019), the Valley Air District is partnering with CARB to conduct additional targeted anti-idling enforcement.

### Use Environmental Reviews or Laws

Use existing processes to address community concerns. For instance, a community could utilize the Public Nuisance Law to require changes at a facility or location that is causing problems (See Mobile Sources Enforcement). Concerning land use, most municipalities already have a process in place to review proposals for new developments through their planning and zoning boards. The AB 617 Community Steering Committee could participate in this process, or ensure the state and local air quality regulators are actively involved. Members could also encourage a state agency or attorney general to review California Environmental Quality Act (CEQA) proposals for large new sources of pollution in the community- and potentially litigate on behalf of residents.

### Audits of High Risk Facilities

AB 617 sets up and revitalizes some processes to address dangerous stationary sources of pollution. See the pages on Stationary Sources to learn more.

# Measures to Reduce Pollution

## ENHANCE EXISTING TOOLS

### Replicate Existing Programs

Existing programs in other localities can act as a template for change in your community. For instance, Los Angeles already has a program to install air filtration in public schools (SQAQMD, 2007). Building from this model, this program can be adapted to other places.

### Enhance Existing Programs

Improving existing programs is another way to address problems. For instance, in West Oakland's CERP (BAAQMD, 2019), the District plans to improve their complaint response system to better respond to community needs.

### Improve Collaboration

Sometimes to solve a problem, all that is needed is better communication and collaboration among partners that don't normally work together. For instance in Fresno, the community is asking the city and the local air district to establish a Memorandum of Understanding (MOU) to work together to address land use and development issues (SJVAPCD, 2019).

## CREATE NEW TOOLS

### New Education Programs

Examples of education programs include workforce development programs, school programs that teach about air pollution and protecting your health, and a public notification system for air pollution.

### Incentive Funding

Most community emission reduction plans (CERPs) include state funding. Deciding how to spend the money is one of the most important things Steering Committee members do.

## CREATE NEW TOOLS

### Mitigate Exposure

Projects to mitigate exposure to pollution include, but are not limited to, an air filtration program for homes, and the installation of sound walls or vegetative buffers.

### Capacity Building, New Staff, and Board Members

Improving diversity or capacity on boards and at agencies can have positive effects. For instance, using AB 617 money to fund a grant writer that writes grants for clean-air projects in the community could have benefits that multiply over time.

### Land Use Policies

Changing land use requires the buy-in from your local city or county. This Guidebook doesn't cover land use, but see the West Oakland CERP (BAAQMD, 2019) for great examples.

### Studies & Planning

Oftentimes potential new regulations must be studied first. Studies can be good starting points for future action. For instance in Fresno, the city is studying the potential effects of new truck routes around the community (SJVAPCD, 2019).

### Fee & Penalties

A fee or penalty has two impacts: It dissuades individuals or businesses from carrying out certain acts, and it produces fee or fine money that can be used for beneficial purposes.

### New Rules and Regulation

An agency can create a new rule or regulation, such as a rule on what engines can run in trucks, or outlawing burning in fireplaces.



# Safer Distances

## HIGHWAYS AND MAJOR ROADS

California freeway studies show a 70% drop in particulate pollution levels at 500 feet. Levels approach background concentrations at 2,000 feet. However, exposures vary based on many factors, such as how heavily trafficked the roadway is and the time of day (CARB, 2017).

1000 FEET



Google Maps 2020

500 FEET



Google Maps 2020

## OIL AND GAS

### Refineries

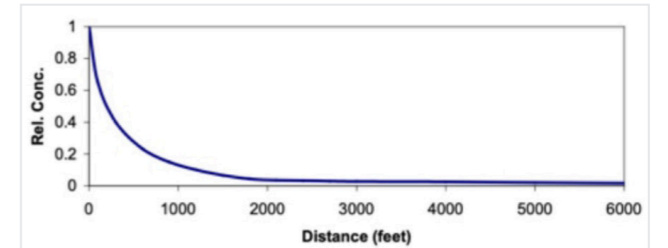
Non-routine events such as fires and other malfunctions can create significant emissions.

### Oil and Gas Wells & Storage

Suggested setbacks from oil and gas facilities range from 1,000 feet to one mile. Environmental justice advocates support a 2,500 foot separation to prevent public health harm, such as preterm birth, asthma and cancer (VISION, 2020). The Los Angeles County Department of Public Health found a 1,500 foot separation is necessary to limit air quality, odor and noise impacts, but that a buffer this size would not protect from impacts like fire and explosions (2018). In Colorado, a 1,000 foot separation from high- occupancy buildings such as schools, hospitals, and nursing homes is mandated by law (2013). The California Department of Education recommends citing schools 1,500 feet from roads or areas where gasoline, diesel, or other combustible or poisonous gases are transported or stored (2000).

## DISTRIBUTION CENTERS

Transport refrigeration unit (TRU) operations are the largest onsite diesel particle pollution sources at distribution centers, followed by truck travel. CARB estimates an 80% drop in pollutant concentrations at approximately 1,000 feet from a distribution center (CARB, 2005). Heavily trafficked roads that lead to and from the distribution center impact those close by.



CARB 2005

*Sensitivity of Concentration to Downwind Distance from a Distribution Center with TRUs*

## DRY CLEANERS

For a one machine dry cleaning operation, cancer risk can be reduced by as much as 75% by establishing a 300 foot separation. For larger operations, a separation of 500 feet is suggested (CARB, 2005).

## RAILWAYS & RAILYARDS

Air quality modeling conducted for the Roseville Rail Yard predicted the highest impacts within 1,000 feet, and is particularly associated with service and maintenance activities. The next highest impact is between a half mile and one mile of the yard, depending on wind direction and intensity (CARB, 2005).



Google Maps 2020

## CHROME PLATERS

CARB modeling shows localized risk of hexavalent chromium diminishing significantly at 300 feet. However, due to the extreme toxicity of the substance and the variability of chrome plating activities, a distance of 1,000 feet is suggested (CARB, 2005).

# Risk Reduction

## BUFFER ZONES

Keeping distance between people and sources of pollution is the one of the best strategies for reducing risks to health and safety. However, buffer zones are hard to achieve after an incompatible land use is already in place. Other mitigation options (see below) are best for improving public health for people who live, work, learn or play in close proximity to major pollution sources. Protections can be ensured for future development through local land use planning and processes or state mandate.

## AIR FILTRATION

Studies show that particle filtration systems can be highly effective for reducing indoor air pollution. Central ventilation systems with high efficiency filtration removes 50- 99% of particulate pollution while portable, plug-in air cleaners can remove 30-90% of the particles in the air (CARB, 2017).



## CERP

- The city of San Francisco requires high efficiency filtration in new developments in areas deemed high pollution exposure zones (San Francisco Department of Public Health, 2008).
- The South Coast Air Quality Management District has been renovating and installing high efficiency air filtration in schools for over a decade now. In an early 2006 pilot study, the agency found both stand-alone air cleaners and high-efficiency filters in HVAC systems achieved a 90% reduction in indoor PM2.5 pollution in classrooms (2007).
- The Fresno, Wilmington, East LA and Shafter CERPs included air filtration for schools within the AB 617 boundaries (2019).

**EDUCATION** See the Education, Health & Community page.

## WEATHERIZATION

Improved insulation and stopping air leaks can better seal a building, and when paired with high efficiency air filtration, can improve indoor air.

## SIDEWALK AND BICYCLE LANE PLACEMENT



Bicycle lanes are buffer zones to protect users from road pollution.

Placing bicycle paths and sidewalks away from busy roads reduces exposure for users (CARB, 2017).

## SOUND WALLS & VEGETATIVE BARRIERS (TOGETHER)

Studies show a 15-50% reduction in pollution concentrations within 500 feet of a highway in the presence of a well-designed sound wall (CARB, 2017). Vegetative barriers, such as a thick barrier of trees or bushes, can reduce pollution concentrations by up to 20%. Most significantly, the combined use of vegetation and sound walls can reduce vehicle pollution downwind by up to 60% (Bowker, 2007).

### EFFECTIVE



U.S. E.P. A 2016

Example of effective vegetative barriers.

### INEFFECTIVE



U.S. E.P. A 2016

Example of ineffective vegetative barriers.



## INCONCLUSIVE EVIDENCE FOR

### ■ Moving Building Air Inlets

Moving building air inlets: Research suggests placing air intakes on rooftops or on sides of buildings that do not face roads and other pollution sources can decrease pollutant concentrations indoors (BAAQMD, 2016). However, air modeling shows that pollution plumes often “flow” around buildings and moving air intakes is not an effective pollution-mitigation strategy (CARB, 2017).

### ■ Roadway Elevation

Depressed or elevated roadways result in higher pollutant mixing and dispersion, and therefore lower near-road concentrations of air pollutants. However, the impacts are not significant enough to warrant this strategy as a means to reduce pollution (CARB, 2017).

# Trucks

Zero emission technology & alternative fuel vehicles are a great alternative to high polluting diesel equipment, and have become more commonplace.

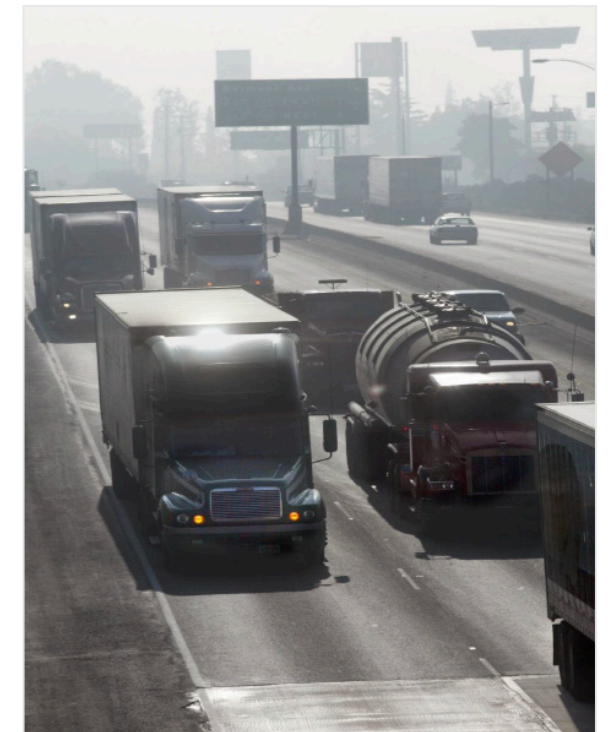
However, these technologies are expensive and will need the necessary infrastructure to continue to grow. During the CERP development process, you will likely have the opportunity to choose between investing in electric buses and trucks, natural gas technology, or a combination of the two.

## CARB'S TRUCKLAND BUS RULE

Requires large diesel trucks to install diesel particulate filters and replace older engines with a 2012 model by 2023

### ■ Potential Measures to Consider for CERPS

- **Strategy 1:** Target incentive funds for local owner/ operators
- **Strategy 2:** Change truck routes (see Heavily Trafficked Roads)
- **Strategy 3:** Invest in public charging stations
- **Strategy 4:** Replace public buses (school, transit) with all-electric versions.
- **Strategy 5:** Increase outreach to, and incentives for, clean commercial fleets at warehouses and other facilities that operate heavy-duty diesel trucks
- **Strategy 6:** Revise business licensing procedures to require current and proposed businesses to disclose truck visits per day (West Oakland, 2019).



CVAQ

Trucks are required to install diesel PM filters.



**FACILITY-BASED MOBILE SOURCE MEASURES  
(ALSO KNOWN AS INDIRECT SOURCE RULES)**

Facility-based rules seek to reduce emissions from mobile sources associated with facilities, like trucks visiting ports or warehouses, or construction equipment used in development projects. These rules are developed and implemented by local air districts, as opposed to most mobile source rules that are developed by the state.

**Example elements include:**

- Zero / near-zero emission on-site equipment
- Required Solar panels / electrical storage
- Required EV or alternative fueling infrastructure
- Voluntary fleet certification or facility requirement
- Mitigation fee
- Green delivery options (e.g., opt-in fee paid by consumers to fund cleaner fleets)



*EV fleets are alternative green delivery options.*

**CERP Language**

Develop Facility-Based Mobile Source Measures, including an Indirect Source Rule for warehouses (Wilmington, 2019).

# Passenger Vehicles

**DRIVE CLEAN IN THE SAN JOAQUIN**

The San Joaquin Valley Air District’s vehicle replacement program provides \$9,500 to low-moderate income residents of disadvantaged communities to replace their older vehicle with a newer cleaner vehicle.

**Shafter’s CERP**

- Provides an additional \$20,000 in incentives to replace 300 cars in Shafter with battery electric and hybrid versions ( making them basically free!)
- Provides \$850,000 to install up to 78 publically accessible electric vehicle charges in the community
- A CERP could add funding for home solar and EV chargers too!

**Car Technology**

On September 23rd of 2020 California Governor Newsom banned the sale of new gas-powered cars starting in 2035



*Hybrid vehicle connected to public charging station.*



*Public EV Charging stations can be found in many cities.*

# Mobile Source Enforcement

## MOBILE SOURCE RULE OR REGULATORY PROGRAM

### Heavy Duty Vehicle Inspection Program

Any heavy-duty vehicle traveling in California, including vehicles registered in other states and foreign countries, can be inspected for excessive smoke and tampering, and engine certification label compliance. Tests are performed by CARB inspection teams at border crossings, CHP weigh stations, fleet facilities, and randomly selected roadside locations.

### Idling

Idling for more than 5 minutes is illegal.

### Transport Refrigeration Units (TRU):

TRUs are designed to refrigerate or heat perishable goods. TRUs are the largest onsite diesel PM emission sources in distribution centers, followed by truck traffic. TRUs must meet labeling and in use performance standards. As of 2020, CARB is considering new requirements to transition TRU fleets to zero emission operations.

### Off - Road Construction Equipment

Construction equipment must meet certain emissions standards.

### Drayage Truck Rule

Heavy-Duty Vehicles that carry goods to or from a port or intermodal facility are required to be equipped with a 2007 or newer model year engine. By 2023, they must be equipped with a 2010 or newer model year engine.

### Truck and Bus Rule

Requires large diesel trucks to install diesel particulate filters or replace older engines with cleaner engine technology. Starting in 2020, the DMV will withhold vehicle registration for trucks that do not comply.

## MOBILE SOURCE RULE OR REGULATORY PROGRAM

### Advanced Clean Trucks

Truck manufacturers would be required to sell zero emission trucks as an increasing percentage of their California sales. By 2035, zero-emission trucks must be between 40-75% of total truck sales, depending on truck size.

## ENFORCEMENT COLLABORATION

CARB has the primary authority to enforce mobile source regulations, however, they have limited ability to survey and enforce all rules in every Californian city all the time. Municipalities which govern smaller regions within the state are sometimes better equipped to enforce rules locally.

CARB and another enforcement agency (local police, an air district, etc.) can enter into a Memorandum of Understanding (MOU) in which CARB authorizes the entity to investigate and enforce their mobile source rules.

### Example:

CARB and the San Diego Air District enter into an MOU regarding enforcement of select CARB regulations (2014).

## CHOOSE INSPECTION SITES

Choose sites in your community you want CARB to inspect. Sites could include roadside locations, sites near schools or homes, warehouses, construction sites, or a port.

## KEEP FINE MONEY LOCAL

Request money generated from local fines and other enforcement activities are kept locally for local projects. It could go into a local mitigation or community benefit fund.

## RULES RELATED TO PORTS

### All Truck Rules Apply

See Mobile Source rules and regulatory programs

## RULES RELATED TO PORTS

### ■ Ocean Going Vessels & Fuel

Vessels are required to switch to cleaner fuel within 24 nautical miles of the California coast.

### ■ Shore Power

An estimated one-third of vessel emissions occur while the ship is at berth (docking). By 2020, all container, cargo and tanker vessels visiting one of six terminals (number of ports expected to increase) would be required to achieve at least an 80 percent reduction in engine emissions at berth. Plugging into electrical power at the dock is expected to be the most common method for complying.

### ■ Cargo Handling Equipment

Existing regulation sets requirements for Tier 4 emission standards (reducing harmful emissions by about 85% – 90%) for cargo handling equipment at ports and rail yards. CARB staff are currently assessing the availability and performance of zeroemission technology as an alternative to all combustion-powered cargo equipment. Rule would be effective by 2026.

### ■ Commercial Harbor Craft

Existing regulation requires certain harbor craft to meet Tier 3 engine standards. CARB is evaluating the feasibility of Tier 4 engine technology and advanced retrofit control devices for tug boats and barges as part of the second edition of the rule.

### ■ Vessel Speed

CARB is evaluating the need to develop an ocean-going vessel speed reduction program.

## RULES RELATED TO PORTS

### ■ Fuel Standards

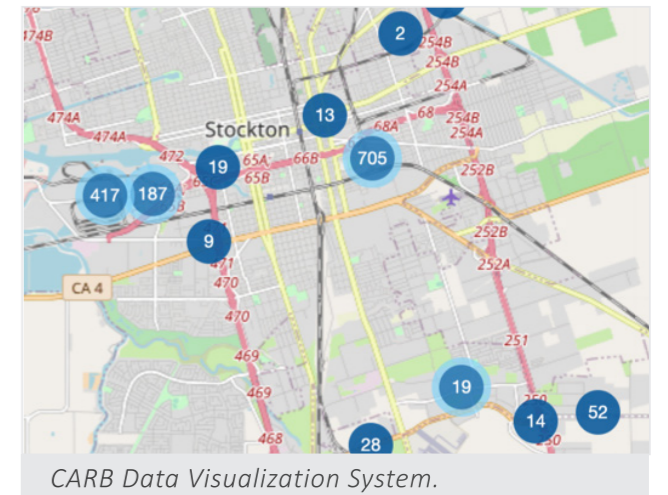
Ships tend to run on the dirtiest grade of diesel fuel available, known as bunker fuel, which is significantly dirtier than the diesel used in cars and trucks. Beginning in 2007, all ferries, tugboats, and other harbor craft in California were required to use lower-sulfur diesel (comparable to land-based diesel).

## RULES RELATED TO PORTS

### ■ California Air Resources Board

The California Air Resources Board's Enforcement Data Visualization System provides community members a user-friendly way to access CARB enforcement information.

See: [webmaps.arb.ca.gov/edvs/](http://webmaps.arb.ca.gov/edvs/)



## POINT OUT IDLING

Highlight locations for increased enforcement in parts of the community where truck idling is common.

## INCREASE INSPECTION FREQUENCY

Ask for CARB and the Air District's average inspection frequency of your community. Now increase it.

## PUBLIC NUISANCE LAWS

California's Public Nuisance law can be a great tool for residents to fight back against a nuisance, such as impacts from a toxic landfill or a meat rendering plant. A public nuisance is an activity or thing that affects the health, safety, or morals of a whole neighborhood or community, as opposed to a single victim.

California statute makes it a crime to create or maintain a public nuisance, or to fail to remove one.

### ■ Example:

**Example:** Residents in Avenal, CA have been complaining for years of smells and associated health impacts related to the medical waste, tires, paint, dead animals and other waste dumped at the local landfill. However, the local San Joaquin Valley Air District has not cited the landfill for public nuisance. The District claims they must receive three complaints in one day before a citation can be issued. Enforcement of public nuisance laws must be improved at this District for the law to better benefit residents.



# Mobile Source Enforcement CERP Examples

## ENHANCED ENFORCEMENT REFERRAL PROCESS

Develop an enhanced referral system so that issues identified beyond the scope of Air District's authority will be referred to the appropriate agency on the day of the investigation (West Oakland).

## UPDATE AIR DISTRICT COMPLAINT POLICY

Conduct a series of community workshops to solicit input from residents on Air District Complaint Policy. Commit to update the policy accordingly (West Oakland).

## PROVIDE ANNUAL REPORT ON ENFORCEMENT ACTIVITIES OF STATIONARY SOURCES

The Air District's Enforcement Division will provide an annual update to the Steering Committee summarizing the progress of the West Oakland Enforcement Strategy for the next 5 years (West Oakland).

## POST NO IDLING SIGNAGE

Staff will work with local entities to establish "no truck idling" signage in locations prioritized by the CSC (Carson, Long Beach).

## CONDUCT QUARTERLY IDLING SWEEPS

Conduct, at minimum, quarterly idling sweeps and focused inspections for one calendar year (Carson, Long Beach).

## INCREASE MOBILE SOURCE INSPECTIONS

### Steering Committee

CARB will collaborate with the Steering Committee to:

- Improve complaint reporting
- Conduct more focused inspections
- Report back during meetings to Steering Committee

CARB will meet annually with the Committee to prioritize enforcement measures and identify new locations for inspection (West Oakland).

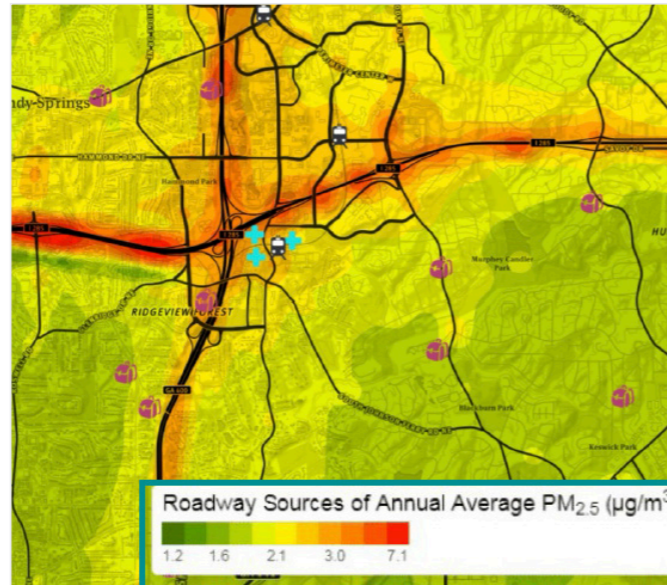
## BLOCK TRUCK TRAFFIC

Identify the appropriate agency (e.g., local Department of Transportation) to collaborate on assessing the feasibility of physical interventions to prevent truck traffic from entering residential neighborhoods (Wilmington).

# Heavy Trafficked Roads

## TRUCK ROUTES

In San Diego, rerouting heavy-duty trucks away from residential streets is estimated to have decreased diesel particulate matter by 99 percent near residences and schools (CARB, 2017). However, local scale traffic restrictions merely shift the problem to other roads. It is important to reroute trucks to non-residential roads that can handle the traffic, as well as ensure re-routing does not cause back-ups, delays, or significant detours, as these can increase overall emissions.



Atlanta Regional Commission, 2020

Map showing estimated levels of PM<sub>2.5</sub> pollution in the I-285/Ga. 400 interchange area.

## PROTECTIONS AND BUFFERS

See Mitigation page for more information.

## VEHICLE FLOW AND TRAFFIC SIGNAL MANAGEMENT

Mechanisms that reduce the amount of stop and go traffic can reduce vehicle emissions. Rakha et al. (2009) found a well-timed green wave (all vehicles only need to stop at the first traffic signal along a road section) can reduce nitrogen oxide emissions from vehicles by 50 percent, compared with the extreme case of all vehicles having to stop at all signals. The same is true for highways. A study of freeway traffic emissions determined that emissions from heavy-duty vehicles during road-work congestion were highest, followed by rush-hour congestion, when compared with periods of free-flowing traffic (Zhang, 2011).

## SPEED REDUCTION

The optimal speed for internal-combustion engine vehicles is 35-55 mph. Speed limit reductions on high-speed roadways can reduce tailpipe emission rates up to 30 percent (CARB, 2017). However, limiting speed using speed bumps, crosswalks, stop signs and other road surface designs results in a series of accelerations and decelerations, which increases vehicle emissions.

## INCENTIVES & ENFORCEMENT

See Mobile Source Enforcement for relevant California enforcement programs, and Trucks and Passenger Vehicles for incentive information.

## LOW EMISSION ZONES / ECO ZONES

Low Emission Zones are designated areas that deny access to vehicles that do not meet a certain emissions standard. Many such zones have been implemented across Europe and in Mexico. These cities have learned that it is necessary for the zones to encompass an entire population or city, as neighborhood-level eco-zones merely shift traffic patterns (increasing emissions elsewhere) without creating an incentive for cleaner vehicles.

## CONGESTION CHARGES

The Ecopass program in Milan, Italy is a traffic pollution charge designed to discourage the use of polluting vehicles inside central Milan. Clean vehicles do not need to pay a charge, while more polluting vehicles do. The road pricing scheme delivered a 15-20% reduction in pollution, a 20% reduction in traffic, and a 20% increase in public transportation use, including an increase in subscribers to a public bike sharing program in central Milan (Kodukula, 2013). Other congestion charges did not have the same positive effect though, proving this scheme lacks consistent findings to support its use (CARB, 2017). It is also important to consider the disparate impacts of congestion charges on low-income residents.

# Stationary Source CERP Examples

## EXAMPLE BARCT LANGUAGE

“Evaluate the technical feasibility and cost-effectiveness of BARCT to reduce [insert pollutant here] emissions from [insert pollution source here]. Establish BARCT limits. Adopt proposed rule and enforce requirements. Engage the CSC in the rulemaking process, with possible rule working group meetings in the community.”

### ■ CARB Coordinate Inspections of Stationary Sources with Air District

CARB will coordinate with Air District staff and will select, based on Steering Committee input, stationary sources for joint inspections (West Oakland).

### ■ Action 1:

#### Reduce Leaks from Oil Tankers (Course of Action (s))

- Use optical gas imaging technology, air monitoring, and other available emissions information to identify potential fugitive emission leaks from oil tankers and conduct targeted enforcement of Rule 1142- Marine Tank Vessel Operations
- Evaluate opportunity to amend South Coast AQMD Rule 1142 to require marine vessels to calibrate and maintain pressure relief devices and require recordkeeping, with the goal of minimizing fugitive emission leaks

#### Example of fence-line monitoring:

Install infrared methane monitoring systems at natural gas storage sites as a preventative action against leaks and explosions.



EPA, 2018

Close up of an SPod monitor, a solar-powered “drop in place” sensor that provides real-time data.

## EXAMPLE BARCT LANGUAGE

### ■ Action 2:

#### Conduct Refinery Air Measurements to Identify and Address VOC Leaks (Course of Action (s))

- Conduct periodic mobile air measurement surveys and FLIR gas imaging in and around refineries
- Utilize more efficient and effective leak detection systems known as advanced measurement techniques (Smart LDAR), such as Fourier transform infrared spectroscopy (FTIR), Ultraviolet Differential Optical Absorption Spectroscopy (UV-DOAS), Solar Occultation Flux(SOF) and infrared cameras, to identify, quantify, and locate VOC leaks in real time, allowing for faster repair in a manner that is less time consuming, labor intensive, and potentially more comprehensive than traditional LDAR

#### Example Health Risk Assessment Language:

“Air District will conduct expedited Health Risk Assessments for facilities X, Y, and Z, and report back to the Steering Committee within one year.”



EPA, 2009

Pressure relief valves (PRVs) and fusible plugs (over-pressure protection)--always leak test the outlet.

### ■ Increase Stationary Sources Inspections

The Enforcement Division will increase inspections in the community for the next 5 years by (1) inspecting all the permitted facilities and sources within a 2-year period, (2) Inspecting any unpermitted facilities and sources identified by the Steering Committee, and (3) Annually tracking and documenting the number of inspections conducted, date and location (West Oakland).

**Note:** AB 617 increased the penalty for a stationary source violation from \$1,000 to \$5,000 a day!



## EXAMPLE BARCT LANGUAGE

“Evaluate the technical feasibility and cost-effectiveness of BARCT to reduce [insert pollutant here] emissions from [insert pollution source here]. Establish BARCT limits. Adopt proposed rule and enforce requirements. Engage the CSC in the rulemaking process, with possible rule working group meetings in the community.”

### ■ Action 4

#### Intitiate rule development to amend rule 1178 - further reductions of VOC emissions from storage tanks at petroleum facilities

# Stationary Sources

## HEALTH RISK AND TECHNOLOGY ASSESMENTS

### ■ Best Available Control Technology

AB 617 requires the accelerated review and potential update of rules related to pollution controls for stationary sources (referred to as Best Available Control or Retrofit Control Technology, BACT or BARCT). Air Districts must host a public hearing to discuss the public health benefits, clean air benefits, and cost-effectiveness of certain controls prior to adopting the new rules. It is important for the Steering Committee to know the rules under evaluation, and demand regular updates. As CERP measures, the Steering Committee can also give the District deadlines for when the evaluations must be done, prioritize certain rule updates, mandate the number and type of public meetings, and mandate the state be involved in the assessments to increase oversight.

***Monitored facilities are more likely to reduce pollution.***

### ■ Health-Risk Assesment and Reduction Plans

The Air Toxics Hot Spots Act requires industrial sources to report the types and quantities of toxic air contaminants facilities routinely release into the air. The Act then requires relevant Air District to evaluate the health risks of these emissions, and, if the risk is too high, requires owners of the facilities to reduce their emissions. As CERP measures, the Steering Committee can prioritize and expedite the review of facilities of concern in the community. If this strategy is included, it is important to demand updates on the assessment, and give the District deadlines for when the evaluations must be done. The Committee can also mandate the state be involved in the assessments.

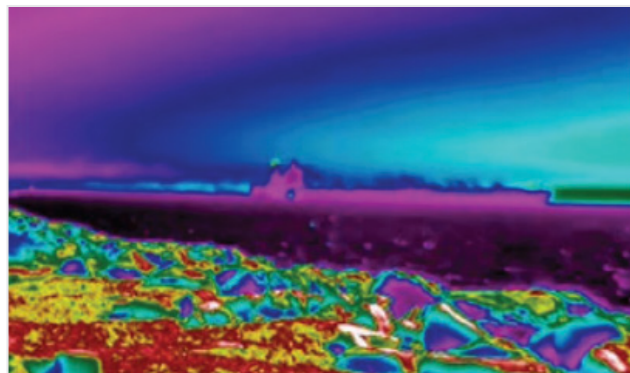
## INSPECTIONS AND MONITORING

### Increased & Enhanced Inspections

AB 617 requires the accelerated review and potential update of rules related to pollution controls for stationary sources (referred to as Best Available Control or Retrofit Control Technology, BACT or BARCT). Air Districts must host a public hearing to discuss the public health benefits, clean air benefits, and cost-effectiveness of certain controls prior to adopting the new rules. It is important for the Steering Committee to know the rules under evaluation, and demand regular updates. As CERP measures, the Steering Committee can also give the District deadlines for when the evaluations must be done, prioritize certain rule updates, mandate the number and type of public meetings, and mandate the state be involved in the assessments to increase oversight.

### Infrared Cameras

Inspectors can use specialized infrared cameras to view emissions of gases (including methane and VOCs) that would otherwise be invisible to the naked eye.



Wilmington CERP, 2019

*Infrared Cameras can detect gases not visible to the naked eye.*

### X-Ray Fluorescence (XRF):

Inspectors can use this handheld instrument to identify the types of chemicals that are on a surface or in a dust pile. For example, and XRF can be used to scan surfaces to identify which specific may be deposited in that location, and which locations that have the highest levels of those toxic metals.



Wilmington CERP, 2019

*XRF device used to identify chemicals and toxic metals.*

### H2S Analyzers

Inspectors can use this handheld instrument to measure hydrogen sulfide gas levels in the air. This information can be used to identify a potential source of rotten egg type odors.

## INSPECTIONS AND MONITORING

### Toxic Vapor Analyzers (TVA)

Inspectors can use TVAs to provide information about the level of certain gases in a specific area. This includes methane and volatile organic compounds (VOCs), which are emitted by and other types of sources.



*TVA device*

### Fenceline Monitoring

According to AB 617, Air Districts are authorized to require a stationary source to deploy a fence-line monitoring system.

# Ports

## PORT OF LA & LONG BEACH

### ■ Clean Truck Fund

The Ports plans to institute a fee on all trucks entering the ports in order to generate funding to transition port fleets to near-zero emissions in the short term and zero emissions by 2035. Zero emission and low-NOx trucks are exempt from the fee.

### ■ Truck-Only Lanes



*Truck only lanes help reduce emissions.*

A few states have experimented with freeway lanes wholly or partially devoted to trucks. By separating trucks from other traffic, truck-only lanes can improve traffic flow (which reduces emissions) and enhance safety. In the United States, this technique is used most often on short highway segments in dense urban areas that have a lot of truck traffic, or that link a port to the regional/national highway system.

### ■ Clean Trucks Program

Starting in October 2008, the Port of LA turned its port into a type of Low Emission Zone. It banned super-polluting pre-1989 trucks from entering their terminals followed by a series of more progressive bans. By 2012, all trucks serving the Port of L.A. had to meet 2007 federal emissions standards, resulting in an 80 percent reduction in truck emissions.

## PORT OF LONG BEACH

### ■ Off Peak Program

The Port of Long Beach instituted a Traffic Mitigation Fee designed to discourage busydaytime traffic and the ensuing backup of trucks into the surrounding neighborhoods. A flat fee is charged for all truck entries which goes to fund night time and weekendgate services. By extending operational hours, the Port spreads out truck visits and avoids major backups. The terminal operators also use an appointment system to spread truck trips out over the hours of operation.

## PORT OF LONG BEACH

### ■ Advanced Vehicle Electrification Project

Project will design, install and deploy electrical charging infrastructure, including electrical conduit, wires, switchboards, transformers and switchgears, to support battery-electric yard tractors and forklifts.

### ■ Electrical Vehicle Blueprint

The California Energy Commission awarded \$200,000 to the Port to identify an economical, demonstrated approach to EV planning that other California seaports can replicate.

### ■ Green Ship Incentive Program



EPA, 2022

*Reducing exposure to diesel exhaust at and near ports is important for public health and the environment.*

Provides financial incentives for ships with the newest engines. Vessels with main engines meeting Tier 2 standards will be eligible for an incentive of \$2,500 per ship call. For ships meeting Tier 3 standards, the incentive will increase to \$6,000 per ship call.

### ■ Green Flag Program

The Port of Long Beach's Green Flag Program rewards vessel operators with lower docking fees and environmental recognition if they observe a 12-knot speed limit within a 20-nautical-mile radius of the port for a 12-month period.

### ■ Clean Air Action Plan

Set the Port on the path to zero-emission goods movement, with the goals of transitioning terminal equipment and on-road trucks to zero emissions by 2030 and 2035, respectively.



## PORT OF LONG BEACH

### ■ CERP Strategies

- **Strategy 1** : Improve safety at street intersections near the port
- **Strategy 2** : Improve Truck Routing
- **Strategy 3** : Update the network of truck routes and truck prohibited streets
- **Strategy 4** : Improve Truck route signage
- **Strategy 5** : Conduct traffic enforcement spot-checks
- **Strategy 6** : Use urban design to promote use of truck routes
- **Strategy 7** : Improve training for issuing parking tickets
- **Strategy 8** : Change parking regulations
- **Strategy 9** : Consider increasing truck parking fines
- **Strategy 10** : Conduct targeted parking enforcement

## PORT OF OAKLAND

### ■ Sustainable Freight Advisory Committee

The Air District works with the City and Port of Oakland and other agency and local partners to create a Sustainable Freight Advisory Committee to provide recommendations to each agency's governing board or council. The Committee's scope includes: air quality issues, enhanced/increased enforcement of truck parking and idling, improved referral and follow-up to nuisance and odor complaints related to goods movement, improvements to the Port appointment system, charging infrastructure and rates, developing land-use restrictions in industrial areas, and consideration of video surveillance to enforce truck parking, route, and idling restrictions.

### ■ Seaport Air Quality Plan

The Port of Oakland committed to be a zero-emissions Seaport. Their Plan includes:

- Seaport Emissions Inventory
- Port-wide Air Monitoring
- Converting a portion of fleet to battery electric vehicles
- Incentivized vessel speed reduction
- Engineering feasibility study for container terminal electrification
- Expanding electrical charging infrastructure

### ■ Electrical Infrastructure Plan

The Port plans to work with the utilities to develop electrical infrastructure plans to support port electrification. This includes a Maritime Power Capacity Study for Terminal Electrification and a plan to remove barriers to adoption of zero-emission trucks, such as cost, land, and ownership of charging equipment.

### ■ Truck Management Plan

The West Oakland Truck Management Plan is the result of a joint planning effort undertaken by the Port of Oakland, City of Oakland and community residents. It is designed to reduce the effects of transport trucks on local streets, improve safety, reduce local diesel emissions, and improve quality of life for West Oakland residents.

## SHORE POWER

Using landside electrical power for ships at berth- to run lights, pumps, communications, refrigeration- rather than diesel-burning engines is a practice known as shore power, or cold ironing. This practice cuts air pollution from ships at berth by 100 percent (PM, NOx, SOx, GHGs) (CARB, 2018). However, there are emissions associated with the generation of electricity to provide power to the vessels. Concerning costs, infrastructure for shore power costs from \$1 million to \$5 million per berth (CARB, 2007). Equipment cost for vessels are between \$150 thousand to \$1 million (CARB, 2018).

### California Ports and Marine Terminals

By 2020, all vessels visiting one of six California terminals (see left) are required to achieve at least an 80 percent reduction in engine emissions while at berth. Plugging into electrical power at the dock is expected to be the most common method for complying. CARB is considering adding the Port of Stockton to the list of Ports that must comply with this rule.



## SHIP BONNETS

A US company developed and patented the Advanced Maritime Emission Control System, an Exhaust Intake Bonnet that connect a vessel's smokestack with an emissions treatment technology. The technology reduces ships' emissions while at berth by 80-85% (PM, NOx, SOx) (CARB, 2018). While a new technology, a few units are in use at the Port of Long Beach. CARB projects that one system may cost about \$8 million per dock, with zero costs for the ship (2018).

## SELECTIVE CATALYTIC REDUCTION (SCR)

SCR is a proven technology for reducing NOx emissions by up to 90 percent. SCR systems are installed on the engine exhaust system and the necessary equipment is fully housed on the vessel. The expected cost of installation is about half a million dollars.

### Ports SCR

Ports could require all ships to have SCR systems in order to dock or provide reduced dockage fees for cleaner vessels.

# Ocean Going Vessels

There are multiple ways to reduce emission from ocean-going vessels while at sea and while at berth. These include modifying a ship, modifying a dock, or modifying both. See below about the challenges and opportunities.

## CHALLENGES

Information derived from CARB, 2018

### Challenges to Cleaning up Ocean-Going Vessels:

- **Expensive:** The largest capacity container ships can cost up to \$150 million.
- **Long Lifespan:** Ships are meant to last about 25 years, meaning turnover will be slow.
- **Challenging to retrofit:** Because an ocean-going vessel is typically built around the large main engine, space is limited. This makes retrofits involving modifications, such as large control equipment or changes in piping, either impossible or extremely expensive.
- **Lack of Ship Consistency:** There are about 55,000 ocean-going vessels (OGVs) worldwide. The vast majority of OGVs travel internationally with routes that change depending on market demand and the cargo they are transporting. Because of this, OGVs that visit California ports will change from year to year.
- **Fueling Issues:** Fuel is expensive, and fuel type availability depends on where a ship docks. Fuel is the biggest operating expense. By some estimates, fuel is about 80 percent of operating costs. As a result, emission reduction technologies that involve more expensive fuels can have a significant impact on operating costs.
- **Fuel Disincentives:** In addition to costs and availability of fuels, the operator of the vessel is typically responsible for the fuel costs. Therefore, there is less incentive for the owner(s) of the vessel to pay for expensive retrofits.

## ENGINE RETROFITS



There are several retrofit control technologies that can be applied to ship engines to reduce emissions and improve performance. These include fuel injection, electronically controlled lubrication systems, electronic engine monitoring and control, ultra-slow-speed diesel engines, and engine de-rating. Policies to encourage vessel owners to use the latest technologies in vessels visiting California could reduce emissions and improve efficiency.

## RECYCLING HEAT ENERGY

Another technology application available for cargo ships is exhaust heat recovery. These systems pass hot exhaust gases through a steam generator, which powers electrical generators to generate electricity for shipboard use. Such a system can produce a 10-20 percent reduction in emissions. A heat recovery system could cost approximately \$10 million to install, with an estimated fuel savings of \$1.2 million a year. There would be a total net savings of \$4.6 million over the lifetime of the vessel.



# Trains & Railyards

## TRAINS

### Trains are difficult to regulate.

Local Air Districts and the California Air Resources Board lack the regulatory authority to impose rules on trains. Most emission reductions to date have come from federal rules on trains, and voluntary agreements between California and major train companies like Union Pacific and BNSF. California is in the process of petitioning the US E.P.A to strengthen existing emission standards for locomotives, and is creating new, creative programs to reduce emission from locomotive use (not regulating the trains themselves).



EPA, 2016  
Medium horsepower locomotive.

**Incentives to replace equipment can be a useful tool** to reduce emissions on railyards. However, locomotives are expensive and can take a big bite out of your budget. Switchers, which move trains within in a railyard, are smaller and less expensive. They also stay local, as opposed to cross-country trains. Therefore changing old switchers with cleaner versions can have a larger emissions benefit for a local community than changing the locomotives.

Switchers	Locomotives
<ul style="list-style-type: none"> <li>• Small, lower horsepower</li> <li>• Typically older</li> <li>• Generally stay local</li> <li>• Approximate cost per switcher: \$1 million</li> </ul>	<ul style="list-style-type: none"> <li>• Large, high horsepower</li> <li>• Travel throughout the country</li> <li>• Approximate cost per train: \$2.6 million</li> </ul>



### A study of health risks from rail yards ...

A study of health risks from rail yards in California found that shifting to cleaner trucks and cleaner switchers was a “key factor” in reducing cancer risks by 75 percent to residents near the BNSF San Bernardino rail yard between 2005 and 2010 (CARB, 2011).

## TRAINS

### Almost all equipment on railyard can be electrified.

This includes cargo handling equipment, drayage trucks, forklifts, and transport refrigeration units (TRUs). Incentives and regulations that promote electrification, charging infrastructure and on-site solar energy could be a great tool for reducing emissions on the railyard. A study of health risks from rail yards in California found that shifting to cleaner trucks and cleaner switchers was a “key factor” in reducing cancer risks by 75 percent to residents near the BNSF San Bernardino rail yard between 2005 and 2010 (CARB, 2011).

### Electrified freight lines are commonly found in Europe and in some portions of the U.S.

- The Black Mesa and Lake Powell Railroad in Arizona is electrified along its entire 78-mile length;
- Electric freight railways operate in Texas and Iowa;
- Passenger trains traveling to New York City are required to switch from diesel to electric power in the tunnels entering Manhattan and leading to Grand Central Terminal and Penn Station;
- More than 70 percent of Russia’s freight rail network is electrified.

## OTHER EMISSION REDUCTION & MITIGATION IDEAS

### Train Bonnets

(overhead ventilation hood that fits atop idle locomotives in rail yards to collect and filter emissions)

### Limit Idling

(locomotives can be equipped with automatic idling controls, auxiliary engines or batteries, or be connected to electric power to keep onboard technology and keep the engine coolant and oil warm while the main engine is off.)

### Enhance efficiency of rail yard operations

(Improving logistics and scheduling can reduce the number of trucks and trains waiting at a rail yard, and moving maintenance and fueling stations far away from residential areas. After demands by local residents, Union Pacific relocated a truck entry gate from near the local high school to the other side of the facility, reducing the students’ exposure to pollution from the trucks serving the facility)

# Education, Health & Community

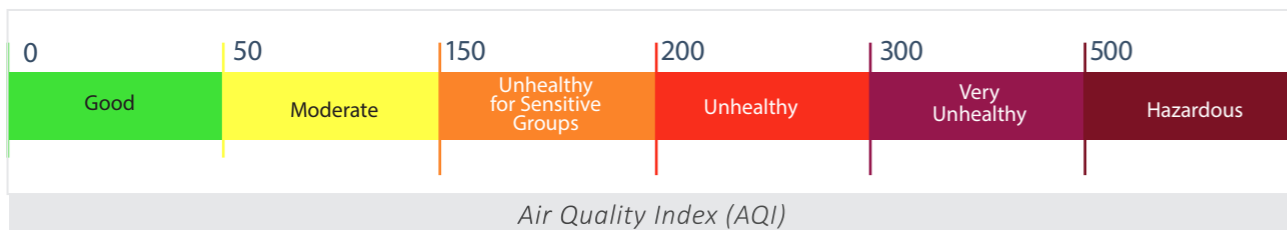
## AIR QUALITY ALERT SYSTEMS

When people know the air quality is bad, and know the impact it has on their health, people can take necessary precautions to protect themselves.

A study in Toronto looked at the connection between air quality alerts and hospital visits. They found that when alerts were called, there was a corresponding reduction in emergency room visits for asthma, and fewer hospital admissions for COPD and asthma. There was no connection with cardiovascular disease impacts, potentially because people are often unaware of the fact that particle pollution negatively impacts our heart (Samet, 2018).

In some countries, an air quality alert can lead to emergent measures to reduce emissions and limit exposure. For instance in Beijing, the most severe air pollution episodes lead to a red alert with mandatory provisions, including suspending primary and middle schools, banning use of specific vehicles, stopping some outdoor construction work, closing predesignated industrial facilities, and banning fireworks (The Lancet, 2018). In the same fashion, Mullins and Bharadwaj showed that an air quality alert system reduced pollution by 20% and reduced mortality by 6% among the elderly in Santiago, Chile (2014).

However, air quality alerts need to be tailored to the communications needs of the community in order to be effective. In a study of residents from Portland and Houston, one-third of study participants were aware of air quality advisories but only ~10–15% claimed to have changed activities during such an episode. The perception of poor air quality, which was not related to PM<sub>2.5</sub> or ozone measurements or the advisories, was what dictated action. The study concluded that public health messages not reaching the public during potentially hazardous weather and air quality conditions (Semenza, et al 2008).



## ASTHMA MANAGEMENT PLANS

An asthma management plan is a written plan that one can create with a doctor to help control a child's asthma. Schools and daycares should have asthma management plans in place for the children in their care.

## MEDICAL ACCESS

In the West Oakland CERP, the City and County committed to expand existing programs such as (1) free health check-ups for infants through teens, (2) Asthma Management at schools, (3) correcting inequity in health outcomes for children; (4) reducing premature mortality of men and boys in Alameda County; and (5) developing and implementing a five-year county plan to improve health and achieve health equity.

## AIR POLLUTION HEALTH IMPACTS RESEARCH

Baseline health information is needed in order to assess the impact of the CERP over time. Also, health studies could help identify certain pollution problems in a neighborhood.

## CAPACITY BUILDING FOR HEALTHCARE PROVIDERS

Improving health practitioners understanding of air pollution- its sources, effects, and strategies to mitigate the health impacts- would better improve patient care.

## UNCONSCIOUS BIAS WORKSHOPS

Unconscious biases affect our perceptions, interactions and decision-making processes and can often lead to detrimental policies and practices toward minority and disadvantaged groups. Unconscious Bias Workshops for government employees or the entire Steering Committee to teach strategies to recognize and minimize unconscious bias could lead to better communication and understanding among all stakeholders, and better policies as a result!

## GREEN BUSINESS STRATEGIC PLAN

The City of Oakland is working to develop a Green Business Strategic Plan to attract, retain, and support innovative green companies in West Oakland. This effort includes the development of criteria for green business certification for new and existing businesses (West Oakland CERP, 2019).

# Healthy Homes

(see air filtration in Mitigation as well)

## RESIDENTIAL SOLAR

### Existing programs in California:

- Disadvantaged Community Single Family Solar Homes Program:** Provides up-front financial incentives for the installation of rooftop solar for income-qualified owners of single family homes in disadvantaged communities. The program is administered by GRID Alternatives and has an annual budget of \$10 million from 2019 through 2030.
- Solar on Multifamily Affordable Housing Program:** Provides financial incentives for installing solar photovoltaic (PV) energy systems on multifamily affordable housing in disadvantaged communities. The program has \$100 million annually and has a goal of installing 300 megawatts of generating capacity by 2030. The program is administered by the SOMAH Nonprofit Administrative Partnership.
- Disadvantaged Community Green Tariff Program:** Procures 100 percent renewable energy on behalf of customers while providing them a 20 percent discount on their otherwise applicable utility rate. The 20 percent discount can be applied as a discount to CARE rates. The DAC-GT program will begin in 2020 and will be run through the utility company (Pacific Gas and Electric).
- Community Solar Green Tariff Program:** Procures 100 percent renewable energy on behalf of the customers while providing a 20 percent rate reductions. However, under this program the projects providing the solar energy must be sited within a top 25 percent Disadvantaged Community and the subscribers must reside within a top 25 percent DAC and live within 5 miles of the solar project. The program is approved to serve up to 41 megawatts of power and serve 6,800 customers. In order to enroll in the program communities must contact their utility (Pacific Gas and Electric).

## RESIDENTIAL SOLAR

### CERP Strategy

- Strategy 1:** The District will help to coordinate meetings with entities that offer incentives for solar photovoltaic (PV) installation (Fresno, 2019).
- Strategy 2:** The district will commit up to \$1.5 million in District funding to incentivize the installation of residential solar and zero and near-zero emission appliances by committing a 10% match to state funding (Saftner, 2019).



*Incentives for solar installations may be offered to low income communities.*

CERP measures can address the same issue, but some can go further in solving the problem.

## WEATHERIZATION

Weatherization of a home can reduce the penetration of outside pollutants into the home and decrease the overall energy demand of the house. Indoor air pollution can build up though, so it's important to pair weatherization activities with energy-efficient appliance upgrades to ensure clean indoor air. Coupled all of this with solar energy, the decreased energy demands can mean lower energy bills and decreased emissions from natural gas.

### Weatherization activities can include:

- Test, repair, or replace refrigerator, water heater, heating/cooling systems, and gas cooking appliances;
- Increase insulation of walls, ceilings, floors, & attics;
- Weather-stripping, caulking all doors and windows;
- Water heater blankets;
- Ensure carbon monoxide detectors are present
- Test and improve air filtration systems in the home

### Potential CERP Strategy

District will partner with local agencies to commit \$2 million to cover 100% of the cost of weatherization improvements in low-income households that have a young child, senior citizen or individual with a heart or lung disease.



# Safe Schools

## EDUCATION

Education is a powerful tool to build the capacity of schools, students and parents to engage in and respond to air quality issues. For example, the San Joaquin Valley Healthy Air Living (HALS) program empowers participating schools to make informed decisions about outdoor activities based on real-time air quality conditions. School staff sign up for automated notifications when air quality becomes harmful, and receive recommendations regarding the modification or cancellation of outdoor activities. The program also includes access to resources like anti-idling signs, air quality widgets for school websites, bilingual informational materials, and bilingual educational speakers.

## AIR MONITORING

Schools may choose to get air quality information from government-operated monitoring stations, however, these stations can be many miles away. Installing a monitor at the school can provide accurate, real-time air quality information for the school and surrounding residences, and engage students in better understanding their environment.

## AIR FILTRATION

Air filtration reduces the concentration of particulate pollution indoors. Older HVAC systems and basic air filtration used in some schools only remove a small fraction of the very fine particles. More efficient HVAC air filters and standalone air cleaners can be important tools for creating healthier air for children.

### ■ CERP Strategy

Provide up to \$250,000 in incentive funding for 10 schools to retrofit schools with advanced HVAC filtration systems. For schools with older HVAC systems that cannot be retrofitted, they may receive up to 100% of the cost of approved standalone air cleaner units (Shafter, 2019).

## WEATHERIZATION

Weatherization of schools has the same positive effects as it does for homes (see Healthy Homes).

## ANTI - IDLING

Limiting car and school bus idling by instituting anti-idling or idle-reduction policies can have positive impacts on air quality for children.

## ELECTRIC SCHOOL BUSES

Replacing older school buses is important to reduce children's exposure to diesel emissions. New, zero-emission battery electric buses are significantly cleaner, and cost less to run.

### ■ CERP Strategy

Provide \$6,400,000 to cover 100% of the cost to replace 16 diesel school buses that operate within the community with zero- emission battery-electric school buses at \$400,000 each (Fresno, 2019).

Don't forget funding for electric charging stations!

## ROADSIDE BARRIERS

Barriers between schools and heavily trafficked roads can help protect kids from air pollution. For vegetative barriers, the US EPA suggests the use of an evergreen species with mature, dense greenery located downwind and close to the roadway. Sound walls are recommended when the school is near a highway, but nowhere else, as the walls create significant barriers through the community (2015).

### ■ CERP Strategy

As part of the Safe Routes to Schools Program in West Oakland, the City closes streets next to public schools twice a day to keep cars and trucks away from arriving and departing students (West Oakland CERP, 2019).

## PEDESTRIAN AND BICYCLE INFRASTRUCTURE IMPROVEMENTS

Pedestrian and bicycle paths that lead from residential areas to the school can reduce traffic congestion and improve student health. For instance, the addition of walking and biking paths at Roosevelt Middle School in Eugene, Oregon reduced traffic volumes near the school by 24% (Safe Routes, 2012). However, you must ensure these paths are along routes with lower traffic volumes in order to keep kids safe and reduce pollution exposure. Safety, lighting, access, and maintenance requirements should be considered.

# Urban Greening & Cooling

## WHICH TREES?

Trees that are best suited to trapping particulate matter including Pine, Cypress, Hybrid Popular, and Redwoods. Large healthy trees greater than 77 cm in diameter remove approximately 70 times more air pollution annually than small healthy trees less than 8 cm in diameter.

### Trees offer a wealth of benefits:

- They can remove pollution by intercepting particulate matter on plant surfaces and absorbing gaseous pollutants;
- They emit oxygen
- Trees offer improved psychological and physical well-being
- They can cool ambient temperature, provide shade, and improve energy efficiency of buildings
- Trees reduce CO<sub>2</sub>;
- Trees limit erosion and reduce rainwater
- Trees improved neighborhood aesthetic and increase property values

## RESIDENTIAL TREE PROGRAM

A voluntary yard tree program, where a city or utility company provides residents tree saplings and the residents maintain them, can increase urban canopy while reducing energy demand and sharing lifetime costs.

### CERP Strategy

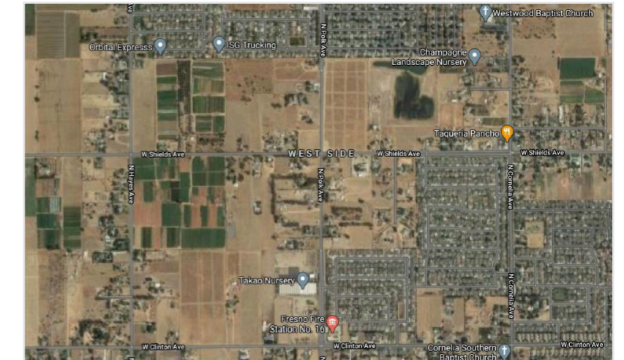
The District commits \$5000 to a study by San Joaquin Green and free Foundation of Kern to identify planting locations, and maintenance and irrigation needs in the community to support existing and add new trees (Shafter).

## RAIL TO TRAIL

Trees that are best suited to trapping particulate matter including Pine, Cypress, Hybrid Popular, and Redwoods. Large healthy trees greater than 77 cm in diameter remove approximately 70 times more air pollution annually than small healthy trees less than 8 cm in diameter.



Google Maps, 2020  
*Thick, intentional (11) tree cover in the Fresno neighborhood of Fig Garden.*



Google Maps, 2020  
*Sparse tree cover on the West Side of Fresno*

In 2000, the Fig Garden Homeowner Association Beautification Ordinances were instated to help preserve trees and enforce some minimum standards of property maintenance.

## “COOL” PAVEMENTS



Bioneighbors Sustainable Homes LLC  
*James Peterson of the roofing company BioNeighbors applies a coating of Acrymax to the roof of a row home in Philadelphia*

Heat transfer from pavements, which cover about one-third of a typical U.S. city, can increase local temperatures. This effect is known as the “urban heat island effect”. Increased temperatures can then increase ozone pollution. Cool pavements, which reflect rather than absorb the sun’s rays, are intended to mitigate urban heat islands, however, recent evidence shows they can increase the body temperature of those walking on the roads and increase glare (Bloomberg, 2019). “Cool pavements” may be best suited for rooftops and parking lots, and tree- shade for streets with pedestrians.

# Active & Public Transportation

## ACTIVE TRANSPORTATION

Active Transportation including walking and biking translates to less vehicle miles traveled. Passenger vehicles are a large source of climate-warming greenhouse gases, but not a significant source of directly emitted particulate or toxic pollution. Active transportation improvements are thus climatesmart strategies that can improve the livability of a community, but not an effective pollution-reduction measure. It is important to note, poorly placed bike lanes on heavily trafficked roads can put bikers and breathers in danger due to increased exposure to pollution. Bike lanes placed along less-traveled roadways that connect desirable locations are the best option for safe, enjoyable trips that are most likely to bring people out of their cars and protect those without vehicles.

### CERP Strategy

- Provide \$1,000,000 for the development and construction of Class 1, Class 2, and Class 3 bicycle paths, lane striping, and routes.
- Projects proposed under this measure must be consistent with the Approved 2005 City of Shafter General Plan and Bicycle Plan or any related planning efforts (Shafter, 2019).

## BIKE & CAR SHARING

A bike or car share system is a network of shared bicycles or cars available for short-term use. For example, with a bike share program, you can check out a bicycle or scooter from locations around the city, ride to your destination, and then leave the bicycle for someone else to use. Benefits include reduced emissions, convenient connections to transit, and improved health through active transportation. Read above for an example of a car-share program. Other ideas include e-bike and e-scooter sharing and placing secure bicycle lockers around the community.

### CERP Strategy

Provide \$500,000 for the electric vehicles charging infrastructure and administrative funding needed for a partnering car share provider to launch a car share program in the Shafter community (Shafter 2019).

## PUBLIC TRANSPORTATION

Free or reduced-fare transit passes have the potential to increase transit ridership, enhance the mobility of disadvantaged groups, and reduce the environmental footprint of transportation. Under the right conditions, these programs can also reduce traffic congestion and motor vehicle use.

### CERP Strategy

Incentive program to fund a partner group to launch a bike share program in the community (Stockton, 2020).



#### Program Highlight: Green Raiteros



Photo by (Myung J. Chun / Los Angeles Times)

*Green Raiteros was started by Rey Leon, founder and executive director of The Latino Environmental Advancement & Policy Institute*

Green Raiteros is a rideshare program in Huron, CA that builds on an indigenous ride-sharing practice that has existed for many decades in the San Joaquin Valley. The program connects predominantly Latino and agricultural families in central California to Fresno for critical services, increasing access to public health, education, and economic opportunities. The on-demand transportation utilizes two electric vehicles and volunteer drivers. Riders can book a Raiteros

via phone, by visiting the Green Raiteros office, or by using an app. Green Raiteros drivers are provided insurance via the program and are reimbursed for miles driven. Charging stations to support the electric cars were installed in Fresno and Huron by EVgo. Green Raiteros is a rideshare program in Huron, CA that builds on an indigenous ride-sharing practice that has existed for many decades in the San Joaquin Valley. The program connects predominantly Latino and agricultural families in central California to Fresno for critical services, increasing access to public health, education, and economic opportunities. The on-demand transportation utilizes two electric vehicles and volunteer drivers. Riders can book a Raiteros via phone, by visiting the Green Raiteros office, or by using an app. Green Raiteros drivers are provided insurance via the program and are reimbursed for miles driven. Charging stations to support the electric cars were installed in Fresno and Huron by EVgo.



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See the rest at: <https://ww2.arb.ca.gov/capp-communities>

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