The Path to Clean Air

Richmond, North Richmond & San Pablo

Community Emissions Reduction Plan

April 2024

RICHMOND - NORTH RICHMOND - SAN PABLO COMMUNITY PATH TO CLEAN AIR

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

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Members of the Community Steering Committee

The members of the Community Steering Committee (CSC) are people who work, live, or grew up in the Path to Clean Air (PTCA) area. They represent various neighborhoods, occupations, public agencies, and industries. CSC members have spent time and energy on developing the PTCA Plan in collaboration with the Air District, CARB, local jurisdictions, and partner agencies and organizations.

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** Dr. Henry Clark was a longtime Richmond resident and an inspirational member of the Community Steering Committee until his death on June 2, 2022*

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EXECUTIVE SUMMARY

In 2017, the California Legislature passed a law (Assembly Bill 617) requiring the state's air districts to partner with communities highly impacted by air pollution to create community-based emissions reduction plans. Since 2018 the Air District has partnered with community members from the Richmond, North Richmond, San Pablo community - otherwise referred to as the Path to Clean Air (PTCA) area. The area's approximately 160,000 residents live, work and spend their time near many air pollution sources, which include oil refining, and other large industrial businesses, freeways, rail yards, a marine port, and many smaller sources. The PTCA was nominated by the Air District and selected by California Air Resources Board (CARB) to develop a Community Air Monitoring Plan in 2018, which was completed in 2021. In 2021 the PTCA area was nominated by the Air District and selected by CARB to develop a Community Emissions Reduction Plan. The resulting PTCA Plan charts a path towards equal partnership in the work to improve local air quality.

The PTCA Community Steering Committee (CSC), representative of members who work, live or grew up in the PTCA area, directed the plan development, while the Air District provided technical and logistical support. Early work between the CSC and the Air District centered on relationship building and balancing power dynamics. For example, CSC norms were established in certain subcommittees to prioritize community voice in a "progressive stack" format wherein people from marginalized groups are selected to speak first at meetings. Similarly, the CSC's consensus process empowered the community to drive decision making by designating local industry representatives and city and government representatives as non-voting members. In 2023, the CSC established a process to revise the Charter as part of the transition from a governing CSC to a community led CSC. The CSC's Governance Ad Hoc changed the Charter to further clarify the statement of purpose, membership makeup and voting requirements, roles and responsibilities, meeting procedures, materials, and participation.

In parallel with relationship building, the CSC and Air District began developing a common understanding of the area's air quality issues. A list of community concerns was developed with CSC input based on a variety of public engagement efforts, from traditional town hall meetings to use of community organizing and Social Pinpoint mapping in which community-members provided information on location-specific community assets and challenges. The community's influence during the assessment phase resulted in successfully leveraging existing social networks to collect over 500 comments documenting the impact of poor air quality in which health consequences from air pollution and physical reactions to air pollution were the most commonly expressed concerns.

In addition to community-identified issues and challenges, the PTCA Plan is based on a comprehensive technical assessment. The technical assessment categorizes air pollution contributions - in terms of both emissions and exposure - for each of the area's main sources such as fuel refining and other industrial activities; cargo ships, rail operations, and construction equipment; goods movement and vehicle traffic; and fireplaces and gas appliances. Findings from the assessment reveal that some of the worst pollution emitters currently operate with Air District permits. The technical assessment quantifies and identifies pollutants, such as fine particulate matter, and attributes pollutants to each of the main sources; it also includes modeled exposure contributions. It is with this detailed assessment that specific strategies were developed to target the most egregious pollution sources, including the Chevron Richmond

Refinery, as well as strategies to target specific pollutants, such as fine particulate matter, which is especially dangerous due to its potential to contribute to cancer, heart attack, stroke, and other respiratory diseases.

The Community Description chapter and appendix document the racial, ethnic and socio-economic composition of the area and provides a stark analysis of the health outcomes of PTCA residents. The PTCA residents are predominantly Latinx, Asian, and Black/African American. Despite a rich history of activism against fossil fuel operations as well as air pollution regulatory initiatives, disparate health outcomes persist. Low-income and Black/African American residents experience higher rates of emergency room visits in comparison to non-White residents, a higher risk of dying from strokes and heart disease, and higher rates of asthma among children and Black residents.

It is within the context of severe pollution burden and associated health disparities that the CSC created PTCA Plan goals to develop more stringent air pollution policies that advance social healing and restoration, to lower the community's disproportionate exposure to air pollution by reducing toxic emissions, to empower the community and to hold government accountable to enforce regulations more effectively on high-polluting industries.

The PTCA Plan was co-written with the CSC members.

Air District staff and CSC members spent several months writing strategies that seek to achieve the community's desired transformation. The PTCA Plan includes a range of strategies, from practical procedural changes to highly ambitious and transformative actions. Rather than limit the expansiveness of strategies, actions include discussion of likely political, fiscal, and legal limitations and potential obstacles, in order to balance expectations. In this way, the PTCA Plan introduces an assertive program of strategies and actions to fundamentally address long standing environmental injustices. The strategies involve moving towards a "just transition" to a renewable energy economy and holding the fuel refining industry accountable. Other far-reaching strategies detailed in the plan include eliminating health disparities by expanding health care to low-income PTCA residents and supporting guaranteed income programs. Many other visionary strategies are contained in the PTCA Plan and it is imperative that the Air District, the CSC, and the multitude of partner agencies responsible for implementation convene and work with the business community to ensure enduring change.

Chapter 1: Introduction

In 2017, the California Legislature passed AB617, requiring the state's air districts engage in a collaborative process between communities highly impacted by air pollution emissions and exposure to create a Community Emissions Reduction Plan that presents a list of strategies to reduce emissions and exposure in these communities. The Richmond-North Richmond-San Pablo community, also known as the Path to Clean Air (PTCA) area, is among these AB617 communities. It comprises the cities of Richmond and San Pablo, and the following unincorporated areas in Contra Costa County: Bay View, East Richmond Heights, Rollingwood, Tara Hills, Montalvin Manor, North Richmond, and El Sobrante.

Under direction and resourcing from the California Air Resources Board (CARB), the Bay Area Air Quality Management District (Air District), along with local community leaders from the aforementioned communities, have worked to develop the PTCA Community Emissions Reduction Plan, also referred to as the PTCA Plan. The PTCA Plan includes strategies to reduce harmful air pollution emissions and exposure that impacts people where they live, work, and play. This process has strived to work alongside the PTCA communities impacted by high cumulative pollution exposure burden. In return, the PTCA communities are empowered to refocus the Air District on local impacts and solutions, led by community priorities.

The Plan lays out a series of measures to be implemented over the next ten years by state, regional, and local agencies to reduce pollution in the community. Throughout several years in the planning phase, a steering committee made up of residents, industry, workers, advocates, and local agencies have met monthly to vet the creation and structure of the PTCA Plan, along with establishing governance structures that will serve for the implementation phase. The PTCA Plan was community driven, written by and designed to serve those in the PTCA community for years to come. The PTCA Plan has many different authors to authentically reflect community interests. The Air District will continue to build and maintain relationships with the community during Plan implementation. Likewise, the Air District will convene and support agency stakeholders in implementing the strategies in the Plan.

Path to Clean Air Plan Overview

Chapter 1 summarizes the purpose and scope of the Plan, including history of AB617 legislation, its implementation through the CARB, and how resources are funneled to the PTCA Plan.

Chapter 2 is information about all Community Steering Committee (CSC) members who were involved in the creation of the Plan, their roles, and their affiliations.

Chapter 3 is the PTCA Plan vision, principles and goals. This framework provides guidance in the form of core values CSC members chose to incorporate in the creation and implementation of the PTCA Plan.

Chapter 4 describes the PTCA community, including the long history of sources generating pollution that impacts the community, such as industrial, port-related, transportation, and other sources.

Chapter 5 describes the pollutants and impacts that are the focus of the Plan; fine particulate matter (PM2.5), diesel particulate matter, cancer risk, and chronic health impacts from toxic air

contaminants. It also goes into exposure assessments, demonstrating which parts of the PTCA area are most impacted.

Chapter 6 describes enforcement processes by the Air District and CARB in the PTCA Plan, along with proposed goals and strategies for each agency to enhance these efforts.

Chapter 7 describes the strategies proposed by the CSC to carry out the goals of the Plan. Action will be needed from many entities, including CARB, Air District, the City of Richmond, City of San Pablo, and others. Proposed actions cover five community concern thematic areas: Commercial & Industrial, Marine & Rail, Public Health and Reducing Exposure, Vehicles and Trucks, Streets and Freeways, Logistics and Warehouses ("Mobile"), and Fuel Refining. In addition, there are Cross-Cutting issues that span more than one topic area: Compliance & Enforcement, Land use, Properly Resource CERP Implementation, and Urban Greening. This chapter includes the Strategies needed to carry out Goals, referencing detailed information that can be found within appendices.

Chapter 8 is an overview of the California Air Resources Board (CARB) Statewide Actions, and how they relate to the PTCA community.

Chapter 9 describes additional steps and structures that will be carried out during the implementation phase of the Plan, along with methods to track implementation of this Plan's strategies.

Appendices to the Plan include all of the Actions related to Strategies, the detailed technical analysis, enforcement details, community outreach information, and other materials.

Chapter 2: Community Steering Committee

Overview of the CSC Members and their Affiliations

The Community Steering Committee (CSC) is a diverse group of community members who live and/or work in the PTCA area, and includes high school students, college and university students, health-care and government professionals, educators, activists, architecture and planning professionals; retired elders, people who are relatively new to the area and people who have lived in the area their entire lives; and people who have personally experienced or are closely connected to people with personal experience of health disparities related to poor air quality.

In 2021, community members were selected through an Air District led application process that included completing a Conflict of Interest form. To have an adequately diverse cross-section of the population with opportunities for all to be engaged in the process, the Air District decided that the CSC would have a minimum of 27 and a maximum of 31 members, with two non-voting members who represent local business and industrial companies, including Chevron. In 2023, the CSC moved to a community led governing structure, with designated city and government representatives also considered non-voting members and the two non-voting members representing business and industrial companies expanded to include trade unions.

Starting in April of 2021, the CSC scheduled monthly steering committee meetings that were open to the public. The CSC operated under the Brown Act from April 2021 through March 2023, which made community building a challenge. However, one-on-one conversations between CSC members were held in the first few months, laying a foundation of collaboration and trust. Monthly meetings often included presentations by the Air District to help inform the CSC members of technical issues related to air quality monitoring, permitting, and enforcement. Eventually, with the expiration of AB 2449, the CSC decided at the February 2023 CSC meeting to request transitioning to a community-governed governance structure that allowed the continuation of virtual meetings, and allowed for more community building without the formalities and rigidity that compliance with the Brown Act requires. The transition from a Brown Act CSC to a community-governed CSC became official with a vote at the April 5, 2023, Air District Board of Directors meeting.

To keep momentum going between monthly meetings, the CSC formed ad hoc working groups of small groups of CSC member volunteers who focused on specific issues and met more frequently than monthly CSC meetings. A list of each ad hoc, with short descriptions of their members and purpose, are on the following pages.

Ad Hoc Working Groups

Vision and Principles Ad Hoc

The goal for the Vision and Principles Ad Hoc was to take the collective values and agreements of the CSC and draft the Vision and Principles for the group. It was one of the first action items for the CSC and helped guide the CSC as it moved forward in designing the PTCA Plan, and it is

intended to continue to be a reference during the implementation process of the PTCA Plan. The Ad Hoc grouped the CSC values into five principles: Collaborative and Involved Stakeholders, Community and Equity-Centered, Understandable Information and Data-Driven, Led by Strategy Goals and Prioritizes Effective Strategies, and Follow a Transparent Process and Commit to Restorative Investments.

The Vision and Principles Ad Hoc consisted of six committee members: Nancy Aguirre, Y'Anad Burrell, Philip Mitchell, Kevin G. Ruano Hernandez, David Severy, and Vernon Whitmore.

Technical Assessment Ad Hoc

The goals of the Technical Assessment Ad Hoc were to: build the expertise of the committee members to engage in discussion and inform decisions; conduct a thorough analysis of air pollution data and determine community concerns and the targets that will have the greatest impact to support the key issues statements; and promote clear and effective communication and education by developing meaningful descriptions of air quality issues.

The Technical Assessment Ad Hoc consisted of six committee members: Nancy Aguirre, Marisol Cantú, Luz Gomez, Hakim Johnson, Jeff Kilbreth, Jessica Range, and Kevin G. Ruano Hernandez.

Community Description Ad Hoc

The goal of the Community Description Ad Hoc was to tell the story of the PTCA area; to clearly explain why the CSC was created; and the health and air pollution problems of the PTCA area that the CSC is trying to solve. The Ad Hoc described the demographics and history of the community by incorporating various sources, including the Census, CalEnviroscreen, local policy, and community perspectives from the Town Hall.

The Community Description Ad Hoc consisted of five committee members: Nancy Aguirre, Jeffrey Kilbreth, Kevin G. Ruano Hernandez, Heidi Swillinger, and Vernon Whitmore.

Governance Ad Hoc

The Governance Ad Hoc arose from the need to transition from being an Air District Board of Directors appointed committee to a community governed committee. This transition was timed with the expiration of AB 2449, which allowed Brown Act committees to meet virtually during the Pandemic. The Governance Ad Hoc led an update to the CSC charter in 2023, will continue to make charter revisions as necessary, and is responsible for recruiting and recommending new CSC members to the full CSC for confirmation.

The Governance Ad Hoc consisted of five committee members: Alfredo Rafael Angulo-Castro, Heidi Swillinger, Jessica Range, Marisol Cantú, and Nancy Aguirre.

Problems to Solutions (P2S) Ad Hoc

The Problems to Solutions Ad Hoc began the research and writing process to draft solutions addressing the six areas of community concern and helped ensure a community-driven process.

The Problems to Solutions Ad Hoc including: Nancy Aguirre, Alfredo Rafael Angulo-Castro, Francisco Avila, Marisol Cantú, Jeff Kilbreth, Omoniyi (Niyi) Omotoso, Dave Severy, and Heidi Swillinger.

Problem to Solutions Ad Hoc Writing Teams

The Problems to Solutions Ad Hoc consists of several writing groups that address major air quality sources in the PTCA area. Each writing group, listed below with more detail, was supported by Air District staff. Each working group drafted two to three Key Issues Statements and the solutions related to each statement. The Key Issues were developed from common themes found in the community concerns shared through various platforms such as the Path to Clean Air Social Pinpoint platform, Community Town Hall, and community input from the monitoring plan. The Problems to Solutions Ad Hoc members facilitated a Jamboard brainstorm session during a CSC meeting to collect feedback from CSC members to guide the next steps and to incorporate in the final Plan.

Marine and Rail (M&R)

The Marine and Rail (M&R) writing group addressed reducing diesel emissions, including supporting and advancing CARB's efforts that are already underway, and minimizing the cumulative effects of marine and rail due to the port infrastructure. The M&R writing group consisted of two committee members: Jessica Range and Heidi Swillinger.

Commercial and Industrial (C&I) Sources Near Communities

The Commercial and Industrial (C&I) writing group addressed reducing overall PM exposure, $PM_{2.5}$ exposure, fugitive dust and the variety of commercial and industrial sources, including both large and small operations. The C&I writing group consisted of the two CSC co-chairs and one non-voting member: Y'Anad Burrell and Alfredu Rafael Angulo-Castro and Hakim Johnson.

Public Health and Reducing Exposure

The Public Health writing group addressed reducing vulnerabilities and exposure to air pollution and improving public health data and reporting. The Public Health writing group consisted of four committee members: Jeff Kilbreth, Omoniyi (Niyi) Omotoso, Darlena David, and Simren Sandhu.

Mobile: Vehicles and Trucks, Streets and Freeways, and Logistics and Warehouses

The Mobile writing group addressed high exposure from freight trucks, emissions from fossil-fuel powered vehicles, and streets and freeways. The Mobile writing group consisted of two committee members: Francisco Avila and Dave Severy.

Odors and Smells

The Odor and Smells writing group addressed the deferred maintenance and poor housekeeping from facilities producing odors and the need for expanding compliant system education, outreach, and access. The Odor and Smells writing group consisted of one committee member: Nancy Aguirre.

Refineries: Fuel Refining, Supporting Facilities, Storage, and Distribution

The Refineries writing group addressed the fuel refining sector as the largest source of emissions in the area, persistent flaring coming from this sector, and lack of accountability with Air District Regulations. The Refineries writing group consisted of four committee members: Marisol Cantú, Lizbeth Ibarra, Jeff Kilbreth, and Heidi Swillinger.

Cross-cutting strategies

The Cross-cutting strategies consisted of seven small groups that address topic areas and strategies are relevant to more than one of community concern areas: Land Use was led by Alfredo Rafael Angulo-Castro; Promoting Urban Greening by Dr. Omoniyi Omotoso; Website by Nancy Aguirre; Compliance and Enforcement by Heidi Swillinger; Community Engagement by Nancy Aguirre and Dave Severy; Legislative by Jeff Kilbreth; and Underreported Dangers by Jeff Kilbreth.

To learn more about the CSC please see Appendix G.

Chapter 3: Vision and Principles and Plan-level Goals

The Vision Statement and Principles

Vision Statement

We envision that all people grow and live in neighborhoods, with human-centered infrastructure planning, including space for our communities to safely be together, free of emission sources and air pollution. The effects of air pollution are known to cause severe health risks that include asthma, cancer, heart disease and other serious long-term health conditions. We envision removing barriers to health equity for all residents, as well as a significant reduction of pollution-driven respiratory illness rates in children. We aim to accomplish this by using effective communication strategies to inform people of elevated health risks in real time, by developing community led efforts to monitor emissions, by holding industry and all polluters accountable, and by strategizing a measurable reduction in emissions and exposure.

Principles

Collaborative and Involved Stakeholders

Serve as effective leaders in collaborating with elected officials to become engaged, accountable, and reflective of our communities' best wishes. Empower long term relationships between grassroots organizations, businesses, and local governments.

Community and Equity-Centered

Through an equity-centered lens, community voices will be at the forefront of this process. The communication tools used to reach community members will be diverse, inclusive, and ensure an understanding of the process.

Understandable Information and Data-Driven

Building on data from the community air monitoring plan to inform community members about the short and long-term effects of health as a result of poor air quality in their neighborhoods. Share information in a format that the community can understand including the use of popular education tools, youth voices, and media to ensure decision making is data driven.

Led by Strategy Goals and Prioritizes Effective Strategies

Prioritize the most effective emissions reduction and monitoring strategies to eliminate sources of pollution to the highest extent possible in a manner that is sustainable for the long-term.

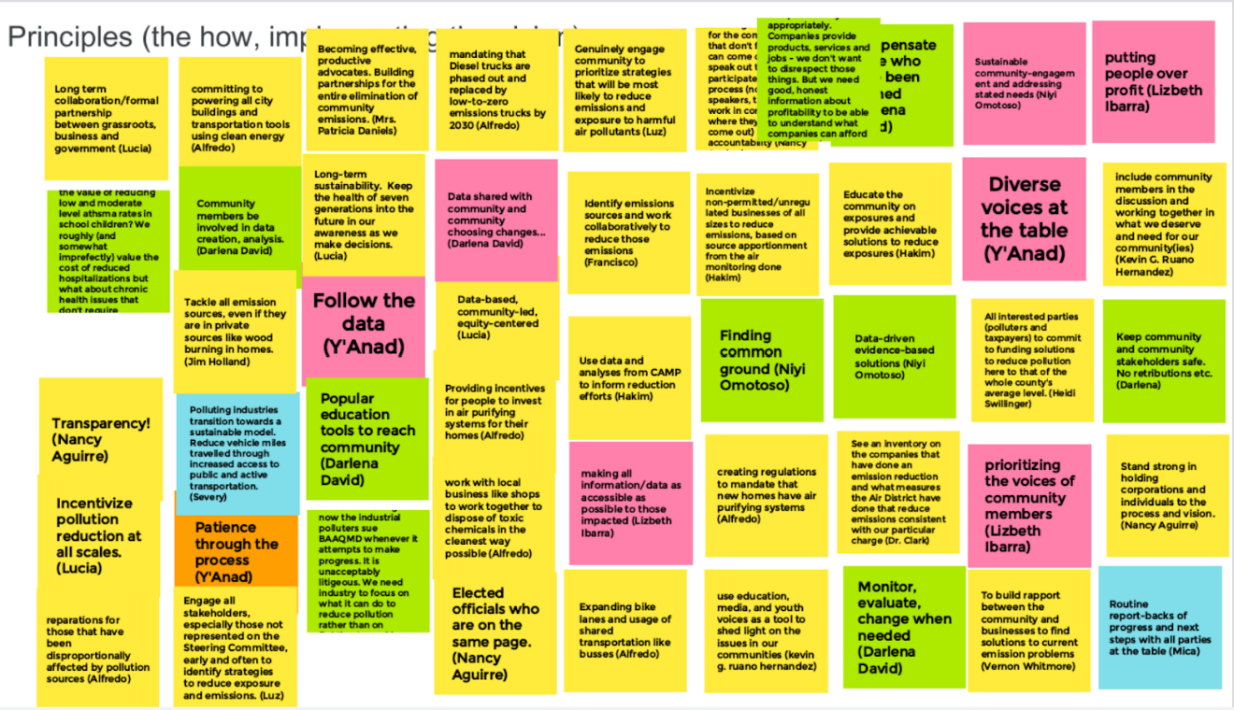
Follow a Transparent Process and Commit to Restorative Investments

Transparency through real-time communication with community members about progress and updates, with an emphasis on ensuring the information reaches everyone at all socioeconomic levels. A commitment to restorative investment in communities that have been disproportionately harmed by environmental injustice.

Development and Use of the Vision and Principles

The Vision and Principles concept was introduced to the CSC in June 2021. The Vision is a description of the future the community wants to see and acts as the guide throughout the process to focus on what the community envisions and hold all stakeholders accountable. The Principles reflect the CSC's values and help the CSC in their work towards achieving the Vision.

In July 2021, the co-chairs Alfredo Angulo-Castro and Y'Anad Burrell collaborated with Air District staff to create and facilitate a brainstorming activity with the CSC via a Jamboard, an online digital interactive whiteboard that can be accessed by all members to provide ideas. The activity prompted CSC members to share their hopes and dreams for the PTCA Plan, values for the Vision, and Principles that will help achieve the Vision.



Screenshot from CSC Meeting #4 Vision and Principles Jamboard Activity; July 2021

After the brainstorming activity, five CSC members volunteered to work with the co-chairs in an Ad Hoc to debrief on the Jamboard brainstorming activity, group ideas into common themes, and then analyze the themes to draft the Vision and Principles per the CSC's collective ideas. The Vision and Principles Ad Hoc was composed of a total of seven committee members: Nancy Aguirre, Philip Mitchell, Kevin G. Ruano Hernandez, David Severy, Vernon Whitmore, and co-chair Y'Anad Burrell and Alfredo Angulo-Castro.

In August 2021, the Ad Hoc presented their work to the CSC. This included groupings from the common themes heard in the brainstorming session the month prior and initial draft Vision and Principles. The CSC was asked to review and vote on final draft Vision and Principles in September 2021.

Vision and Principles Guide Plan Development and Implementation

Throughout the development PTCA Plan process, the Vision and Principles helped maintain focus, direction, and proper framing, by creating a shared cohesive set of outcomes understood by all those involved in drafting the Plan.

When the Plan is approved and adopted, it is intended that the Vision and Principles will still be used to guide the continuation of the process. The Principles can serve as accountability tools to ensure that the implementation is collaborative, community- and equity-centered, data-driven, accessible, transparent and reparative to the communities that have been unjustly burdened and harmed by poor air quality.

Additionally, due to the complexity of some of the problems and strategies, the implementation process may be very long-term and will likely involve onboarding new partners. As new partnerships form throughout that process, and in response to the needs of certain strategies, this document can help set intentions and serve as a foundation for those relationships.

Plan-Level Goals

Plan-level Goals are mileposts that will be used during PTCA Plan implementation to help track and report progress. These Goals are intended to be:

- Overarching, high impact
- Exciting, marketable, punchy, help to tell the story, get people interested.
- Center equity to lift up the needs of the most impacted.
- Help align strategies and actions towards an agreed upon outcome.

The CSC worked with the Air District to develop plan-level Goals. The process to create draft and final Goals including a presentation to the CSC about Goals and how they fit into the PTCA effort, time for CSC members to brainstorm individually and share their Goal ideas, and the convening of a CSC member working group. The working group synthesized and organized the Goal ideas into themes and then developed draft and final proposed Goals. The CSC reviewed the final Goals and voted to approve them at the September 2023 meeting.

Goal #1: In pursuit of our right to breathe clean air, promote environmental justice, and ensure the well-being of our residents and workers, our community-driven emissions reduction plan is rooted in Just Transition principles. This plan seeks to address the consequences of historical racial disparities by developing more stringent air pollution policies that advance social healing and restoration.

Goal #2: In pursuit of reducing historically high rates of asthma, cancer, and other chronic health conditions, our plan seeks to lower our community's disproportionate exposure to air pollution by reducing toxic emissions from local sources by 30-50% by 2035.

Goal #3: Through education and engagement, our plan aims to empower our community by providing resources and tools to promote understanding of air pollution and its impact on our health and environment.

Goal #4: Our goal is to hold our government accountable for implementing our plan, including its strategies and actions, to protect our health and environment and effectively enforce regulations on high-polluting industries and other toxic sources of emissions in our community.

Chapter 4: Community Description

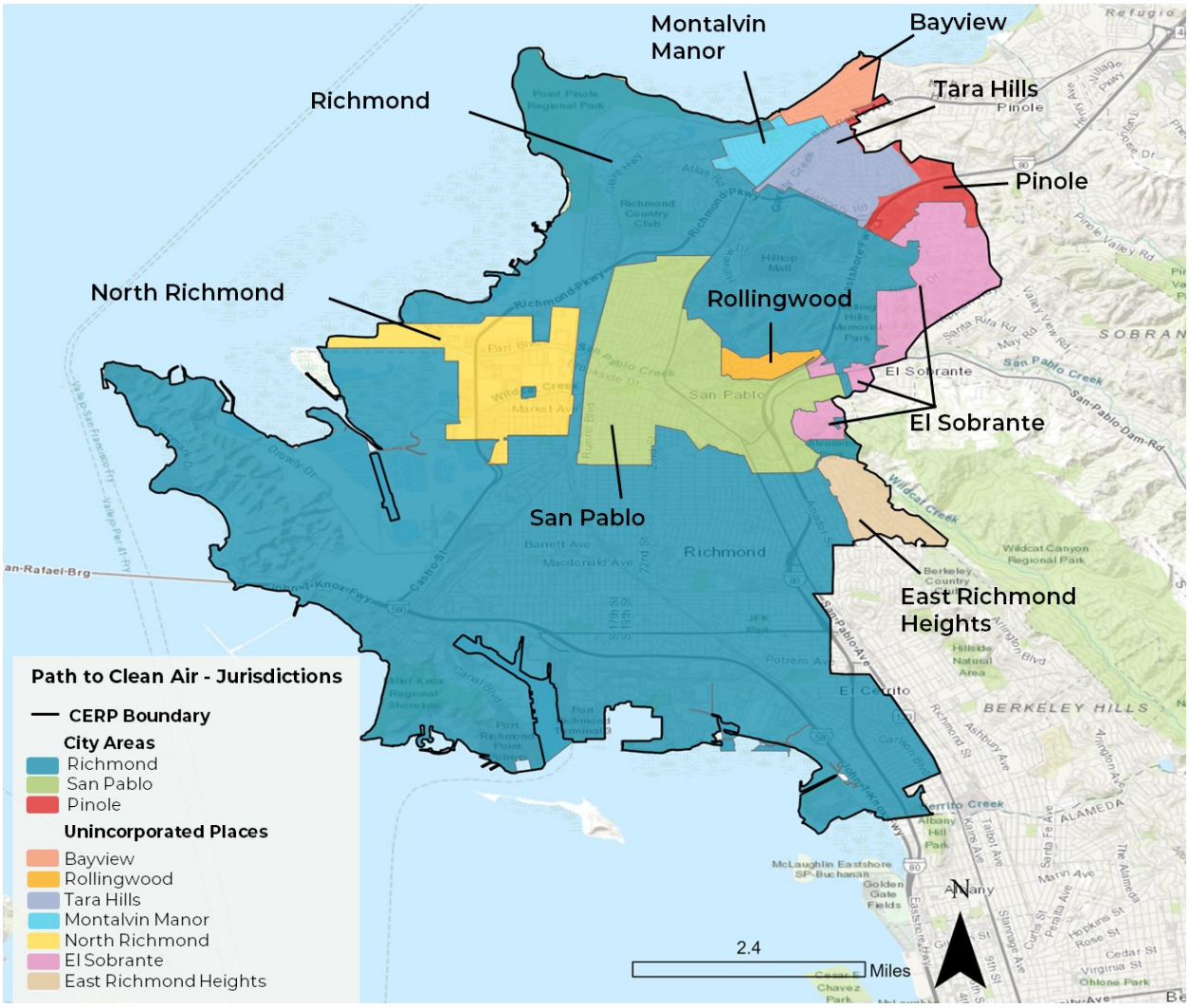


Figure 4-1. Community Emissions Reduction Plan Boundary and Component Geographies.

The PTCA area comprises the cities of Richmond and San Pablo and several unincorporated areas in Contra Costa County including Bay View, East Richmond Heights, Rollingwood, Tara Hills, Montalvin Manor, North Richmond, and El Sobrante (see Figure 4-1). These towns were founded on land originally inhabited by the Ohlone people. Historic activity brought waves of immigration, including many Black workers, to the area's burgeoning shipbuilding and chemical production industry. Today, communities of color are located adjacent to industrial uses and freeways in which diesel trucks transport goods, resulting in a high pollution-burden.

Situated near the East Bay waterfront, the PTCA community — with a current population of almost 166,450 people — was a magnet for World War II-era industries like shipbuilding, chemical production, and oil refining. In the 1940s, the population surged as many workers, including many people of color, flocked to the area for jobs. This period was part of the Second Great Migration. Black Americans migrated en masse to the West Coast for jobs and a haven from the Jim Crow policies prevalent in the American South that enforced segregation and marginalized

Black communities. Despite their contributions to the region's growth during and after the war, newly arrived Black and Brown people were targets of exclusionary labor and housing policies that continue to negatively affect income, homeownership, mobility, and wealth accumulation to this day.

Today, the PTCA community has become a significant corridor for transporting goods via ship, rail, and 18-wheelers, leading to congested freeways and roads running through residential communities. These transportation corridors include I-580 to the south, I-80 to the east, Richmond Parkway to the west, and San Pablo Avenue through the center of our community. When drivers seek to bypass freeway congestion, traffic spills onto residential streets in the PTCA community. In addition to these transportation corridors, the Chevron Refinery, rail yards, and rail lines associated with the Port of Richmond lie west of the PTCA area.

The Chevron Refinery is by far the largest single generator of emissions in the PTCA community for many air pollutants. For example, the graphic below shows that the Chevron Refinery emits more fine particulate matter and sulfur dioxide than all other contributing sources in our community combined. Chevron also is the largest source of numerous toxic air contaminants, such as hydrogen cyanide, sulfuric acid, manganese, and hydrogen sulfide.

The following are the source sectors of emissions represented in Figures 4-2 and 4-3 below:

- Area Sources: smaller stationary sources of pollution that are geographically dispersed and not covered by the Air District's permit requirements. Examples include residential sources like fireplaces and consumer products. Examples include dry cleaning facilities, oil and natural gas production, industrial boilers fired by coal, wood, and oil, and hazardous waste incineration.

- Off-Road Mobile Sources: mobile sources of air pollution, including locomotives, marine vessels, aircraft, heavy equipment, recreation equipment, and small engines and tools (such as lawnmowers).[1]

- On-Road Mobile Sources: mobile sources of air pollution, including motorcycles, passenger cars and trucks, and commercial trucks and buses.[2]

- Other Point Sources (non-Chevron): other permitted stationary sources of air pollution besides the Chevron refinery, such as factories, power plants, and gas stations that emit various air pollutants.[3]

[1] Environmental Protection Agency. (n.d.-b). *Mobile sources of air pollution*. EPA. https://www.epa.gov/mobile-source-pollution/learn-about-how-mobile-source-pollution-affects-your-health#:~:text=Mobile%20sources%20of%20air%20pollution,-Mobile%20sources%20of&text=On%2Droad%20vehicles%20include%3A,Commercial%20trucks%20and%20buses

[2] Ibid.

[3] Environmental Protection Agency. (n.d.-c). *Stationary Sources of Air Pollution*. EPA. https://www.epa.gov/stationary-sources-air-pollution

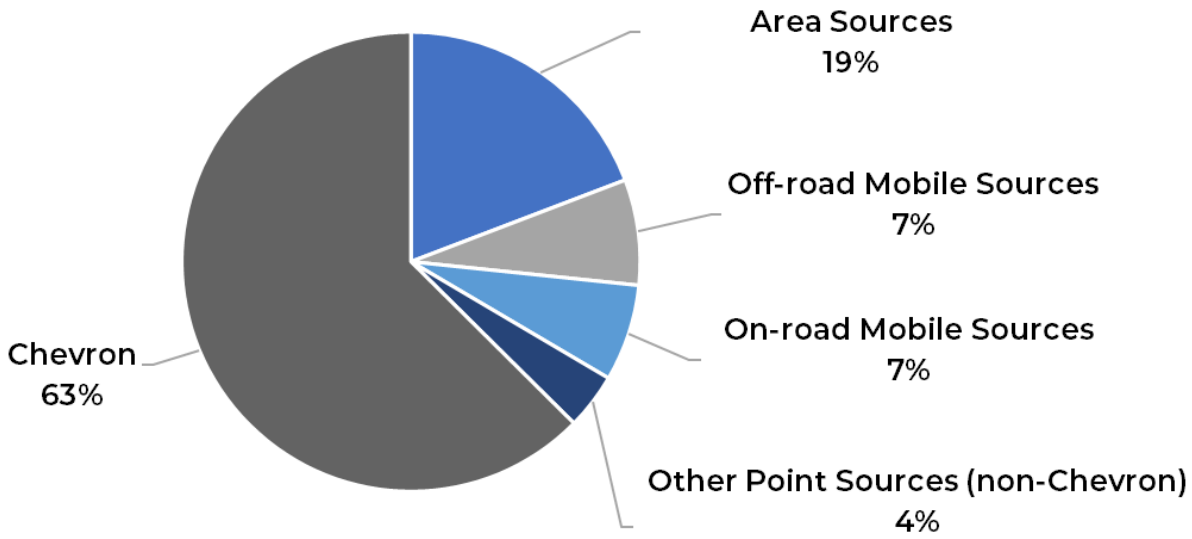


Figure 4-2. 2019 PM2.5 Emissions for the PTCA Community by Source Sector; Source: BAAQMD

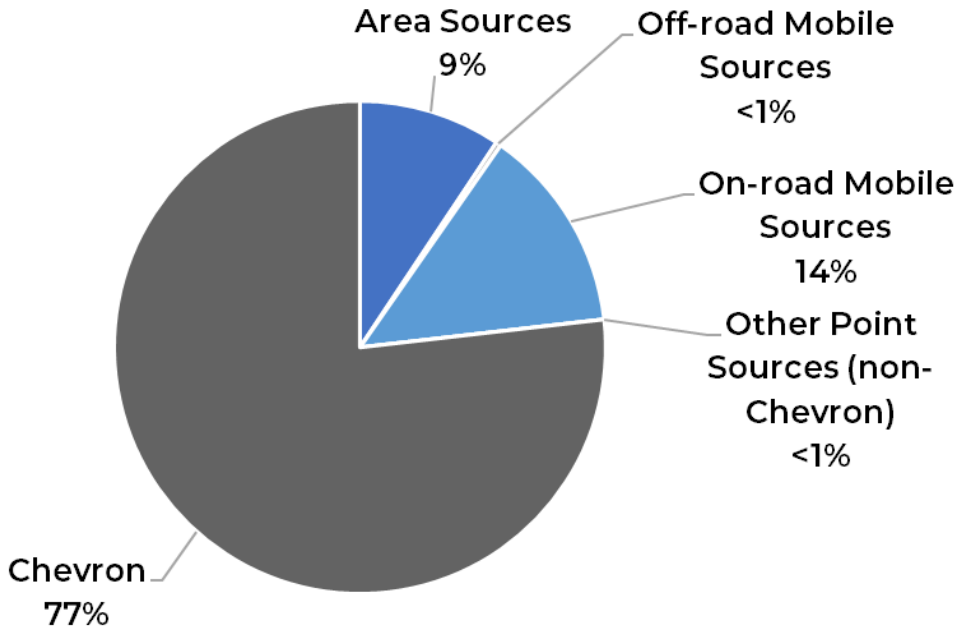


Figure 4-3. 2019 Manganese Emissions for the PTCA Community by Source Sector; Source: BAAQMD

In the PTCA community, more than 50% of residents are Black, indigenous, and people of color (BIPOC) – a higher proportion than BIPOC people living in the rest of Contra Costa County. Communities of color disproportionately live in close proximity to the Chevron Refinery, the major source of air pollution in our area, and/or within 1,000 feet of a freeway or railway. Our

population of unhoused people experiences even more pollution exposure from local sources than housed residents.

Due to these compounding factors, residents in census tracts near Chevron, freeways, and railroads experience some of the highest pollution burdens in the state, according to CalEnviroScreen 4.0. Most census tracts in the PTCA community experience higher-than-state-average rates of asthma, heart attack emergency department visits, and incidences of babies born with low birth weight. These health outcomes disproportionately affect people of color.

One-third of PTCA community members reside in low-income households that make less than half the area median income of $103,599. The Area Median Income (AMI) is the midpoint of a region's income distribution, where half of the families in a region earn more than the median income and half earn less than the median income. In addition, when compared to the rest of our county, fewer PTCA community members have health insurance coverage or are in the labor force. When compared to the rest of the county, the number of people with less than a high school level of education is twice as high. In the PTCA community, white people, followed by Asian people, comprise the highest proportion of those with a higher education degree.

PTCA residents are employed mostly in the fields of education, health, and social assistance. Other large employment areas are administration, arts, entertainment, accommodation, food services, construction, transportation and warehousing, and utilities.

In low-income census tracts of our county, many people live more than half a mile from a grocery store. The PTCA community, however, has the most census tracts in which many households have low food access, defined as living more than one-half mile from the nearest supermarket, supercenter, or large grocery store, and no car access - potentially hindering their ability to travel to a grocery store.

According to elections data from 2018 (the last election data available), our residents have among the lowest voter participation rates in our county. Despite this, residents are profoundly cognizant and concerned about air pollution and its impact on our lives. The PTCA community has a deep history of environmental and social justice activism. Community members have formed coalitions to stand against fossil fuel operations, primarily led by Black and Brown activists. The West County Toxics Coalition, for example, was formed in 1986 to empower low-income residents in communities of color to exercise greater control over environmental problems generated by the Chevron Refinery and other sources of pollution.[4] Communities for a Better Environment has similarly advocated strongly for greater emissions restrictions from the refinery and decreasing greenhouse gas emissions from Richmond facilities.[5] In the 1960s, the Black Panther Party had a heavy presence in communities like North Richmond, working to meet the needs of Black and Brown communities ignored by decision-makers.[6]

Historically, the PTCA communities of color were sited next to industrial sites due to many factors, including racist policies that allowed for the institution of racial covenants and discriminatory lending, which created and enforced residential segregation. Racial covenants were legal attempts to prohibit people of color from purchasing or living in homes in certain areas designated as white communities, which resulted in residential segregation throughout the

[4] *West County Toxics Coalition*. http://www.westcountytoxicscoalition.org/. Accessed 13 June 2022.

[5] *Richmond | Communities for a Better Environment*. https://www.cbecal.org/organizing/northern-california/richmond/. Accessed 13 June 2022.

[6] *Richmond Pulse - New Exhibit Highlights Richmond's Connection to Black Panthers*. 1 Feb. 2016, https://richmondpulse.org/2016/01/31/new-exhibit-highlights-richmonds-connection-to-black-panthers/.

country.[7] Lending discrimination is when lenders make decisions related to mortgage applications based on factors such as a person's race. While the local and state government no longer enforces such segregation, the legacy of generations of disinvestment and abandonment lingers today, as seen by our contrasting health outcomes compared to wealthier, whiter parts of Contra Costa County.

See Appendix B Community Description, for additional historical context and demographic, pollution exposure and health data.

This community description is dedicated to the memory of Dr. Henry Clark, a pioneer of the Bay Area's environmental justice movement. A longtime Richmond resident,[8] Dr. Clark was an inspirational member of the Community Steering Committee until his death on June 2, 2022.

Our work would not have been possible without the contributions of Bay Area Air Quality Management District staffer Lily MacIver, who tracked down, coherently presented, and helped us interpret vast amounts of data necessary to accurately describe our community and the challenges it faces from air pollution.

[7] California Land Title Association. (n.d.). Discriminatory Racial Covenants and their Removal from Antiquated Real Property Records. https://www.clta.org/page/Consumer18

[8] Bernard, S. (2018, December 12). *Henry Clark and three decades of environmental justice*. Richmond Confidential. https://richmondconfidential.org/2012/12/06/henry-clark-and-three-decades-of-environmental-justice/

Chapter 5: Air Pollution Overview

To support the development of the Plan, the Air District worked closely with the CSC to conduct an extensive technical assessment of air pollution sources and impacts in the PTCA area. This assessment was organized around key steps in the air pollution pathway shown in Figure 5-1, which leads from emissions of air pollution to potential health effects. To characterize the first step in the pathway, a baseline emissions inventory was developed that quantified the amount of air pollutants discharged into the atmosphere by sources within the PTCA area. Ambient pollutant concentrations were then evaluated using monitoring and modeling methods, which provide different but complementary types of information. Air quality monitors measure the concentration of specific air pollutants at selected locations, capturing the effects of all pollution sources and allowing changes in air quality to be tracked over time. Air quality models supplement this information by providing an estimate of pollutant concentrations at unmonitored locations and under projected future conditions. Modeling was also used to provide more detailed information on the relationship between specific sources of emissions and pollutant concentrations. Lastly, human exposures and health risks resulting from local emission sources were assessed by combining modeled pollutant concentrations with population data and toxicity factors.

Figure 5-1. The air pollution pathway from emissions to health effects.

This chapter provides a summary of key findings from the technical assessment, including insights from both monitoring and modeling activities. Some of the key findings discussed in this chapter include:

- Air monitoring data showed that levels of some pollutants, including fine particulate matter ($PM_{2.5}$) and certain toxic air contaminants (TACs), have not improved over the past ten years.
- Local air monitoring projects revealed how air quality can vary from place to place within the PTCA area, as well as occurrences of higher levels of pollutants that may be associated with specific local pollution sources.
- The 2019 baseline emissions inventory assembled for the PTCA area shows that the Chevron refinery and related fuel refining sources accounted for over half of local emissions of numerous pollutants, including sulfur oxides (SO_x), $PM_{2.5}$, manganese, nickel, and hydrochloric acid.
- An exposure analysis indicated that fuel refining and on-road mobile source sectors combined accounted for about three-fourths of the annual average residential $PM_{2.5}$ exposure and about 90% of the population-weighted score for non-cancer health effects from TACs attributable to local sources within the PTCA community.

More detailed findings that support specific Plan strategies and actions are presented in Chapter 7 and supplementary technical information is provided in Appendices C (modeling) and D (monitoring).

Types of Air Pollutants

Several factors influence air pollution levels in the PTCA area, including emissions from local sources within the PTCA area, emissions from sources outside the PTCA area, chemical reactions between different pollutants after they are emitted, and meteorological conditions. Sources of air pollution are wide-ranging and include anthropogenic sources like commercial and industrial facilities, motor vehicles, trains, ships, and residences, as well as natural sources like wildfires and airborne sea salt. Certain pollution sources or operations produce multiple pollutants at the same time, such as burning fuels or other materials.

Two main categories of air pollutants are Criteria Air Pollutants (CAPs) and Toxic Air Contaminants (TACs), as summarized in Table 5-1. CAPs are six common air pollutants that harm human health and are pollutants that the U.S. Environmental Protection Agency (U.S. EPA) sets standards for under the Clean Air Act, called the National Ambient Air Quality Standards (NAAQS).[9] California also has ambient air quality standards (CAAQS) for several air pollutants.[10] The original CAAQS predate the creation of the U.S. EPA and its first NAAQS, and some of the existing CAAQS are more stringent than the NAAQS. However, attainment of the NAAQS has precedence over attainment of the CAAQS. TACs are pollutants that are known or suspected to cause cancer or other serious health effects.[11] Of these pollutants, particulate matter and various TACs are of higher concern due to their health impacts and the numerous sources of these pollutants in the PTCA area.

Table 5-1. Categories and examples of air pollutants.

Pollutant Category	Description	Pollutants in this Category
Criteria Air Pollutants (CAPs)	Six common air pollutants that harm human health and have NAAQS set by the U.S. EPA	• Ozone (O_3) • Particulate matter ($PM_{2.5}$ and PM_{10}) • Carbon monoxide (CO) • Nitrogen dioxide (NO_2) • Sulfur dioxide (SO_2) • Lead (Pb)
Toxic Air Contaminants (TACs)	TACs include over 200 pollutants identified by CARB that are known or suspected to cause cancer or other serious health effects	Examples of TACs: • Benzene, toluene, ethylbenzene, xylene (BTEX), which are volatile organic compounds (VOCs) found in gasoline and released through combustion of fossil fuels • Diesel particulate matter (DPM), resulting from combustion of diesel fuel • Certain metals such as mercury, chromium, and arsenic

[9] U.S. EPA webpage on Criteria Air Pollutants: https://www.epa.gov/criteria-air-pollutants
[10] CARB webpage for the California Ambient Air Quality Standards: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards
[11] CARB webpage on Toxic Air Contaminants: https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants

$PM_{2.5}$ refers to fine inhalable particles with diameters of 2.5 micrometers or smaller.[12,13] Fine particles are much smaller than the width of a human hair, as illustrated in Figure 5-2, and can travel deep into the lungs and bloodstream, where they can cause or contribute to short-term health effects like bronchitis and asthma attacks, and long-term effects like heart disease and respiratory conditions like emphysema. $PM_{2.5}$ can be directly emitted into the air (referred to as primary PM) or can form in the air through complex reactions of other pollutants that are emitted as gases (often referred to as secondary $PM_{2.5}$). $PM_{2.5}$ is emitted from many sources, notably the combustion of fossil fuels for industrial operations; by cars, trucks, and other on-road mobile sources; and off-road mobile sources such as trains, ships, tugboats, recreational watercraft, and construction equipment. Other combustion sources of $PM_{2.5}$ include residential wood stoves and fireplaces, certain restaurants, and diesel generators. There are non-combustion sources of $PM_{2.5}$, such as dust from unpaved surfaces, vehicle brakes, and facilities with sand, gravel, and metal operations. Natural sources of $PM_{2.5}$ emissions include wind-blown dust and sea salt, and biogenic sources that contribute to particle formation.

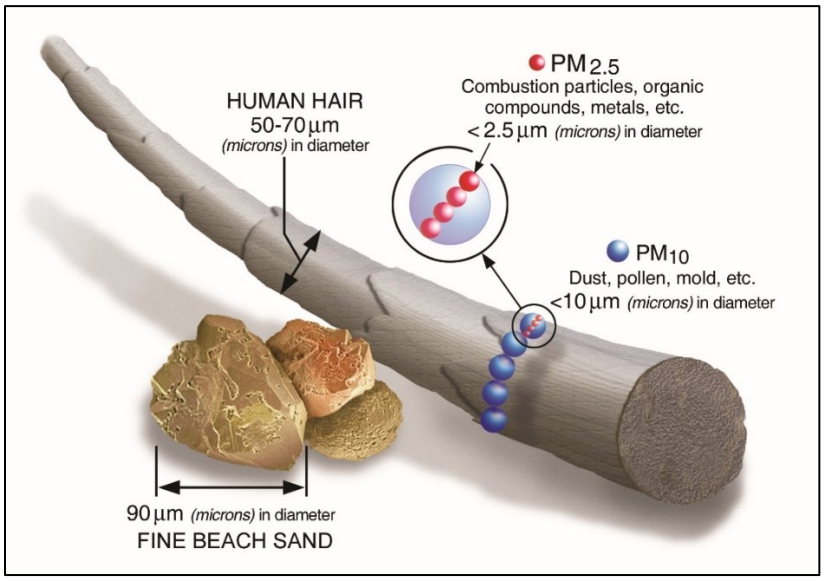


Figure 5-2. Illustration of size comparisons for types of particulate matter. Image source: U.S. EPA.

Particulate matter comes in many shapes, sizes, and compositions. Black carbon, commonly known as soot, is a component of particulate matter. Black carbon is correlated with diesel particulate matter, which is of particular health concern because of its toxicity. Another category of particulate matter is ultrafine particles, which are particles with diameters of less than 0.1 micrometers. These very small particles can travel farther into the body and cause adverse health effects. The health effects of different components and sizes of particulate matter is an active and evolving area of scientific research.[14]

[12] CARB webpage on Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10}): California Air Resources Board. https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health
[13] U.S. EPA webpage on Particulate Matter (PM) Basics: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics
[14] For more information on the health effects of ultrafine particles (UFP), see: https://www.nature.com/collections/bjiiefcddb; https://link.springer.com/article/10.1007/s00038-019-01202-7; or https://www.liebertpub.com/doi/abs/10.1089/089426802320282310.

TACs, also referred to as air toxics, are pollutants that are known or suspected to cause cancer and other serious health effects such as neurological, reproductive, developmental, cardiovascular, or respiratory conditions. There are over 200 substances or groups of substances in the list of TACs as defined by CARB. Some examples of TACs include diesel particulate matter; particulate metals such as arsenic, manganese, and chromium; and volatile organic gases such as benzene and formaldehyde. Sources of different TACs vary by specific contaminant, and many TACs are co-emitted during combustion or evaporation of fuels. The California Office of Environmental Health Hazard Assessment (OEHHA) has developed Reference Exposure Levels (RELs) for non-cancer health impacts for chronic (annual), 8-hour, and acute (1-hour) exposures for many TACs, which can be compared with measured or modeled TAC data.[15] The REL is the concentration level at or below which no adverse non-cancer health effects are expected for the specified chronic, 8-hour, or 1-hour exposure. Examples of non-cancer chronic health effects include damage to the respiratory, nervous, immune, and reproductive systems and neurological and developmental disorders. At higher levels, exposure to TACs can cause acute health effects such as headaches, nausea, respiratory irritation and asthma episodes, and irritation of the eyes, nose, throat, and skin. OEHHA also establishes cancer potency factors for TACs. Additional metrics to assess the impacts of the combination of different TACs, including cancer risk and chronic hazard index (HI), are described in the Model-Based Exposure Assessment section found later in this chapter (see footnotes 26 and 27).

Air Quality Monitoring

Air quality monitoring systems measure levels of different pollutants in the air, providing information about how much pollution people may be exposed to. There are several air monitoring systems and networks in operation within the PTCA area. Air monitoring efforts are conducted by different organizations and agencies, and the data they collect include different pollutants and have different purposes and end uses. The PTCA Air Monitoring Reference Guide provides more information on these different monitoring systems.[16]

Ambient air quality monitoring provides information on the outdoor air we breathe in our neighborhoods and communities. There are several methods for monitoring ambient air quality, each with different purposes, strengths, and limitations. However, no single monitoring system can inform every aspect of air quality and air monitoring is not feasible in all places at all times and for all pollutants. Air monitoring data reflect the combined impacts of pollution emissions and influences from meteorological conditions and chemical reactions in the atmosphere, some of which may not be included or may have considerable uncertainty in emissions inventories or air quality modeling.

The Air District operates a multi-pollutant network of long-term air monitoring sites across the Bay Area.[17] Data provided by the Air District's network can help characterize long-term air quality trends and is used for comparison with health-based standards, in particular, the NAAQS set by the EPA.[18] The Air District's network includes a monitoring site in San Pablo (on Rumrill Blvd. near Market Ave.), in Richmond (at 7th Street and Hensley Street), and in Point Richmond. The Air District also requires Chevron to conduct air monitoring at or near the refinery fenceline for

[15] OEHHA's Summary of Acute, 8-hour and Chronic Reference Exposure Levels (RELs): https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary
[16] Air Monitoring Data Reference Guide for the Path to Clean Air area: https://www.baaqmd.gov/~/media/files/ab617-community-health/richmond/quarterly-report-documents/ptca-monitoring-data-inventory-pdf.pdf?la=en
[17] The Air District's Annual Air Monitoring Network Plan (2023): https://www.baaqmd.gov/~/media/files/technical-services/2023_network_plan-pdf.pdf?la=en
[18] Description of U.S. EPA's health-based NAAQS: https://www.epa.gov/air-trends/air-quality-design-values

compliance with several EPA and Air District requirements. Air District Regulation 9, Rule 1 (Rule 9-1)[19] and Regulation 9, Rule 2 (Rule 9-2)[20] require ground-level monitoring of sulfur dioxide (SO_2) and hydrogen sulfide (H_2S), respectively, and Air District Regulation 12, Rule 15 (Rule 12-15) requires certain monitoring along the refinery fenceline.[21] Chevron also operates three in-community air monitoring stations as part of an agreement with the City of Richmond.[22] The specific pollutants measured by Air District and Chevron monitoring sites and systems in the PTCA area are listed in Table 1. Figure 5-3 shows a map of Air District-operated and Chevron-affiliated monitoring sites in the PTCA area.

Table 5-2. Monitoring conducted by the Air District or Chevron in the PTCA area. Measurement abbreviations: ozone (O_3), carbon monoxide (CO), nitrogen oxide (NO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), particulate matter (PM). Meteorological measurements generally include temperature, wind speed, and wind direction.

Monitoring Organization or Program	Monitoring Location	Pollutants and Parameters Measured
Air District	San Pablo (Rumrill Blvd.)	O_3, CO, NO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, selected air toxics
Air District	Richmond (7th Street)	SO_2, H_2S, Air Toxics
Air District	Point Richmond	H_2S
Chevron-Ground Level Monitoring	Chevron Castro	SO_2 and H_2S
Chevron-Ground Level Monitoring	Chevron Golden Gate	SO_2 and H_2S
Chevron-Ground Level Monitoring	Chevron Gertrude	SO_2, H_2S, Meteorology
Chevron-Richmond Community Monitoring	Atchison Village	Black Carbon, $PM_{2.5}$, H_2S, Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, Ammonia, n-Heptane, n-Hexane, 3-Methylpentane, n-Octane, 1,2,3-Trimethylbenzene, 1,2,4 Trimethylbenzene, 1,3,5-Trimethylbenzene, 2,2,4-Trimethylpentane, Meteorology
Chevron-Richmond Community Monitoring	North Richmond	Black Carbon, $PM_{2.5}$, H_2S, Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, Ammonia, n-Heptane, n-Hexane, 3-Methylpentane, n-Octane, 1,2,3-Trimethylbenzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2,2,4-Trimethylpentane, Meteorology
Chevron-Richmond Community Monitoring	Point Richmond	Black Carbon, $PM_{2.5}$, H_2S, Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, Ammonia, n-Heptane, n-Hexane, 3-Methylpentane, n-Octane, 1,2,3-Trimethylbenzene, 1,2,4-

[19] Air District Regulation 9, Rule 1: Sulfur Dioxide: https://www.baaqmd.gov/rules-and-compliance/rules/reg-9-rule-1-sulfur-dioxide
[20] Air District Regulation 9, Rule 2: Hydrogen Sulfide: https://www.baaqmd.gov/rules-and-compliance/rules/reg-9-rule-2-hydrogen-sulfide
[21] Air District Regulation 12, Rule 15: Petroleum Refining Emissions Tracking: https://www.baaqmd.gov/rules-and-compliance/rules/regulation-12-rule-15--petroleum-refining-emissions-tracking
[22] Data from Chevron-operated air monitoring systems are available in real-time: https://www.richmondairmonitoring.org/measurements.html

Monitoring Organization or Program	Monitoring Location	Pollutants and Parameters Measured
		Trimethylbenzene, 1,3,5-Trimethylbenzene, 2,2,4-Trimethylpentane, Meteorology
Chevron-Fenceline Monitoring	Along refinery fenceline	Benzene, Toluene, Ethylbenzene, p-xylene, H_2S, SO_2, Butane, Ethane, Methane, Propane, Pentane

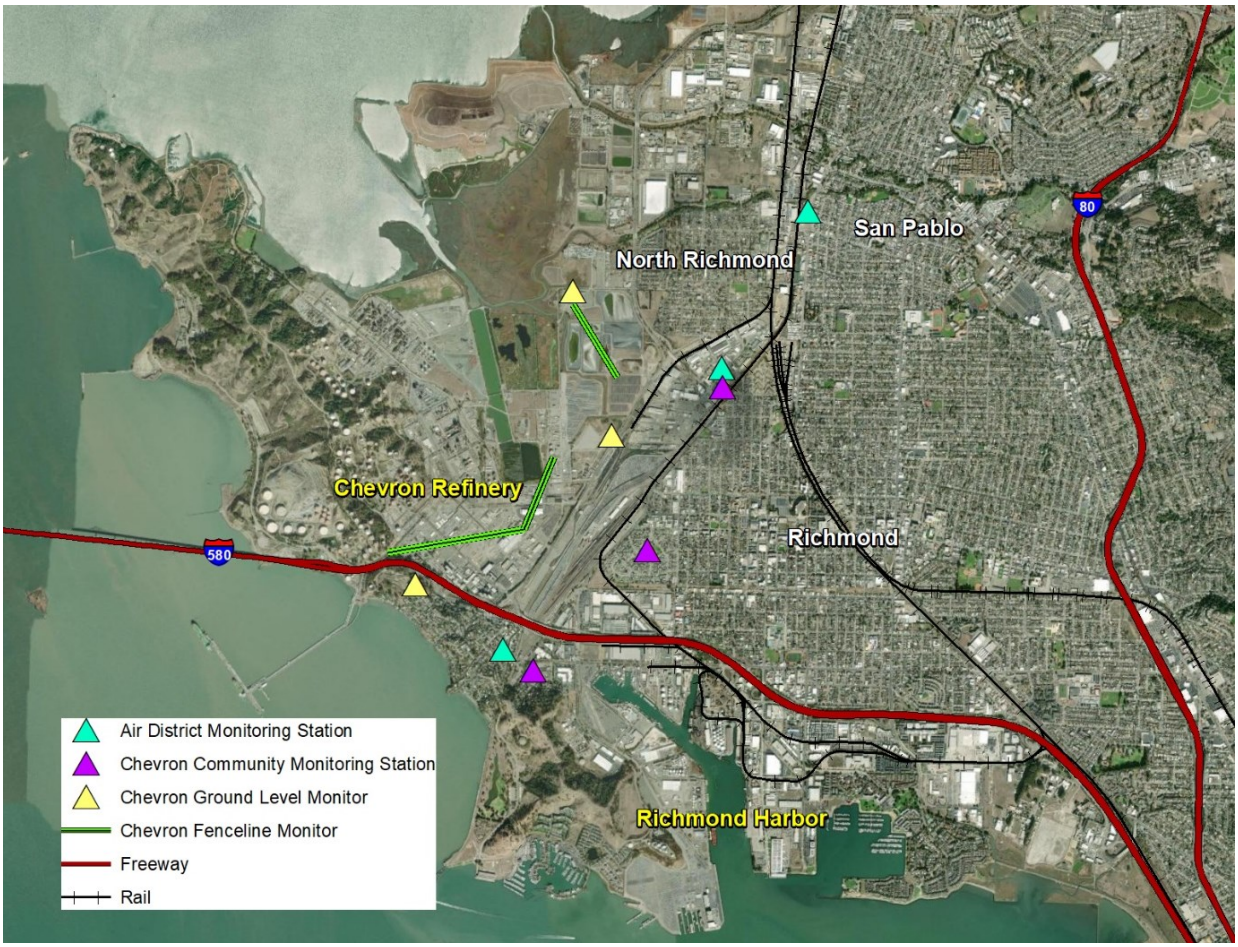


Figure 5-3. Locations of Air District-operated monitoring sites and selected Chevron-affiliated monitoring sites and systems in the PTCA area.

Comparing measured concentrations of pollutants in the air to EPA's health-based NAAQS is one way to assess air quality in terms of health impacts. This comparison uses a statistic called a design value. Each year, for each air monitoring site, a design value is calculated using measured pollutant concentrations over the past three years.[23] Tracking how design values change over time provides information on whether overall air quality is improving, worsening, or holding steady relative to air quality standards, and helps illustrate how design values can vary across different locations and for different pollutants. Design values for annual average and 24-hour $PM_{2.5}$, 8-hour ozone, and 1-hour nitrogen dioxide for the San Pablo air monitoring site are

[23] EPA Air Quality Design Values website: https://www.epa.gov/air-trends/air-quality-design-values.

below their respective NAAQS levels (Table 5-3). However, reductions in $PM_{2.5}$ concentrations at levels below the NAAQS have been shown to have health benefits. EPA is currently considering lowering (in this case strengthening) the existing NAAQS for annual $PM_{2.5}$ to a level between 9 and 10 micrograms per meter cubed (µg/m^3), and the annual average $PM_{2.5}$ design value for the San Pablo air monitoring site may be above the new standard.[24]

Table 5-3. Design values (2020-2022) for fine particulate matter ($PM_{2.5}$), ozone, and nitrogen dioxide at the San Pablo monitoring site. Units are in micrograms per meter cubed (µg/m^3), parts per million (ppm), or parts per billion (ppb), depending on pollutant.

National Ambient Air Quality Standard	**Level of the NAAQS**	**San Pablo Monitoring Site 2020-2022 Design Value**
Annual $PM_{2.5}$ (2012 standard)	12 µg/m^3	10.0 µg/m^3
24-Hour $PM_{2.5}$ (2006 standard)	35 µg/m^3	27 µg/m^3
8-Hour Ozone (2015 standard)	0.70 ppm	0.52 ppm
1-Hour Nitrogen Dioxide (2010 standard)	100 ppb	32 ppb

The design value for annual $PM_{2.5}$ assesses long-term, or chronic, exposure to $PM_{2.5}$, while the design value for 24-hr $PM_{2.5}$ assesses exposure to shorter-duration $PM_{2.5}$ episodes. Design values for annual $PM_{2.5}$ at Air District monitoring sites, including the San Pablo air monitoring site, have remained below the NAAQS (Figure 5-4). In some years, the San Pablo monitoring site had one of the higher design values for annual $PM_{2.5}$ among other Air District monitoring sites. While significant progress was made in the past, annual average $PM_{2.5}$ concentrations have not notably increased (worsened) or decreased (improved) in the last ten years.

The 24-hour $PM_{2.5}$ design value, as opposed to the annual $PM_{2.5}$ design value, is much more strongly affected by shorter-term air quality events, such as smoke from wildfires. In recent years, wildfire smoke contributed to numerous occurrences of high 24-hour $PM_{2.5}$ concentrations across the Bay Area, leading to design values above the NAAQS (Figure 5-5). Outside of the recent years with severe wildfire events, the 24-hour $PM_{2.5}$ design values were below the current 24-hr $PM_{2.5}$ NAAQS.

Design values for 8-hour ozone (Figure 5-6) and 1-hour nitrogen dioxide (Figure 5-7) have been well below the NAAQS at the San Pablo monitoring site for the last decade. Ozone forms in the atmosphere from reactions of other pollutants, especially under sunny, hot weather conditions. In the Bay Area, ozone levels are generally higher farther inland from the coast and Bayshore. Nitrogen dioxide (NO_2) and other nitrogen oxides (NO_x) react with other pollutants to form both particulate matter and ozone.

[24] EPA Press Release on reconsideration of the PM NAAQS, January 2023: https://www.epa.gov/pm-pollution/proposed-decision-reconsideration-national-ambient-air-quality-standards-particulate

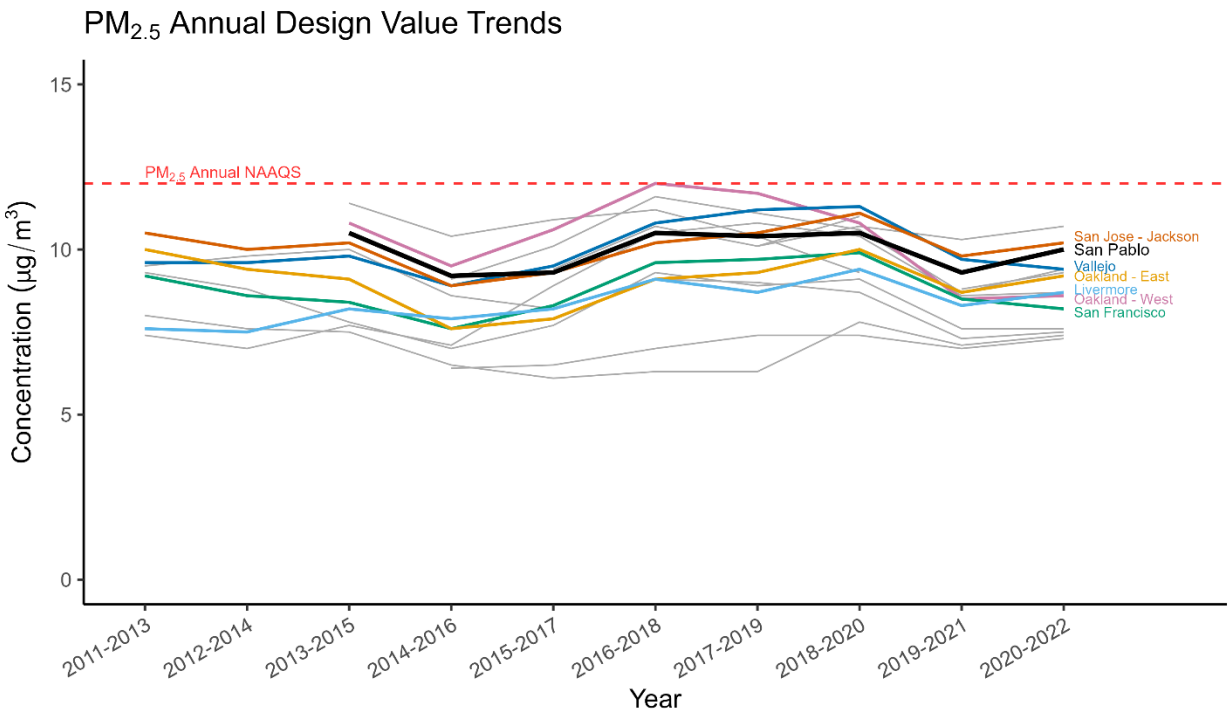


Figure 5-4. Design values for annual $PM_{2.5}$ at Air District monitoring sites. Each line represents design values at a different monitoring site. Grey lines denote design values for Air District monitoring sites that are not otherwise labeled. Design values for annual $PM_{2.5}$ have not notably increased (worsened) or decreased (improved) over the past ten years.

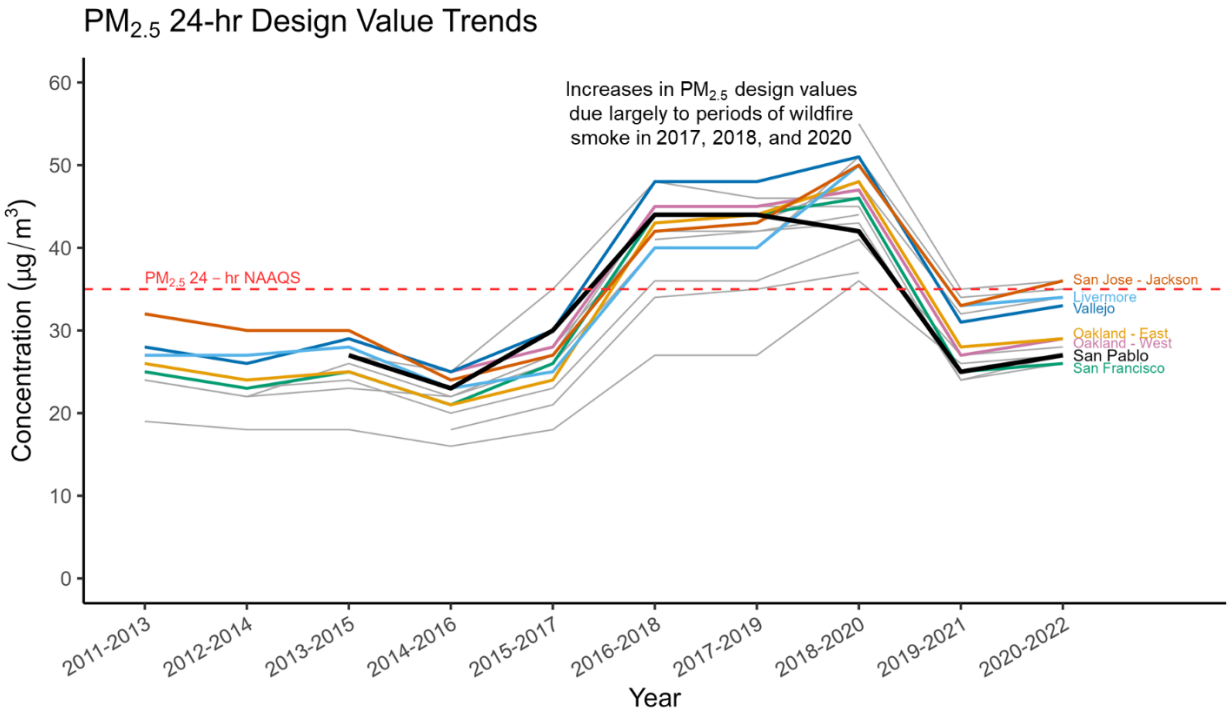


Figure 5-5. Design values for 24-hr $PM_{2.5}$ at Air District monitoring sites. Each design value represents three years of data. Grey lines denote design values for Air District monitoring sites that are not otherwise labeled. Smoke from wildfires was the main driver for increases in 24-hr $PM_{2.5}$ design values in recent years.

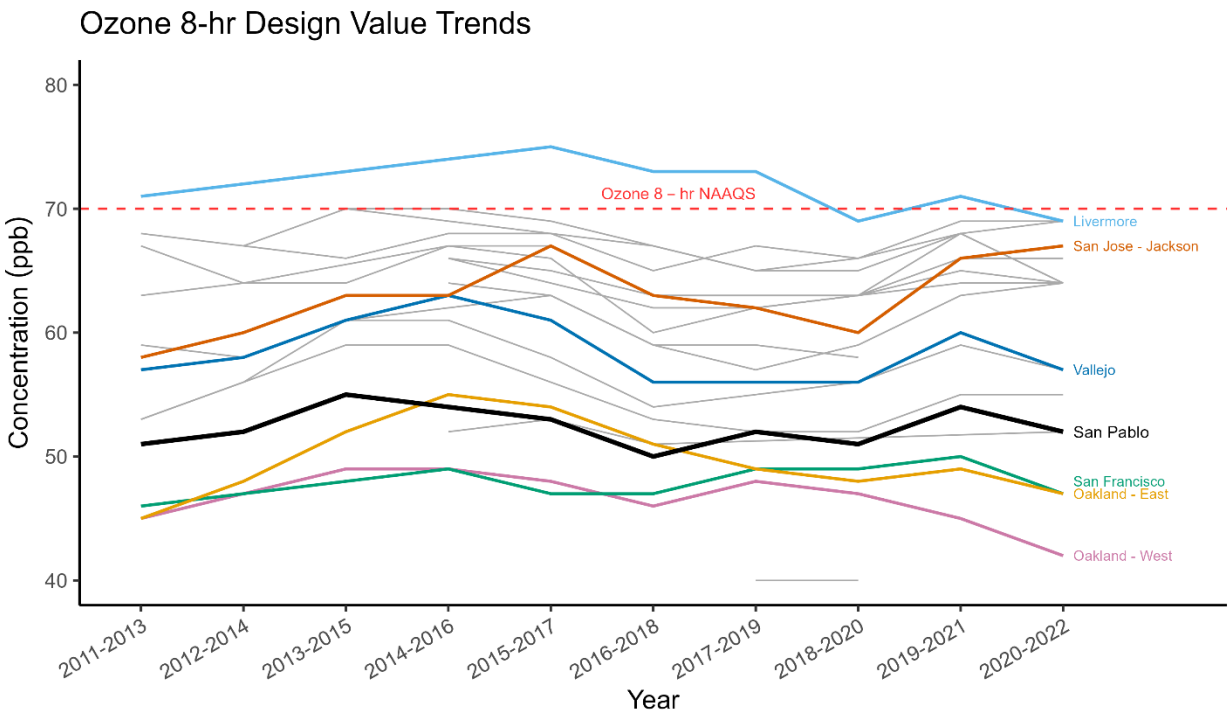


Figure 5-6. Design values for 8-hr ozone at Air District monitoring sites. Grey lines denote design values for Air District monitoring sites that are not otherwise labeled. Design values for 8-hr ozone at the San Pablo monitoring site have remained well below the NAAQS for the past ten years.

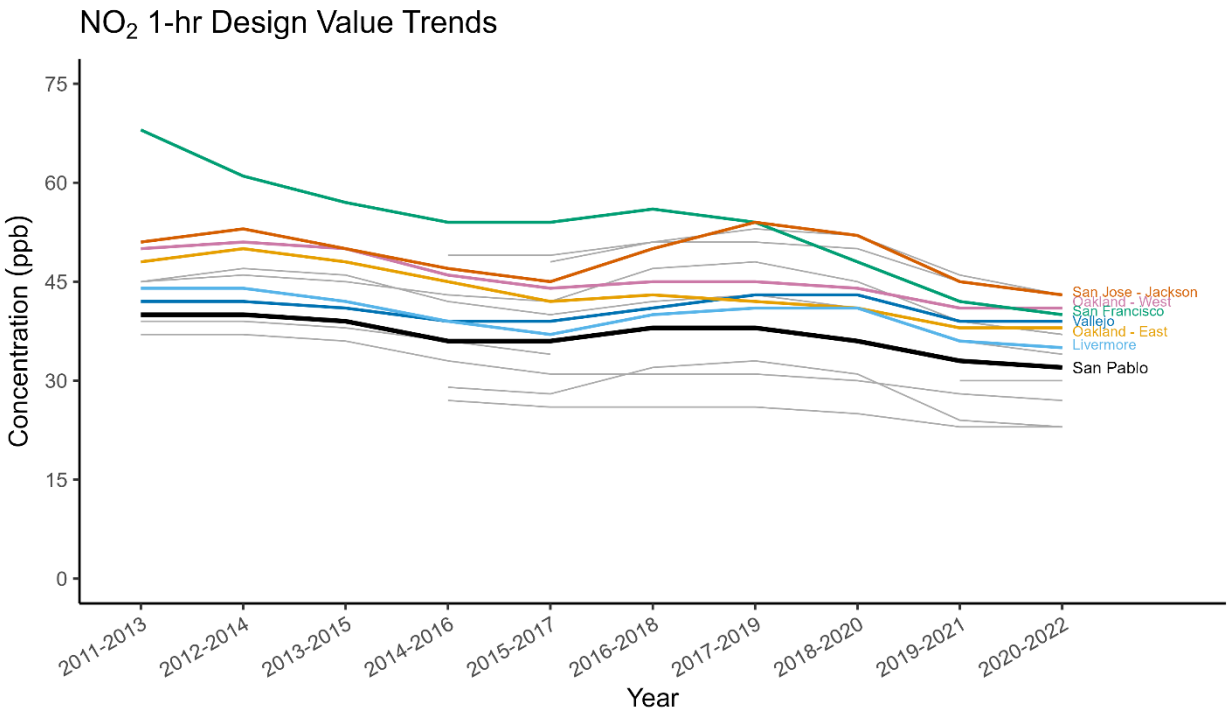


Figure 5-7. Design values for 1-hr nitrogen dioxide (NO_2) at Air District monitoring sites. Grey lines denote design values for Air District monitoring sites that are not otherwise labeled. Design values for 1-hr NO_2 at the San Pablo monitoring site have remained well below the NAAQS for 1-hr NO_2 of 100 ppb for the past ten years.

While design values (using 3-year averages) are intended for comparisons with the NAAQS, assessing air quality measurements on shorter time scales, such as on an annual, daily, and even hourly basis, reveals additional information about how air quality changes over time in different locations. Annual average $PM_{2.5}$ concentrations at the Air District's monitoring sites from 2013-2022 are shown in Figure 5-8, and the bold blue line represents $PM_{2.5}$ concentrations at the San Pablo monitoring site. Over the 10-year period shown, annual $PM_{2.5}$ concentrations fluctuate due to changes in emissions and meteorology. In some recent years, smoke from wildfires caused significant air quality impacts in the Bay Area and contributed to higher $PM_{2.5}$ concentrations, notably in 2017, 2018, and 2020. The site with the highest annual average $PM_{2.5}$ concentration, or peak site, varies from year to year. San Pablo has often been one of the sites with higher annual average $PM_{2.5}$ concentrations. The NAAQS for annual-average $PM_{2.5}$ of 12 µg/m^3 is shown for reference as well, though having one year, or one value, over that standard does not in itself indicate a violation of the standard.

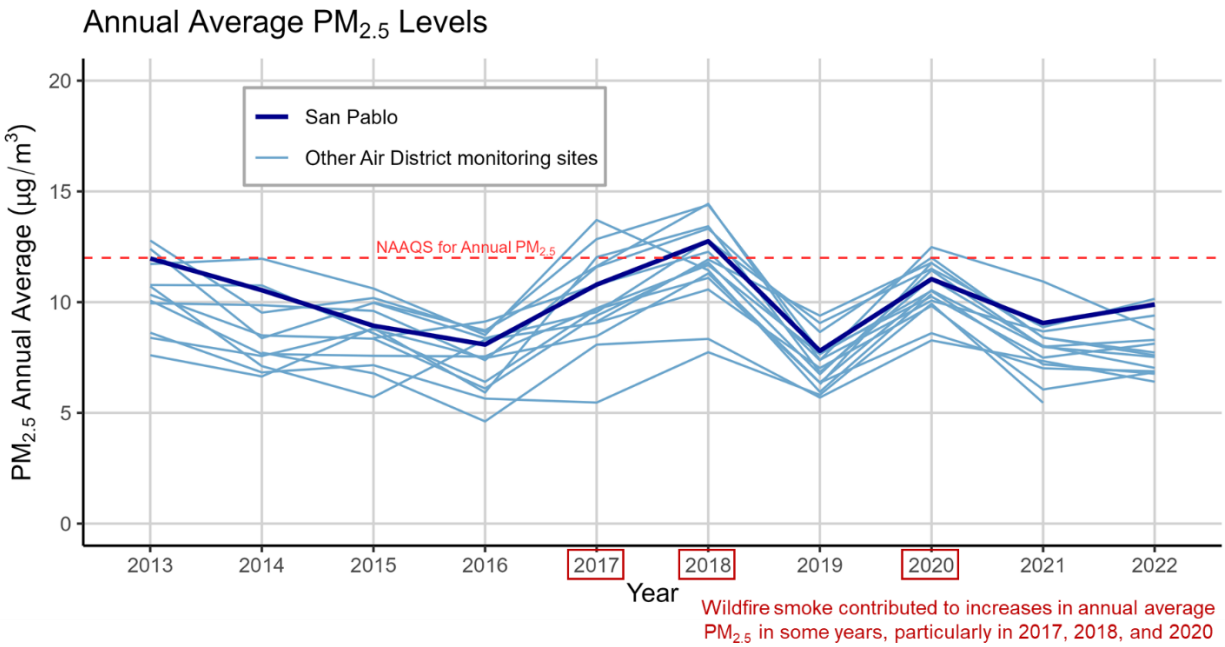


Figure 5-8. Annual average $PM_{2.5}$ levels at Air District monitoring sites. Year to year fluctuations in $PM_{2.5}$ levels are due largely to changes in emissions and meteorology. Wildfires contributed to higher $PM_{2.5}$ levels at times, notably in 2017, 2018, and 2020.

Local Variability in $PM_{2.5}$ Levels

Data from the Air District's long-term monitoring sites provide important information on how air quality has varied over time and compares with air quality standards in the PTCA area. However, this data alone cannot fully explain the complex air pollution impacts found throughout the PTCA area given the complex mix of local air pollution sources in proximity to where people spend time. Additional measurement data, such as from monitoring efforts under the PTCA Community Air Monitoring Plan (CAMP), provide additional information that can help build a more complete picture of air quality and exposure burden in the community. The CAMP and additional information on these air monitoring projects, including quarterly monitoring updates with initial analyses, can be found on the Air District's website.[25]

Networks of lower-cost air quality sensors can provide data in more locations than is feasible with long-term monitoring sites. An example of data from one project in the CAMP, a network of about 50 air quality sensors operated by Groundwork Richmond/Ramboll under a CARB Community Air Grant, is shown in Figure 5-9. The data shown are from late December 2020 and illustrate how $PM_{2.5}$ concentrations can fluctuate regionally and locally over hours and days. $PM_{2.5}$ concentrations across the sensor network follow very similar day-to-day variations, driven by regional emissions and weather patterns. Many factors influence particulate matter measurements at a specific location, including instrumentation (regulatory monitor vs. sensor), proximity to emissions sources, sensor installation considerations (such as airflow obstructions), sensor calibration, meteorology, and topography. Sometimes, transport of pollution from other areas or events like wildfires are large contributors on the worst $PM_{2.5}$ days. However, it's also

[25] Air District website with materials for the Path to Clean Air Community Air Monitoring Plan: https://www.baaqmd.gov/community-health/community-health-protection-program/richmond-area-community-health-protection-program/community-air-monitoring

important to note that many common in-community sources, such as industrial facilities, smaller businesses, trains, and vehicles on roads contribute to $PM_{2.5}$ concentrations year-round and can be responsible for shorter-duration periods of higher concentrations of $PM_{2.5}$ in specific places. At times, higher $PM_{2.5}$ concentrations are observed only at one or a few nearby sensors, indicating a local contribution to $PM_{2.5}$ that may not be captured by long-term monitoring networks with less spatial density. More examples of insights from the Groundwork Richmond/Ramboll sensor network data can be found in Chapter 7 of this document and in the CAMP quarterly monitoring updates.

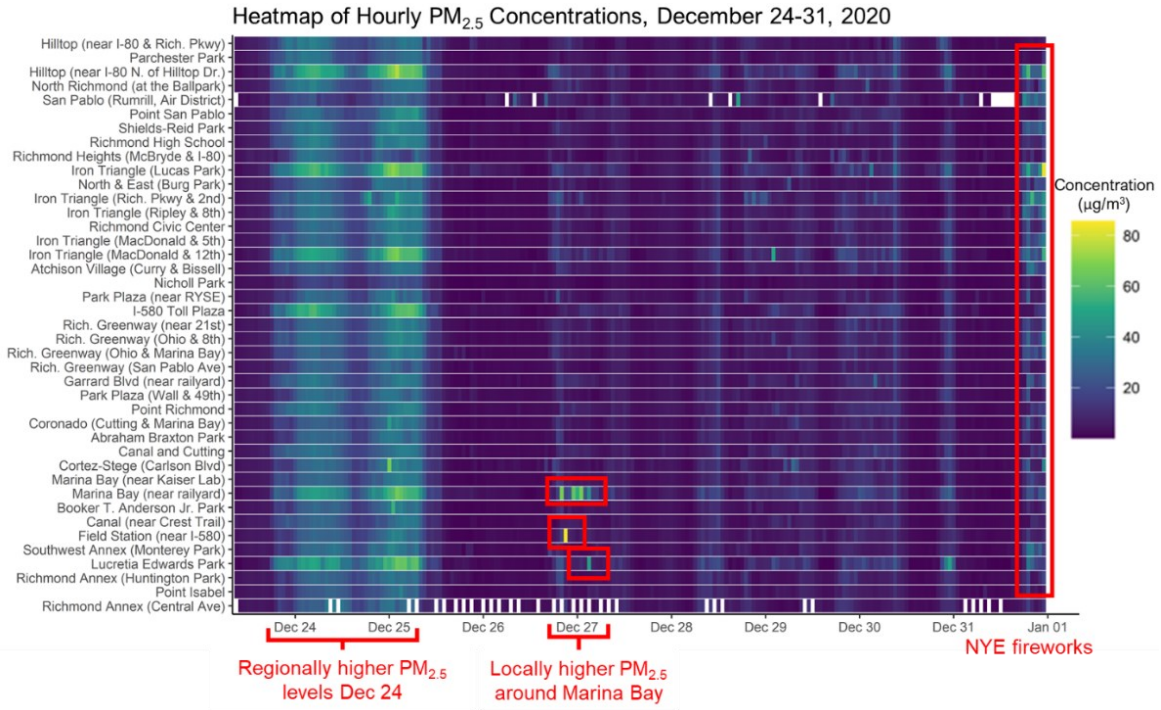


Figure 5-9. $PM_{2.5}$ concentrations measured across a network of lower-cost sensors operated by Groundwork Richmond/Ramboll, and at the Air District's San Pablo monitoring site.

Data from another sensor network project in the CAMP, operated by Physicians, Scientists, and Engineers for Healthy Energy (PSE) and the Asian Pacific Environmental Network (APEN), highlighted variability in several pollutants (including $PM_{2.5}$, NO_2, and black carbon) and impacts of pollution from traffic, among additional key findings.[26] This project also consisted of about 50 air quality sensors located across the PTCA area.

Mobile monitoring (collecting air quality data from moving vehicles) can also provide information on spatial variability in different air pollutants. Aclima conducted a mobile monitoring project from August-October 2019 and collected data for several pollutants along repeated drives throughout the PTCA area.[27] Data from that project showed higher concentrations of NO_2 and CO near busy roadways, which are pollutants commonly associated with traffic, as well as areas of higher $PM_{2.5}$ around Parchester Village, North Richmond, and the I-580 corridor and Harbor areas (Figure 5-10). Many of these locations are at the interface

[26] PSE website for the Richmond Air Monitoring Network and Final Report: https://www.psehealthyenergy.org/our-work/programs/environmental-health/richmond/
[27] Aclima's Richmond-San Pablo $PM_{2.5}$ Hotspot Report: https://rspreport.aclima.tools/

between industrial and residential areas, highlighting the potential increased air pollution burden and exposure in these locations.

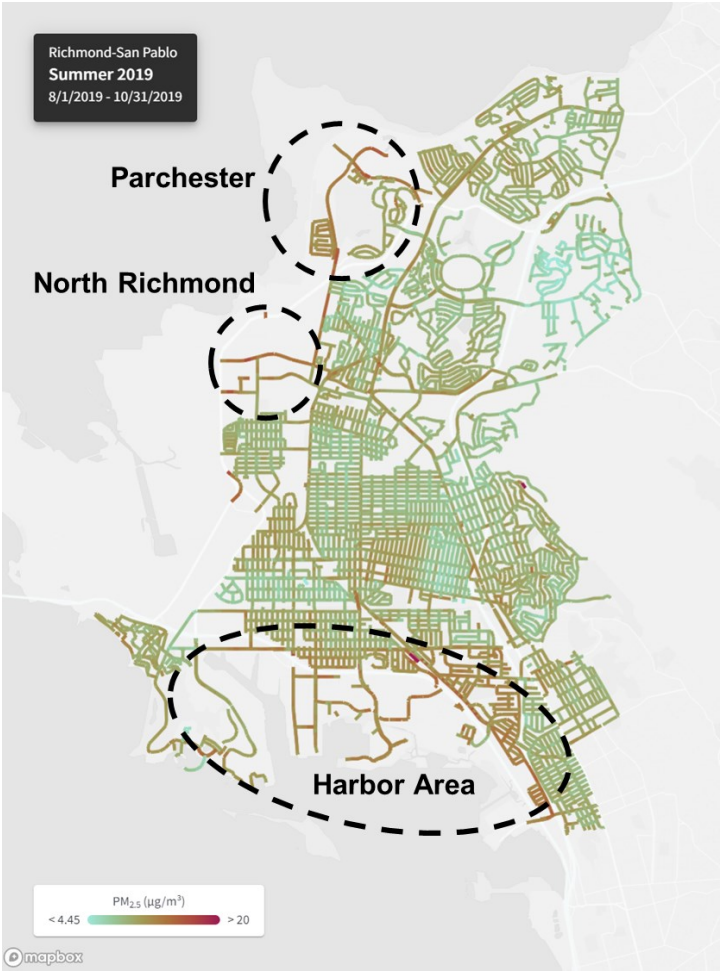


Figure 5-10. Screenshot from Aclima's Richmond-San Pablo $PM_{2.5}$ Report, annotated with areas where higher levels of $PM_{2.5}$ were found. Air monitoring for this specific project was conducted from August to October 2019.

Trends and Variability in Air Toxics Data

The Air District measures selected volatile organic compounds (VOCs), many of which are TACs, at its San Pablo (Rumrill Blvd.) and Richmond (7th St. and Hensley St.) monitoring sites. These VOCs are measured by collecting air into a canister over 24 hours, and the collected samples are then analyzed at the Air District's laboratory. VOC samples are collected at these monitoring sites every twelfth day.[28] VOCs can come from many kinds of facilities, operations, processes, and consumer products. Some sources of VOCs in outdoor air include:

- Combustion of fuels (like gasoline, diesel, wood, coal, and cooking oils)
- Evaporation (vapors) from certain products, such as gasoline, paints, solvents, and cleaners
- Oil and gas refining, processing, transport, and storage
- Landfills, scrapyards, and water treatment facilities

- Smoke from wildfires, agricultural fires, and prescribed fires

Table 5-4 lists the maximums, minimums, and averages of the VOC samples as measured at the San Pablo and Richmond monitoring sites from 2016-2020 in comparison to measurements across all Air District monitoring sites. In general, concentrations of most measured VOCs were higher at the San Pablo monitoring site compared to the Richmond monitoring site. Some of the higher measured concentrations were during recent periods of wildfire smoke. Average concentrations of several compounds were also higher at the San Pablo monitoring site compared to the network-wide average, including benzene, toluene, ethylbenzene, and xylenes (BTEX compounds), possibly indicating greater emissions of BTEX locally. The San Pablo monitoring site also reported the highest 24-hour concentrations of toluene, o-xylene, and ethylene dichloride across the Air District's network for the 2016-2020 period.

Table 5-4. Maximum, minimum, and 5-year average VOC concentrations measured at the San Pablo **(SP)** and Richmond-7th Street **(Rich.)** air monitoring sites in comparison to all Air District monitoring sites **(Network)** from 2016-2020. 5-year averages for a VOC that were higher than the network-wide average are in blue. Maximum individual samples that were the highest across the network in the five years are in red. Underlined concentrations denote values that are below the method detection limit (MDL).

Volatile Organic Compound (VOC)	SP 5-yr avg.	SP Max	SP Min	Rich. 5-yr avg.	Rich. Max	Rich. Min	Network 5-yr avg.	Network Max	Network Min
Acetone	**5.33**	15.10	1.78	**5.29**	59.97	1.11	4.96	71.52	0.03
Acetonitrile	0.03	1.01	0.00	0.02	1.05	0.00	0.04	18.86	0.00
Acrylonitrile	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.32	0.01
1,3-Butadiene	0.01	0.11	0.00	0.01	0.13	0.00	0.01	0.54	0.00
Benzene	**0.20**	1.46	0.00	0.14	1.37	0.00	0.19	3.12	0.00
Carbon tetrachloride	0.10	0.13	0.08	0.10	0.13	0.08	0.10	0.16	0.07
Chloroform	0.01	0.05	0.00	0.01	0.05	0.00	0.02	0.38	0.00
Dichloromethane	**0.12**	5.75	0.01	0.09	0.95	0.01	0.09	5.75	0.01
Ethyl alcohol	2.23	8.20	0.35	1.74	12.32	0.24	4.09	119.64	0.02
Ethylbenzene	**0.13**	1.14	0.00	0.07	0.34	0.00	0.09	1.20	0.00
Ethylene dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene dichloride	0.00	**0.02**	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Freon-113	0.07	0.08	0.05	0.07	0.08	0.05	0.07	0.24	0.04
Methyl chloroform	0.00	0.02	0.00	0.00	0.00	0.00	0.01	1.27	0.00
Methyl ethyl ketone	0.22	0.74	0.01	0.20	0.79	0.01	0.25	5.74	0.01
Tetrachloroethylene	0.00	0.05	0.00	0.00	0.04	0.00	0.00	0.34	0.00
Toluene	**0.59**	**3.93**	0.01	0.34	1.23	0.01	0.42	3.93	0.01
Trichloroethylene	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.38	0.00
Trichlorofluoromethane	0.23	0.28	0.17	0.23	0.30	0.19	0.24	0.67	0.16
Vinyl chloride	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.04	0.00
m/p-Xylene	**0.29**	2.93	0.01	0.16	0.90	0.01	0.21	3.15	0.01
o-Xylene	**0.13**	**1.45**	0.01	0.06	0.32	0.01	0.08	1.45	0.00

Benzene, a carcinogen, is a TAC of particular concern due to its known health impacts even at relatively low concentrations. Most of the measured benzene concentrations have been below 0.5 ppb across the network, which is below OEHHA's chronic reference exposure level for benzene of 1 ppb (Figure 5-11). Most of the measurements above 1 ppb occurred during periods of wildfire smoke. Some monitoring sites, including San Pablo, have recorded instances of relatively higher benzene concentrations (over 0.5 ppb) outside of periods of wildfire smoke, possibly indicating local emissions of benzene.

Several monitoring sites, including San Pablo, recorded more occurrences of relatively higher toluene concentrations compared to other sites in the network (Figure 5-12). In fact, the highest 24-hour concentration of toluene measured throughout the network from 2016-2020 was at the San Pablo site, and that measurement was not during a wildfire smoke period. This may indicate greater emissions of toluene from local sources near the San Pablo monitoring site. While benzene and toluene share similar sources, toluene is now often used as a replacement for benzene in certain products, such as solvents. Although some of toluene concentrations measured at the San Pablo site were higher than in other typical urban areas, they were well below OEHHA's chronic and acute reference exposure levels (RELs) of 110 ppb and 1300 ppb, respectively.

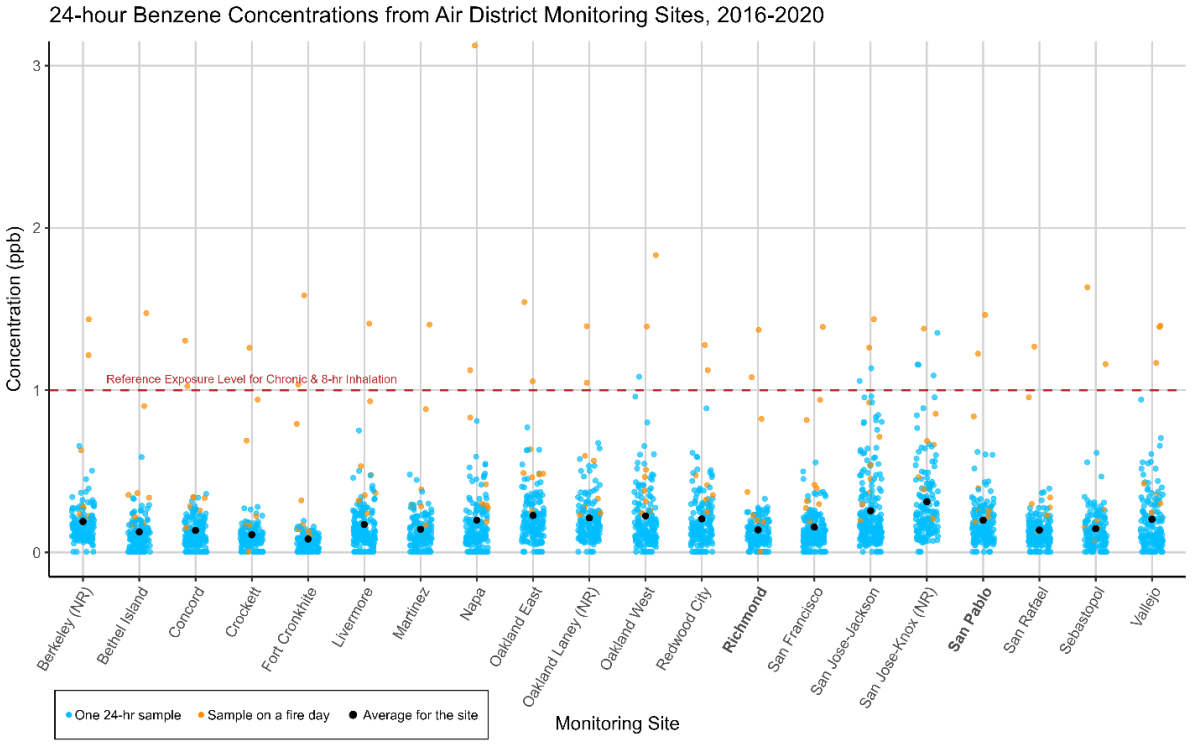


Figure 5-11. 24-hour benzene concentrations at Air District monitoring sites, 2016-2020. Each blue or red dot represents an individual 24-hour measurement, where orange dots indicate measurements during wildfire smoke periods. The larger black dot indicates the 5-year average concentration.

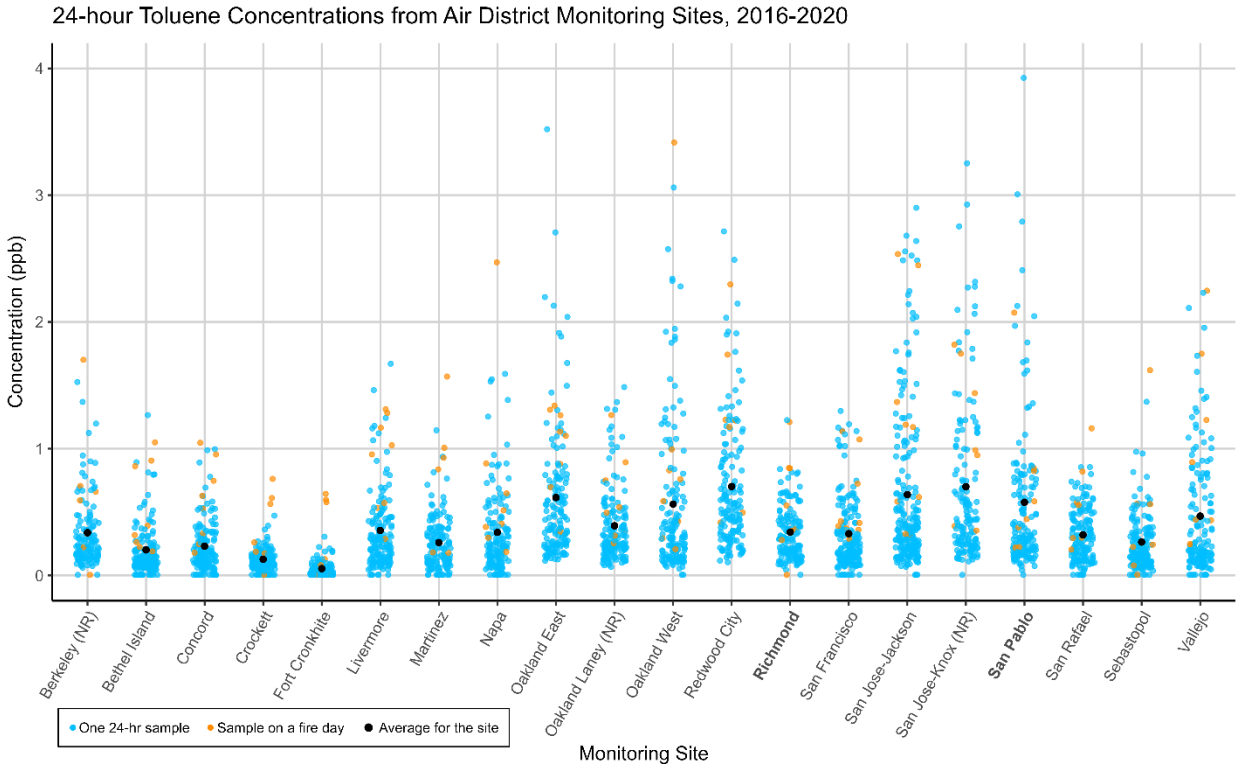


Figure 5-12. 24-hour toluene concentrations at Air District monitoring sites, 2016-2020. Each blue or red dot represents an individual 24-hour measurement, where orange dots indicate measurements during wildfire smoke periods. The larger black dot indicates the 5-year average concentration.

Annual average concentrations of several monitored VOCs have decreased (improved) since routine monitoring began at Air District long-term air monitoring sites, but those decreases in concentrations have leveled off in recent years. Figure 5-13 and Figure 5-14 show annual average concentrations of benzene and toluene, respectively, at the San Pablo, Richmond, and Vallejo monitoring sites. Vallejo is shown for reference since that monitoring site has a longer data record, and until the early 1990s reported annual average benzene concentrations above 1.0 ppb, which is the REL for chronic and 8-hour inhalation of benzene. After considerable decreases (improvements) in annual average benzene and toluene concentrations from the 1980s to early 2000s, concentrations have generally remained steady for the most recent decade.

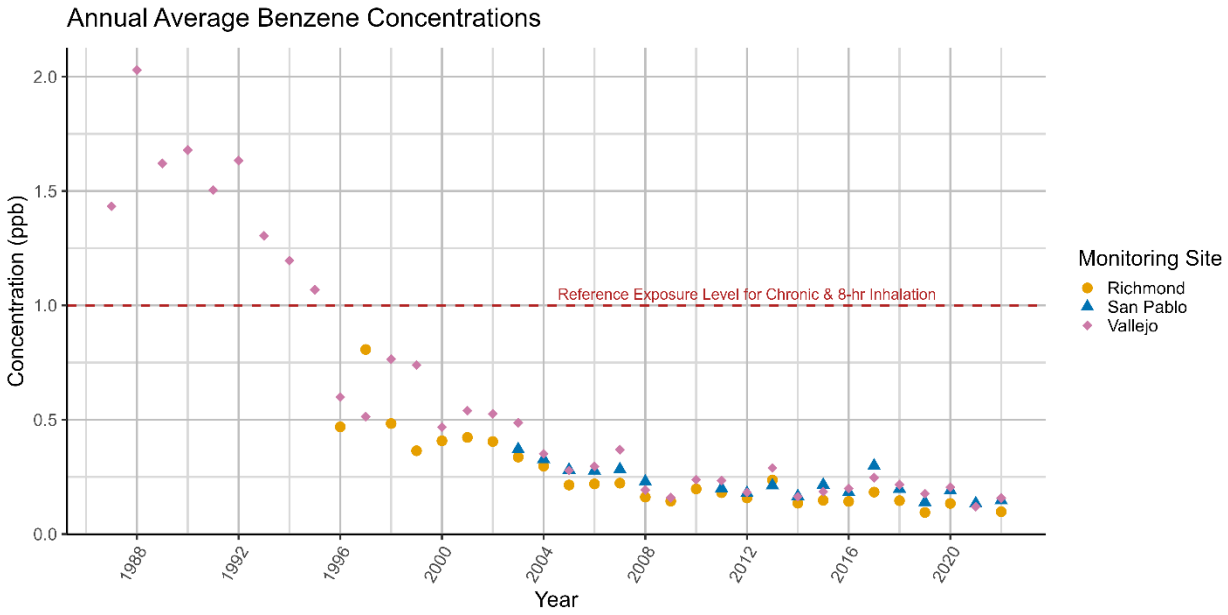


Figure 5-13. Annual average benzene concentrations at selected Air District monitoring sites. Data for the year 2021 are unavailable at the Richmond-7th Street monitoring site due to pandemic-related site access restrictions. Note that the monitoring sites have different periods of record; the first years with complete data for the Richmond and San Pablo air monitoring sites were 1996 and 2003, respectively.

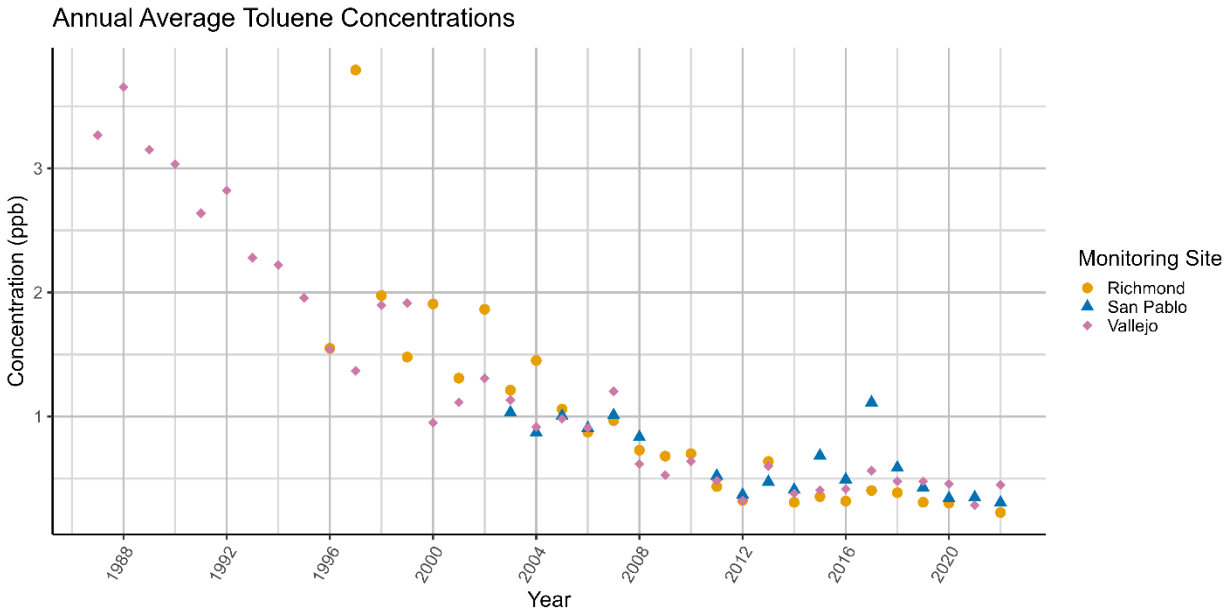


Figure 5-14. Annual average toluene concentrations at selected Air District monitoring sites. Data for the year 2021 are unavailable at the Richmond-7th Street monitoring site due to pandemic-related site access restrictions. Note that the monitoring sites have different periods of record; the first years with complete data for the Richmond and San Pablo air monitoring sites were 1996 and 2003, respectively.

One of the projects included in the PTCA CAMP was an air toxics monitoring project conducted using the Air District's air monitoring van. The primary purpose of this project was to screen areas selected by the CAMP's Community Steering Committee for certain VOCs and identify locations with higher levels of those VOCs that may be opportunities for reducing pollution emissions and

exposure (Figure 5-15). This project found numerous occurrences of higher than typical levels of different VOCs. Figure 5-16 shows instantaneous (1-second) measurements of benzene by drive date and target monitoring area. While most of the measurements were relatively low, there were several occurrences of higher benzene levels on different dates and in different areas. Instantaneous measurements are not directly comparable to health metrics for acute exposures, as those metrics are based on 1-hour exposure periods; however, these short-duration observations of higher VOC levels can still point to air quality issues that warrant actions to reduce pollution emissions and exposure. Examples of occurrences of higher VOC levels that may be associated with certain facilities and operations are described in Appendix D: Air Monitoring.

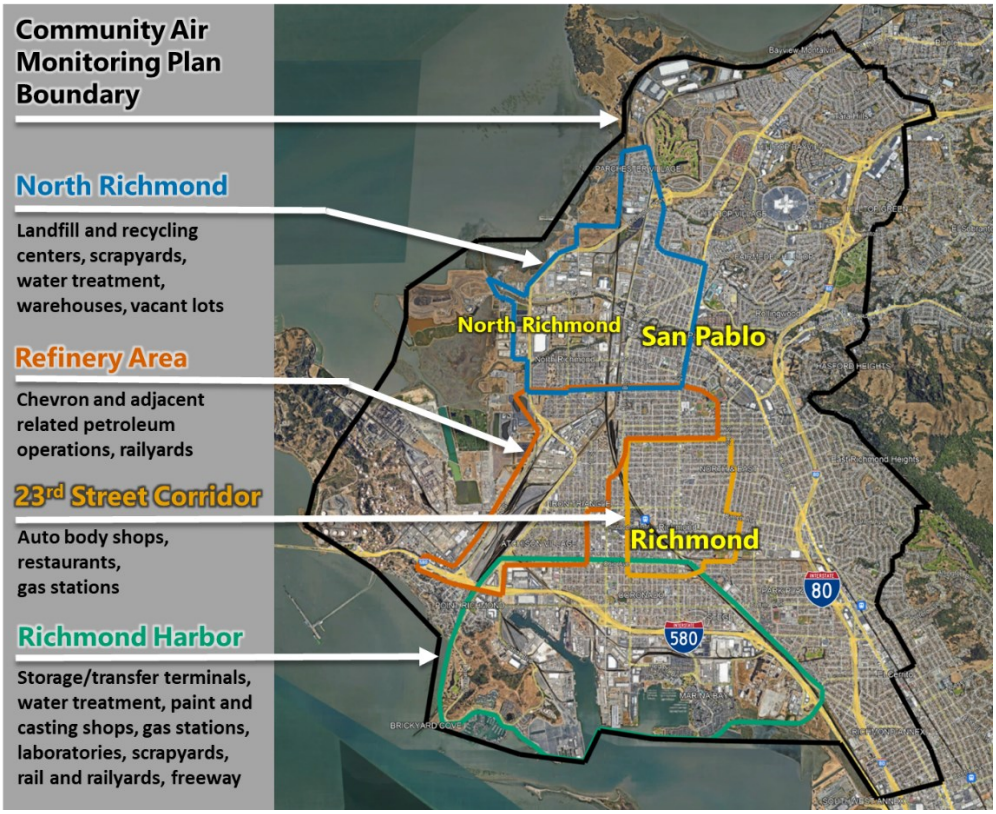


Figure 5-15. Map of the target monitoring areas for the PTCA CAMP air toxics monitoring study.

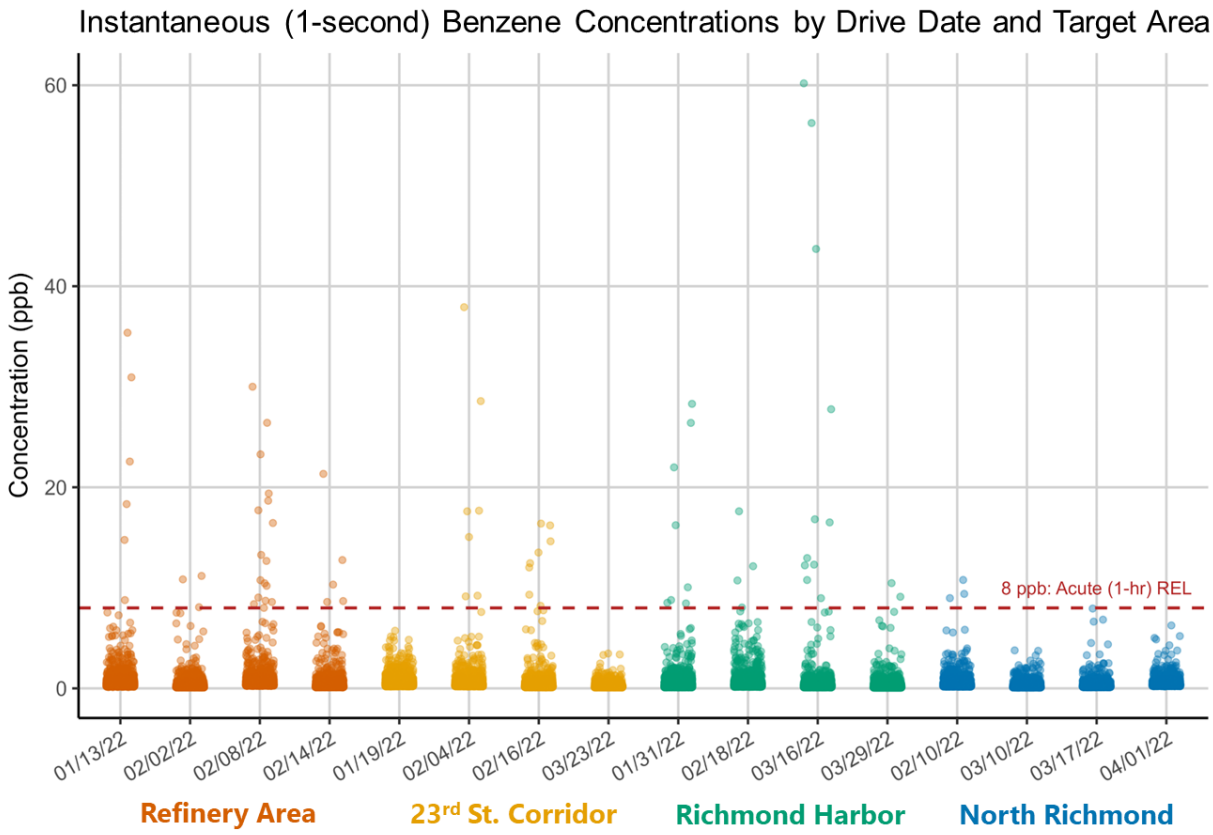


Figure 5-16. Benzene concentrations by drive date and target area, as measured during the air toxics monitoring study. Each dot represents a 1-second benzene measurement. The acute (1-hour) REL is shown for reference, but note that 1-second measurement data is not directly comparable to the acute REL.

Emissions Inventory Development

For the PTCA technical assessment, a baseline emissions inventory was developed for the year 2019 that included the two main categories of air pollutants – criteria air pollutants (CAPs) and toxic air contaminants (TACs) – as well as toxicity-weighted emissions (TWE) information. As discussed in the section below on TACs, toxicity weighting provides a useful means of accounting for the relative toxicity of the different TACs in an inventory, which is important because individual TACs have different toxicity levels and health effects. By converting mass-based emissions into TWE, it is easier to determine which TACs and sources may be of most concern.[29] This inventory covered stationary sources (e.g., permitted facilities) and mobile sources (e.g., ships, cars, and trucks) operating in and around the PTCA area (see Figure 5-17 for locations of permitted sources and roadways included in the inventory). Importantly, the emissions inventory development and exposure assessment described in this chapter relate to direct emissions from local sources only and do not address pollution that is transported from outside the community and/or formed through secondary processes in the atmosphere. For the Chevron refinery, the baseline 2019 inventory was supplemented with an updated 2021 inventory that includes recent test data and other information. This section summarizes the 2019

[29] Note that TWE do not quantify health risks, which requires additional information on pollutant concentrations and human exposures.

baseline inventory, with more detailed information provided in Appendix C, including an overview of updates to the Chevron inventory.

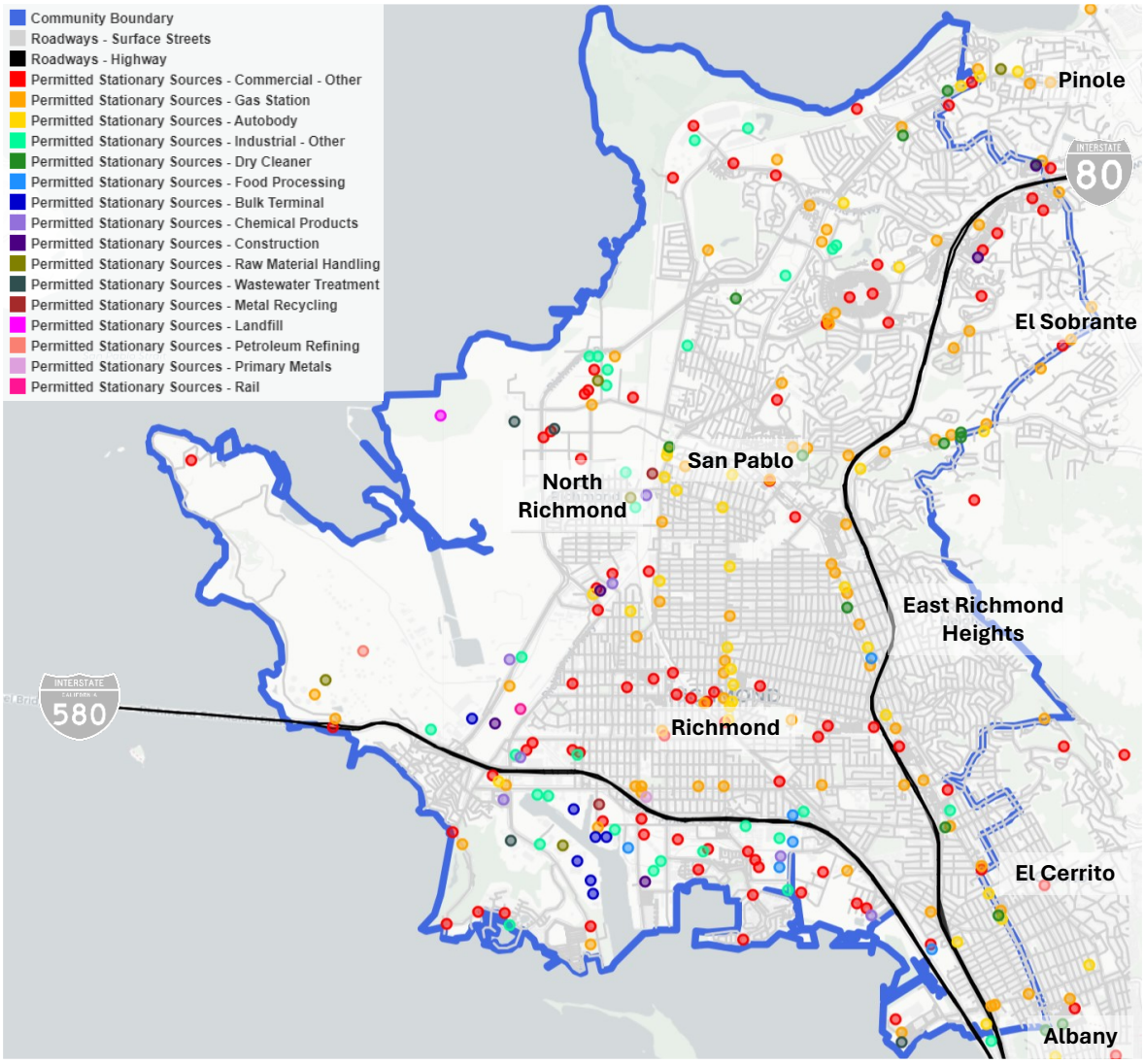


Figure 5-17. Map of permitted sources and roadways included in the PTCA emissions inventory. Note that the inventory includes some sources located outside the community boundary that are likely to impact air quality within the community.

Note that the 2019 emissions estimates were organized around the six community concerns described in Chapter 2. Table 5-5 lists these community concerns and the sources associated with each of them. Analysis of emissions and modeling results focused on the first four concerns in Table 5-5: fuel refining, commercial and industrial sources near communities, vehicles and trucks, and marine and rail operations. The remaining concerns are focused on issues not directly, or not comprehensively, addressed by emissions inventory development and modeling (e.g., odors and smells, wildfire smoke, accessible health data).

Table 5-5. Community concerns and associated emissions sources.

Community Concern	Sources Included in Emissions Inventory
Fuel Refining, Support Facilities, Storage, and Distribution	Chevron Richmond Refinery Chemtrade Kinder Morgan Liquids Terminals Phillips 66 Marine (Bulk) Terminal TransMontaigne IMTT Richmond Products Terminal Qualawash Holdings LLC Gas Stations
Commercial and Industrial Sources Near Communities	Permitted sources not included under *Fuel Refining* (e.g., Levin Terminal, autobody shops, food processing facilities, aggregate facilities) Construction activities Restaurants Fugitive dust from vacant lots and other unstable surfaces)
Vehicles and Trucks, Streets and Freeways, and Logistics	Cars and trucks operating on freeways and surface streets (including road dust) Warehouses and truck-related businesses Diesel truck idling and congestion
Marine and Rail	Ocean going vessels Harbor craft (e.g., tugs) Ferries Cargo handling equipment Railyards Rail lines
Odors and Smells[a]	Fuel Refining City of Richmond Wastewater Treatment Plant West Contra Costa County Landfill AAK Oil Others (e.g., cannabis growing and processing, site remediation)
Addressing Public Health and Reducing Exposure	Wildfire smoke Residential wood smoke Accessible health data Sensitive receptor sites Incompatible land use development

[a] Note that "Odors and Smells" did not end up being a separate category for which strategies were developed.

Criteria Air Pollutant Emissions

Table 5-6 summarizes emissions of nitrogen oxides (NO_x), total organic gases (TOG), reactive organic gases (ROG), sulfur oxides (SO_x), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or

equal to 2.5 microns ($PM_{2.5}$), carbon monoxide (CO), and ammonia (NH_3)[30]. Note that some of these pollutant designations refer to classes of compounds. For example, ROG consists of organic compounds assumed to be reactive at urban scales, including toxic species such as benzene. These pollutants are either criteria air pollutants (CAPs) or species that serve as precursors to the formation of CAPs in the atmosphere. This table shows that fuel refining is a significant source of CAPs in the PTCA area, emitting more than half the SO_x and $PM_{2.5}$ emissions from sources in the PTCA emissions inventory. $PM_{2.5}$ is of particular concern in the community, as this pollutant is known to have health effects at concentration levels below the NAAQS. The Chevron Refinery alone accounts for 63% of local $PM_{2.5}$ emissions, with key $PM_{2.5}$ sources at Chevron including the fluidized catalytic cracking unit, cogeneration, and cooling towers (see Table 5-7, which is a detailed breakout of the "Permitted Fuel Refining Sources" row in Table 5-6).

Sources in the Vehicles & Trucks area of concern account for about 7% of the $PM_{2.5}$ emissions in the 2019 inventory, with road dust emissions emerging as the most significant source in this area of concern. Road dust accounts for 65% of $PM_{2.5}$ emissions from on-road mobile sources in the study area, which reflects recent trends showing that sharp reductions in tailpipe emissions have increased the relative influence of non-exhaust processes (such as road dust and brake wear) with respect to total on-road emissions.

[30] Note that NH_3 is also an air toxic, so its emissions are accounted for in the calculation of toxicity-weighted TAC emissions presented in the section that follows.

Table 5-6. Criteria pollutant emissions from all sources in the PTCA community (units = tons/year).

Emissions Source	NO_x	TOG	ROG	SO_x	PM_{10}	$PM_{2.5}$	CO	NH_3
Permitted Fuel Refining Sources	500.1	635.8	504.4	483.8	498.3	476.5	210.7	56.0
Marine & Rail	1,167.0	92.8	81.0	41.6	28.3	26.7	391.4	0.8
- OGV Berthing – Chevron	*161.7*	*9.4*	*7.9*	*21.4*	*6.2*	*6.0*	*15.7*	*0.2*
- OGV Berthing – Phillips 66	*9.0*	*0.5*	*0.4*	*1.2*	*0.3*	*0.3*	*0.9*	*<0.1*
- OGV Berthing – IMTT	*5.0*	*0.3*	*0.2*	*0.7*	*0.2*	*0.2*	*0.5*	*<0.1*
- Other OGV	*412.1*	*27.7*	*24.1*	*18.0*	*6.2*	*5.9*	*32.5*	*0.4*
- Ferries	*122.9*	*17.4*	*15.3*	*<0.1*	*3.3*	*3.1*	*106.8*	
- Commercial Harbor Craft	*259.4*	*32.2*	*28.3*	*<0.1*	*8.3*	*7.9*	*182.7*	
- Cargo Handling Equipment	*5.7*	*0.8*	*0.7*	*<0.1*	*0.1*	*<0.1*	*4.1*	*<0.1*
- Railyards	*44.4*	*0.6*	*0.6*	*<0.1*	*1.2*	*0.9*	*9.7*	*<0.1*
- Rail lines	*146.8*	*3.9*	*3.4*	*0.2*	*2.6*	*2.4*	*38.5*	*0.1*
Industrial & Commercial Sources	73.9	2,473.9	466.7	7.8	241.7	107.2	402.0	6.7
- Permitted (non-refining)	*66.6*	*2,158.6*	*227.8*	*5.0*	*59.8*	*26.3*	*84.0*	*6.7*
- Restaurants		*1.1*	*0.4*		*12.0*	*12.0*		
- Construction (non-mobile)[a]		*199.6*	*186.4*		*109.7*	*11.0*		
- Residential wood combustion	*7.4*	*114.7*	*52.1*	*2.8*	*60.2*	*57.9*	*317.9*	
Vehicles & Trucks	635.3	421.1	383.5	6.3	261.8	52.2	3,166.3	46.3
- Trucks	*472.8*	*197.4*	*179.5*	*3.5*	*22.3*	*12.0*	*1,451.5*	*26.5*
- Light Duty Passenger Vehicles	*108.0*	*161.3*	*148.0*	*2.7*	*12.9*	*5.4*	*1,370.9*	*19.5*
- Buses	*10.9*	*1.4*	*1.2*	*<0.1*	*0.4*	*0.2*	*9.4*	*0.1*
- Motor Homes	*2.5*	*1.0*	*1.0*	*<0.1*	*0.2*	*0.1*	*3.3*	*0.1*
- Motorcycles	*12.2*	*56.6*	*50.8*	*<0.1*	*0.2*	*0.1*	*295.0*	*0.1*
- Road Dust					*225.2*	*33.7*		
- Transportation Refrigeration Units	*28.8*	*3.4*	*3.0*	*<0.1*	*0.7*	*0.7*	*36.2*	*<0.1*
Misc. Sources	605.2	2,385.3	1,398.0	47.7	104.6	93.2	3,595.3	133.4
- Offroad Equipment	*179.1*	*181.2*	*169.4*	*0.4*	*15.0*	*14.3*	*2,209.9*	*0.4*
- Recreational Boats	*76.0*	*246.9*	*227.8*	*0.1*	*15.1*	*14.4*	*1,092.3*	*0.2*
- Fuel Combustion (non-permitted)	*318.5*	*95.6*	*42.8*	*5.9*	*55.6*	*55.5*	*241.1*	*<0.1*
- Other	*31.7*	*1,861.6*	*958.0*	*41.4*	*18.8*	*8.9*	*52.1*	*132.8*
Total – All Sources	**2,981.5**	**6,008.9**	**2,833.5**	**587.2**	**1,134.6**	**755.8**	**7,765.8**	**243.1**

[a]The non-mobile portion of construction emissions refers to fugitive dust generated by construction activities. Construction equipment emissions are included under the "Offroad Equipment" subcategory.

Table 5-7. Criteria pollutant emissions from permitted fuel refining sources (units = tons/year).

Process Type	NO_x	TOG	ROG	SO_x	PM_{10}	$PM_{2.5}$	CO	NH_3
Chevron Refinery	485.04	399.28	310.83	322.08	494.73	473.01	206.86	55.96
- Backup Generator (BUG)	1.63	0.04	0.04	<0.01	0.11	0.10	0.36	
- Barge Loading					0.13	0.12		
- Boilers/Process Heaters	300.21	37.11	26.48	43.05	54.18	54.18	172.42	14.63
- Fluidized Catalytic Cracking Unit	101.96	7.72	4.94	200.46	241.98	228.61	28.84	40.44
- Coating and Cleanup		0.01	0.01					
- Cogeneration	33.47	15.36	1.43	4.16	91.36	91.17	0.63	
- Cooling Towers		6.13	6.13		83.91	76.34		
- Fugitives	0.02	86.09	55.65				0.07	0.15
- Gasoline Dispensing		0.18	0.18					
- Generators	0.66	0.06	0.05	<0.01	0.01	0.01	0.11	
- Other	8.44	53.69	44.13	0.30	1.02	0.75	3.20	
- Storage Tanks		119.43	114.67	0.10	0.20	0.12		0.69
- Sulfur Plants	28.83	0.20	0.17	68.09	19.76	19.54		
- Tank Cars and Trucks – Working Losses		29.21	29.21			0.00		
- Tanker Loading					0.71	0.68		
- Vacuum Distillation		0.02	0.02					
- Vapor Recovery/Flares	9.82	30.70	15.00	5.92	1.36	1.36	1.23	
- Wastewater Treatment		13.32	12.71					0.05
Other Permitted Sources	15.08	236.51	193.56	161.71	3.54	3.49	3.86	
- Chemtrade West	2.05	0.13	0.06	161.65	2.88	2.85	0.68	
- Richmond Products Terminal	0.04	12.80	12.80	<0.01	<0.01	<0.01	0.01	
- Phillips 66 Company	<0.01	178.19	138.31	<0.01	0.34	0.32	0.01	
- TransMontaigne	3.50	6.85	5.75	0.01	0.08	0.08	0.87	
- IMTT Richmond CA	0.48	1.06	1.02	0.01	0.04	0.04	0.14	
- Kinder Morgan	8.88	14.07	12.26	0.04	0.20	0.20	2.12	
- Qualawash Holdings LLC	0.13	0.37	0.31	<0.01	<0.01	<0.01	0.02	
- Gas Stations		23.04	23.04					
Permitted Fuel Refining Total	**500.12**	**635.79**	**504.39**	**483.79**	**498.26**	**476.50**	**210.72**	**55.96**

Toxic Air Contaminants

The 2019 inventory for the PTCA area includes emissions estimates for 158 TACs. Because these compounds have different toxicity levels and health effects, toxicity-weighted emissions (TWE) were also calculated in two ways. For TACs listed as carcinogens, the mass emissions for each TAC were multiplied by cancer potency factors from the Office of Environmental Health Hazard Assessment (OEHHA), and then summed. For TACs listed as causing other kinds of health impacts, emissions were divided by chronic reference exposure levels (RELs), and then summed.[31] For some TACs, both kinds of TWE were calculated. The resulting TWE provide a useful

[31] Note that one or more of the OEHHA health values were available for 96 of the 158 TACs in the PTCA inventory. Emissions for the remaining compounds could not be included in the TWE calculations.

means of comparing the relative toxicity of TACs in an inventory; however, TWE do not quantify health risks, which also require the consideration of how many people are exposed, for how long, and at what levels (concentrations).

Table 5-8 summarizes cancer and chronic TWE for sources in the study area. This table shows that permitted fuel refining sources[32] account for about 52% of total chronic TWE and about 11% of total cancer TWE in the PTCA community. Mobile sources (Marine & Rail + Vehicles & Trucks) account for about 61% of total cancer TWE; however, it should be noted that some vessel emissions are attributable to Chevron and other fuel refining facilities. When those emissions are considered, fuel refining accounts for about 15% of total cancer TWE and about 55% of total chronic TWE in the PTCA community.

Table 5-8. Cancer and chronic TWE from all sources in the PTCA community.

Emissions Source	Cancer TWE		Chronic TWE	
	Value	%Contribution	Value	%Contribution
Permitted Fuel Refining Sources	23,598.9	10.5%	1,531.0	51.9%
Marine & Rail	99,005.8	44.1%	248.2	8.4%
- OGV Berthing – Chevron	*8,884.7*	*4.0%*	*78.4*	*2.7%*
- OGV Berthing – Phillips 66	*495.3*	*0.2%*	*4.4*	*0.1%*
- OGV Berthing – IMTT	*272.3*	*0.1%*	*2.4*	*0.1%*
- Other OGV	*19,528.7*	*8.7%*	*59.3*	*2.0%*
- Ferries	*15,220.7*	*6.8%*	*22.6*	*0.8%*
- Commercial Harbor Craft	*38,490.9*	*17.1%*	*57.1*	*1.9%*
- Cargo Handling Equipment	*241.9*	*0.1%*	*0.4*	*0.0%*
- Railyards	*4,035.1*	*1.8%*	*6.2*	*0.2%*
- Rail lines	*11,836.3*	*5.3%*	*17.5*	*0.6%*
Industrial & Commercial Sources	4,403.8	2.0%	131.9	4.5%
- Permitted Sources (non-refining)	*1,258.4*	*0.6%*	*19.8*	*0.7%*
- Restaurants	*38.3*	*0.0%*	*2.1*	*0.1%*
- Construction (non-mobile)	*2,417.1*	*1.1%*	*88.7*	*3.0%*
- Residential wood combustion	*690.0*	*0.3%*	*21.3*	*0.7%*
Vehicles & Trucks	37,945.8	16.9%	325.9	11.0%
- Trucks	*29,067.9*	*13.0%*	*130.6*	*4.4%*
- Light Duty Passenger Vehicles	*4,325.2*	*1.9%*	*76.1*	*2.6%*
- Buses	*649.1*	*0.3%*	*1.7*	*0.1%*
- Motor Homes	*280.7*	*0.1%*	*0.8*	*0.0%*
- Motorcycles	*1,565.5*	*0.7%*	*32.2*	*1.1%*
- Road Dust	*792.7*	*0.4%*	*82.7*	*2.8%*
- Transportation Refrigeration Units	*1,264.7*	*0.6%*	*1.9*	*0.1%*
Misc. Sources	59,500.0	26.5%	714.0	24.2%
- Offroad Equipment (Construction, etc.)	*36,857.0*	*16.4%*	*163.5*	*5.5%*
- Recreational Boats	*10,317.8*	*4.6%*	*231.2*	*7.8%*
- Fuel Combustion (non-permitted)	*4,871.8*	*2.2%*	*135.4*	*4.6%*
- Other	*7,453.3*	*3.3%*	*183.9*	*6.2%*

[32] Individual sources associated with fuel refining are listed in Tables 5-5 and 5-9.

Emissions Source	Cancer TWE		Chronic TWE	
	Value	%Contribution	Value	%Contribution
Total (All Sources)	**224,454.3**	**100.0%**	**2,951.0**	**100.0%**

Table 5-9 provides a breakdown of cancer and chronic TWE from permitted fuel refining sources, with Chevron emissions shown by process type. The data in Table 5-9 show that Chevron accounts for about 96% of chronic TWE and 99% of cancer TWE from permitted fuel refining sources. Furthermore, four process types at Chevron (the fluidized catalytic cracking unit, boilers/process heaters, cogeneration, and the sulfur plant) account for 92% of chronic TWE and 87% of cancer TWE from permitted fuel refining sources. It should also be noted that the Chemtrade facility accounts for 4% of chronic TWE from permitted fuel refining sources.

Table 5-9. Cancer and chronic TWE from permitted fuel refining sources.

Emissions Source	Cancer TWE		Chronic TWE	
	Value	%Contribution	Value	%Contribution
Chevron Refinery	23,465.71	99.44%	1,464.10	95.63%
- Fluidized Catalytic Cracking Unit	*1,064.00*	*4.51%*	*592.81*	*38.72%*
- Boilers/Process Heaters	*18,728.09*	*79.36%*	*144.98*	*9.47%*
- Cogeneration	*722.86*	*3.06%*	*469.47*	*30.66%*
- Sulfur Plants			*195.35*	*12.76%*
- Vapor Recover/Flares	*1,064.79*	*4.51%*	*21.92*	*1.43%*
- Fugitives	*231.91*	*0.98%*	*15.02*	*0.98%*
- Storage Tanks	*633.95*	*2.69%*	*12.53*	*0.82%*
- Wastewater Treatment	*82.67*	*0.35%*	*5.15*	*0.34%*
- Other	*153.03*	*0.65%*	*4.25*	*0.28%*
- Backup Generators (BUG)	*507.60*	*2.15%*	*0.75*	*0.05%*
- Coating AND Cleanup	*0.75*	*<0.01%*	*0.61*	*0.04%*
- Barge Loading	*12.30*	*0.05%*	*0.42*	*0.03%*
- Cooling Towers	*214.68*	*0.91%*	*0.35*	*0.02%*
- Tank Cars and Trucks – Working Losses	*10.46*	*0.04%*	*0.27*	*0.02%*
- Storage/Transport Container Cleaning	*4.33*	*0.02%*	*0.15*	*0.01%*
- Generators	*34.24*	*0.15%*	*0.05*	*<0.01%*
- Surface Blasting	*0.05*	*<0.01%*	*0.01*	*<0.01%*
- Gasoline Dispensing	*<0.01*	*<0.01%*	*<0.01*	*<0.01%*
- Tanker Loading			*<0.01*	*<0.01%*
Other Permitted Sources	133.24	0.56%	66.92	4.37%
- Chemtrade West	*11.12*	*0.05%*	*64.40*	*4.21%*
- Richmond Products Terminal	*17.40*	*0.07%*	*0.36*	*0.02%*
- Phillips 66 Company	*10.87*	*0.05%*	*0.24*	*0.02%*
- TransMontaigne Operating Company LP	*11.87*	*0.05%*	*0.23*	*0.02%*
- IMTT Richmond CA	*17.77*	*0.08%*	*0.09*	*0.01%*
- Kinder Morgan Liquids Terminals, LLC	*0.98*	*<0.01%*	*0.04*	*<0.01%*
- Qualawash Holdings LLC	*0.02*	*<0.01%*	*<0.01*	*<0.01%*
- Gas Stations (Retail and Non-Retail)	*63.22*	*0.27%*	*1.57*	*0.10%*
Permitted Fuel Refining Total	**23,598.94**	**100.00%**	**1,531.02**	**100.00%**

Tables 5-10 and 5-11 provide information on individual TACs that contribute significantly to cancer and/or chronic TWE in the PTCA community. These tables include emissions data for 12 TACs that, when combined, account for 97% of the cancer TWE and 93% of the chronic TWE at Chevron, and 96% of the cancer TWE and 92% of the chronic TWE among all local sources combined.[33] The data shown in these tables reflect the raw mass of emissions in lbs/year, with no weighting factors applied. However, in the last two rows (shown in beige), total emissions for each TAC have been toxicity weighted to help identify which pollutants most contribute to cancer and chronic TWE.

Table 5-10 shows that the fuel refining sector accounts for 100% of hydrogen cyanide and sulfuric acid emissions and the majority of emissions for other key TACs, including hydrogen cyanide manganese (77%), nickel (64%), and hydrochloric acid (93%). Manganese and nickel are the two pollutants with the highest total chronic TWE in the inventory, closely followed by benzene. The fuel refining sector is also a key source of formaldehyde (19%) and arsenic (27%) emissions.

Table 5-11 shows more detailed information for Chevron and other permitted fuel refining sources. This table shows that the TACs with the highest emissions at Chevron are hydrogen cyanide, hydrochloric acid, sulfuric acid, and formaldehyde. However, the TACs with the highest chronic TWE are manganese, nickel, and sulfuric acid.

[33] Though these 12 TACs are being highlighted for summary purposes, note that all TACs which have been assigned cancer potency factors and or chronic RELs are accounted for in the TWE shown in Tables 5-8 and 5-9.

Table 5-10. Emissions of selected TACs from all sources in the PTCA community.

Emissions Source	Diesel PM	Form-aldehyde	Benzene	Hydrogen Cyanide	1,3-butadiene	Acrolein	Manganese	Nickel	Arsenic	Hydrochloric Acid	Sulfuric Acid	Hexavalent Chromium
Permitted Fuel Refining Sources	247.49	21,418.75	6,450.02	91,667.17	501.88	24.71	2,282.79	269.65	32.22	31,431.78	18,134.12	15.40
Marine & Rail	41,873.84	25,531.65	3,734.00		329.53		1.92	7.54	77.31			0.05
- OGV Berthing – Chevron	*3,211.53*	*1,615.71*	*388.02*		*20.76*			*4.59*	*49.75*			
- OGV Berthing – Phillips 66	*179.02*	*90.07*	*21.63*		*1.16*			*0.26*	*2.77*			
- OGV Berthing – IMTT	*98.42*	*49.51*	*11.89*		*0.64*			*0.14*	*1.52*			
- Other OGV	*8,158.28*	*7,614.16*	*1,113.43*		*98.27*			*2.14*	*23.18*			
- Ferries	*6,589.06*	*5,128.74*	*697.47*		*66.23*		*0.33*	*0.06*	*0.01*			*0.01*
- Commercial Harbor Craft	*16,662.73*	*9,481.43*	*1,289.41*		*122.43*		*0.84*	*0.15*	*0.03*			*0.03*
- Cargo Handling Equipment	*104.70*	*223.64*	*30.41*		*2.89*		*0.01*	*<0.01*	*<0.01*			*<0.01*
- Railyards	*1,746.15*	*179.40*	*25.48*		*2.31*		*0.54*	*0.11*	*0.02*			*<0.01*
- Rail lines	*5,123.93*	*1,148.99*	*156.25*		*14.84*		*0.20*	*0.10*	*0.03*			*<0.01*
Industrial & Commercial Sources	161.15	10,287.01	423.93		8.73	40.41	256.64	17.98	5.56	2,414.54		<0.01
- Permitted (non-refining)	*161.15*	*484.86*	*334.53*		*0.95*	*40.41*	*0.04*	*0.53*	*0.02*	*2,414.54*		*<0.01*
- Restaurants		*102.49*	*6.16*		*7.79*		*3.07*	*0.85*	*0.06*			
- Construction (non-mobile)			*83.25*				*251.52*	*16.60*	*5.25*			
- Residential wood combustion		*9,699.66*					*2.01*		*0.24*			
Vehicles & Trucks	13,182.10	14,960.78	19,826.81		2,704.30	123.22	400.19	26.33	6.07			0.22
- Trucks	*10,955.16*	*8,524.36*	*9,012.18*		*1,154.42*	*18.16*	*32.88*	*13.27*	*0.26*			*0.14*
- Light Duty Passenger Vehicles	*393.43*	*3,128.91*	*7,403.54*		*1,014.51*	*9.74*	*17.29*	*7.12*	*0.14*			*0.07*
- Buses	*275.96*	*287.51*	*64.01*		*6.12*	*0.04*	*0.77*	*0.30*	*<0.01*			*<0.01*
- Motor Homes	*117.21*	*24.20*	*34.81*		*1.21*	*0.05*	*0.30*	*0.12*	*<0.01*			*<0.01*
- Motorcycles		*1,994.53*	*3,176.11*		*515.12*	*95.23*	*0.35*	*0.20*	*<0.01*			*<0.01*
- Road Dust							*348.52*	*5.30*	*5.66*			
- Transportation Refrigeration Units	*1,440.35*	*1,001.27*	*136.17*		*12.93*		*0.07*	*0.01*	*<0.01*			*<0.01*
Misc. Sources	14,996.74	48,041.73	64,321.88		7,928.99	6,586.15	30.33	102.40	0.42			0.96
- Offroad Equipment	*13,759.67*	*12,014.92*	*8,720.58*		*1,892.71*	*402.61*	*3.43*	*16.84*	*0.03*			*0.34*
- Recreational Boats	*63.67*	*13,512.37*	*15,540.10*		*3,743.85*	*826.85*	*5.05*	*32.00*	*<0.01*			*0.60*
- Fuel Combustion (non-permitted)	*944.51*	*15,492.08*	*7,571.26*		*5.79*		*20.77*	*45.76*	*0.38*			*0.02*
- Other	*228.89*	*548.47*	*7,412.51*		*116.82*	*1,088.19*	*1.08*	*7.81*	*0.01*			*<0.01*
Total	**70,461.31**	**113,766.02**	**69,679.21**	**91,667.17**	**9,303.62**	**2,505.99**	**2,971.87**	**423.90**	**121.59**	**33,846.32**	**18,134.12**	**16.63**
Total (Cancer TWE)	162,765.63	3,503.28	14,407.31		11,537.18			847.06	3,085.57			19,009.07
Total (Chronic TWE)	241.31	144.27	368.26	174.40	75.46	122.60	564.93	517.50	138.62	64.40	310.52	1.41

Table 5-11. Emissions of selected toxics from permitted fuel refining sources (lbs/year).

Process Type	Diesel PM	Formaldehyde	Benzene	Hydrogen Cyanide	1,3-butadiene	Acrolein	Manganese	Nickel	Arsenic	Hydrochloric Acid	Sulfuric Acid	Hexavalent Chromium
Chevron Refinery	234.56	21,331.10	6,256.31	91,667.17	498.77	24.71	2,282.78	269.59	32.22	31,431.78	14,384.27	15.40
- Backup Generators (BUG)	*219.74*											
- Barge Loading		*2.90*	*41.23*				*0.31*		*0.06*		*<0.01*	
- Boilers/Process Heaters		*4,377.75*	*2,341.13*				*107.95*	*11.42*	*21.11*	*18,358.35*	*879.34*	*15.00*
- Fluidized Catalytic Cracking Unit		*1,226.59*	*0.06*	*91,667.17*	*0.82*	*24.71*	*35.36*	*257.84*	*10.44*	*13,073.42*		*<0.01*
- Coating AND Cleanup								*<0.01*				*<0.01*
- Cogeneration		*9,988.85*	*855.17*		*0.61*		*2,137.92*	*0.14*	*0.39*		*2,106.95*	
- Cooling Towers			*28.16*									
- Fugitives			*120.33*		*96.44*							
- Gasoline Dispensing			*<0.01*									
- Generators	*14.82*											
- Other		*12.64*	*616.66*				*1.13*	*<0.01*	*0.21*		*0.27*	
- Storage/Transport Container Cleaning		*1.02*	*14.50*				*0.11*		*0.02*		*<0.01*	
- Storage Tanks			*897.11*		*321.92*							
- Sulfur Plant											*11,397.70*	
- Surface Blasting							*<0.01*	*<0.01*				
- Tank Cars and Trucks – Working Losses			*45.77*		*0.03*							
- Vapor Recover/Flares		*5,721.33*	*1,231.47*		*46.98*			*0.18*				*0.39*
- Wastewater Treatment			*64.73*		*31.98*							
Other Permitted Sources	12.93	87.65	193.71		3.11		<0.01	0.06	<0.01		3,749.85	<0.01
- Chemtrade West	*1.38*	*56.14*	*4.31*		*3.11*						*3,749.85*	
- Richmond Products Terminal	*1.83*	*0.05*	*57.56*				*<0.01*	*0.01*	*<0.01*			*<0.01*
- Phillips 66 Company	*0.86*	*0.02*	*38.94*				*<0.01*	*0.00*	*<0.01*			*<0.01*
- TransMontaigne	*1.45*	*7.48*	*34.01*				*<0.01*	*0.01*	*<0.01*			*<0.01*
- IMTT Richmond CA	*7.42*	*3.79*	*1.03*				*<0.01*	*0.03*	*<0.01*			*<0.01*
- Kinder Morgan		*19.78*	*0.28*									
- Qualawash Holdings LLC		*0.40*	*0.01*									
- Gas Stations			*57.58*									
Total (lbs/yr)	**247.49**	**21,418.75**	**6,450.02**	**91,667.17**	**501.88**	**24.71**	**2,282.79**	**269.65**	**32.22**	**31,431.78**	**18,134.12**	**15.40**
Total (Cancer TWE)	571.71	989.55	1,485.01		656.96			539.83	818.82			17,782.92
Total (Chronic TWE)	0.85	40.75	37.96	174.40	4.30	1.21	434.32	329.80	36.79	59.80	310.52	1.32

Model-based Exposure Assessment

While the emissions inventory is a valuable tool, additional information is required to fully understand human exposures to air pollution. For example, a source's proximity to residences and its emissions release characteristics (e.g., an elevated stack vs. a low-level release) influence the source's contributions to pollutant concentrations and exposures. Therefore, the District performed air dispersion modeling to provide a more complete picture of air quality issues and source impacts from local sources in the PTCA area. The community-scale modeling was generally conducted with U.S. EPA's AERMOD model, which can produce fine-grained pollutant concentration estimates near emissions sources. AERMOD was used to estimate concentrations at receptors spaced 50 meters apart to provide hyper-local, block-by-block information.[34] Importantly, dispersion modeling was performed for each emissions source separately to allow the contributions from each source to impacts at a given location to be tracked and compared. Finally, it should be noted that this modeling analysis focused on long-term average exposures and did not assess exposure to shorter variations in pollutant concentrations, which are better characterized by monitoring and other modeling approaches (for example, the flaring analysis presented in Appendix C).

This section summarizes the modeling results, providing maps of pollutant concentrations and human exposures and further assessing the contributions of specific local sources to exposures and health risks across the PTCA community. The modeling and source attribution analyses presented here focus on $PM_{2.5}$, DPM, cancer risk,[35] and chronic hazard index (HI, or CHI),[36] and it should be noted that cancer risk and chronic HI values were essentially derived by combining cancer and chronic TWE with dispersion model outputs. As a result, these metrics reflect the additive impact of all TACs with established cancer potency factors or chronic RELs.

Mapping Exposures

Total pollutant exposures in the PTCA community are the result of many factors, including local emissions sources, the transport of pollution from outside the community, and chemical and physical processes in the atmosphere. To support Plan strategy development, local-scale air quality modeling was performed for sources within the PTCA emissions boundary to generate the local source portion of annual average pollutant concentrations across the community at 50-meter resolution. These modeling results provide information on the relative impact of various local sources that are the target of Plan actions, and Appendix C provides additional

[34] For assessing $PM_{2.5}$ impacts from the Chevron Refinery, existing results from the California Puff (CALPUFF) model were used in place of AERMOD outputs. The CALPUFF modeling was originally conducted to support amendments to District Rule 6-5, which limits emissions from refinery fluidized catalytic cracking units.

[35] The cancer risk metric used in this PLAN represents an estimate of the chance that a person might develop cancer as a result of exposure to emitted carcinogens at a given residential location, assuming 30 years of exposure beginning at the third trimester of pregnancy, and considering, where appropriate, Age Sensitivity Factors to account for inherent increased susceptibility to carcinogens during infancy and childhood. This is consistent with the way that cancer risk is defined in the Air District's Regulation 2, Rule 5. Although a population-weighted version of this metric can be informative (Figure 5-18, and throughout the text), it is not an estimate of a net or average impact on the number of cases of cancer among the local population.

[36] In contrast to cancer risk, the chronic Hazard Index (HI) does not represent a probability. It is a score created by comparing modeled levels of multiple toxic air contaminants (TACs) to officially established reference levels (RELs), above which there is reason to anticipate some harmful effects. Conventionally, a Hazard Index above 1.0 indicates that the modeled level is not expected to be safe for all individuals. Because the Plan modeling holds aside exposures from non-local sources, and does not consider exposures from other pathways such as food or drinking water, a Hazard Index less than 1.0 may still present reason for concern or action, especially if there is reason to believe that including those other exposures would lead to a score above 1.0, or to a body burden (dose) that is cumulatively significant.

information on how these local source impacts compare with a modeled estimate of total pollutant concentrations that accounts for pollutant transport and other factors.

These modeled concentrations resulting from local source emissions were averaged across each Census block in the PTCA area. To characterize long-term residential exposures, these block-level concentrations were then multiplied by the number of people residing in each Census block. Either perspective (unweighted ambient concentration, or concentration multiplied by population) can be informative, depending on the question or issue at hand.

As an example, Figure 5-18 shows contributions to ambient $PM_{2.5}$ concentrations, both with and without population weighting, resulting from all sources modeled in the PCTA community. The left panel depicts unweighted concentrations, which are highest within the Chevron Refinery, the West Contra Costa County Landfill, and the harbor channel. However, these areas generally have low population density, with few if any residents. When population density is taken into account (right panel), the emphasis shifts toward areas where more people reside, with greater total exposure (concentration times population). Such areas include neighborhoods in and around the Iron Triangle, where high population densities coincide with relatively elevated $PM_{2.5}$ concentrations. Densely populated stretches along transportation corridors also receive more emphasis. All else being equal, a densely populated neighborhood with the same level of exposure (i.e., concentration) will likely experience a larger number of attributable health impacts from $PM_{2.5}$ than a sparsely populated neighborhood, simply because it has more people. On the other hand, the worst levels of $PM_{2.5}$ might be found in a sparsely populated neighborhood—and regardless of the number of people involved, this situation is also important.

Similarly, Figures 5-19 and 5-20 show cancer risk and chronic HI values (left panels, "concentrations") and corresponding population-weighted values (right panels, "exposures") resulting from all sources modeled in the PTCA community. Areas with higher cancer risk values can be seen where diesel sources operate, such as along freeways and near railyards and construction projects. Areas with higher chronic HI values can be seen around Chevron, Chemtrade, the West Contra Costa County Landfill, and along I-80. When residential population density is taken into account (right panels of Figures 5-19 and 5-20), neighborhoods in and around the Iron Triangle, as well as along I-80 and Carlson Boulevard (which also runs parallel to a rail line), are emphasized for both cancer risk and chronic HI exposures.

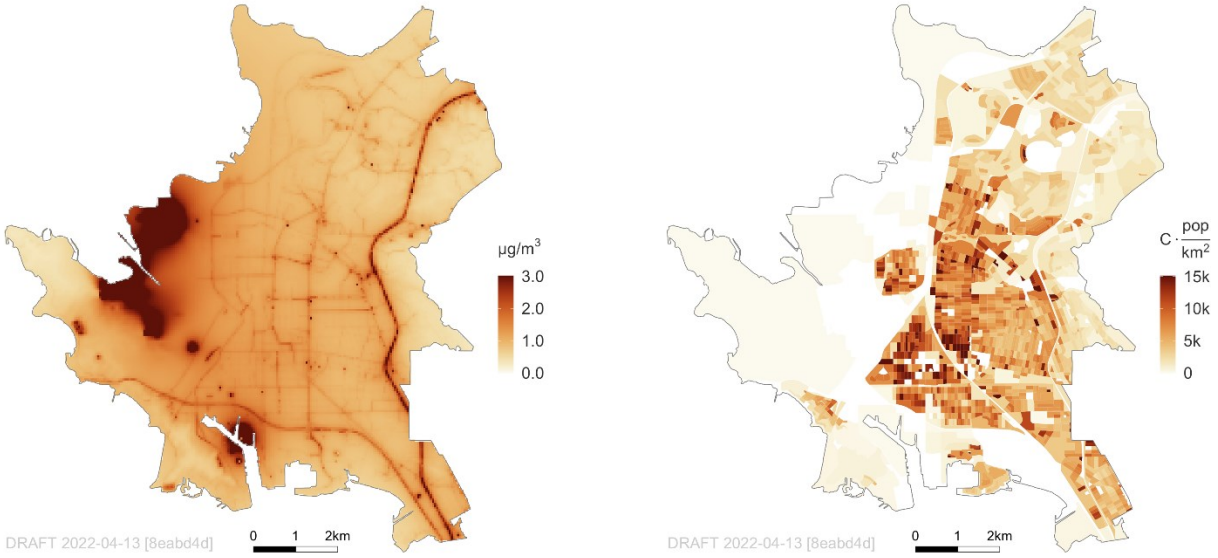


Figure 5-18. Left panel: modeled contributions, from local sources, to ambient $PM_{2.5}$ concentrations. (Maps do not depict total concentrations, which would include contributions from other sources that were not modeled, including sources outside the PTCA area.) Right panel: after population weighting is applied. "C" is the metric shown in the left panel ($\mu g/m^3$), which is multiplied by residential population density (pop/km^2). A value of 10k means that, over a 1 km^2 area, the total impact is estimated to be equivalent to 10,000 people being exposed to 1.0 $\mu g/m^3$ above background. It could be that 5,000 people are exposed to C = 2.0 $\mu g/m^3$, or that 20,000 people are exposed to C = 0.5 $\mu g/m^3$, above background. In either case, using conventional approaches to modeling long-term effects, the population health impacts—that is, the number of attributable adverse events—are expected to be similar.

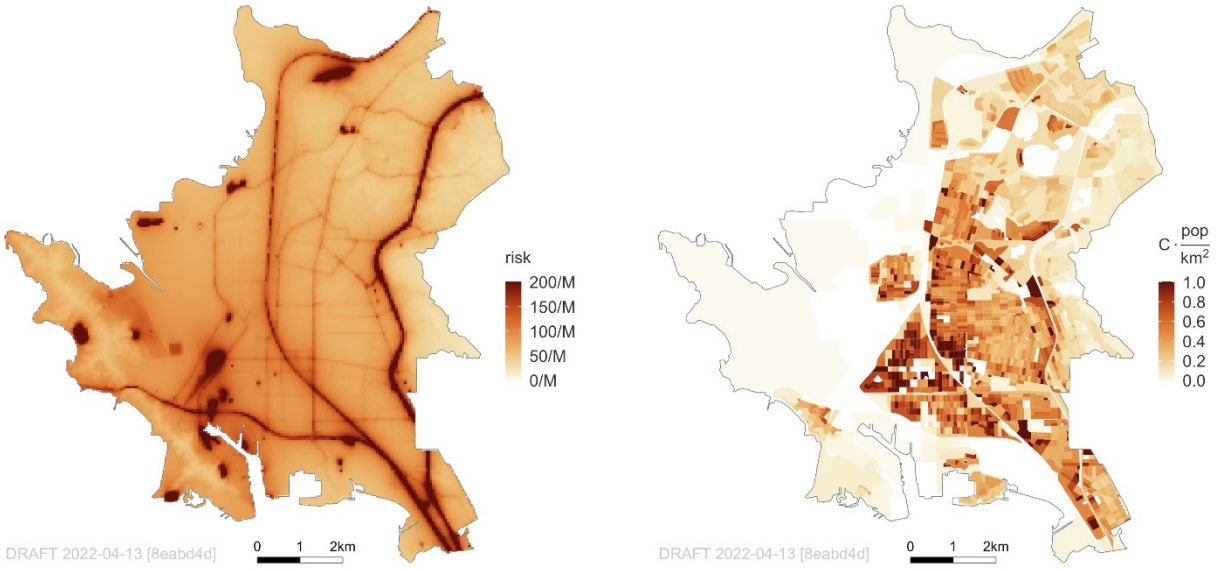


Figure 5-19. Left panel: modeled contributions from local sources to cancer risk. Right panel: after population weighting is applied. As in Figure 5-18, "C" is the metric shown in the left panel ("cancer risk"), which is multiplied by residential population density (pop/km^2). Note that scaling C by population is not intended to yield an estimate of attributable cases of cancer, or the probability of developing cancer, in the local population. One reason for this is that the cancer-risk metric used herein is calculated by assuming a health-protective scenario (30 years of exposure beginning at the 3rd trimester), consistent with the Air District's Regulation 2, Rule 5.

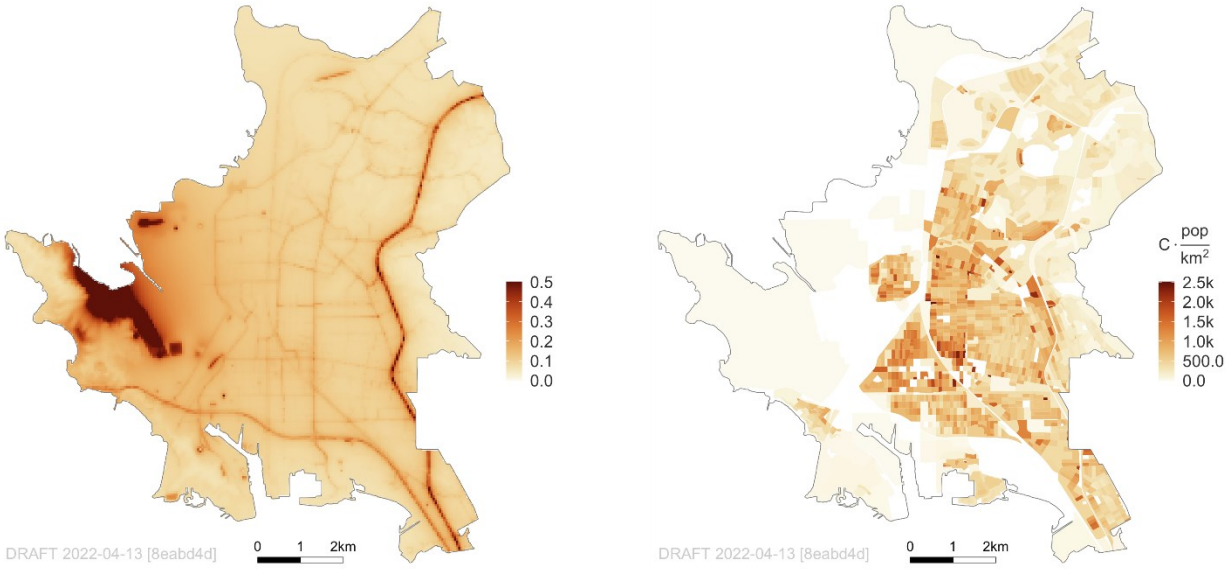


Figure 5-20. Left panel: modeled contributions from local sources to chronic hazard index (HI). Right panel: after population weighting is applied. As in Figure 5-18, "C" is the metric shown in the left panel ("chronic hazard"), which is multiplied by residential population density (pop/km^2). In contrast to Figure 5-18, the units in the right panel do not have a straightforward interpretation (see text; a primary reason is that chronic HI values do not follow a ratio scale, so HI = 2 is not necessarily twice as impactful as HI = 1). Nevertheless, the right panel may be helpful to indicate where a larger number of people might be affected, if contributions from other sources and pathways were cumulatively significant.

Source Attribution Analyses

In addition to mapping exposure from all local sources, contributions of individual sources or groups of sources to pollutant exposures were quantified as a further aid to strategy development. In this sub-section, source contributions are evaluated according to the areas of concern identified by the community, with a focus on fuel refining, commercial and industrial sources near communities, vehicles and trucks, and marine and rail operations. As previously noted, this evaluation of local source impacts was intended to support Plan strategy development and does not represent total pollutant exposures within the community. For example, modeling results indicate that local source emissions result in an average residential $PM_{2.5}$ exposure of 1.06 µg/m^3, which is about 15% of total $PM_{2.5}$ exposure in the PTCA community based on regional modeling results (see Appendix C for more details). For air toxics, local sources account for 40% of population-weighted DPM exposure in the PTCA community and 36% of average residential cancer risk.

For the four areas of concern considered, Figure 5-21 shows local source contributions to annual average residential exposures for $PM_{2.5}$ concentrations, cancer risk, and chronic HI. As noted above, the average resident of the PTCA community is exposed to a population-weighted $PM_{2.5}$ concentration of 1.06 µg/m^3 (Figure 5-21, left panel).[37] The vehicles and trucks and fuel refining categories combine to account for three-fourths of this value, with commercial and industrial sources contributing 20% (0.21 µg/m^3). For chronic HI, vehicles and trucks and fuel refining are again important, accounting for about 90% of the average residential value of 0.11 that is

[37] Note that this $PM_{2.5}$ concentration and other modeling results shown in this sub-section reflect local source impacts only.

attributable to local sources (Figure 5-21, middle panel). Key TACs that contribute to chronic risks in the PTCA community are manganese, nickel, benzene, sulfuric acid, and DPM.

For cancer risk, vehicles and trucks account for over half of the average residential value of 84.3 per million, and marine and rail operations account for another 43% of that value (36.4 out of 84.3 per million). This means that on-road and off-road mobile sources combine to account for over 90% of the average residential cancer risk attributable to local sources. Key TACs that contribute to cancer risks in the PTCA community are DPM, benzene, and hexavalent chromium.

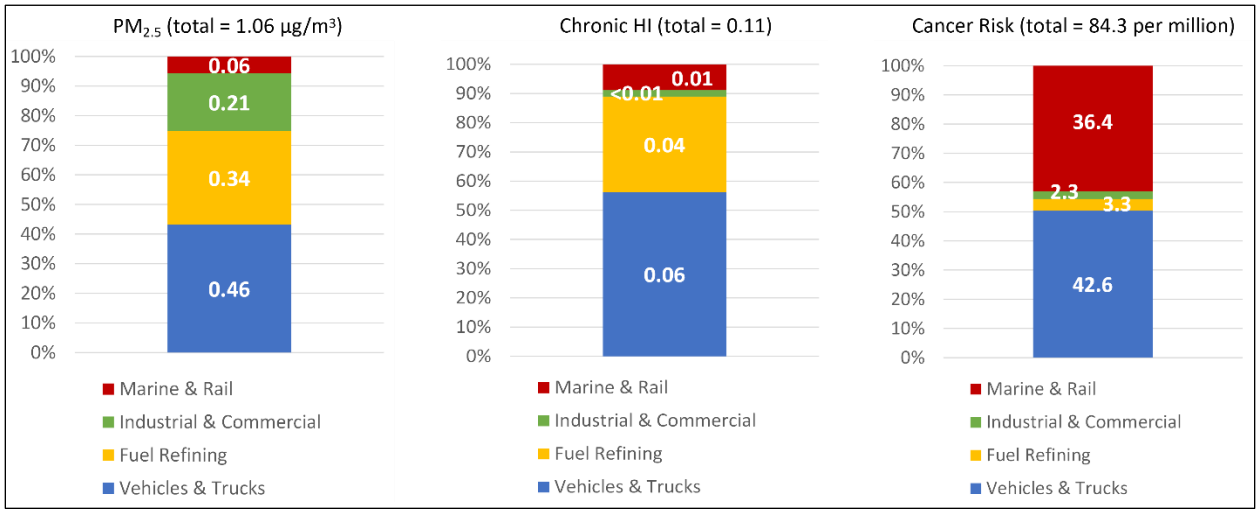


Figure 5-21. Source contributions to modeled impacts for the PTCA community; values shown within the stacked bars represent annual average residential exposures attributable to local sources (i.e., the value to which the average community resident would be exposed).

Of course, the community concerns shown in Figure 5-21 represent broad sectors covering many individual sources, as highlighted in Table 5-1. Therefore, more detailed analyses were performed to identify specific facilities and processes that are driving the source contributions shown in Figure 5-21.

A Closer Look at PM2.5

On-road mobile sources (vehicles and trucks) account for about 43% of the $PM_{2.5}$ exposure attributable to local sources within the PTCA community (0.46 of 1.06 µg/m^3). In Figure 5-22, the $PM_{2.5}$ stacked bar chart from Figure 5-21 is expanded using a pie chart that provides greater detail for on-road mobile source emissions. The pie chart portion of the figure shows that road dust emissions account for more than two-thirds of total $PM_{2.5}$ impacts from on-road mobile sources. Contributions from vehicle categories labeled as "Truck"[38] and "Non-Trucks"[39] are roughly equal and include exhaust emissions, tire wear, and brake wear. This finding highlights a recognized trend in emissions inventories for on-road sources: as exhaust emissions have declined through the implementation of stringent emissions standards, non-exhaust emission sources like road dust represent a greater share of the $PM_{2.5}$ emissions. Due to the growing importance of road dust emissions, Caltrans has funded a study of this source category that is

[38] The "Trucks" category includes light-heavy duty, medium-heavy duty, and heavy-heavy duty trucks.
[39] The "Non-Truck" category includes all vehicles not treated as "Trucks," including passenger cars, light and medium duty trucks, and buses.

being conducted by UC Riverside, with staff from CARB, EPA, and BAAQMD serving on the project's review panel.[40]

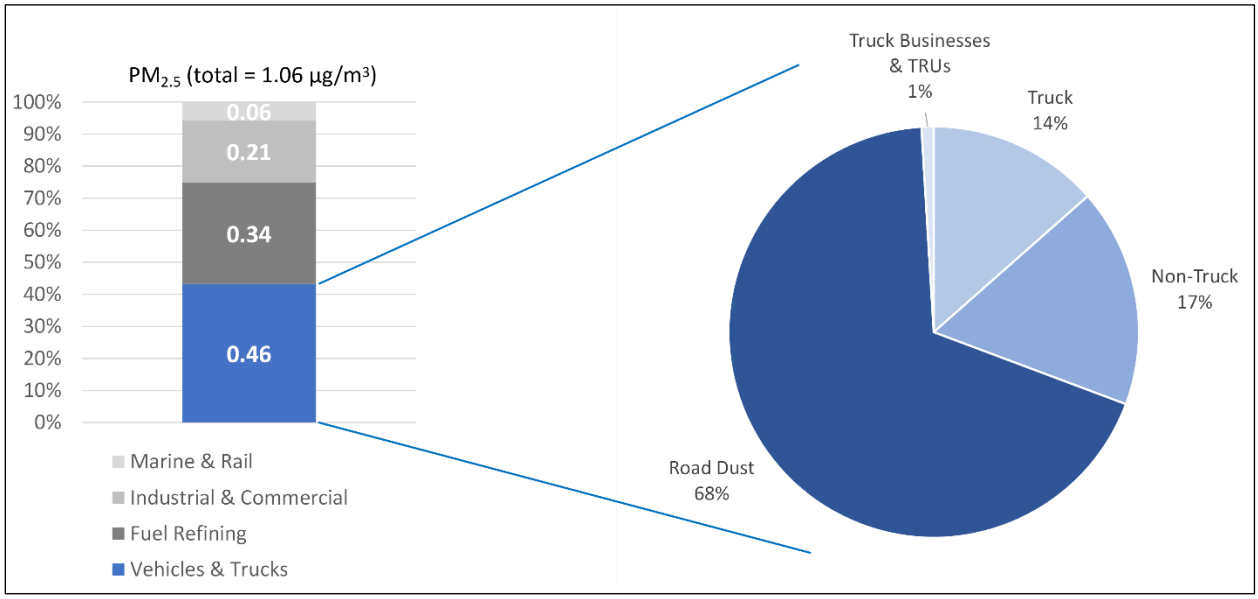


Figure 5-22. Source contributions to average residential $PM_{2.5}$ exposures, with the vehicles and trucks source category shown in detail.

For fuel refining sources, Figure 5-21 shows that this area of concern accounts for an average residential $PM_{2.5}$ exposure of 0.34 µg/m³, or about one-third of the $PM_{2.5}$ exposure attributable to local sources within the PTCA community. The Chevron Refinery is responsible for 94% of this value (0.32 µg/m³), and as previously shown in Table 5-7, the fluidized catalytic cracking unit (FCCU) is currently the largest $PM_{2.5}$ source at Chevron, accounting for 229 of the 479 tons of $PM_{2.5}$ emitted by the facility. Though District Rule 6-5 is slated to sharply reduce emissions from the FCCU, analyses conducted in support of amendments to that rule showed that other $PM_{2.5}$ sources at Chevron will continue to drive disparities in impacts from that facility.[41] Figure 5-23 shows per capita $PM_{2.5}$ exposures by race/ethnicity and by Chevron source type (FCCU, non-FCCU), highlighting the role of non-FCCU emissions in creating exposure inequities.

[40] Research notes on this project are available at: https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/research-notes/task3785-rns-9-21-a11y.pdf.
[41] See: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-6-rule-5-particulate-emissions-from-refinery-fluidized-catalytic-cracking-units/2020-amendment/documents/20210525_11_fsr_0605_app_a1-pdf.pdf.

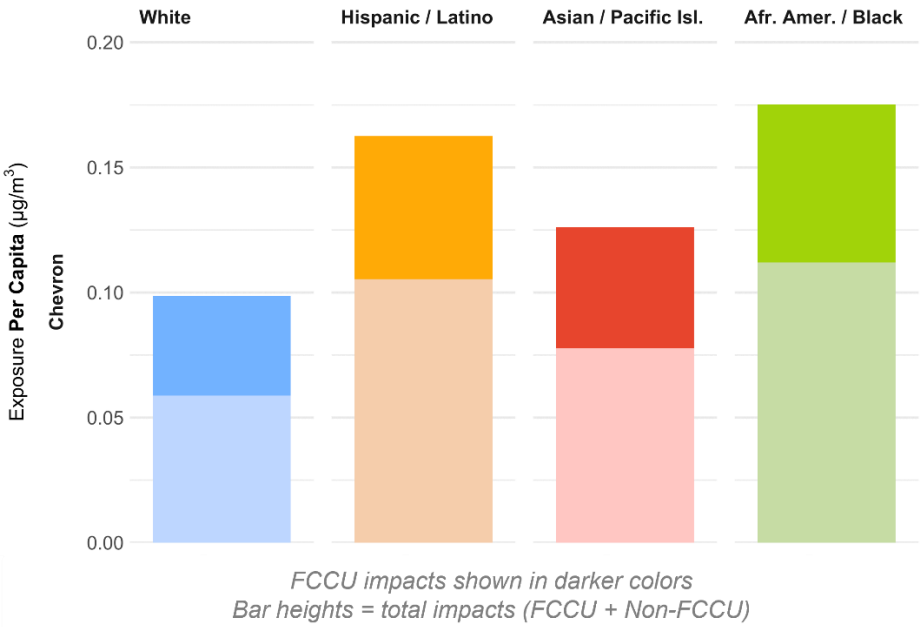


Figure 5-23. Disparities in $PM_{2.5}$ exposure resulting from emissions from the Chevron Refinery.

A Closer Look at Chronic HI

On-road mobile sources (vehicles and trucks, streets and freeways, logistics and warehouses) account for about 55% of the chronic HI attributable to local sources within the PTCA community (0.06 of 0.11). In Figure 5-24, the chronic HI stacked bar chart from Figure 5-21 is expanded using a pie chart that provides greater detail for on-road mobile sources. The pie chart portion of the figure shows that the "Non-Truck" and "Road Dust" categories are roughly equal and combine to account for more than three-fourths of total chronic HI from on-road mobile sources. Key TACs emitted by on-road mobile sources that contribute to chronic risks in the PTCA community are benzene (from non-truck vehicles) and manganese (from road dust).

The fuel refining area of concern accounts for 33% of the chronic HI exposure attributable to local sources in the PTCA community (0.036 of 0.11). The Chevron refinery alone accounts for 29% of this exposure (0.032 of 0.11), so Figure 5-25 expands the chronic HI bar chart to show greater detail for Chevron processes. This figure shows that 80% of Chevron's chronic HI impact is attributable to three processes: cogeneration,[42] the sulfur recovery unit (SRU), and the FCCU. Key TACs emitted by these processes include manganese (HRSG), sulfuric acid (SRU), nickel and hydrogen cyanide (FCCU).

[42] The cogeneration process shown in Figure 5-25 includes two gas turbines, each with an associated heat recovery steam generator (HRSG).

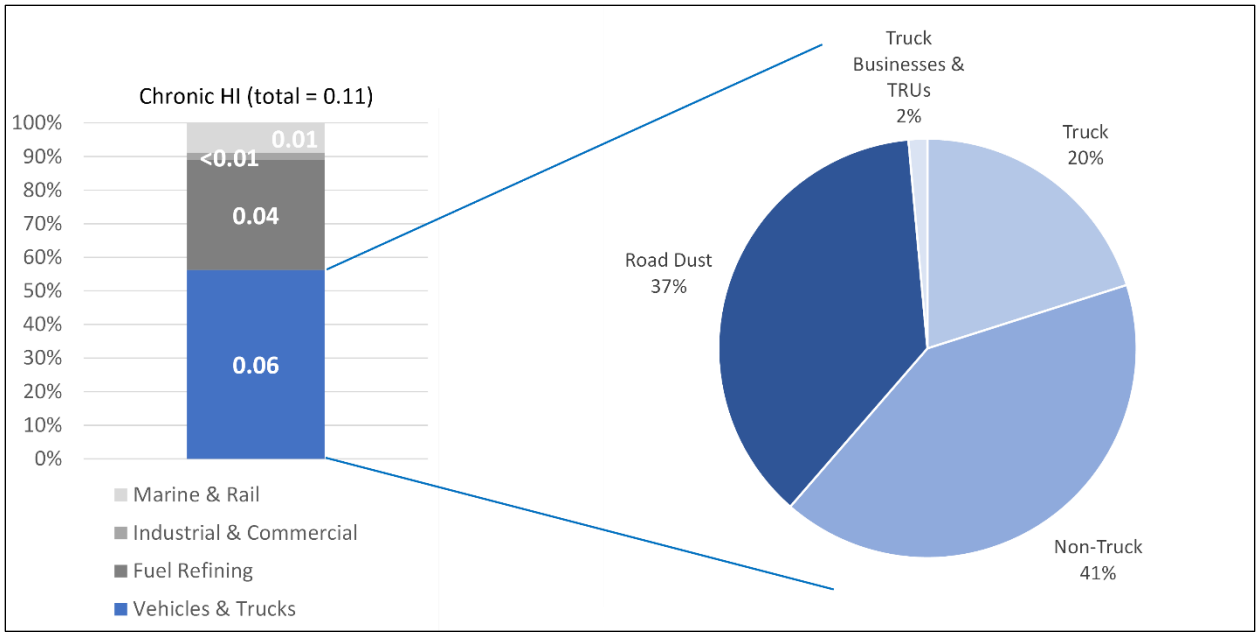


Figure 5-24. Source contributions to average residential chronic HI values, with the vehicles and trucks source category shown in detail.

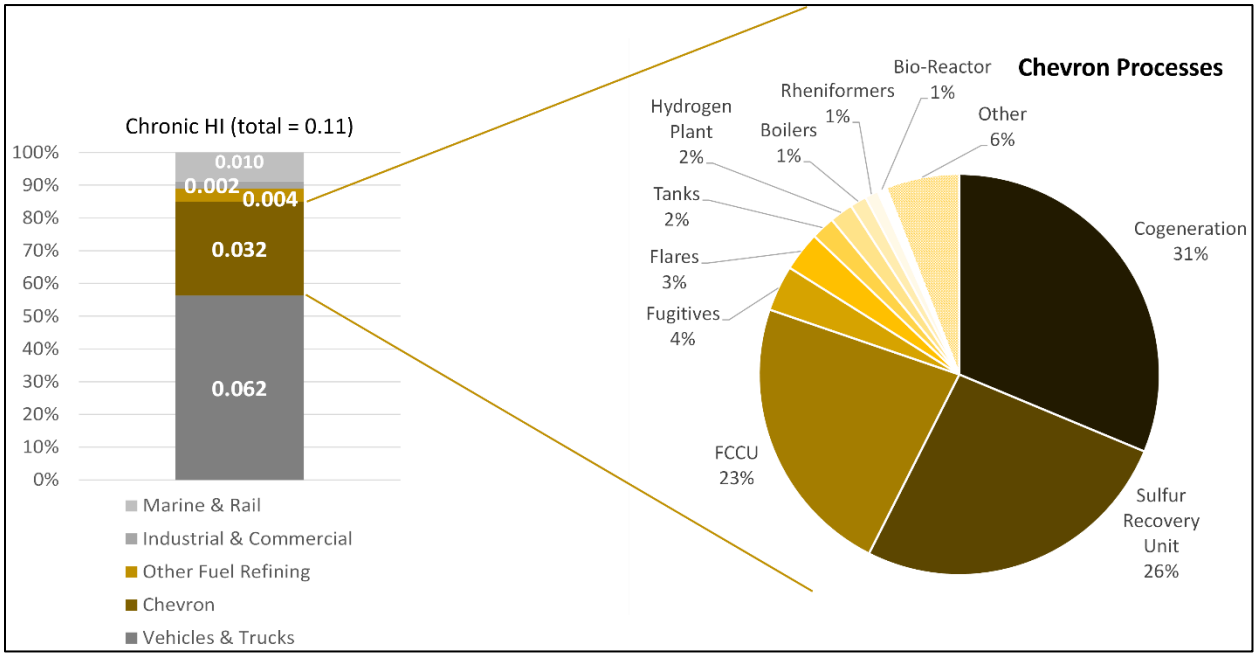


Figure 5-25. Source contributions to average residential chronic HI values, with Chevron processes shown in detail.

A Closer Look at Cancer Risk

On-road mobile sources account for just over half of the cancer risk attributable to local sources within the PTCA community (42.6 of 84.3 in a million). In Figure 5-26, the stacked bar chart for cancer risk from Figure 5-21 is expanded using a pie chart that provides greater detail for on-road mobile sources (vehicles and trucks). The pie chart portion of the figure shows that the "Truck" category accounts for almost three-fourths of total cancer risk from on-road mobile

sources operating within the PTCA community. This category focuses on trucks operating on roadways, and another 8% of the total cancer risk from on-road mobile sources is attributable to trucks and transportation refrigeration units (TRUs)[43] operating at warehouses and other business locations. Virtually all the cancer risk associated with these categories is due to DPM, as these trucks and TRUs are largely diesel powered.

Figure 5-27 shows that the marine and rail area of concern accounts for 43% of the cancer risk attributable to local sources in the PTCA community (36.4 of 84.3 in a million). The pie chart in Figure 5-27 shows that the locomotives operating on rail lines and at railyards account for just under half of the cancer risk impact from this area of concern. Commercial harbor craft (e.g., tugboats) account for almost one quarter (23%) of the impact. It should be noted that approximately half of harbor craft and other marine vessel activity in the PTCA area are connected to Chevron and other fuel refining operations.

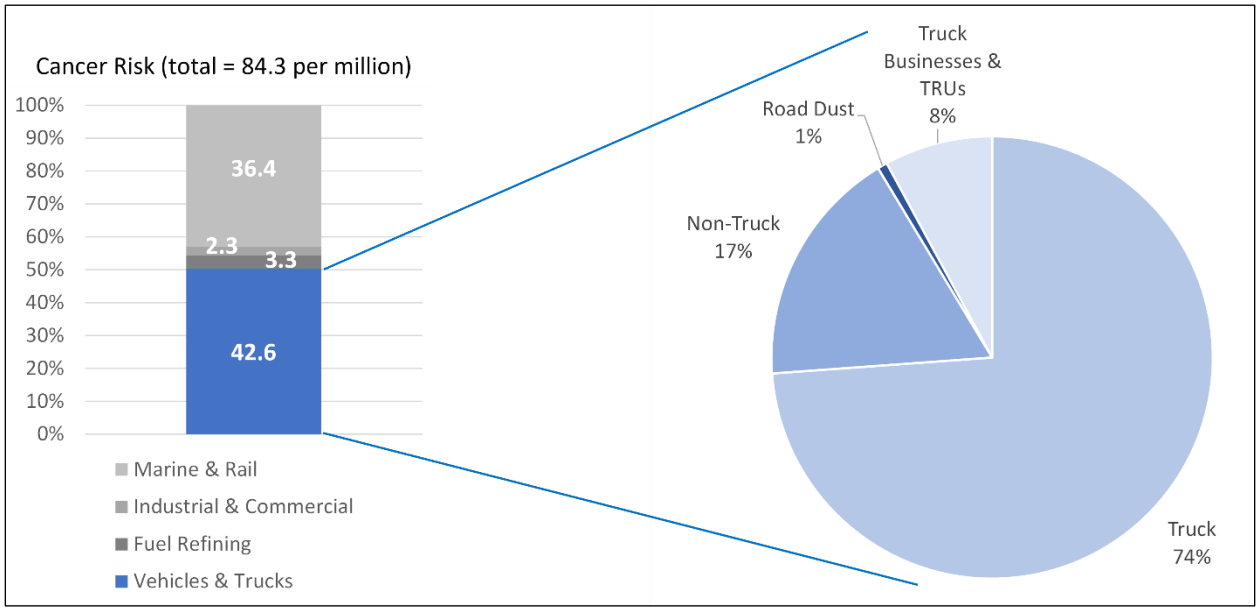


Figure 5-26. Source contributions to average residential cancer risk, with the vehicles and trucks source category shown in detail.

[43] TRUs are refrigeration systems powered by diesel engines that are installed in truck trailers, vans, or shipping containers used to transport perishable products.

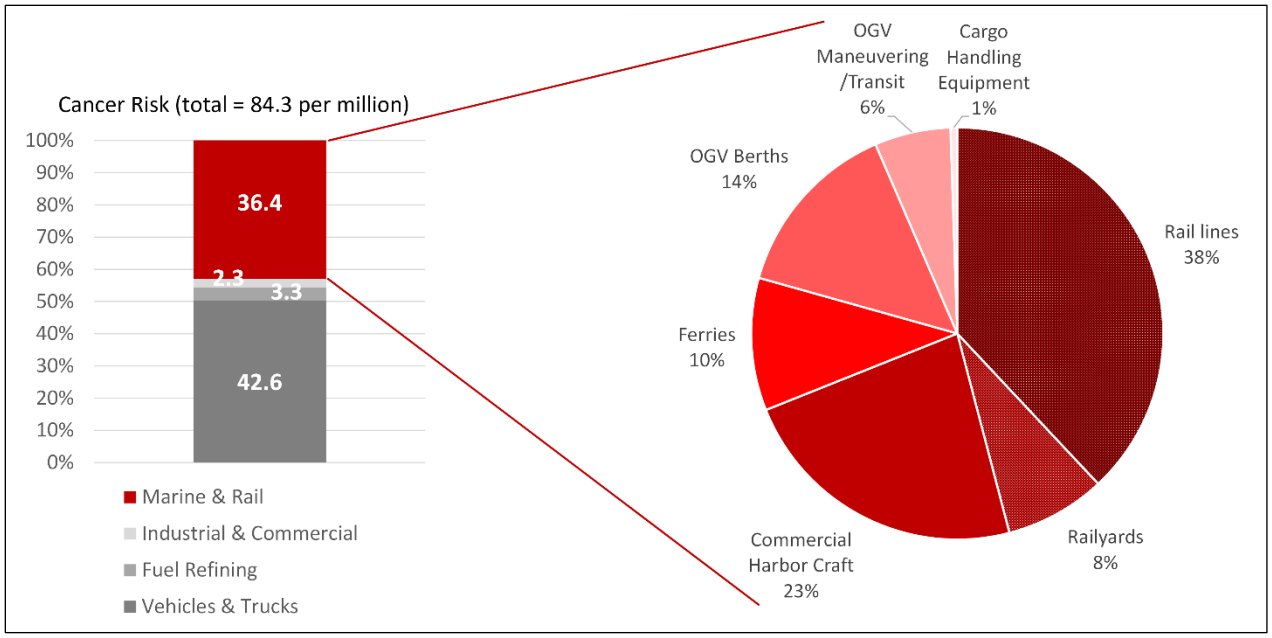


Figure 5-27. Source contributions to average residential cancer risk, with the marine and rail area shown in detail.

Summary

Trends in air quality monitoring data show that levels of several pollutants, including $PM_{2.5}$ and some TACs, have not shown improvements in the past ten years (Figures 5-4, 5-5, 5-8, 5-13, and 5-14). Monitoring data also revealed spatial variability in levels of different pollutants across the PTCA area and illustrated examples of short-term air pollution events that may indicate contributions from local pollution sources (Figures 5-9, 5-10, and 5-16).

The baseline emissions inventory assembled for the PTCA area shows that the Chevron refinery and related fuel refining sources account for over half of local emissions of CAPs such as SO_x and $PM_{2.5}$; key TACs such as manganese, nickel, and hydrochloric acid; and total chronic TWE (Tables 5-6, 5-8, and 5-10). In addition, these sources account for 100% of local emissions of the TACs hydrogen cyanide and sulfuric acid (Table 5-10). Mobile sources (i.e., marine and rail, vehicles and trucks) are also important local emitters, accounting for 61% of local cancer TWE (Table 5-8).

From an exposure standpoint, the fuel refining and vehicles and trucks areas of concern combine to account for about three-fourths of average residential $PM_{2.5}$ exposure and about 90% of the average residential chronic HI value attributable to local sources (Figure 5-21). Road dust emissions from vehicular traffic are a leading contributor to $PM_{2.5}$ exposure due to the proximity of roadways to residences (Figure 5-22). Vehicles and trucks also account for about half of average residential cancer risk attributable to local sources (Figure 5-26).

Supplementary technical information on air quality monitoring, emissions inventories, and air quality modeling can be found in Appendix C (modeling) and Appendix D (monitoring).

Chapter 6 – Enforcement Overview & Findings

This chapter provides an enforcement overview and the data findings of regulated sources from the past four years to better understand the local air quality issues in the PTCA area, specifically in the local zip codes of 94801, 94802, 94803, 94804, 94805, 94806, 94807, and 94564. The Air District and the California Air Resources Board (CARB) share enforcement responsibilities in the PTCA area, with the Air District primarily responsible for regulating stationary sources and CARB primarily responsible for regulating mobile sources. Stationary and mobile source enforcement may be conducted jointly by the two agencies. This chapter summarizes stationary and mobile source enforcement data from 2019 to 2022, used to help identify and develop enforcement strategies that aim to address community concerns and align with the AB617 goals to reduce emissions in the area.

ENFORCEMENT AUTHORITY

The enforcement programs of the Air District and CARB strive to ensure compliance and minimize local and regional impacts from air pollution. This section explains the enforcement authorities over stationary and mobile sources.

STATIONARY SOURCES

The California Health and Safety Code grants Air Districts the authority to adopt and enforce air pollution regulations to achieve state and federal air quality standards. The Air District's Compliance and Enforcement Division (C&E) enforces local, state, and federal regulations for a variety of stationary sources in the PTCA area. The following are a few examples of stationary sources in the PTCA area and corresponding Air District regulations for those types of operations:

- Petroleum Refining (subject to the Title V program that encompasses a wide range of Air District, state, and federal regulations)
- Bulk Terminals (Rule 8-33)
- Landfill (Rule 8-34)
- Sewage treatment plants (source specific rule under development, Rule 9-1 and Rule 9-2)
- Gasoline stations (Rule 8-7)
- Stationary and portable engines and generators (Rule 9-8)
- Boilers (Rule 9-7)
- Auto body shops (Rule 8-45)
- Coating operations (Rule 8-4, Rule 8-19, Rule 8-31, and Rule 8-32)
- Asbestos renovation and demolition projects (Rule 11-2 and Rule 11-14)
- Other sites/facilities with sources that have the potential for particulate emissions are subject to Rule 6 (e.g., Cement and Asphalt Plants, Metal Recyclers, Construction Sites, Bulk Material Handling Facilities, etc.)

MOBILE SOURCES

CARB is the primary authority for developing and enforcing regulations to control emissions from portable and mobile sources and consumer products in California, except in cases where federal law preempts CARB's authority. The Air District may refer to or partner together with CARB to investigate air quality concerns relating to the following mobile sources listed below:

- Portable equipment
- Heavy-duty idling
- Cargo handling equipment
- Off-road construction equipment
- Commercial harbor craft
- Ocean-going vessels (OGV)
- At-Berth (Shore Power)
- Drayage trucks
- Transport refrigeration units
- On-board incineration on cruise ships
- Fuel sulfur and operational requirements within 24 nautical miles for ocean-going vessels

Although CARB has authority to regulate emissions from these sources, it does not have regulatory authority over where vehicles drive or park. The authority to regulate and enforce parking and truck routes within the PTCA area is held by the City's Police and Transportation Services departments. It will be the responsibility of those departments to apply any truck parking or traffic strategies in the PTCA area.

ENFORCEMENT OF STATIONARY SOURCES

AIR DISTRICT ENFORCEMENT PROGRAM

The C&E Division at the Air District is responsible for administering the core enforcement programs of the agency. Approximately 40 Air District staff are currently in the field and assigned to the C&E inspection program to enforce applicable Air District, state, and federal rules and regulations, and ensure compliance with air quality rules and regulations within the jurisdiction of the nine Bay Area counties.

Approximately 10% of C&E's inspection staff (staff), or 5 staff, are assigned to provide daily coverage in the PTCA area. Additional staff from other regions of the Air District may be temporarily reassigned to help respond to air quality complaints or assist during incidents. Staff assigned to the area help conduct inspections and perform other enforcement program activities, including:

- Investigations of community complaints and general air quality concerns,
- Unannounced compliance inspections of Air District permitted facilities and investigations at sites that may not have a permit,
- Investigations of excess emissions and Title V deviations reported to the Air District, and
- Responding to and investigating major incidents such as fires associated with manufacturing or industrial processes, or other major air emission releases.

Staff may take enforcement action through the issuance of a Notice of Violation or Notice to Comply when a facility is discovered to be in violation of an air quality regulation. Staff will work together with other divisions at the Air District and or other regulatory agencies, when applicable, to ensure that the facility takes corrective actions to prevent recurrences of the violation. As part of this process, staff will track the progress of the corrective actions and provide compliance assistance, as necessary. Occasionally, staff may discover unpermitted sources that fall within the Air District's jurisdiction. In these situations, staff will issue a Notice of Violation for any unpermitted sources or operations and will facilitate discussions with the facility owner and Air District Engineer to begin the permitting process.

Stationary Sources in the PTCA Area

Staff conduct routine, unannounced inspections of stationary sources of air pollution. Figure 6-1 provides a closer look at the different types of Air District permitted facilities located in the PTCA area (see also Figure 5-17). The chart also shows the number of each type of facility in the area. See Appendix E in the enforcement plan for a complete list of Air District permitted facilities located in the 94801, 94802, 94803, 94804, 94805, 94806, 94807, and 94564 zip codes.

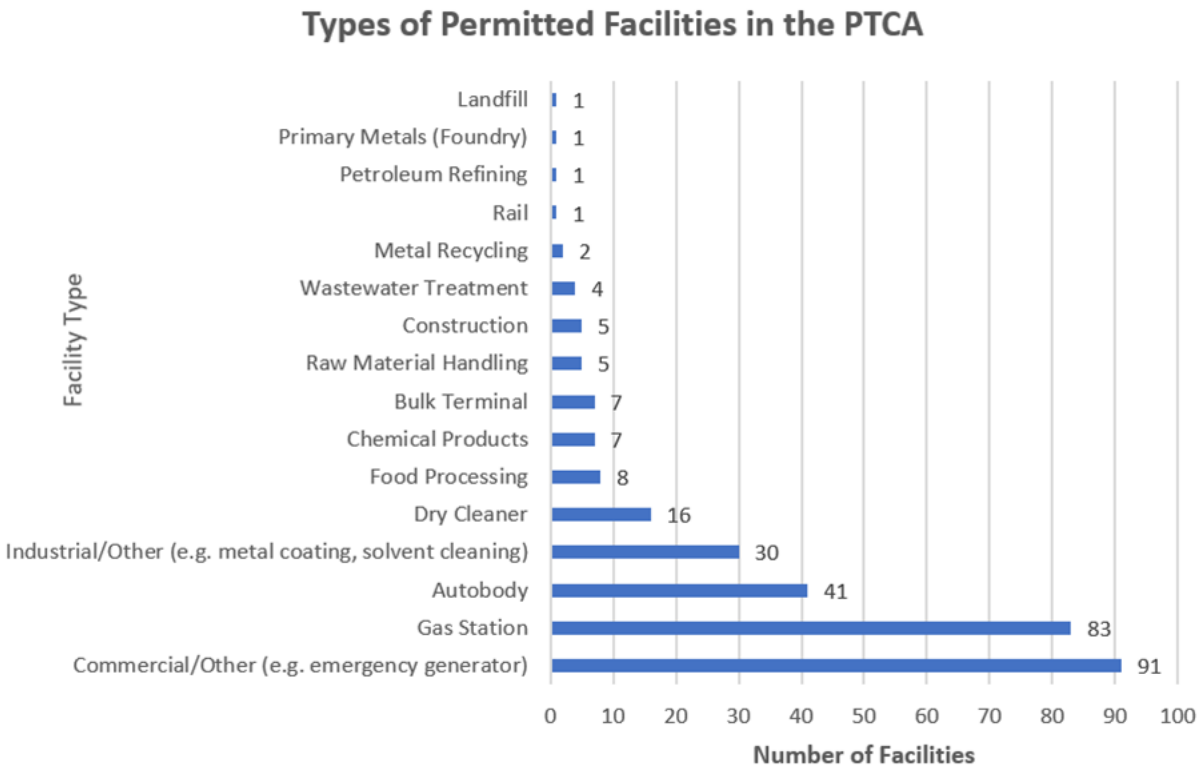


Figure 6-1. Types of Permitted Facilities in the PTCA area

4-Year Enforcement History of Stationary Sources

The Air District compiled a 4-year enforcement history in the PTCA area for stationary sources. This data includes a 4-year summary of compliance inspections, complaint investigations, and violations from January 2019 through December 2022.

Compliance Inspections

The PTCA area has over 300 Air District permitted facilities as of December 2022. Unannounced compliance inspections are conducted at sites or facilities that have an Authority to Construct or a Permit to Operate. As part of an inspection, staff meet with the owner or operator of a facility to ensure sources are operating in compliance with Air District regulations, permit requirements, and other state and/or federal rules and regulations. Staff review equipment, operational processes, and records to determine a facility's compliance status. In the 4-year period, staff have completed 938 area source inspections at Air District permitted facilities in the PTCA area. These inspections often include a comprehensive review of the of the following when determining whether a facility is operating in compliance with air quality rules and regulations:

- Permit review and conditional requirements,
- Air District, state and federal rules that may apply,
- Process upsets and equipment malfunctions at permitted facilities,
- Deviations from a facility's permit, operating parameters, monitoring and recordkeeping requirements,
- Major incidents such as fires or other air emission releases, and
- Facilities and sites of operation that do not already have an Air District permit where there may be an air quality concern.

There are three facilities in the PTCA area subject to the Clean Air Act, Major Facility Review Program (Title V). These facilities include the West Contra Costa County Landfill, Chemtrade West US LLC, and the Chevron Refinery. The Title V Program requires large industrial facilities that trigger certain emissions thresholds to operate under a single comprehensive operating permit that covers all applicable Air District, state, and federal air quality requirements. The thresholds that trigger Title V Program permitting include facilities that have a potential to emit:

- 100 tons per year of a criteria pollutant,
- 10 tons per year of a Hazardous Air Pollutant (HAP); or
- 25 tons per year of any combination of HAPs.

All instances of non-compliance of a facility's Title V permit must be reported to the Air District as a Title V permit deviation. From 2019 to 2022, 841 Title V permit deviations were reported between the three Title V facilities in the PTCA area, with 800 of those deviations reported by the Chevron Refinery. Staff investigate each Title V permit deviation and take the appropriate enforcement action following the conclusion of the investigation.

In addition to inspections at permitted facilities, staff also conduct compliance inspections subject to the Air District's Asbestos Demolition and Renovation Program and Gasoline Dispensing Facility (GDF) Program. Asbestos and GDF programs are specialty programs that encompass the entire jurisdiction of the Air District, including the PTCA area. In the 4-year period

between 2019 and 2022, staff completed 192 asbestos demolition and renovation site inspections, and 53 GDF inspections. Staff assigned to these programs cover large geographical areas and conduct frequent inspections and may concentrate on specific Air District regions at a time, as opposed to other staff that have general area assignments and focus specifically on the PTCA area.

Reportable Compliance Activities

Permitted facilities within the PTCA area may be subject to Air District monitoring requirements. Excess emissions registered on a continuous emissions monitor, ground level monitor, parametric monitor, and/or a pressure relief device, are required to be reported to the Air District as a Reportable Compliance Activity (RCA). Permitted facilities experiencing an inoperative monitor or requesting breakdown relief, must also submit an RCA notification. Figure 6-2 summarizes the RCA categories and number of RCAs received by the Air District. In the 4-year period between 2019 and 2022, a total of 1,127 RCAs were reported to the Air District in the PTCA area. Air District staff are responsible for investigating each RCA reported to the Air District. See Appendix E for a complete list of RCAs from 2019 to 2022.

Reportable Compliance Activities (RCA) Data

Type	2019	2020	2021	2022	Total
Excess	115	162	168	197	**642**
Breakdown	12	10	15	11	**48**
Inoperative Monitor	98	108	118	111	**435**
Pressure Relief Valve	1	0	1	0	**2**
Total	**226**	**280**	**302**	**319**	**1127**

Figure 6-2. PTCA area 4-year RCA Data

Air Quality Complaint Investigations

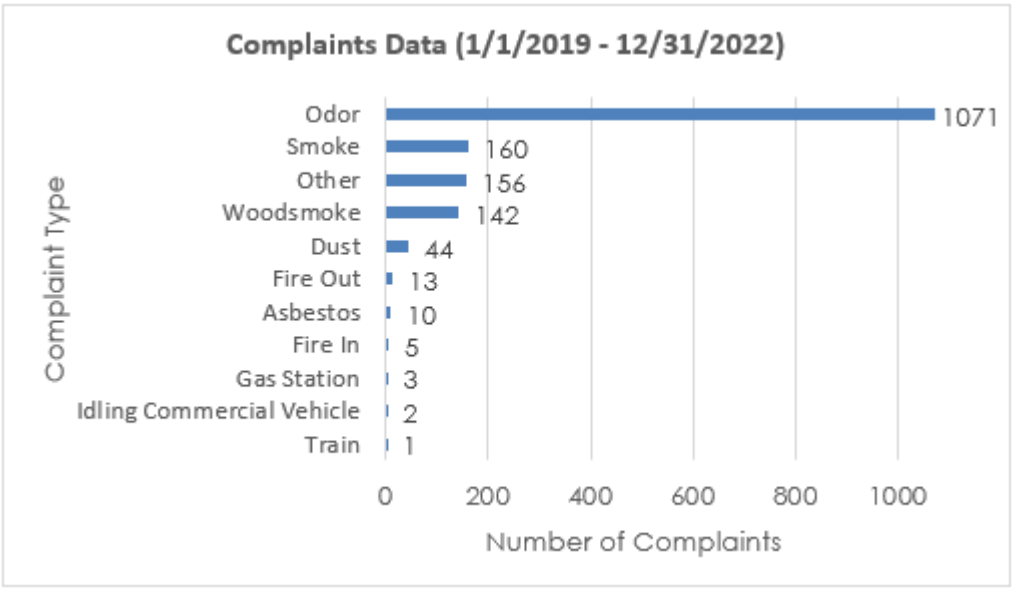
The Air Quality Complaint Program is a key program of the Air District. Community members are often the first to notice an air pollution concern, such as visible emissions or odors, and reporting a complaint allows the Air District to address the concern in a timely manner. While Air District staff are not first responders, staff investigate every air pollution complaint and strive to achieve early intervention to address air quality concerns to protect public health.

The Air District aims to respond to air quality complaints expeditiously, often within 30 minutes. In situations where complaints are received after business hours or on weekends, staff will

respond on the next business day. During an air quality complaint investigation, staff conduct a thorough inspection at the alleged facility/site or potential source of emission to ensure it is operating in compliance with air quality regulations. Investigations may result in Air District enforcement actions, including public nuisance and/or violations of other applicable Air District regulations and requirements. Staff works with the facility/site contact to resolve any air quality issue and notifies the complainant of the investigation outcome.

The Air District updated the Air Quality Complaint Program in early 2021 after hosting five public workshops to seek community feedback and input on improving the program. Based on community feedback, the Air Quality Complaint Policy and Procedures have been updated to expand Air District's ability to confirm complaints, provide clarity and additional guidance on the complaint response and investigation process, clarify public nuisance authority, explain different types of enforcement actions, address confidentiality concerns, and enhance accessibility to information and resources. In addition to updating the Air Quality Complaint Policy and Procedures, supplemental program materials were also developed and/or updated, such as the emissions log, a video series explaining the complaint process, and a helpful tips sheet on reporting an air quality complaint. A new online Air Quality Complaint Reporting system was also developed to better capture information provided by members of the public regarding air quality concerns.

Air quality complaint investigations make up a large portion of the enforcement activities in the PTCA area. In the 4-year period between 2019 and 2022, a total of 1,607 air quality complaints were received by the Air District. Figure 6-3 shows the complaint summary by type. Within the PTCA area, odors are the greatest concern of the community, followed by complaints of smoke. The "Other" complaint type is mostly associated with allegations of flaring activities.



Calendar Year	Number of Complaints
2019	449
2020	410
2021	392
2022	356
Total	**1607**

Figure 6-3. Types of Air Quality Complaints in PTCA area

Figure 6-4 below is a breakdown of the odor complaints in the PTCA area. Of the odor complaints that did allege a specific site or facility, Chevron Refinery, a petroleum refining facility, received the most odor complaints, approximately 28 percent of odor complaints, followed by Veolia/City of Richmond wastewater treatment plant, which received 16 percent of odor complaints in the PTCA area during the period between 2019 and 2022. Approximately 33 percent of the odor complaints filed by complainants during the 4-year period did not allege a specific source. Additionally, 5 percent of the odor complaints in the PTCA area were one, or two-time, single complaints. See Appendix E for a complete list of complaints received in the PTCA area.

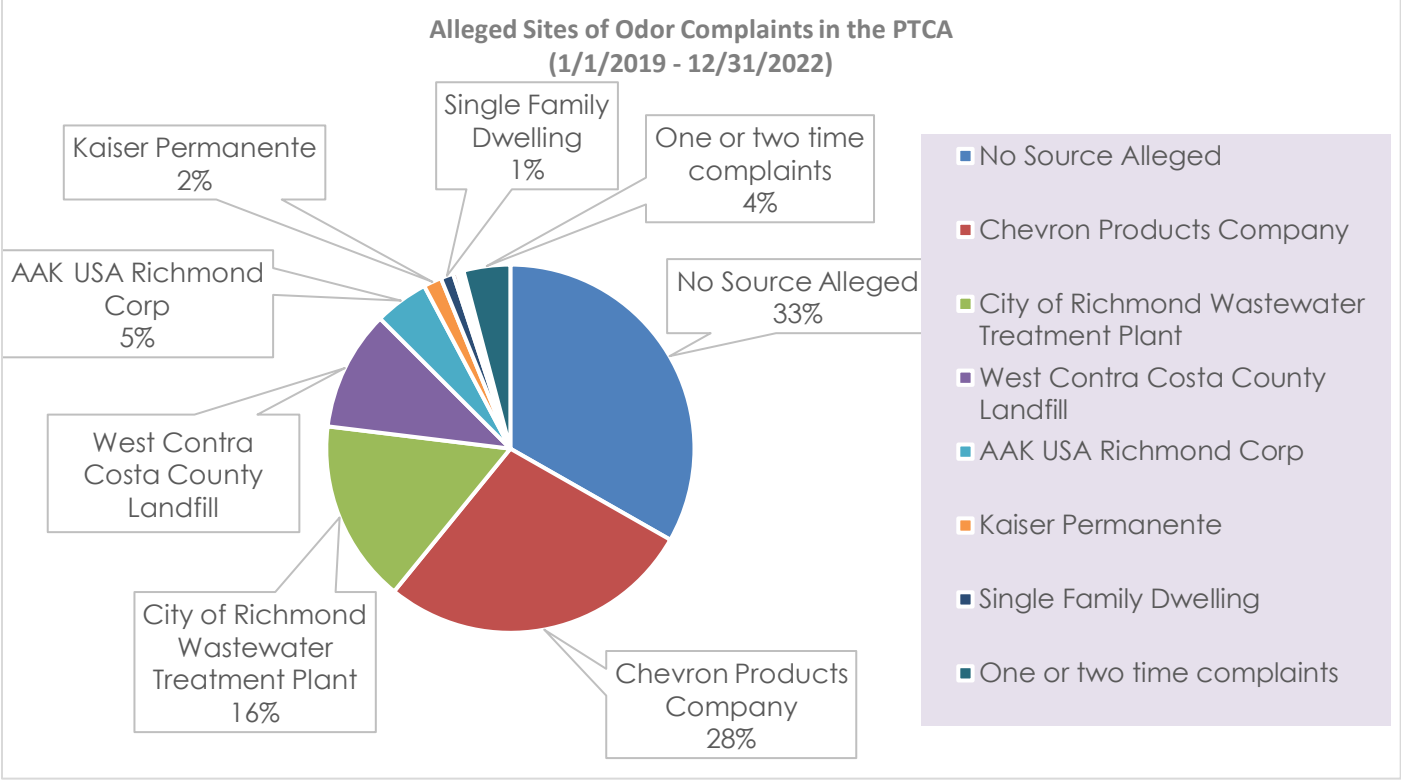


Figure 6-4. Alleged Sites of Odor Complaints in the PTCA area

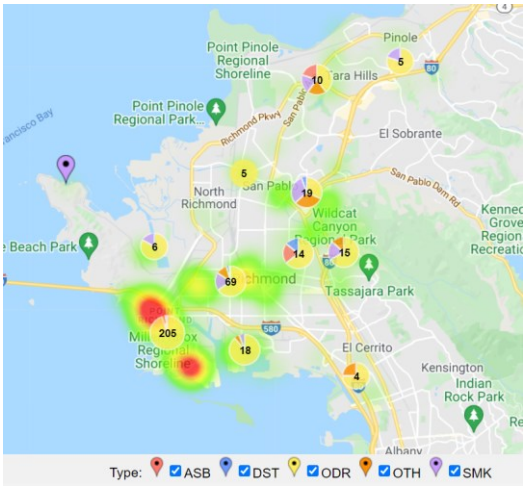
It is important to note that at the time an air quality complaint is filed, the source of alleged emissions may not be known by the complainant, as seen by the 33% of complaints without an alleged source. While not all information may be known, the Air District encourages complainants to be as descriptive as possible when reporting a complaint, especially for odors. Descriptors such as "bad" or "terrible," although true, are not as helpful to an air quality complaint investigation as descriptors such as "burnt plastic" or "rotten eggs." Providing specific details, observations and information about the potential source can help locate the source of emissions and identify compliance issues more quickly.

Staff achieved a confirmation rate of 18.2%* for all air quality complaints received in the PTCA area during the 4-year period between 2019 and 2022. This is in comparison to a 10.2%* air quality complaint confirmation rate for the entire 9-county Air District jurisdiction during the same reporting period. The confirmation rates in the PTCA area and throughout the Bay Area are expected to continue to increase as a result of the updates made to the Air Quality Complaint Program in early 2021, expanding the Air District's ability to confirm air quality complaints.

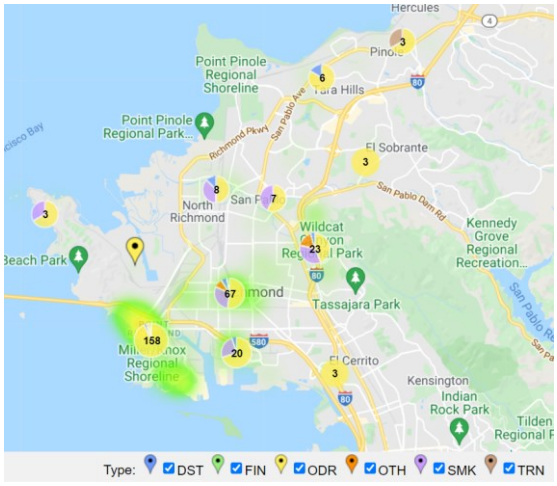
The heat maps found in Figure 6-5 illustrate the distribution of reported air quality complaints by complainant location in the PTCA area over the last four years. Areas appearing in darker colors (red, orange) indicate locations within the PTCA area where a higher volume of air quality complaints have been received by the Air District and are further distinguished by complaint type as indicated on the bottom of each figure. The heat maps indicate that areas surrounding the heavy industrial locations of the PTCA area, including locations of the Chevron Refinery and the Veolia/City of Richmond wastewater treatment plant, have reported the most air quality complaints, with vast majority being odor concerns.

**Air quality complaint confirmation rates exclude woodsmoke complaints.*

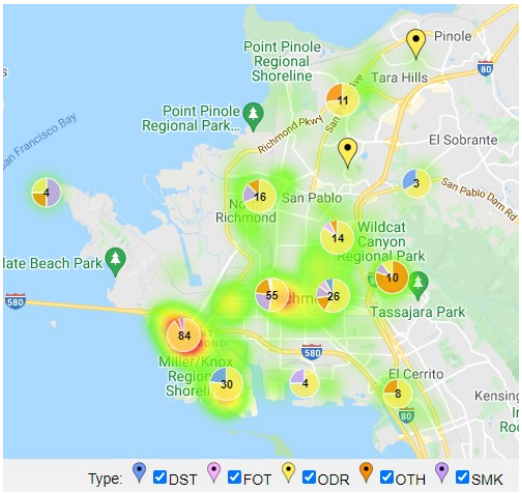
2019
Total Complaints: 449



2020
Total Complaints: 410



2021
Total Complaints: 392
Anonymous Complaints: 54



2022
Total Complaints: 356
Anonymous Complaints: 46

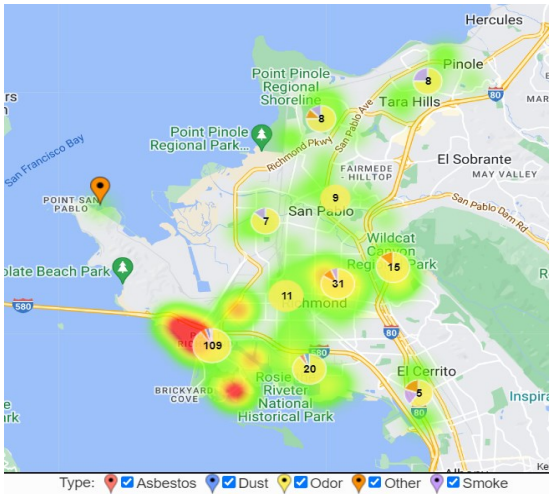


Figure 6-5. Heat Maps of Filed Air Quality Complaints in the PTCA area by Complainant Location (anonymous complaints and woodsmoke complaints are not shown on maps)

Notice of Violations and Notice to Comply

Notice of Violation (NOV) and Notice to Comply (NTC) are mechanisms used by staff to cite facilities discovered to be operating a source in violation of Air District, state, or federal air quality regulations. A single NOV or NTC may be issued to document one or more violations.

An NTC may occasionally be issued for minor or de-minimis violations that are administrative in nature and do not cause or are associated with emissions. An NTC is an enforcement action to

place the facility on notice that there is a compliance concern. In the 4-year period between 2019 and 2022, 25 NTCs were issued, see Figure 6-6.

Notice to Comply:

- Total number issued between 2019 and 2022: 25
  - Chevron Products Company: 9
  - Gas Stations: 5
  - Others: 11

Calendar Year	Number of NTCs
2019	18
2020	0
2021	6
2022	1

Figure 6-6. PTCA area 2019-2022 Notice to Comply Summary

With an NOV, staff cite the type of source(s) and regulation(s) violated and document the compliance issue and cause, the number of regulatory violations associated with the NOV, the extent of harm associated with the violation(s), and how the violation(s) was stopped or corrected in a detailed NOV report.

When an NOV is issued, the facility is required to take immediate corrective actions, including taking steps to prevent it from happening again. Facilities that do not correct violations or take measures to prevent them risk increased penalties for repeat or continuing violations. In the 4-year period between 2019 and 2022, a total of 602* NOVs were issued. Over 80% of the NOVs issued were operational violations, followed by monitoring violations at 12% of violations, over the reporting period.

The table below summarizes the different types of violations. Operational violations are associated with excess emissions typically caused by failure to follow permit conditions and improper use of equipment. Monitoring violations include exceedances discovered from monitoring devices such as continuous emissions monitors, parametric monitors, and ground level monitors, and other recordkeeping or maintenance requirements specified in regulations. Permit violations are issued to facilities discovered to be operating equipment without a valid

Authority to Construct or Permit to Operate. Administrative violations cover issues such as late reporting and missing reports. See Figures 6-7 and 6-8.

Type	2019	2020	2021	2022	Total	Percentage
Permits	10	0	4	4	18	3.0%
Administrative	6	3	2	8	19	3.2%
Monitoring	5	6	17	41	69	11.5%
Operational	74	55	175	192	496	82.4%
Total	**95**	**64**	**198**	**245**	**602***	**100%**

Figure 6-7. PTCA area 2019-2022 Violation Summary

**11 NOVs were cancelled over the reporting period and are not reflected in the 602 total tally of NOVs.*

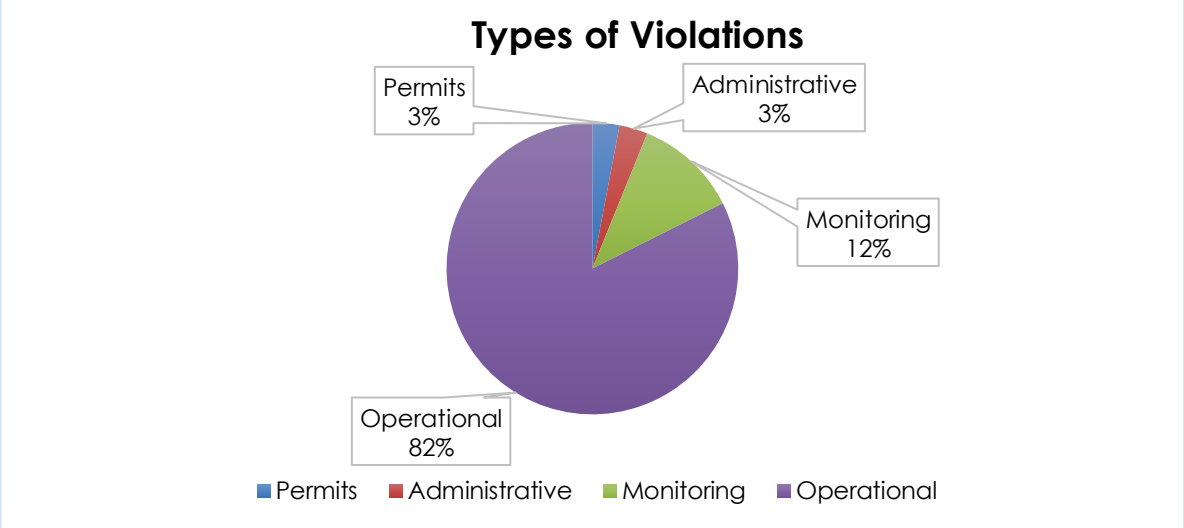


Figure 6-8. PTCA area 2019-2022 Violation Summary by Type

Figure 6-9 shows the sites or facilities in the PTCA area that received more than one NOV from 2019 to 2022.

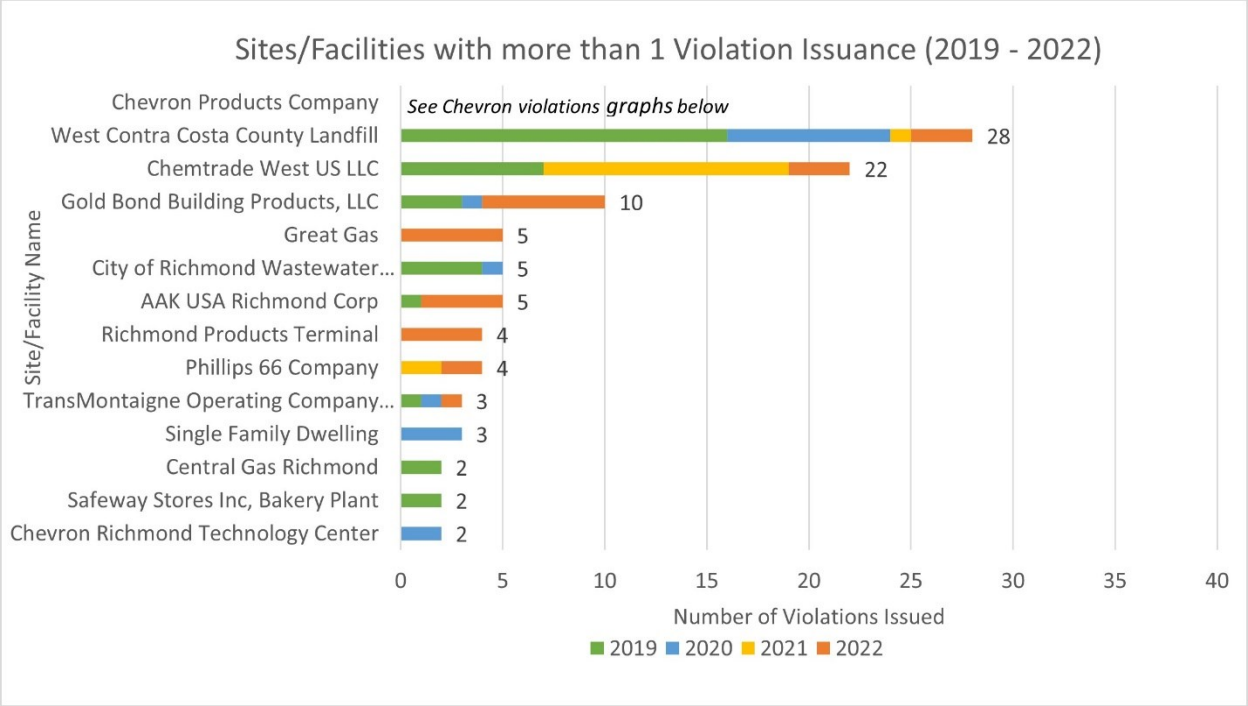


Figure 6-9. PTCA area 2019-2022 Violation Summary by Facility

A closer look at the Chevron Refinery in the graph and chart below (Figures 6-10 and 6-11) shows that the Chevron Refinery was issued a total of 486* violations in the past 4 years. The majority of citations issued to the Chevron Refinery were for operational violations.

**8 cancelled NOVs for the PTCA area were associated with the Chevron Refinery and are not reflected in the 486 total tally.*

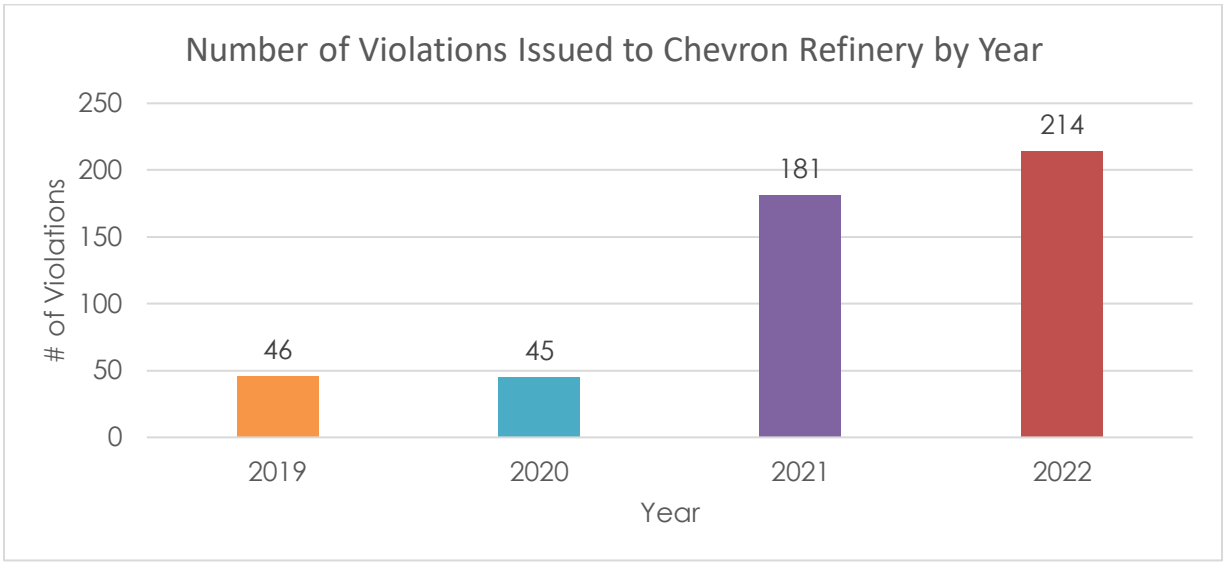


Figure 6-10. PTCA area 2019-2022 Total Violations Issued to the Chevron Refinery by Year

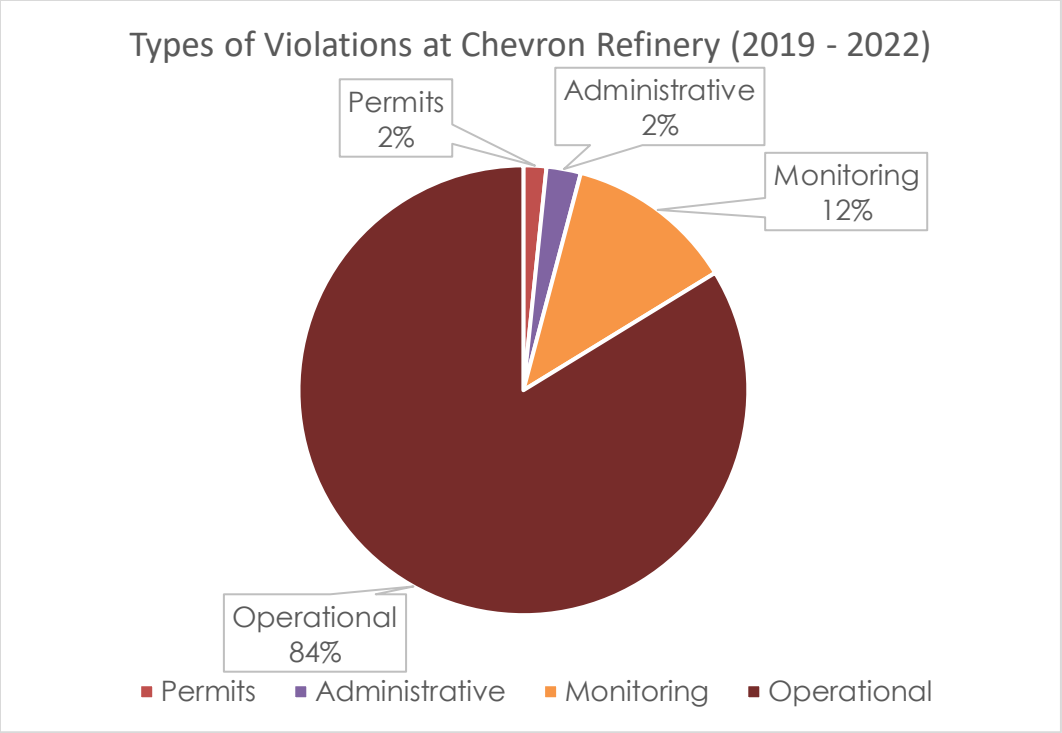


Figure 6-11. PTCA area 2019-2022 Violation Summary for the Chevron Refinery by Type

A violation of the Air District's, Rule 1-301, Public Nuisance, is categorized as an operational violation. The Chevron Refinery was cited eight times for Public Nuisance violations between 2019 and 2022. Figure 6-12 provides additional information for each Public Nuisance occurring in the reporting period.

RULE CITED	OCCURRENCE DATE	ISSUANCE DATE	VIOLATION DETAILS
1-301	11/06/2021	8/01/2022	Public nuisance due to odor impacts in the community.
1-301	10/24/2021	10/24/2021	Multiple confirmed complaints due to flaring activity.
1-301	8/10/2021	8/27/2021	Complaints confirmed to flaring event, 8/10/2021.
1-301	5/27/2021	6/09/2021	Public nuisance due to flaring and black smoke.
1-301	2/09/2021	4/07/2021	Public nuisance due to oil spill from the long wharf.
1-301	11/02/2020	3/01/2021	Flaring incident with visible emissions that resulted in 16 confirmed public complaints.
1-301	8/14/2020	10/01/2020	Complaints confirmed to flare event, 8/14/2020.

RULE CITED	OCCURRENCE DATE	ISSUANCE DATE	VIOLATION DETAILS
1-301	3/07/2019	6/27/2019	Richmond odors (refinery-wide outage).

Figure 6-12. Public Nuisance Summary for the Chevron Refinery, 2019-2022

The increase in violations issued to the Chevron Refinery in the calendar years 2021 and 2022 was attributed to several factors. In March 2020, in response to the quickly developing pandemic, a shelter-in-place order was mandated in the state, bringing operations of businesses to a standstill. The Air District quickly shifted operations in response to the pandemic, however, the ability to conduct in-person facility inspections and investigations was limited at that time. As operations normalized, staff began processing and investigating Title V deviations and RCAs accrued during the early stages of the pandemic, with the conclusion of an investigation often resulting in the issuance of an NOV. The additional dedicated staff assigned to the Chevron Refinery in 2021 aided in the effective investigation and processing of the accrued Title V deviations and RCAs, and further contributed to the increase of violations issued in calendar years 2021 and 2022. See Appendix E for a complete list of violations issued in the PTCA area.

Reportable Flaring Events at the Chevron Refinery

A reportable flaring event is defined in Air District Rule 12-12 as a flaring event where over 500,000 standard cubic feet of gas are flared on a calendar day, or one where over 500 pounds of sulfur dioxide are emitted in a day. The Air District's flaring regulations are designed to limit the frequency and magnitude of flaring events by requiring refineries to implement a Flare Minimization Plan as seen in Rule 12-12, and to monitor the flares, per Rule 12-11. These two Rules require refineries, including the Chevron Refinery, to conduct several action items, including, but not limited to:

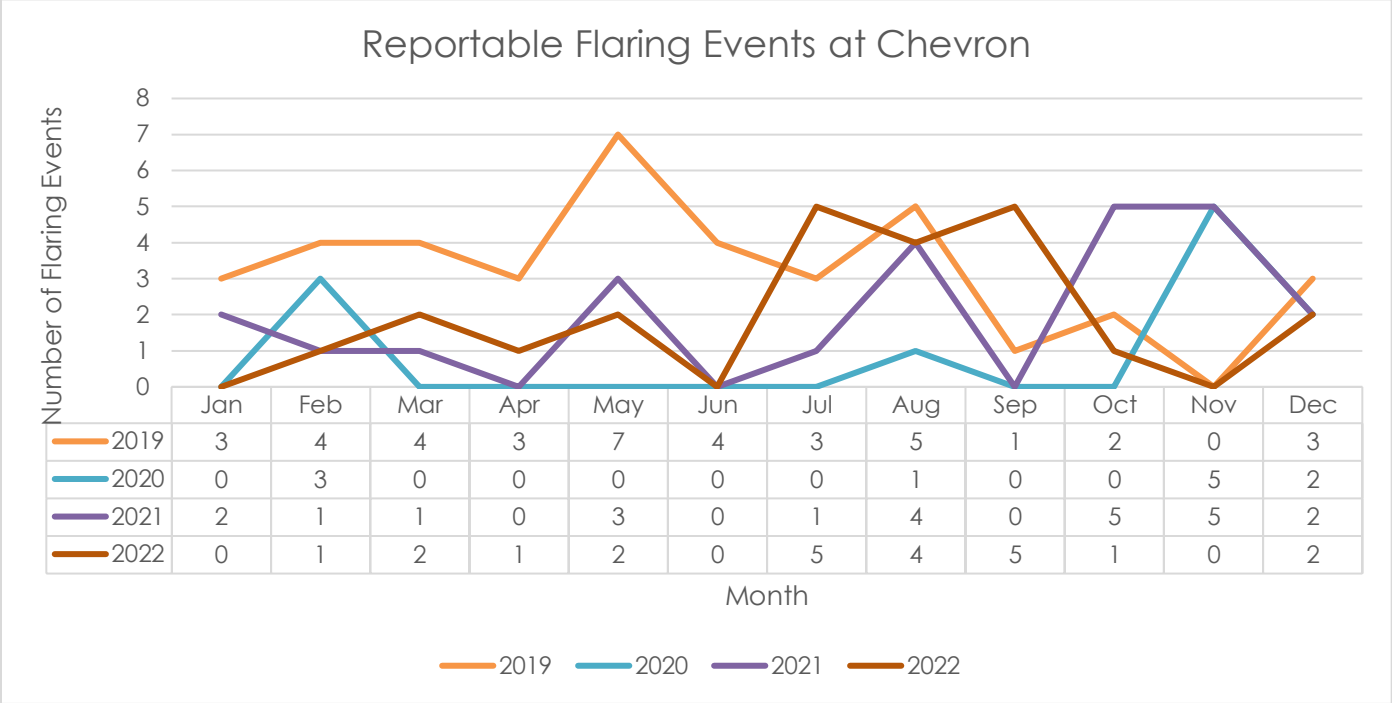
- Immediately notify the Air District of a reportable flaring event.
- Monitor the volume and composition of gases burned in flares.
- Calculate the emissions based on flare data collected.
- Determine the reason for the flaring and implement prevention measures.
- Continuously monitor and record the flares.
- Submit flare data monthly to the Air District
- Implement QA/QC of flare systems including the monitoring of flare pilots, vent gas flow, and sampling systems.

Between 2019 and 2022, there have been approximately 161 total reportable flaring events across the five Bay Area refineries. More than half of the total number of reportable flaring events, or 97 of those events, were reported by the Chevron Refinery. Several notable events occurring at the Chevron Refinery in the past four years have contributed to the disproportionate distribution of the reportable flaring events. In late 2018, the Chevron Refinery commissioned the operation of a new hydrogen unit and associated hydrogen flare. More than half of refinery's flaring events in the past four years have been associated with the commissioning of the new hydrogen unit. The flaring events at the hydrogen flare are caused by a hydrogen imbalance at the refinery, which can include downstream units going offline, and startups and shutdowns of units associated with the hydrogen plant, resulting in the combustion

of excess hydrogen along with carbon monoxide, and methane. It should be noted that the excess hydrogen streams combusted at the hydrogen flare contain a lower sulfur content as compared to flaring streams combusted at the refinery's other flaring systems and the hydrogen plant flare is source tested to ensure at least a 98% destruction efficiency.

Other contributing events causing significant flaring at Chevron refinery include an electrical issue experienced in 2020 that caused process unit upsets, and when a major storm in 2021 knocked down the refinery steam supply, nearly causing a refinery-wide shut down and flaring. These two events alone resulted in the issuance of a significant number of NOVs for flaring related regulations. Additionally, in 2022, the Chevron Refinery went through a major turnaround, resulting in more, but brief and lower emitting, reportable flaring events.

Figure 6-13 summarizes the number of reportable flaring events from the Chevron Refinery between 2019 and 2022. It is important to note that the length of time and duration of each reportable flaring event can vary depending on what caused the flaring. Each reportable flaring event requires the refinery to submit a causal analysis report detailing the root cause of the event along with measures to prevent future occurrences per Rule 12-12. Each causal analysis event is reviewed and investigated by C&E staff.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	3	4	4	3	7	4	3	5	1	2	0	3
2020	0	3	0	0	0	0	0	1	0	0	5	2
2021	2	1	1	0	3	0	1	4	0	5	5	2
2022	0	1	2	1	2	0	5	4	5	1	0	2

Figure 6-13. Reportable Flaring Event at Chevron Refinery, 2019-2022

Air District Rule 12-11 requires that a monthly report of flare data be submitted to the Air District for every flare subject to the Rule. This includes total daily and monthly vent gas flow and vent gas composition, among many other requirements, from refineries subject to this rule. Flare monitoring data are available on the Air District's website, https://www.baaqmd.gov/about-air-quality/research-and-data/flare-data.

Centering Community Needs in Plan Enforcement

The Air District recognizes the importance of enforcement in the PTCA community. The success of a community emissions reduction plan depends heavily on a robust enforcement program. It is the goal of the Compliance & Enforcement Division to continuously enhance its enforcement efforts to target noncompliance based on community concerns and feedback, and conduct frequent inspections, investigations, and take appropriate enforcement actions upon discovery of violations, to ensure regulated facilities and sites operate in compliance with all applicable air quality rules and requirements. Based on community concerns, the Air District has developed enforcement strategies that specifically address key issues identified in the PTCA Plan. Please refer to Chapter 7 for details.

Enforcement of Mobile Sources

CARB ENFORCEMENT PROGRAMS

The California Air Resources Board's (CARB) Enforcement Division aims to develop partnerships with PTCA community organizations to co-lead the development of community-focused action plans that reduce disproportionate exposures within the Richmond, North Richmond, and San Pablo (R/NR/SP) boundary. CARB is charged with enforcing its regulations applicable to mobile sources, consumer products and other area-wide categories, such as fuels, and climate programs, while the Air District is primarily responsible for enforcement relating to stationary sources (e.g., boilers, refineries).

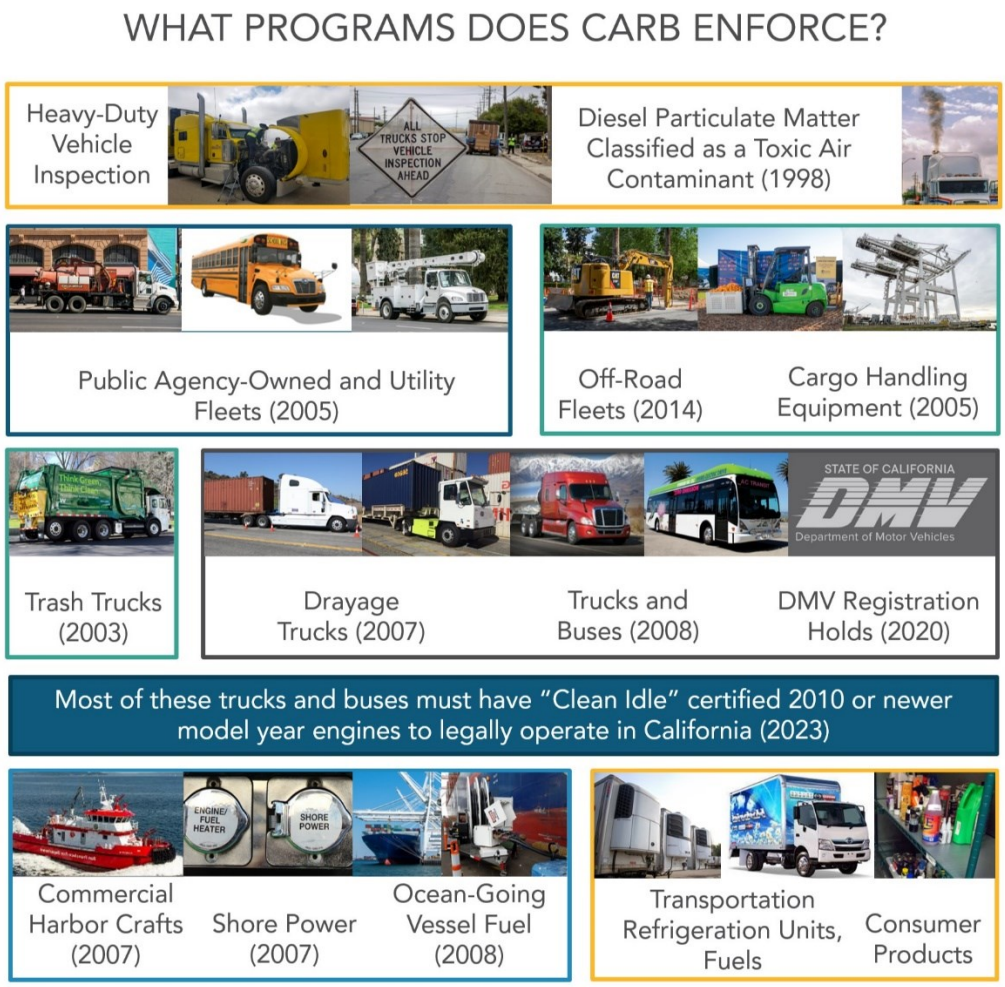


Figure 6-14: Programs CARB Enforces

CARB enforcement programs cover the vehicles we drive, the diesel engines that power our economy, consumer products that we purchase, and greenhouse gas (GHG) emissions from our industries and activities. The goal of CARB enforcement programs is to achieve comprehensive compliance in every regulation that CARB adopts. Through enforcement, we work to bring responsible parties into compliance and in doing so achieve a level playing field across industry so that no company can benefit from non-compliance at the expense of another; and to deter industry from future violations.

CARB applies enforcement programs in accordance with the enforcement policy, which was updated in 2017. CARB uses data and inspections to identify potential non-compliance, and then investigate each case. Once a violation is identified, CARB notifies the potential violator and evaluates what happened. CARB works with the party to achieve compliance and measure the relevant facts and circumstances of each case, relative to eight factors set in law and described in the enforcement policy, to determine an appropriate penalty. The case is settled when the responsible party has achieved compliance and paid an appropriate penalty. If the case cannot be settled, CARB works with legal staff to refer the case to California's Attorney General for litigation.

Field inspectors are a critical component of the diesel enforcement program. The inspectors work across the state to inspect trucks and other equipment for compliance with CARB's diesel regulations, such as the Heavy-Duty Diesel Vehicle Inspection Program, Solid Waste Collection Vehicle, Drayage Truck, Statewide Truck and Bus, Tractor-Trailer Greenhouse Gas, and Transport Refrigeration Unit. Field inspectors also conduct inspections for compliance with Public Agencies and Utilities, In-Use Off-Road, and School Bus Idling regulations. CARB inspectors examine heavy-duty vehicles and equipment at numerous locations throughout California, such as at California Highway Patrol scale facilities, warehouses, fleet yards, construction sites, random roadside locations, truck stops, rest areas, ports, and rail yards.

CARB's enforcement activities can be found in CARB's Enforcement Data Visualization System (EDVS), located here: Enforcement Data Visualization System – California Air Resources Board. A guide to how to use EDVS is here: Enforcement Data Visualization System (ca.gov).

HEAVY-DUTY DIESEL VEHICLE ENFORCEMENT

CARB regulations establish stringent emission requirements that new diesel vehicles must meet. These requirements required engine manufacturers to meet lower particulate matter (PM) and nitrous oxide (NOx) emission standards. Many manufacturers employed the installation of diesel particulate filters to meet the PM standard, as well as exhaust aftertreatment to meet the NOx emission standard. These devices remove more than 98 percent of toxic diesel emissions from Heavy Duty Diesel Trucks (HDDTs) when properly functioning. In addition, because diesel engines and equipment are designed to last decades, CARB's diesel fleet regulations require operators to replace older, higher polluting vehicles and equipment with cleaner vehicles, equipment, and technologies to provide emission reductions as quickly as possible. These regulations apply to operators of on-road diesel vehicles such as trucks, and off-road diesel vehicles and equipment including construction and cargo handling equipment, transport refrigeration units, commercial harbor craft, and other sources. As a result of these programs, CARB has greatly reduced diesel PM and NOx emissions by over 90 percent in communities statewide.

CARB developed a comprehensive heavy-duty vehicle inspection and maintenance (HD I/M) regulation to ensure that vehicles' emissions control systems are properly functioning when traveling on California's roadways. The Board approved the regulation in December 2021, with implementation to be phased in starting January 2023. Dubbed the Clean Truck Check, the program combines periodic vehicle testing requirements with other emissions monitoring techniques and expanded enforcement strategies to identify vehicles in need of emissions related repairs and ensures any needed repairs are performed. When fully implemented, the program will provide significant reductions in smog-forming and carcinogenic toxic air pollution necessary to achieve federal air quality mandates and healthy air in California's communities.

As reported in EDVS, CARB did not do any heavy-duty diesel inspections for years 2019 through 2022 within the R/NR/SP community border, including all heavy-duty vehicle inspection programs, idling, transport refigeration units and off-road. CARB will work with the Community Steering Committee to prioritize inspection locations to ensure that sufficient enforcement is taking place in the community.

Truck and Bus RULE

Nearly all trucks and buses in California are already, or will be, required to have a certified 2010 or newer model year engines by January 2023, to comply with CARB's Truck and Bus rule to legally operate in California. In fact, California is entering its third year where the California Department of Motor Vehicles (DMV) is holding registration for some trucks and buses that are not in compliance with CARB's Truck and Bus rule as a requirement of Senate Bill 1. Due to CARB regulation implementation and enforcement, the compliance rate statewide for the rule was 98 percent in 2022. Trucks and buses that cannot demonstrate compliance with the statewide truck and bus rule will have registration holds placed on them at DMV and will be prevented from being driven in California. According to DMV data, in year 2022, vehicles registered in the R/NR/SP community zip codes had a 97 percent compliance rate for heavy-duty diesel vehicles and 95 percent for light-duty diesel vehicles.

Marine Enforcement

Inspection results for marine programs in R/NR/SP

	2019	2020	2021	2022
Commercial Harbor Craft	37	0	0	0
Ocean Going Vessel	6	2	2	3
Total Inspections	43	2	2	3
Total Non-compliant	5	0	0	0
Compliance rate	88%	100%	100%	100%

Figure 6-15 CARB inspection results

Analysis of the enforcement data for inspection activities in the Port of Richmond suggests that there is a high compliance rate. However, given the lack of spatial data for some programs within the marine enforcement section, CARB acknowledges the need for better data management, which will allow for higher resolution of enforcement activities within the community. While most commercial harbor craft inspections were conducted across the Oakland Inner Harbor in Alameda, these vessels will often enter the Oakland Inner Harbor and can impact Richmond/San Pablo residents.

Consumer Goods

Consumer product inspections are an important regulatory tool to improve public health in the community. Consumer products, such as hairsprays, deodorants, and flooring, are widely used but can be sources of toxic air containments (TACs) and volatile organic compounds (VOC) that community members bring into their homes. From 2019 to 2022, CARB conducted 20 consumer products inspections in 7 locations within the PTCA community. All 20 inspection results are pending further investigation.

In January 2021, CARB and Lexfloor Incorporated, (Lexfloor), of Richmond, reached a settlement agreement in the amount of $5,000. Lexfloor sold, supplied, and offered for sale in California noncompliant laminate flooring that contained medium density fiberboard. The flooring products contained formaldehyde emissions above the limits set forth in the Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products, which has been in effect since January 1, 2009. To come into compliance, Lexfloor has since stopped sales of the noncompliant flooring and no longer imports laminate flooring. More information here: https://ww2.arb.ca.gov/lexfloor-inc-settlement

Fuels

CARB is authorized to adopt standards, rules, and regulations to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state ambient air quality standards at the earliest practicable date. CARB's fuels effort is made up of several components which broadly fall into two categories: (1) adopting and enforcing fuel specifications, and (2) controlling emissions from marketing and distributing fuels in California.

Fuel inspections 2019-2022

Fuel	Inspections
Gas	171
Diesel	30

Figure 6-16 CARB fuel inspections

From 2019 through 2022, CARB conducted 201 fuel inspections which resulted in zero violations. Although there is a high compliance rate, CARB will continue to inspect for fuel violations to ensure continued compliance.

Landfill

California's Landfill Methane Regulation requires municipal solid waste landfills to reduce methane and other air pollutant emissions through emissions monitoring and through capturing fugitive methane. In August 2022, an inspection of 38 wells found 4 exceedances at the West Contra Costa Landfill. Per a CARB and the Air District memorandum of understanding, these inspection results were referred to the Air District for follow-up.

Oil and Gas

In 2017, CARB approved the Oil and Gas Regulation to reduce emissions of methane from oil and gas production, processing, storage, and transmission compressor stations, which account for four percent of methane emissions in California. The regulation requires:

- Owners/operators of oil and natural gas facilities to conduct quarterly leak detection and repair (LDAR) surveys to monitor components for leaks and requires detected leaks to be repaired within a specified time frame.
- Take actions to limit intentional (vented) and unintentional (leaked or fugitive) emissions from equipment and operations.

It is also important to remember that locating and repairing leaks from the oil and gas sector may provide additional benefits because the same leaks also have the potential to release air toxins and volatile organic compounds, such as benzene. CARB and the Air District have a Memoranda of Agreement between the two agencies for the Oil and Gas Regulation, which is primarily enforced by the Air District.

Other Areas of Mobile Enforcement

CARB enforces many areas related to mobile vehicles including engines, fuel containers, refrigerants, and windshield washer fluids. All these programs contribute to CARB's overall efforts to tackle emissions of all types from all sources. All 16 inspections listed below resulted in no violations. See appendices for more information on these programs.

Other mobile enforcement programs 2019-2022

Program	Inspections
49-State Vehicle Program	3
On-Road Motorcycles	1
Off-Highway Recreational Vehicle	1
Portable Fuel Container	4
HFC-134a Refrigerant	1
Recreational Marine Engines	1
Automotive Windshield Washer Fluid	1

Figure 6-17 CARB mobile enforcement programs

Complaints Received

CARB staff responds to all complaints within 24 hours, or the next business day. The complainant gets a complaint ID number, and an email is sent to the complainant when the complaint is opened and when it is closed. Phone calls are made to the complainant if more info is needed. Often details cannot be discussed during the inspection process but every attempt to resolve the complaint will be made. CARB takes enforcement action based on the investigation of the complaint which can lead to a notice of violation. Sometimes the investigations can take long and remain pending until resolved, other times the complaints are not actionable because CARB did not receive enough information to initiate an investigation. Based on the nature of the complaint, we may refer the complaint to another agency that has the appropriate jurisdiction. CARB received 10 mobile complaints from the R/NR/SP community between 2019-2022. Most of the complaints CARB received were for smoking vehicles. CARB also received 24 non-mobile complaints from 2019-2022, mostly consisting of odors, open burning, and issues from stationary source facilities, which were referred to the Air District for action.

Complaints Received at CARB 2019-2022

Complaint/Program Type	Number	Action Taken
Light-duty vehicles	1	Referred to another agency
Off Road	1	Found to be in compliance. No further action
Smoking vehicle	7	Under investigation (6), Referred to another agency (1)
Truck and Bus	1	Referred to another agency

Figure 6-18 CARB complaints received

An important part of AB 617 is increasing community awareness of the tools that are available to residents. Reporting complaints to both the Air District and CARB enables members of the public to play an active role in addressing air pollution concerns in their community. Both agencies rely on community input for identifying additional locations and sources of concern. CARB accepts

and addresses all air quality complaints as they come into the system, including mobile sources and oil and gas facilities. To report a complaint to CARB regarding environmental concerns, please go to CalEPA's online complaint system at:

About the Environmental Complaint System | CalEPA (For all complaints, including air, water, and soil).

Supplemental Environmental Projects

CARB has a Supplemental Environmental Project (SEP) policy that allows community-based projects to be funded from a portion of the penalties received, up to 50 percent, during the settlement of enforcement actions. SEPs can improve public health, reduce pollution, increase environmental compliance, and bring awareness to communities most burdened by environmental harm. Currently, SEPs have funded the installation and maintenance of air filtration systems in the West Contra Costa School District. CARB staff can help community members or organizations identify where SEPs would be more impactful and assist with the submittal of proposals.

For more information on SEPs, please visit: Supplemental Environmental Projects (SEP).

Or Email us at: SEP@arb.ca.gov.

Chapter 7: Key Issues and Strategies

Introduction

This chapter describes the approach used by the Community Steering Committee (CSC) and the Air District to develop community concerns, key issue statements, strategies, and actions. This chapter also presents the Plan's strategies, organized by community concern or by cross-cutting issue, and a summary of the actions to achieve each strategy. Detailed information about each action, including implementation information can be found in Appendix A: Actions.

Community Concerns

A list of community concerns was developed with CSC input based on a variety of public engagement efforts conducted from 2018 through 2021, including the Path to Clean Air Social Pinpoint platform, Community Town Hall, community input during development of the monitoring plan, and CSC review of the PTCA community-scale emissions inventory (See Appendix J: List Of Community Concerns For The Path To Clean Air Community Emissions Reduction Plan). The full list of community concerns was summarized into six categories that reflected major recurring themes. These thematic community concern areas served as a foundation for creating Key Issue Statements, the first step in developing the Plan's strategies and actions.

Community Concern Thematic Areas

- Commercial and Industrial Sources Near Community
- Fuel Refining, Support Facilities, Storage, and Distribution
- Public Health and Reducing Exposure
- Marine and Rail
- Vehicles and Trucks, Streets and Freeways, Warehouses and Logistics
- Odors and Smells from Industry

Key Issue Statements

Key issue statements are summary statements that describe the PTCA community concerns and priorities. They are grounded in the information and findings from the PTCA Plan technical assessment, community profile, enforcement findings, and community lived experience. The CSC and the Air District worked together to gather and consider information including community history, emissions inventory, air modeling data, air pollution measurements, Air District compliance and enforcement data, and other sources of information to understand community-identified concerns. These data helped provide a common understanding of the causes of air pollution emissions and exposure, as well as the extent and scope of impacts on the health and quality of life for people in the PTCA area.

Key issue statements were developed for the community concern thematic areas described above. The CSC and the Air District worked together to organize the following into said statements:

- Community Concerns: priority issues and challenges identified by the community
- Existing Conditions: pollutants or risks of concern identified in the Emission Inventory or by air modeling, compliance or enforcement issues based on 3-year enforcement history summaries, data, and maps

- Source (type, amount, pollutant): specific source of the pollutant or risk associated with the concern
- Risk to People (sensitive receptors, health, demographics): at-risk population or sensitive receptors in proximity to the concern, information about that group's health (e.g., rates of asthma), as well as demographics (e.g., age).
- Consequence: the "so what" statement that explains the outcome or impact on people or other types of impacts (e.g., "second order effects")

CSC members and Air District staff used the following framework and format to develop draft and then final key issue statements:

KEY ISSUE STATEMENT FRAMEWORK

_____ is a concern because it is _____,

Community Concern Existing Conditions/Activities

that results in _____, which impacts _____

Source (Type, Amount, & Pollutant) Risk to People (Sensitive Receptors, Health, & Demographics)

and causes (or leads to)_____ .

Consequence

Writing and Reviewing Key Issues and Strategies

In June 2022, the Problems to Solutions (P2S) Ad Hoc of the CSC convened. The P2S Ad Hoc led the research, writing, and review of key issues, strategies, and actions addressing six community concern thematic areas. The P2S Ad Hoc helped ensure key issues and strategies were developed following a community driven process rather than a top-down government process (see Chapter 2: Steering Committee Members for more details about the P2S Ad Hoc).

The P2S initially formed six writing groups – one for each of the community concern thematic areas. Writing groups were supported by Air District staff. As needed, the groups consulted with other experts, e.g. CARB or local agency staff. All writing teams were guided by the PTCA Strategy Writer's Guide (see Appendix K). The Writer's Guide is a tool that was developed with the CSC to provide a common framework for developing and reviewing strategies and actions. The Writer's Guide includes descriptions of the necessary strategy and action components and provides criteria for writing and reviewing teams to assess whether strategies are feasible and aligned with the PTCA Visions and Principles (See Chapter 3: Vision and Principles).

During the writing process it was identified that one thematic area – Odors and Smells from Industry – should be broadened to more generally cover compliance and enforcement issues relevant to the entire PTCA area. Additionally, three other issue areas relevant to the entire PTCA area were also identified: Land Use, Promoting Urban Greening, and Resource PTCA Plan Implementation. Small writing teams were formed to develop strategies and actions for these broader "cross-cutting" issues – that is, issues that have an impact on the entire PTCA area or that cut across several community concerns.

All P2S Ad Hoc writing groups sought input from the full CSC to develop key issues and get feedback on the types of strategies and actions that would best address the community concerns identified (see Chapter 2: Steering Committee Members for more details about the P2S Ad Hoc writing teams). Finally, the P2S Ad Hoc writing team leads worked with volunteers from the CSC to review and comment on the initial draft key issues, strategies, and actions. Concurrently, Air District staff from all Divisions and the Executive Office provided review and feedback on the initial draft strategies.

The process to develop key issues and strategies began in June 2022 and concluded in September 2023. The following is a snapshot view of the writing and reviewing timeline:

- June 2022 - P2S Ad Hoc Convenes
- Sept 2022 to Nov 2022 - Key Issues developed in CSC monthly meetings
- Oct 2022 to Sept 2023 - P2S Ad Hoc focus on strategies and actions for community concerns
- March 2023 to Sept 2023 - P2S Ad Hoc focus on cross-cutting strategies and actions
- June 2023 to Aug 2023 - initial draft strategies and actions complete
- July 2023 to Sept 2023 - CSC Review Teams and Air District Review
- Oct 2023 - draft strategies and actions complete

Key Issue Statements, Strategies and Actions

The PTCA Plan key issue statements, strategies, and a summary of the actions under each strategy, as well as introductory and background information, are presented for each of the five community concern thematic areas in alphabetical order. Strategies and a summary of the actions for each of the cross-cutting issues follow the community concern thematic areas. Complete details about each action, including how the action is suggested to be implemented and progress evaluated, can be found in Appendix A: Actions.

1. Commercial and Industrial Sources Near Community
2. Fuel Refining, Support Facilities, Storage, and Distribution
3. Public Health and Reducing Exposure
4. Marine and Rail
5. Vehicles and Trucks, Streets and Freeways, Warehouses and Logistics
6. Compliance and Enforcement
7. Land Use
8. Resource PTCA Plan Implementation
9. Urban Greening

Commercial and Industrial Sources Near Community

Introduction

Commercial and Industrial Sources Near Community includes large industrial facilities as well as smaller industrial and commercial sources. Generally, for these facilities, there are issues surrounding particulate matter exposure and toxic air contaminants, as well as challenges surrounding the diversity of sources that fall into this category. Emissions of air pollutants from some businesses and activities can have a significant exposure impact on the nearby areas, even if the contribution is just a small percentage of the area's total emissions of that pollutant. This can be especially true for businesses located near where people live or spend time. There

are also larger industrial operations that contribute in varying degrees to both local and area-wide impacts, depending on the activity at the facility generating the emissions.

Many emissions in this sector are associated with activities and processes where the emissions are not collected by an air pollution control device or emitted from a stack, and are referred to as fugitive emissions. Since these emissions may occur at ambient temperatures and near the ground, they can have significant near facility impacts. Common types of fugitive emissions are 1) VOC emissions from evaporation of fuels, solvents, or paints and 2) PM emissions from stockpiles of materials or disturbed surfaces. Restaurants are also a significant source of $PM_{2.5}$.

Additionally, some of the larger facilities in the PTCA area are of concern in terms of health risk from toxic air contaminants (TACs). Facilities with sources that emit TACs may be subject to risk-related requirements via the Air District's Rule 11-18, which was adopted to reduce health risks from emissions of TACs from existing facilities. In the PTCA emissions inventory, the "Commercial & Industrial Sources Near Community" category contributes more than 5% of the total burden for the following TACs: formaldehyde, manganese, naphthalene, and cadmium as well as the following CAPs: TOGs and $PM_{2.5}$.

Key Issues

Key Issue 1: PM Exposure: Fine Particulate Matter
"Commercial and Industrial Sources Near Community" are responsible for 20% of the modeled local $PM_{2.5}$ (or "fine particulate matter") exposure for community members within the PTCA area. Exposure to $PM_{2.5}$, in the short term and long term, can result in health impacts such as premature mortality, increased hospital admissions, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, restricted activity days, and reduced lung development in youth. The most adverse impacts are experienced by vulnerable and sensitive populations, including infants and children and those suffering from heart and lung diseases.

Key Issue 2: PM Exposure: Fugitive Dust
Operations and facilities that process or house materials that produce or release fugitive dust are a concern because particulate matter entrained into the air results in $PM_{2.5}$ and PM_{10} exposure that has negative health impacts for the community. Sources of fugitive dust in the PTCA area include, but are not limited to, concrete batch plants, rock crushing operations, and other raw/loose material operations. They can also include construction/demolition activities, nurseries, dust from trackout, and vacant lots (including those with a history of containing hazardous soil). Some fugitive dust can also have toxic components.

Key Issue 3: Cumulative Impacts from Local Facilities: Diverse Sources
The Commercial and Industrial Sources Near Community category, as a whole, generates cumulative impacts that are challenging to address because the impacts come from a variety of sources, including both permitted and non-permitted sources and small and large businesses. Sources can be spread throughout the community in varying patterns and emissions can be sometimes sporadic in nature. Regulation, understanding impacts, and ensuring compliance can thus be more difficult. All this is a concern and finding solutions for this category will require a complex multi-pronged approach.

Key Issue 4: Cumulative Impacts from Local Facilities: Large Industrial Facilities
Large industrial facilities within this category are of concern for the PTCA community because of particulate matter emissions and other health hazards. These include facilities like Levin Terminal, Sims Metals, the West Contra Costa County (WCCC) Landfill, and Gold Bond (formerly New

NGC, Inc.). Several of these facilities are Rule 11-18 facilities required to be evaluated for health risk impacts. Levin Terminal and the WCCC Landfill are significant contributors to the modeled $PM_{2.5}$ exposure from this category, and New NGC has been identified by community as a problematic source of visible emissions and fugitive dust. Additionally, metal recycling facilities can be sources of fugitive dust as well as highly toxic TAC emissions and have been concerns due to previous fires onsite.

Key Issue 5: Cumulative Impacts from Local Facilities: Commercial and Smaller Industrial Facilities Commercial and smaller industrial facilities within this category are a concern because, while individual sources and businesses within the category may be small, their incremental impacts can present significant issues for the community. Restaurants in and near the PTCA area, for example, contribute 10.5% of total $PM_{2.5}$ exposure due to localized emissions sources. Backup generators, food trucks, auto body shops, and dry cleaners are additional sources, often similarly small in size and interspersed throughout neighborhoods, and also have the potential to adversely impact nearby residences.

Strategies

Strategy 1. Control Fugitive Dust

This strategy is meant to better control sources of fugitive dust by preventing particulate matter, including toxic particulate matter, from becoming airborne (especially beyond facility perimeters) and/or reducing community exposure.

Component	Description
Strategy #	Commercial & Industrial (C&I) 1
Strategy name	Control Fugitive Dust
Key Issue (KI) Addressed	KI 1: Fine PM KI 2: Fugitive Dust KI 3: Diverse Sources KI 4: Large Industrial Facilities
Objective (intended outcome of the strategy)	Reduce fugitive dust exposure in the PTCA area via more stringent regulatory requirements. By 2025, implement the most advanced best management practices for controlling fugitive dust at the project level.
Narrative on how Strategy meets Feasibility Criteria	As this strategy mainly relies on identification and implementation of best practices, it should be able to be incorporated via existing mechanisms at the Air District (e.g., rule development) and within local government (e.g., planning departments), without requiring new sources of funding. As with any strategy, it may have some financial impacts due to additional burden for the regulated community (e.g., cost of implementing certain best practices on site); but this impact would be analyzed in greater detail via the Dust White Paper and any barriers would be addressed. Other potential areas of political concern are water use and possible housing barriers related to CEQA. Water usage can be associated with implementing certain best practices, and this can bring up concerns with drought and statewide water availability. Regarding CEQA, any barriers to housing construction that might be associated with dust control requirements could present conflict if they are perceived as limiting much needed housing

Component	Description
	projects. Both water use and CEQA impacts on housing will be considered as part of rule development for any future Air District regulatory requirements, however. Technical feasibility is good, given that there are known control mechanisms and best practices. However, accurately measuring and/or modeling dust impacts can be challenging due to the complex mechanisms at play with dust entrainment (levels and frequency of dust-generating activity, amounts of dust, meteorological conditions, etc.). This can also present problems with respect to the enforceability of certain requirements. Authority is solid, given that both the Air District and local government can encourage and require best practices for dust. The Air District can serve as a champion for this and has already begun work. Timelines vary. The Air District is already developing a white paper. As best practices are identified and vetted, many can be implemented quickly. Local governments may be able to move faster than Air District rule development, but in both cases the knowledge from the Dust White Paper will accomplish a lot of the necessary work up front (i.e., identifying and recommending best practices).
Narrative on how Strategy meets Vision and Principles Criteria	The Dust White Paper will engage affected stakeholders. The Ad Hoc group for Commercial and Industrial Sources Near Community will be engaged for feedback as well. Any rule development pathways identified from the white paper will involve stakeholder engagement to get input from those impacted by dust exposure. Best practices implemented via several pathways (Air District white paper and rule development + Local Government) are intended to set up the strategy for the most effective and sustainable emissions reductions. Potential impacts on certain facilities or sites should be tracked to ensure unintended consequences, such as increased costs passed down to the consumer, are not realized (e.g., in the case of the landfill or in the case of construction projects). It should also be ensured, via C&I Action 1.3, that the best practices identified for dust are applicable to the community-identified facilities/sites that have particulate matter impacts and generate benefits for the community with respect to reduced impacts from said sites.
List of Actions (# and name)	C&I 1.1: Dust White Paper (identify Best Management Practices (BMPs), evaluate Rule Development opportunities, and implement recommendations C&I 1.2: Advocate for and/or Implement Local Best Practices (locally-required BMPs; outreach/education on dust control and BMPs) with Partners C&I 1.3: Gap Analysis regarding Dust White Paper and BMPs for Community-Identified Sources

Strategy 2. Utilize Permitting to Address Commercial and Industrial Sources Near Community

This strategy includes permitting actions to address permitted facilities in the PTCA area, including via education and outreach, continued and enhanced collaboration with internal

and external parties, reviews of Title V emissions, and potential amendments to Permitting Rules (e.g., Rule 2-1, 2-2, and/or 2-5).

Component	Description
Strategy #	Commercial & Industrial (C&I) 2
Strategy name	Utilize Permitting to Address Commercial and Industrial Sources Near Community
Key Issue (KI) Addressed	KI 3: Diverse Sources KI 4: Large Industrial Facilities KI 5: Commercial and Smaller Industrial Facilities
Objective (intended outcome of the strategy)	Make permitting processes more accessible and understandable. Strengthen permitting processes by incorporating Environmental Justice (EJ) principles and stronger protections for communities.
Narrative on how Strategy meets Feasibility Criteria	This is feasible in that it utilizes processes and expertise that is either already in place or able to be put in place within existing functions of the Air District. Challenges with feasibility exist, however, in that this strategy will require additional resources to implement each of the strategy actions, as well as strong partnerships with relevant external agencies.
Narrative on how Strategy meets Vision and Principles Criteria	This meets the vision and principles in that it is directly responding to the asks of the community with respect to a need to have greater transparency for Air District permitting (which can be addressed in part by education and outreach to shed light on current processes). It also involves bringing in community to inform rule development with respect to permitting rules.
List of Actions (# and name)	C&I 2.1: Undertake an Education, Outreach, and Communications effort with respect to Air District permitting C&I 2.2: Maintain and strengthen collaborative efforts with other Air District Divisions and external partners C&I 2.3: Conduct periodic reviews of emissions reduction progress for Title V facilities C&I 2.4: Open permitting rules for rule development. Evaluate rule amendment opportunities

Strategy 3. Reduce Exposure from Food Preparation

This strategy will identify mechanisms to reduce exposure to pollution from food preparation activities, like from charbroiling at restaurants. Strategy actions include focusing on $PM_{2.5}$ emission reductions, as well as ensuring other food preparation activities that may have concerning impacts are addressed as needed. This approach builds on the identification of a restaurants-focused strategy in the AB617 "Owning Our Air: West Oakland Community Action Plan" (WOCAP).

Component	Description
Strategy #	Commercial & Industrial (C&I) 3
Strategy name	Reduce Exposure from Food Preparation
Key Issue (KI) Addressed	KI 1: Fine PM KI 3: Diverse Sources KI 5: Commercial and Smaller Industrial Facilities

Component	Description
Objective (intended outcome of the strategy)	Reduce the 10% contribution to localized $PM_{2.5}$ exposure that is attributed to restaurants. Lower community air pollution impacts from restaurants in a manner that takes into account potential burden on small businesses. Identify any other food preparation operations or activities that may have concerning contributions to local emissions and exposure.
Narrative on how Strategy meets Feasibility Criteria	A white paper approach for restaurants and evaluation of needs for other food preparation activities is a feasible and reasonable approach given that there are uncertainties surrounding technical solutions for restaurant emissions and that other food preparation facilities have not stood out as top concerns from community feedback nor from review of the emissions inventory. Air District Rule Development already has a restaurants white paper in their pipeline in response to the WOCAP restaurants strategy. Given the importance of food in daily life and culture, imposing restrictions related to food preparation could elicit strong feelings from a variety of stakeholders, including the general public. This will need to be accounted for with respect to identifying appropriate solutions.
Narrative on how Strategy meets Vision and Principles Criteria	Given that restaurants are embedded within the community and are located near where people live, addressing emissions from restaurants will have a direct impact on reducing exposure for community members who live near restaurants, and who may be disproportionately impacted. However, there could be potential unintended consequences for restaurants (as many may be small businesses) due to greater regulatory burden in regulating their emissions. Incentives may be an important mechanism to help curb these potential negative impacts. A white paper approach will allow for proper discussion of all aspects of the issue (i.e., pros and cons) and be a mechanism through which the Air District can gather community feedback on the best path forward.
List of Actions (# and name)	C&I 3.1: Restaurants White Paper C&I 3.2: Other Food Preparation: Evaluate the Need for Further Study and/or Additional Actions C&I 3.3: Evaluate potential mechanisms for achieving voluntary emissions reductions from food preparation facilities and operations (incentives and/or behavioral change campaigns) and implement promising mechanisms on a rolling basis

Strategy 4. Large Industrial Sources

The goal of the Large Industrial Sources strategy is to address and reduce particulate matter and toxic air contaminant emissions and related health hazards, such as visible dust and fugitive dust, from large facilities. These facilities include Levin Terminal, the West Contra Costa County Landfill, Sims Metal, and Gold Bond (formerly New NGC, Inc.).

- Levin Terminal: Levin Terminal is one of the top 3 permitted sources of residential $PM_{2.5}$ exposure in this category, at a 20% contribution, and because of additional unknown and/or permitted sources at this facility, including movement of uncovered bulk materials like coal and pet coke. It is also a facility subject to Rule 11-18.

- Gold Bond: Gold Bond (formerly New NGC, Inc.) is a concern because it has received complaints for particulate emissions from storage stockpiles, vessel offloading of raw gypsum, and manufacturing, and 4 Notices of Violation (NOVs) for excessive visible emissions and public nuisance in 2022. It is also a facility subject to Rule 11-18.
- West Contra Costa County Landfill: WCCC Landfill is a concern because it is in the top 3 permitted sources of residential $PM_{2.5}$ exposure in this category (13%), it is a Title V facility, and has received complaints and 25 notices of violation (NOVs) between January 2019 and December 2021. It is also a facility subject to Rule 11-18.
- Scrap Metal and Recycling Facilities: Scrap metal and recycling facilities (Sims Metal and Pick and Pull) are concerning because of dust and fires from solid waste, scrap metal, and recycling facilities. Certain emissions data for metal facilities, such as particulate matter and TAC emissions, are not well known and are not captured in our permitted sources inventory.
- Other Large Facilities: While the above list represents large facilities that have been heard as community concerns multiple times, it is not an exhaustive list. Other facilities came up during CSC discussions as part of strategy development, which were then included under this action category. Additional large facilities may present as concerns in the future as well - these are also intended to be covered under the general actions described in the action for 'Other Large Facilities'. Facilities subject to Rule 11-18 that are not explicitly named above will also be captured under this subcategory.

Component	Description
Strategy #	Commercial & Industrial (C&I) 4
Strategy name	Large Industrial Sources
Key Issue (KI) Addressed	KI 2: Fugitive Dust KI 3: Diverse Sources KI 4: Large Industrial Facilities
Objective (intended outcome of the strategy)	Better address community concerns and impacts from large facilities including Levin Terminal, the West Contra Costa County Landfill, Sims Metal, and Gold Bond (formerly New NGC, Inc.): • Address and reduce particulate matter emissions and other health hazards, such as exposure from visible dust and fugitive dust. • Implement Rule 11-18 as expeditiously as possible in order to reduce toxics impacts from some of these facilities.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible in that several of the actions rely on an adopted rule: Rule 11-18, which is already starting to be implemented. Timelines are a factor, however, in that Phase 1 facilities will be completed before Phase 2 facilities, and the pace of progress for implementing Rule 11-18 across all relevant facilities is dependent upon staff resources. Other actions rely on the results of the Dust White Paper and implementation of the recommendations from the paper, in the form of BMPs and rule development concepts. These are both feasible mechanisms for better controlling dust and $PM_{2.5}$ exposure. For compliance-related information, the large facility reporting is being aligned with the annual reporting for the CERP, which is feasible and intended to help with streamlining. Gap analyses are intended to address any areas that specifically-identified mechanisms in the CERP do not sufficiently address.

Component	Description
Narrative on how Strategy meets Vision and Principles Criteria	This meets the vision and principles in that it focuses on large facilities of concern specifically identified by the community. It also focuses on facilities that trigger thresholds to require an HRA to be conducted as part of Rule 11-18, which is a priority for the community in terms of reducing impacts from toxics.
List of Actions (# and name)	C&I 4.1: Implement Rule 11-18 at Large Facilities (Non-Fuel Refining) C&I 4.2: Levin Terminal: Implement Rule 11-18 and Conduct Gap Analysis C&I 4.3: Gold Bond (formerly New NGC): Gap Analysis C&I 4.4: West Contra Costa County Landfill: Implement Rule 11-18 and Conduct Gap Analysis C&I 4.5: Metal Recycling (Sims, Pick n Pull): Source Evaluation C&I 4.6: Other Large Industrial Facilities: Gap Analysis

Strategy 5. Commercial and Smaller Industrial Facilities

Commercial and smaller industrial facilities within this category include backup generators, auto body shops, and dry cleaners, among others. This strategy is meant to address community concerns about impacts from these types of facilities, as well as taking into consideration that these are often small businesses.

Component	Description
Strategy #	Commercial & Industrial (C&I) 5
Strategy name	Commercial and Smaller Industrial Facilities
Key Issue (KI) Addressed	KI 3: Diverse Sources KI 5: Commercial and Smaller Industrial Facilities
Objective (intended outcome of the strategy)	This strategy is meant to address community concerns with respect to smaller facilities and sources (of a commercial or industrial nature). The objective is to reduce local and potential hyperlocal impacts from any of these sources.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible with respect to rule development for BUGs and autobody shops. It is also feasible with respect to identifying any other smaller businesses of concern, via review of monitoring and modeling work that is ongoing as part of AB617 work in the PTCA area. In terms of timelines, depending on community priority, actions in this strategy could end up being pursued later, as the community may prefer that larger sources of emissions or exposure be addressed before smaller sources. This will need to be determined at implementation, however.
Narrative on how Strategy meets Vision and Principles Criteria	This meets the vision and principles in that it focuses on smaller sources and facilities of concern specifically identified by the community. It also takes into account the potential burden on small businesses, and the possible need for a tailored approach to helping small businesses reduce their emissions, as they can have the potential to be more significantly affected by socioeconomic impacts of regulations.
List of Actions (# and name)	C&I 5.1: Backup Generators (BUGs): Reduce localized exposure from BUGs C&I 5.2: Autobody Shops: Address Concerns with Auto Body Shops C&I 5.3: Other Smaller Businesses (Dry Cleaners, others) C&I 5.4: Enhanced Small Business Outreach

Fuel Refining, Support Facilities, Storage and Distribution

Introduction

Fuel Refining, Support Facilities, Storage, and Distribution (i.e., the fuel refining sector) is a community concern of the highest importance for the PTCA area. Emissions and exposure from sources owned by and associated with fossil fuel-centric industrial corporations, including the Chevron Richmond Refinery and Chemtrade, have polluted the community for decades. Toxic air contaminants, harmful particulate matter, and other pollution from the fuel refining sector negatively impact both public health and the environment.

Data on emissions and exposure impacts from the fuel refining sector, including specific data for the Chevron Richmond Refinery, is provided in detail in Chapter 5 – Pollution Overview - as well as in Appendix C: Supplemental Technical Information - Emissions and Modeling. Note that Appendix C has information on an updated emissions inventory for Chevron, as well as an analysis of potential short-term health impacts from flaring events at Chevron.

In alignment with the PTCA Vision and Principles, the CSC has drafted the following statement regarding the fuel refining sector:

> *"The PTCA community is seeking transformation from a legacy of historical and systematic redlining of communities of color and government agencies that have failed to protect our community's health. Moving beyond this reality in an era of climate chaos caused by an over-dependence on the fossil fuel industry is daunting, but essential. To confront these challenges and ensure the survival of our children and grandchildren, our community must create a bold vision for a just transition and bring it to life through our AB617 Community Emissions Reduction Plan."*

The five fuel refining sector strategies were developed to cover a broad span of impacts from Fuel Refining, Support Facilities, Storage, and Distribution, and include:

1. Move Towards a Just Transition
2. Reduce Persistent Flaring and Improve Incident Response
3. Hold Chevron and Other Emitters Accountable for Reducing Pollution and Negative Public Health Impacts from their Operations
4. Reduce Exposure and Public Health Impacts from Toxic Air Contaminants (TACs) Emitted by the Fuel Refining sector
5. Reduce Exposure and Public Health Impacts from Particulate Matter and Other CAPs Emitted by the Fuel Refining sector

Key Issues

Key Issue 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA Area

The Chevron Refinery and its partner operations are a concern because the Chevron Richmond Refinery is the third largest refinery - and one of the largest stationary sources of pollution - in the state of California. According to the Air District Emissions Inventory for the PTCA area, Chevron is the single largest $PM_{2.5}$ source in the Path to Clean Air community, accounting for 63% of local $PM_{2.5}$ emissions. It emits more fine particulate matter and sulfur dioxide than all other contributing sources in our PTCA area combined. Fuel refining and associated sources account for 33% of

local source contributions to residential exposure to both $PM_{2.5}$ and air toxics that have chronic health effects. Furthermore, other facilities support Chevron's operations including storage and distribution; this includes Chemtrade, a large sulfuric acid production plant that emits $PM_{2.5}$, sulfuric acid, and other air toxics. People of color – due to historical redlining and segregation - disproportionately live in close proximity to the Chevron Refinery, the major source of air pollution in our area, and/or within 1,000 feet of a freeway or railway. More than 50% of our community members are Hispanic/Latino, Black/African American or Asian. Due to the high levels of exposure, over half of our PTCA area is designated by the State of California as being 'disadvantaged', which is defined as "communities disproportionately burdened by multiple sources of pollution and with population characteristics that make them more sensitive to pollution." Consequently, our community experiences higher-than-average rates of illness related to, and likely made worse by, air pollution: including asthma and babies with low birth weights.

Key Issue 2: Lack of accountability with Air District Regulations

The lack of accountability with respect to compliance with Air District Regulations is a major concern because 86% of Air District Notices of Violations within the PTCA area are associated with Chevron and other fuel-refining related sources. Of the 299 Notices of Violation, 79% are from the Chevron Products Company from 2019 to 2021. While these statistics are in part a factor of the large number of sources at Chevron and the number of regulations the facility is subject to, the community is nevertheless deeply concerned about compliance issues at the Chevron Richmond Refinery. In particular, the community has voiced concerns about compliance, flaring activities, and potential health risks related to the following: hydrogen unit, hydro processing unit, and crude unit. Additionally, the three processes that contribute the most to the Chronic Hazard Index at Chevron are: the heat recovery steam generator, sulfur recovery unit and Fluidized Catalytic Cracking (FCC) unit. Toxic emissions such as $PM_{2.5}$, NO_x, SO_x, and other pollutants can harm the community and lead to detrimental health impacts for vulnerable BIPOC community members living in high exposure areas. Thus, compliance and accountability with respect to meeting regulatory requirements are key. Proper use and resolution of Notices of Violations can help mitigate environmental regulation exceedances, which should help protect public health.

Key Issue 3: Persistent flaring

Flaring, which may involve visible emissions triggered by equipment malfunctions, process upsets, other upset conditions, and/or short-term incidents, is a concern at the Chevron Refinery because flaring events can produce higher levels of emissions of sulfur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), air toxics such as benzene, and greenhouse gasses such as methane. Chevron is already a concern because it emits more of the criteria air pollutants fine particulate matter ($PM_{2.5}$) and sulfur dioxide (SO_2) than all other sources in the community-scale emissions inventory combined, and the refinery is also the largest source of numerous toxic air contaminants, such as hydrogen cyanide, sulfuric acid, manganese, and hydrogen sulfide. Constant flaring just adds another element to the problem. Flaring events have the potential to result in elevated levels of SO_2 and other compounds, which can have negative respiratory impacts on local residents, including individuals suffering from asthma and bronchitis. A staggering 1 in 4 people in Richmond have asthma, twice the average for California. Flaring activity and exposure to air pollution can also result in other concerning health outcomes, including mental health issues such as stress, anxiety, depression, and other forms of trauma. Overall, the economic, educational and health impact on the community due to flaring is an important issue that needs to be addressed.

Key Issue 4: Just Transition
A Just Transition is imperative for the people of Richmond-North Richmond-San Pablo. The PTCA community is a frontline community that has long been subject to historical and systematic racist policies and impacted by the largest refinery in Northern California, the Chevron Richmond Refinery. Fuel refining produces emissions that harm public health and destroy the environment. Government has failed to adequately protect our community's health from the impacts of a fossil fuel industry that prioritizes corporate capital gains and passes off the burden of harmful externalities to the people. In order to reach our climate and equity goals, we must end the refining and combustion of fossil fuels as soon as possible. A Just Transition must center on community health, but also address the impacts of the transition on workers and communities.

Strategies

Strategy 1. Move Towards a Just Transition

This Strategy lays foundational steps towards a Just Transition, including educating the PTCA CSC and Air District on how Just Transition would apply to the Zero Emission Future and a managed phase-down of fossil fuels in the PTCA area. It includes the formation of a Just Transition Subcommittee (JTS) that will establish Just Transition Principles and Criteria, which will be used in the prioritization and implementation of the PTCA Plan. The JTS will also explore ways to apply the criteria to governmental policymaking and rulemaking.

The PTCA CSC has drafted the following preamble about the importance of a Just Transition:

> *"We live in a community seeking transformation from a legacy of historical and systematic redlining of communities of color and failure of government agencies to protect our community's health. Moving beyond this reality in an era of climate chaos caused by an over-dependence on the fossil fuel industry is essential. To confront these challenges and ensure the survival of ourselves and our children and grandchildren, our community must create a bold vision for a just transition and bring it to life through our AB617 Community Emissions Reduction Plan.*
>
> *At its core, a Just Transition is a deeply democratic process that shifts away from the fossil fuel industry to just, clean, renewable energy. It interweaves the needs of industry workers and frontline communities who have been most harmed by the polluters. It does this through vision planning and strategically building economic and political power to create a more equitable, sustainable, and just community.*
>
> *Our plan to reduce emissions and exposure in our community is rooted in principles of Just Transition. Our strategies are designed to implement the following principles:*
>
> 1. *Support the workers of industries in transition away from the fossil fuel industry towards just clean renewable energy jobs*
> 2. *Sustain investment in communities impacted by transition or by extractive industries to diversify local economies*
> 3. *Improve enforcement of existing regulations*
> 4. *Fund Just and clean renewable energy development through taxes or fines on fossil fuel companies*

5. *Embrace community-driven planning and decision-making*
6. *Prioritize the need for broad social healing and restoration*

As we pave our path forward, we commit to forging a collective decision-making process that provides pathways for regenerative economies through green jobs, protects the land and Bay as polluters decommission, and most importantly, addresses community health burdens.

Additionally, to achieve a Just Transition, we recognize the importance of an effective, long-term partnership between our community, the PTCA CSC, the City of Richmond, the City of San Pablo, Contra Costa County, Air District, and other regulatory agencies. Through AB617, we have laid the groundwork for this partnership. This partnership will empower our community to pave the way toward a Just Transition, environmental justice, and a thriving future."

Component	Description
Strategy #	Fuel Refining (FR) 1
Strategy name	Move Towards a Just Transition
Key Issue Addressed	KI 4: Just Transition KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA area KI 2: Lack of accountability with Air District Regulations KI 3: Persistent flaring
Objective (intended outcome of the strategy)	Lay the foundation for a Just Transition to a fossil fuel-free future, with community, workers, and governmental leaders at the helm.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible in that it lays out some foundational steps towards advancing Just Transition in the PTCA area. It focuses on key elements of education and collaboration. The formation of a Just Transition Subcommittee (JTS) can provide a platform for advancing Just Transition and facilitate conversations and potential partnerships with both governmental and non-governmental organizations. Creation of an online shareable folder of Just Transition educational materials will help support education and aid communications with key stakeholders. Resources to support the JTS and a potential JT Project Consultant will be sought from CARB, Air District, and/or other funders as available. Incorporating Just Transition principles and criteria into implementation is also feasible, as an implementation plan will be created and updated regularly for the PTCA Plan.
Narrative on how Strategy meets Vision and Principles Criteria	This strategy will advance Just Transition: a transition away from fossil fuels and towards a just, clean, renewable-energy future. The Just Transition movement is meant to drive racial and social equity and advance ecological restoration. It focuses on democratizing and redistributing resources and power by centralizing community and workers' concerns and needs. This strategy, and the actions within it, will help ensure accountability for a Just Transition within the PTCA area. To do this, CSC members will create a vision plan for a Just Transition. This will start with a Just

Component	Description
	Transition Subcommittee that elevates Just Transition Principles throughout the PTCA Plan and policy making.
List of Actions (# and name)	FR 1.1. Educate the CSC and Air District on how Just Transition would apply to the Zero Emission Future and a managed phase-down of fossil fuels in the PTCA area. The CSC will establish a Just Transition Subcommittee (JTS) as part of Path to Clean Air Plan Implementation by Q2 2024 FR 1.2. Incorporate Just Transition Principles and Criteria in the prioritization and implementation of the PTCA Plan and explore incorporating these in governmental policymaking and rulemaking

Strategy 2. Reduce Persistent Flaring and Improve Incident Response

This strategy is focused on eliminating persistent flaring (i.e., minimizing flaring occurrences) and reducing the impacts (both in terms of physical health and psychological health) on the PTCA community, as well as responding to incidents in a more effective manner. A clear priority that has been identified by the CSC members is reducing frequency of flare activity and reducing emissions from flares at the Chevron Richmond Refinery.

In recent years, there have been increases not only in flaring frequency, but also in flaring emissions at Chevron Richmond Refinery. As part of strategy development, an evaluation of historical flaring trends was conducted. Monthly flaring data reported per Regulation 12, Rule 11 – Flare Monitoring at Refineries was reviewed for the time period covering 2016 to 2022.

The analysis showed:

- There was a significant increase in flaring frequency and emissions was observed after October 2018, which was when the new hydrogen plant at the Chevron Richmond Refinery started operation.
- Though the hydrogen flare only started operation in October 2018, when looking at the 2016 – 2022 period, the hydrogen flare processed the highest volume of vent gas in comparison to the other flares. Thus, in 4 years' time the hydrogen flare processed more gas than any other single flare processed across 6 years' time.
    - Non-methane hydrocarbon (NMHC) emissions from the hydrogen flare were highest among the flares operated at the facility. The source of NMHC emissions were primarily due to the large amount of pilot and purge gas required to operate the hydrogen flare.
    - SO_2 emissions from the hydrogen flare were negligible during the 2016-2022 period. This is because vent gas routed to hydrogen flare is typically high purity hydrogen (with hydrogen purity in excess of 99.99 percent).
- The North Isomax Flare was responsible for the majority of SO_2 emissions in the flare category during the 2016 – 2022 period.

Overall, flaring activity at Chevron Richmond Refinery has significantly increased during the 2016 – 2022 period. Flaring activity has increased not only due to start-up of the hydrogen flare in 2018, but also due to increased flare activity across the entire Chevron Richmond Refinery since the start-up of the hydrogen plant.

Reducing persistent flaring and improving incident response around flaring and other incidents is paramount to the PTCA community.

Component	Description
Strategy #	Fuel Refining (FR) 2
Strategy name	Reduce Persistent Flaring and Improve Incident Response
Key Issue (KI) Addressed	KI 3: Persistent flaring KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA area KI 2: Lack of accountability with Air District Regulations KI 4: Just Transition
Objective (intended outcome of the strategy)	Reduce flaring events to the lowest levels possible (in terms of frequency and emissions), including during emergencies / upset, via more consistent and competent operations with an ultimate goal of zero routine or planned flaring. Improve community satisfaction with communications surrounding major incidents and flaring. Increase public awareness of and knowledge around flaring activities, with the goal of providing better information on health impacts and incident response activity.
Narrative on how Strategy meets Feasibility Criteria	There is negative health impact associated with direct inhalation of pollutants from flaring events and other incidents, but also other pathways involving psychological stress and consequent bodily responses that can be damaging in the short and/or long term (cardiovascular, inflammatory, etc.). The actions presented in this strategy focus on measures that would provide timely notification and increase availability of information for community, as the community has shared that a lack of information during flaring events is both a safety concern and a source of emotional distress. There are examples of successful flaring notification at the other Air District such as Flare Event Notification System (FENS)[44] implemented by South Coast Air Quality Management (SCAQMD), which is a real time notification system that provides location and information related to the flaring of the event in real time as soon as the notification is received. With examples of similar strategies that have been successfully implemented in other refinery communities, the implementation of a similar strategy to the PCTA community is feasible. Other strategies in this section focus on rule amendment efforts that would lead to reduction in both frequency and emissions from flares. The flare rules for the Air District have not been amended since mid-2000. Based on information that has been compiled since the adoption of the flare rules, the Air District staff has already identified potential amendment items that would strengthen and increase effectiveness of the rule. In addition, there are already more stringent emission limits and monitoring requirements present in other flare regulations adopted by other air districts and the EPA that can be evaluated for inclusion in Air District rule amendments.

[44] https://xappprod.aqmd.gov/fens/public; https://www.aqmd.gov/docs/default-source/news-archive/2019/south-coast-aqmd-launches-fens.pdf

Component	Description
Narrative on how Strategy meets Vision and Principles Criteria	Frequent flaring activity has not only been a source of safety and health concerns but also a source of trauma and emotional stress for the PCTA community. The actions presented in this section aim to reduce the flaring activity via rule amendment, provide timely notification of flaring events to the community, and increase information availability related to flaring events for the public. Reduction in flaring activity via rule amendment is intended to lead to a decrease in emissions, specifically those emissions that pose negative health impacts to the PTCA community. Timely issuance of notification and increased availability for flaring events will allow the impacted community to take appropriate action to mitigate the negative health impacts from flaring events. The action items in this section meet the vision and principles criteria. These actions are expected to reduce flaring activity and the PTCA area's exposure to air pollutants generated during a flaring event, which will lessen the negative health impact and emotional distress caused by flaring.
List of Actions (# and name)	FR 2.1. Air District and the CSC will work with the City of Richmond to strengthen the Industrial Safety Ordinance (ISO). FR 2.2. The Air District will coordinate with the CSC to improve and expand communications about all flaring events for the fuel refining sector in the PTCA area and also for major incidents at both fuel-refining and non-fuel refining sources. Communications mechanisms will be developed in collaboration with a CSC Communications Subcommittee and include (A) a new webpage and (B) standardized internal and external communication protocols. FR 2.3. Air District and CSC will collaborate with Contra Costa County to recommend improvements for their Community Warning System. FR 2.4. Air District will improve its incident response program to get more transparent and user-friendly information to a wider audience faster during and after major incidents. FR 2.5. CSC will make recommendations on the improved communications protocols to the Air District Board of Directors (BOD) Incident Response Ad Hoc FR 2.6. Air District will initiate a rule development effort, further evaluating potential updates to flaring rules (Rule 12-11 and Rule 12-12), by the end of 2024. Rule development efforts will aim to incorporate health impacts analyses, enhance rule enforceability, and establish new and/or more stringent limits. Health and Safety Code requirements will be satisfied as well. + Cross references to all other relevant PTCA strategies and actions

Strategy 3. Hold Chevron and Other Emitters Accountable for Reducing Pollution and Negative Public Health Impacts from their Operations

This strategy is meant to increase accountability for polluters through more effective compliance and enforcement activities (e.g., inspections and investigations); legal approaches and penalties; permitting; monitoring and measurements; communications, education and outreach; and equity and environmental justice. This also helps ensure accountability for the Air District, as the lead implementer or partner for many of the actions identified in this strategy -

and as a partner committed to increasing transparency with the CSC and community. Continuous improvement over time is key.

Component	Description
Strategy #	Fuel Refining (FR) 3
Strategy name	Hold Chevron and Other Emitters Accountable for Reducing Pollution and Negative Public Health Impacts from their Operations
Key Issue (KI) Addressed	KI 2: Lack of accountability with Air District Regulations KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA area KI 3: Persistent flaring
Objective (intended outcome of the strategy)	An enhanced and standardized inspection protocol for Chevron that is informed by the CSC. Use enhanced monitoring and monitoring data analysis to help improve our emissions modeling, rule development, compliance & enforcement, and public communication.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible because it leverages work that falls within the wheelhouse of various sections of the Air District, with the overall goal of comprehensively increasing accountability for industry and ensuring the Air District meets community expectations in carrying out its duties. Actions cover compliance and enforcement, legal approaches, penalties, monitoring, measurements, permitting, environmental justice and equity. The type of work covered by the actions is feasible, although resources will be critical to being able to complete many of these actions as they build upon, or expand into greater depth or focus, existing types of responsibilities of Air District staff. While certain legal elements of enforcement necessarily must be confidential in order to protect ongoing investigations or negotiations, the basic intent of the legal portions of this strategy are generally feasible. Communities impacted by air pollution issues have a right to be informed of progress and results to ensure facilities are held accountable for violations - transparency is feasible to the extent it will not impede enforcement efforts. For these strategies to be successfully implemented, the Air District must periodically consult the CSC to gain a clear vision of the community expectations for these strategies. Some of these actions are also priorities for the Air District's Community Advisory Committee; it is expected there will be synergy between these different community-led planning processes (CSC and Air District CAC) and the Air District's Strategic Plan.
Narrative on how Strategy meets Vision and Principles Criteria	This strategy will meet the vision and principles criteria in that it increases the public's access to information on the compliance of facilities within the PTCA area. These actions provide a setting for the Air District to share annual results of inspections, complaint responses, and major air pollution incidents that occur. It also lays the groundwork for how the Air District can incorporate community feedback into legal enforcement approaches and for setting up a process to invest a portion of the funds from settlements back into the communities impacted by these violations. This strategy can redress harm to communities caused by air quality violations through actions that seek to deter future air quality violations and

Component	Description
	to reinvest funds collected from penalties back into the impacted neighborhoods to improve air quality and public health. Further, actions that center around meaningful involvement of community leaders from the CSC and CAC (who live in communities overburdened by pollution in the development of these policies) while allowing the Air District the necessary discretion and flexibility to successfully resolve violations, serves to promote community voice and strengthen partnership between government and the community. These actions will ensure greater transparency and partnership with communities in the PTCA area by promoting the complaint system, creating better communication during responses to major incidents, and by reporting results to the community as progress is made during response implementation. Furthermore, compliance and enforcement activities are especially important in historically overburdened communities that often are located near sources of pollution from businesses and industry. Incorporating civil rights and equity-based actions is critical to meeting the vision and principles as well. These communities may be the closest to air quality problems, accidents, and major incidents, meaning their health, safety, and quality of life are under threat from proximity to air quality issues.
List of Actions (# and name)	FR 3.1. Air District will develop and implement a standardized Chevron inspection protocol in partnership with the CSC. FR 3.2 Increase the frequency of Air District inspections, audits, and investigations at Chevron and Chemtrade. FR 3.3. Seek to build a strong collaborative relationship with operators and Union Health and Safety representatives. FR 3.4. Transparent, Regular, and Inclusive Updates on Compliance and Enforcement Activity at Chevron. FR 3.5. Air District will expedite the Notice of Violations resolution process in the fuel refining sector. FR 3.6. Air District will coordinate on enforcement with federal, state (USEPA, CARB, and the Attorney General's Office), and local enforcement partners (District Attorneys, City and County Counsel) on fuel refining violations, enforcement, and other legal issues, as appropriate. FR 3.7. Air District will provide quarterly and annual updates to CSC about penalties assessed against fuel refining sector facilities and all other sources in the PTCA area. FR 3.8. Air District will collaboratively develop, with the CSC, and pilot legal enforcement approaches for fuel refining facilities within one year of final approval of the PTCA Plan. Then this will be expanded to cover all PTCA sources. FR 3.9. First, Air District will partner with the CSC to develop, within 1 year of PTCA Plan adoption, a Community Benefits Policy (CBP) that invests up to 100% of penalty monies from the fuel refining sector back into the PTCA area. Then, Air District will partner with the CSC to expand the Fuel Refining Community Benefits Policy (CBP) to cover the full PTCA area.

Component	Description
	FR 3.10. Air District will develop a program by 2026 to apply a Title VI/Gov. Code section 11135 lens including, but not limited to, a process for applying civil rights/disparate impact analyses for Air District refinery-related permitting activities in the PTCA area. FR 3.11. Air District will expand the distance and circumstances covered by Air District notifications for fuel refining permit actions. FR 3.12. Follow the Air District's new EJ Chapter in its California Environmental Quality Act (CEQA) Guidance. FR 3.13. Improve refinery fenceline and community air monitoring programs. FR 3.14. Improve source emissions monitoring and reporting for sources at the Chevron Refinery and fuel refining-related facilities. FR 3.15. Refinery-related measurement data accessibility improvements. + Cross references to all other relevant PTCA Plan strategies and actions

Strategy 4. Reduce Exposure and Public Health Impacts from Toxic Air Contaminants Emitted by the Fuel Refining Sector

This strategy is focused on reducing exposure to toxic air contaminants experienced by the PTCA community as a result of localized sources of emissions from the fuel refining sector. It is especially critical to address large facilities with numerous sources of toxics, including Chevron and Chemtrade.

Component	Description
Strategy #	Fuel Refining (FR) 4
Strategy name	Reduce Exposure and Public Health Impacts from Toxic Air Contaminants (TACs) Emitted by the Fuel Refining sector
Key Issue (KI) Addressed	KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA area
Objective (intended outcome of the strategy)	Reduce exposure burden from Toxic Air Contaminants (TACs) to the lowest level feasible. Reduce Toxicity Weighted Emissions (TWE) from the fuel refining sector, with the goal of a 30-50% reduction before 2035.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible because it relies on an adopted rule - Rule 11-18 - which is currently being implemented and is designed to achieve reductions in Toxic Air Contaminants (TACs) and the associated health risks from those pollutants. Additionally, to strengthen the rule, various amendment items are currently being considered. Furthermore, an analysis of best available controls for source categories that may not be addressed, to the extent desired, via Rule 11-18 has been conducted. For any sources that may pose health risks that are not adequately addressed under Rule 11-18, a source-specific rule development evaluation will be performed. However, it is not

Component	Description
	guaranteed that each single source is a suitable candidate for regulatory control.
Narrative on how Strategy meets Vision and Principles Criteria	Rule 11-18 is a health risk-based rule requiring reduction in TAC emissions that pose increased health risks to nearby communities. By targeting the major stationary sources in the community, including the fuel refining sector which generates over half of the toxicity weighted emissions associated with chronic health effects and cancer risk, the pollution burden on the entire community will be reduced. It is particularly important to address impacts to communities located closest to the refinery, specifically the BIPOC population historically and disproportionately affected by health conditions such as asthma, low-birth weights, and diabetes. Further, by adding in an action to address any remaining burden post Rule 11-18 implementation, this strategy builds in a backstop plan to help ensure the community gets the reductions in exposure they deserve and demand.
List of Actions (# and name)	FR 4.1. Amend Rule 11-18 to improve stringency, efficiency, transparency, and public engagement FR 4.2. Prioritize implementation of Rule 11-18 for Chevron FR 4.3. Implement Rule 11-18 at Chemtrade FR 4.4. Implement Rule 11-18 at all other fuel-refining and fuel-refining related facilities subject to the rule and Provide Regular Updates on Rule 11-18 Implementation FR 4.5. Evaluate and Implement Targeted Single-Source Category Controls to further reduce public health impact from TACs + Cross references to all other relevant PTCA Plan strategies and actions

Strategy 5. Reduce Exposure from Particulate Matter and Other Criteria Air Pollutants Emitted by the Fuel Refining Sector

This strategy aims to reduce exposure to $PM_{2.5}$ from fuel refining and fuel refining-related sources in the PTCA area, as the sector - with a majority coming from Chevron - contributes around one third of the $PM_{2.5}$ exposure experienced from local sources. It includes implementing Rule 6-5, which will result in a large reduction in $PM_{2.5}$, as well as finalizing a methodology to calculate risk from $PM_{2.5}$ and then evaluation how to incorporate health risk into rule development and/or a risk reduction program that would cover fuel refining sources, in addition to other sources of $PM_{2.5}$.

Component	Description
Strategy #	Fuel Refining (FR) 5
Strategy name	Reduce Exposure and Public Health Impacts from Particulate Matter and Other CAPs Emitted by the Fuel Refining sector

Component	Description
Key Issue (KI) Addressed	KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA area
Objective (intended outcome of the strategy)	Reduce $PM_{2.5}$ emissions from the fuel refining sector by 30-50% by 2034
Narrative on how Strategy meets Feasibility Criteria	There are numerous scientific studies that link $PM_{2.5}$ exposure to a variety of health issues including premature death in people with heart or lung disease, nonfatal heart attacks, aggravated asthma, and increased respiratory symptoms. The actions presented in this section are expected to reduce $PM_{2.5}$ emissions and exposure, and thus help reduce health risk: including via the implementation of Rule 6-5, adoption of PM methodology, and integration of health risk from PM into the existing Air District regulation. Implementation of Rule 6-5 will lead to significant emissions reductions, as the Fluidized Catalytic Cracking Unit (FCC unit or FCCU) is a major source of $PM_{2.5}$ emissions in this PCTA community and the rule will require FCCUs to meet a stringent emission standard equivalent to a wet gas scrubber. This emission level has been achieved in practice at FCCUs operating at other refineries. Though there is ongoing litigation for this rule, the implementation timeline for Rule 6-5 is not expected to be impacted until a judgment for this case becomes available. The adoption and implementation of PM methodology into Air District rules will allow the Air District to limit $PM_{2.5}$ exposures using health risk-based metrics through the existing permitting program, Rule 11-18, and/or new rules. The PM methodology is already in the development process and has been presented to the Advisory Council and public for comments. There are also other efforts by the state (e.g., CARB) and federal government to better understand health impacts from criteria air pollutants, including cumulative impacts (see Public Health Strategy 6). Other actions provided in this section aim to identify stronger controls that can help reduce the health impacts and regional and local air quality impacts associated with NO_x and SO_2 emissions. NO_x and SO_2 are precursors to secondary PM which may increase the PM exposures for the PCTA community.
Narrative on how Strategy meets Vision and Principles Criteria	The fuel refining sector is responsible for 63% of local $PM_{2.5}$ emissions according to the Air District Inventory. The actions presented in this section aim to reduce the negative health impacts associated with $PM_{2.5}$ emissions for the community either by directly limiting $PM_{2.5}$ emissions or by using health risk-based metrics to require the $PM_{2.5}$ emissions reductions. The $PM_{2.5}$ emission reductions from these strategies will lead to reductions in $PM_{2.5}$ exposure, which in turn would mitigate the negative health impacts that the community is suffering from due to high level of exposures to air pollutants in the PCTA community.

Component	Description
	The actions provided in this section will evaluate the negative impacts to health and local and regional air quality associated with NO_x and SO_2 emissions with the aim to proceed with rule development if the findings indicate that NO_x and SO_2 emissions in the region do have significant impacts. Other actions presented in this section are in alignment with vision and principles criteria for key issue statements since the potential outcome of the strategies include proceeding with rule development efforts, which would lead to NO_x and SO_2 emission reductions that would mitigate negative impacts to the PCTA community from both health and air quality perspectives.
List of Actions (# and name)	FR 5.1. Implement Rule 6-5 FR 5.2. Finalize $PM_{2.5}$ Local Risk Methodology for rule development and accountability FR 5.3. Develop and implement health-based rules for PM, upon finalizing a methodology to account for health risk from PM. Evaluate with respect to fuel refining sources, non-fuel refining sources, and other significant sources. Initiate by the end of 2025. FR 5.4. Include work to improve quantification of PM and VOC emissions from cooling towers (see Fuel Refining Strategy 3 Action 3.13) FR 5.5. Initiate rule development for NO_x emissions from combustion sources at petroleum refineries by the end of 2024 FR 5.6. Initiate rule development to evaluate controls to reduce SO_2 emissions and Secondary PM[45] generated by Chevron and related industries in the PTCA area + Cross references to all other relevant PTCA Plan strategies and actions

Marine and Rail

Introduction

Marine and Rail (M&R) is a community concern because marine and rail facilities and operations tend to have a variety of pollution sources present that result in concentrations of harmful emissions, such as diesel particulate matter (DPM), with cumulative impacts on residents. M&R sources account for 43% of the cancer risk attributable to local emissions sources in the PTCA community, as well as chronic health risk. In addition, M&R operations tend to utilize older, larger, dirtier equipment that can be challenging to upgrade and replace with cleaner technologies. The following key issues elaborate on the concerns surrounding the M&R sectors identified in partnership with the community.

[45] https://www3.epa.gov/region1/airquality/pm-what-is.html

Key Issues

Key Issue 1: Cancer Risk
Marine and rail is primarily a concern because it accounts for 43% of cancer risk (36.4 of 84.3 in a million) attributable to local emissions sources in the PTCA area, as well as chronic health risk. This means local residents impacted by marine and rail operations, who are disproportionately low-income, unhoused and/or people of color, face exposures to toxic air contaminants (TACs), high levels of Diesel PM, and other drivers of cancer risk and chronic health risk.

Key Issue 2: Older, Larger, Dirtier Equipment
Marine and rail operations are a concern because they function with older equipment that mainly run on large fossil fuel-powered engines. They also cross long distances through regions with varying regulatory authorities, making it more challenging to incorporate cleaner, zero-emission technology into the existing fleet of equipment.

Key Issue 3: Marine and Rail Hubs
Operations at hubs like ports, terminals, and intermodal rail yards are a concern because they have a wide variety of pollution sources present that result in concentrations of harmful emissions, like toxic diesel particulate matter, with cumulative impacts on residents. When these hubs are near or upwind of sensitive receptors or community gathering points, exposure impacts are an even greater concern. For example, the Port of Richmond is located near Miller Knox Regional Park, a popular recreational area where community members gather, exposing visitors to pollution.

Strategies

Strategy 1. Reduce Cancer and Chronic Health Risk from Rail Operations and Facilities

This strategy seeks to reduce cancer and chronic health risk from rail operations and facilities within the PTCA community.

Component	Description
Strategy #	Marine & Rail (M&R) 1
Strategy name	Reduce Cancer and Chronic Health Risk from Rail Operations and Facilities
Key Issue (KI) Addressed	KI 1: Cancer Risk KI 2: Older, Larger, Dirtier Equipment KI 3: Marine and Rail Hubs
Objective (intended outcome of the strategy)	Lower the cancer and chronic health risk attributable to rail operations via CARB's existing In-Use Locomotive Regulation, which is anticipated to reduce rail emissions in the PTCA area by more than 70% by 2033. The longer-term strategy is 100% zero emissions operations. This will be accomplished through the early deployment of Tier 4 and zero emission locomotives by Union Pacific, BNSF, Richmond Pacific, Amtrak, and Caltrans (Capitol Corridor and San Joaquin's passenger rail).
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible. CARB is the champion and has proposed an In-Use locomotive regulation that could achieve this outcome. This regulation will include a funding source, can be implemented in a reasonable timeframe, within current legal authorities, and we do not foresee a major political

Component	Description
	barrier. EPA has responded to a petition to look into establishing requirements for new and preempted locomotives. There is a need for dedicated staff at the Air District, and CARB, to support the implementation of these actions and this strategy, in addition to time from the CSC and/or the public.
Narrative on how Strategy meets Vision and Principles Criteria	The In-Use Locomotive regulation's focus on getting to zero-emissions while also prioritizing providing benefits to the state's most impacted communities. This aligns with PTCA Vision and Principles. Implementation of the Rail strategy would directly benefit those living adjacent to rail lines and/or operations, such as those within the Iron Triangle neighborhood in the City of Richmond. This is important because these overburdened neighborhoods are located adjacent to polluting sources due to historic, racist redlining and zoning practices. Requirements for cleaner rail equipment (running along rail lines and in rail yards) would improve the health of those most acutely impacted (those living and working adjacent to rail operations), as well as for the greater community. By working with CARB directly, who has authority to regulate some rail sources, and with support from the Air District, who can incentivize cleaner Rail, this strategy is set up to maximize reductions in emissions and exposure. Working with EPA to address federally preempted rail equipment will complement the state-level approach.
List of Actions (# and name)	M&R 1.1: Regulate Emissions Reductions from Rail M&R 1.2: Enforce Emissions Reductions for CARB In-Use Locomotive Regulation M&R 1.3: Incentivize ("Find and Fund") Emissions Reductions M&R 1.4: Conduct Further Study related to programs and/or regulations related to Marine and Rail M&R 1.5: Conduct Education and Outreach Efforts to Marine and Rail operators to align their business plans with PTCA Plan strategies

Strategy 2. Reduce Cancer and Chronic Health Risk from Ocean Going Vessel Operations

This strategy seeks to reduce cancer and chronic health risk from Ocean Going Vessel operations within the PTCA community.

Component	Description
Strategy #	Marine & Rail (M&R) 2
Strategy name	Ocean Going Vessels (OGVs)
Key Issue (KI) Addressed	KI 1: Cancer Risk KI 2: Older, Larger, Dirtier Equipment KI 3: Marine and Rail Hubs
Objective (intended outcome of the strategy)	Decrease emissions from OGVs, both at berth and in transit, specifically addressing emissions not expected to be reduced through current regulations. Address emissions from bulk vessels, which are not currently included in the At Berth regulation and must be addressed.

Component	Description
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible regarding At Berth emissions for which CARB is the champion and has already adopted regulations. CARB's Interim Evaluation Report verifies the feasibility of this regulation's implementation. Reducing in transit (i.e., emissions that occur while not at berth - either while maneuvering or in transit near shore) emissions would require a community and/or agency champion to put forth incentives and/or a new regulation. If created, this regulation may lend itself to an incentives-based mechanism. There may be political obstacles with authority, due to the multi-jurisdictional nature of OGV transit. There is a need for dedicated staff at the Air District, and CARB, to support the implementation of these actions and this strategy, in addition to time from the CSC and/or the public.
Narrative on how Strategy meets Vision and Principles Criteria	Our strategy is an attempt to reduce at berth emissions and to expand CARB's current regulations beyond at berth to include in-transit emissions, in an effort to reduce emissions and total impact from OGVs. For the community, it is important to address in transit emissions that impact public health - specifically emissions that occur near enough to shore that they result in exposure to community on land. CARB should keep in mind any potential unintended consequences of statewide implementation of any new regulations (e.g., trickle down economic consequences), while developing new regulations.
List of Actions (# and name)	M&R 2.1: Regulate Emissions Reductions for OGVs At Berth M&R 2.2: Enforce Emissions Reductions for OGVs M&R 2.3: Incentivize ("Find and Fund") Emissions Reductions M&R 2.4: Conduct Further Study M&R 2.5: Conduct Education and Outreach Efforts M&R 2.6: Regulate Emissions Reductions for OGVs In Transit

Strategy 3. Reduce Cancer and Chronic Health Risk from Commercial Harbor Craft

This strategy seeks to reduce cancer and chronic health risk from commercial harbor craft within the PTCA community.

Component	Description
Strategy #	Marine & Rail (M&R) 3
Strategy name	Commercial Harbor Craft
Key Issue (KI) Addressed	KI 1: Cancer Risk KI 3: Marine and Rail Hubs
Objective (intended outcome of the strategy)	Reduce localized cancer and chronic health risk, from commercial harbor craft (CHC). Transition the CHC fleet to the cleanest technology possible, especially zero emission technology.
Narrative on how Strategy meets Feasibility Criteria	This strategy has a champion in that CARB has a recently updated regulation mandating the turnover of the CHC fleet statewide, with earliest compliance for oldest, highest-emitting engines. There are cost challenges with commercial fishing vessels that have resulted in less stringent requirements in

Component	Description
	the adopted regulation for that category of vessels, and cost may continue to present challenges in the future if funding is not adequate. A technology evaluation will be completed every 2 years, providing ample opportunity to evaluate the landscape for the commercial harbor craft and consider adjusting implementation as needed, (e.g., adding stringency, adding funding, updating understanding of cleanest technologies and zero emission availability, or, in the worst-case scenario, acknowledging lack of availability of cleaner technology). There is a need for dedicated staff at the Air District, and CARB, to support the implementation of these actions and this strategy, in addition to time from the CSC and/or the public.
Narrative on how Strategy meets Vision and Principles Criteria	The goal of this strategy is to reduce the cancer and chronic health risk from commercial harbor craft, which will have a direct benefit for those disproportionately harmed by emissions and exposure to pollutants from CHC. Strategies like these will help to address certain impacts from historic, racist redlining practices by reducing the pollution sources that have existed in communities over generations. Some of the vessels in this category include public transit services, specifically ferries. CARB's regulation is prioritizing zero emission technology for ferries, which would provide additional benefit in that impacts would not just be reduced for those exposed at shore near CHC operations, but also for individuals during their commute. There is potential for some smaller local business owners, e.g., fishing operations, to be impacted by the phase in of some more stringent requirements from CARB's CHC regulation. Incentives funding should be available to help ease this burden.
List of Actions (# and name)	M&R 3.1: Regulate Emissions Reductions from CHC M&R 3.2: Enforce Emissions Reductions for CHC M&R 3.3: Incentivize ("Find and Fund") Emissions Reductions M&R 3.4: Conduct Further Study M&R 3.5: Conduct Education and Outreach Efforts

Strategy 4. Reduce Cancer and Chronic Health Risk from Cargo Handling Equipment

This strategy seeks to reduce emissions from Cargo Handling Equipment within the PTCA community. Cargo handling equipment is any motorized vehicle used to handle cargo or perform routine maintenance activities at ports and intermodal rail yards. The type of equipment includes yard trucks (hostlers), rubber-tired gantry cranes, container handlers, forklifts, etc. CARB's current Cargo Handling Equipment (CHE) Regulation, adopted in 2005, establishes requirements for in-use and newly purchased diesel equipment that reduce diesel particulate matter (PM) and oxides of nitrogen (NO_x). CARB currently is assessing zero-emission technologies and additional solutions including efficiency improvement. CARB plans to develop amendments to the CHE Regulation (post-2025), so there is support and leadership at the statewide implementer level for reducing CHE emissions.

Goods movement at ports and intermodal rail yards is expected to continue and may increase to meet demand for just-in-time goods. With new technologies to lower CHE emissions (low/zero emissions equipment), there are opportunities to reduce the potential impact from ports and rail yards in advance of amended statewide regulations. There is a need for dedicated staff at the Air District, and CARB, to support the implementation of actions in this strategy, in addition to time from the CSC and/or the public.

Component	Description
Strategy #	Marine & Rail (M&R) 4
Strategy name	Cargo Handling Equipment
Key Issue (KI) Addressed	KI 3: Marine and Rail Hubs
Objective (intended outcome of the strategy)	Reduce emissions from cargo handling equipment (CHE). Reduce CHE contribution to cumulative facility impacts from marine and rail hubs. Prioritize accelerated development and deployment of zero emission cargo handling equipment.
Narrative on how Strategy meets Feasibility Criteria	CARB currently has plans to develop amendments to their Cargo Handling Equipment regulation (by 2025), so there is support and leadership at the statewide implementer level for reduction of emissions from cargo handling equipment. There is a need for dedicated staff at the Air District, and CARB, to support the implementation of these actions and this strategy, in addition to time from the CSC and/or the public.
Narrative on how Strategy meets Vision and Principles Criteria	CARB staff would also consider opportunities to prioritize the earliest implementation in or adjacent to the communities most impacted by air pollution.
List of Actions (# and name)	M&R 4.1: Regulate Emissions Reductions from CHE M&R 4.2: Enforce Emissions Reductions for CHE M&R 4.3: Incentivize ("Find and Fund") Emissions Reductions M&R 4.4: Conduct Further Study M&R 4.5: Conduct Education and Outreach Efforts

Strategy 5. Reduce Cancer and Chronic Health Risk from Cumulative Impact Facilities and Operations

This strategy seeks to reduce cancer and chronic health risk from Cumulative Impact Facilities and Operations within the PTCA community. M&R sources in the PTCA are co-located along with other associated facilities and operations. These co-located facilities and operations function as goods movement hubs and can have cumulative exposure impacts on the PTCA community.

Component	Description
Strategy #	Marine & Rail (M&R) 5
Strategy name	Cumulative Impact Facilities and Operations
Key Issue (KI) Addressed	KI 1: Cancer Risk KI 2: Older, Larger, Dirtier Equipment KI 3: Marine and Rail Hubs

Component	Description
Objective (intended outcome of the strategy)	To address and reduce the cumulative impacts from Marine and Rail and associated facilities and operations which often are co-located and function as a goods movement hub. Reductions at M&R goods movement hubs that have the greatest exposure impacts on the PTCA community.
Narrative on how Strategy meets Feasibility Criteria	There are existing CARB regulations, either proposed or passed, that seek to reduce emissions from individual sources at these goods' movement hubs. There is support and funding for some emissions reductions for a few of these sources. CARB could be a great champion for this work, as the regulator. However, there is not a great approach for addressing the total cumulative impacts from the variety of sources associated with a given facility or operation. Traditional regulatory focus tends to be at the source or equipment-type level, so it is a challenge to identify mechanisms to address cumulative impacts from given hubs of activity. There is a need for dedicated staff at the Air District, and CARB, to support the implementation of these actions and this strategy, in addition to time from the CSC and/or the public.
Narrative on how Strategy meets Vision and Principles Criteria	By addressing the cumulative impacts where M&R facilities and operations overlap, we will be reducing impacts for the most disproportionately harmed communities who live adjacent to these M&R goods movement hubs, in addition to those frontline communities living near individual M&R facilities or operations. Hubs of industry were historically located in redlined communities, so this approach directly addresses that legacy of pollution of our most at-risk communities.
List of Actions (# and name)	M&R 5.1: Regulate Emissions Reductions from Cumulative Impact Facilities and Operations M&R 5.2: Identify opportunities to reduce emissions from on-site mobile and stationary equipment at railyards and ports M&R 5.3: Incentivize ("Find and Fund") Emissions Reductions M&R 5.4: Conduct Further Study M&R 5.5: Conduct Education and Outreach Efforts M&R 5.6: Identify opportunities to reduce emissions from on-site mobile and stationary equipment at railyards and ports

Public Health and Reducing Exposure

Introduction

Public health and reducing exposure is a crucial issue because the PTCA community faces disproportionate levels of air pollution as well as pre-existing health vulnerabilities resulting from lower socioeconomic status, poor living conditions, limited amenities, and inadequate social and health services. Plan strategies can help reduce pollution exposure, bolster comprehensive public health and social services, and promote human-centered planning, policies, and programming to reduce social determinants of health and the public health burden from air pollution. Furthermore, improving data systems, collaboration, and research efforts are essential

for tracking and addressing pollution and health outcomes, as well as enhancing public education and setting goals for improvement in public health policies and programs.

Many of the following health actions do not yet have an identified funding source. However, one funding source for health-promoting initiatives may be a Community Benefits Policy (CBP) Pilot, which would invest a portion of penalty funds associated with sources in the PTCA into the community, as described in further detail in FR Action 3.9.

Key Issues

Key Issue 1: Reducing Vulnerabilities to Air Pollution and Improving Social Determinants of Health
Poor health outcomes are associated with exposure to air pollution. The PTCA area has disproportionate levels of air pollution. In addition to breathing poor-quality air, our community has pre-existing health vulnerabilities. These vulnerabilities are based on lower socioeconomic status, poor living conditions, unhoused status, limited neighborhood amenities, scarcity of social and health services, and age and health condition. The most significant impact is on young children, pregnant and/or breastfeeding women, and the elderly. These vulnerabilities increase the risk of developing air pollution-related diseases and worsen health outcomes. Climate change is also a growing concern as it exacerbates these vulnerabilities. More comprehensive health and social services are needed to decrease these vulnerabilities and subsequently lower our community's burden of adverse health risks and outcomes. More human-centered planning is needed to improve living conditions, neighborhood facilities and health clinics.

Key Issue 2: Reducing Exposure to Air Pollution
High air pollution exposure for community members worsens health outcomes for various illnesses, including cancer, chronic respiratory diseases and chronic heart problems. In addition to high pollution levels, climate change increases the frequency and severity of wildfires, further increasing our exposure to harmful air. Additionally, the combination of industrial pollution and frequent wildfires needs further assessment. Air pollution exposure reduction is integral to improving public health and health equity in our PTCA communities.

Key Issue 3: Improving Data and Public Health Goals & Reporting
Many health policies and programs can be improved if a comprehensive system tracks and trends pollution and health outcomes. We need significant investments in epidemiological research, as well as improved health risk factors, health impact data, and methods and approaches for Health Risk Assessments (HRAs). Finally, we need additional education about public health, air pollution health risks and impacts, and to develop goals for improvement.

Strategies

Strategy 1. Increase Health Resilience and Improve Social Determinants of Health

This strategy seeks to reduce the harmful impact of social determinants of health on historically disadvantaged communities in the PTCA area. This would be accomplished through expanded healthcare for low-income PTCA residents - especially Black residents, advocacy and support for a guaranteed income program, and a study on reparations. In the PTCA community, studies show Black residents have the worst health outcomes for most air pollution-related diseases. (see the Community Description Chapter).

Component	Description
Strategy #	Health (H) 1
Strategy name	Increase Health Resilience and Improve Social Determinants of Health
Key Issue (KI) Addressed	KI 1: Reducing Vulnerabilities to Air Pollution and Improving Social Determinants of Health
Objective (intended outcome of the strategy)	Find opportunities for reparations for Black residents and expand health care access for the CERP Community's Black residents. Increase financial security for CERP Community residents and build relationships with West Contra Costa Unified School District (WCCUSD) to help bolster their asthma programming.
Narrative on How Strategy Meets Feasibility Criteria	Contra Costa County Health Services will be asked to implement action H 1.3, which would build on existing programs and current efforts. H 1.1 and H 1.3 both have political and technical support and are within existing legal frameworks. A timeline has yet to be determined. H 1.1 and H 1.2 ask that local jurisdictions (the cities of Richmond, San Pablo, and Contra Costa County) support State reparations efforts related to Black residents in the PTCA area. This action will need political support and input from community members and community-based organizations to write its scope, goals, and findings. H 1.4 will be led by the CSC, and its feasibility depends on the willingness and interest of the West Contra Costa Unified School District (WCCUSD).
Narrative on How Strategy Meets Vision and Principles Criteria	Through expanded opportunities for health care, financial security, and economic justice, this strategy tries to reflect the needs of the people who have been disproportionately harmed by environmental injustice, especially Black residents who have some of the worst health outcomes in the PTCA community.
List of Actions (# and name)	H 1.1: Promote and advocate for a guaranteed income pilot for low-income CERP residents. H 1.2: Support State reparations efforts as they relate to Black residents in the PTCA area and in Contra Costa County. H 1.3: Ask CCHS to expand CalAIM programming for MediCal-eligible in the PTCA area and in Contra Costa County. H 1.4: Build relationships with the West Contra Costa Unified School District (WCCUSD) to help bolster their asthma management programming.
Strategy Metric(s)	Was the action implemented or completed? (yes/no?) Was funding increased or obtained, and if relevant, is the new funding source permanent? A measure of impact: How many more people/places/units were served/implemented/installed?

Strategy 2. Reduce Air Pollution at Home

This strategy seeks to reduce exposure to air pollution for CERP residents at home, including residents who are homeowners, renters, and experiencing homelessness.

Component	Description
Strategy #	Health (H) 2
Strategy name	Reduce Air Pollution at Home
Key Issue (KI) Addressed	KI 2: Reducing Exposure to Air Pollution
Objective (intended outcome of the strategy)	Reduce exposure to air pollution where people live.
Narrative on how Strategy meets Feasibility Criteria	The strategy supports existing programs and provides research services to identify program gaps, promotes and creates incentive programs, and updates regulations. These actions will work to better protect PTCA residents from indoor pollution at home and better protect unhoused residents from outdoor pollution. Many of these programs are currently funded and can be continued with current authorities. Air District, the cities of Richmond and San Pablo, Contra Costa County, and the CSC: - These organizations must dedicate time to implement this strategy and these actions. These actions are technically and politically feasible, as they are already underway. Air District: - Air District must coordinate and support partners with research summaries and recommendations. This could require significant additional resourcing from Air District beyond its current capacity. This Strategy requires partnerships between various agencies, including Air District, the cities of Richmond and San Pablo, the County, the CSC, and PTCA area members. Some of the existing programs are run by state agencies and existing public-private partnerships and will require coordination to move forward together.
Narrative on how Strategy Meets Vision and Principles Criteria	The Strategy meets the PTCA Vision and Principles Criteria by working to decrease indoor air pollution exposure and reduce the risk of individuals developing an air pollution-related disease. For those individuals that suffer from asthma and other lung diseases, reducing indoor exposure can decrease the chance of triggering a severe episode. Thus, the Strategy can create positive health outcomes in the long term and directly benefit CERP residents.

Component	Description
	The strategy also addresses disparities in the built environment, as older rental housing often lacks proper retrofitting to keep air pollution out and lacks indoor air filtration. The strategy also asks jurisdictions to change rental standards to require air filtration, cooling, and heating for all properties. Jurisdictions are encouraged to engage landlords in developing these policy changes in the planning stage and to provide landlords with financial support ahead of mandates as part of a strategy to prevent financial burdens for landlords and pricing renters out of their current rental units. The Strategy reflects the need of PTCA residents who have been disproportionately harmed by environmental injustice by increasing access to clean air at home. It aims to make participation in available retrofit programs more accessible to low-income residents of the PTCA area. There is a risk that retrofit programs that invest in rental owner-occupied housing will lead to gentrification and price low-income families out of the community. This would be an unintended consequence of the Strategy but must be weighed against the potential health benefits for the existing PTCA residents. The implementers of this action are encouraged to safeguard against this and think of protective, proactive measures to protect against gentrification.
List of Actions (# and name)	H 2.1: Support better access to home retrofits in the PTCA area H 2.2: Support transition to electric appliances for PTCA residents H 2.3: Assess if rental standards can require indoor air filtration in the PTCA community H 2.4: Assess and address gaps in the programming that protects the unhoused from air pollution in the PTCA area H 2.5: Reduce exposure to wood burning H 2.6: Create incentives for electric lawn and gardening equipment
Strategy Metric(s)	Was the action implemented or completed? (yes/no?) Was funding increased or obtained, and if relevant, is the new funding source permanent? A measure of impact: How many more people/places/units were served/implemented/installed?

Strategy 3. Promote Healthy Food Access

There is empirical evidence to suggest that across the United States, racial segregation, discriminatory planning, and exclusionary zoning create unequal neighborhoods in which low-income and Black, Indigenous, People of Color (BIPOC) have limited "health-promoting resources" (e.g., grocery stores, green spaces, etc.) and a disproportionate number of "health-restricting resources" (e.g., fast food, liquor stores, and incompatible land uses). Social determinants of health (SDOH), such as food insecurity, are among the most impactful driving forces behind health disparities. Factors such as limited access to affordable healthy food

choices (e.g., grocery stores, farmers' markets with EBT options, healthy food at corner stores, etc.), poverty, low wages, and transportation barriers are SDOH and make people more susceptible to developing short and long-term adverse health outcomes. One-third of our PTCA area is comprised of low-income households that reside more than half a mile from the nearest grocery store. In addition, the COVID-19 pandemic and climate change have worsened food insecurity.

Our PTCA area demands more comprehensive policies promoting food access and increased availability of healthier food choices in our community. Community engagement with a human-centered focus on the policy development process is critical to ensure the desired outcomes. Our local public health agency, Contra Costa County Health Services (CCHS), has a pivotal role in leading the implementation of such policies.

This strategy asks for the writing of policies to increase refrigeration capacity for healthy food items at corner stores, study CalFRESH/EBT to increase enrollment, healthy food availability in retail environments, and less unhealthy food at check-outs.

This strategy asks that CCHS increase programming to improve access to healthy food in retail settings and to conduct a study on increasing CalFresh enrollment within the CERP Community. It asks the City of Richmond, the City of San Pablo, and Contra Costa County (local jurisdictions) to seek funding to increase the number of food retail businesses. CCHS and local jurisdictions are asked to coordinate and develop a Healthy Food Retail Model Ordinance for local jurisdictions. Lastly, West Contra Costa Unified School District (WCCUSD) is asked to revise and implement a Wellness Policy for West County Unified that promotes healthy food.

Component	**Description**
Strategy # 3	Health (H) 3
Strategy name	Promote Healthy Food Access
Key Issue (KI) Addressed	KI 1: Reducing Vulnerabilities to Air Pollution and Improving Social Determinants of Health
Objective (intended outcome of the strategy)	Local jurisdictions create processes and programs to promote healthy food access, write model ordinances or permitting guidelines that increase the siting of healthy retailers, and encourage healthy food retail programs and investment.
Narrative on How Strategy Meets Feasibility Criteria	This strategy asks that funding is found for actions #3.1, #3.2, and #3.3 Without secured funding, the feasibility of these actions diminishes as they will require substantial resources. However, these actions, particularly #3.1, #3.2, and #3.3, which ask for increased food options and a study to inform increasing CalFRESH enrollment, will provide immediate benefits to the CERP communities. Action #3.4 asks local jurisdictions and West County Unified School District to adopt policies or initiatives. Feedback from these entities is needed to understand the feasibility of these actions.

Component	Description
Narrative on How Strategy Meets Vision and Principles Criteria	This strategy applies the best current knowledge and thinking to address food access disparities resulting from socioeconomic and racial inequities. However, it should be noted that addressing food access and food deserts is complex. Increasing food access via food retail does not address food insecurity's root causes and structural drivers, like poverty, low wages, unaffordable food pricing, segregated land uses, and inadequate and inequitable transportation options. Health Strategy #1 has actions that speak to poverty and low wages, and the Mobile Strategies address transportation issues.
List of Actions (# and name)	H 3.1: Expand CCHS programming to increase healthy food in retail settings in West Contra Costa County. H 3.2: Ask EHSD to Study the current state of CalFresh - California state's Supplemental Nutrition Assistance Program (SNAP) - enrollment within the CERP Community and identify solutions to current barriers to enrollment. H 3.3: Find funding to increase the number of food retail businesses in the PTCA community. H 3.4: Develop a Healthy Food Retail Model Ordinance for potential adoption by local jurisdictions in the PTCA area.
Strategy Metric(s)	Was the "action" implemented or completed? (yes/no?) Was funding increased or obtained, and if relevant, is the new funding source permanent? A measure of impact: How many more people/places/units were served/implemented/installed?

Strategy 4. Promote Resilience Centers

One of the PTCA community's most important assets is resiliency. The PTCA community continues to be resilient despite the environmental and social injustice it faces. Easily accessible resilience centers (i.e., shelter and resources during climate and other emergencies) are crucial for building resilience capacity and for protecting sensitive populations. These centers can provide a safe place for temporary shelter and relief during days of extreme heat or operate as centers for distributing necessities such as food and multilingual information during and after disasters such as wildfires, flaring events from Chevron, or prolonged electrical outages. Developing resilience centers is a public health priority for the PTCA CSC. Resilience centers and the opportunities they offer can mitigate the vulnerabilities to air pollution experienced by the most sensitive populations, especially children and unhoused persons. Resilience centers should be where people congregate and be easily accessible to sensitive populations. Examples would be all community centers, libraries, and shelters for the unhoused. As proposed permanent facilities, resilience centers would operate year-round and provide infrastructure for clean air, cooling, and/or emergency/disaster relief centers. Available state funding could also support expanding air filtration technology to all schools and homeless shelters in the PTCA area.

Component	Description
Strategy #	Health (H) 4
Strategy name	Promote Resilience Centers
Key Issue (KI) Addressed	KI 2: Reducing Exposure to Air Pollution
Objective (intended outcome of the strategy)	Ensure that all residents in the PTCA area have access to a Resilience Center that provides indoor air filtration, has programming to meet community members' needs, and is sustainably funded.
Narrative on how Strategy meets Feasibility Criteria	The success of these actions will depend on local governments and Air District staff's capacity to work on such initiatives, as well as the capacity of community partners.
Narrative on how Strategy Meets Vision and Principles Criteria	The first action in the strategy promotes resilience centers because they have a crucial role in supporting the PTCA Vision and Principles in numerous ways. They can help mitigate air pollution exposure by providing safe indoor spaces equipped with air filtration systems. Additionally, Resilience Centers can address the environmental, health, and socio-economic disparities the PTCA area faces. Through access to clean and cool air, vital social resources, health programs, community engagement, and education, these centers promote equity by addressing some of the underlying health disparities that disproportionately affect the PTCA area. Resilience centers have many benefits, such as providing access to resources by serving as community hubs where residents can get information on healthcare, job opportunities, educational resources, and social services. Resilience Centers can also offer health and wellness programs tailored to specific community needs, such as preventive care, nutrition, mental health support, and exercise facilities. Resilience centers can serve as platforms for community organizing, civic engagement, and empowerment by providing spaces for community meetings, discussions, and workshops, enabling residents to voice their concerns, collaborate on solutions, and advocate for their community. Lastly, resilience centers can offer educational programs focused on environmental justice, climate change, and sustainable practices. The second action focuses on getting air filtration into all facilities where the most vulnerable subpopulations congregate, e.g., all schools, libraries, senior and youth centers, and shelters for the unhoused. There is also the potential to develop a residential air filter distribution using CARB's Community Air Protection Incentives program funding. Providing free air filtration devices to community residents increases accessibility and addresses financial barriers.

Component	Description
	This strategy strives to provide all people in the CERP Community access to air filtration where they live, work, play, and gather.
List of Actions (# and name)	H 4.1: Advocate for funding for Resilience Centers H 4.2: Ensure resources for high-efficiency air filtration unit distribution and installation programs and support for partnerships to benefit vulnerable populations and places
Strategy Metric(s)	Was the "action" implemented or completed? (yes/no?) Was funding increased or obtained, and is the new funding source permanent? (yes/no?) A measure of impact: How many more people/places/units were served/implemented/installed?

Strategy 5. Pollution & Public Health Education, Outreach, Accountability, and Health Data Tracking

This strategy aims to give community members accessible information so they can understand local pollution concerns, pollution reduction measures, and health improvement goals, as well as the air pollution reduction initiatives that are currently planned or in development. The actions entail the development of a user-friendly dashboard, health workers disseminating air pollution information, and tracking and using health metrics related to air pollution exposures.

Component	Description
Strategy #	Health (H) 5
Strategy name	Education, Outreach, Accountability, & Health Data Tracking
Key Issue (KI) Addressed	KI 3: Improving Data and Public Health Goals & Reporting
Objective (intended outcome of the strategy)	Increase community members' access to relevant and accessible information so they can understand local air pollution problems, pollution reduction opportunities, health improvement goals, and the air pollution improvement initiatives currently planned or in development.

Component	Description
Narrative on how Strategy Meets Feasibility Criteria	Contra Costa Health Services plans to create a Public Health Dashboard. It is suggested that Air District provides existing/available and relevant information annually for this dashboard. These can be simplified versions of information and findings that are currently available in the PTCA Plan and/or information and findings from the annual PTCA Plan progress report with achievements and challenges. Informational updates can be based on AB 617 strategy implementation, as would program goals, initiatives, community events, etc. Feasibility will need to consider the additional staff time and costs to CCHS of setting up this website.
Narrative on How Strategy Meets Vision and Principles Criteria	This strategy helps increase public education and knowledge about local air pollution issues. Increasing the information available to residents will increase community participation and empowerment. By achieving this strategy's actions, we can increase community engagement in air pollution initiatives and facilitate inclusive data-driven decision-making processes to address air pollution and its associated health impacts in AB 617 Communities.
List of Actions (# and name)	H 5.1: Work with County Health Services to create a dashboard for health data and air pollution education materials. H 5.2: Work with health workers to deliver information on air pollution, health impacts, and mitigation opportunities. H 5.3: Implement the findings of the CARB-funded study to improve health metrics tracking in AB 617 Communities.
Strategy Metric(s)	Was the "action" implemented or completed? (yes/no?) Was funding increased or obtained, and if relevant, is the new funding source permanent? A measure of impact: How many more people/places/units were served/implemented/installed?

Strategy 6. More Complete Health Risk Data and HRAs, Including Pollutant Interactions

We need a rigorous review of how we measure the health risks associated with the cumulative impacts of air pollution. We define cumulative impacts here as the combined and incremental effects of exposure to multiple pollutants.* Most chronic health research has focused on the impact of single pollutants. One area of particular concern is the possibility that certain pollutants, when combined, are worse for public health than the sum of the impacts of individual pollutants. In other words, combinations of pollutants may cause health risk factors greater than we currently understand. We define health risk factors here as pollutant exposures that increase the likelihood of a person developing a disease or health condition.

The emerging picture painted by the most recent research is that fine particulate matter ($PM_{2.5}$) is an even more serious problem than was previously known. Making it imperative that more research be done both on $PM_{2.5}$ alone and on the impact of $PM_{2.5}$ in combination with other

toxic pollutants commonly found in many industrial and agricultural communities. $PM_{2.5}$ is a complex mixture of many compounds, including heavy metals and polycyclic organic hydrocarbons. More research may be needed on the health impacts of combinations of pollutants, including $PM_{2.5}$, NO_x, SO_x, Nickel, Manganese, Benzene, Sulfuric Acid, DPM, Formaldehyde, Acrolein, Arsenic, etc. Research should focus on pollution's correlation to a wide range of chronic health problems, including but not limited to asthma, diabetes, insulin effectiveness, obesity, cardiovascular problems, low birth weights, cognitive development, mental health, Alzheimer's, Parkinson's, and behavioral problems in children.
Regarding easier-to-use tools for project HRAs that focus on the top pollutants, CARB is asked to design a simple spreadsheet screening tool that would quickly and roughly calculate the impact of a project on the top pollutants that impact public health. This will clarify if a project will have significant pollution impacts before the full EIR comes out, which often takes two or more years. It will also allow planning staff and decision-makers to proactively identify appropriate mitigation measures and project conditions.

** This strategy does not consider other pollution or contaminant exposure pathways like water contact and skin absorption. This is important when thinking about the Chronic Hazard Index. A contribution of +0.1 from air pollution is certainly "significant" (i.e., pushes above the threshold deemed "safe") when the "body burden" / contributions from other pathways are already above 0.9.*

Component	Description
Strategy	Health (H) 6
Strategy name	More complete health risk data and HRAs, including pollutant interactions
Key Issue (KI) Addressed	KI 3: Improving Data and Public Health Goals & Reporting
Objective (intended outcome of the strategy)	The strategy is focused on enhancing our understanding of the health risks from Criteria Air Pollutants (CAPs), Toxic Air Contaminants (TACs), and air pollutant interactions. We also aim to provide tools that will allow planners and project stakeholders to work together more easily with a simpler but more focused picture of the health-damaging pollution associated with a project.
Narrative on how Strategy meets Feasibility Criteria	The strategy is focused on enhancing our understanding of air pollutant interactions, the health risks from CAPs and TACs, and providing tools that will allow all planners and project stakeholders to work together with a simpler but accurate picture of health-damaging pollution. The timelines to complete and apply this research are not clearly known; therefore, the timeline for implementation and impact are best guesses and completely uncertain. Further investigation and background assessments are needed to find relevant research already complete, what research is currently being done, what the research limitations are, and how the research is/can be used to drive policy toward a helpful outcome(s).
Narrative on How Strategy Meets Vision and Principles Criteria	These actions seek to address the PTCA area's needs by improving our understanding of pollution-driven health risks to inform project decisions and emission reduction priorities.

Component	Description
	The challenge for this strategy will be to include and engage community stakeholders meaningfully, especially if residents need to be engaged to generate political support for more research funding. These topics are also complex for the layperson, and the work will need to be done primarily by professionals. Progress on the strategy's metrics must be communicated understandably to the community constituents.
List of Actions (# and name)	H 6.1: Advocate for expanded basic research on the health impacts of $PM_{2.5}$ exposure and add basic research on NO_x, SO_x, and the most damaging TACs H 6.2: Develop a methodology for integrating health risks from CAPs and TACs H 6.3: Improve HRA completeness, quality, and ease of use in permitting decisions
Strategy Metric (s)	Was the "action" implemented or completed? (yes/no?) Was funding increased or obtained, and if relevant, is the new funding source permanent? A measure of impact: How many more people/places/units were served/implemented/installed? Were all the actions adequately funded?

Vehicles and Trucks, Streets and Freeways, Logistics and Warehouses ("Mobile")

Introduction

Limiting exposure from Vehicles and Trucks, Streets and Freeways, Logistics and Warehouses (hereafter referenced as Mobile) is of critical community concern because mobile sources such as truck and non-truck emissions produce a significant amount of air quality pollution in the PTCA community. Much of the PTCA area is built on car-oriented streets and more work can be done to promote safety through traffic calming and encouraging residents to use alternative forms of transportation, such as micro-mobility hubs, public transit, and cycling. As warehouses and logistics centers continue to operate in the PTCA area, traffic is prone to overflow into residential areas, exposing residents to fossil-fueled powered vehicle exhaust. Development and implementation of a truck management plan (TMP) can help reduce truck emissions and calm traffic.

Key Issues

Key Issue 1: Goods Movement

High exposure to pollution from freight trucks is a concern because goods movement is a major contributor to local emissions impacting the PTCA area. Modeled emissions estimate that truck use through and within the community contributes 37% of total average residential cancer risk and 41% of toxic DPM exposure attributable to local sources. This is a problem, not only because freeways and truck routes run through disproportionately burdened communities, but also because truck magnet sources, such as logistics centers and warehouses, are disproportionately placed in these communities.

Key Issue 2: Truck and Non-Truck Vehicle Emissions
Emissions from driving fossil-fuel powered vehicles are a concern because fuel combustion produces tailpipe pollution that negatively impacts both air quality and health. Brake and tire wear further contribute to adverse impacts. Trucks that are powered by diesel engines emit harmful pollution, including $PM_{2.5}$ and toxic DPM. Modeling estimates show that within the PTCA area trucks are responsible for 6% of the $PM_{2.5}$ exposure and 41% of the DPM exposure attributable to local sources. In addition, modeling estimates show that within the PTCA area non-truck vehicles contribute 7% of the $PM_{2.5}$ exposure attributable to local sources. This exposure puts air quality and the health and safety of residents, workers, and others at risk in the PTCA area.

Key Issue 3: Streets and Freeways
Vehicle traffic on freeways and car-oriented streets are a concern because driving a) increases PM exposure from re-suspended road dust, b) emits tailpipe pollution, and c) increases collision risks. In the PTCA area, modeling estimates show that road dust accounts for 30% of residential $PM_{2.5}$ exposure attributable to local sources. This exposure puts air quality and the health and safety of residents, workers, and others at risk in the PTCA area.

Strategies

Strategy 1. Truck-Attracting Businesses

This strategy will work to establish consistent local policies and ordinances for new truck-attracting businesses to require electrification in advance of state requirements.

Component	Description
Strategy #	Mobile 1
Strategy name	Truck-Attracting Businesses
Key Issue (KI) Addressed	KI 1: Goods Movement
Objective (intended outcome of the strategy)	To work with local jurisdictions to establish consistent policies and ordinances in advance of state regulatory requirements for new truck-attracting businesses to install electric infrastructure to accommodate the increased use of ZEVs. Infrastructure can include electrical conduits at docks and delivery/heavy-duty truck parking spaces. Another intended outcome would be to require truck-attracting businesses to install and store sufficient solar panels to offset the electric energy needed to support new ZEV fleets.
Narrative on how Strategy meets Feasibility Criteria	Local jurisdictions have the authority to adopt policies and ordinances governing development within their boundaries. Implementation of this strategy is primarily legislative; therefore, funding is needed to advocate with respect to the benefits of adopting EV electrical infrastructure requirements, much like what is found in the Contra Costa Electric Vehicle (EV) Readiness Blueprint. The physical construction of EV electrical infrastructure will be borne by developers. As more EV fleet requirements are passed and implemented by local, state, and federal governments, businesses will need infrastructure to support the rising use of EV vehicles.

Component	Description
	Further, PG&E has prepared the 2022 Integrated Resources Plan (IRP) that outlines how the utility will shape its future energy portfolio to meet California's clean energy goals in a reliable and cost-effective manner.[46] While the electricity use associated with electric vehicles is expected to increase, PG&E predicts that its overall sales in electricity would increase only slightly (up to eight percent). The expected increases in energy efficiency and solar photovoltaic projects are expected to offset much of the growth in electric vehicles, as well as economic and population driven growth. The potential increase in electric vehicles in the PTCA area is within the range that PG&E forecasts in the IRP for 2030 within its service area. Overall emissions associated with providing electricity from power plants are expected to decline or remain relatively consistent. Also, the state Renewables Portfolio Standard (RPS) requires that 50% of electricity retail sales be served by renewable resources by 2026, 60% by 2030, and 100% by 2045. Therefore, strategy implementation is not expected to result in an increase in air emissions associated with electricity over those already accounted for in the IRP.
Narrative on how Strategy meets Vision and Principles Criteria	Supporting local jurisdictions' adoption of ZEV electrical infrastructure requirements will support the transition to ZEVs, which will reduce related traffic emissions within the PTCA area. For example, the Richmond Parkway (Parkway) is a regionally-significant major transportation corridor, serving both local and national goods movement and commuters and functioning as part of the San Francisco Bay Trail. The Parkway travels through much of the PTCA area connecting I-80 and I-580, both of which are designated by the FHWA as Primary Highway Freight System routes. Many freight facilities are located on or near the Parkway, including a seaport, rail lines, and rail yards. Traffic congestion, including traffic backups on westbound I-580 in the A.M. have also impacted the Parkway. Planned residential and industrial developments along the corridor may worsen traffic conditions. The local community suffers impacts from the Parkway without much corresponding benefit. During the development of the recently completed MTC-funded Richmond-Area Community-based Transportation Plan (CBTP), residents in the designated disadvantaged neighborhoods adjoining the Parkway cited cut-through traffic (both of trucks and other vehicles) as a major concern. Adoption of ZEV electrification infrastructure will support the transition to cleaner fleets which will reduce vehicle-related emissions on the Parkway and other travel corridors within the PTCA area. CARB has adopted regulations for on-road vehicles that will further reduce emissions; infrastructure will be needed to support the growth of new ZEVs over the coming years. California's Advanced Clean Cars II Regulations require all new passenger vehicles sold in California to be

[46] PG&E Integrated Resources Plan (IRP) - 2022. https://www.pge.com/en_US/for-our-business-partners/energy-supply/integrated-resource-plan/integrated-resource-plan.page

Component	Description
	ZEVs by 2035. ZEVs include battery electric vehicles, plug-in hybrid vehicles (PHEV), and hydrogen fuel cell vehicles. The Advanced Clean Fleet Regulations also require zero-emission truck fleets in California by 2045. Milestones are staggered, based on truck types. For drayage fleets, starting in 2024, only zero-emission trucks may be added to service; and by 2035, all drayage trucks must be zero-emission trucks. Other trucks, such as last-mile delivery vehicles, have more aggressive implementation schedules. The affected vehicles account for 14% of PTCA area emissions with respect to the DPM emissions in the 2019 PTCA Plan inventory.
List of Actions (# and Name)	Mobile 1.1: Model and Map Freight Activity. Model and map daily freight trip activity for commercial and industrialized businesses in the PTCA area. Mobile 1.2: Model Policy/Ordinance for Low to Zero Emission Operations. Develop and disseminate a model policy/ordinance for reviewing and approving truck-attracting businesses, incorporating current best practices to achieve low to zero emission operations. Mobile 1.3: Truck-Attracting Businesses. In coordination with CARB, local, and regional agencies, review policies and assess opportunities to require and/or encourage truck-attracting businesses to incorporate zero emission operations. This would include electrifying loading docks, trucks, and TRUs and incorporating EV capable/ready infrastructure for all vehicle classes visiting the facility. Mobile 1.4: Magnet Source Rule. Air District will study feasibility and approach for a Bay Area Indirect Source (Magnet Source) Rule

Strategy 2. Prioritize Air Quality Benefits of Traffic Calming and Other Safety Improvements on Local Streets and Freeways

This strategy will explore using existing public health, air quality, and safety data to identify priority traffic and safety improvements with air pollution co-benefits.

Component	Description
Strategy #	Mobile 2
Strategy name	Prioritize Air Quality Benefits of Traffic Calming and Other Safety Improvements on Local Streets and Freeways
Key Issue (KI) Addressed	KI 1: Goods Movement KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	Use existing public health, air quality, and safety data to identify and prioritize transportation infrastructure improvements that will provide safety benefits and reduce emissions and exposure. Once the priorities are identified, the strategy seeks to find funding and implement the needed infrastructure improvements using the best construction management practices and the cleanest technology and equipment available.

Component	Description
Narrative on how Strategy meets Feasibility Criteria	The strategy is a tool that will take existing and available data to inform recommendations for safety improvements and air quality projects. Though traffic calming alone does not address the issue of over-sized trucks sharing roadways with bikes and pedestrians, some preventative measures can be used to dissuade trucks from endangering cyclists and pedestrians, such as public education campaigns. The strategy draws on existing funding sources to implement safety improvements that reduce emissions and exposure. As the strategy seeks to bring existing sources of funding into communities, in general, we anticipate support for the strategy. The strategy will require a multi-agency approach to collecting and analyzing the data and then developing criteria. Funding applications also benefit from a multi-agency approach. We recommend that stakeholders be engaged and consulted in each of the strategy's actions.
Narrative on how Strategy meets Vision and Principles Criteria	The strategy relies on available data and ground-truthing from community stakeholders to reduce emissions and exposure in communities.
List of Actions (# and Name)	Mobile 2.1: Criteria for Safety and Air Quality Projects. Develop and propose criteria for safety improvements and air quality projects. Mobile 2.2: Identify Areas at Intersection of Safety and Air Quality. Use data to identify areas with high air pollution exposure, unmaintained transportation infrastructure, and areas in need of increased road safety to prioritize traffic calming projects. This could include bike lanes and road diets. Mobile 2.3: Funding. Seek public funding sources (e.g., state and federal grants) for road infrastructure improvements. Mobile 2.4: Best Management Practices for Construction. Encourage transportation construction projects employ best management practices that reduce emissions, such as use of low to zero emission equipment and dust control measures.

Strategy 3. Multi-Jurisdictional Truck Management Plan

This strategy will assess feasibility and need for a Multi-Jurisdictional Truck Management Plan (TMP), and create a robust, community-informed TMP.

Component	Description
Strategy #	Mobile 3
Strategy name	Multi-Jurisdictional Truck Management Plan (TMP)
Key Issue (KI) Addressed	KI 1: Goods Movement KI 2: Truck and Non-Truck Vehicles KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	Reduce truck-related emissions exposure and congestion from neighborhood streets through the creation of a TMP that reduces traffic

Component	Description
	flow, as well as exposure to humans, through the strategic timing and regulation of regional truck traffic.
Narrative on how Strategy meets Feasibility Criteria	A multi-jurisdictional truck management plan (TMP) will require substantial resources and buy-in from several jurisdictions in the PTCA area. As of 2023, the cities of Richmond and San Pablo do not have TMPs of their own. Already over-stretched, there will be funding and capacity issues to support development of a TMP. Discussions have pointed to WCCTAC as a possible TMP convener, with the caveat that feasibility studies and truck traffic analyses should precede any efforts to form a working group. Contra Costa County has land-use authority, so could play a pivotal role in supporting these efforts. We estimate a 2-year planning phase and 5-year implementation plan. See the West Oakland Truck Management Plan as an example of a TMP.
Narrative on how Strategy meets Vision and Principles Criteria	A multi-jurisdictional TMP to reduce neighborhood exposures to truck emissions and to limit residential truck traffic adheres to the Plan vision. Air District maps document the highest concentrations of mobile and stationary sources impacts, overlayed with socioeconomic data, in the PTCA area. Air District staff understand that to achieve equitable outcomes from this strategy jurisdictions require substantial resources for early studies and buy-in. Overall, if fewer trucks are going through neighborhoods, truck emissions will be reduced. An existing-conditions report documenting baseline truck counts and parking demand followed by future traffic and parking projections based on planned and approved magnet facilities. The TMP needs to include an analysis of equitable outcomes, much like the 2021 LA County Goods Movement Strategic plan and the Portland 2040 Freight Plan.
List of Actions (# and name)	Mobile 3.1: Initial Truck Management Plan Assessment. Prepare an initial feasibility assessment and needs analysis for the TMP. This will include input from communities impacted by truck parking, truck movement and safety, truck signs and communication, current truck routes and truck route enforcement. Mobile 3.2: Create a TMP. After completion of the initial assessment, create a robust, community-informed TMP, alongside WCCTAC, that considers establishing new truck-prohibited streets and new truck routes across jurisdictions; assesses an off-hours deliveries program to reduce overall truck congestion; designates urban freight parking and time zones, and establishes clean last-mile delivery options; enhances citywide truck signage for wayfinding; and educates business owners and residents about the air quality and health benefits of routing and parking laws.

Strategy 4. Equitable Street Sweeping

This strategy will study, implement and evaluate an Enhanced Street Sweeping Program to decrease community members' exposure to the road dust.

Component	Description
Strategy #	Mobile 4
Strategy name	Equitable Street Sweeping
Key Issue (KI) Addressed	KI 1: Goods Movement KI 2: Truck and Non-Truck Vehicles KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	The strategy seeks to provide PTCA communities with the amount of street sweeping needed to decrease community members' exposure to road dust caused by traffic and goods movement. As stated in KI 1, 2, and 3, freeways, street truck routes, and truck magnet sources are features of disproportionately burdened communities (KI #1); brake and tire wear contribute to adverse health impacts (KI #2); and road dust accounts for 30% of residential PM2.5 exposure attributable to local sources (KI #3). For these reasons, Mobile Strategy 4 seeks to ensure that disproportionately burdened communities within the PTCA area receive a fair share of street sweeping services, commensurate with the amount of goods movement, traffic, and dust pollution these communities face. The Plan technical assessment provides further information about estimated emissions and exposure reduction that can be achieved through Mobile Strategy 4. For context, note that the WOCAP includes a strategy that calls on the City of Oakland to implement an equitable street sweeping program in West Oakland. The WOCAP technical assessment estimates a 10% reduction in road dust can be achieved through enhanced street sweeping.
Narrative on how Strategy meets Feasibility Criteria	We believe that Mobile Strategy 4 is potentially feasible. Mobile Strategy 4 does not require new technology and does not require capital investment. However, implementation will require political and community support and funding commitments. While a similar strategy is included in the WOCAP, this Plan covers multiple local jurisdictions (the cities of San Pablo, Richmond, and Contra Costa County) and therefore additional coordination. There is also the potential for negative impacts on communities, such as if more frequent street sweeping results in additional parking ticket fines for community members due to increased conflicts between street parking and the street sweeping schedule. A community engagement outreach program will be needed to ensure that an equitable street sweeping program is desired by community members and possible adverse outcomes are mitigated.
Narrative on how Strategy meets Vision and Principles Criteria	Analysis and engagement are needed to ensure the strategy aligns with the priorities of the Plan communities, and the ability of local jurisdictions to fund and implement new programs to increase street sweeping in impacted communities.

Component	Description
	$PM_{2.5}$ and road dust has been identified as some of the largest forms of mobile pollution in the PTCA area and addressing these pollutants is consistent with the Plan's Vision and Principles. The study described in Action 4.1 will identify the neighborhoods that are most in need of more frequent street sweeping services.
List of Actions (# and Name)	Mobile 4.1: Street Sweeping Study. Work with local jurisdictions and Air District staff on a study to identify which PTCA areas would benefit most from street sweeping initiatives, while ensuring equitable outcomes for communities that have historically suffered from divestment. Mobile 4.2: Implement Enhanced Street Sweeping Program. With support from the CSC and Air District, local governments implement enhanced street sweeping programs in Plan neighborhoods that will benefit most. Mobile 4.3: Street Sweeping Program Feedback. After implementing equitable street sweeping, convene a working group to evaluate successes, challenges, and opportunities.

Strategy 5. Supporting Transition to Clean Fleets

The strategy will support residents, businesses, and governments in a transition to ZEV clean fleets.

Component	Description
Strategy #	Mobile 5
Strategy name	Support Transitions to Clean Fleets
Key Issue (KI) Addressed	KI 1: Goods Movement KI 2: Truck and Non-Truck Vehicle Emissions KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	The strategy seeks to support residents, businesses, and governments in a transition to ZEV clean fleets through better coordination with CARB on enforcement, outreach, education, and incentive distribution. The strategy outcome is that residents, businesses, and governments are better served by CARB initiatives, acquire cleaner fleets especially for goods movement, and deploy ZEV light- and heavy-duty vehicles in advance of state requirements.
Narrative on how Strategy meets Feasibility Criteria	The strategy draws on existing enforcement and funding sources to bring ZEVs to the PTCA area. We anticipate support for the strategy. The strategy will require a multi-agency approach to developing successful coordination between agencies conducting enforcement, and outreach and education about available incentives. We recommend that stakeholders be engaged and consulted in each of the strategy's actions.
Narrative on how Strategy meets Vision and Principles Criteria	The strategy relies on available programs to benefit stakeholders in the community by making incentive dollars and ZEVs more available to community members, businesses, and local governments. The strategy seeks to remove barriers to receiving a less-than-equitable share of enforcement resources and incentive funding.

Component	Description
List of Actions (# and name)	Mobile 5.1: Clean Fleet Enforcement. Investigate how municipal governments can coordinate with CARB on clean fleet enforcement. Mobile 5.2: Heavy-Duty Vehicle Support. Support heavy-duty vehicle transition to cleaner fleets through incentives, education, and outreach. Includes school buses. Mobile 5.3: Light-Duty Vehicle Support. Support light-duty vehicle transition to cleaner fleets through incentives, education, and outreach.

Strategy 6. Public Transit, Bike, and Pedestrian Infrastructure

This strategy will improve access to safe, affordable, and reliable alternatives to driving, including bus, rail, microtransit, and active transportation options.

Component	Description
Strategy #	Mobile 6
Strategy name	Public Transit and Active Transportation
Key Issue (KI) Addressed	KI 2: Truck and Non-Truck Vehicle Emissions
Objective (intended outcome of the strategy)	Beginning in 2030, all community members who live or work in the Plan area have access to safe, affordable, and reliable alternatives to driving that allow community members to reach all their main destinations. These modes of travel include bus, rail, microtransit, and active transportation options that serve people of all abilities.
Narrative on how Strategy meets Feasibility Criteria	As California continues to codify its efforts to meet transportation climate goals, it is expected that more funding will become available. Through the implementation of the Climate Action Plan for Transportation Investment (CAPTI), it is possible that more funding will shift from road and highway infrastructure toward alternatives to driving. Identifying the correct authority or agency within the PTCA area may prove to be a challenge, so it is imperative to work with individual decision makers who can champion this strategy. Fortunately, staff and elected officials at the city, county, regional, and state levels have similar ambitions and have taken steps to bolster active and public transportation funding. Additionally, it is encouraging to see state funding flow directly into the Plan through the recent Transformative Climate Communities[47] grant awarded to the City of Richmond, which will provide community organizations with resources to build upon their work toward this goal.
Narrative on how Strategy meets Vision and Principles Criteria	Transportation is the largest source of GHGs and harmful pollutants that lead to poor health outcomes, with personal vehicle travel making up a significant part of these emissions. Due to decades of disinvestment in public and active transportation throughout the PTCA area, many residents do not have viable alternatives to owning and driving a

[47] Transformative Climate Communities Grant: https://www.grants.ca.gov/grants/transformative-climate-communities-planning-grant/

Component	Description
	personal car. Expanding access to shared modes of travel decreases emissions from vehicles and improves public health. Many decisions about transportation infrastructure were motivated by racial biases and discrimination, such as the construction of highways and roads that disenfranchised neighborhoods and impacted communities at the household and community levels. This strategy aims to undo many of those racially motivated systemic changes and benefit the people who have been historically burdened. Many of these actions will succeed through having robust community input, where their transportation and mobility needs will be placed at the center.
List of Actions (# and Name)	Mobile 6.1: Zero Emission Bus Fleets by 2040. Complete transition to all-electric hybrid and/or hydrogen bus fleet on all routes within the PTCA area by 2040. Mobile 6.2: Bike and Scooter Share Stations. Advocate for affordable bike and scooter-share stations in the most impacted communities within the PTCA area. Mobile 6.3: Expanding Micro-Transit. Expand micro-transit and advocate for a permanent program building on the existing Richmond Moves initiative. Mobile 6.4: Funding Transit Operations. Advocate for additional public funding towards transit operations.

Cross-Cutting Issues

Compliance & Enforcement

Introduction

Compliance and Enforcement is a cross-cutting issue because across all source types in the PTCA area - both fuel refining and non-fuel refining - the community has concerns about businesses and industries with compliance issues. This is especially critical with respect to compliance issues that can affect the health, safety, and quality of life for those who live, work, and play in the PTCA area. Concerns and violations need to be addressed through the Air District's complaint system and through inspections and investigations that are responsive to the lived experience of the community and their concerns.

Compliance & Enforcement Strategy

Component	Description
Strategy #	Compliance & Enforcement (C&E) 1
Strategy name	Compliance and Enforcement
Key Issue (KI) Addressed	FR KI 1: Fuel refining sector in Richmond is the Largest Source of Emissions in PTCA Area FR KI 2: Lack of accountability with Air District Regulations C&I KI 3: Cumulative Impacts from Local Facilities: Diverse Sources

Component	Description
	C&I KI 4: Cumulative Impacts from Local Facilities: Large Industrial Facilities
Objective (intended outcome of the strategy)	Prioritize fielding complaints and conducting inspections and investigations to address facilities of community concern, such as those with issues that impact health, safety, and quality of life. Develop tailored strategies to address facilities that are an ongoing concern for the community. Meet with the community regularly through implementation to track new facilities of concern that emerge to protect the health, safety, and quality of life of people who live in close proximity to polluting sources.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible in that it intends to build on existing practices to ensure alignment between Compliance & Enforcement staff and the community's concerns, as well as to develop communication and transparency as the Air District proactively works to resolve ongoing issues. Outreach efforts to promote the complaint system are feasible. Some elements to keep in mind however are resources and successful education efforts around how best to use the system. Incomplete complaints that don't list specifics, addresses, or provide contact information can make it difficult to respond in a timely manner. Therefore, it is also critical to make sure complainants have access to effective resources so they can file complete, detailed complaints. It will also be important to set appropriate expectations around how the complaint process works as a tool. This is due to Air District staff not being first responders. Furthermore, it is important to set expectations around the depth of information that can be shared after each incident since they evolve in real time, and it is important to gather all information necessary before releasing findings and determining appropriate action. With respect to facilities of community concern, this is feasible because the Air District Compliance and Enforcement team already prioritizes certain facilities or facility types when there are ongoing issues of non-compliance, or when there is a greater risk to the public from non-compliance. As mentioned before, the biggest impediment to successful implementation of this strategy will be limited staff capacity. There are six full- time C&E field staff in the PTCA area, and three are solely dedicated to the Chevron refinery. Increased attention to facilities of concern to the community could reduce the availability of staff to respond to complaints and conduct required inspections for the permitted facilities in West Contra Costa County. It is important to note that at times assignments may need to be changed and adjusted due to C&E staffing needs. Aligning with the Resource PTCA Plan Implementation Strategy is thus an important component of feasibility for this strategy.
Narrative on how Strategy meets	The complaint system and targeted compliance and enforcement activities are especially important in historically overburdened

Component	Description
Vision and Principles Criteria	communities that often are located near sources of pollution from businesses and industry. These communities may be the closest to air quality problems, accidents, and/or major incidents, meaning their health, safety, and quality of life can be under threat from proximity to air quality issues. This strategy will help with greater transparency and partnership with communities in the PTCA area by promoting the complaint system, prioritizing addressing facilities and operations identified by community as concerns, and by reporting results to the community as progress is made during response implementation. It meets Vision and Principles criteria in that it relies on the important voice of the community and the CSC. Actions that center around meaningful involvement of community leaders from the CSC and community members in the PTCA highlight the valuable lived experience of those who live in neighborhoods overburdened by pollution.
List of Actions (# and name)	C&E 1.1: Develop an outreach campaign to promote the Air District Air Quality Complaint Program and pilot an enforcement tip hotline for industry workers. C&E 1.2: Conduct targeted investigations of facilities of community concern (i.e., facilities identified and prioritized using community concern and AB617 data). C&E 1.3: Update CSC regularly with respect to compliance status of facilities identified as a result of community concerns or those with issues that impact health, safety, and quality of life.

Land Use

Introduction

This strategy seeks changes in land use as protective measures to separate communities from pollution sources and locations of exposure. Land use strategies that protect people from air pollution are crucial to reducing health impacts and are especially important for sensitive receptors and residential populations. Zoning regulations can establish buffers to protect people from freeway pollution, require best practices for building and design, such as indoor filtration, and prevent the siting of *new* polluting businesses near sensitive uses. Additionally, land use tools such as amortization can phase out the most egregious *existing* polluting businesses near sensitive uses. By considering air quality impacts in land use decisions and employing techniques to redress environmental injustices and prevent further harm, as described in the actions below, policymakers can help reduce exposure to air pollution and improve public health.

Land Use Strategy

Component	Description
Strategy #	Land Use 1
Strategy name	Land Use
Key Issue (KI) Addressed	C&I KI 1: Fine Particulate Matter C&I KI 2: Fugitive Dust

Component	Description
	C&I KI 3: Diverse Sources C&I KI 4: Large Industrial Facilities C&I KI 5: Commercial and Smaller Industrial Facilities M&R KI 3: Marine and Rail Hubs H KI 2: Reducing Community Exposure to Air Pollution Mobile KI 1: Goods Movement Mobile KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	The goal of this strategy is to focus on land use regulations, conditions of approval, and protective zones to reduce the cumulative impact and concentration of polluting sources within the PTCA area. Recommended strategies will separate, buffer, and otherwise protect sensitive receptors and residential areas from existing and potential future pollution sources and exposure, with an intended outcome of improving community health for all, including disproportionately impacted communities.
Narrative on how Strategy meets Feasibility Criteria	This strategy will benefit from strong champions both within and outside of local governments because it may experience opposition from industry representatives and be difficult politically to implement. Though some aspects of this strategy would likely be implemented over a longer timeframe, others can be implemented as part of local municipal ordinance updates in a shorter timeframe. Overall, the regulatory updates could help to reverse discriminatory zoning and housing policy impacts that are still present today and create lasting health improvements for the most pollution-burdened communities.
Narrative on how Strategy meets Vision and Principles Criteria	Land use regulations such as zoning and other policies that limit pollution exposure can be effective instruments for promoting racial and social equity because they shape the built environment. Land use regulations can also ease the PTCA community's disproportionate environmental burden, preventing the concentration of polluting industries near these communities and increasing restrictions on these industries. This strategy aligns with the CSC's Vision and Principles in that, when implemented, it will help reverse the air pollution impacts from historic and systemic discriminatory land use decisions, which resulted in the co-location of BIPOC and low-income communities near polluting industries.
List of Actions (# and name)	LU 1.1: Support Envision CCC 2040, and Other General Plan and Zoning Updates LU 1.2: Community-Informed Amortization LU 1.3: Buffer Zones and/or Overlay Zones LU 1.4: Site Development Standards and Conditions of Approval LU 1.5: Zoning Regulations and Business Permitting
Strategy Metric(s)	Were the policies, plans, ordinances, or research mentioned in the actions below implemented? Which ones and by which jurisdictions? To what effect? Describe the impact (did it help community members)?

Resource PTCA Plan Implementation

Introduction

Properly resourcing the PTCA Plan is a cross-cutting strategy due to multiple factors. Many of the strategies that will reduce pollution and protect public health are constrained by a limitation in existing Air District staff resources. Current resource limitations and staffing needs must be addressed to guarantee the PTCA Plan ambitions can be fully achieved.

Resource PTCA Plan Implementation Strategy

Component	Description
Strategy #	R1
Strategy name	Properly resource the PTCA Plan to ensure community-identified priority strategies and actions are fully implemented.
Key Issue (KI) Addressed	-
Objective (intended outcome of the strategy)	This strategy is focused on ensuring the Air District is effectively resourced to deliver on commitments identified in the PTCA Plan strategies and actions, as prioritized by the CSC and the PTCA community. The CSC strongly recommends the Air District prioritize staff resources to focus on PTCA Plan strategy implementation and other high priority efforts within the PTCA that may emerge during implementation. Current resource limitations and staffing needs must be addressed to guarantee the PTCA Plan ambitions can be fully achieved. Additionally, throughout implementation, resources will need to be re-evaluated to ensure appropriate staff and funding levels are dedicated to PTCA Plan implementation as well as address other emerging needs. Resources will need to be flexible to be responsive to new information, updated community perspectives, and emerging opportunities. This strategy also considers the role of the CSC in helping inform the Air District annual budget processes, as well as any mid-year budget adjustments, with respect to the resources needed to ensure PTCA Plan commitments are met. It also considers CSC participation in the development and implementation of the Air District's Strategic Plan, which is an opportunity to share the CSC and PTCA community priorities and views with the Air District Board of Directors. For additional information about implementation including a discussion of early priorities and processes to develop the annual implementation plan and report on progress, successes, and challenges, see PTCA Plan Chapter 9, Implementation and Reporting.
Narrative on how Strategy meets Feasibility Criteria	This strategy is feasible, but success relies on political support from Air District leadership and the Board, as well as having CSC champions engage on a regular and ongoing basis in implementation, budget, and strategic planning efforts.
Narrative on how Strategy meets Vision and Principles Criteria	This strategy focuses on ensuring the Air District is effectively resourced to deliver on commitments identified in the PTCA Plan strategies and actions, as prioritized by the CSC and the PTCA community. As such, the intent of this strategy is for resource allocations to reflect the needs of the people who have been disproportionately harmed by environmental injustice and to

Component	Description
	center the priorities of stakeholders burdened by air pollution who would most benefit from action.
List of Actions (# and name)	R 1.1 Allocate Dedicated Staff Resources to CSC Early Priorities R 1.2: Co-develop and implement an annual Implementation Plan R 1.3: Engage with the Air District on Annual Budget Planning R 1.4: Engage with Air District on Strategic Planning

Urban Greening

Introduction

Implementation of the Urban Greening cross-cutting strategy will provide a myriad of ecosystem services in the PTCA area, including increasing green spaces throughout the PTCA area, providing vegetative buffers from polluting sources, mitigating urban heat island effects, and providing walkable trails throughout the community. Urban green space also offers health benefits by improving allergic respiratory conditions, cardiovascular conditions, and psychological well-being.[48] Though planting trees and vegetation alone are not enough to reduce emissions of all pollutants in the PTCA area, urban greening can provide buffers between pollution sources and people in the community. At a neighborhood level, work is already coinciding with this strategy, such as the Richmond Rising Grant recently awarded to the City of Richmond. The City of San Pablo, too, has projects such as Rumrill Boulevard Complete Streets Project and Sutter Ave Green Street Project that helps improve multimodal safety and stormwater facilities, respectively. Combined with opportunities to educate and engage the community through the addition of green infrastructure, Urban Greening seeks to shift the heavy emphasis on grey infrastructure to green.

Urban Greening Strategy

Component	Description
Strategy #	Urban Greening (UG) 1
Strategy name	Urban Greening
Key Issue (KI) Addressed	Mobile KI 2: Goods Movement Mobile KI 3: Streets and Freeways
Objective (intended outcome of the strategy)	Increase tree planting within the Plan area in low-income census groups and around sensitive receptors.
Narrative on how Strategy meets Feasibility Criteria	This strategy meets the feasibility criteria because of renewed funding commitments to the City of Richmond. For a long time, limited long-term funding and local government staff capacity have been issues for implementing jurisdictions. The City of Richmond, for example, has no dedicated urban forestry staff and will often contract work out to Groundwork Richmond, a local community organization, to complete maintenance.

[48] Nguyen PY, Astell-Burt T, Rahimi-Ardabili H, Feng X. Green Space Quality and Health: A Systematic Review. Int J Environ Res Public Health. 2021 Oct 20;18(21):11028. doi: 10.3390/ijerph182111028. PMID: 34769549; PMCID: PMC8582763. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8582763/

Component	Description
	In 2023 the City of Richmond, along with a coalition of partners, received a Transformative Climate Communities (TCC) Grant from the California Strategic Growth Council, worth $35 million, to implement several neighborhood-level urban greening projects in the Santa Fe, Coronado, and Iron Triangle neighborhoods over the next 5 years. The TCC Grant will align with the guidance outlined in the City of Richmond Urban Greening Master Plan (2017). Unfortunately, the TCC grant does not extend to the City of San Pablo and will only last for 5 years. Success of this initial investment fund may unlock other sources of state and federal funding such as CARB's Community Air Protection Incentives. Further, the City of Richmond has prepared a mapping file of street tree canopy throughout the city. Since the City of San Pablo does not have the capacity to do the same, it will have to prioritize a street tree canopy mapping process in order to understand where to focus plantings in the City of San Pablo (though San Pablo, in general, has a larger tree canopy than Richmond). Though political support is not entirely present, the hope is that this strategy continues to educate local government leaders and advocate for increased, permanent funding to implement green infrastructure throughout the PTCA area.
Narrative on how Strategy meets Vision and Principles Criteria	According to the AB 617 Richmond San Pablo Social Pinpoint data, urban heat island effects are a serious concern in the PTCA area. In addition, low-income communities of color are most susceptible to the impacts of climate change. We know that planting trees will not solve the PTCA area's emissions problems, but by prioritizing street tree plantings and vegetation in neighborhoods with limited tree canopies and high concentrations of $PM_{2.5}$, this strategy will help to decrease exposure to air pollution for future generations. Further, by incorporating workforce training already included in Groundwork Richmond's programming, a partner of the City of Richmond's urban forestry plan, this strategy equips people from the most burdened communities to learn marketable skills in a green economy, well in alignment with the City of Richmond's Green-Blue New Deal. In Richmond, lower income census tracts have fewer trees. A 2021 meta-analysis concluded that lower-income "[...]people show more beneficial effects than affluent people, particularly when concerning public green spaces/parks[...]"[49] Urban greenery is a tool to further health and social equity. In addition, as recipients of the $35 million Transformative Climate Communities (TCC) Richmond Rising Grant, the City of Richmond is poised in the next 5 years to accomplish, with the help of the State, several urban greening projects, including tree plantings, trails, urban agriculture, fruit tree giveaways, and veggie RX pilot programs.

[49] Rigolon A, Browning MHEM, McAnirlin O, Yoon HV. Green Space and Health Equity: A Systematic Review on the Potential of Green Space to Reduce Health Disparities. Int J Environ Res Public Health. 2021 Mar 4;18(5):2563. doi: 10.3390/ijerph18052563. PMID: 33806546; PMCID: PMC7967323. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7967323/

Component	Description
	Urban greening provides many benefits for the community, including: improved air quality, access to green space through physical activity, mental health improvement, not to mention environmental benefits for the environment. In addition, workforce development opportunities can be created through urban greening strategies that can further train a green workforce and spur economic development for a labor force that is knowledgeable about environmental issues.
List of Actions (# and name)	UG 1.1: Plant Street Trees and Vegetation in Priority Neighborhoods UG 1.2: Education and Funding Opportunities UG 1.3: Require New Development to Include Vegetative Buffers UG 1.4: Green Workforce Development

Chapter 8: CARB Statewide Strategies

Overview of California Air Resources Board's Statewide Actions

Community-scale air pollution exposure is caused by many factors, including the cumulative impacts of multiple pollution sources. Effective solutions require multiple strategies at both the statewide and local levels to deliver new emissions reductions directly within these communities. The California Air Resources Board (CARB) has adopted a number of comprehensive air quality and climate plans over the last several years that lay out new emissions reduction strategies. These plans include the recent State Strategy for the State Implementation Plan,[50] California's 2022 Climate Change Scoping Plan,[51] the California Sustainable Freight Action Plan,[52] the Short-Lived Climate Pollutants Reduction Strategy,[53] and the 2020 Mobile Source Strategy,[54] along with a suite of incentive programs. CARB is continuing to develop air quality and climate plans that will further reduce emissions. The Community Air Protection Blueprint[55] further identified additional actions to reduce the air pollution burden in heavily impacted communities throughout the State. Together, these plans provide a foundation for the new actions identified as part of this community emissions reduction program.

This chapter illustrates CARB's role in the community emissions reduction program by broadly describing the regulatory and incentive-based statewide actions CARB has taken to reduce emissions statewide. It also highlights specific actions that address areas of concern identified by the PTCA community. CARB's potential enforcement strategies are described in Chapter 6 of the PTCA Plan.

Incentive Programs

CARB operates incentive programs that reduce the costs of developing, purchasing, or operating cleaner technologies. The programs help ensure cleaner cars, trucks, equipment, and facilities are operating in our neighborhoods by driving the development of new, cleaner technologies and by accelerating their sale and adoption. Specifically, they accelerate the introduction of advanced technology vehicles and equipment, accelerate the turnover of older and higher-emitting vehicles and equipment, and increase access to clean vehicles and transportation in disadvantaged communities and lower-income households.

While CARB is responsible for program oversight, some programs are implemented in partnership with local air districts. Examples of CARB incentive programs include:

[50] California Air Resources Board, 2022 State Strategy for the State Implementation Plan, September 12, 2022, available at: https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy
[51] California Air Resources Board, California's 2017 Climate Change Scoping Plan, September 2022, available at: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents
[52] California Department of Transportation, California Sustainable Freight Action Plan, July 2016, available at: https://dot.ca.gov/programs/transportation-planning/freight-planning/california-sustainable-freight-action-plan
[53] California Air Resources Board, Short-Lived Climate Pollutant Reduction Strategy, March 2017, available at: https://ww2.arb.ca.gov/resources/documents/slcp-strategy-final
[54] California Air Resources Board, 2020 Mobile Source Strategy, October 2021, available at: https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy
[55] California Air Resources Board, Final Community Air Protection Blueprint for Selecting Communities, Preparing Community Emissions Reduction Programs, Identifying Statewide Strategies, and Conducting Community Air Monitoring, October, 2018, available at: https://ww2.arb.ca.gov/capp-blueprint

- Carl Moyer Memorial Air Quality Standards Attainment Program[56]
    - The Community Air Protection Incentives[57] are implemented by the air district through this program,
- Proposition 1B: Goods Movement Emission Reduction Program,[58]
- Funding Agricultural Replacement Measures for Emission Reductions Program,[59] and
- Low Carbon Transportation Investments and Air Quality Improvement Program (which includes the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project).[60]

Community Air Protection Incentives

Since 2017, the California Legislature has appropriated money annually from the Greenhouse Gas Reduction Fund (GGRF) for incentives to support AB 617. In advance of initial community selection in 2018, the Legislature directed that CAP incentives appropriated in Fiscal Year (FY) 2017-18 be focused on disadvantaged and low-income communities through the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) and the Proposition 1B Goods Movement Emission Reduction Program (Proposition 1B Program) to provide immediate air quality benefits in heavily impacted communities.

Between FYs 2017-18 and 2022-23, the Legislature appropriated $1,162 million in CAP incentives (Table 1 in Appendix A).[61] The Legislature initially appropriated incentives to generate immediate air quality benefits in communities most likely to participate in AB 617 – primarily disadvantaged communities – as the Program began to develop. Additionally, the Board set specific priority population investment targets for the funds: 70 percent in and benefiting disadvantaged communities and 80 percent in and benefiting disadvantaged or low-income communities. Through May of 2023, air districts have expended over $465 million dollars with $184 million in AB617 communities. The majority of the remaining $281 million in CAP incentives expended (94%) have been in other disadvantaged and low-income communities across the State.[62]

To expand on initial funding options in the CAP Guidelines, CARB developed a process for the air districts to fund new projects responsive to community priorities and to expand stationary source incentives. CARB staff worked with the air districts and California Air Pollution Control Officers Association (CAPCOA) through late 2019 and early 2020 to ensure the process maximized flexibility to support projects requested by community members while simultaneously meeting the need to assess emissions reductions and other benefits. Agency staff shared draft language

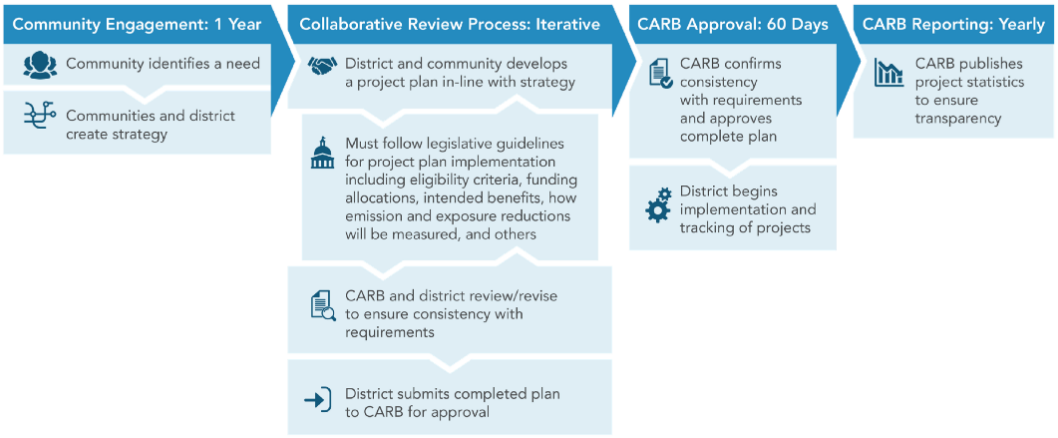
[56] For more information on the Carl Moyer Memorial Air Quality Standards Attainment Program, visit: https://ww2.arb.ca.gov/our-work/programs/carl-moyer-memorial-air-quality-standards-attainment-program.
[57] For more information on the Community Air Protection Incentives, visit: https://ww3.arb.ca.gov/msprog/cap/capfunds.htm
[58] For more information on the Proposition 1B: Goods Movement Emission Reduction Program, visit: https://ww2.arb.ca.gov/our-work/programs/proposition-1b-goods-movement-emission-reduction-program.
[59] For more information on the Funding Agricultural Replacement Measures for Emission Reductions Program, visit: https://ww2.arb.ca.gov/our-work/programs/farmer-program.
[60] For more information on the Low Carbon Transportation Investments and Air Quality Improvement Program, visit: https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program.
[61] California Air Resources Board, AB 617 Budget Frequently Asked Questions – Summary of AB 617 Funding, available at: https://ww2.arb.ca.gov/sites/default/files/2023-05/AB617%20Funding%20Questions_update%20Final_5.23.23.pdf

[62] Disadvantaged and low-income communities as defined by Assembly Bill 1550 (Gomez, Chapter 369, Statutes of 2016), read more here: https://calepa.ca.gov/envjustice/ghginvest/

with the public in May 2020 and incorporated their guidance as well as feedback from the air districts into the final version in October 2020.

The revised guidelines allow air districts to expeditiously develop and fund projects to reduce emissions from stationary sources and to address those concerns identified and prioritized in AB 617 community emissions reduction programs. As a criterion for CARB's approval of a Community Emissions Reduction Program (CERP), air districts must describe the level of support for the CERP and its strategies to the Community Steering Committee. Subsequent proposed project plans to implement incentive-based strategies must also document strong, widespread, and clear community support and include descriptions of community benefits, both those benefits that are quantifiable and those more qualitative in nature. The graphic below illustrates the process by which a CERP is developed and approved. This iterative process allows districts and CARB to account for complicated, unique, or unusual projects and ensure that they will be responsive to community needs.

Community Air Protection Project Plan Review Process



Several innovative incentive projects were initiated in 2022 and funded by Community Air Protection Program Incentives. San Joaquin Valley Air Pollution Control District (SJVAPCD) has numerous Community Identified Projects totaling over $3 million, including wood stove replacements, EV charging infrastructure, dust harvesters, lawn and garden, and alternatives to agricultural burning. With support from Portside Environmental Justice Neighborhoods' CSC, SDAPCD proposed, and CARB approved, an electric truck pilot project for Portside to incentivize e-truck purchases without requiring scrapping old trucks as a Community Air Protection Incentives – Community Identified Project. On behalf of their AB 617 communities, South Coast Air Quality Management District (SCAQMD) has submitted a Draft AB 617 Truck Incentives Workplan to CARB for review that will provide opportunities for fleet owners to assess the suitability of zero-emission or near-zero-emission medium- or heavy-duty trucks and supporting infrastructure by allowing them to test drive the cleaner trucks for some time.

Staff recognizes that other communities, particularly those that have been consistently nominated but not yet selected for participation in AB 617, could likewise benefit from their air districts implementing these kinds of innovative new projects. CARB staff is currently working with the air districts to revise the CAP Guidelines to incorporate many of these approved community-identified projects as new chapters eligible for any air district to implement in their most heavily

impacted communities. New chapters will include incentives for agency partnerships, vegetative barriers and urban greening, emergency diesel generator replacement, paving, sidewalk, and bike path projects, dial-a-ride vehicle replacement, alternatives to agricultural burning, and low-dust nut harvesters. Staff will continue to work with the air districts to develop these revisions, and plan to publish these revised Guidelines in Spring 2024.

Regulatory Programs

Federal, State, and local air quality agencies all work together to reduce emissions. At the federal level, the U.S. Environmental Protection Agency (U.S. EPA) has primary authority to control emissions from certain mobile sources, including sources that are all or partly under federal jurisdiction (e.g., some farm and construction equipment, aircraft, marine vessels, locomotives), which it shares in some cases with air districts and CARB. The U.S. EPA also establishes ambient air quality standards for some air pollutants. At the State level, CARB is responsible for controlling emissions from mobile sources and consumer products (except where federal law preempts CARB's authority), controlling toxic emissions from mobile and stationary sources, controlling greenhouse gases from mobile and stationary sources, developing fuel specifications, and coordinating State-level air quality planning strategies with other agencies.

Regionally, air districts are primarily responsible for controlling emissions from stationary and indirect sources (with the exception of consumer products in most cases) through rules and permitting programs within their regions.

CARB regulatory programs are designed to reduce emissions to protect public health, achieve air quality standards, reduce greenhouse gas emissions, and reduce exposure to toxic air contaminants. CARB establishes regulatory requirements for cleaner technologies (both zero and near-zero emissions) and their deployment into the fleet for cleaner fuels and to ensure in-use performance. CARB's regulatory programs are broad – impacting stationary sources, mobile sources, and multiple points within product supply chains from manufacturers to distributors, retailers, and end-users. CARB's regulations affect cars, trucks, ships, off-road equipment, consumer products, fuels, and stationary sources.

One important and relevant regulatory authority of CARB is to adopt measures to reduce emissions of toxic air contaminants from mobile and non-mobile sources, known as Airborne Toxic Control Measures (ATCM).[63] These regulatory measures include process requirements, emissions limits, or technology requirements. Additionally, CARB implements the Statewide Air Toxics "Hot Spots" Program[64] to address the health risk from toxic air contaminants at individual facilities across the State. The Air Toxics "Hot Spots" Program includes several components to collect emissions data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels.

Under the Air Toxics "Hot Spots" Program, air districts are required to set a threshold for facilities that pose a significant health risk and prioritize facilities for health risk assessments. Air districts also establish a risk value above which facilities must conduct a risk reduction audit and emissions reduction plan. Facilities must develop these health risk assessments, risk reduction audits, and

[63] California Health and Safety Code § 39650 et seq.
[64] Assembly Bill 2588, Air Toxics "Hot Spots" Information and Assessment Act, Connelly, Statutes of 1987, California Health and Safety Code § 44300 et seq.

emission reduction plans. CARB provides technical guidance to support smaller businesses in conducting health risk assessments and developing emissions reduction plans.

Additionally, CARB has pursued enforceable agreements with industry that result in voluntary but enforceable adoption of the cleanest technologies or practices and provide assurance that emissions reductions will be realized. CARB's agreement with the Union Pacific Railroad Company and BNSF Railway Company to accelerate the introduction of cleaner locomotives in the South Coast Air Basin is an example of an enforceable agreement.

CARB Actions Related to the PTCA Community

This section highlights CARB actions that specifically relate to the PTCA community. This list should not be interpreted as exhaustive but rather illustrative of some of the major statewide strategies driving emissions reductions in conjunction with those local-level strategies identified in this community emissions reduction program. Additional CARB foundational strategies can be found in Appendix D and Appendix F of the Community Air Protection Blueprint.[65] The list of CARB actions and their anticipated benefits in current AB 617 communities is also available on the Program CommunityHub.[66]

Recently Adopted CARB Regulations

In August 2022, CARB approved the **Advanced Clean Fleets regulation.**[67] The Advanced Clean Fleets regulation is part of a comprehensive strategy that would, consistent with public health needs, accelerate the widespread adoption of zero-emission vehicles (ZEV) in the medium- and heavy-duty truck sector and in light-duty package delivery vehicles. The ACF regulation would require certain fleets to deploy ZEVs starting in 2024 and would establish a clear end date for new medium- and heavy-duty internal combustion engine (ICE) vehicle sales in 2040. See Mobile strategies in Chapter 7.

In November 2022, CARB approved the **Advanced Clean Cars II regulations.**[68] The Advanced Clean Cars II regulations will rapidly scale down light-duty passenger car, pickup truck, and SUV emissions starting with the 2026 model year through 2035. The regulations are two-pronged. First, it amends the Zero-emission Vehicle Regulation to require an increasing number of zero-emission vehicles and relies on currently available advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric, and plug-in hybrid electric vehicles, to meet air quality and climate change emissions standards. These amendments support Governor Newsom's 2020 Executive Order N-79-20, which requires all new passenger vehicles sold in California to be zero emissions by 2035. Second, the Low-emission Vehicle Regulations were amended to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions. The regulations will substantially reduce air pollutants that threaten public health and cause climate change. While further developing the zero-emission vehicle market, the regulations also take additional steps to clean up internal combustion engines and will provide public health benefits of at least $12 billion over the life of the

[65] California Air Resources Board, Final Community Air Protection Blueprint for Selecting Communities, Preparing Community Emissions Reduction Programs, Identifying Statewide Strategies, and Conducting Community Air Monitoring, October 2018, available at: https://ww2.arb.ca.gov/capp-blueprint.
[66] Community Air Protection Program Communities: https://ww2.arb.ca.gov/capp-communities
[67] For more information on the Advanced Clean Fleets regulation, visit: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets
[68] For more information on the Advanced Clean Cars II regulations, visit: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii

regulations by reducing premature deaths, hospitalizations, and lost workdays associated with exposure to air pollution. See Mobile strategies in Chapter 7.

In December 2022, CARB approved amendments to the **Commercial Harbor Craft (CHC) regulation**.[69] CARB has regulated commercial harbor craft since 2009. By the end of 2022, the Current Regulation will require Tier 2 or 3 engines on a subset of harbor craft (excursion vessels, ferries, tugboats, crew & supply vessels, barges, and dredges). The 2022 Amended CHC Regulation adds or expands requirements for vessels regarding emissions, reporting, fuel use, idling, and facility power, among others. Some of these new requirements go into effect as early as January 1, 2023. Harbor craft are in the top three emitting categories at seaports, contributing more diesel particulate matter emissions than trucks in 2023 at the San Pedro Bay Ports. The amendments are expected to reduce diesel PM from covered vessels by 89 percent and NOx by 54 percent at full implementation. This is expected to avoid 531 premature deaths, 161 hospital admissions, and 236 emergency room visits, providing $5.25 billion in benefits versus $1.98 billion in costs statewide. See Marine and Rail strategies in Chapter 7.

In April 2023, CARB approved the **In-Use Locomotive regulation**[70]. The In-Use Locomotive Regulation (Regulation) will achieve emission reductions from diesel-powered locomotives and increase the use of zero-emission (ZE) technology. The Regulation will help meet California's public health, air quality, and climate goals by reducing criteria pollutants, toxic air contaminants, and greenhouse gas emissions for locomotives in use. See Marine and Rail strategies in Chapter 7.

In May 2023, CARB adopted the **Hexavalent Chromium Airborne Toxic Control Measure (ATCM)**.[71] The ATCM results in the most stringent regulation of hexavalent chromium emissions from the chrome plating industry (compared to federal standards and District rules), with the goal of eliminating toxic hexavalent chromium emissions from the chrome plating industry in California over time.

Upcoming CARB Regulations

Cargo Handling Equipment Regulation Amendments – Mobile cargo handling equipment is any motorized vehicle used to handle cargo or perform routine maintenance activities at California's ports and intermodal rail yards. The type of equipment includes yard trucks (hostlers), rubber-tired gantry cranes, container handlers, forklifts, etc. The prior Mobile Cargo Handling Equipment (CHE) Regulation was adopted in 2005 to reduce toxic and criteria emissions to protect public health and was fully implemented by the end of 2017. CARB staff is currently assessing the availability and performance of zero-emission technology to further reduce emissions. For more information, visit: https://ww2.arb.ca.gov/our-work/programs/cargo-handling-equipment.

Catalytic Converter Theft Reduction - This strategy consists of innovative assistance to deter thefts of vehicle catalytic convertors in communities selected for the Community Air Protection Program. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2018-10/final_community_air_protection_blueprint_october_2018_appendix_f.pdf

[69] For more information on the Commercial Harbor Craft Amendments, visit: https://ww2.arb.ca.gov/our-work/programs/commercial-harbor-craft
[70] For more information on the In-Use Locomotive Regulation, visit: https://ww2.arb.ca.gov/our-work/programs/reducing-rail-emissions-california/locomotive-fact-sheets
[71] For more information on the Hexavalent Chromium Airborne Toxic Control Measure, visit: https://ww2.arb.ca.gov/our-work/programs/chrome-plating-atcm

Commercial Cooking Suggested Control Measure - This strategy consists of a two-phase process to evaluate California's current emission reduction requirements for commercial cooking operations that prepare food for human consumption and, if necessary, make improvements to achieve additional reductions in particulate matter 10 microns or less in diameter (PM10), particulate matter 2.5 microns or less in diameter (PM2.5) and volatile organic compound emissions that contribute to ozone formation. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2018-10/final_community_air_protection_blueprint_october_2018_appendix_f.pdf See Commercial and Industrial Sources Near Community Chapter 7.

Composite Wood Products Control Measure Amendments - This strategy will amend the CARB Composite Wood Products Airborne Toxic Control Measure (ATCM), approved in 2007. The Composite Wood Products ATCM established formaldehyde emission standards for three types of composite wood products (hardwood plywood, particleboard, and medium-density fiberboard) and requires that all consumer goods that contain such materials (e.g., flooring, cabinets, furniture) destined for sale in California must comply with the Composite Wood Products ATCM. For more information, visit: https://ww2.arb.ca.gov/our-work/programs/composite-wood-products-program

Consumer Products Standards - The primary goal of this measure is to help attain federal ozone standards in the South Coast by addressing projected growth in consumer product emissions. While this measure focuses on attaining federal air quality standards in the South Coast, where nearly 15 million residents face the most extreme and persistently high ambient ozone levels in the nation, it will also facilitate the attainment of State and federal air quality standards in other California regions. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf

Future Measures for Aviation Emissions Reductions - The primary goal of future measures for aviation is to reduce emissions from airport and aircraft-related activities. The identified emission sources for the aviation sector are main aircraft engines, auxiliary power units (APU), and airport ground transportation. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf

Future Measures for Ocean-Going Vessel Emissions Reductions - The primary goal of future measures for OGVs is to further reduce emissions from OGVs that are transiting, maneuvering, or anchoring in Regulated California Waters (RCW) and while docking at berth in California seaports. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf See Marine and Rail strategies in Chapter 7.

Ocean Going Vessels In-Transit - The 2020 At-Berth Regulation was adopted by CARB's Board in August 2020. The At-Berth Regulation expands existing regulations by adding more types of visits and two new vessel categories: auto carriers and tankers and the new ports and terminals that receive these vessel types. The At-Berth Regulation Interim Evaluation Report (published on December 1, 2022) and provides CARB's Board and the public with an implementation status update for the At-Berth Regulation. One of the key recommendations from the Report is to pursue future reductions from ocean-going vessels while they are transiting, maneuvering, and anchoring, as most emissions from ocean-going vessels occur while they are transiting. CARB will be performing an ocean-going vessel technology assessment during the next 18 months that will explore the best strategies for further reducing emissions from ocean-going vessels (including in transit). See Marine and Rail strategies in Chapter 7.

Off-Road Zero-Emission Targeted Manufacturer Rule - The goal of the Off-Road Zero-Emission Targeted Manufacturer Rule is to achieve criteria pollutant and GHG emissions reductions by accelerating the development and production of zero-emission off-road equipment and powertrains. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf See "Mobile" Chapter 7.

Spark-Ignition Marine Engine Standards - The goal of this measure is to reduce emissions from new spark-ignition (SI) marine engines by adopting more stringent exhaust standards for outboard and personal watercraft, which currently do not use catalyst control technologies. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf See Marine and Rail strategies in Chapter 7.

Tier 5 Off-Road Vehicles and Equipment - This measure is to establish more stringent standards and test procedures for new, off-road compression-ignition (CI) engines to reduce NOx, PM, and carbon (CO2) emissions (referred to as Tier 5) for all off-road engine power categories, including those that do not currently utilize exhaust after-treatment such as diesel particulate filters (DPF) and selective catalytic reduction (SCR). For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf See "Mobile" Chapter 7.

Transport Refrigeration Unit Regulations, Part 2 – Transport refrigeration units congregate at distribution centers, railyards, and other facilities, resulting in the potential for health risks to those that live and work nearby. In February 2022, CARB adopted amendments to the Transportation Refrigeration Unit Airborne Toxic Control Measures (TRU ATCM). The amendments include requirements for the transition of diesel-powered truck TRUs to zero-emission, a particulate matter emission standard for newly manufactured non-truck TRUs, lower global warming potential refrigerant, facility registration, and reporting expanded TRU reporting and labeling, and fees. Staff are assessing zero emission options for non-truck TRUs and plan to take a second rulemaking (Part 2) to the Board for consideration in 2025. See Commercial and Industrial Sources Near Community strategies in Chapter 7.

Zero-Emission Appliance Standards – Zero-emission standards for new appliances are in alignment with the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) as they would reduce building-related greenhouse gas (GHG) emissions. These standards would also assist California with meeting State and federal air quality standards and achieving public health benefits because they would also provide important smog-forming NOx emission reductions. CARB committed to exploring developing and proposing zero-emission GHG standards for new space and water heaters sold in California as part of the 2022 State Strategy for the State Implementation Plan (2022 State SIP Strategy) adopted in September 2022. For more information, visit https://ww2.arb.ca.gov/our-work/programs/zero-emission-appliance-standards See Public Health and Reducing Exposure strategies in Chapter 7.

Zero-Emissions Truck Measure - This measure would seek to accelerate the number of zero-emissions (ZE) trucks beyond existing measures (including the proposed Advanced Clean Fleets regulation). This strategy is a modification of the publicly suggested On-Road Heavy-Duty Vehicle Useful Life Regulation. The already adopted ACT regulation will result in almost 420,000 ZE trucks on the road by 2037, and the proposed Advanced Clean Fleets (ACF) regulation would increase the number of ZE trucks by another 220,000 to a total of 640,000. However, in 2037, even after the implementation of the ACT and ACF regulations, about 480,000 heavy-duty combustion-powered trucks will still be on the road. In this modified approach, staff would seek

to upgrade these remaining heavy-duty combustion trucks to new or used ZE trucks rather than to trucks with cleaner combustion engines. For more information, visit: https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf See Mobile strategies in Chapter 7.

Estimated Emission Reductions from CARB Measures

It is important to note that the Statewide regulations provided in this CERP are in the early phases of development, and their adoption and implementation timelines are not well established. As a result, a draft emissions inventory, and estimated benefits are not yet available for many regulations still in development. As these emissions inventories are developed overtime, CARB staff will provide estimated benefits in future updates.

Chapter 9 Implementation and Reporting

Achieving the ambitions of the PTCA Plan will require a dedicated commitment to active implementation and ongoing reporting of both successes and challenges. This chapter describes the approach to Plan implementation and annual reporting.

The Plan has a five-year horizon to initiate and complete strategies and actions, and a 10-year horizon for continued tracking to prevent backsliding and to ensure continued progress towards Plan Goals. Plan implementation will require commitments from a variety of agencies, organizations, and stakeholders. The Air District is a key implementation partner and lead, alongside CARB and the local jurisdictions within the PTCA area. The Air District holds the unique role of convening agencies responsible for implementation. The Air District has committed to ensuring adequate resources are provided during Plan implementation (see the Resource PTCA Plan Implementation strategy), for example, make regulations more stringent, enhance enforcement, and incentivize equipment replacements. Local jurisdictions such as the cities of Richmond and San Pablo and Contra Costa County will play a critical role in Plan implementation, for example by updating codes to create health-protective zoning regulations where industrial and residential land uses intersect and considering new multi-jurisdictional planning to better manage truck routes and impacts. The CSC will continue the vital role of pushing for accountability and transparency and will help prioritize and drive Plan implementation. Many other stakeholders will be involved in implementing strategies centered around the needs of people who have been disproportionately harmed by environmental injustice.

In alignment with the PTCA Vision and Principles, the Plan Goals will be achieved by implementing the strategies and actions detailed in Chapter 7.

Key Agencies with Roles in Plan Implementation

Air District
The Air District is the regional agency responsible for assuring clean air in the nine counties that surround the San Francisco Bay (except northeastern Solano and northern Sonoma counties). The Air District writes and implements air quality plans, adopts and enforces regulations to control air pollution from stationary sources, offers incentives to government agencies, businesses, and individuals to voluntarily reduce air pollution, engages with communities and provides technical and policy guidance regarding air quality, and manages the Spare the Air program. The Air District builds and maintains relationships with the CSC and agency stakeholders and sustains partnerships with communities across the region.

Cities of Richmond and San Pablo
The City of Richmond and City of San Pablo have authority for their respective land-use and transportation decisions. Their City Councils make land-use decisions by adopting general and specific plans, zoning regulations, and certifying environmental reports for land-use projects, such as housing, commercial, and industrial developments.

County of Contra Costa
Contra Costa County has authority for growth, conservation, and community life in the unincorporated areas within the County. The County makes decisions about zoning and development, including certifying environmental reports for land-use projects such as housing,

commercial and industrial developments, and decisions about sustainability and environmental justice.

Contra Costa Health Services
Contra Costa Health Services provides health care services to all people in Contra Costa County with special attention to those who are most vulnerable to health problems. Several departments are within the Health Services Division including Environmental Health and Public Health, focusing on communities and populations most at risk for poor health outcomes and those most affected by environmental inequities.

CARB
CARB is the state agency charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. CARB identifies pollutants that pose the greatest health risks, such as DPM, benzene in gasoline and formaldehyde in consumer products. CARB is also responsible for establishing the state's air quality standards to protect those at greatest risk – children, older adults and people with lung and heart disease.

As implementation begins and actions are worked on and refined, additional partners will surface and be engaged.

Implementation Mechanisms

The Plan calls on multiple agencies to commit resources to implement the strategies and actions. The following describes the types of mechanisms that can help achieve the ambitions of the Plan.

Incentives. Securing funding for diesel engine and equipment replacements, electric charging and hydrogen fuel station infrastructure can accelerate the turnover of older equipment and facilitate the transition to cleaner equipment and vehicles.

Rule Development. California law sets forth the rulemaking process by which CARB and the Air District are responsible for developing and adopting the specific rules and regulations needed to achieve healthy air quality.

Enforcement. Stricter enforcement is widely recognized as a component of environmental justice. Several agencies have enforcement authority in the PTCA area. CARB enforces "mobile" sources such as heavy-duty truck engine types, ensuring that transport trucks adhere to the latest, cleanest engine requirements. The Air District enforces stationary sources (permitted industrial facilities and wood burning, for example). Cities and counties have local code enforcement authority to make sure businesses comply with zoning regulations and traffic control authority to ensure transport trucks stay on designated truck routes. Additional agencies also are involved in enforcement such as the U.S. EPA.

Permitting and Land Use. Stationary sources, such as factories, are issued permits that define how much air pollution they can emit. In California, local air districts have the authority to grant permits to stationary sources.[72] Local planning departments issue land use and building permits. The county health department issues hazardous materials permits. Various state agencies also regulate industrial activities involving hazardous materials such as DTSC and Cal EPA.

[72] https://ww2.arb.ca.gov/permitting

Advocacy. After the Plan is adopted, the CSC will continue to advocate for Plan implementation, will meet regularly to review progress, evaluate programs and budgets, and make recommendations. In addition, CSC members, community members, business owners, and other stakeholders likely will need to advocate and communicate with collaborating agencies to ensure their continued support for Plan strategies and the resources needed for implementation. The Air District and CSC will work collaboratively to build alliances among allies to help ensure Plan implementation success.

Education. Community education about technical aspects of Plan implementation and agency education about the on-the-ground conditions in the PTCA area will continue during implemented.

Research and Further Study. Several topics will need to be better understood through research, additional study or data analysis to help determine the most strategic course of action.

The table below presents example mechanisms to reduce pollution from four key sectors analyzed in the Plan emissions inventory.

Stationary Point Sources w/Permits  Refineries, power plants, gas stations, autobody shops	**Stationary Area Sources**  Fireplaces, water heaters, consumer products	**On-Road Mobile**  Cars, trucks, buses	**Off-Road Mobile**  Ships, aircraft, rail, construction equipment
Example Mechanisms **Enforcement:** Enhance enforcement, legal approaches and penalties.	**Example Mechanisms** **Incentives:** Offer incentives to replace wood-burning devices or other older home appliances	**Example Mechanism** **Agency operations:** City of Richmond, City of San Pablo and Contra Costa County conduct more frequent street sweeping to control road dust	**Example Mechanism** **Regulation:** CARB adopts and implements the In-Use Locomotive Regulation that will ensure existing rail cars are as clean as possible and locomotive fleet turnover to newer, cleaner technology is accelerated

CSC, Standing and Ad Hoc Committees Implementation Roles

Once the Plan has been adopted the CSC will begin Plan implementation. The CSC will support and direct activities to achieve Plan Goals in alignment with the PTCA Vision and Principles. The CSC will form, disband, or maintain Standing and Ad Hoc committees with specific and defined roles and responsibilities as well as expected outcomes, as needed. The Air District will participate in up to two standing committees.

- **Current Committees**
  - CSC
    - The CSC will be an important body during Plan implementation. The CSC will be asked to review work progress and provide input on the pollution reduction strategies and Plan actions. This will require strong communication

between the CSC and Air District staff to ensure there are clear priorities established early on, and actions selected for implementation align with the communities' air quality priorities. It is anticipated that the CSC will meet quarterly.

- Community Engagement Standing Committee
  - The Community Engagement Standing Committee will continue to use its member's networks to seek input on Plan actions during implementation. The Committee will determine how best to engage the public in the PTCA area, as well as consider unique outreach tactics for the different types of Plan strategies and actions. The Committee will be encouraged to continue building and strengthening connections with the community to make the most positive impact. The Committee will build coalitions with other community leaders in the Plan area and environmental justice organizations across the Bay Area.

- Governance Ad Hoc Committee
  - The Governance Ad Hoc will assist with decision making, provide feedback on budgetary matters and respond to speaking requests (at Air District Board of Directors meetings, for example) and mentor other CSC members.

- **Proposed Committees** (potential committees that may convene as needed and as resources allow)
  - Implementation Ad Hoc
    - An Implementation Ad Hoc would assist the Air District with the preparation of the annual implementation plan (described below), and help call for, and lead, smaller implementation working teams as necessary.

  - Legislative Ad Hoc
    - A Legislative Ad Hoc would organize support for legislative proposals that protect public health and reduce air pollution. This includes working with the Air District to identify the CSC's legislative priorities if any emerge. The Ad Hoc would develop fact sheets and action alerts to support the CSC in determining legislative priorities and organize support among local leaders and other stakeholders within the PTCA area.

  - Communications Subcommittee
    - A Communications Subcommittee would help design, implement and monitor improved and expanded communications about flaring events for the fuel refining sector in the PTCA area and also for major incidents at both fuel-refining and non-fuel-refining sources. Communications mechanisms would be developed in collaboration with the CSC and include (A) a new webpage and (B) standardized internal and external communication protocols (see Fuel Refining Action 2.2).

  - Just Transition Subcommittee
    - A Just Transition Subcommittee (JTS) would provide a platform for advancing Just Transition and facilitate conversations and potential partnerships with both governmental and non-governmental organizations. The JTS would create an online shareable folder of Just Transition educational materials to help support education and aid communications with key stakeholders and will elevate Just Transition Principles through the PTCA Plan and policy making. (see Fuel Refining Action 1.1 and 1.2).

  - Community Benefits Policy Subcommittee

- A Community Benefits Policy Subcommittee would work with the Air District to gather public input and develop first a Fuel Refining, and then a PTCA wide, Community Benefits Policy. The committee would work to ensure the policy includes criteria for investment, is tied to air quality and climate protection, incorporates Just Transition principles, and has community driven mechanisms to include community voice. (see Fuel Refining Action 3.9).

Annual Implementation Plan

Air District staff and the CSC will co-develop an annual Implementation Plan that will prioritize strategies and actions for implementation in consultation with responsible Air District Divisions and partner agencies. This will be a yearly work plan rather than a full re-planning effort, and it is not expected that developing this work plan will redirect significant resources away from ongoing Plan implementation. The CSC and the Community Engagement Standing Committee may, as needed, identify community-level implementation opportunities such as advocacy, education, securing resources and community engagement activities to include in the Implementation Plan. The Implementation Plan will identify ongoing administrative needs, such as appropriate Air District staff resource needs, and will inform annual Air District budget planning. Ongoing logistical and communications activities such as maintaining the Air District PTCA web pages will also be addressed. After the first year of Plan implementation, development of the annual Implementation Plan will begin with an evaluation of the previous year's implementation activities to identify and address challenges that may blocking progress towards the Plan Goals.

Tracking Plan and Strategy Implementation Progress

The PTCA Plan is a living document. In addition to documenting progress on Plan implementation, the **Annual Report** will provide an opportunity to refine strategies and actions, consider whether additional actions are necessary, and communicate success stories and lessons learned, in accordance with CARB's guidance (*Blueprint 2.0*).

At the minimum, the Annual Report will contain the following:

- report on strategy and action implementation progress from all agencies and stakeholders identified as "lead action implementers"
- description of implementation successes and challenges including describing if the level of allocated staff resources was sufficient or if there were shortfalls
- identification of other barriers to Plan implementation
- identification of new opportunities to advance Plan Goals

The Annual Report will be developed with input from the CSC or a delegated Standing or Ad Hoc committee and will be presented to the full CSC. Development of the Annual Report will offer an opportunity to identify alignment or misalignment with the annual Implementation Plan and make necessary adjustments. In accordance with CARB, the Annual Report will be made available to the public by October 1st every year and will be presented to the Air District Board of Directors and transmitted to CARB. In addition to the content outlined above, the Annual Report will include an emissions management report (described below).

Emissions Inventory Improvement and Reporting

An Emissions Management Report will accompany the Annual Report and is intended to improve the accuracy and transparency of Plan emissions data so that progress toward emissions reductions can be demonstrated over time. The Emissions Management Report will focus on permitted sources and include emissions data for a minimum of five CAPs and a

minimum of 20 high-priority TACs. It will include analysis and commentary on changes in emissions levels (noting whether changes were due to changes in the way emissions are calculated, or industry operational changes, etc.). The Emissions Management Report and a simplified summary of the report will be made available to the CSC, partner agencies and local government officials along with the Annual Report.

For key implementation milestone years 5 and year 10, an emissions inventory update will be completed including all sources (stationary, mobile, etc.). Additionally, the Air District will prepare a tool for converting emissions changes into cancer risks and use the tool to update exposure and health risk data for the 5- and 10-year milestone reports and make information public (to CSC and other stakeholders). The Air District will continue to explore other options for comparing emissions inventory and exposure data, such as calculating "impact per ton" for sources of concern.

PTCA Plan Glossary

Acronyms

Acronym	Phrase/Term
AB 617	Assembly Bill 617
AIM	Assessment Inventory & Modeling Division of the Air District
Air District	Bay Area Air Quality Management District
BAAQMD	Bay Area Air Quality Management District or Air District
BMP	Best management practices
BRT	Bus rapid transit
BUGs	Backup generators
Cal EPA	California Environmental Protection Agency
C&E	Compliance & Enforcement Division of the Air District
CAMP	Community Air Monitoring Plan
CAP	Criteria air pollutant
CAPP	CARB's Community Air Protection Program
CARB	California Air Resources Board
CBO	Community-based organization
CCCTA	Contra Costa County Transportation Authority
CEQA	California Environmental Quality Act
CHC	Commercial harbor craft
CHE	Cargo handling equipment
DPM	Diesel particulate matter
DTSC	State of California Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EDF	Environmental Defense Fund
FCCU	Fluidized catalytic cracking units
FHWA	Federal Highway Administration
FTG	Freight trip generation
GHG	Greenhouse gases
HDDTs	Heavy Duty Diesel Trucks
HEPA	High efficiency particulate air filter
HRA	Health risk assessment
M&M	Meteorology & Measurements Division of the Air District
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NOV	Notice of violation
OEHHA	California Office of Environmental Health and Hazard Assessment

OGV	Ocean Going Vessel
PTCA	Path to Clean Air
PM	Particulate matter
$PM_{2.5}$	Fine particulate matter
PPB	Parts per billion
PPM	Parts per million
PZEV	Partial zero emission vehicle
RELs	Reference exposure levels, can be acute or chronic
RRP	Risk reduction plan
SCAQMD	South Coast Air Quality Management District
TAC	Toxic air contaminant
TMP	Truck management plan
TWE	Toxicity-weighted emissions, can be acute or chronic
TRU	Transportation refrigeration unit
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
ZEV	Zero emission vehicle

Criteria Air Pollutants and Toxic Air Contaminants

Criteria Air Pollutants

The Clean Air Act requires the U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for six common CAPs. These pollutants are found all over the U.S. They can harm your health and the environment, and cause property damage. Read more about each of these criteria pollutants summarized on the US EPA website.

Carbon Monoxide: CO is a colorless, odorless gas that can be harmful when inhaled in large amounts. CO is released when something is burned.

Ground-level Ozone: Ozone is a gas composed of three atoms of oxygen. Ozone occurs both in the Earth's upper atmosphere and at ground level. Ozone can be good or bad, depending on where it is found. Ozone at ground level is a harmful air pollutant, because of its effects on people and the environment, and it is the main ingredient in "smog."

Lead: Lead is a naturally occurring element found in small amounts in the earth's crust. While it has some beneficial uses, it can be toxic to humans and animals, causing health effects.

Nitrogen Dioxide (NOX): Nitrogen Dioxide (NO_2) is one of a group of highly reactive gases known as oxides of nitrogen or nitrogen oxides (NO_x). Other nitrogen oxides include nitrous acid and nitric acid. NO_2 is used as the indicator for the larger group of nitrogen oxides.

Particulate Matter (PM): A mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye.

Sulfur Dioxide (SO_2): U.S. EPA's national ambient air quality standards for SO_2 are designed to protect against exposure to the entire group of sulfur oxides (SO_x). SO_2 is the component of greatest concern and is used as the indicator for the larger group of gaseous sulfur oxides (SO_x).

Toxic Air Contaminants

According to section 39655 of the California Health and Safety Code, a TAC is "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." Below are the top 20 toxic air contaminants in the PTCA emissions inventory. These compounds were identified by weighting emissions of individual TACs by health values compiled by OEHHA: cancer potency factors and chronic and acute reference exposure levels (RELs). These 20 TACs account for at least 96% of the cancer, chronic, and acute toxicity-weighted emissions (TWE) in the PTCA emissions inventory.

1,3-butadiene: Produced through the processing of petroleum and is mainly used in the production of synthetic rubber but is also found in smaller amounts in plastics and fuel.

Acrolein: Primarily used as an intermediate in the synthesis of acrylic acid and as a biocide. It may be formed from the breakdown of certain pollutants in outdoor air or from the burning of organic matter including tobacco, or fuels such as gasoline or oil. It is toxic to humans following inhalation, oral or dermal exposures.

Acrylonitrile (CH_2=CHCN): A toxic, colorless to pale-yellow liquid, harmful to the eyes, skin, lungs, and nervous system. It may cause cancer. Workers may be harmed from exposure to acrylonitrile. The level of exposure depends upon the dose, duration, and work being done.

Ammonia (NH_3) is a common toxicant derived from wastes, fertilizers and natural processes. Ammonia nitrogen includes both the ionized form (ammonium, NH_4^+) and the unionized form (ammonia, NH_3). Ammonia occurs naturally in air, soil, and water. Ammonia is used as an agricultural fertilizer and in many cleaning products.

Arsenic: A naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Benzene: Also known as benzol, a colorless liquid with a sweet odor. Benzene is used as a constituent in motor fuels; as a solvent for fats, waxes, resins, oils, inks, paints, plastics, and rubber; in the extraction of oils from seeds and nuts; and in photogravure printing. It is also used as a chemical intermediate. Benzene is also used in the manufacturing of detergents, explosives, pharmaceuticals, and dyestuffs.

Chromium (hexavalent): A naturally occurring element in rocks, animals, plants, soil, and volcanic dust and gases. Chromium compounds, in either the chromium (III) or chromium (VI) forms, are used for chrome plating, the manufacture of dyes and pigments, leather and wood preservation, and treatment of cooling tower water.

Cobalt: Cobalt (chemical symbol Co) is a hard, gray-blue metal that is solid under normal conditions. Cobalt is like iron and nickel in its properties and can be magnetized like iron. The most common radioactive isotope of cobalt is cobalt-60 (Co-60). Cobalt-60 is a byproduct of

nuclear reactor operations. It is formed when metal structures, such as steel rods, are exposed to neutron radiation.

Diesel Particulate Matter (DPM): A component of diesel exhaust that includes soot particles made up primarily of carbon, ash, metallic abrasion particles, sulfates, and silicates. Diesel soot particles have a solid core consisting of elemental carbon, with other substances attached to the surface, including organic carbon compounds known as aromatic hydrocarbons.

Ethylene Dichloride: A colorless, toxic, volatile liquid having an odor resembling that of chloroform. It is denser than water, and it is practically insoluble in water.

Formaldehyde: A colorless flammable gas with a pungent odor that is highly reactive with many substances.

Hydrochloric Acid: Used in the production of chlorides, for refining ore in the production of various manufacturing operations.

Hydrogen Cyanide: The primary source of cyanide in the air is from car exhaust. Other airborne sources include emissions from chemical processing, other industries, and municipal waste incinerators.

Hydrogen Sulfide (H2S): A flammable, colorless gas that smells like rotten eggs. People usually can smell hydrogen sulfide at low concentrations in air ranging from 0.0005 to 0.3 parts per million (ppm).

Maleic Anhydride: Lube oil adhesives synthesized from maleic anhydride that are used to prolong oil-change intervals and improve engine efficiency.

Manganese: Metallic manganese is used primarily in steel production to improve hardness, stiffness, and strength. It is also used in carbon steel, stainless steel, and high-temperature steel, along with cast iron and superalloys.

Nickel Carbonyl: Occurs naturally in the environment at low levels. Nickel is an essential element in some animal species, and it has been suggested it may be essential for human nutrition.

Sulfuric Acid: A colorless oily liquid. It is soluble in water with release of heat. It is corrosive to metals and tissue. It will char wood and most other organic matter on contact but is unlikely to cause a fire.

Vinyl Chloride: Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products.

Definition of terms

AB 617 – Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) directs the state, in consultation with local air districts, to select communities in California that are exposed to high levels of air pollution. Selected communities will work with local air districts on action plans to reduce people's exposure to particulate matter and toxic air contaminants, and/or to develop community air monitoring plans.

AB 2449 – AB 2449 allows the legislative body of a local agency to use teleconferencing without complying with the traditional Brown Act teleconferencing rules or the modified AB 361 rules in certain circumstances.

Abatement Device – Devices designed to capture, remove and/or reduce pollutants that would otherwise be emitted into the air. Examples are baghouses, scrubbers, dust collectors, direct flame afterburners, vapor recovery units, and water sprayers.

Air District or BAAQMD – The regional air pollution control agency with jurisdiction over the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, Santa Clara, San Mateo, and the southern portions of Solano and Sonoma counties. The Air District oversees policies and adopts regulations for the control of air pollution from stationary sources, adopts clean air plans, offers incentives for emission reductions from mobile sources, enforces air quality rules, and collects, monitors, and models air quality data.

Best Practices to Reduce Emissions – Measures that reduce emissions, and therefore reduce health risks from air pollution. Examples include retrofitting diesel generators to low or zero emitting technology, electrifying loading docks, limiting truck idling times, requiring low or zero emitting truck engines, and adding abatement devices to stationary sources.

Best Practices to Reduce Exposure – Measures that may not reduce actual emissions but reduce people's exposure to pollutants and reduce health risks. Examples include HVAC (heating ventilation, air conditioning) air filters, planting vegetation between a source of pollution and residential units and prohibiting trucks on residential streets.

Back-up Diesel Generator (BUG) – BUGs include stationary generators and portable generators. Stationary generators are often sources of emergency power for commercial, industrial, and residential buildings. Portable generators are used as temporary power when and where an electrical grid is not available, at construction sites, outdoor gatherings such as concerts and festivals, and disaster recovery sites. See also diesel engine.

Black Carbon – Black carbon is the sooty black material emitted from gasoline and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. It comprises a significant portion of particulate matter. Inhalation of black carbon is associated with health problems including respiratory and cardiovascular disease, cancer, and birth defects.

Bus Rapid Transit (BRT) – Bus rapid transit (Also called a busway or transitway) is a public transport system designed to improve capacity and reliability relative to a conventional bus system, by prioritizing intersection signals for transit, creating bus-only lanes and bus loading platforms, collecting fares on the platform before entering the bus, and serving limited stops.

California Air Resources Board (CARB) – The state agency that oversees policies and adopts regulations for the control of air pollution from mobile sources and some stationary sources. CARB's mission is to promote and protect public health, welfare, and ecological resources through the reduction of air pollutants.

California Environmental Quality Act (CEQA) – State environmental legislation designed to protect the environment and to inform and engage the public about projects considered by California public agencies. Applies to many projects proposed to be conducted or approved by a California public agency, including private projects requiring government approval. The public is engaged through scoping meetings, public notice, public review, hearings, and the

judicial process. Documents to inform the public include an initial study (IS), to determine if a negative declaration or environmental impact report is needed; a negative declaration (ND), if no environmental impacts are identified in the initial study; and an environmental impact report (EIR), if the initial study does identify environmental impacts that need to be mitigated. On whole, CEQA and these documents help prevent or minimize environmental impacts through development of project alternatives, mitigation measures, and mitigation monitoring.

Cargo Handling Equipment (CHE) – Includes a variety of equipment at ports, warehouses, and rail yards including yard tractors, cranes, forklifts, and container handlers such as top picks and side picks, and bulk handling equipment, such as tractors, loaders, dozers, excavators, and backhoes.

Chrome Plating – Often referred to simply as "chrome" a technique of electroplating a thin layer of chromium onto a metal object. The chromed layer can be decorative, provide corrosion resistance, ease cleaning procedures, or increase surface hardness. The process of chrome plating causes hexavalent chromium, a toxic air contaminant, to be emitted as an aerosol that can be inhaled and entrained inside the lungs.

Complete Streets – A transportation policy to design and operate streets to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. A complete street may include sidewalks, bike lanes (or wide paved shoulders), dedicated bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and other features. See also transit-oriented development and mixed-use land use.

Cooling Towers – A cooling tower is a heat rejection device that transfers the waste heat from a water stream to the atmosphere through the cooling of the water stream to a lower temperature. Common applications for cooling towers include cooling the circulating water used in oil refineries, petrochemical and other chemical plants, thermal power stations and HVAC systems for cooling buildings.

Commercial Land Use – Commercial land use is a land use designated by the local governing body for retail, service, or office use, such as shopping malls, restaurants, office buildings, grocery stores, pharmacies, banks, hotels, or movie theatres.

Community-scale Modeling – Community scale modeling is air quality modeling at the local level, to determine air pollution concentrations within a community. See also regional-scale modeling.

Criteria Air Pollutants (CAP) – Criteria air pollutants are defined by the U.S. EPA and include six air pollutants that the Clean Air Act directs the U.S. EPA to set standards for: particulate matter, photochemical oxidants (including ozone), carbon monoxide, sulfur oxides, nitrogen oxides and lead. These pollutants are found all over the U.S. They can harm human health and the environment, and cause property damage. See also National Ambient Air Quality Standards (NAAQS).

Cumulative Air Quality Impact – A cumulative air quality impact is an environmental impact which results from the incremental impacts of an action or project when added to other past, present, and reasonably foreseeable future actions. For example, a manufacturing facility, a high-traffic freeway, and a construction site may each have an air quality impact that is not

substantial when considered by itself but may have a substantial cumulative air quality impact when all three are considered together.

Diesel Engine – A diesel engine is an internal combustion engine powered by diesel fuel that creates incomplete combustion that results in the release of particulate matter emissions. Also called a compression-ignition engine. Diesel engines can power mobile, portable, and stationary equipment.

Diesel particulate matter (DPM) – Diesel particulate matter is the solid material in diesel exhaust. Diesel particulate matter is typically composed of carbon particles ("soot", also called black carbon) and numerous organic compounds, including over 40 known cancer-causing organic substances. DPM is a toxic air contaminant.

Environmental Protection Agency (U.S. EPA) – The environmental protection agency is the federal agency responsible for control of air and water pollution, toxic substances, solid waste, and cleanup of contaminated sites. The U.S. EPA sets national ambient air quality standards for criteria air pollutants, such as ozone, particulate matter, and lead.

Excavators – Excavators are used for digging, material handling, construction, demolition, and other tasks. Excavators consist of a boom, dipper, bucket, and cab on a rotating platform.

Fine Particulate Matter ($PM_{2.5}$) – See particulate matter.

Gasoline Dispensing Facilities (GDF) – Gasoline dispensing facilities are gas stations.

Green Workforce: A broad group of careers that contribute directly to moving society and the built environment towards sustainability.

Greenhouse Gases (GHG) – Greenhouse gases are gases in the atmosphere that have a warming effect on the climate, including but not limited to: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons and hydrofluorocarbons.

Health Risk Assessment (HRA) – A health risk assessment is the calculation of probable health impacts based on exposure to pollution. See also toxic air contaminants.

High Efficiency Particulate Air Filters (HEPA filters) – High efficiency particulate air filters are a type of mechanical air filter that work by forcing air through a fine mesh filter that traps small harmful particles such as pollen, pet dander, dust mites, and tobacco smoke. HEPA filters can also remove between 50% and 98% of particles in air, depending on the particle size and the filter minimum efficiency reporting value (MERV) rating. See also minimum efficiency reporting value.

Hot Spot – A hot spot is an area where air toxic contaminant concentration levels are higher than in the overall region. See also toxic air contaminants.

Indirect Sources – Indirect sources are land uses and facilities that attract or generate motor vehicle trips and thus result in air pollutant emissions, for example, shopping centers, office buildings, warehouses, and airports.

Industrial Land Use – Industrial land use is land designated by the local governing body for manufacturing, assembly, and distribution of goods; may include land uses such as ports, factories, warehouses, and repair and equipment maintenance shops.

Minimum Efficiency Reporting Value (MERV) – Minimum efficiency reporting values are values that rate the effectiveness of air filters on a scale of 1 to 16. Higher MERV ratings correspond to a greater percentage of particles captured. See also high efficiency particulate air filters.

Mixed-use Land Use – Mixed-used land use is land designated by the local governing body for two or more land uses, such as residential, commercial, cultural, institutional, and/or industrial uses. For example, mixing housing with office and retail uses (both considered commercial land use). Often designed to be a pedestrian-friendly development. See also transit-oriented development and complete streets.

Mobile Sources of Air Pollution – Mobile sources of air pollution are sources of air pollution such as automobiles, motorcycles, trucks, off-road vehicles, boats, trains, and airplanes.

National Ambient Air Quality Standards (NAAQS) – National Ambient Air Quality Standards are standards for the allowable ambient air concentrations of harmful pollutants, established by the U.S. EPA under authority of the Clean Air Act. See also criteria air pollutants. See also ppm and ppb.

Off-road Vehicles – Off-road vehicles are vehicles designed for use on steep or uneven ground or roads, for example, in construction, freight, and agricultural uses. Types include scrapers, backhoes, loaders, and forklifts. Quad bikes and ATVs (all-terrain vehicles) are also off-road vehicles.

On-road Vehicles – On-road vehicles are vehicles designed for use on paved roads, for example passenger cars, buses, motor homes, vans, motorcycles, and various sizes of trucks.

Particulate Matter (PM) – Particulate matter includes a wide range of disparate particles that vary greatly in terms of their size and mass, physical state (solid or liquid), chemical composition, toxicity, and how they behave and transform in the atmosphere. PM is commonly characterized based on particle size. Ultrafine PM includes the very smallest particles less than 0.1 micron in diameter (one micron equals one-millionth of a meter). Fine PM or $PM_{2.5}$ consists of particles 2.5 microns or less in diameter (includes ultrafine PM). Coarse PM refers to particles between 2.5 microns and 10 microns in diameter. The term "coarse" particles may be misleading; it should be emphasized that even "coarse" particles are still very tiny, many times smaller than the diameter of a human hair. PM10 consists of particles 10 microns or less in diameter (includes ultrafine, fine and coarse PM).

Parts Per Billion (ppb) – Parts per billion is a unit of measurement used to specify the concentration of a pollutant, such as in ambient air quality standards. For reference, ppb is the equivalent of one drop in one billion drops of water or about one drop of water in a swimming pool. The NAAQS standard for sulfur dioxide (SO_2) is measured in ppb. See also ppm and NAAQS.

Parts Per Million (ppm) – Parts per million is a unit of measurement used to specify the concentration of a pollutant, such as in ambient air quality standards. For reference, one ppm is the equivalent of about one cup of water in a swimming pool, and one ppm is equivalent to 1,000 ppb. The NAAQS standards for carbon monoxide (CO), nitrogen dioxide (NO2) and Ozone (O3) are measured in ppm. See also ppb and NAAQS.

Partial Zero Emission Vehicle (PZEV) – A partial zero emission vehicle is an automobile that has zero evaporative emissions from its fuel system and meets Super Ultra Low Emissions Vehicle

(SULEV) tailpipe-emission standards. Evaporative emissions are the gasoline fumes that escape during refueling or from the fuel tank and supply lines. See also ZEV.

Regional-scale Modeling – Regional-scale modeling is air quality modeling at a regional level, to determine air pollution concentrations within the region. See also community-scale modeling.

Residential Land Use – Residential land use is land designated by the local governing body for dwelling units. Can include single-family and/or multi-family housing, often specifies the number of dwelling units allowed per lot or acre; for example, R-1 means the parcel is zoned for a single-family residence.

Rule Development - Rule Development is the process the Air District uses to write regulations that govern stationary sources of air pollution in the Bay Area, including technical research, engagement with affected stakeholders, public meetings to allow input by affected parties such as industries and communities, and the preparation of CEQA and socio economic analyses (for a list of current rules and regulations see: https://www.baaqmd.gov/rules-and-compliance/current-rules.

Safe Routes to School (SRTS) – Safe Routes to School is an international movement and a federal program to make it safe, convenient, and fun for children, including those with disabilities, to bicycle and walk to school.

Sensitive Land Uses – Sensitive land uses are places where sensitive populations are most likely to spend their time, such as schools, playgrounds, daycare centers, nursing homes, medical facilities, and residential communities. See also sensitive populations or sensitive receptors.

Sensitive Populations or Sensitive Receptors – Sensitive populations or sensitive receptors are people, including infants, children, the elderly, those with pre-existing conditions (such as asthma), pregnant women, and athletes (due to higher breathing rates) that are at greater risk than the general population to the adverse health effects of air pollutants. See also sensitive land uses.

Stationary Sources of Air Pollution – Stationary sources of air pollution are non-mobile sources of air pollution such as boilers, gas turbines, petroleum refining and processing units, and manufacturing equipment that emit air pollutants. A facility, such as a power plant or refinery, houses multiple sources within its property.

Solvent Cleaning Operations A process using solvents or solvent vapor to remove water insoluble contaminants such as grease, oils, waxes, carbon deposits, fluxes, and tars from metal, plastic, glass, and other surfaces.

Transloading – The operation of transferring cargo from one transportation mode to another. May also refer to the operation of transferring cargo from one container to another for any of several reasons, such as for consolidation, weight restrictions, palletizing, leasing contract requirements, or supply chain management (e.g., to synchronize delivery of goods to meet real time demands).

Transit-oriented Development (TOD) – A type of land use that includes a mixture of housing, office, retail and/or other amenities integrated into a walkable neighborhood and located within a half-mile of quality public transportation. See also mixed-use land use and complete streets.

Toxic Air Contaminants (TACs) – Toxic air contaminants (also toxic air pollutants or air toxics) are those pollutants that cause, or may cause, cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. Includes formaldehyde, methanol, ammonia, diesel particulate matter, and many others. See also diesel particulate matter.

Transportation Refrigeration Unit (TRU) – Transportation refrigeration units are refrigeration systems commonly powered by diesel internal combustion engines designed to refrigerate or heat perishable products that are transported in various containers, including semi-trailers, truck vans, shipping containers, and rail cars.

Vehicle Miles Traveled (VMT) – Vehicle miles traveled is the number of miles a vehicle is driven and can be used to measure the number of miles traveled for all vehicles in a geographic region over a given time period. Annual VMT denotes the miles driven over a one-year period.

Zero-emission Vehicle (ZEV) – A zero-emission vehicle is a battery electric, hydrogen fuel cell electric, or other alternatively fueled vehicle that has no direct emissions (evaporative or tailpipe) of pollution. See also PZEV.