apcd air pollution control district
SANTA BARBARA COUNTY

MEMORANDUM

DATE: September 29, 2022

TO: Community Advisory Council (CAC) Members

FROM: Alex Economou, (805) 979-8333, AJE@sbcapcd.org

SUBJECT: October 13 CAC Meeting to Discuss the 2022 Ozone Plan

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Every three years, the District is required to update our plan to attain and maintain the state 1-hour and 8-hour ozone standards. The 2022 Ozone Plan (2022 Plan) will be the tenth triennial update to the initial state Air Quality Attainment Plan adopted by the Santa Barbara County Air Pollution Control District (District) Board of Directors in 1991. The draft 2022 Plan is composed of seven chapters that address air quality trends, the emission inventory, stationary source control measures, transportation control measures, voluntary incentive programs, and the attainment strategy.

At the previous June 22, 2022 CAC meeting, the District discussed the first three chapters of the 2022 Plan. The meeting was informational only (i.e., no formal CAC recommendation sought), as we provided background on the history of our planning efforts, the air quality exceedances and trends, and the emission inventory. To review the presentation that was shown at the June meeting, please visit www.ourair.org/community-advisory-council-agenda-june-22-2022/.

At the upcoming October 13, 2022 CAC meeting, the District will present Chapters 4 - 7, which discuss stationary source and transportation control measures as well as voluntary incentive programs, and the attainment strategy. At this meeting, we solicit input from the CAC and ultimately seek out recommendations to forward the 2022 Plan to the District Board for proposed adoption.

To review the contents of the previously adopted Ozone Plans, please visit www.ourair.org/planning-clean-air. If there are questions or concerns that you would like to discuss beforehand, please contact me at (805) 979-8333 / e-mail: AJE@sbcapcd.org

ATTACHMENT:

A. Draft of the 2022 Ozone Plan

ATTACHMENT A

Draft of the 2022 Ozone Plan

Santa Barbara County Air Pollution Control District
Community Advisory Council

260 San Antonio Road, Suite A
Santa Barbara, California 93110

2022 Ozone Plan

October 2022 – Draft

Aeron Arlin Genet, Air Pollution Control Officer

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CHAPTER 1 – INTRODUCTION

Background

Ozone is a gaseous pollutant consisting of three oxygen atoms (O_3). Ozone is not directly emitted into the atmosphere, but instead, it is produced by photochemical reactions between oxides of nitrogen (NOx) and reactive organic compounds (ROCs) in the presence of heat and sunlight. Breathing ground-level ozone can cause a number of health effects in broad segments of the population, and it is especially harmful for children, the elderly, and people with asthma or other respiratory problems. Both the California Air Resources Board (CARB) and U.S. Environmental Protection Agency (EPA) have set ambient air quality standards to protect public health. The Santa Barbara County Air Pollution Control District (District) creates planning documents to help attain these health-based standards as it is critical to our mission to protect the people and the environment of Santa Barbara County from the effects of air pollution.

Updating our Plan for Clean Air in Santa Barbara County

The 2022 Ozone Plan (2022 Plan) is the tenth triennial update to the initial state Air Quality Attainment Plan adopted by the District Board of Directors in 1991. Prior ozone plan updates were completed for 1994, 1998, 2001, 2004, 2007, 2010, 2013, 2016, and 2019. In the past, the District has prepared air quality attainment plans that have addressed both the state and federal ozone standards. This 2022 Plan addresses the state ozone standards only because the District is designated "attainment" for the federal 8-hour ozone standards, including the most recent standard of 0.070 parts per million (ppm) promulgated by the EPA in 2015. Table 1-1 provides a summary of the state and federal ambient air quality standards for ozone.

TABLE 1-1: STATE AND FEDERAL OZONE STANDARDS

Ambient Air Quality Standard	Year Adopted	Statutory Standard	Attainment Status
State 1-Hour	1988	0.09 ppm	Nonattainment
State 8-Hour	2005	0.070 ppm	
Federal 1-Hour	1979	0.12 ppm	Attainment [1]
Federal 8-Hour	1997	0.08 ppm	Attainment [2]
	2008	0.075 ppm	Attainment
	2015	0.070 ppm	Attainment

[1] Designated as attainment in 2002. Standard revoked in 2005.
[2] Standard revoked in 2015.

Each of the ozone plan updates have implemented an "every feasible measure" strategy to ensure continued progress toward attainment of the state ozone standards.[3] Since 1991, the District has adopted or amended more than 30 control measures aimed at reducing emissions from stationary sources of air pollution and to help Santa Barbara County reach attainment of the state ozone standards. These measures have substantially reduced NOx and ROC emissions, which are the precursor pollutants to ozone.

Along with the implementation of statewide measures, the District's control measure strategy has successfully improved Santa Barbara County's air quality as we've witnessed a downward trend in ozone exceedances. In 2016, the County was designated as nonattainment-transitional because less than three ozone exceedances occurred in a single calendar year. The nonattainment-transitional designation meant that the County was close to attaining the state standard, but in order to be designated as attainment, air quality measurements from the most recent 3-year period must show that both the 1-hour and the 8-hour standards are not violated. After decades of hard work and improved air quality conditions, Santa Barbara County was designated as attainment for the state ozone standards in 2019. However, unpredictable weather patterns and air pollutant emission dispersion can lead to different pollutant concentration outcomes from one year to the next. The 2019 attainment designation was applicable for only a single year, and due to the recent exceedances, the County is currently designated as nonattainment. A summary of the changes in attainment status is shown below in Table 1-2.

TABLE 1-2: CHANGES IN ATTAINMENT STATUS FOR THE STATE OZONE STANDARDS

Designation Years	Attainment Status
1989 - 2015	Nonattainment
2016 - 2018	Nonattainment - Transitional
2019	Attainment
2020 - 2021	Nonattainment

In September 2022, CARB notified the District that Santa Barbara County will be redesignated as nonattainment-transitional. This change is anticipated to be approved by the CARB Board of Directors in January 2023 and finalized by the California Office of Administrative Law (OAL) later that year. When Santa Barbara County's designation changes to nonattainment-transitional, the main requirements of the 2022 Plan are not changed. However, prior to implementing new control measures, the District must review the plan and determine whether the stationary source control measures scheduled for adoption are needed to accomplish expeditious attainment of the state ozone standards. The District may delay a control measure if it determines that delaying the measure will not slow progress toward achieving or maintaining the state ozone standards. This

[3] Pursuant to California Health and Safety Code, Section 40914(b), the District employs an alternative emission reduction strategy that incorporates *every feasible measure* on an *expeditious adoption schedule.*

change in designation does not affect the control measures that are already in place and being implemented.

When a region is designated nonattainment or nonattainment-transitional, the California Clean Air Act requires the region to report their progress in meeting the state mandates and revise the Air Quality Attainment Plan to reflect changing conditions on a triennial basis. The triennial plan progress report and revision requirements (as codified in California Health and Safety Code, Section 40910 et seq.) must assess the overall effectiveness of the air quality program and the extent of air quality improvement in the last 3 years. The revision must also incorporate new data and emission inventory projections. Table 1-3 provides a more complete list of the triennial plan report and revision requirements and where they are addressed in the 2022 Plan.

TABLE 1-3: TRIENNIAL PLAN REPORT AND REVISION REQUIREMENTS

Requirement	CH&SC Section	Ozone Plan Section
Air Quality Trends and Population Exposure	§40913(a), §40924(b)(1)	Chapter 2, Appendix A
Population, Vehicular Activity, and Emission Trends	§40913(a)(4), §40925(a)	Chapters 2, 3, and 5
Emission Inventory	§40913(a)(5), §40918(a)(5)	Chapter 3, Appendix B
Stationary Source Control Measures	§40913(a)(6), §40918(a)(2), §40924(b)(2)	Chapter 4
Control Strategy Cost-Effectiveness	§40913(b), §40922	Chapter 4
Every Feasible Measure and Expeditious Adoption	§40914(b), §40925.5(b)	Chapter 4
Contingency Measures	§40915, §40925.5(c)	Chapter 4
Transportation Control Measures	§40913(a)(6), §40918(a)(3)	Chapter 5
Voluntary Incentive Strategies	§40913(a)(7)	Chapter 6
Attainment and Maintenance Strategy	§40913(a)	Chapter 7

Plan Highlights

The tenth triennial update to the Ozone Plan includes a few significant changes from prior plans. These include:

- Ocean-Going Vessel (OGV) Emission Inventory: In March 2022, CARB finalized a significant update to the OGV emission inventory and related methodology. The updated inventory provides a more accurate estimate of the vessel operating conditions (ship speeds and engine loads). Changes to vessel operating conditions have occurred at least in part due to the District's successful Vessel Speed Reduction (VSR) program. Overall, the newer data set results in a significant decrease in current and future marine shipping nitrogen oxides (NOx) emission estimates within Santa Barbara County waters. Although NOx emissions from marine shipping still account for a large percentage of our emission inventory, we continue to focus our efforts on achieving near-term reductions in this sector.

- Control Measures in the Plan: The California Health and Safety Code requires that the 2022 Plan include cost-effective strategies to both attain and maintain the ozone standards. Each ozone plan update includes an evaluation of feasible reduction measures for stationary sources and considers numerous factors such as technology advancements, efficiency measures, cost-effectiveness, and the successful implementation of measures at other California air districts. As discussed in Chapter 4, all of the control measures that were found to be feasible in prior ozone plan updates have been implemented, and any additional measures that could be proposed yield relatively smaller emission reductions with higher associated costs. The 2022 Plan still carries forward some of the contingency measures and "further study" measures from the 2019 Plan. We also discuss how the Assembly Bill 617 Rule Development Schedule interacts with the 2022 Plan.

- Statewide Regulations and Incentive Funds: CARB continues to pursue substantial reductions of ozone precursors in the mobile source sector. CARB's comprehensive mobile source strategy implements and expands research and pilot projects, incentive programs, and regulations related to on-road and off-road vehicles. Two of the new regulations that are described in this 2022 Plan surround the recent amendments at the statewide level to the Commercial Harbor Craft Regulation and the Small Off-Road Equipment (SORE) Regulation. Furthermore, recent legislation allocates a significant amount of state funding to local districts, allowing the districts to achieve reductions from mobile sources through incentive programs.

CHAPTER 2 – LOCAL AIR QUALITY

Breathing ground-level ozone can cause a number of health effects that are observed in broad segments of the population. Ozone can damage the respiratory system, cause inflammation, irritation, and symptoms such as coughs and wheezing. High levels of ozone are especially harmful for children, the elderly, and people with asthma or other respiratory problems. Ground-level ozone also impacts the economy by increasing hospital visits and medical expenses, loss of work time due to illness, and damage to agricultural crops.

Ozone is not emitted directly into the atmosphere. It is formed through a series of complex chemical reactions involving the precursor pollutants nitrogen oxides (NOx) and reactive organic compounds (ROC), heat, and sunlight. Ozone typically follows a diurnal cycle, where the levels tend to increase throughout the day and decrease during the nighttime hours. However, there are additional factors that influence ozone levels. For example, meteorological conditions, such as temperature, inversions, and stagnant air can lead to a buildup of pollutants, and topography can prevent the dispersion of the pollutants and trap air masses close to the ground. Due to these factors as well as the potential for transport winds to move the polluted air masses, ozone is considered a "regional" pollutant. This means that the locations where ozone levels are highest are not necessarily the locations where the precursor pollutants are emitted.

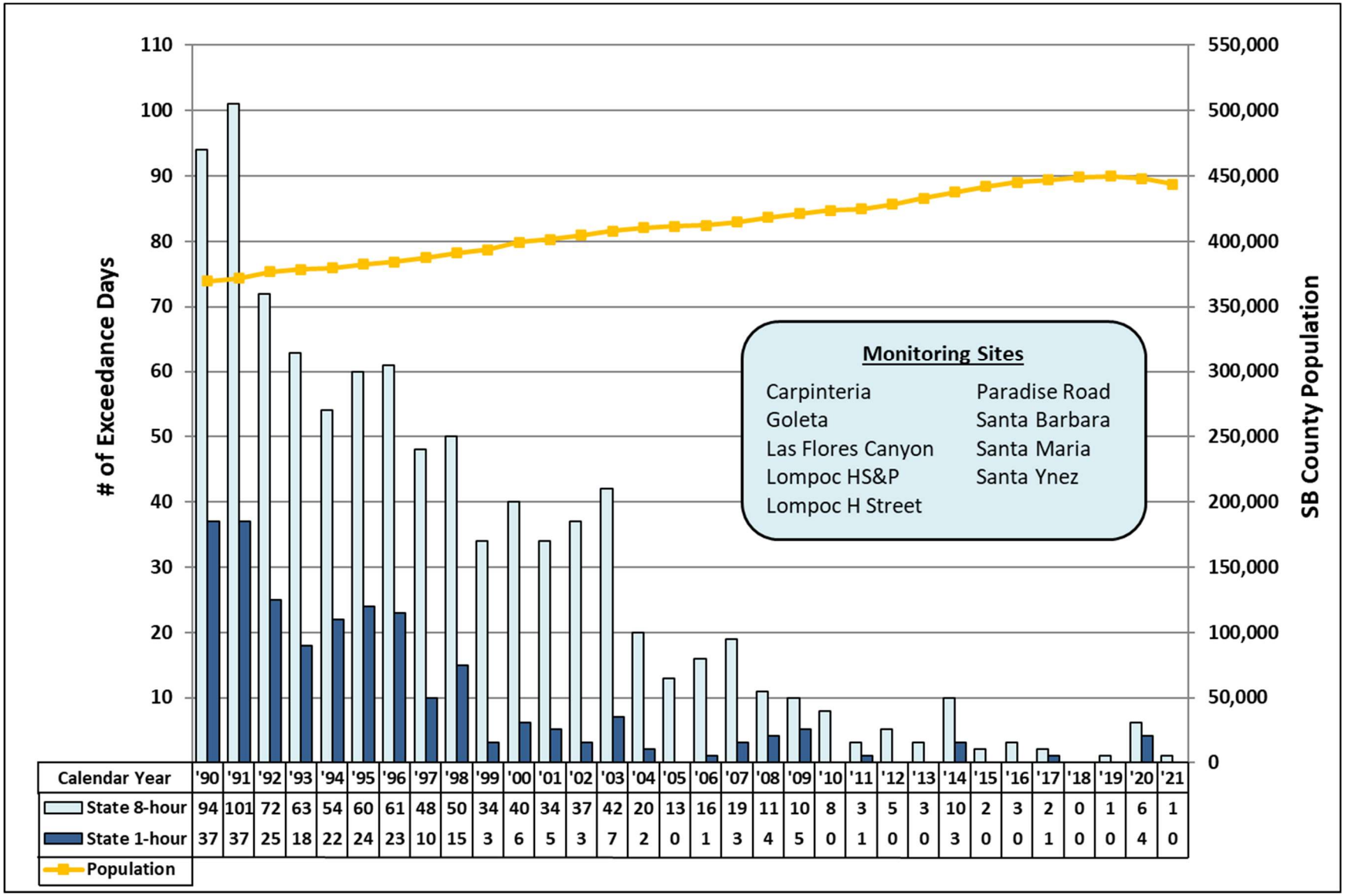
The California Clean Air Act requires the California Air Resources Board (CARB) to evaluate and identify air quality-related indicators for the District to use in assessing its progress toward attainment of the state ozone standard.[4] This chapter highlights those indicators and demonstrates the progress the District has made over the last few decades in improving the air quality throughout Santa Barbara County. Over time, both voluntary and regulatory measures, as well as technology improvements and better community planning, have led to tremendous improvements in Santa Barbara County's air quality. As a result of these efforts, people's overall exposure to ozone continues to decrease.

Exceedance Trends

Santa Barbara County's air quality has improved dramatically over the years as evidenced by the declining number of state 1-hour and 8-hour ozone exceedances. An *exceedance* is a measured concentration at a monitoring station that surpasses the ozone standard. As displayed in Figure 2-1, 1-hour ozone exceedances have decreased from a high of 37 days in 1990 to a low of zero days in five out of the last seven years. Since 1990, the number of 8-hour ozone exceedance days range from a high of 101 days in 1991 to a low of zero days in 2018. These improvements in air quality have occurred despite a 20 percent increase in countywide population growth. Although much progress has been made, Santa Barbara County experienced a handful of exceedances for the most recent 3-year period. A brief analysis of the most recent exceedances of the 8-hour ozone standard (i.e., 70 ppb) and factors that contributed to each exceedance are described below in Tables 2-1 and 2-2.

[4] California Health and Safety Code, Sections 39607(f) and (g).

FIGURE 2-1: 8-HOUR AND 1-HOUR OZONE EXCEEDANCE TRENDS VS POPULATION SANTA BARBARA COUNTY, 1990-2021 [5]



Calendar Year	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21
State 8-hour	94	101	72	63	54	60	61	48	50	34	40	34	37	42	20	13	16	19	11	10	8	3	5	3	10	2	3	2	0	1	6	1
State 1-hour	37	37	25	18	22	24	23	10	15	3	6	5	3	7	2	0	1	3	4	5	0	1	0	0	3	0	0	1	0	0	4	0
Population																																

[5] Population data from the State of California, Department of Finance, E-4 Population Estimates for 2021-2022, with 2020 Census Benchmark [May 2022].

TABLE 2-1: SANTA BARBARA COUNTY EXCEEDANCE DAYS, 2019-2021

Year	Exceedance Day	8-hour Ozone Concentrations (ppb)								
		Paradise Road	Las Flores Canyon	Carpinteria	Santa Barbara	Goleta	Santa Ynez	Lompoc HS&P	Lompoc H St.	Santa Maria
2019	10/6/2019	71	72	72	66	62	69	64	28	45
2020	8/18/2020	72	45	51	35	38	60	44	17	32
	8/19/2020	86	50	56	45	43	67	40	17	21
	8/20/2020	76	59	43	38	37	41	30	16	20
	8/21/2020	86	46	43	35	34	66	50	14	27
	10/2/2020	62	74	86	72	66	63	64	30	48
	10/3/2020	69	74	83	81	67	62	62	20	35
2021	6/17/2021	72	41	31	40	38	61	40	18	NA

Values greater than the state 8-hour ozone standard of 70 ppb are highlighted in yellow.

TABLE 2-2: CONTRIBUTING FACTORS TO THE EXCEEDANCE DAYS, 2019-2021

Exceedance Days	Contributing Factors
10/6/2019	Strong south-eastern transport winds with hot weather
8/18/2020 - 8/21/2020	Northern California Wildfires with strong northern transport winds: LNU (Sonoma–Lake–Napa Unit) Lightning Complex SCU (Santa Clara Unit) Lightning Complex CZU (San Mateo–Santa Cruz Unit) Lightning Complex
10/2/2020 - 10/3/2020	Creek Fire in Fresno County
6/17/2021	Heat wave with stagnant conditions

Air Quality Indicators – Peak Concentrations

One of the indicators that is used to assess air quality trends is the Expected Peak Day Concentration (EPDC). The EPDC is calculated by CARB for each monitoring site and it represents the maximum ozone concentration expected to occur at the site. The EPDC is based on a statistical calculation using the daily maximum 1-hour and 8-hour ozone concentrations for a rolling period of three calendar years. For example, the 2020 EPDC for a monitoring site uses data from 2018, 2019, and 2020. The EPDC is useful for tracking air quality progress at individual monitoring stations since it is relatively stable, thereby providing a trend indicator that is not heavily influenced by year-to-year changes in meteorological conditions.

Figures 2-2 and 2-3 show the 1-hour and 8-hour EPDC trends for the years 1990 through 2020 for the six selected monitoring sites in Santa Barbara County that typically record the highest ozone concentrations. These figures show that both the 1-hour and 8-hour expected peak day concentrations have significantly decreased over time. For the 1-hour EPDCs, all monitoring stations are below the 1-hour ozone standard. For the 8-hour EPDCs, three monitoring stations remain above the 8-hour ozone standard. A listing of the EPDC values for these six monitoring sites can be found in Appendix A.

The EPDC is an indicator representing the maximum ozone concentration expected to occur at a monitoring station.

Violations and Designation Values

For Santa Barbara County to attain the state ozone standard, air quality measurements must show that both the 1-hour and the 8-hour standards were not violated during the previous three calendar years. To evaluate whether an ozone *violation* occurred, the first step is to identify all ozone *exceedances* within the last three-year period. According to the CARB designation process, an exceedance that is higher than the site's EPDC is identified as being affected by an *extreme concentration event* (e.g., weather conditions conducive to high concentrations of ozone). Extreme concentration events are not violations of the state ozone standard and are excluded from the designation value process.

The *designation value* for a monitoring site is the highest representative reading at that monitoring site over the last three years. Since extreme events are not considered representative, the designation value for each site is the highest concentration observed that is less than or equal to the EPDC at that site. If the designation value is higher than a state standard, then it indicates that a violation has occurred within the last three years at that monitoring site. Table 2-3 presents the EPDCs and 8-hour ozone designation values for all Santa Barbara County monitoring stations for the last three years.

Figure 2-2: State 1-Hour Ozone Expected Peak Day Concentration
Top 6 Santa Barbara County Monitoring Sites, 1990-2020

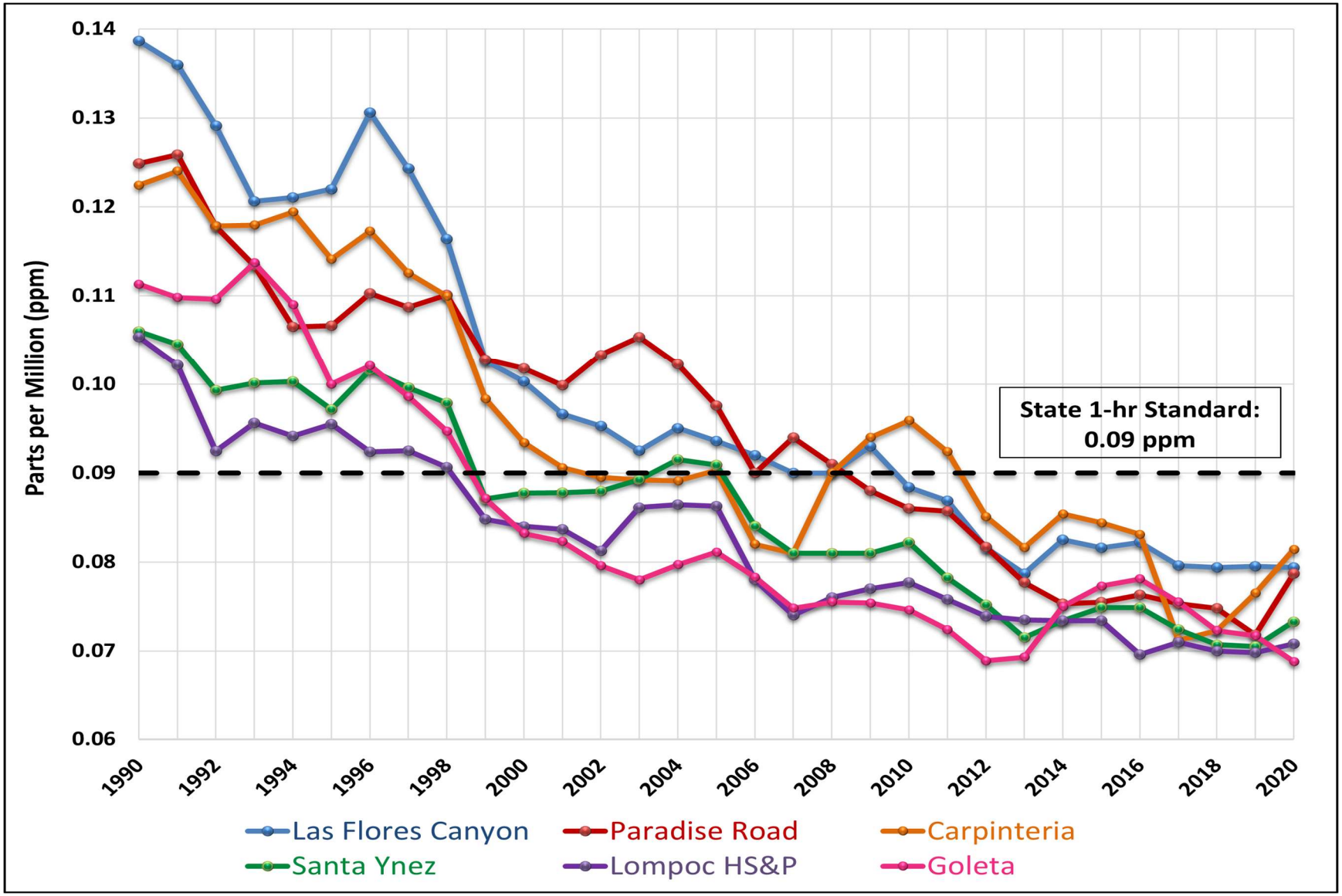


FIGURE 2-3: STATE 8-HOUR OZONE EXPECTED PEAK DAY CONCENTRATIONS
TOP 6 SANTA BARBARA COUNTY MONITORING SITES, 1990-2020

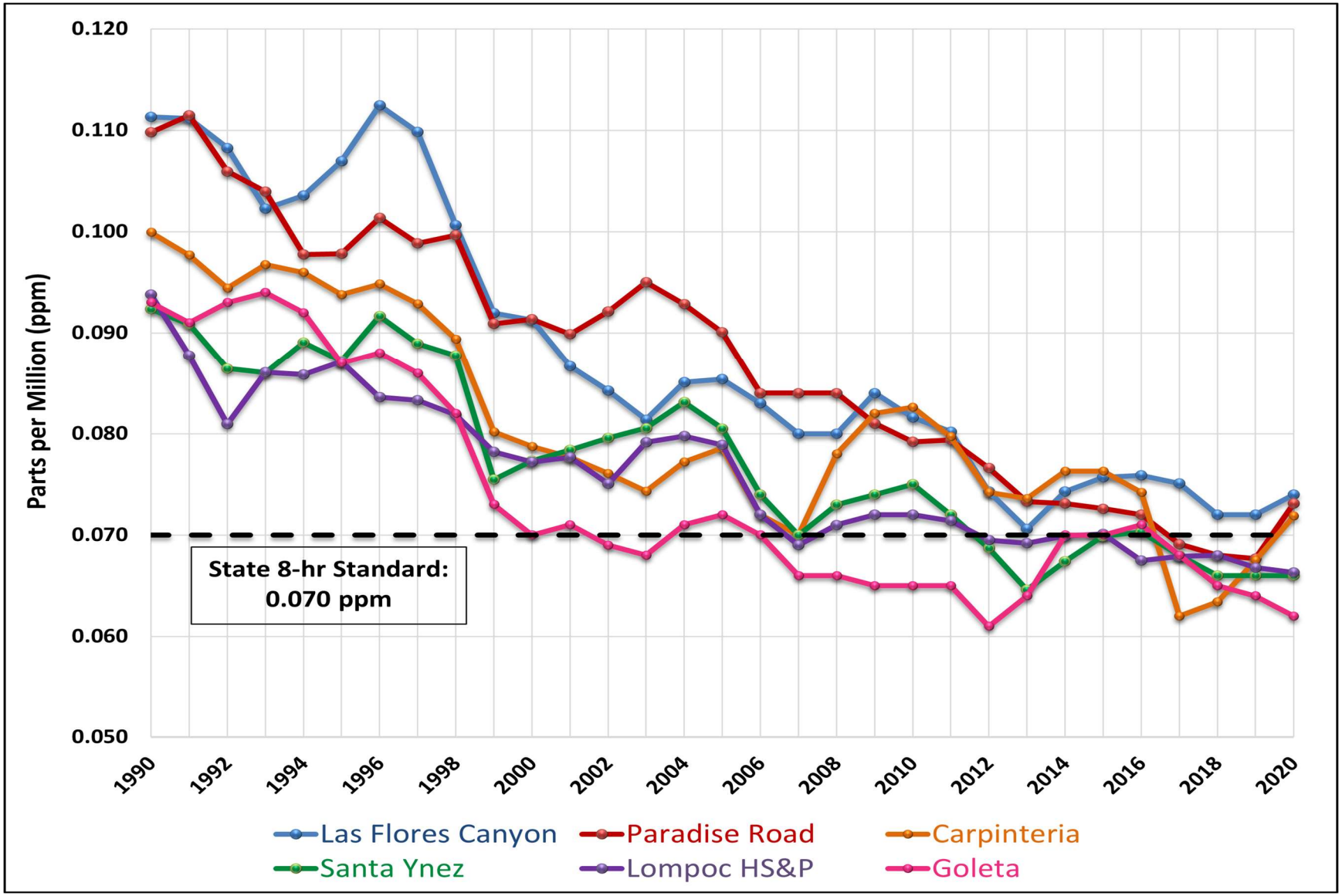


TABLE 2-3: SANTA BARBARA COUNTY 8-HOUR EPDCS AND DESIGNATION VALUES, 2018-2020

Monitor Location	State Criteria for 8-hour Ozone	Annual Values (ppm)		
		2018	2019	2020
Paradise Road	EPDC	0.068	0.068	0.073
	Designation Value	0.067	0.071	0.086
Las Flores Canyon	EPDC	0.072	0.072	0.074
	Designation Value	0.069	0.072	0.074
Carpinteria	EPDC	0.063	0.068	0.072
	Designation Value	0.063	0.067	0.086
Santa Barbara	EPDC	0.067	0.066	0.064
	Designation Value	0.067	0.066	0.062
Goleta	EPDC	0.065	0.064	0.062
	Designation Value	0.065	0.062	0.062
Santa Ynez	EPDC	0.066	0.066	0.066
	Designation Value	0.065	0.061	0.066
Lompoc HS&P	EPDC	0.068	0.067	0.066
	Designation Value	0.067	0.067	0.067
Lompoc H St.	EPDC	0.056	0.054	0.038
	Designation Value	0.056	0.053	0.038
Santa Maria	EPDC	0.054	0.049	0.051
	Designation Value	0.063	0.049	0.050

Invalid EPDC due to insufficient data are highlighted in gray.
Designation values greater than the state ozone standard are highlighted in yellow.

As indicated in the table above, the monitoring sites at Paradise Road, Carpinteria, and Lompoc HS&P currently have invalid EPDCs. These three sites, all of which were operated by a third-party consultant, experienced issues where some of the monitoring data did not meet the necessary quality assurance criteria. After removing the affected data, the sites no longer met the minimum requirement to have a valid EPDC. These quality assurance data issues have since been resolved by installing new equipment or adjusting the operating protocols to meet new EPA requirements. However, for the 2020 monitoring year, the invalid EPDCs cannot be used to exclude the extreme concentration events at these sites, and so the designation value exceeds the invalid EPDC. Even if the EPDCs were valid, the Paradise Road and Carpinteria monitoring stations still recorded exceedances that would be considered violations of the state 8-hour ozone standard and would result in a non-attainment status for the entire County.

The designation values show that three monitoring stations (Paradise Road, Las Flores Canyon, and Carpinteria) currently have designation values over the state 8-hour standard. As for the state 1-hour standard, Figure 2-2 shows that it has not been violated for the last decade since all monitoring sites have valid 1-hour EPDCs below the standard. However, to be considered

attainment for ozone, Santa Barbara County needs to meet both the 1-hour and 8-hour standard. This means that Santa Barbara County cannot record an ozone value that is above the standard but below the EPDC value during the last three-year period.

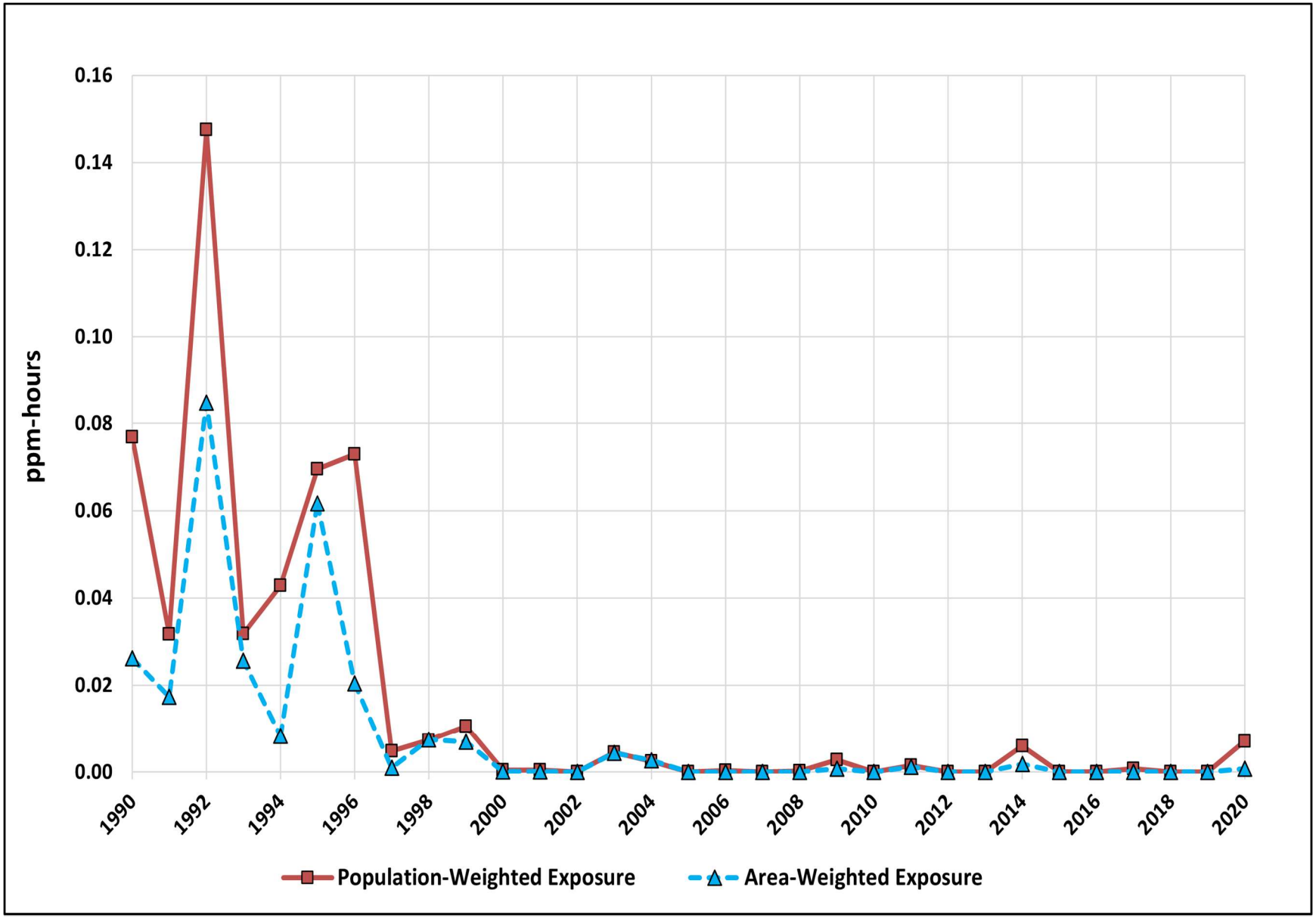
Air Quality Indicators – Population and Area Exposure

CARB has developed a methodology to assess exposure to air pollutants within Santa Barbara County. The "exposure indicators" are the population-weighted exposure (PWE) indicator and the area-weighted exposure (AWE) indicator. These metrics provide an indication of the potential for chronic adverse health impacts. Unlike the EPDC, which tracks progress at individual locations, the population-weighted and area-weighted exposure indicators consolidate hourly ozone measurements from all sites within the District into a single average exposure value.

The calculation methodology assumes that an "exposure" occurs when a 1-hour ozone measurement is higher than 0.09 ppm (the level of the state 1-hour ozone standard). The PWE and AWE consider both the magnitude and the duration of hourly ozone concentrations above the state standard. However, the PWE is higher if the exposure is recorded near population centers, while the AWE is higher if the exposure covers more land area, based on the monitoring station network. The resulting annual exposure indicator is the sum of all the hourly exposures during the year and presents the results as an average per exposed person (PWE indicator) or average per exposed unit of land area (AWE indicator).

The population- and area-weighted exposure data obtained from CARB is presented in Figure 2-4. This figure shows that both exposure indicators have decreased over time and that these air quality indicators have been very low during the last 20 years due to dramatic improvements in local air quality. The values are near zero since ozone levels in the County rarely exceed 0.09 ppm for a 1-hour period.

FIGURE 2-4: POPULATION- AND AREA-WEIGHTED EXPOSURE
SANTA BARBARA COUNTY, 1-HOUR OZONE, 1990-2020



CHAPTER 3 – EMISSION INVENTORY

This chapter presents the reactive organic compound (ROC) and nitrogen oxide (NOx) emission inventory used in the development of this 2022 Plan. The District's emission inventory accounts for pollutants emitted from all emission sources, including fuel combustion at industrial facilities, consumer product usage, and motor vehicles. The emission inventory is compiled through a collaborative effort by the District and CARB, and the emissions are classified under one of the following source categories:

- **Stationary Sources** – Larger facilities and processes that are typically subject to District permitting requirements.
- **Area-Wide Sources** – Small, geographically dispersed processes that are typically not subject to District permitting requirements.
- **Mobile Sources** – This source type is subdivided into two categories:
  - **On-Road Motor Vehicles** – Passenger cars, motorcycles, trucks, and buses.
  - **Other Mobile Sources** – Ships, planes, trains, and off-road equipment.

The inventory includes emissions from two geographical regions: Santa Barbara County and the Outer Continental Shelf (OCS). The Santa Barbara County region encompasses all onshore sources of air pollution within Santa Barbara County and the State Tidelands (all waters within three nautical miles of the shoreline). The OCS extends from the State Tideland boundary out to 100 nautical miles from the shoreline.

The inventories presented in this chapter are "planning emissions inventories," commonly referred to as "summer seasonal" inventories. A planning inventory accounts for seasonal variation because most ozone standard exceedances occur during the April to October "ozone season." A planning inventory does not include the emissions from natural sources such as biogenics, oil and gas seeps, and wildfires since they are not regulated nor controlled through the implementation of emission control measures. Additional information on natural sources can be found in Appendix B.

Baseline Inventory

For every inventory, a baseline year must be chosen. Since the purpose of the base year inventory is to represent relatively current emissions, there is a general preference to use as recent a year as practical. However, some years may not be representative of normal operations. For example, the 2020 inventory is expected to be atypical in many ways due to the effects of the COVID-19 pandemic. Activity levels for all source categories will be altered as a result of the reduced economic conditions and changes in behavior from widespread state and local "stay at home" orders. This 2022 Plan uses 2018 as the base year because the 2018 inventory is the most recent and complete inventory available for all of the source categories. Furthermore, CARB is using a 2018 base year for inclusion in their 2022 State Implementation

Plan (SIP) submittal to the EPA, so the 2018 inventory data has been thoroughly reviewed and refined for accuracy.

This Plan uses a 2018 Base Year since it is the most recent and complete inventory year for all of the source categories.

The emission inventory is divided into four major categories: stationary, area, on-road motor vehicle, and other mobile sources. Emissions from each category are calculated with approved methodologies that use the most current data available for the category. For example, the 2018 base year stationary source emissions are calculated with annual data that facilities reported to the District. The area source emissions are estimated jointly by CARB and the District. On-road motor vehicle emissions are calculated by applying CARB's EMission FACtor (EMFAC) model output to the transportation activity data provided by the Santa Barbara County Association of Governments (SBCAG).[6] Finally, CARB provides emission estimates for other mobile sources such as ocean-going vessels, locomotives, aircraft, and agricultural equipment.

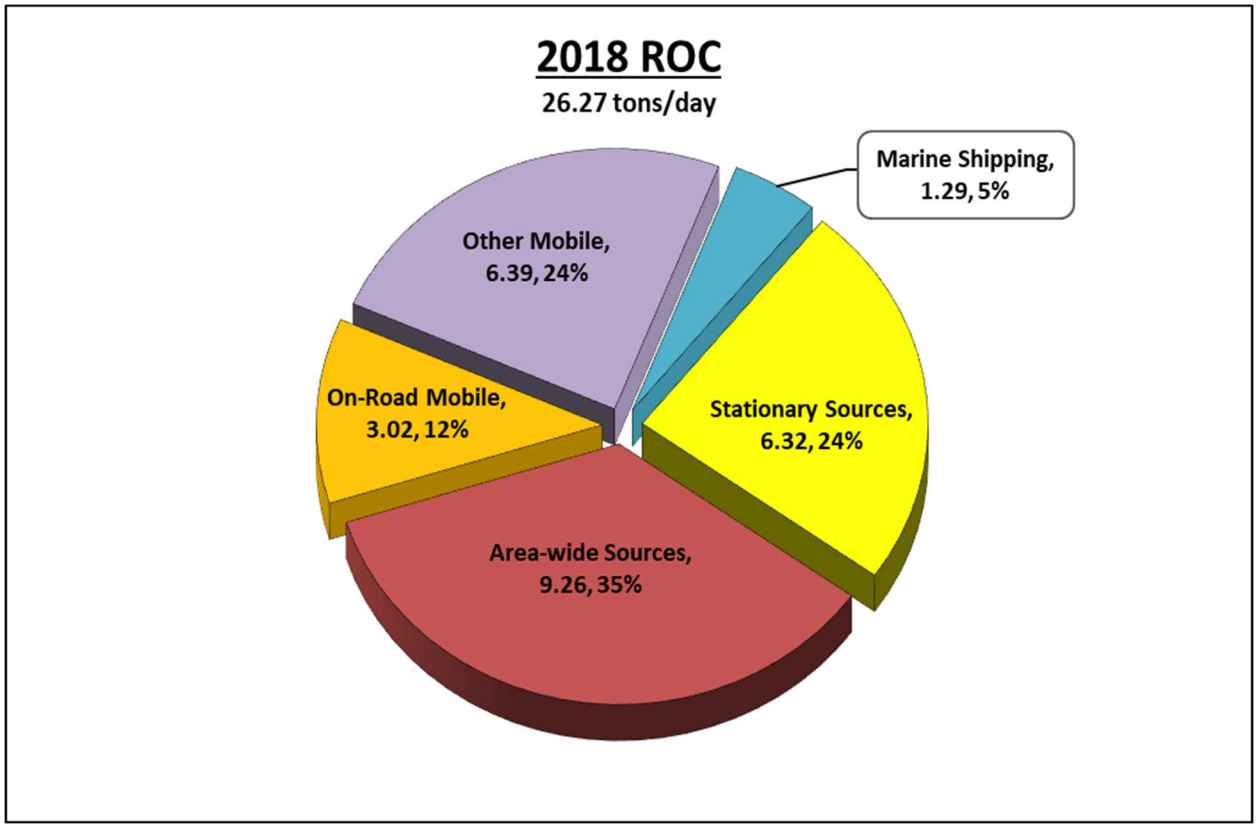
Figure 3-1 shows the emissions and relative contribution of ROC and NOx during 2018 for each source category. Due to the large amount of marine shipping emissions in the District's emission inventory, the District separated ocean-going vessels from the other mobile source categories so that the relative impact can be more easily identified. Some of the highlights of Figure 3-1 include the following:

- Stationary and area-wide sources account for about 59 percent of the baseline ROC inventory. The majority of these emissions are from coating and solvent operations, oil & gas operations, and pesticide usage.
- Other mobile sources account for 24 percent of the ROC emissions, with the remaining 19 percent coming from on-road vehicles and ocean-going vessels category.
- 66 percent of the NOx inventory is attributed to ocean-going vessels in the OCS (see "Impacts from Marine Shipping" at the end of this chapter for further discussion).
- An estimated 14 percent of the NOx emissions in the baseline inventory are from on-road motor vehicles, while area-wide sources, stationary sources, and the remaining other mobile sources contribute the remaining 20 percent to the baseline NOx emissions.

The combined amount of ozone precursors (ROC + NOx) is shown in Figure 3-2. The stationary source emissions are approximately 14 percent of the total inventory, which is a positive reflection of the District's stationary source control program. Based on staff estimates, the stationary source emission inventory would be four times greater if no emission control rules had been adopted and implemented by the District.

[6] More information regarding the on-road mobile source trends and measures can be found in Chapter 5.

FIGURE 3-1: BASELINE ROC AND NOX EMISSIONS (TONS PER DAY) AND DISTRIBUTION (%)



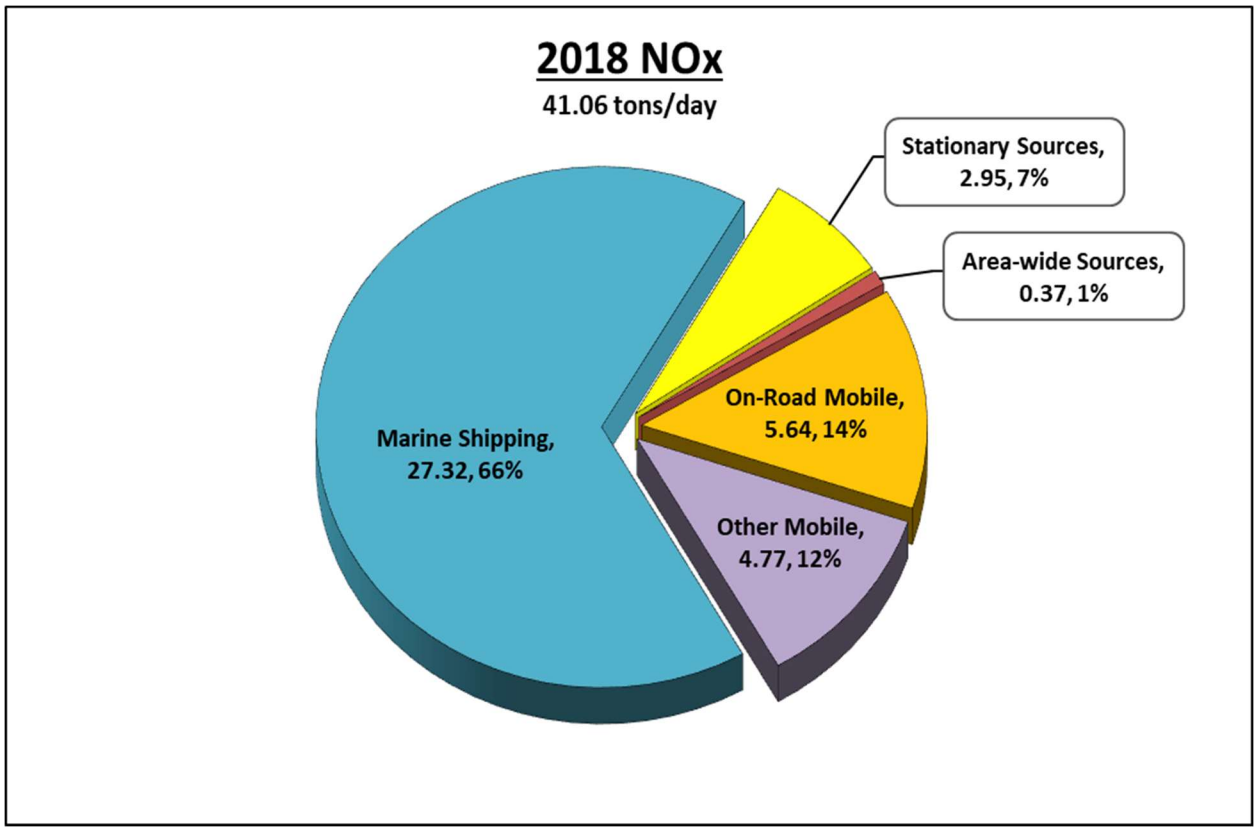
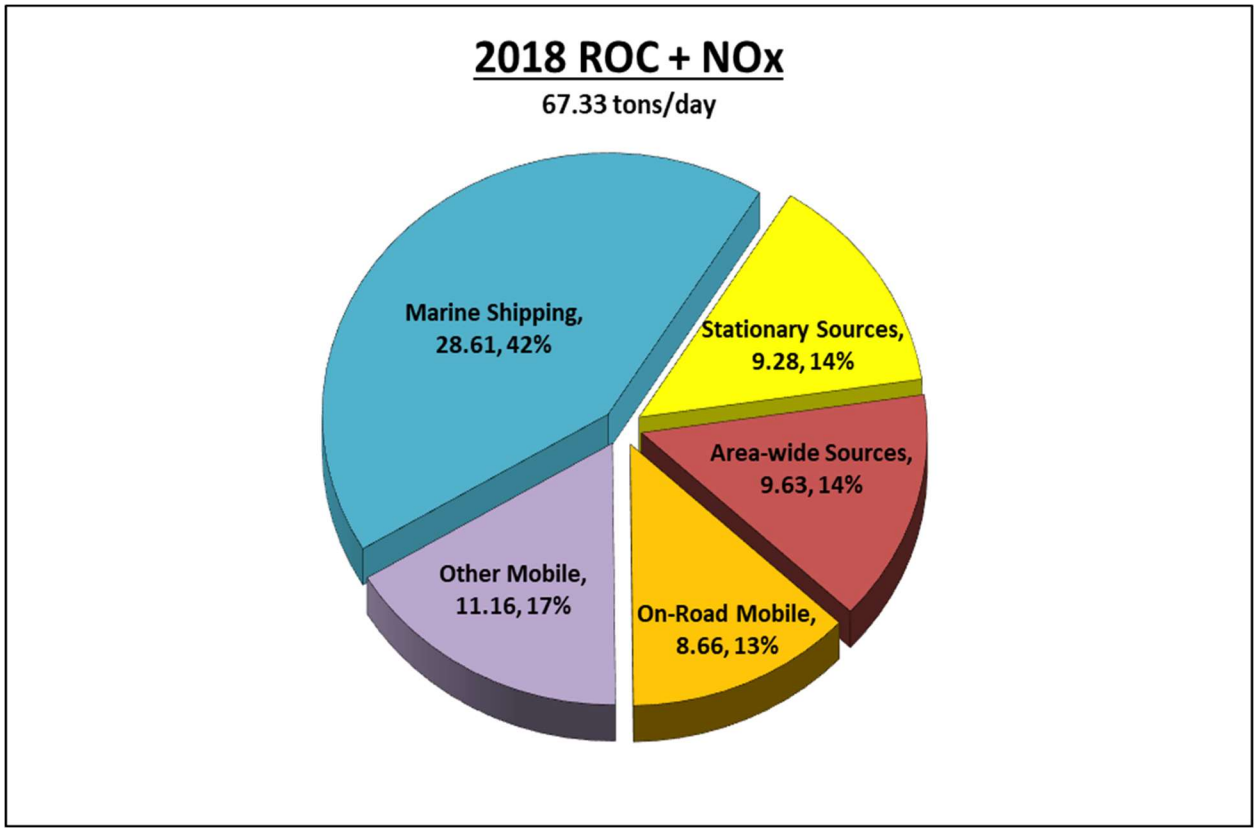


FIGURE 3-2: COMBINED BASELINE ROC AND NOX EMISSIONS (TONS PER DAY) AND DISTRIBUTION (%)



Growth Profiles

To understand how the emission inventory may change over time, the 2018 inventory is projected into the future using activity-specific growth profiles. Growth profiles contain the estimated changes in the values of pollution-producing activities, known as "activity indicators." Examples of activity indicators include population, housing, and economic output, and the ratio of these activity indicators creates the growth rate (relative to the base year). CARB has developed dozens of growth profiles by collecting information from reputable sources such as the California Energy Commission and the Department of Finance. These growth profiles are then applied to the affected source categories to build the forecasted inventory. If the District has more accurate information or estimates based on local data, the District can work with CARB to refine the growth profiles.

In this plan, the growth profiles are established to demonstrate what the projected emission inventory could look like in the years 2025, 2035, and 2045. Growth profile data is shown in Table 3-1.

TABLE 3-1: SANTA BARBARA COUNTY GROWTH PROFILES

Activity Indicator	Units	Value				Growth Rate from 2018			Data Source
		2018	2025	2035	2045	2025	2035	2045	
Population	Residents	452,953	470,188	501,060	524,389	4%	11%	16%	1
Housing	Households	148,071	154,657	164,811	172,485	4%	11%	16%	1
Vehicle Miles Travelled	Million Daily Miles	9.91	10.19	10.33	10.52	3%	4%	6%	2
Natural Gas Combustion: *Residential*	Million Therms	54.18	55.07	53.43	48.77	2%	-1%	-10%	3
Natural Gas Combustion: *Commercial*	Million Therms	22.66	24.74	26.66	29.40	9%	18%	30%	3
Natural Gas Combustion: *Industrial*	Million Therms	9.85	10.39	11.02	11.56	5%	12%	18%	3
Petroleum Production: *Onshore*	MMbbl Oil	3.31	3.31	3.31	3.31	0%	0%	0%	4
Petroleum Wells: *Onshore*	Active + Idle Wells	2,186	2,037	1,843	1,666	-7%	-16%	-24%	4
Petroleum Wells: *Offshore*	Active + Idle Wells	396	324	352	318	-18%	-11%	-20%	4
Ocean Going Vessels: *Auto Carriers*	Growth Rate	--	--	--	--	6%	17%	14%	5
Ocean Going Vessels: *Containerships*	Growth Rate	--	--	--	--	22%	74%	136%	5
Ocean Going Vessels: *Tankers*	Growth Rate	--	--	--	--	-2%	2%	2%	5

Data Source References:

1) Department of Finance, which is similar to the SBCAG Regional Growth Forecast 2050 [January 2019]
2) SBCAG Regional Travel Demand Model and Connected 2050 Regional Transportation Plan and Sustainable Communities Strategy
3) REMI (Regional Economic Models, Inc.) output using California Energy Commission data
4) Staff estimate based on data from the California Geologic Energy Management Division (CalGEM) and Bureau of Ocean Energy Management (BOEM)
5) Freight Analysis Framework model, compiled by the Bureau of Transportation Statistics and the Federal Highway Administration

Discussion on Oil & Gas Growth Profiles

Over the last few decades, oil & gas operations have gone through multiple cycles of growth and contraction based on market demands, product transportation methods, and technological innovations. On a statewide level, the California Air Resources Board estimates that oil production in California will decrease by approximately 2.9% each year.[7] However since the 2013 Plan, the District has used a zero percent growth rate for oil & gas-related activities due to uncertainty in the sector for Santa Barbara County over the long term. For this 2022 Plan, staff reviewed the historical records from both the California Geologic Energy Management Division (CalGEM) and Bureau of Ocean Energy Management (BOEM) to establish new growth factors based on local data.

For onshore oil & gas activity, staff recommends using the countywide onshore oil production, as measured in million barrels of oil, as the activity factor that correlates best with the actual NOx emissions from the oil & gas sector. NOx emissions are created by combustion equipment, such as steam generators in cyclic steaming operations and internal combustion engines being used to drive the oil pumps. Although there may be a statewide decline in oil production, staff recommends maintaining a neutral, local growth rate in onshore oil production as there may be new combustion-related projects to enhance or maintain the output of existing, active wells. Best Available Control Technology (BACT) is typically required for any new major oil & gas projects, driving down the project emissions.

Onshore NOx tracks with onshore Oil Production.

Onshore ROC tracks with onshore Well Count.

For ROC emissions related to onshore oil & gas activity, staff recommends using the total active and idle oil & gas wells as the activity factor that correlates best with the actual ROC emissions from the oil & gas sector. Although there are generally more emissions from active wells than idle wells, idle wells are still a concern due to fugitive emissions from leaking components. Once a well is fully plugged and abandoned, the associated emissions can be removed from the District's emission inventory. Staff estimates that approximately 1% of idle wells will be removed from service each year. This trend is supported by the typical declining production capabilities of older oil wells and the recent idle well regulation changes adopted by CalGEM in 2019.[8] The idle well regulation changes discourage operators from leaving their wells in an idle state and creates incentives for operators to manage and eliminate their idle wells by entering into Idle Well Management Plans.

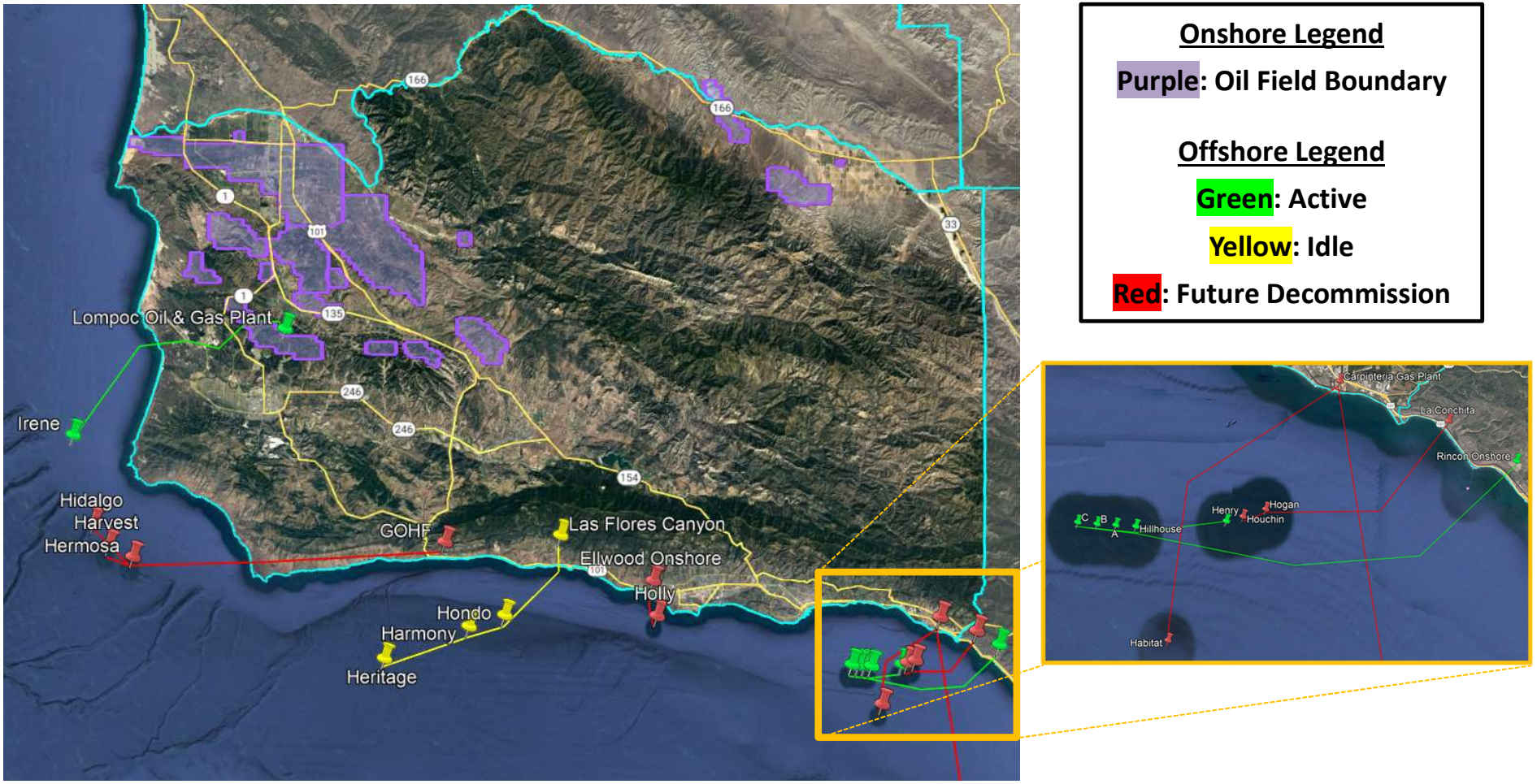
[7] Based on statewide annual production reports from 2000 – 2016 from CalGEM, previously known as the CA Department of Conservation, Division of Oil Gas, and Geothermal Resources (DOGGR).
[8] www.conservation.ca.gov/calgem/idle_well

Offshore NOx and ROC tracks with offshore Well Count.

For offshore oil & gas activity, staff recommends using the total active and idle oil & gas wells as the activity factor that correlates best with both the actual NOx and ROC emissions. Offshore emissions in the oil & gas sector have been greatly affected by the rupture of the Plains All American Pipeline, which occurred in May 2015. The shutdown of the pipeline has prevented multiple offshore facilities from producing oil, reducing their economic viability and forcing two operators to begin the decommissioning of their offshore platforms. Once the platforms are fully decommissioned, the stationary source emissions will be reduced even further. However, the Plains All American Pipeline may be rebuilt or replaced, which would allow some of the offshore platforms to resume operations. The County of Santa Barbara has discretionary authority over onshore oil & gas projects in unincorporated areas and is therefore the lead agency under the California Environmental Quality Act (CEQA) for most oil & gas projects. If a new pipeline project or alternative product transportation method is approved, there may be an increase in offshore emissions from the Exxon Mobil Santa Ynez Unit compared to the Base Year of 2018, and the growth rate used in this Plan accounts for this change to occur sometime between 2025 and 2035.

To help visualize the various onshore and offshore oil and gas operations, as well as the current operating status and future decommissioning efforts for the offshore platforms, please see Figure 3-3 below.

FIGURE 3-3: ONSHORE OIL FIELDS AND OFFSHORE FACILITIES IN SANTA BARBARA COUNTY



Inventory Forecast

Inventory forecasts are created through CARB's California Emission Projection Analysis Model (CEPAM). CEPAM applies the county-specific growth profiles, along with emission control profiles derived from existing local, statewide, and federal rules, to forecast the emission inventory for future years. For this 2022 Plan, the growth and control profiles are applied to the 2018 Base Year Inventory to forecast District-wide ozone precursor emissions for 2025, 2035, and 2045. Table 3-2 displays a summary of the results grouped by source category. At the end of this chapter, Table 3-3 provides a detailed summary of emissions grouped by source sub-category, and Figures 3-4 and 3-5 provide graphical displays of the historical and projected emissions.

TABLE 3-2: ROC AND NOX EMISSION FORECAST SUMMARY (TONS PER DAY)

Source Category	ROC				% Change (2018 – 2045)
	2018	2025	2035	2045	
Stationary Sources	6.32	6.09	6.10	6.32	**0%**
Area-wide Sources	9.26	10.41	10.75	11.06	**20%**
On-Road Vehicles	3.02	1.99	1.24	0.92	**-70%**
Other Mobile [9]	6.39	4.97	3.22	2.64	**-59%**
Marine Shipping	1.29	1.51	2.02	2.80	**117%**
ERCs	-	0.40	0.40	0.40	**-**
Total	**26.27**	**25.37**	**23.72**	**24.14**	**-8%**

Source Category	NOx				% Change (2018 – 2045)
	2018	2025	2035	2045	
Stationary Sources	2.95	2.85	2.83	2.92	**-1%**
Area-wide Sources	0.37	0.35	0.32	0.31	**-17%**
On-Road Vehicles	5.64	2.82	1.69	1.36	**-76%**
Other Mobile [9]	4.77	3.47	2.68	2.33	**-51%**
Marine Shipping	27.32	30.09	39.53	21.80	**-20%**
ERCs	-	0.81	0.81	0.81	**--**
Total	**41.71**	**40.39**	**47.87**	**29.52**	**-28%**

The emission inventory forecasts have been adjusted upward based on the ERCs that were in the District Source Register as of October 2021. These ERCs represent previous voluntary emission reductions that can be purchased and/or used by a project applicant to compensate for emission increases from a new or modified stationary source. If the ERCs are used for future projects, offset trading ratios may also be applied, further reducing the amount of potential emission increases related to the use of ERCs.

[9] Marine Shipping emissions have been broken-out of the "Other Mobile" category in this table.

In reviewing the summary tables by source category and source sub-category, some of the overall inventory trends from the growth and control profiles can be identified. For example:

- There are expected increases in ROC emissions from stationary and area sources of pollution due to increases in population, which will increase consumer product and solvent usage.
- There are expected increases in ROC emissions due to pesticides compared to the base year of 2018. The reason for the projected pesticide increase is that the CARB methodology forecasts Agricultural Pesticides on a 5-year average, and 2018 was a low pesticide usage year based on the data reported by the California Department of Pesticide Regulations (DPR).
- The impact of existing regulations for both on-road vehicles and other offroad mobile equipment will substantially reduce the ROC and NOx emissions from these categories over time. Even though the total population of these units is anticipated to increase, the transition to more zero-emission equipment and vehicles will dramatically reduce the emission contributions from these sectors.
- There are large emission fluctuations over the next 20 years due to the future growth and controls on the marine shipping sector, which are discussed in more detail in the next section, *Impacts from Marine Shipping*.

Impacts from Marine Shipping

Large ships traveling along the coast of Santa Barbara County produce significant air emissions. Every year, approximately 1,400 different ocean-going vessels (OGVs) make around 6,500 total transits through the Santa Barbara Channel Region. Due to the massive engines on these ships, these transits are responsible for more than 65 percent of the NOx inventory, making marine shipping the single largest source of NOx emissions in the County.

The District has studied the local meteorological conditions that have led to high ozone readings and exceedances of the state and federal ozone standards. Exceedances typically occur between April and October ("ozone season"), and the conditions that are most conducive to exceedances include stagnant air, temperature inversions, and the presence of ozone precursor pollutants. The Santa Barbara area frequently experiences a pressure gradient that moves air from offshore to onshore. This means that air pollution produced by ships transiting off the coast can contribute to the ozone levels that are measured onshore.

Marine Shipping Emission Methodology

Marine shipping emissions are estimated by CARB using its OGV methodology. This methodology was recently revised in March 2022, and it has been updated to include recent Automated Information System (AIS) speed data from the vessels.[10] Speed data is critical to documenting the emission impacts of these ships since it helps quantify the amount of fuel

[10] AIS is a tracking system where the location, speed, and directional data of each ocean-going vessel is transmitted to help avoid collisions.

burned and pollutants emitted from the various vessel types.

Historically, many ships were travelling through the Santa Barbara Channel at a speed of 16 to 18 knots, but the new methodology with the recent AIS data now accounts for the ships that participate in the Protecting Blue Whales and Blue Skies Vessel Speed Reduction (VSR) program.[11] For this voluntary VSR program, the District and its partners incentivize companies to slow down to 10 knots or less off the California coast. By slowing down, the vessels reduce fuel use and help protect endangered whales. Shipping companies receive recognition and financial awards based on their cooperation with program parameters. This program, as well as other factors that promote slow-steaming operations, have significantly reduced the local NOx emissions from the marine shipping sector.

CARB's updated OGV methodology also incorporates estimates of future growth in marine shipping activities and the associated control profiles. NOx emissions from this sector are forecasted to increase by approximately 45 percent, peaking in the year 2035. This projected growth is primarily due to anticipated increases in container ship traffic to transport commodities, such as furniture, electronics, and other manufactured goods, to the Ports of Los Angeles and Long Beach.

OGVs are one of the few source categories that are expected to increase in emissions due to the anticipated growth in the container ship industry.

As for the control profiles, there are existing regulations under the International Maritime Organization (IMO) and United States Environmental Protection Agency (EPA) that require lower NOx standards for newly built vessel engines. New engines have to meet the Tier 3 standard, which emit approximately 80% less NOx as compared to the Tier 1 and Tier 2 engines that are being used on most ships today. However, OGVs are designed to remain in service for 25 years or more, and so it can take many years to realize the benefits of new technologies incorporated into new vessel designs. Tier 3 engines aren't anticipated to see widespread use until 2035, and in the meantime, the marine shipping sector continues to be the largest source of NOx within the County.

[11] www.bluewhalesblueskies.org

TABLE 3-3: EMISSIONS BY SOURCE SUB-CATEGORY (TONS PER DAY)

	ROC				NOx			
STATIONARY SOURCES	**2018**	**2025**	**2035**	**2045**	**2018**	**2025**	**2035**	**2045**
ELECTRIC UTILITIES	0.01	0.03	0.02	0.02	0.03	0.07	0.05	0.05
COGENERATION	-	-	-	-	-	-	-	-
OIL AND GAS PRODUCTION (COMBUSTION)	0.06	0.06	0.05	0.05	1.03	0.99	1.00	0.98
PETROLEUM REFINING (COMBUSTION)	-	-	-	-	0.01	0.01	0.01	0.01
MANUFACTURING AND INDUSTRIAL	0.02	0.02	0.02	0.02	0.54	0.53	0.54	0.62
FOOD AND AGRICULTURAL PROCESSING	0.02	0.02	0.01	0.01	0.34	0.28	0.25	0.26
SERVICE AND COMMERCIAL	0.06	0.07	0.07	0.07	0.77	0.77	0.77	0.78
OTHER (FUEL COMBUSTION)	-	-	-	-	0.10	0.09	0.09	0.09
SEWAGE TREATMENT	-	-	-	-	-	-	-	-
LANDFILLS	0.05	0.05	0.05	0.05	0.01	0.01	0.01	0.01
INCINERATORS	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SOIL REMEDIATION	-	-	-	-	-	-	-	-
OTHER (WASTE DISPOSAL)	0.50	0.51	0.52	0.53	-	-	-	-
LAUNDERING	0.01	0.01	0.01	0.01	-	-	-	-
DEGREASING	0.53	0.58	0.63	0.79	-	-	-	-
COATINGS AND RELATED PROCESS SOLVENTS	0.37	0.42	0.45	0.55	-	-	-	-
PRINTING	0.49	0.46	0.47	0.52	-	-	-	-
ADHESIVES AND SEALANTS	0.40	0.45	0.48	0.52	-	-	-	-
OTHER (CLEANING AND SURFACE COATINGS)	0.09	0.10	0.11	0.14	-	-	-	-
OIL AND GAS PRODUCTION	2.85	2.55	2.44	2.20	0.06	0.06	0.06	0.06
PETROLEUM REFINING	0.05	0.05	0.05	0.05	-	-	-	-
PETROLEUM MARKETING	0.53	0.44	0.39	0.38	-	-	-	-
OTHER (PETROLEUM PRODUCTION)	-	-	-	-	-	-	-	-
CHEMICAL	0.01	0.01	0.01	0.01	-	-	-	-
FOOD AND AGRICULTURE	0.26	0.27	0.32	0.39	-	-	-	-
MINERAL PROCESSES	-	-	-	-	0.05	0.05	0.05	0.06
ELECTRONICS	-	-	-	-	-	-	-	-
OTHER (INDUSTRIAL PROCESSES)	-	-	-	-	-	-	-	-
STATIONARY SOURCE TOTAL	**6.32**	**6.09**	**6.10**	**6.32**	**2.95**	**2.85**	**2.83**	**2.92**

TABLE 3-3: EMISSIONS BY SOURCE SUB-CATEGORY (TONS PER DAY)

	ROC				NOx			
AREA SOURCES	**2018**	**2025**	**2035**	**2045**	**2018**	**2025**	**2035**	**2045**
CONSUMER PRODUCTS	2.88	3.03	3.37	3.70	-	-	-	-
ARCHITECTURAL COATINGS AND SOLVENTS	0.65	0.69	0.72	0.73	-	-	-	-
PESTICIDES/FERTILIZERS	4.74	5.55	5.61	5.63	-	-	-	-
ASPHALT PAVING / ROOFING	0.15	0.17	0.19	0.21	-	-	-	-
RESIDENTIAL FUEL COMBUSTION	0.20	0.20	0.20	0.20	0.37	0.29	0.26	0.25
FARMING OPERATIONS	0.59	0.45	0.34	0.28	-	-	-	-
CONSTRUCTION AND DEMOLITION	-	-	-	-	-	-	-	-
PAVED ROAD DUST	-	-	-	-	-	-	-	-
UNPAVED ROAD DUST	-	-	-	-	-	-	-	-
FUGITIVE WINDBLOWN DUST	-	-	-	-	-	-	-	-
FIRES	-	-	0.01	0.01	-	-	-	-
MANAGED BURNING AND DISPOSAL	-	0.28	0.28	0.28	-	0.06	0.06	0.06
COOKING	0.03	0.03	0.03	0.03	-	-	-	-
OTHER (MISCELLANEOUS PROCESSES)	-	-	-	-	-	-	-	-
AREA SOURCE TOTAL	**9.26**	**10.41**	**10.75**	**11.06**	**0.37**	**0.35**	**0.32**	**0.31**

ON-ROAD MOTOR VEHICLES	**2018**	**2025**	**2035**	**2045**	**2018**	**2025**	**2035**	**2045**
LIGHT-DUTY PASSENGER (LDA)	0.88	0.52	0.39	0.26	0.67	0.33	0.23	0.13
LIGHT-DUTY TRUCKS - 1 (LDT1)	0.13	0.06	0.04	0.01	0.08	0.03	0.02	0.01
LIGHT-DUTY TRUCKS - 2 (LDT2)	0.70	0.52	0.35	0.18	0.64	0.35	0.22	0.08
MEDIUM-DUTY TRUCKS (MDV)	0.53	0.36	0.26	0.15	0.60	0.27	0.16	0.06
LIGHT HEAVY-DUTY GAS TRUCKS - 1 (LHDV1)	0.22	0.13	0.08	0.02	0.24	0.13	0.08	0.02
LIGHT HEAVY-DUTY GAS TRUCKS - 2 (LHDV2)	0.02	0.01	0.01	-	0.03	0.01	0.01	-
MEDIUM HEAVY-DUTY GAS TRUCKS (MHDV)	0.03	0.01	0.01	0.01	0.06	0.02	0.02	0.01
HEAVY HEAVY-DUTY GAS TRUCKS (HHDV)	-	-	-	-	0.02	0.01	0.01	0.01
LIGHT HEAVY-DUTY DIESEL TRUCKS - 1 (LHDV1)	0.03	0.02	0.01	-	0.56	0.25	0.14	0.02
LIGHT HEAVY-DUTY DIESEL TRUCKS - 2 (LHDV2)	0.01	0.01	-	-	0.14	0.05	0.03	-
MEDIUM HEAVY-DUTY DIESEL TRUCKS (MHDV)	0.04	0.01	0.01	0.01	0.70	0.35	0.34	0.33
HEAVY HEAVY-DUTY DIESEL TRUCKS (HHDV)	0.04	0.02	0.02	0.02	1.23	0.65	0.58	0.51

TABLE 3-3: EMISSIONS BY SOURCE SUB-CATEGORY (TONS PER DAY)

	ROC				NOx			
ON-ROAD MOTOR VEHICLES (Continued)	**2018**	**2025**	**2035**	**2045**	**2018**	**2025**	**2035**	**2045**
MOTORCYCLES (MCY)	0.34	0.29	0.26	0.24	0.10	0.08	0.08	0.07
HEAVY-DUTY DIESEL URBAN BUSES (UB)	0.01	0.01	-	-	0.29	0.13	0.07	0.01
HEAVY-DUTY GAS URBAN BUSES (UB)	0.01	-	-	-	0.02	0.01	0.01	-
SCHOOL BUSES - GAS (SBG)	-	-	-	-	0.01	-	-	-
SCHOOL BUSES - DIESEL (SBD)	-	-	-	-	0.13	0.09	0.06	0.03
OTHER BUSES - GAS (OBG)	0.01	-	-	-	0.01	0.01	0.01	-
OTHER BUSES - MOTOR COACH - DIESEL (OBC)	-	-	-	-	0.03	0.01	0.01	0.01
ALL OTHER BUSES - DIESEL (OBD)	-	-	-	-	0.05	0.01	0.02	0.03
MOTOR HOMES (MH)	0.01	-	-	-	0.03	0.01	0.01	-
ON-ROAD MOTOR VEHICLE TOTAL	**3.02**	**1.99**	**1.45**	**0.92**	**5.64**	**2.82**	**2.09**	**1.36**

OTHER MOBILE SOURCES	**2018**	**2025**	**2035**	**2045**	**2018**	**2025**	**2035**	**2045**
AIRCRAFT	0.23	0.24	0.26	0.28	0.12	0.13	0.15	0.16
TRAINS	0.02	0.01	0.01	0.01	0.46	0.30	0.30	0.27
OCEAN GOING VESSELS	1.29	1.51	2.02	2.80	27.32	30.09	39.53	21.80
COMMERCIAL HARBOR CRAFT	0.03	0.03	0.03	0.02	0.43	0.44	0.43	0.37
RECREATIONAL BOATS	3.81	2.80	1.92	1.59	0.77	0.71	0.67	0.67
OFF-ROAD RECREATIONAL VEHICLES	0.25	0.20	0.12	0.07	0.01	0.01	0.01	0.01
OFF-ROAD EQUIPMENT	1.44	1.25	0.56	0.39	1.07	0.69	0.44	0.39
OFF-ROAD EQUIPMENT (PERP)	0.02	0.01	0.01	0.02	0.26	0.12	0.10	0.11
FARM EQUIPMENT	0.36	0.25	0.15	0.10	1.65	1.05	0.58	0.35
FUEL STORAGE AND HANDLING	0.22	0.17	0.15	0.16	-	-	-	-
OTHER MOBILE SOURCE TOTAL	**7.67**	**6.48**	**5.23**	**5.44**	**32.09**	**33.55**	**42.21**	**24.12**

TOTAL – ALL SOURCE CATEGORIES	**26.27**	**24.96**	**23.32**	**23.74**	**41.06**	**39.58**	**47.06**	**28.72**
EMISSION REDUCTION CREDITS	-	0.40	0.40	0.40	-	0.81	0.81	0.81
GRAND TOTAL FOR SANTA BARBARA COUNTY	**26.27**	**25.37**	**23.72**	**24.14**	**41.06**	**40.39**	**47.87**	**29.52**

* Cells with a "-" denote that the source category contributes less than 0.005 tons/day of ROC or NOx.

FIGURE 3-4: ROC EMISSION TRENDS BY SOURCE CATEGORY

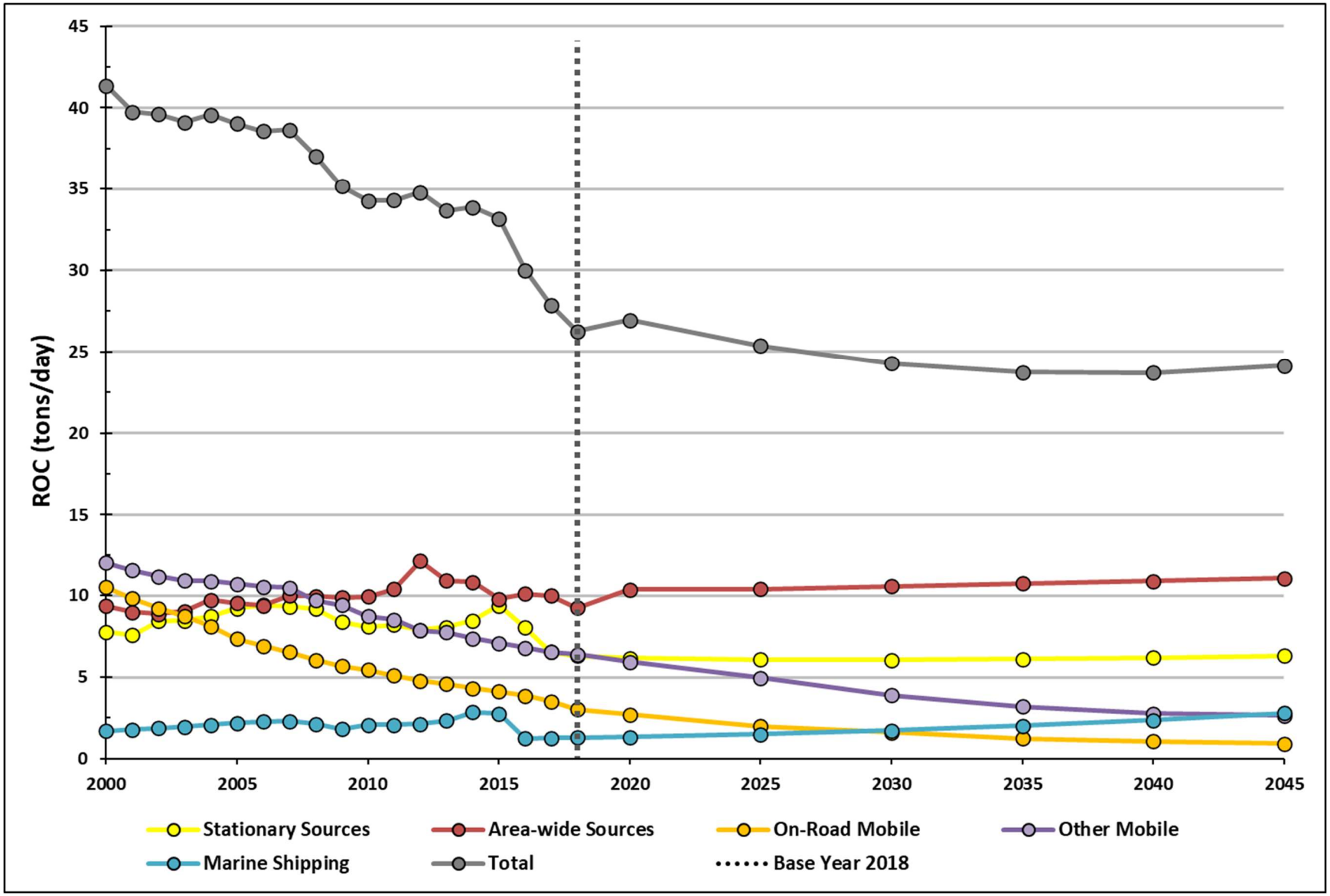
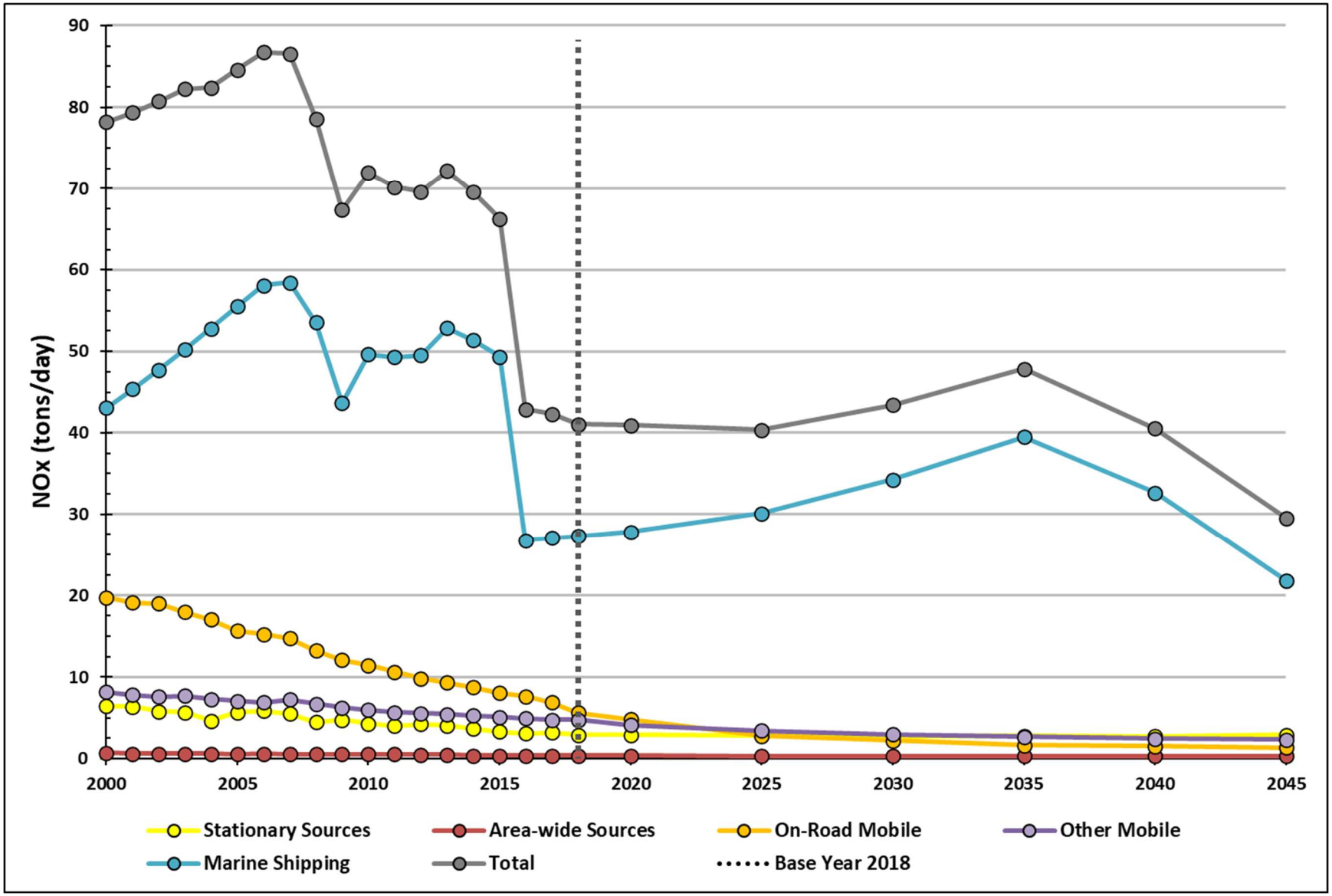


FIGURE 3-5: NOX EMISSION TRENDS BY SOURCE CATEGORY



CHAPTER 4 – STATIONARY SOURCE EMISSION CONTROL MEASURES

This chapter summarizes the emission control measures that reduce reactive organic compounds (ROC) and nitrogen oxides (NO_x) from stationary sources of air pollution. Control measures are categorized as *adopted*, *proposed*, *contingency*, or *further study.* The following describes the four control measure types:

- ***Adopted*** control measures are those that the District has formally adopted as District rules.
- ***Proposed*** control measures are those that the District plans to adopt for the purpose of attaining the state ozone standards by the earliest practicable date.
- ***Contingency*** measures are those that may be adopted if CARB determines that the District isn't making adequate progress towards attaining the standard.
- ***Further study*** measures are those that the District plans to investigate further before making a commitment to adopt them.

The proposed, contingency, and further study control measures are classified according to an analysis of their applicability to Santa Barbara County, their potential emission reductions, their cost-effectiveness, their feasibility to implement, and whether similar measures have already been adopted in other areas of California. The measures listed in these sections are only initial proposals based on the evaluation of currently available information. Prior to implementation, the measures would be subject to the established rule development process, which includes public notices, workshops, and consideration by the District Board of Directors. During rule development, new information regarding the availability of control technologies, emission reduction potential, and costs of the measures may affect whether they are ultimately adopted or removed from further consideration.

Adopted Control Measures Prior to 2022 Ozone Plan

Since the original 1991 Air Quality Attainment Plan for the state ozone standard, the District has adopted more than 30 control measures that reduced ROC and NOx emissions from stationary sources of air pollution. These control measures cover a wide-range of source categories, which includes oil & gas facilities, automotive coating operations, and internal combustion engines. The various control measures and their adoption dates can be found below in Table 4-1.

TABLE 4-1: EMISSION CONTROL MEASURES ADOPTED PRIOR TO THE 2022 OZONE PLAN

ROC Control Measures			
Rule	**Control Measure Name**	**Adoption Date**	**Main Change**
339	Motor Vehicle and Mobile Equipment Coating	Nov-1991	New Rule
331	Fugitive Emissions Inspection and Maintenance	Dec-1991	Expand Monitoring
329	Cutback and Emulsified Asphalt Paving Materials	Feb-1992	Lower ROC limits
346	Loading of Organic Liquid Cargo Carriers	Oct-1992	New Rule
349	Polyester Resin Operations	Apr-1993	New Rule
351	Surface Coating of Wood Products	Aug-1993	New Rule
343	Petroleum Storage Tank Degassing	Dec-1993	New Rule
326	Storage of Reactive Organic Compound Liquids	Dec-1993	Expand Applicability
325	Crude Oil Production and Separation	Jan-1994	Expand Applicability
354	Graphic Arts	Jun-1994	New Rule
344	Petroleum Sumps, Pits and Well Cellars	Nov-1994	New Rule
341	Municipal Solid Waste Landfills	Sep-1997	New Rule
353	Adhesives and Sealants	Aug-1999	New Rule
323	Architectural Coatings	Nov-2001	Lower ROC limits
339	Motor Vehicle and Mobile Equipment Coating	Jun-2008	Lower ROC limits
321	Solvent Cleaning Operations	Sep-2010	Lower ROC limits
330	Surface Coating of Metal Parts and Products	Jun-2012	Lower ROC limits
337	Surface Coating of Aerospace Vehicles	Jun-2012	Lower ROC limits
349	Polyester Resin Operations	Jun-2012	Lower ROC limits
353	Adhesives and Sealants	Jun-2012	Lower ROC limits
323.1	Architectural Coatings	Jun-2014	Lower ROC limits
NOx Control Measures			
Rule	**Control Measure Name**	**Adoption Date**	**Main Change**
333	Reciprocating Internal Combustion Engines	Dec-1991	New Rule
342	Boilers, Steam Generators, Heaters (5+ MMBtu/hr)	Mar-1992	New Rule
359	Flares and Thermal Oxidizers	Jun-1994	New Rule
352	Natural Gas-Fired Furnaces and Small Water Heaters	Sep-1999	New Rule
360	Boilers and Water Heaters (0.075 - 2 MMBtu/hr)	Oct-2002	New Rule
361	Boilers, Steam Generators, Heaters (2 - 5 MMBtu/hr)	Jan-2008	New Rule
333	Reciprocating Internal Combustion Engines	Jun-2008	Expand Applicability
352	Natural Gas-Fired Furnaces and Small Water Heaters	Oct-2011	Lower NOx limits
360	Boilers and Water Heaters (0.075 - 2 MMBtu/hr)	Mar-2018	Lower NOx limits
342	Boilers, Steam Generators, Heaters (5+ MMBtu/hr)	Jun-2019	Lower NOx limits
361	Boilers, Steam Generators, Heaters (2 - 5 MMBtu/hr)	Jun-2019	Lower NOx limits

Proposed Control Measures

Under the California Clean Air Act, each air district that is nonattainment for the state ozone standard must demonstrate a five percent reduction in emissions per year or adopt every feasible measure available to that district.[12] Since previous Ozone Plans have shown that the District cannot achieve a five percent per year emission reduction, the District has historically taken the approach of evaluating and adopting every feasible measure. To ensure that the District has adopted or has proposed to adopt every feasible measure, staff performed the following:

- Compared the District's rules to rules currently adopted by other California air districts;
- Reviewed new staff reports and guidance documents on any recent or upcoming revisions to other air district, CARB, and EPA rules; and
- Considered the magnitude of the emissions reductions as well as the cost-effectiveness of the measures.

In reviewing the literature, no new feasible control measures were identified for adoption within the upcoming 3-year period covered by this Plan. The District has already adopted over 30 measures to regulate the various stationary source categories in the County. We've followed an expeditious schedule, and by doing so, there are very few source categories remaining that are feasible to regulate. Furthermore, the County is expected to be redesignated as nonattainment-transitional based on the 2021 and 2022 monitoring data. A nonattainment-transitional designation means that the County is, once again, close to attaining the ozone standard. Staff's assessment is that no additional stationary source control measures are necessary in order to attain and maintain the ozone standards.

Contingency Measures

Contingency measures are potential control measures that may be adopted if CARB determines that the District isn't making adequate progress towards attaining the standard. If CARB makes such a determination, the District has 180 days to adopt the contingency measure as a rule. This means that the contingency measures need to be refined enough such that they could be adopted under the timeline required by California Health and Safety Code. Two of the solvent-related measures from the 2019 Plan have been retained as contingency measures since the impacts of the solvent measures are well understood. However, the graphics arts measure has been moved to Further Study because additional research and industry outreach would be needed prior to adopting such a rule, which is expected to take more than 180 days. The contingency measures for the 2022 Plan are shown in Table 4-2 below, and a brief description of each affected source category is included to provide context about the measure.

[12] California Health and Safety Code, Section 40914(b).

TABLE 4-2: CONTINGENCY MEASURES FOR THE 2022 PLAN

Rule	Description	Potential Emission Reductions
321	**Solvent Cleaning Machines and Solvent Cleaning** Revisions to lower the general cleaning ROC limit from 50 grams per liter (g/L) to 25 g/L.	6.4 tpy ROC
351	**Surface Coating of Wood Products** Revisions to include solvent cleaning provisions at 25 g/L.	0.4 tpy ROC

Solvent Cleaning Machines and Solvent Cleaning

Many industries use solvents to help clean their manufactured products or to maintain their production equipment and general work areas. The District originally adopted Rule 321 in February 1975 with very basic solvent requirements, and one of the more recent amendments to the rule occurred in 2010. The 2010 amendments focused on transitioning many industries from using organic-based solvents, which typically have a ROC content of around 800 grams per liter, to aqueous solvents with a ROC content of 50 g/L. This contingency measure would implement an ever lower 25 g/L ROC standard. The 25 g/L standard is already incorporated into other prohibitory rules at the District, such as Rules 330, 337, 349, and 353 (which affect Metal Parts, Aerospace, Polyester Resin, and Adhesive operations). The lower standard would be applicable to general solvent operations not covered by the aforementioned rules, and it would require operators to further dilute their solvent mixture or to switch to another compliant solvent. More information on compliant solvents can be found at the South Coast AQMD's Clean Air Solvent website.[13]

Surface Coating of Wood Products

Similar to the solvent cleaning measure above, this Contingency Measure would add more solvent cleaning provisions to Rule 351, which is only applicable to operations performed in wood shop applications. Rule 351 was originally adopted in 1993 to establish ROC limits on the coating operations, and only very basic solvent requirements were included at the time. This contingency measure would implement a 25 g/L ROC standard for solvents used at the wood shop, and the measure may require the facilities to use a spray gun washer to clean the spray guns used in the coating operation. These solvent standards have been in place at a number of other air districts for the last decade.

[13] www.aqmd.gov/home/programs/business/business-detail?title=certified-clean-air-solvents

Further Study Measures

Further Study measures are potential control measures that the District plans to investigate further before making a commitment to adopt them. The further study measures are shown below in Table 4-3, and a brief description of each affected source category is included to provide context about the measure.

TABLE 4-3: FURTHER STUDY MEASURES FOR THE 2022 PLAN

Rule	Description	Potential Emission Reductions
354	**Graphic Arts** Revisions to include solvent cleaning provisions at 25 – 100 g/L and additional requirements for Rotogravure, Flexographic, Lithographic, Letterpress, and Screen Printing operations. Consider permitting existing facilities to enforce the rule.	49 tpy ROC
—	**Organic Material Composting Operations** Require management practices for small composting facilities and control devices for larger facilities.	28 tpy ROC
352	**Natural Gas-Fired Furnaces and Small Water Heaters** Revisions to lower the NOx emission limits from 55 ppm to 20 ppm for new residential furnaces [Point of Sale rule].	60 tpy NOx

Graphic Arts

The District adopted Rule 354 in June 1994 to address ROC emissions from graphic art operations. ROC emissions from graphic arts occur due to the evaporation of solvents in inks, dampening solutions, and cleaning solutions. Beginning in the 2004 Clean Air Plan, the District identified a potential revision to Rule 354 to include additional low-ROC requirements for this source category. This updated graphic arts control measure was kept as a proposed measure until 2017, at which point, the District shifted it to contingency due to the nonattainment-transitional designation for ozone and the prioritized focus on NOx control measures. For this 2022 Plan, staff proposes to shift the graphic arts control measure to Further Study. As discussed in the Contingency Measure section above, additional research and industry outreach would be needed prior to amending the rule.

Organic Material Composting Operations

Composting is a relatively new source category that involves the aerobic decomposition of organic solid waste materials, such as green waste, manures, biosolids, and food waste. The composting process can generate odors as well as a substantial amount of ROC and ammonia emissions. Composting facilities are under the regulatory umbrella of CalRecycle, with many regulations being enforced by the Local Enforcement Agency (Santa Barbara County Public Health – Environmental Health Services).

Composting has been on the District's Further Study list since the 2013 Plan, but this source category is currently being evaluated on a statewide level due to the implications of Senate Bill (SB) 1383, enacted in 2016. SB 1383 mandates that CalRecycle develops a regulation that reduces the disposal of organic materials in landfills by 75 percent by 2025.[14] This means that new or expanded compost operations will be required statewide, and additional collaboration is necessary among the various stakeholders to address the challenges of the expansion as it relates to the existing air quality laws and requirements. Potential emission control strategies for composting operations include using best management practices or control devices to reduce ROC and ammonia emissions. District staff will continue to track new information on this item and assess whether an official rule development proceeding is warranted.

Natural Gas-Fired Furnaces and Small Water Heaters

The District adopted Rule 352 in September 1999 to address NOx certification requirements for newly installed natural gas furnaces and water heaters. Rule 352 applies to furnaces that have a heat input capacity less than 175,000 Btu/hr and water heaters that have a heat input capacity less than 75,000 Btu/hr. These units are typically installed in residences and do not require a Permit to Operate from the District, and so the rule is organized as a "Point of Sale" rule where the manufacturers must sell units that are certified to the NOx standards. A 55 ppm NOx standard for both water heaters and furnaces was initially adopted for the 1999 rule, and the certification level for water heaters was lowered to 15 ppm NOx during the 2011 rule amendments.[15]

For this Further Study measure, District staff is investigating whether a 20 ppm NOx certification level for new furnaces is warranted. Both the South Coast AQMD and the San Joaquin Valley APCD have already adopted the 20 ppm NOx standard in recent years, and the Bay Area AQMD is currently in the rule development process for a similar measure. Residential furnaces contribute approximately 95 tons per year of NOx to Santa Barbara County's emission inventory. If this measure was adopted locally, it may reduce emissions by 60 tons per year after the end of the 20-year implementation period (which is the expected lifespan of the equipment). To achieve the 20 ppm NOx standard, manufacturers may incorporate ultra-low NOx burners into the furnace design. The additional costs of these burners would be passed to the consumer, resulting in an increase of approximately $108 - $240 per furnace. Staff's initial assessment shows that this measure has a cost-effectiveness range of $20,000 - $30,000 per ton of NOx reduced.

This ultra-low NOx furnace measure could be considered feasible to adopt in Santa Barbara County within the next 3-year period. However, Staff proposes to keep this measure as Further Study due to recent efforts by the California Air Resources Board as they explore the feasibility of a zero-emission standard for this equipment sector. Under their 2022 Statewide SIP strategy,

[14] Compared to a 2014 baseline year.
[15] NOx ppm values referenced to 3 percent stack gas oxygen.

CARB is proposing a new zero-emission standard for furnaces and water heaters sold in California. This measure may require that beginning in 2030, new furnaces and water heaters sold in California (for either new construction or replacement of existing equipment) would need to meet a zero -emission NOx standard. It is expected that this regulation would rely heavily on electric heat pump technologies, and natural gas units would be phased out. The Bay Area AQMD and South Coast AQMD are also exploring similar zero-emission measures that may be implemented on a quicker timeline compared to the statewide measure. District staff will continue to track new information on these proceedings and assess whether a zero-emission standard is feasible within Santa Barbara County.

Assembly Bill 617 – BARCT Assessments

Even though no new stationary source measures are being proposed for the 2022 Plan, the District is still required to evaluate and adopt feasible, cost-effective rules in accordance with the Assembly Bill 617 (AB 617) Best Available Retrofit Control Technology (BARCT) Rule Development Schedule that was adopted by the District Board in 2018.[16] Under the AB 617 mandate, three BARCT assessments are anticipated to be performed in 2023, and these assessments would only apply to the AB 617 industrial sources.[17] The District expects to achieve additional NOx reductions from implementing BARCT at these sources, and the reductions will help the District reach attainment. A listing of the remaining assessments on the BARCT Rule Development Schedule is shown below in Table 4-4.

TABLE 4-4: REMAINING ASSESSMENTS ON THE AB 617 BARCT RULE DEVELOPMENT SCHEDULE

Rule	Description	Scheduled Adoption	Potential Emission Reductions
333	**Reciprocating Internal Combustion Engines** Require applicable units to meet the BARCT NOx standards. Remove the rule exemption for units that have been derated to less than 50 horsepower.	2023	76 tpy NOx
358	**Stationary Gas Turbines** Require applicable units to meet the BARCT NOx standards.	2023	45 tpy NOx [18]
362	**Miscellaneous Combustion Sources** Require applicable units (e.g. dryers, dehydrators, ovens, furnaces, and kilns) to meet the BARCT NOx standards.	2023	1 tpy NOx

[16] The AB 617 Rule Development Schedule can be found here: www.ourair.org/community-air/
[17] "AB 617 industrial sources" are large sources in the County that are subject to the CARB Cap and Trade Program due to their greenhouse gas emissions.
[18] In Base Year 2018, emission reductions from this measure would be 0. However, the measure may result in a 45 tpy NOx reduction using the affected facility's operational baseline.

As part of the “all feasible measure” analysis for the Ozone Plan, District staff also evaluated the feasibility of applying the three BARCT assessments to all facilities within the County. It was determined that such rule proceedings would only achieve 1-2 tons of NOx emission reductions per year. Hence, expanding the BARCT assessments to all non-AB 617 facilities within the County was not considered feasible at this time based on the magnitude of the emission reductions.

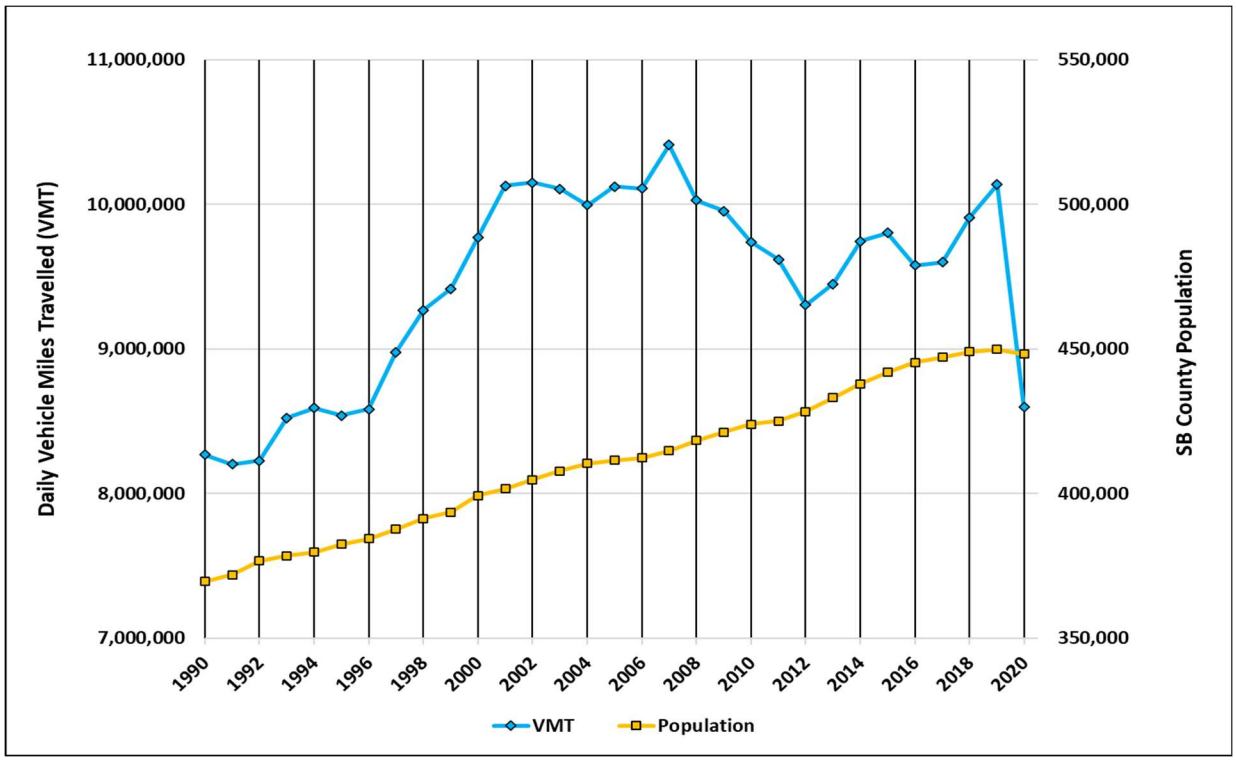
CHAPTER 5 – ON-ROAD TRANSPORTATION CONTROL MEASURES

In June 1993, the boards of the Santa Barbara County Association of Governments (SBCAG) and the Santa Barbara County Air Pollution Control District (District) jointly approved a Memorandum of Understanding (MOU), which effectively placed the responsibility for developing the transportation elements of the air quality plans with SBCAG. This MOU allows SBCAG to assist the District in a cooperative effort toward meeting the District's responsibilities for developing the transportation elements of its state and federal air quality plans. Under the MOU, SBCAG is responsible for the development and analysis of the 2022 Plan's on-road mobile source emission estimates and transportation control measures (TCMs). This chapter includes a discussion of vehicle activity trends and a summary of the transportation control measures.

Vehicle Activity Trends

On-road mobile source emissions make up a large portion of the District's inventory as tens of thousands of cars and trucks are driven on the roadways every day. As each vehicle travels a different distance, the main trend to look at is the total amount of daily vehicle miles travelled (VMT) within the District. The total amount of daily VMT between 1990 and 2020 is shown in Figure 5-1, and the data was compared against the population within the County.

FIGURE 5-1: POPULATION AND DAILY VMT TRENDS - SANTA BARBARA COUNTY, 1990-2020 [19]



[19] VMT data is the Caltrans Public Road data derived from the Highway Performance Monitoring System.

Although the relative amounts have varied over the period, the daily VMT growth for the entire period from 1990 to 2020 is less than the population growth (i.e., 21% growth in population, 4% growth in VMT). Table 5-1 shows a breakdown of the average annual growth rates for population and VMT over the last three decades (1990-2020). This table allows us to identify any changes in driving behavior over the various time periods, as State law requires areas designated as nonattainment for the state ozone standard to substantially reduce the rate of increase in passenger vehicle trips and VMT.[20]

TABLE 5-1: POPULATION AND VMT ANNUAL GROWTH RATES

Time Period	Population Average Annual Growth Rate	VMT Average Annual Growth Rate	Ratio (Population : VMT)
1990 - 2000	0.80%	1.82%	1 : 2.26
2000 - 2010	0.61%	- 0.03%	1 : (- 0.05)
2010 - 2019	0.68%	0.45%	1 : 0.67
2019 - 2020	- 0.35%	- 15.20%	(- 1) : (- 43.66)

As shown in the table, VMT growth significantly outpaced population growth during the 1990s. However, over the last two decades, the trend has reversed and VMT growth has been slowed down and held to near-zero levels. Many factors can influence the region's VMT, such as the unemployment rate, cost of housing, and the price of fuel.

COVID-19 Effects on Regional Travel

Countywide VMT decreased by approximately 15% in 2020 due to the effects of the COVID-19 pandemic.

The COVID-19 global pandemic and subsequent emergency shut-downs beginning in March 2020 had a tremendous influence on regional travel patterns throughout 2020 and 2021. Among many other effects, COVID-19 forced an analysis of how people work and their relationships with what has traditionally been defined as their workplaces. As shown in Figure 5-1, countywide VMT decreased significantly in 2020, by approximately 15%, to levels not seen for nearly 25 years. Transit ridership decreased by nearly 55% as riders were hesitant to board buses for public health concerns, and rail ridership also was similarly affected. The lasting effects of the COVID-19 global pandemic will require careful analysis and monitoring for many years going forward, as more businesses may encourage the continued use of telecommuting, thereby reducing countywide VMT.

[20] California Health and Safety Code, Section 40918(a)(3). VMT is considered a surrogate for vehicle trips for state performance standard monitoring.

Transportation Control Measures

The main way SBCAG and the District help reduce the amount of VMT is through the implementation of locally adopted transportation control measures. The California Health and Safety Code defines "transportation control measures" as:

> *…any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. (CA HSC §40717.g.)*

Under the federal Clean Air Act, a transportation control measure is any measure:

> *…listed in CAA section 108, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Notwithstanding the first sentence of this definition, vehicle technology-based, fuel-based, and maintenance-based measures which control the emissions from vehicles under fixed traffic conditions are not TCMs for the purposes of this subpart. (40 CFR 93.101)*

Generally, TCMs are programs or activities that states and localities can implement to encourage the traveling public to rely less on the automobile or to use the automobile more efficiently. TCMs reduce emissions from on-road motor vehicles by: improving the existing transportation system to allow motor vehicles to operate more efficiently; inducing people to change their travel behavior to less polluting modes; or ensuring emission control technology improvements in the motor vehicle fleet are fully and expeditiously realized. SBCAG and the District have used the guidance provided by the U.S. Department of Transportation under Section 108(f)(1)(a) of the federal Clean Air Act when determining the criteria pollutant emission reduction potential and the feasibility of TCMs. Examples of potential TCMs listed in the Clean Air Act include:

1) Improved public transit programs,
2) Adding new pedestrian paths and bicycle lanes,
3) Restriction of roads to high-occupancy vehicles,
4) Programs for shared-ride services,
5) Adding park-and-ride facilities,
6) Traffic flow improvement projects,
7) Programs to control extended vehicle idling,
8) Transportation demand management programs, and
9) Programs that facilitate the voluntary removal of older light-duty autos and trucks.

While most on-road mobile source emission reductions are attributable to motor vehicle emission controls established by federal and state laws and the natural attrition of older, more polluting vehicles (i.e., fleet turnover), TCMs are an integral part of air quality plans and help meet multiple objectives (e.g., multimodal access, fuel efficiency, etc.). TCMs also address the

need for the traveling public to carefully consider:

1) The implications of continued reliance on the single-occupant vehicle as the major choice of commute trips;
2) The need to provide and promote alternatives to single-occupant vehicle travel; and,
3) Limiting those factors that promote single-occupant vehicle travel.

SBCAG's Connected 2050 Regional Transportation Plan and Sustainable Communities Strategy (RTP-SCS) explores the region's land use and travel patterns, accounts for the demographic growth that will force new demands on both, and presents a vision for how they can work together to satisfy the goals important to the region.[21] One of the five goals of the RTP-SCS focuses on the environment, and it aims to "Foster patterns of growth, development and transportation that protect natural resources and lead to a healthy environment." Some of the objectives under the Environment goal include: reducing criteria pollutant and greenhouse gas emissions, reducing vehicle miles traveled, promoting transit use and alternative transportation, and encouraging affordable housing and mixed-use development within urban boundaries.[22] The goals and objectives outlined in the RTP-SCS are consistent with the implementation of TCMs as outlined in the federal and state Clean Air Acts. Additional information on how the RTP-SCS dovetails with the transportation control measures in this 2022 Plan is provided later in this Chapter, under "*Implementation Activities for TCMs.*"

Adopted TCMs

TCMs are originally developed by SBCAG prior to being incorporated into the District's Ozone Plan. Once adopted by SBCAG, the TCMs are thoroughly reviewed by District staff and incorporated into the next Ozone Plan to be approved by the District Board. All of the adopted TCMs are listed below in Table 5-2. Table 5-2 also summarizes the implementation characteristics of the adopted TCMs, as they form the basis for the 2022 Plan on-road mobile source control strategy.

[21] Santa Barbara County Connected 2050 Regional Transportation Plan and Sustainable Community Strategy, Chapter 3, SBCAG, August 2021.
[22] See Connected 2050 RTP-SCS, Table 2-2.

TABLE 5-2: SANTA BARBARA COUNTY TRANSPORTATION CONTROL MEASURES

TCM	TCM Name	TCM Type	Adopting Agency	Implementing Agency	Commitments	Monitoring Mechanism [Agency]
T-1 T-2	Trip Reduction Program; Employer-Based TDM Program	Voluntary; Programmed	County and Cities	County and Cities; SBCAG Traffic Solutions	Resolution of Commitments from Affected Jurisdictions; City and County TDM Programs	Transportation Demand Management (TDM) Program [SBCAG]
T-3	Work Schedule Changes	Voluntary	County and Cities	County and Cities; Private Sector	Adopted County Policy, 1988	TDM Program [SBCAG]
T-4	Area-wide Ridesharing Incentives	Voluntary	County and Cities	SBCAG	Interagency Agreement	TDM Program [SBCAG]
T-5	Improve Commuter Public Transit Service	Programmed	County and Cities	SBCAG; SBCAPCD; Other County Transit Operators	Federal Transportation Improvement Program (FTIP) and Regional Transportation Improvement Program (RTIP); Short Range Transit Plan (SRTP)	RTP List of Programmed Projects [SBCAG]
T-6	High Occupancy Vehicle Lanes	Programmed	Caltrans; SBCAG	Caltrans; SBCAG	FTIP and RTIP; Measure A Strategic Plan	RTP List of Programmed Projects [SBCAG]
T-7	Traffic Flow Improvements	Programmed	County and Cities	County and Cities; Caltrans; SBMTD; SBCAG	FTIP and RTIP	RTP List of Programmed Projects [SBCAG]
T-8	Parking Management	Programmed	City of Santa Barbara	City of Santa Barbara	Parking Ordinance	Parking Task Force [City of Santa Barbara]
T-9	Park-and-Ride Lots / Fringe Parking	Voluntary; Programmed	County and Cities	County and Cities; Caltrans	FTIP and RTIP; Park and Ride Plan	RTP List of Programmed Projects [SBCAG]; Caltrans, District 5
T-10	Bicycle and Pedestrian Programs	Programmed	County and Cities	County and Cities; Caltrans; SBCAG	FTIP and RTIP; General Bikeway Elements; Bikeway Master Plans	RTP List of Programmed Projects [SBCAG]
T-13	Accelerated Retirement of Vehicles	Voluntary	SBCAPCD	SBCAPCD	SBCAPCD Contract	Old Car Buy Back Program [SBCAPCD]
T-14	Activity Centers	Voluntary	SBCAG	County and Cities; SBMTD	Sustainable Community Strategy (SCS)	SBCAG RTP-SCS [CARB]
T-17	Telecommunications	Voluntary	County and Cities	County and Cities; Private Sector	Not Applicable	TDM Program [SBCAG]
T-18	Alternative Fuels	Voluntary	SBCAPCD	County and Cities; SBCAPCD	Not Applicable	Various Plans [SBCAPCD]
T-19	Public Education	Committal; Voluntary	County and Cities; SBCAPCD; SBCAG	County and Cities; SBCAPCD; SBCAG	Not Applicable	Not Applicable

Implementation Activities for TCMs

Once TCMs are adopted, they can be implemented through a variety of programs and projects over varying time periods. Since the last triennial update to the Ozone Plan, many activities, programs, and construction projects have been completed, or are currently being completed, to implement the adopted TCMs. TCMs can be regional in nature, or they can be implemented via projects or programs in specific jurisdictions. TCM implementation is subject to local planning efforts, goals, and priorities, as well as funding constraints. Although not a complete listing, Table 5-3 lists several ongoing projects related to the adopted TCMs that have been implemented during the 2019-2022 reporting period. Following is a more detailed description of some of these projects/programs.

TABLE 5-3: PROJECTS COMPLETED OR ONGOING UNDER PREVIOUSLY ADOPTED TCMS

TCM	TCM Name	Project Sponsor	Project Description
T-5	Improve Commuter Public Transit Service	SBCAG, Ventura CTC	Measure A – South Coast Interregional Transit Program
T-6	High-Occupancy Vehicle Lanes	SBCAG, Caltrans	US 101 HOV Lanes: Carpinteria
T-10	Bicycle and Pedestrian Programs	SBCAG, County and Cities	Measure A Bicycle, Pedestrian and Safe Routes to School Projects and Programs (Countywide on-going)
		SBCAG Traffic Solutions	Open Streets Events (Countywide on-going)
			EZ Bike Project
		SBCAG, Caltrans, County and Cities	Active Transportation Program
T-13	Accelerated Retirement of Vehicles	SBCAPCD	The Old Car Buy Back Program pays Santa Barbara County vehicle owners $1,000 to voluntarily retire 1997 or older light or medium-duty vehicles.
T-14	Activity Centers	SBCAG, SBMTD, County and Cities	Sustainable Community Strategy implementation
T-18	Alternative Fuels	SBCAPCD and other agencies	EV Readiness Plan for the Central Coast
		SBCAPCD	Tri-Counties Hydrogen Readiness Plan
		SBCAPCD, County and other agencies	Central Coast Alternative Fuel Vehicle Readiness Plan
		SBCAPCD and other agencies	Central Coast Go-Zero: Zero Emission Vehicle Readiness Implementation Plan
		Central Coast Clean Cities Coalition	U.S. Department of Energy Clean Cities Coalition Network Outreach, Education, and Performance Tracking Program

Santa Barbara County Sustainable Community Strategy (Part of T-14)

The SBCAG Sustainable Community Strategy was initially incorporated into the 2013 Plan under the Activity Centers (T-14) measure. In August 2021, SBCAG adopted the Connected 2050 RTP-SCS, which shows how the region will achieve the required greenhouse gas (GHG) per capita emission targets as well as the co-benefits of reducing criteria pollutants. The Connected 2050 RTP-SCS builds on the groundwork laid out in the initial RTP-SCS and is based on a preferred land use and transportation scenario, which lays out one possible pattern of future growth and transportation investment for the region. The RTP-SCS preferred scenario emphasizes a transit-oriented development and infill approach to land use and housing, supported by complementary transportation and transit investments. Population and job growth is allocated principally within existing urban areas near public transit. Allocation of future growth directly addresses the jobs-housing balance by emphasizing job growth in the North County and housing growth in the South County.

The RTP-SCS consists of three core, inter-related components:

1) A land use plan, including residential densities and building intensities sufficient to accommodate projected population, household, and employment growth;
2) A multi-modal transportation network to serve the region's transportation needs; and
3) A "regional greenprint" cataloguing open space, habitat, and farmland as constraints to urban development.

Consistent with the region's SCS, TCM T-14 emphasizes transit-oriented development, infill growth, and complementary investments in a multi-modal transportation network, which will result in reductions of ozone precursor emissions. It should be noted that the RTP-SCS does not intend to and has no authority to prescribe local land uses or to limit the authority and autonomy of local jurisdictions planning for their own land use needs. SB 375 expressly preserves local governments' right to plan their own land use.[23]

Alternative Fuels Planning and Infrastructure (Part of T-18)

The California Air Resources Board's Zero Emission Vehicle (ZEV) regulation (initially adopted in 1990) requires auto manufacturers to implement technology improvements and make the cleanest cars available for sale to the general public.[24] This regulation has encouraged the auto sector to innovate and further develop battery electric vehicles, fuel cell electric vehicles, and other alternative fuel technologies. In 2018, Governor Brown issued Executive Order B-48-18, setting ambitious targets of 200 hydrogen fueling stations and 250,000 electric vehicle chargers to support 1.5 million ZEVs by 2025 and 5 million ZEVs on California roads by 2030. These milestones were further bolstered in 2020 when Governor Newsom issued Executive Order N-

[23] California Government Code, Section 65080(b)(2)(K).
[24] ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about

79-20, which calls for all new cars and passenger trucks sold in California to be zero-emission vehicles by 2035.

To complement and support California's efforts in transitioning to ZEVs statewide, various regional projects and plans have been implemented by a number of agencies. This includes the EV Readiness Plan for the Central Coast, the Tri-Counties Hydrogen Readiness Plan, the District's Clean Air Grants for Infrastructure Program, the District's lead role in the Central Coast Clean Cities Coalition, and other alternative fuel and infrastructure planning efforts.

Since 2011, the District has taken a lead role in working with the Electric Drive 805 coalition (formerly Plug-in Central Coast) to prepare our region for ZEVs by securing grants to lay the groundwork for planning electric vehicle charging stations and hydrogen fueling infrastructure in the Central Coast region. The Electric Drive 805 Steering Committee oversees and directs the actions of the coalition and is comprised of representatives from the Community Environmental Council, the Central Coast Clean Cities Coalition (C5), the Ventura County Regional Energy Alliance, and the Air Pollution Control Districts of Ventura, Santa Barbara, and San Luis Obispo Counties. The collaborative efforts of this group led to the preparation of the Electric Vehicle Readiness Plan for Ventura, Santa Barbara, and San Luis Obispo Counties,[25] which includes a vision for electric vehicle adoption and infrastructure in the Central Coast region. The EV Readiness Plan includes siting recommendations for electric vehicle charging sites throughout the Central Coast, taking into consideration that US 101 serves as an inter-regional connection between Southern and Northern California. Locating direct current (DC) fast chargers every 30 to 40 miles along the US 101, from Ventura County through Santa Barbara County and on to San Luis Obispo County, will enable battery electric vehicles to take longer trips and recharge from near empty to 80 percent charge in approximately 30 minutes. The EV Readiness Plan also includes recommendations for locating charging stations near workplaces, regional commercial centers, and major destination centers, as well as single-family and multi-family residences, and identifies outreach strategies for marketing, training, and education for local government and for members of the public.

In 2017, with funding provided by a California Energy Commission (CEC) grant, the District led the efforts to develop a Tri-Counties Hydrogen Readiness Plan.[26] The plan was a joint effort among the Electric Drive 805 coalition partners and involved significant contributions from several other organizations in the region. The plan addresses the siting of hydrogen fueling infrastructure, establishes key public and private stakeholders, implements community outreach efforts, and includes resources for planners, permitting staff and first responders to safely and effectively prepare for the use of hydrogen and fuel cell electric vehicles in the tri-counties region. The plan identified three key priorities for ongoing hydrogen readiness planning efforts in the Tri-Counties: (1) to secure funding to support hydrogen infrastructure

[25] Electric Vehicle Readiness Plan for Ventura, Santa Barbara, and San Luis Obispo Counties (Central Coast), EV Communities Alliance, April 2014

[26] Tri-Counties Hydrogen Readiness Plan, Santa Barbara County Air Pollution Control District, May 2017

build-out, vehicle incentives, and outreach efforts; (2) to develop a strategy for creating commercial opportunities locally for the production and delivery of low-carbon hydrogen; and (3) to increase public awareness of hydrogen and fuel cell electric vehicles to facilitate early adoption and create a foundation for broader consumer acceptance in the future. The development of this plan coincided with the installation of the first hydrogen fueling station in the Central Coast region, which opened in May 2016. The SBCAPCD, Community Environmental Council, and C5 – along with dozens of supporters and fuel cell electric vehicle drivers – celebrated the opening of the station with a highly publicized ribbon cutting ceremony.

In 2019, with funding provided by a CEC grant, the Electric Drive 805 coalition partners completed several tasks identified in the Central Coast Go-Zero: Zero Emission Vehicle Readiness Implementation Plan.[27] These tasks were designed to accelerate the Central Coast region's deployment of zero emission vehicle infrastructure and expand the regional adoption of ZEVs among both consumers and fleet operators. Key implementation tasks for the plan included (1) creation of a ZEV ombudsman; (2) analysis of strategic EV infrastructure siting opportunities using mobile device data; (3) acceleration of medium- and heavy-duty ZEV adoption by regional fleet operators; (4) coordination of site assessments for EV charging stations; (5) ZEV awareness; (6) ZEV safety training for first responders; and (7) site assessments for hydrogen fueling stations.

Another key initiative in this work effort is the continued implementation of the District's Clean Air Grants for Infrastructure Program[28], which provides grants of up to $250,000 to public, private, and nonprofit entities in Santa Barbara County for the installation of electric vehicle charging stations and hydrogen fueling stations. Since 2011, the SBCAPCD has provided funding for 218 Level 2 charging stations and 31 DC fast chargers in Santa Barbara County. As of March 31, 2022, there are a total of 328 Level 2 charging stations and 64 DC fast chargers that are available for public use in Santa Barbara County.[29] If agencies have prioritized zero-emission vehicle technology in their long-term plans, this grant program can help provide infrastructure as they expand their fleets. For example, the Santa Barbara Metropolitan Transit District has adopted a goal of a 100% zero-emission fleet by the year 2030, and this program could help them meet their goal.[30]

In 2020, the District became the lead administrator for C5, which is a nonprofit entity consisting of a group of local stakeholders whose mission is to expand the use of alternative fuel vehicles and fueling infrastructure throughout the Central Coast region. C5 is part of the U.S. Department of Energy's Clean Cities Program and the coalition's objectives include

[27] Central Coast Go Zero: Zero Emission Readiness Implementation Plan, San Luis Obispo County Air Pollution Control District, October 2019.
[28] www.ourair.org/ev-charging-program/
[29] California Energy Commission (2022). Electric Vehicle Chargers in California. Data last updated March 31, 2022. Retrieved July 14, 2022 from www.energy.ca.gov/zevstats
[30] https://sbmtd.gov/electricfuture/

implementing educational and training programs, acting as an information clearinghouse, and organizing green car shows and other outreach activities to show the benefits of alternative fuel vehicles and fueling infrastructure.

Since 2008, the California Energy Commission's Clean Transportation Program (formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program) has also provided funding to support innovation and accelerate the development and deployment of advanced transportation and fuel technologies. Funded by the CEC and implemented by the Center for Sustainable Energy, the California Electric Vehicle Infrastructure Project (CALeVIP) provides incentives for EV charger installations and works with local partners to develop and implement projects that meet current and future regional needs for Level 2 and DC fast charging. In August 2021, the South Central Coast Incentive Project (SCCIP) launched in San Luis Obispo, Santa Barbara, and Ventura counties. The SCCIP leveraged over $12 million of CEC funds with local partner contributions from Central Coast Community Energy, Clean Power Alliance, and the Air Pollution Control Districts of San Luis Obispo, Santa Barbara, and Ventura Counties. In Santa Barbara County, approximately $5 million dollars is being invested from the SCCIP to help fund an estimated 433 new EV chargers countywide. CALeVIP is a major initiative to help fund the deployment of electric vehicle charging stations across the Central Coast region.

TCMs Proposed for Adoption and Further Study

No new TCMs are proposed for adoption or further study at this time. However, as described above, SBCAG and the District remain committed to continue implementing the TCMs that were adopted in previous air quality attainment plans, thereby continuing to reduce mobile source emissions through a variety of transportation control strategies, programs, and projects.

CHAPTER 6 – VOLUNTARY GRANT AND INCENTIVE STRATEGIES

The District's voluntary grant and incentive programs provide funding opportunities to reduce additional ROC, NOx, and particulate matter (PM) emissions within Santa Barbara County. Voluntary grant and incentive programs achieve cost-effective emission reductions related to a variety of equipment types including on-road transportation, marine vessels, agricultural irrigation pumps, and off-road vehicles. These programs primarily retire older, higher-polluting equipment and replace them with newer, cleaner alternatives, thereby reducing ozone precursor emissions and achieving community health benefits. Since 1988, the District has collaborated with local government agencies, commercial businesses, and other local operators to implement a variety of emission reduction projects throughout Santa Barbara County. During this time, the District has awarded over $50 million for projects that have eliminated several thousand tons of smog-forming pollution and particulate matter, both of which harm human health.

Funding Sources

Over the past few years, there has been increased financial support from the California State Legislature to allocate funds for voluntary emission reduction programs. A brief description of seven grant and incentive funding sources and programs is provided below:

1. Carl Moyer Program Funds

The California State Legislature created the Carl Moyer Program in 1998, named after the late Dr. Carl Moyer to recognize his work in the air quality field and his efforts to develop this important program that reduces emissions from heavy-duty diesel engines. The Carl Moyer Program provides grants to replace, repower, or retrofit heavy-duty diesel vehicles, vessels, and agricultural pumps with cleaner engines. The new engines substantially reduce emissions of NOx, ROC, and PM, which complements California's and the District's regulatory clean air programs.

The Carl Moyer Program is a cooperative effort between the California Air Resources Board (CARB) and local air pollution agencies. Each year, CARB awards grants to various California air districts that apply for funds for the local implementation of the Carl Moyer Program. In turn, air districts follow guidelines adopted by CARB and provide grants to public and private entities for the incremental cost of cleaner-than-required engines, equipment, and other sources of air pollution to obtain early emission reductions. To qualify for funding, projects must meet cost-effectiveness requirements.

CARB also implements the Carl Moyer State Reserve Program, which contains a portion of Carl Moyer funds set aside annually for the specific purpose to achieve emission reductions from a

targeted type of emission category, such as off-road equipment, school buses, or landscape equipment.

The District is currently processing Year 24 of the Carl Moyer Program and to date has received approximately $14.9 million to implement Carl Moyer eligible grant projects.

2. Community Air Protection (AB 617) Program Funds

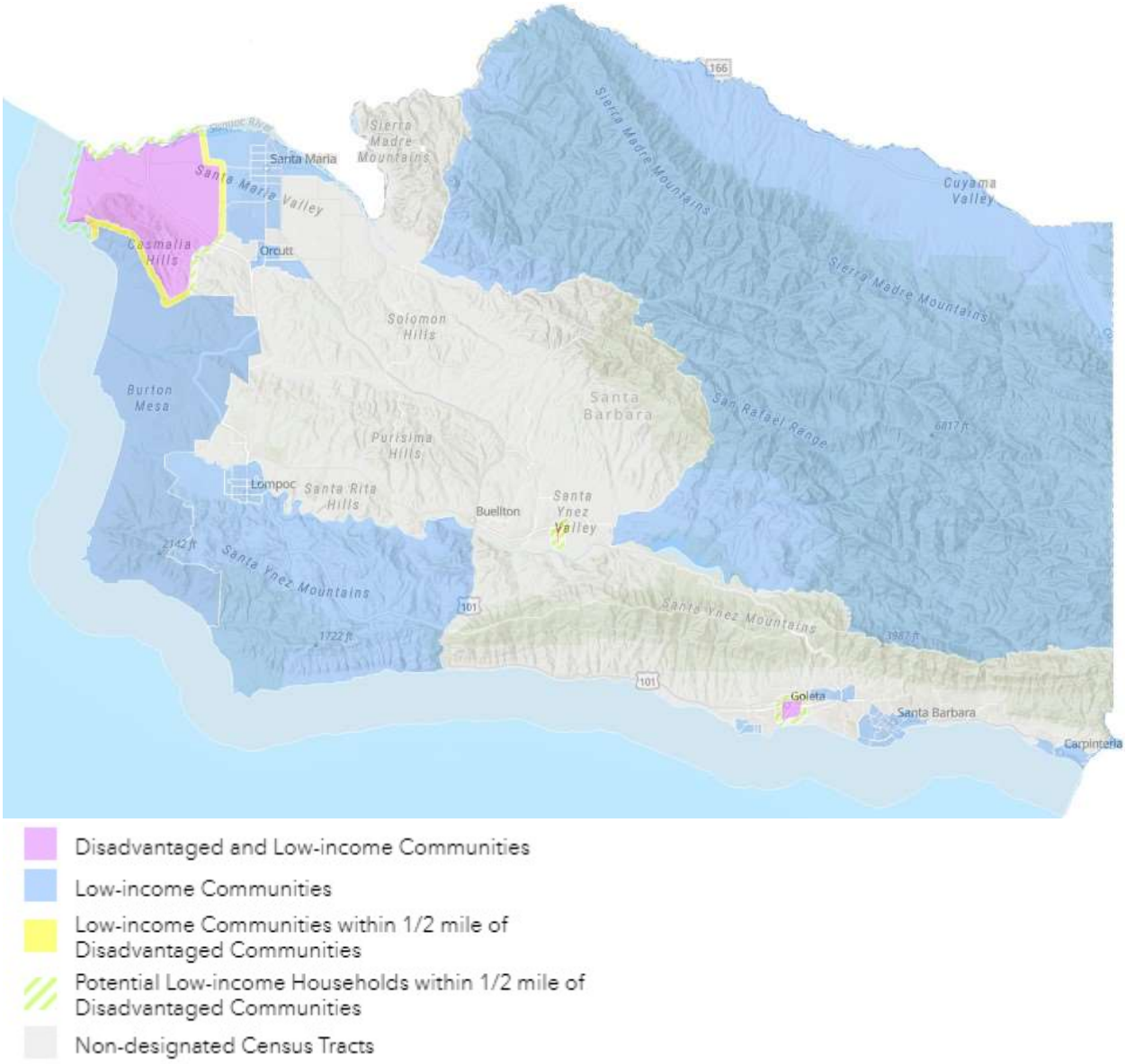
Assembly Bill 617 was signed into law in September 2017. In response to this legislation, CARB created the Community Air Protection Program. The program's focus is to reduce exposure in communities most impacted by air pollution. CARB staff has been working with local air districts, community groups, environmental organizations, and regulated industries to develop a new community-focused action framework for community air protection. The effort includes community air monitoring in prioritized areas, community emissions reduction programs, incentive funding to deploy cleaner technologies, best available retrofit control technology from industrial facilities, criteria and toxic reporting enhancements, and grants to support community participation in the AB 617 process.

The Community Air Protection Program requires the District to identify high priority communities within disadvantaged and low-income areas, and conduct targeted outreach to individuals and organizations within those communities to determine what types of projects would benefit those communities. Using tools and guidance provided by CARB and the California Environmental Protection Agency, such as CalEnviroScreen version 4.0 and other tools and maps, District staff reviewed data for disadvantaged communities in Santa Barbara County and identified numerous census tracts classified as low-income. The map of those communities within Santa Barbara County is shown below in Figure 6-1.[31]

The CAP program provides valuable economic incentives to businesses, health benefits to community members, and also helps fund the District's efforts to engage with the community and meet the legislative requirements of AB 617. The District is currently processing Year 5 of the Community Air Protection program and to date has received approximately $4.3 million to implement eligible grant projects.

[31] The full map of all California communities (California Climate Investments Priority Populations 2022 CES 4.0) can be found at https://webmaps.arb.ca.gov/PriorityPopulations/

FIGURE 6-1: DISADVANTAGED AND LOW-INCOME COMMUNITIES IN SANTA BARBARA COUNTY



3. Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program Funds

In 2017, Assembly Bill (AB) 109 and AB 134 were signed into law to reduce agricultural sector emissions by providing grants and financial incentives. The Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program was created by CARB to satisfy the new mandates. The FARMER program provides grants, rebates, and other financial incentives for agricultural equipment including zero emission utility vehicles, heavy-duty trucks, irrigation pump engines, tractors, and other equipment used in agricultural operations.

The District is currently processing Year 4 of the FARMER program and to date has received approximately $2.9 million to implement FARMER eligible grant projects.

4. $2 DMV Surcharge Funds

In 2004, Assembly Bill 923 authorized air districts to collect a $2 surcharge on vehicle registrations. $2 DMV funds can be used for many types of projects that include, but not limited to:

- Carl Moyer Program eligible projects;
- School bus replacements;
- Alternative fuel and electric vehicle charging infrastructure purchase and installation;
- Accelerated vehicle retirement projects.

The District is currently implementing Year 17 of the $2 DMV Surcharge program and has received approximately $12.3 million to implement $2 DMV eligible grant projects.

5. The Clean Air Fund

The Clean Air Fund was established by the District Board in 2019. Revenue from the District's Mutual Settlement program may be allocated to projects undertaken by the District and/or third parties that provide air quality and human health benefits to the Santa Barbara County community in innovative ways unlike traditional grant fund programs. Clean Air Fund projects are consistent with the District's mission, and potential projects may include the following voluntary incentive programs that reduce emissions:

- Electric landscape equipment replacement programs;
- Air quality research projects or studies;
- Purchase of air monitoring equipment or tools;
- Community outreach projects or programs;
- Regional electric vehicle charging infrastructure programs.

In order to implement the Clean Air Fund, District staff evaluate potential projects or programs and prepare specific proposals for Board approval. Each proposal will include goals and parameters, such as the amount of incentive funding to be used, timelines, target audience, emission control technology to be used, or specific requirements for equipment, outreach, studies, monitoring methods, or reporting.

6. Air Quality Mitigation Fees

Local mitigation funds that are collected from permitted sources, or land use projects, that were required to mitigate their excess emissions.

7. CARB Woodsmoke Reduction Program Funds

Funds allocated through the state's Greenhouse Gas Reduction Fund for CARB to distribute through the California Air Pollution Control Officers Association in conjunction with local air districts. The grant funds help homeowners replace a wood-burning uncertified stove, fireplace insert, or fireplace used as a primary source of heat with a cleaner-burning and more efficient

device. In 2022, the state Legislature allocated an additional $5 million statewide to support the program.

Clean Air Grants Program

The District annually solicits the public to submit project applications to be funded through our Clean Air Grants program. These grant projects benefit public health by cost-effectively replacing old, high-polluting equipment, vehicles, and engines with newer, low, near-zero, and zero-emission equipment, vehicles, and engines. These replacements occur earlier than required by regulation or normal attrition. Grant projects are required to be implemented with a multi-year grant agreement and the grant funds range from $10,000 to $250,000 per project. The District currently operates the following six grant programs:

1. On-Road Vehicle Replacement Grant Program

On-road diesel-fueled vehicles are a major contributor to air pollution, including toxic diesel particulate matter, in the state of California and in the county. CARB continues to pass regulations to reduce emissions from this sector, including supporting a transition to a completely zero emission heavy-duty vehicle fleet in California by 2045 through the Advanced Clean Fleets and Advanced Clean Trucks regulations. The District has included an on-road portion of the Clean Air Grants Program intermittently since 1999. Currently, the District's program incentivizes heavy-duty vehicle owners to turn over their fleets ahead of regulatory requirements by providing funds to replace trucks, buses, solid waste collection vehicles, public agency and utility vehicles, emergency vehicles, and transportation refrigeration units with a zero emission or near-zero emission counterpart. Vehicles must be heavy-duty (greater than 14,000 GVWR), diesel-fueled, compliant with all CARB regulations, and meet engine model year requirements to be eligible.

Since the program's start, the District has repowered or replaced 20 vehicles including 12 engine repowers, three diesel particulate filter retrofits, the purchase of four new CNG-fueled refuse trucks, and most recently, the purchase of an electric urban transit bus for a local transit agency. Altogether, the program has reduced 153comp tons of pollutants (PM and NOx). The District expects this program to gain in popularity in the near future as heavy-duty electric truck technology continues to improve and more models become available on the market.

2. Infrastructure Grant Program

As on-road vehicles continue to be a large source of emissions within Santa Barbara County, the District has worked collectively with neighboring air districts and other groups for several years to advance publicly available electric vehicle (EV) charging infrastructure. Since its inception in 2011, the District's EV charging infrastructure program has provided funding for 249 EV charging stations in Santa Barbara County. Under the current program parameters, public,

private, and non-profit entities are eligible to apply, as well as multi-unit dwelling properties that have four or more units.

With every additional charging station, consumers are more likely to transition from driving conventional gasoline vehicles to electric alternatives. New stations also increase the uptime of existing electric vehicles as owners can easily and conveniently charge their vehicle at multiple locations. This meets the program's ultimate goal of improving local air quality and reducing greenhouse gas emissions.

Initially, EV charging infrastructure projects were funded using local air quality mitigation funds. However, since 2019, the District has utilized funds from the Carl Moyer and Community Air Protection programs to partially fund infrastructure projects that meet specific requirements. In addition to EV charging infrastructure projects being eligible under the Carl Moyer Program guidelines, the District also has the ability to fund hydrogen and compressed natural gas fueling stations. However, EV charging stations are the only infrastructure project category that the District has funded to date. There is no cost-effectiveness threshold for infrastructure projects.

3. School Bus Replacement Grant Program

Since 2001, the District has invested $3.9 million of grant funds into local school district transportation bus fleets. This has included the replacement of 39 older, high-polluting diesel-powered school buses with new low or zero-emission school buses, the retrofit of 33 school buses with diesel particulate filters to capture toxic exhaust, the replacement of compressed natural gas (CNG) fuel tanks in four school buses, and the replacement of 17 CNG fueling hoses at a school district.

The deployment of electric school buses throughout California is an emerging technology as mainstream school bus manufacturers have entered the market. Air district staff will continue to work with bus vendors and school districts on the advancement, practicality, and cost-effectiveness of funding electric-powered school bus projects in our county.

4. Off-Road Equipment Replacement Grant Program

Since the inception of the Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer) in 1998, the Air District has invested more than $10 million into the Off-Road Equipment Replacement Program (ORERP). Moyer was the primary source of ORERP funding for many years, until 2017 when Assembly Bills 617, 109, and 134 were signed into law, creating two additional funding programs: the Community Air Protection (CAP) program and the Funding Agriculture Replacement Measures for Emission Reductions (FARMER) program.

The ORERP incentivizes the replacement of portable and stationary, off-road compression-ignition (CI or diesel), and large spark-ignition (LSI) projects such as construction, agriculture, and industrial equipment. Priority for grant funds in this category is given to projects with zero-emission and near-zero emission technology as well as projects located within low-income or

disadvantaged communities, as defined by AB 1550 and SB 535. The map of low-income and disadvantaged communities shown in Figure 6-1 can be found here: https://webmaps.arb.ca.gov/PriorityPopulations/.

Currently, there are no compliance deadlines for the replacement of equipment in this category, yet the ORERP has been our most popular program to date with more than 140 funded projects with emission reductions totaling more than 820 tons (ROG, NOX, and PM). Assisting in the replacement of old dirty equipment has not only helped improve air quality, but it has incentivized local businesses to upgrade their fleets with new cleaner technology. The District expects this program to remain popular for the foreseeable future as new cleaner technology becomes more feasible to our constituents.

5. Agricultural Engine Repower Grant Program

This program has been funding repower projects for Agriculture pumps for over 25 years. For the majority of that time, the District helped fund the replacement of old diesel-powered engines with newer cleaner diesel-powered engines. Not until very recently did the District change the format of this program to focus funding efforts solely on new electric pumps.

The District has helped fund over 85 projects with emission reductions totaling more than 530 tons (ROG, NOx, and PM). This is a unique project type for the District as we are able to provide funding for both the purchase of the new electric pump as well as the required infrastructure to power the electric pump.

6. Marine Engine Repower Grant Program

The Marine Program has been extremely popular with vessel owners based in Santa Barbara County. Since its inception, we have been able to fund over 95 projects with emission reductions totaling more than 260 tons (ROG, NOx, and PM). There have been recent updates to the Commercial Harbor Craft Regulation which include upcoming compliance deadlines for all commercial marine vessels.

Currently, the District's Marine Program offers incentives to marine vessels to turn over their existing, older diesel-fueled engines ahead of regulatory requirements listed in the Commercial Harbor Craft Regulation. These older engines must be diesel-fueled, and currently compliant with all CARB regulations. The marine community is aware of these upcoming deadlines and are actively reaching out to the District for guidance on how to best remain in compliance. We continually work with the local marine community, relaying the availability of grant funds, and working with them to assist in the transition to a compliant status, prior to their specific deadline.

Incentive Programs

The District currently operates four highly popular and successful incentive programs. These programs vary in scope and include light-duty vehicle scrap, electrified landscape equipment, wood burning fireplace replacements, and marine vessel speed reduction. Unlike the grant programs that require a multi-year contractual grant agreement for each project, the incentive programs generally operate as short-term voucher program with incentive amounts less than $10,000 per project.

1. Old Car Buy Back Incentive Program

Cars and trucks are a major source of smog pollution in Santa Barbara County, and older vehicles cause much more air pollution than newer ones. Since 1993, the Old Car Buy Back Program has accelerated the removal of older vehicles from the on-road fleet to reduce air pollution. Individuals receive a financial incentive to take their older vehicles off the road voluntarily. Under the program's current parameters, vehicle owners receive $1,000 to voluntarily retire their fully legal and operational 1997 or older, light or medium-duty car, truck, van, or SUV.

Participants with eligible vehicles work directly with licensed auto dismantlers who permanently destroy (i.e., crush) the old cars and trucks. The three dismantlers in Santa Barbara County that implement this program on the District's behalf are Steelhead Recyclers in Goleta, Central Valley Auto in Lompoc, and Bedlo in Lompoc. Black Road Auto and Tow in Santa Maria, who previously participated in the program, recently closed and the District is anticipating the new owners to join the program. The dismantlers perform these five critical steps:

1. Interface with the vehicle owner,
2. Verify vehicle eligibility (registration history, vehicle title, smog check, and functionality),
3. Issue payment to the vehicle owner,
4. Dismantle the vehicles, and
5. Submit required documentation to the District.

This program provides broad community benefits and is an effective partnership between staff and dismantlers. Over the past 29 years, the District has used $8.6 million of funds to implement the program. Funds were primarily obtained from $2 DMV surcharge fees, but it has also been supplemented with Carl Moyer Program funds, mutual settlement penalty fees, and local air quality mitigation fees. This program has cost-effectively retired or repaired over 8,015 vehicles and reduced an estimated 960 tons of NOx, ROC, and PM emissions throughout the County. The cost-effectiveness varies by vehicle, but is typically less than $17,000 per ton.

2. Landscape Equipment Electrification Incentive Program

Gasoline- and diesel-powered landscape equipment emit nitrogen oxides, particulate matter, carbon dioxide, and other pollutants. They contribute to regional smog and increased health risk for long-term operators of the equipment. CARB is currently working on amending the Small Offroad Engine (SORE) Regulation to transition this sector to zero emission with manufacturers required to sell primarily electric-only landscape equipment by 2024.

The District's Landscape Equipment Electrification Funds (LEEF) Program provides incentives to landscaping businesses, public agencies, schools, and non-profits to purchase zero emission electric landscape equipment. The District operated the LEEF Program for two years with $200,000 total of internal funding to help purchase 729 pieces of electric landscape equipment. Twenty pieces of gasoline equipment were also destroyed as part of a voluntary destruction incentive in LEEF Year 2.

At the end of FY 2021-22 the District was awarded $850,000 in funds from the Carl Moyer State Reserve Program to operate an incentive program for the purchase of commercial electric landscape equipment in accordance with the Carl Moyer Program Guidelines. This program will be similar to the LEEF Programs the District has run in the past, except notably, the destruction of a like-for-like piece of gasoline equipment is required for each piece of new electric equipment. The funds must be expended by the end of 2026.

3. Woodsmoke Reduction Incentive Program

Woodsmoke contains a variety of air contaminants, such as ozone precursors, particulate matter, and air toxic pollutants. Inhalation of woodsmoke can cause significant health and respiratory issues that are detrimental to the quality of one's life. Reducing regional and near-source exposure to woodsmoke is critically important to protecting the health and safety of the community.

The Woodsmoke Reduction Program helps property owners voluntarily replace an uncertified wood-burning stove, fireplace insert, or fireplace used as a primary source of heat with a cleaner-burning and more efficient device. The program is designed to maximize benefits to low-income households and communities by providing a higher incentive amount for these change-out projects. Since the inception of the program in 2017, the District has completed 133 change-outs, with 85 change-outs located in low-income households or communities. Overall, the program has operated with a cost-effectiveness of approximately $3,787 per ton of $PM_{2.5}$ reduced.

Proposed changes to the upcoming Woodsmoke Reduction Program include a focus on outreach to tribal communities and the ineligibility of natural gas-fueled heaters as replacements. Instead, the replacement heating device must be powered by electricity, such as a heat pump or electric fireplace insert. Wood and pellet-burning heating devices that meet the most rigorous emission standards will also be eligible replacement devices.

4. Vessel Speed Reduction Incentive Program

The District has worked for decades to raise awareness of the local impact of marine shipping emissions, identifying these emissions in Clean Air Plans since 1994, and calling for additional regulations to reduce emissions. Significant gains have been made as state, federal, and international measures are in place that will help reduce pollution from the marine sector over the long term, but this sector is still expected to grow. Achieving additional NOx reductions from shipping is key to ensuring continued progress towards attaining and maintaining the state ozone standards.

One strategy to significantly reduce NOx emissions and other criteria pollutants is to reduce vessel speeds, which increases the operational efficiency of the vessel by reducing fuel usage. Vessel Speed Reduction (VSR) can be implemented by most ship types, does not require any capital investments for control equipment, and reduces the noise impacts and risk of lethal ship strikes on endangered whales off the coast. The Santa Barbara Channel is a seasonal feeding ground and migration path for several whale species, including blues, fins, and humpbacks, which travel in and around the shipping lanes.

In recent years, the District and partners have implemented the Protecting Blue Whales and Blue Skies voluntary VSR incentive program for immediate air quality and whale protection benefits. The program began as a VSR Trial in 2014, and due to its success, the program continues to grow larger with every iteration. The current 2022 program began on May 1 and will last until December 15, as these dates typically coincide with ozone season and the seasonal presence of whales off the coast of California. The program requests that companies with container ships, auto carriers, and bulk and general cargo vessels slow down their ships to a speed of 10 knots or less. Containerships and auto carriers account for the majority of the transits in our region and they typically travel at higher speeds. By slowing down to the 10-knot target, vessel transit time through the Channel Region is increased by three to four hours, but it reduces the total amount of fuel burned, resulting in fuel savings and NOx reductions.

The program currently uses a fleet-based approach, as this encourages companies to slow down their entire fleet of vessels. At the end of each season after all of the ship speed data is analyzed, awards are distributed based on the tiered recognition levels, offering monetary incentives and recognition to those companies with a higher fleet participation rate. Recognition efforts can take various forms throughout the entire year. This includes promoting the achievements of the shipping companies through outreach campaigns, press coverage, social media, and web advertisements in prominent shipping, business, and logistics media outlets.

The Blue Whales and Blue Skies program is a collaborative effort involving the Santa Barbara, Ventura, and Bay Area air districts, as well as federal, state, and nonprofit organizations. The District will continue to work with the partners to assess the effectiveness of different incentive strategies and support the analysis of emission impacts associated with the VSR Program.

Funding for the program is currently administered through a CARB Supplemental Environmental Project agreement managed by Ventura County APCD. Additional details about the program, including the active 2022 program, are available at the following website: www.bluewhalesblueskies.org.

CHAPTER 7 – ATTAINMENT STRATEGY

Since the District Board adopted the initial state Air Quality Attainment Plan in 1991, the District has prepared plan updates and has adopted control measures that provide the basis for the air quality programs and regulations in place today. Even though Santa Barbara County briefly attained the state ozone standards, additional work is needed to both attain and maintain the state standards for the years to come. The District will continue to implement its core programs, as described in this chapter, which are expected to result in additional emission reductions. The District also relies on the commitments from CARB to help control emissions from on-road and off-road equipment. The combined efforts will help promote cleaner, healthy air for the residents and visitors of Santa Barbara County.

Stationary Sources

As discussed in Chapter 4 of this Plan and shown on Table 4-1, the District has already adopted more than 30 control measures to reduce ROC and NOx emissions. These control measures cover a wide range of source categories, which includes oil & gas facilities, automotive coating operations, and internal combustion engines. All of the District's existing rules and regulations will remain in effect at the current level of compliance approved by the Board.

Regulation VIII, New Source Review (NSR), is a core component of the District's stationary source control program. Pursuant to the anti-backsliding requirements of California Senate Bill 288 – the Protect California Air Act of 2003, the District's New Source Review requirements will remain in effect. The NSR requirements continue to ensure that new, large projects are controlled through the use of Best Available Control Technology (BACT) and that they provide offsets in the form of Emission Reduction Credits (ERCs) to mitigate any increases above the emission offset threshold. This program prevents air quality degradation by both controlling and offsetting emissions generated by new and modified stationary sources, thus ensuring that they do not interfere with the attainment or maintenance of any air quality standard.

New and existing stationary sources with District permits will continue to be inspected and evaluated by the District's Compliance Division, and this will ensure that the sources continue to meet permit requirements and comply with the District's prohibitory rules. The District manages permits for approximately 1,200 permitted or registered stationary facilities. Field inspectors verify compliance by conducting and documenting facility inspections, reviewing records, and taking enforcement action if permit conditions or rule requirements are not met. The inspection is also a valuable tool to educate the facility operators and to minimize pollution in accordance with their permit.

Emission Inventory Tracking

As discussed in Chapter 3 of this Plan, the District compiles an annual emission inventory and submits the emissions data to CARB, who reviews the data in preparation of their National

Emission Inventory submittal to the U.S. EPA. The emission inventory is compiled using activity level throughput data that permitted facilities are required to submit to the District every year through the District's annual reporting process. Annual reports also serve as a compliance tool to ensure that permitted facilities do not exceed their annual throughput or emission limits.

In the last several years, Assembly Bill 197 (adopted in September 2016) and Assembly Bill 617 (adopted in July 2017) have been passed by the state legislature, further enhancing and streamlining the emission reporting requirements for stationary sources of air pollution. AB 197 created a mandate for CARB to make more emission information readily available on their website for public review. With this directive, CARB created the Pollution Mapping Tool, which displays the reported greenhouse gas, criteria pollutant, and toxic air contaminant emissions for large stationary sources across the state.[32] The Pollution Mapping Tool is useful to allow the public to view emission trends over time and to compare the emissions between different facilities. District staff have been working with CARB to ensure that the emissions information is accurate and presented in a clear, straightforward manner.

In response to AB 617, CARB adopted the Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants. This regulation is intended to help the air districts, community members, scientists, industry, consultants, and government agencies to better identify regions that are most affected and in need of additional resources to resolve inequities related to air pollution exposure. The District is working with CARB on the implementation of this new regulation, which will require additional emission information from the District's permitted facilities. The District has worked closely with local facilities for many decades and has detailed knowledge of these facilities' permitting and data quantification methodologies.

While we have seen a declining amount of NOx and ROC emissions produced locally over the last few decades, the forecasted NOx inventory predicts near-term increases in offshore emissions due to the anticipated growth in the marine shipping sector. These growth projections will be monitored and refined as new data becomes available. The District continues to work with CARB to present the best available information, with the goal of providing the most accurate and complete emission inventory for all emission sectors. Accurate emission projections will help the District evaluate strategies and allocate resources to mitigate air pollution.

Land-use/CEQA Review

Whether it is a newly proposed residential community or a zoning decision for an industrial factory, land use decisions affect air quality. New commercial, industrial, and residential developments contribute to short- and long-term air quality impacts through both the construction and operational emissions of the project. As California continues to grow and the population increases, we expect there to be new developments that emit additional smog-

[32] ww3.arb.ca.gov/ei/tools/pollution_map/pollution_map.htm

forming pollution in our county. These impacts and projections have been incorporated into the forecasted emission inventory in Chapter 3. However, new development proposals must also be evaluated under the California Environmental Quality Act (CEQA) by the decision-making body (e.g., cities, the County, or other special districts or institutions). CEQA requires state and local agencies to identify and reduce the environmental impacts of land-use decisions. In the context of new development projects, the District typically has either a responsible agency or a commenting agency role under CEQA, and reviews and comments on 100 or more projects a year. The District will continue to review development proposals and recommend measures to reduce project-related air quality impacts to ensure that new development does not impact our ozone attainment status. In addition, District staff provides tools and guidance on how to quantify and mitigate air quality impacts related to new developments.

Transportation Control Measures

Generally, TCMs are programs or activities that states and localities can implement to encourage the traveling public to rely less on the automobile or to use the automobile more efficiently. Chapter 5 of this Plan provides a more detailed discussion of the TCMs that have been adopted and continue to be implemented through the planning and funding of various transportation projects and programs in Santa Barbara County. The District participates in the Santa Barbara County Association of Government's (SBCAG) technical review committees, as well as SBCAG's process to develop and update their Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The District also participates in a variety of community programs and events aimed at using automobiles more efficiently or reducing their use, including Santa Barbara County's Sustainability Committee, the Central Coast Clean Cities Coalition, the Green Business Program of Santa Barbara County, Santa Barbara Car Free, and Open Streets events.

CARB Mobile Source Strategy

The 2020 Mobile Source Strategy (2020 MSS) was adopted by the Board of Directors for CARB in October 2021. The document outlines the planning requirements and pathways forward for the various mobile sectors in order to achieve California's numerous goals and targets over the next 30 years. The 2020 MSS addresses light-, medium-, and heavy-duty on-road vehicles, as well as a wide range of off-road equipment sectors. Achieving all of the State's near-and long-term goals requires action across the full spectrum of mobile sources. The scenarios and concepts included in the 2020 MSS provide emission reductions for the purpose of meeting federal ambient air quality standards and substantially reducing greenhouse gas emissions. The District relies on these statewide planning efforts to help reduce the emissions from on-road and off-road equipment. Two of the recently adopted statewide regulations and one new control measure are discussed in more detail below.

Small off-road engines (SORE) are spark-ignition engines rated at less than 25 horsepower that are used to power a variety of equipment including lawn mowers, leaf blowers, chainsaws, and

air compressors. In December 2021, CARB adopted amendments to the SORE regulation to require newly purchased units to meet a zero-emission standard beginning in 2024. Existing gasoline-fired units may still be operated, but they will need to be replaced with electrical alternatives at the end of their useful life. The level of performance of electrical-corded and battery-powered equipment have greatly increased in recent years while the associated costs have been declining, making it technologically feasible to have a zero-emission standard for lawn and garden equipment. The amendments are expected to result in a 43 percent reduction of NOx and a 51 percent reduction of ROG from the source category while also improving the overall health of local communities.

Commercial Harbor Craft, which includes vessels such as ferries, barges, tugboats, and fishing vessels, are a vital part of California's economy. They are essential for moving cargo and providing services at various seaports, harbors, and marinas throughout California. However, coastal areas throughout the State continue to be impacted by their emissions. To help control the emissions from commercial harbor craft, CARB adopted amendments to the Commercial Harbor Craft Regulation in March 2022. The new amendments will require zero-emission options where feasible, and cleaner combustion Tier 3 and 4 engines on all other vessels by 2032. These amendments are expected to result in a 54 percent reduction in NOx and an 89 percent reduction of diesel particulate matter from the source category, which will help reduce the cancer risk to the 22 million residents who live near the California coast.

Although Ocean-Going Vessels (OGV), such as containerships and auto carriers, are primarily regulated by the U.S. EPA and IMO, CARB added a discussion on potential statewide OGV control measures to their 2020 Mobile Source Strategy. CARB is evaluating the concept of incentive or regulatory measures that achieve slower vessel speeds within Regulated California Waters (24 nautical miles from shore). Such a measure is not anticipated until year 2025 or beyond, but the program could be similar to or work in conjunction with the voluntary VSR incentive program that is currently implemented in the Southern California and San Francisco Bay regions. The District continues to advocate for such a program as it would provide the necessary support and funding needed to achieve additional NOx reductions.

Voluntary Incentive Strategies

The voluntary incentive and grant programs that the District currently implements continue to achieve cost-effective reductions in ozone precursor emissions. As explained in Chapter 6, new programs have been created and existing programs have been greatly expanded in recent years due to the state allocation of funds and an increased emphasis on addressing air quality impacts in disadvantaged and low-income communities. The District will continue to pursue additional state and federal funds that can be used locally to improve air quality through voluntary programs.

Prescribed Burn Program

Prescribed burning involves setting planned fires to fallen tree branches, dead grasses and trees, and thick undergrowth to help maintain the overall health of a forest. The District coordinates with local, state, and federal land managers [e.g. Santa Barbara County Fire Department, National Forest Service, Vandenberg Space Force Base] to achieve successful burns with minimal impacts. To have a successful prescribed burn, the land manager must submit the required smoke management plan to the District for review and approval. The smoke management plan outlines how the burn will be conducted and includes details such as how many acres the fire will cover, what will be burned, the methods to notify the public about the burn, and the anticipated meteorological conditions to achieve successful smoke dispersion. Since prescribed burns are highly dependent on the weather, they may be rescheduled if the desired conditions aren't met. If the weather unpredictably shifts during the burn and causes adverse smoke impacts, the land manager can order the fire to be extinguished. To make sure that the land managers and the public are aware of any smoke impacts, the District often sets up a portable air monitor in the nearby community.

As catastrophic wildfires continue to be a growing concern in California, the use of prescribed burning to help reduce hazardous fuels is projected to increase. Prescribed burns are designed to burn less intensely than wildfires since they are ignited amid controlled conditions to minimize potential smoke impacts, while wildfire events are more likely to result in episodes of harmful air quality. Furthermore, prescribed burns make forest environments healthier, more stable, and more resilient to change. Due to historical fire suppression efforts, many forests in California contain excess amounts of vegetation that serve as fuel and, as a result, are highly susceptible to catastrophic wildfires. Prescribed burning is an effective way to reduce the potential for destructive wildfire events and maintain healthy forest ecosystems. As part of this attainment plan, the District will continue to work and coordinate with local, state, and federal stakeholders to increase the efficiency of the Prescribed Burn Program.

Public Awareness and Education

The District uses a variety of methods to share information about air quality and District programs. Those methods include the District website, news releases, air quality alerts, social media (Twitter, Instagram, and Nextdoor), media interviews, educational programs, school and civic group presentations, participation at events and festivals, and phone calls with the public. Efforts are made to provide information in both English and Spanish. All of these activities promote agency awareness and involvement in community programs, encouraging Santa Barbara County residents to consider ways in which they can help reduce air quality impacts.

APPENDIX A – 1-HOUR AND 8-HOUR EXPECTED PEAK DAY CONCENTRATIONS

This appendix presents the numerical values of the 1-hour and 8-hour expected peak day concentrations for the six monitoring sites in the County that typically record the highest ozone concentrations. This data is used to create Figures 2-2 and 2-3.

TABLE A-1: STATE 1-HOUR OZONE EPDCS – TOP 6 MONITORING SITES

Year	Las Flores Canyon	Paradise Road	Carpinteria	Santa Ynez	Lompoc HS&P	Goleta	State 1-hr Standard
1990	0.139	0.125	0.122	0.106	0.105	0.111	**0.09**
1991	0.136	0.126	0.124	0.105	0.102	0.110	**0.09**
1992	0.129	0.118	0.118	0.099	0.092	0.110	**0.09**
1993	0.121	0.113	0.118	0.100	0.096	0.114	**0.09**
1994	0.121	0.107	0.119	0.100	0.094	0.109	**0.09**
1995	0.122	0.107	0.114	0.097	0.096	0.100	**0.09**
1996	0.131	0.110	0.117	0.102	0.092	0.102	**0.09**
1997	0.124	0.109	0.113	0.100	0.093	0.099	**0.09**
1998	0.116	0.110	0.110	0.098	0.091	0.095	**0.09**
1999	0.103	0.103	0.098	0.087	0.085	0.087	**0.09**
2000	0.100	0.102	0.093	0.088	0.084	0.083	**0.09**
2001	0.097	0.100	0.091	0.088	0.084	0.082	**0.09**
2002	0.095	0.103	0.090	0.088	0.081	0.080	**0.09**
2003	0.092	0.105	0.089	0.089	0.086	0.078	**0.09**
2004	0.095	0.102	0.089	0.092	0.086	0.080	**0.09**
2005	0.094	0.098	0.090	0.091	0.086	0.081	**0.09**
2006	0.092	0.090	0.082	0.084	0.078	0.078	**0.09**
2007	0.090	0.094	0.081	0.081	0.074	0.075	**0.09**
2008	0.090	0.091	0.090	0.081	0.076	0.076	**0.09**
2009	0.093	0.088	0.094	0.081	0.077	0.075	**0.09**
2010	0.088	0.086	0.096	0.082	0.078	0.075	**0.09**
2011	0.087	0.086	0.092	0.078	0.076	0.072	**0.09**
2012	0.082	0.082	0.085	0.075	0.074	0.069	**0.09**
2013	0.079	0.078	0.082	0.072	0.074	0.069	**0.09**
2014	0.083	0.075	0.085	0.073	0.073	0.075	**0.09**
2015	0.082	0.076	0.084	0.075	0.073	0.077	**0.09**
2016	0.082	0.076	0.083	0.075	0.070	0.078	**0.09**
2017	0.080	0.075	0.071	0.072	0.071	0.076	**0.09**
2018	0.079	0.075	0.072	0.071	0.070	0.072	**0.09**
2019	0.080	0.072	0.077	0.071	0.070	0.072	**0.09**
2020	0.079	0.079	0.081	0.073	0.071	0.069	**0.09**

Values greater than the state 1-hour ozone standard are highlighted in yellow.

TABLE A-2: STATE 8-HOUR OZONE EPDCS – TOP 6 MONITORING SITES

Year	Las Flores Canyon	Paradise Road	Carpinteria	Santa Ynez	Lompoc HS&P	Goleta	State 8-hr Standard
1990	0.111	0.110	0.100	0.092	0.094	0.093	**0.070**
1991	0.111	0.111	0.098	0.091	0.088	0.091	**0.070**
1992	0.108	0.106	0.094	0.086	0.081	0.093	**0.070**
1993	0.102	0.104	0.097	0.086	0.086	0.094	**0.070**
1994	0.104	0.098	0.096	0.089	0.086	0.092	**0.070**
1995	0.107	0.098	0.094	0.087	0.087	0.087	**0.070**
1996	0.112	0.101	0.095	0.092	0.084	0.088	**0.070**
1997	0.110	0.099	0.093	0.089	0.083	0.086	**0.070**
1998	0.101	0.100	0.089	0.088	0.082	0.082	**0.070**
1999	0.092	0.091	0.080	0.075	0.078	0.073	**0.070**
2000	0.091	0.091	0.079	0.077	0.077	0.070	**0.070**
2001	0.087	0.090	0.078	0.078	0.078	0.071	**0.070**
2002	0.084	0.092	0.076	0.080	0.075	0.069	**0.070**
2003	0.081	0.095	0.074	0.081	0.079	0.068	**0.070**
2004	0.085	0.093	0.077	0.083	0.080	0.071	**0.070**
2005	0.085	0.090	0.079	0.081	0.079	0.072	**0.070**
2006	0.083	0.084	0.072	0.074	0.072	0.070	**0.070**
2007	0.080	0.084	0.070	0.070	0.069	0.066	**0.070**
2008	0.080	0.084	0.078	0.073	0.071	0.066	**0.070**
2009	0.084	0.081	0.082	0.074	0.072	0.065	**0.070**
2010	0.082	0.079	0.083	0.075	0.072	0.065	**0.070**
2011	0.080	0.079	0.080	0.072	0.071	0.065	**0.070**
2012	0.074	0.077	0.074	0.069	0.070	0.061	**0.070**
2013	0.071	0.073	0.074	0.065	0.069	0.064	**0.070**
2014	0.074	0.073	0.076	0.067	0.070	0.070	**0.070**
2015	0.076	0.073	0.076	0.070	0.070	0.070	**0.070**
2016	0.076	0.072	0.074	0.070	0.068	0.071	**0.070**
2017	0.075	0.069	0.062	0.068	0.068	0.068	**0.070**
2018	0.072	0.068	0.063	0.066	0.068	0.065	**0.070**
2019	0.072	0.068	0.068	0.066	0.067	0.064	**0.070**
2020	0.074	0.073	0.072	0.066	0.066	0.062	**0.070**

Values greater than the state 8-hour ozone standard are highlighted in yellow.

APPENDIX B – NATURAL SOURCE EMISSIONS

Natural sources are non-anthropogenic sources that include biogenic emissions, petroleum oil & gas seeps (geogenic), and wildfires. A planning inventory does not include the emissions from natural sources since they are not regulated nor controlled through the implementation of emission control measures. A brief description of the three natural source categories is provided below.

Biogenic Emissions:

Biogenic emissions mainly consist of isoprenes, terpenes, and other ROC that are emitted from plants and trees. NOx emissions are also emitted from the natural soils. The California Air Resources Board estimates biogenic ROC emissions using the MEGAN model (Model of Emissions of Gases and Aerosols from Nature) and biogenic NOx emissions using the DNDC model (Denitrification-Decomposition).

Seeps (or Geogenic Emissions):

Oil and gas seeps have occurred naturally off the coast of California for thousands of years. They are associated with cracks in the Earth's crustal layers in which oil floats to the surface of the water and gas bubbles out and escapes into the air. The emissions are estimated by the District using a combination of various studies surrounding Coal Oil Point, which is located in the Santa Barbara Channel.

Wildfires:

A wildfire is an unplanned, natural event that burns a variety of vegetation types. The California Air Resources Board estimates wildfire emissions using the FOFEM model (First Order Fire Effects Model). This model uses Geographic Information Systems (GIS) data on the fire perimeters, vegetation composition, fuel density (tons/acre), and fuel moisture to estimate the emissions. Wildfires do not include prescribed burns, as prescribed burns are planned events to ignite the fire for resource or safety benefits and defined as an area source.

In order to provide additional perspective on the magnitude of emissions from natural sources, Table B-1 provides the local and statewide emission estimates for natural sources, and Figure B-1 provides the estimates on the statewide wildfire acreage burned over the last two decades.

TABLE B-1: 2018 NATURAL SOURCE ROC AND NOX (TONS PER DAY)

	ROC		NOx	
NATURAL SOURCES	**Santa Barbara County**	**Statewide**	**Santa Barbara County**	**Statewide**
BIOGENICS	54.80	3,432.80	0.36	25.41
SEEPS	26.36	30.80	0.00	0.00
WILDFIRES	0.09	1,244.50	0.06	122.10
NATURAL SOURCE TOTAL	**81.25**	**4,708.10**	**0.42**	**147.51**

FIGURE B-1: STATEWIDE WILDFIRE DATA – ACREAGE OF BURNED WILDLAND