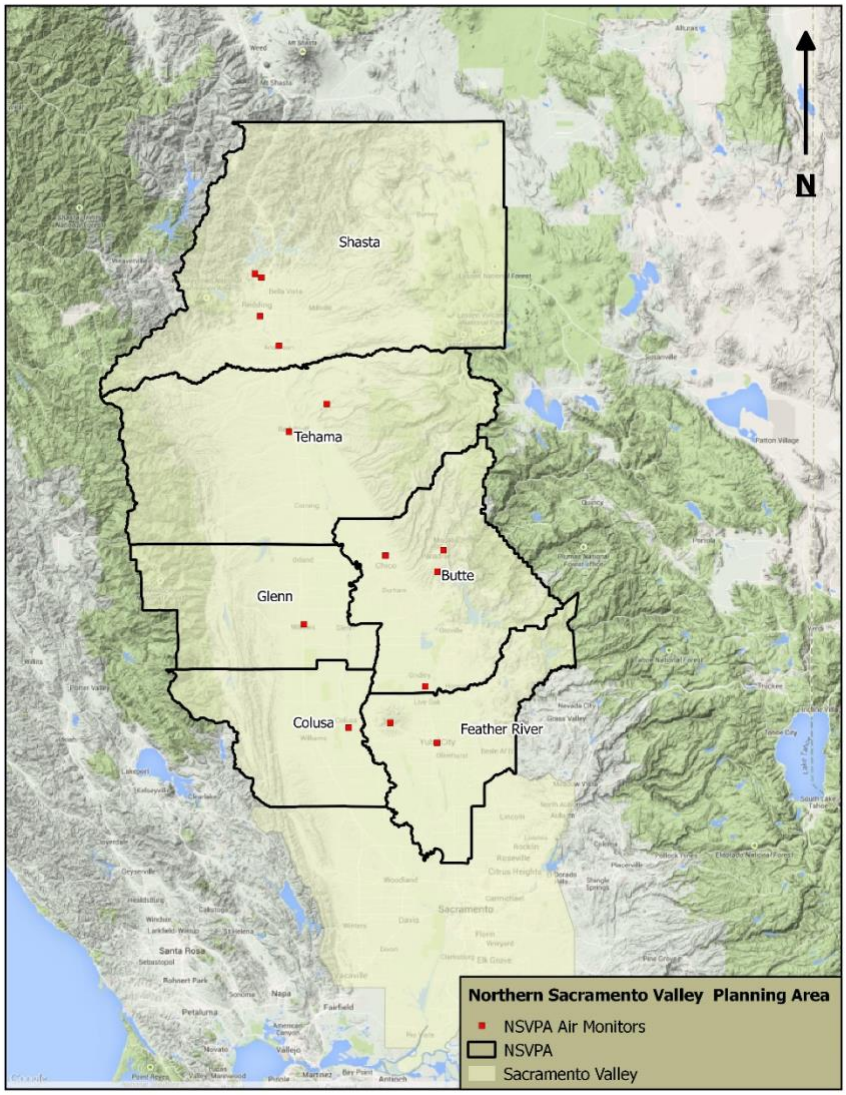


# NORTHERN SACRAMENTO VALLEY PLANNING AREA 2021 TRIENNIAL AIR QUALITY ATTAINMENT PLAN

PREPARED BY THE SACRAMENTO VALLEY AIR QUALITY ENGINEERING AND ENFORCEMENT PROFESSIONALS (SVAQEEP)

# EXECUTIVE SUMMARY

The California Clean Air Act (CCAA) requires air districts which have been designated as a nonattainment area for California Ambient Air Quality Standards (CAAQS) for ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide to prepare and submit a plan for attaining and maintaining the standards. The CCAA also requires that districts review their progress made toward attaining the CAAQS every three years.

The Air Pollution Control Districts and Air Quality Management Districts (Districts) for the counties located in the northern portion of the Sacramento Valley together establish the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA County of Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba counties have agreed to jointly prepare an Air Quality Attainment Plan. Glenn and Colusa Counties are in Attainment but continue to participate in the regional effort.

The 2021 triennial update of the NSVPA Air Quality Attainment Plan (2021 Plan) assesses the progress made in implementing the previous triennial update and proposes modifications to the strategies necessary to attain the CAAQS by the earliest practicable date. The 2021 Plan includes an assessment of progress towards achieving the control measure commitments in the previous Triennial Plan, a summary of the last three years of ozone data, a comparison of the expected versus actual emission reductions for each measure committed to in the previous Triennial Plan, updated control measure commitments, and updated growth rates of population, industry, and vehicle related emissions.

In the NSVPA, ozone can be caused by stationary source emissions, such as from internal combustion engines or boilers, mobile sources such as cars, trucks, and trains, or area sources such as consumer products or wildfires. The NSVPA districts also experience transport ozone from the Broader Sacramento Area (BSA), which comprise of all of the Sacramento Metropolitan AQMD, Yolo-Solano AQMD, and a portion of El Dorado, Placer, and Sutter Counties. Emissions that were originally created in the BSA can be transported northward via prevailing winds to affect the pollution levels of the NSVPA. The impacts of transported BSA air pollution to Districts in the NSVPA are variable. The California Air Resources Board's (CARB) March 2001 assessment of the transport of ozone from the BSA to the NSVPA districts was determined to be inconsequential. No further ozone transport assessments have been undertaken by CARB.

The 2018 through 2020 monitoring data shows a slight increase in the number of exceedances of the 1-hour ozone CAAQS. However, wildfires continue to be a major contributor to these exceedances and the data continues to show a downward trend in the number of exceedances of 8-hour ozone CAAQS. Mobile sources comprise the majority of the NOx emission inventory in 2020, an estimated 68% of the total. Area-wide sources account for 42% of the ROG inventory in 2020. The projected emissions show a downtrend for both ROG and NOx, which are the precursor emissions for ozone. The Carl Moyer and FARMER programs in the NSVPA have resulted in an estimated 281.72 tons of NOx and 31.27 tons of ROG reduced during the past three years. The NSVPA Districts also funded emission reduction projects through AB 617 Community Air Protection Programs, AB 2788/AB 923 Vehicle Fee Programs, Wood Stove Changeout Programs, and Off-Road Voucher Incentive Programs.

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# CHAPTER I – PLAN OVERVIEW

## I.1 LEGISLATIVE REQUIREMENTS

It is the responsibility of each District within the State of California to attain and maintain the ambient air quality standards. If a standard is not met, the CCAA requires the District to create an Air Quality Attainment Plan for the designated criteria pollutant so the District can demonstrate how they plan to meet the standard in the future. Examples of criteria pollutants include ozone ($O_3$), carbon monoxide (CO), sulfur oxides ($SO_x$), and nitrogen oxides ($NO_x$).[1]

The California Health & Safety Code (HSC) requires that the Plan be updated every three years.[2] The HSC §40910 and §40913 require the Districts to achieve CAAQS by the earliest practicable date to protect the public's health, particularly that of children, the elderly, and people with respiratory illness.

The 2021 Plan assesses the progress made in implementing the previous triennial update completed in 2018 and proposes modifications to the strategies necessary to attain the CAAQS by the earliest practicable date. The 2021 Plan includes the following:

1. Assessment of progress towards achieving the control measure commitments in the previous Triennial Plan (HSC §40924(a));
2. Summary of the last three years of ozone data to demonstrate improvement of air quality (HSC §40924(b)(1));
3. Comparison of the expected versus actual emission reductions for each measure committed to in the previous Triennial Plan (HSC §40924(b)(2)); and

[1] HSC §40911(a).
[2] HSC §40924(b), §40925

4. Updated control measure commitments and growth rates of population, industry, and vehicle related emissions (HSC §40925(a)).

The HSC §41503(b) requires that control measures for the same emission sources are uniform throughout the planning area to the extent that is feasible. To meet this requirement, the NSVPA has coordinated the development of the 2021 Plan and has set up a specific rule adoption protocol. The protocol was established by the Technical Advisory Committee (TAC) of the Sacramento Valley Basin-wide Air Pollution Control Council. The protocol allows the Districts in the basin to act and work as a group to coordinate with the Air Resources Board (ARB) as well as industry in the rule adoption process.

The HSC §40912, states that each District responsible for or affected by air pollutant transport shall provide for attainment and maintenance of the State and Federal standards in both upwind and downwind Districts. This section also states that each downwind District's Plan shall contain sufficient measures to reduce emissions originating in each District to below the levels which violates State ambient air quality standards, assuming the absence of the transport contribution.

HSC §40914 requires that each plan achieve a 5 percent or more per year reduction in ozone precursor emissions, unless an alternative measure of progress is approved pursuant to HSC §39607. If a district cannot achieve these reductions, the CCAA provides that districts can develop approvable plans provided the plans commit to:

1. An alternative emission reduction strategy that is equal to or more effective than district-wide emission reductions in improving air quality; or

2. The implementation of every feasible measure on an expeditious schedule.[3]

ARB interprets the adoption of every feasible measure to mean that, at a minimum, a district considers regulations that have been successfully implemented elsewhere. Districts should also consider going beyond what has already been accomplished by evaluating new technologies and innovative approaches that may offer potential emission reductions. Further, districts should consider not only technological factors, but also social, environmental, economic (e.g. cost-effectiveness), and energy factors which prevail in the district, along with the resources realistically available to the district to adopt, implement, and enforce the measures.

## I.2 BACKGROUND OF THE AIR QUALITY ATTAINMENT PLAN AND TRIENNIAL UPDATES

Due to the regional nature of the ozone problem and the fact that the NSVPA counties share the same air basin with the BSA, the Air Quality Attainment Plan and subsequent triennial updates were prepared by the Sacramento Valley Air Quality Engineering and Enforcement Professionals (SVAQEEP) with oversight from the Sacramento Valley Air Basin Control Council's Technical Advisory Committee (TAC). The Basin Control Council (BCC) approves the triennial updates prior to the individual NSVPA Districts adopting the Plan.

[3] Identification of Achievable Performance Standards and Emerging Technologies for Stationary Sources – March 1998; Identification of Performance Standards for Existing Stationary Sources – Last Reviewed, April 2010 http://www.arb.ca.gov/ssps/ssps.htm

The NSVPA Districts jointly prepared the original 1991 Air Quality Attainment Plan. Triennial updates to the Plan were adopted by the BCC for the NSVPA districts in 1994, 1997, 2000, 2004, 2006, 2009, 2012, 2015, and 2018.

## I.3 AREA DESCRIPTION

### a. Geography

The NSVPA includes Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba counties. The Northern Sacramento Valley Air Basin (NSVAB) is synonymous with the NSVPA. These counties comprise the northern portion of the Sacramento Valley and are bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6,000 feet above mean sea level (MSL), with individual peaks rising much higher. The mountains provide a substantial barrier to both locally created pollution and the pollution that has been transported northward on prevailing winds from the BSA. The NSVAB is shaped like an elongated bowl. Temperature inversion layers can act as a lid on the bowl, allowing air pollution to rise to unhealthy levels

Although a significant area of the NSVPA is at elevations higher than 1,000 feet above MSL, the vast majority of its populace lives and works below that elevation.

### b. Population and VMT Growth Data

HSC §40925(a) requires that the triennial updates include population, industry and vehicle related emissions growth experienced in the district and projected for the future. Table I-1 includes the population and vehicle miles traveled data for each county from 1990 to 2010, and the projections for 2015 and 2020.[4]

The population data were derived from reports developed by the California Department of Finance, Demographic Research Unit. The estimates of daily vehicle miles traveled (VMT) for the years 2000 through 2040 are found in ARB's onroad mobile source emissions inventory model, EMFAC2017 v1.0.3 (arb.ca.gov/emfac/emissions-inventory). The average daily VMT has been divided by 1000.

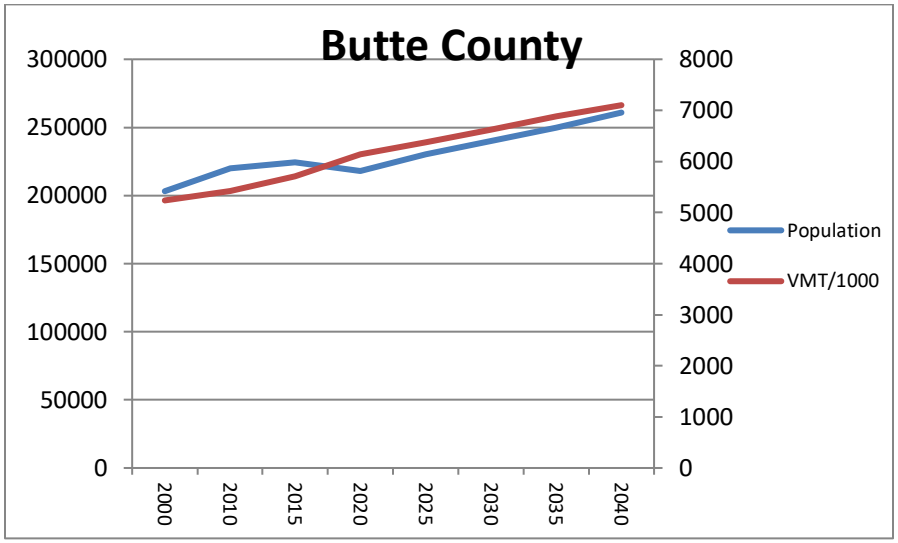
Table I-1: Population and VMT Growth in the NSVPA

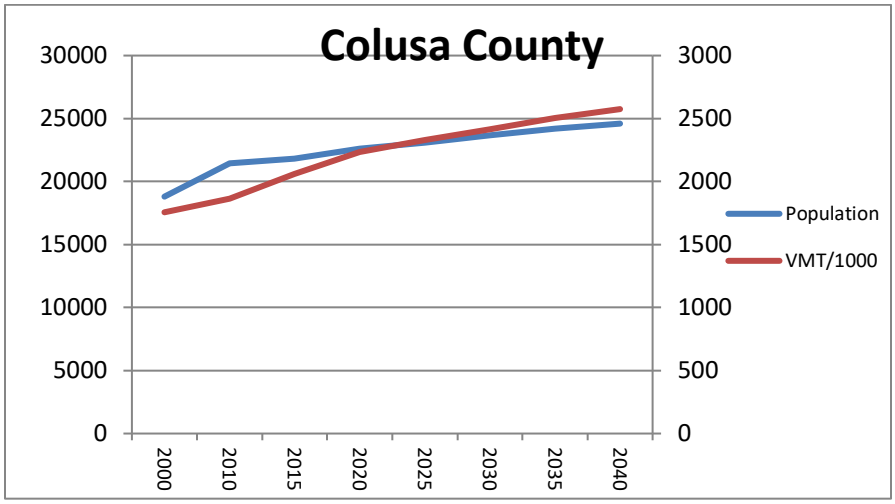
| County | Parameter | 2000 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|---|
| Butte | Population | 203,171 | 219,945 | 224,301 | 217,769 | 230,003 | 239,784 | 249,929 | 260,890 |
| | VMT/1000 | 5,237 | 5,424 | 5,703 | 6,142 | 6,377 | 6,626 | 6,883 | 7,102 |
| Colusa | Population | 18,804 | 21,473 | 21,814 | 22,593 | 23,093 | 23,671 | 24,203 | 24,598 |
| | VMT/1000 | 1,756 | 1,864 | 2,058 | 2,233 | 2,328 | 2,417 | 2,503 | 2,575 |
| Glenn | Population | 26,453 | 28,143 | 28,316 | 29,348 | 29,969 | 30,476 | 30,754 | 30,795 |

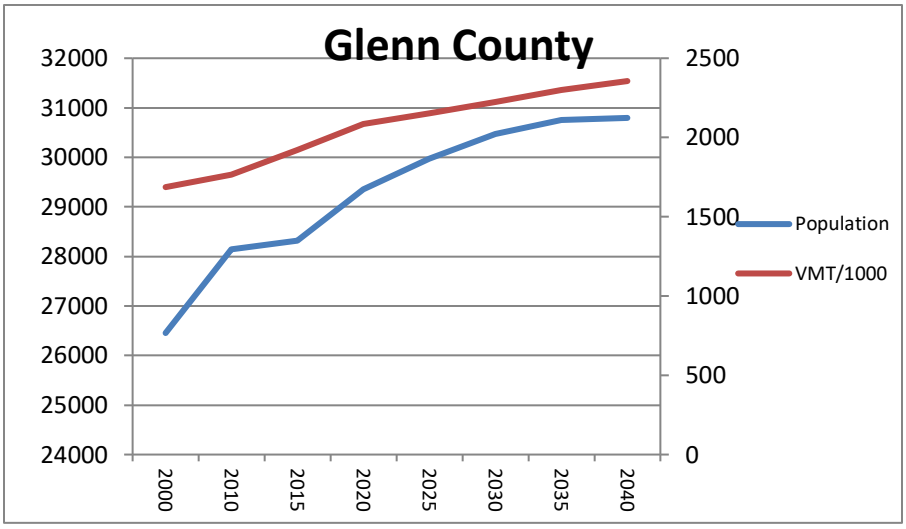
[4] http://www.arb.ca.gov/aqd/almanac/almanac13/appc13.htm

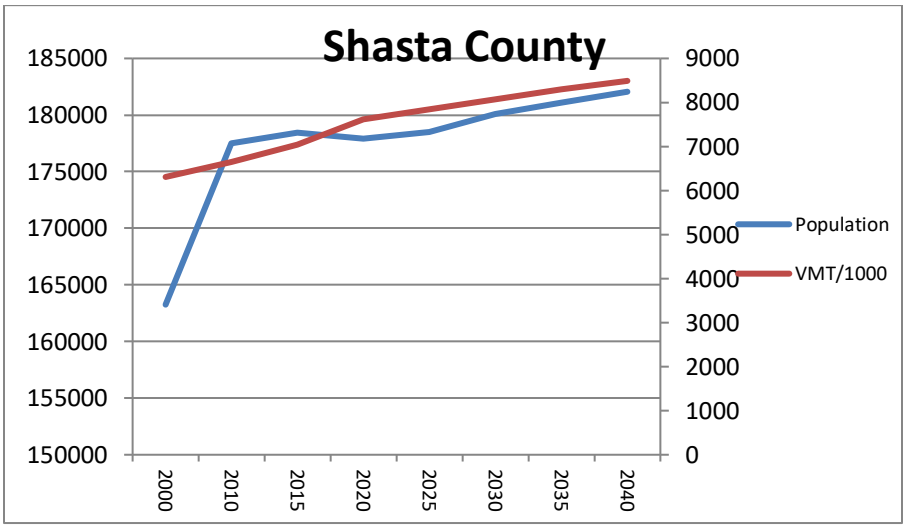
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | VMT/1000 | 1,687 | 1,767 | 1,922 | 2,084 | 2,154 | 2,226 | 2,298 | 2,356 |
| Shasta | Population | 163,256 | 177,472 | 178,422 | 177,925 | 178,494 | 180,103 | 181,111 | 182,059 |
| | VMT/1000 | 6,308 | 6,642 | 7,038 | 7,616 | 7,851 | 8,076 | 8,303 | 8,490 |
| Sutter | Population | 78,930 | 94,669 | 96,976 | 105,747 | 114,346 | 121,376 | 128,009 | 133,610 |
| | VMT/1000 | 2,879 | 3,116 | 3,409 | 3,718 | 3,923 | 4,118 | 4,319 | 4,496 |
| Tehama | Population | 56,039 | 63,487 | 63,155 | 65,885 | 67,470 | 68,681 | 69,823 | 70,558 |
| | VMT/1000 | 3,148 | 3,367 | 3,629 | 3,961 | 4,105 | 4,252 | 4,405 | 4,535 |
| Yuba | Population | 60,219 | 72,329 | 74,472 | 79,290 | 84,206 | 89,339 | 94,627 | 99,755 |
| | VMT/1000 | 1,536 | 1,745 | 1,832 | 1,984 | 2,085 | 2,180 | 2,271 | 2,352 |

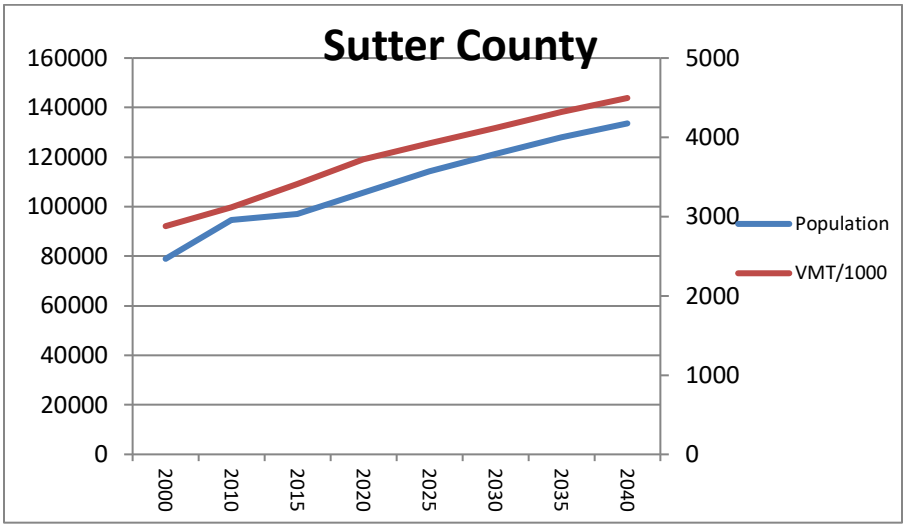
The following charts are a graphical representation of the data in Table I-1. Population and VMT in all counties of the NSVPA are expected to increase through 2040.

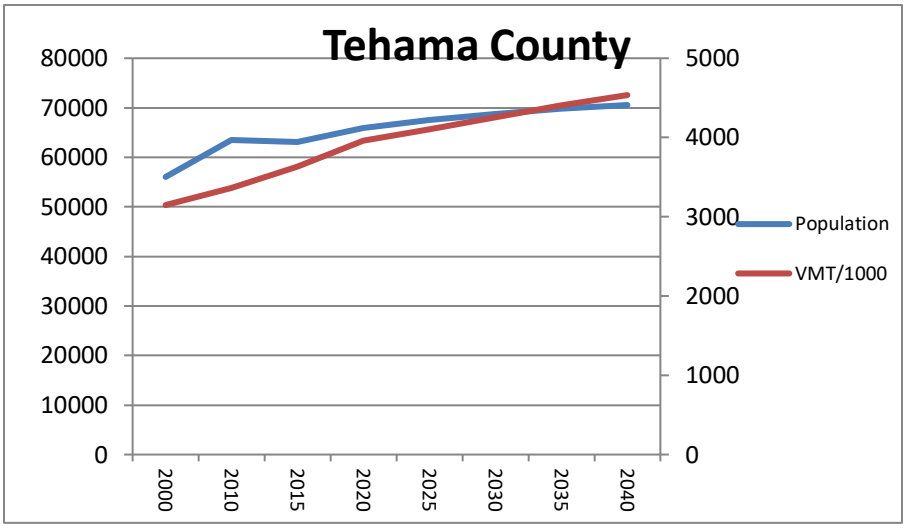


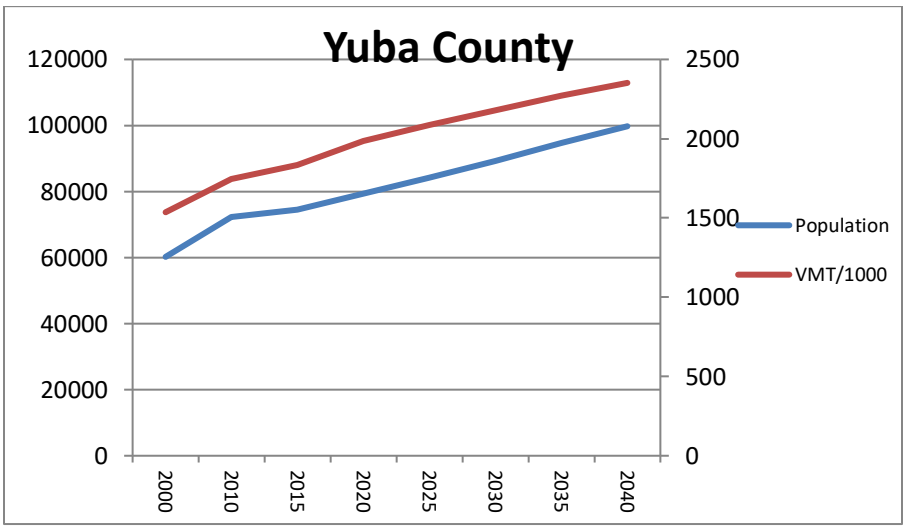

Colusa County
30000
25000
20000
15000
10000
5000
0
3000
2500
2000
1500
1000
500
0
2000
2010
2015
2020
2025
2030
2035
2040
Population
VMT/1000


Glenn County
32000
31000
30000
29000
28000
27000
26000
25000
24000
2500
2000
1500
1000
500
0
2000
2010
2015
2020
2025
2030
2035
2040
Population
VMT/1000


Shasta County
185000
180000
175000
170000
165000
160000
155000
150000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
2000
2010
2015
2020
2025
2030
2035
2040
Population
VMT/1000




**c. Meteorology and Inversions**

Meteorology can play a role in ozone formation. When the weather is warm and the winds are light, a vertical downward motion of air and a natural cooling of the earth's surface act together to form an inversion that traps pollutants. Temperature inversions prevent the vertical dilution of pollutants. Thus,

pollutants remain trapped and are able to increase in concentration in the layer of air where people breathe. Sunlight then causes a chemical reaction between the hydrocarbons and nitrogen oxides to form ozone. Summer subsidence inversions occur on summer days and tend to intensify during the afternoon. Winter radiation inversions occur on winter nights but are usually destroyed by daytime heating bringing a rapid improvement in air quality by afternoon. Both types of inversion mechanisms may exist at any time of the year, and in the fall, both may occur together to produce the heaviest pollution potential.

The climate throughout the NSVAB is similar, especially regarding the valley floor where the majority of the population resides. Summers are typically dry and warm. Most of the precipitation occurs during the winter months from December to March. The Table I.2 provides a range of meteorological data from a site in the northern portion of the NSVAB (Redding), the southern portion of the NSVAB (Marysville), and the foothill area (Paradise).[5]

Table I.2 Meteorology Data

| Site | Summer Ave. (max/min) | Winter Ave. (max/min) | Mean Precipitation |
|---|---|---|---|
| Redding | 95°F/63°F | 57°F/37°F | 35 inches |
| Paradise | 89°F/63°F | 55°F/39°F | 56 inches |
| Marysville | 94°F/59°F | 57°F/38°F | 21 inches |

## I.4 AMBIENT AIR QUALITY STANDARDS

The 1-hour ozone CAAQS (0.09 ppm or 180 µg/m$^3$) was adopted in 1988. Pursuant to Senate Bill 25 (SB25), the ozone standard was analyzed in a report entitled "Adequacy of California Ambient Air Quality Standards: Children's Environmental Protection Act" in consultation with the Office of Environmental Health Hazard Assessment (OEHHA) to evaluate if the 1-hour standard was adequate in protecting public health. Results of the study concluded that adverse health effects could occur in sensitive groups at the existing standard and slated the ozone standard for potential revision. Effective July 26, 2007, the State adopted a more stringent 8-hour ozone standard of 0.070 ppm (or 137 µg/m$^3$) in addition to the 1-hour standard.

The United States Environmental Protection Agency (US EPA or EPA) also adopted ambient air quality standards for ground level ozone. The National Ambient Air Quality Standards (NAAQS) for ground-level ozone of 70 parts per billion (0.070 ppm), became effective on December 28, 2015.[6]

| **AMBIENT AIR QUALITY STANDARDS FOR OZONE** |
|---|

[5] Data provided by the Western Regional Climate Center http://www.wrcc.dri.edu/ 3/30/2015

[6] 80 FR 65292

| State Ozone Standard: | National Ozone Standards: |
|---|---|
| 0.070 ppm for 8 hours | 0.070 ppm for 8 hours |
| 0.09 ppm for 1 hour | Effective December 28, 2015 |

## I.5 AREA DESIGNATIONS

The area designations for the California ozone ambient air quality standards of the NSVPA counties can be found in Table I-3. The Table also includes the previous designations in effect for the 2018 Plan:

Table I-3: NSVPA County Designations for Ozone CAAQS[7]

| County | 2021 Attainment Status[8] | 2018 Attainment Status |
|---|---|---|
| Butte | Nonattainment | Nonattainment |
| Colusa | Attainment | Attainment |
| Glenn | Attainment | Attainment |
| Shasta | Nonattainment-Transitional | Nonattainment |
| Sutter | Nonattainment | Nonattainment |
| Tehama | Nonattainment | Nonattainment |
| Yuba | Nonattainment | Nonattainment |

Several Districts in the NSVPA have also been designated as nonattainment for National ambient air quality standard for 8-hour ozone. The US EPA made the designations in Table I.4 for the 2015 8-hour ozone standard of 0.070 ppm which became effective on August 3, 2018.[9]

Table I.4 NSVPA Designations for Ozone NAAQS

| Area | Designation | Classification |
|---|---|---|
| Butte County | Nonattainment | Marginal[10] |
| Sutter County (partial) | Nonattainment | Moderate |

[7] California Air Resources Board – https://ww2.arb.ca.gov/our-work/programs/state-and-federal-area-designations/state-area-designations Accessed 7/13/2021

[8] California Air Resources Board - https://ww2.arb.ca.gov/rulemaking/2021/sad2020 Accessed 7/13/2021

[9] https://www.epa.gov/green-book/green-book-8-hour-ozone-2015-area-information

[10] 83 FR 25776

| | | |
|---|---|---|
| Sutter Buttes | Nonattainment | Marginal |
| Tuscan Buttes - Tehama County (partial) | Nonattainment | Marginal (Rural Transport) [11] |

As Marginal nonattainment areas, Butte County, Sutter Buttes, and Tuscan Buttes – Tehama County (partial) must meet the 8-hour ozone standard of 0.070 ppm as expeditiously as practicable but no later than 3 years after the effective date of designations, or August 3, 2021[12]. Effective August 3, 2018 US EPA has determined that the final nonattainment area for the Tuscan Buttes meets the criteria for treatment as Rural Transport Area under CAA section 182 (h). [9]As a Moderate nonattainment area and part of the Sacramento Federal Nonattainment Area (SFNA), south Sutter County must meet the standard by August 3, 2024. The SFNA has requested to be bumped-up to a serious classification with an attainment date no later than August 3, 2027.

## I.6 OVERVIEW OF AIR POLLUTANTS AND HEALTH EFFECTS

### a. Ozone

Ozone is found in two regions of the Earth's atmosphere – at ground level and in the upper regions of the atmosphere. Both types of ozone have the same chemical composition ($O_3$). While upper atmospheric ozone protects the earth from the sun's harmful rays, ground level ozone is the main component of smog.

Tropospheric, or ground level ozone, is not emitted directly into the air but is created by chemical reactions between nitrogen oxides ($NO_x$) and reactive organic gases (ROG) in the presence of sunlight. Generally, low wind speeds or stagnant air coupled with warm temperatures and cloudless skies provide for the optimum conditions for ozone formation. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often impacts a widespread area. Ozone can also be transported long distances by wind. For this reason, even rural areas can experience high ozone levels.[13]

In the NSVPA, ozone is a seasonal problem typically occurring during the months of May through October. Sources of NOx and ROG emissions include motor vehicles, power plants, factories, chemical solvents, combustion products from various fuels, and consumer products.

### b. Precursor

Precursors are directly emitted pollutants that when released to the atmosphere forms or contributes to the formation of a secondary pollutant for which an ambient air quality standard has been adopted. Nitrogen oxides and reactive organic gases are precursors to ground level ozone.

[11] 83 FR 25776

[12] Final rule - Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area Classifications Approach (March 9, 2018)

[13] https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#formation

### c. Nitrogen Oxides

Nitrogen oxides (NOx) are a group of highly reactive gasses and are also known as "oxides of nitrogen." Nitrogen oxides include nitrogen dioxide ($NO_2$), nitric oxide (NO), nitrous acid ($HNO_2$) and nitric acid ($HNO_3$). Because NOx is an ingredient in the formation of ozone, it is referred to as an ozone precursor.

NOx is emitted from combustion sources such as cars, trucks and buses, power plants, and off-road equipment. In addition to contributing to the formation of ground-level ozone, and fine particle pollution, $NO_2$ (a component of NOx) is linked with a number of adverse effects on the respiratory system.

### d. Reactive Organic Gases

Reactive organic gases (ROG) are carbon compounds that have atmospheric photochemical reactivity. ROG excludes carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. As required by the US EPA, the ROG inventory is expressed in terms of volatile organic compounds (VOC). VOC emissions are generally slightly less than ROG, because the VOC definition excludes certain compounds such as ethane, acetone, methyl acetate, and perchloroethylene, which do not contribute to ozone formation. The reader may find both terms used in this document.

### e. Health Effects of Ozone

Ozone in the air we breathe can harm our health, especially on hot sunny days when ozone can reach unhealthy levels. Even relatively low levels of ozone can cause health effects.

People most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. In addition, people with certain genetic characteristics, and people with reduced intake of certain nutrients, such as vitamins C and E, are at greater risk from ozone exposure.

Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Children are also more likely than adults to have asthma.

Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground level ozone also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.

Ozone can:

- Make it more difficult to breathe deeply and vigorously
- Cause shortness of breath and pain when taking a deep breath
- Cause coughing and sore or scratchy throat
- Inflame and damage the airways
- Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis
- Increase the frequency of asthma attacks
- Make the lungs more susceptible to infection

These effects have been found even in healthy people but can be more serious in people with lung diseases such as asthma. These effects may lead to increased school absences, medication use, visits to doctors and emergency rooms, and hospital admissions.

Ozone is a powerful oxidant that can irritate the airways causing coughing, a burning sensation, wheezing and shortness of breath. Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli. This leads to wheezing and shortness of breath. In people with asthma it can result in asthma attacks. Long-term exposure to ozone is linked to aggravation of asthma and is likely to be one of many causes of asthma development. Studies in locations with elevated concentrations also report associations of ozone with deaths from respiratory causes.[14]

## I.7 TRANSPORT OF POLLUTANTS

This portion of the Attainment Plan addresses air pollution transport, identifies transport couples, and discusses transport mitigation regulations related to the Upper Sacramento Valley (USV).[15] The CARB has identified that air pollution is transported from the Broader Sacramento Area (BSA)[16] to the Upper Sacramento Valley (USV), thus establishing the BSA/USV transport Couple.[17] The impacts of transported BSA air pollution to Districts in the USV are variable. Transport pollution impacts are classified using terms Inconsequential, Significant, and Overwhelming, as defined in below. The most recent CARB assessment, published in March 2001, indicates that all three of these classifications occur in the BSA/USV transport couple region, with the latest classification of "inconsequential" added to describe the transport couple assessment for Shasta County.

**Inconsequential** is defined as an ozone transport impact classification describing a condition that exists when upwind emissions are not transported or do not appear to contribute significantly to a violation of the State ozone standard in the downwind area. A violation not impacted by transported emissions is considered local and results when the wind flow patterns, and atmospheric conditions do

[14] https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution

[15] **Upper Sacramento Valley (USV) –** includes the Colusa, Butte, Glenn, Tehama, and Shasta County Air Pollution Control Districts, and that area of the Feather River Air Quality Management District which is north of a line connecting the northern border of Yolo County to the southwestern tip of Yuba County and continuing along the southern Yuba County border to Placer County. 17 CCR § 70500

[16] **Broader Sacramento Area (BSA)** – includes the Sacramento Metropolitan Air Quality Management District; Yolo-Solano Air Pollution Control District; the portions of the El Dorado County Air Pollution Control District included in 1990 U.S. Census Tracts 306.01, 307, 308.01, 308.02, 308.03, 308.04, 309.01, 309.02, 310, 311, 312, 315.01, and 315.02; and the portions of the Placer County Air Pollution Control District included in 1990 U.S. Census Tracts 203, 204, 205, 206.01, 206.02, 206.03, 207.01, 207.02, 207.03, 208, 209, 210.01, 210.02, 211.01, 211.02, 212, 213.01, 213.02, 214, 215.01, 215.02, 216, 218.01, and 218.02; and that area of the Feather River Air Quality Management District which is south of a line connecting the northern border of Yolo County to the southwestern tip of Yuba County, and continuing along the southern Yuba County border to Placer County. 17 CCR § 70500

[17] A pair of geographic areas, one considered upwind and one considered downwind.

not strongly suggest responsibility from an upwind area. The responsibility of “inconsequential” transport lies with the downwind area.

**Significant** is defined as an ozone transport impact classification describing a condition in which the emissions from the upwind area contributed measurably to a violation of the State ozone standard in the downwind area on any given day but did not “overwhelm” the area. A violation is considered to be caused by “significant” transport if the emissions from sources within the downwind area combine with the transported air parcel carrying ozone or ozone precursors from the upwind area. A violation classified as “significant” is considered shared, with the responsibility lying with both the upwind and downwind areas.

**Overwhelming** is defined as an ozone transport impact classification describing a condition which exists when emissions from an upwind area independently cause a violation of the State ozone standard in a downwind area on any given day. This classification assumes that significant emission sources in the downwind area were not in the pathway of the air parcel.

# CHAPTER II - AIR MONITORING

## II.1 INTRODUCTION

This chapter of the Plan looks at air quality monitoring data from each of the ozone monitoring sites in the NSVPA. Figure II-1 shows the location of the air monitoring stations operating in the NSVAB. Between 2018 and 2020 there were twelve ozone monitors operating within the NSVAB.

FIGURE II.1 Air Quality and Meteorological Stations in the NSVAB


The State standard allows only one exceedance per year on average at any site within the air district in the preceding three-year period. This takes into account year-to-year weather fluctuation and any exceptional exceedances. The maximum 1-hour and 8-hour concentrations observed between 2018 and 2020 for the NSVPA are shown in Figure II.2 and II.3 below. The 1-hour standard is 0.09 ppm and the 8-hour standard is 0.070 ppm.

2018 and 2020 each had wildfire events of unprecedented size and intensity. The following data includes measurements which took place during these extraordinary events.

Figure II.2 NSVPA Monitoring Sites 1-hour Maximum Ozone Values

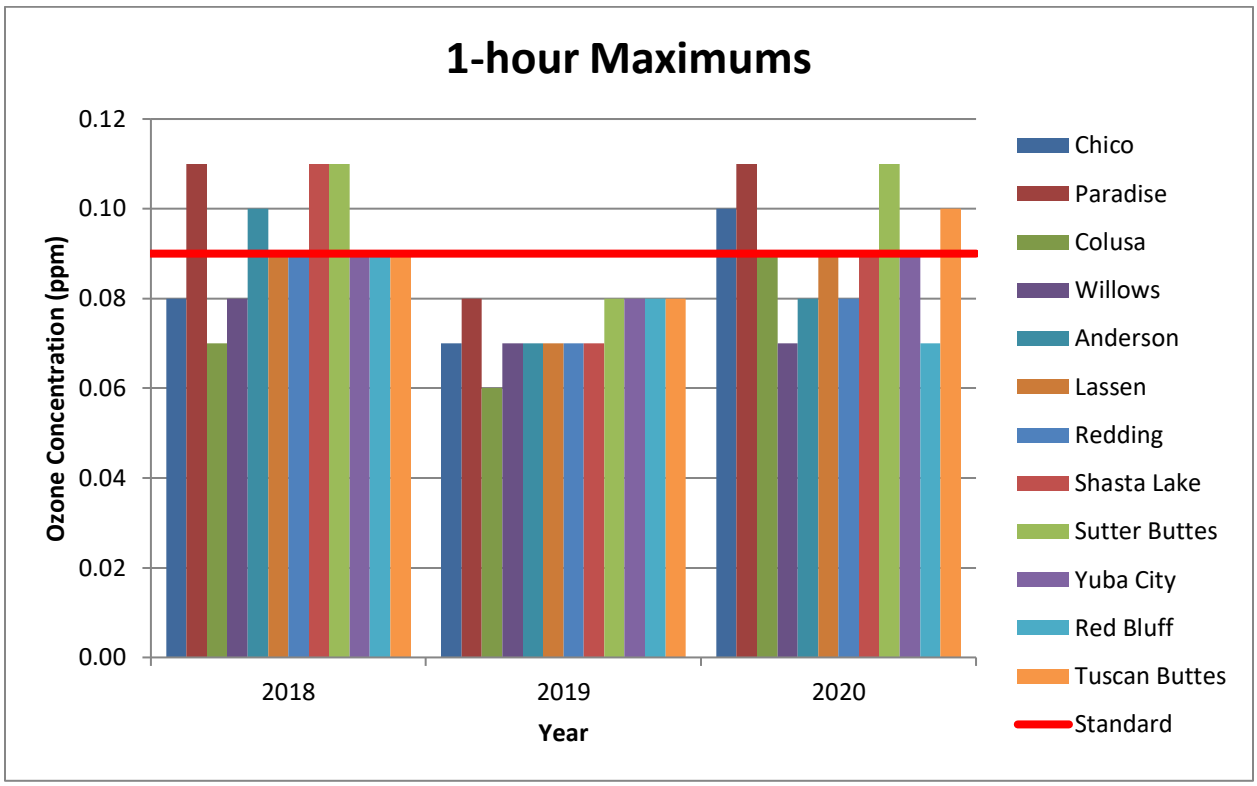
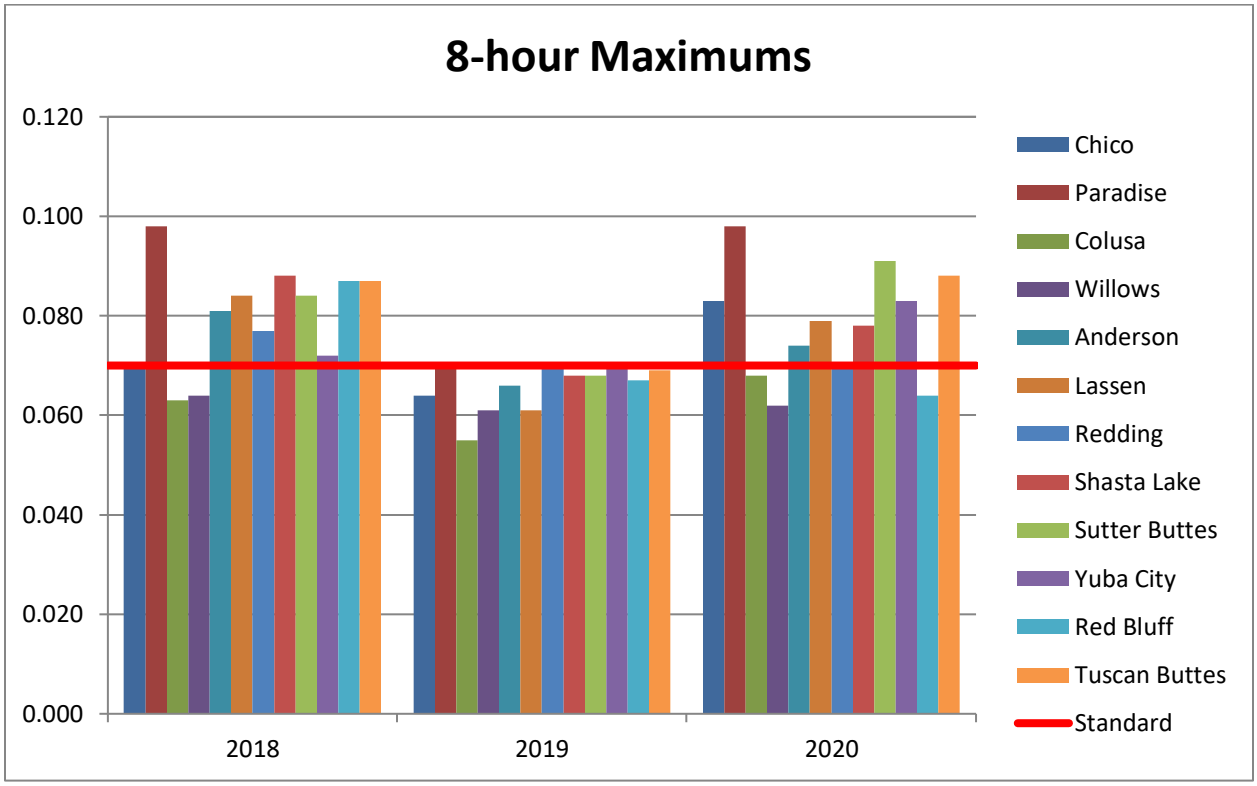



Figure II.3 NSVPA Monitoring Sites 8-hour Maximum Ozone Values




The 1-Hour ozone Expected Peak Day Concentration (EPDC) is a calculated concentration that represents the highest 1-hour ozone concentration expected each year. The 1-hour ozone EPDC is based on the maximum daily hourly observations within three consecutive years and is associated with the last year of the three consecutive years. It is expressed in parts per million (ppm).

The 8-Hour ozone Expected Peak Day Concentration (EPDC) is a calculated 8-hour average concentration that represents the highest State 8-hour ozone average expected each year. The EPDC

is based on the maximum daily State 8-hour averages within three consecutive years and is associated with the last year of the three consecutive years. It is expressed in ppm.

The 1-hour Designation Value is the highest hourly ozone measurement, rounded to two decimal places, during the last three years that is less than or equal to the 1-hour EPDC, also rounded to two decimal places, provided that there is a valid 1-hour EPDC. If there is no valid 1-hour EPDC, the State 1-hour designation value is the highest measurement during the last three years, rounded to two decimal places. The 1-hour designation value represents all hourly ozone measurements in the listed year and the two years before the listed year and is expressed in ppm.

The 8-hour Designation Value is the highest 8-hour ozone average, rounded to three decimal places, during the last three years that is less than or equal to the 8-hour EPDC, also rounded to three decimal places, provided that there is a valid 8-hour EPDC. If there is no valid 8-hour EPDC, the State 8-hour designation value is the highest 8-hour average during the last three years, rounded to three decimal places. The 8-hour designation value represents all 8-hour ozone averages in the listed year and the two years before the listed year and is expressed in ppm.

The number of days > 1-hour standard is the number of days in each year that the maximum 1-hour ozone concentration, after rounding to two decimal places, was greater than 0.09 parts per million. The 1-hour ozone CAAQS is exceeded whenever the daily maximum 1-hour observation (again, after rounding to two decimal places) is greater than 0.09 ppm.

The number of days > 8-hour standard is the number of days in each year that the maximum 8-hour average ozone concentration (after rounding to 3 decimal places) was greater than 0.070 parts per million. The 8-hour average ozone CAAQS is exceeded when the rounded average is greater than 0.070 ppm.

The maximum 1-hour observation is the highest 1-hour concentration observed within the year, expressed in ppm. The 1-hour CAAQS is exceeded when an observation, after rounding to two decimal places, is greater than 0.09 ppm.

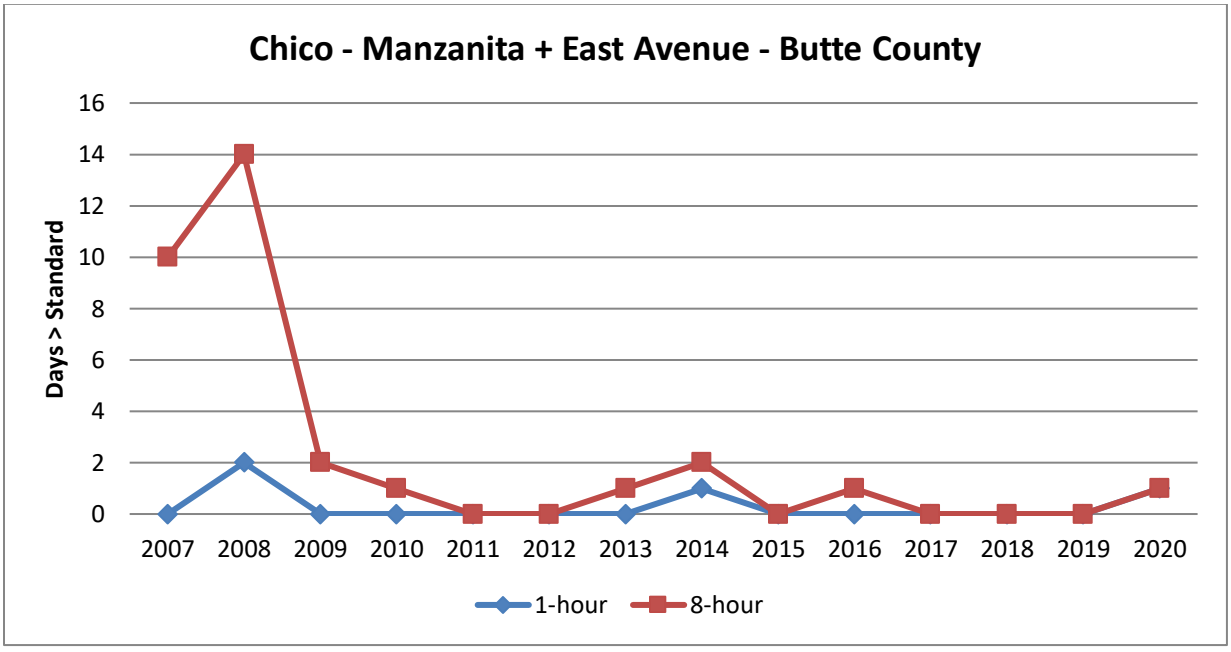
The maximum 8-hour average is the highest 8-hour average ozone concentration of each year. It is blank when there are too few days within the year with enough hourly measurements for the year to be considered representative. The 8-hour average CAAQS is exceeded when the highest 8-hour average during the current year and the two previous years is greater than or equal to 0.070 ppm.

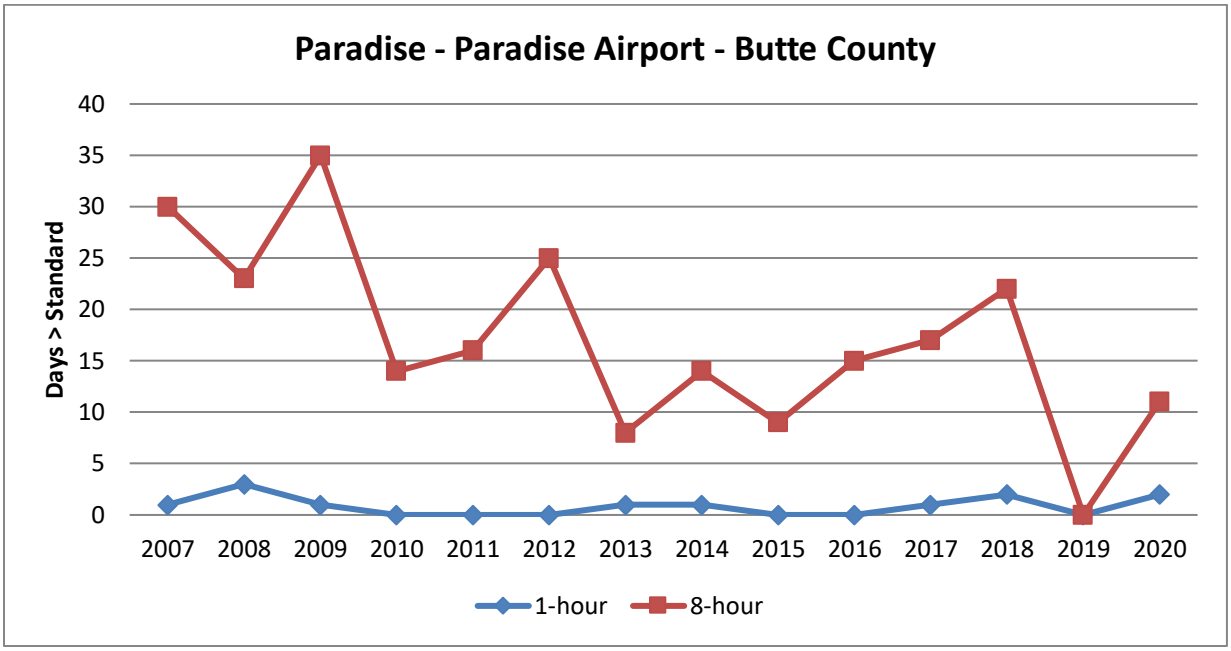
Butte County Monitoring Stations

Between 2018 and 2020 there were two ozone monitoring sites in Butte County. The site at East Avenue in Chico and the site at the Paradise Airport in Paradise. The site on Manzanita Avenue in Chico closed in 2012 when the East Avenue site was started. The data since 2007 shows few days exceeding the 1-hour standard.

| Chico - East Avenue - Butte County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 1 | 1 | 0.10 | 0.083 | 0.08 | 0.068 | 0.078 | 0.069 |
| 2019 | 0 | 0 | 0.07 | 0.064 | 0.08 | 0.068 | 0.076 | 0.068 |
| 2018 | 0 | 0 | 0.08 | 0.070 | 0.08 | 0.070 | 0.077 | 0.071 |

| Paradise - Paradise Airport - Butte County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 2 | 11 | 0.11 | 0.098 | 0.09 | 0.089 | 0.093 | 0.089 |
| 2019 | 0 | 0 | 0.08 | 0.070 | 0.09 | 0.087 | 0.091 | 0.088 |
| 2018 | 2 | 22 | 0.11 | 0.098 | 0.09 | 0.087 | 0.092 | 0.088 |



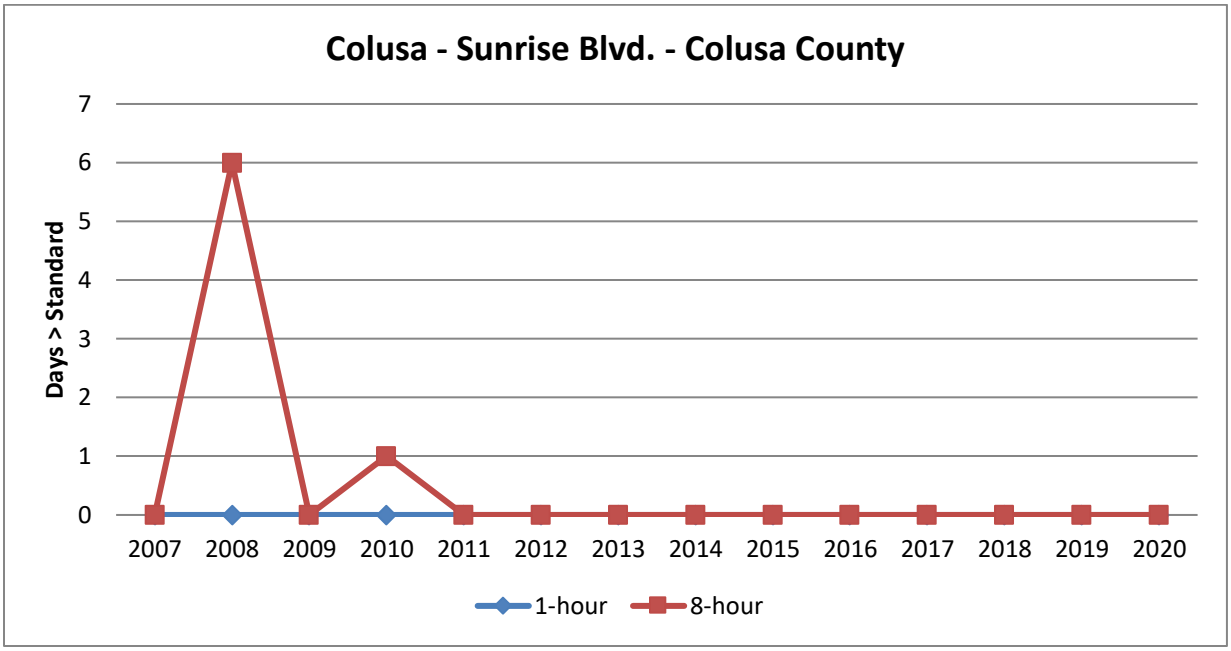



## Colusa County Monitoring Stations

There is one ozone monitoring site in Colusa County. There have been no exceedances of the 1-hour or 8-hour standard since 2010. Colusa County was designated attainment for the ozone CAAQS in 2013.

| Colusa - Sunrise Blvd. - Colusa County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 0 | 0.09 | 0.068 | 0.07 | 0.061 | 0.069 | 0.061 |
| 2019 | 0 | 0 | 0.06 | 0.055 | 0.07 | 0.068 | 0.069 | * |
| 2018 | 0 | 0 | 0.07 | 0.063 | 0.08 | 0.068 | * | * |

* There was insufficient (or no) data available to determine the value.

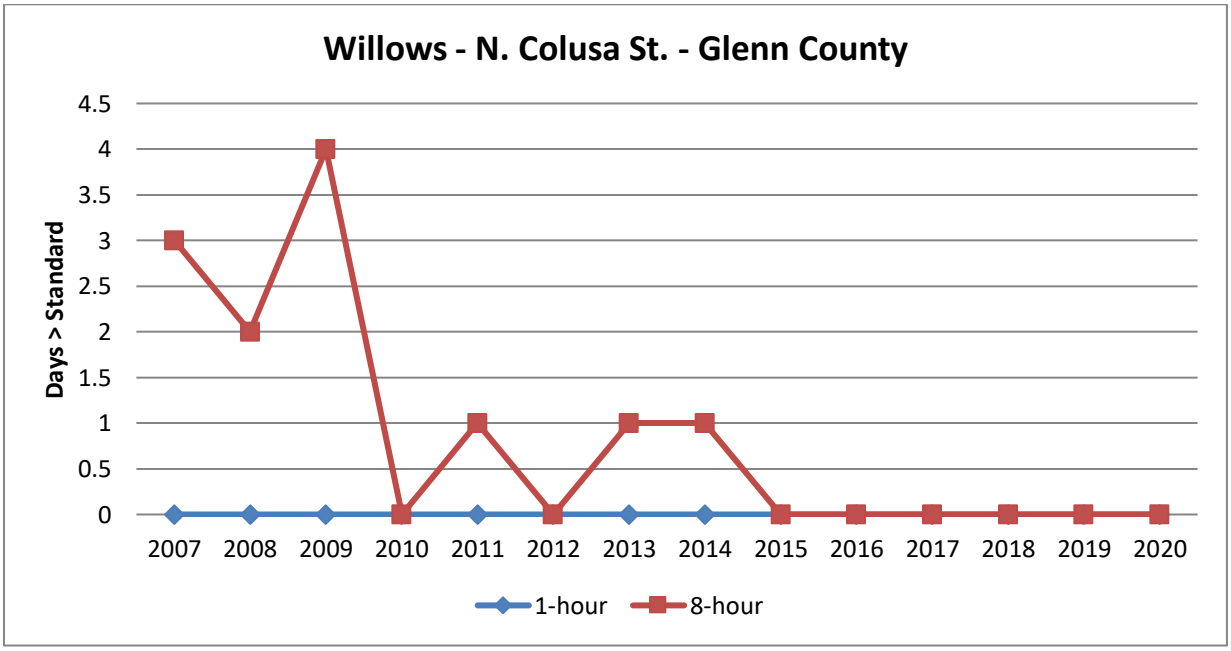



## Glenn County Monitoring Stations

There is one monitoring site in Glenn County. There were no days where the site exceeded the 8-hour standard or the 1-hour standard between 2018 and 2020. Glenn County has had no days exceeding the 8-hour standard beginning 2015 through present. Glenn County was designated to have met attainment for the ozone CAAQS in 2013.

| Willows - N. Colusa Street - Glenn County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 0 | 0.07 | 0.062 | 0.07 | 0.064 | 0.070 | * |
| 2019 | 0 | 0 | 0.07 | 0.061 | 0.07 | 0.067 | 0.071 | * |
| 2018 | 0 | 0 | 0.08 | 0.064 | 0.08 | 0.067 | * | * |

* There was insufficient (or no) data available to determine the value.




## Shasta County Monitoring Stations

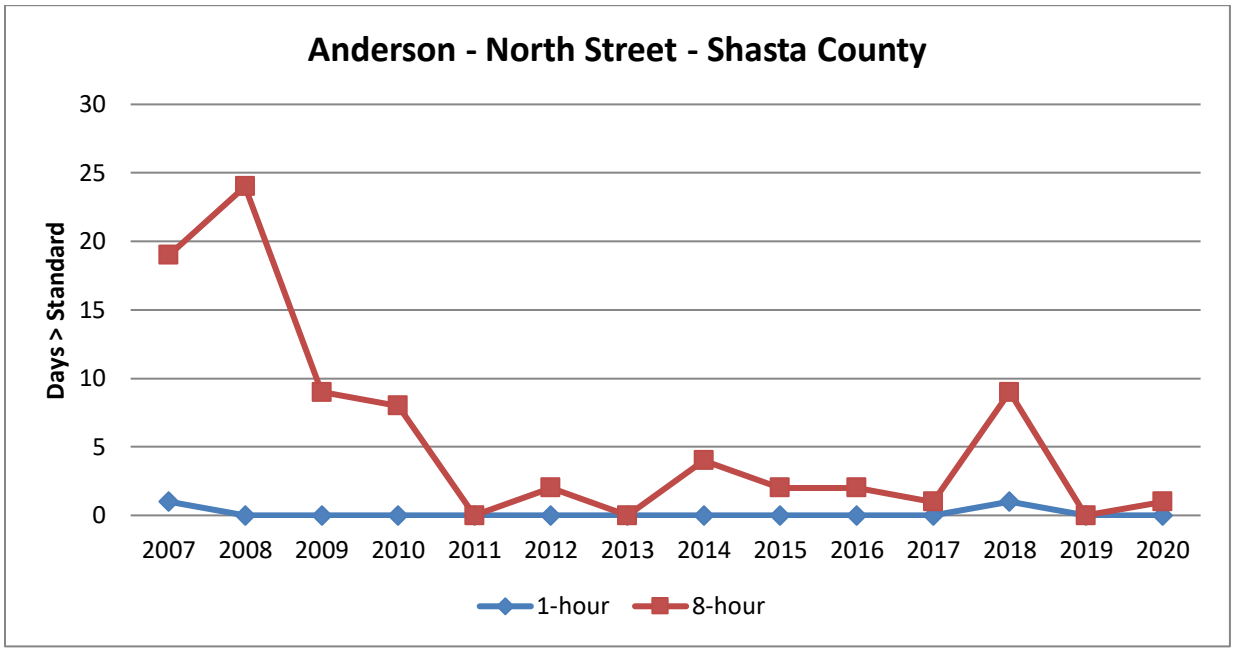
Shasta County has four monitoring sites. These sites are located at North Street in Andersen, Manzanita Lake in Lassen Volcanic National Park, the Health Department in Redding, and Lake Boulevard in Shasta Lake. The Manzanita Lake and Lake Boulevard sites each recorded one day exceeding the 1-hour standard between 2018 and 2020. All but the Shasta Lake – Lake Boulevard site show an overall reduction in the number of days exceeding the 8-hour standard since 2007.

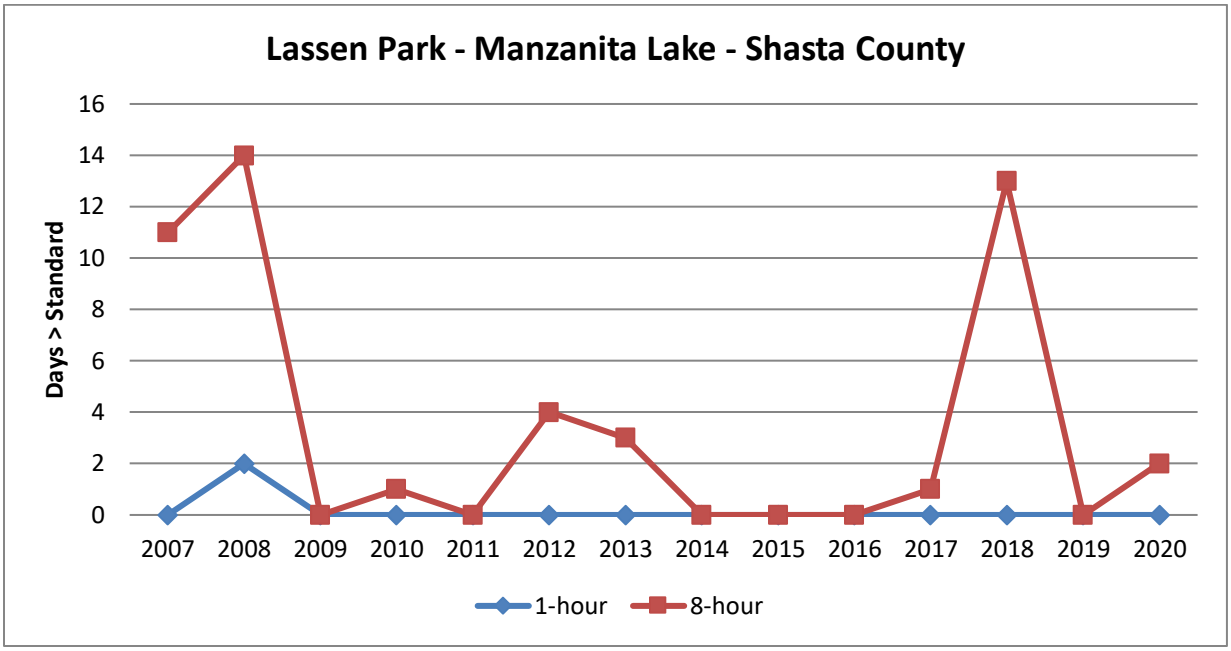
| Anderson - North Street - Shasta County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 1 | 0.08 | 0.074 | 0.09 | 0.077 | 0.087 | 0.078 |
| 2019 | 0 | 0 | 0.07 | 0.660 | 0.09 | 0.081 | 0.086 | * |
| 2018 | 1 | 9 | 0.10 | 0.081 | 0.09 | 0.081 | 0.088 | * |

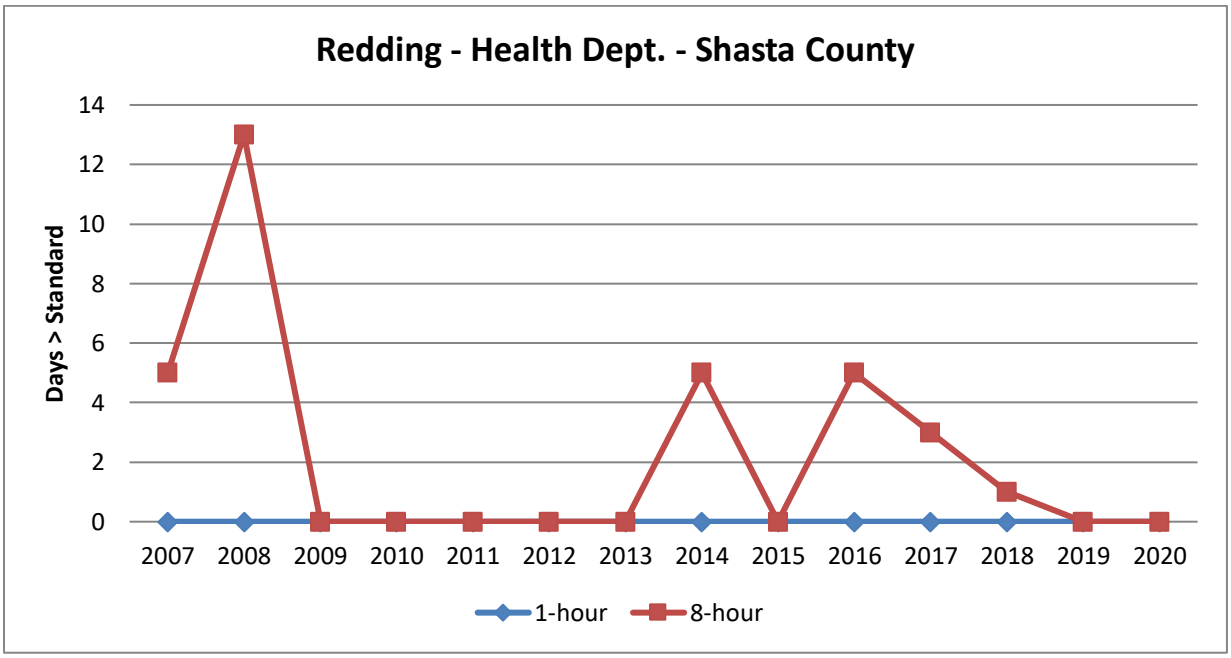
| Lassen Volcanic National Park - Manzanita Lake - Shasta County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 2 | 0.09 | 0.079 | 0.09 | 0.082 | 0.088 | 0.082 |
| 2019 | 0 | 0 | 0.07 | 0.061 | 0.08 | 0.074 | 0.085 | 0.077 |
| 2018 | 0 | 13 | 0.09 | 0.084 | 0.08 | 0.078 | 0.084 | 0.078 |

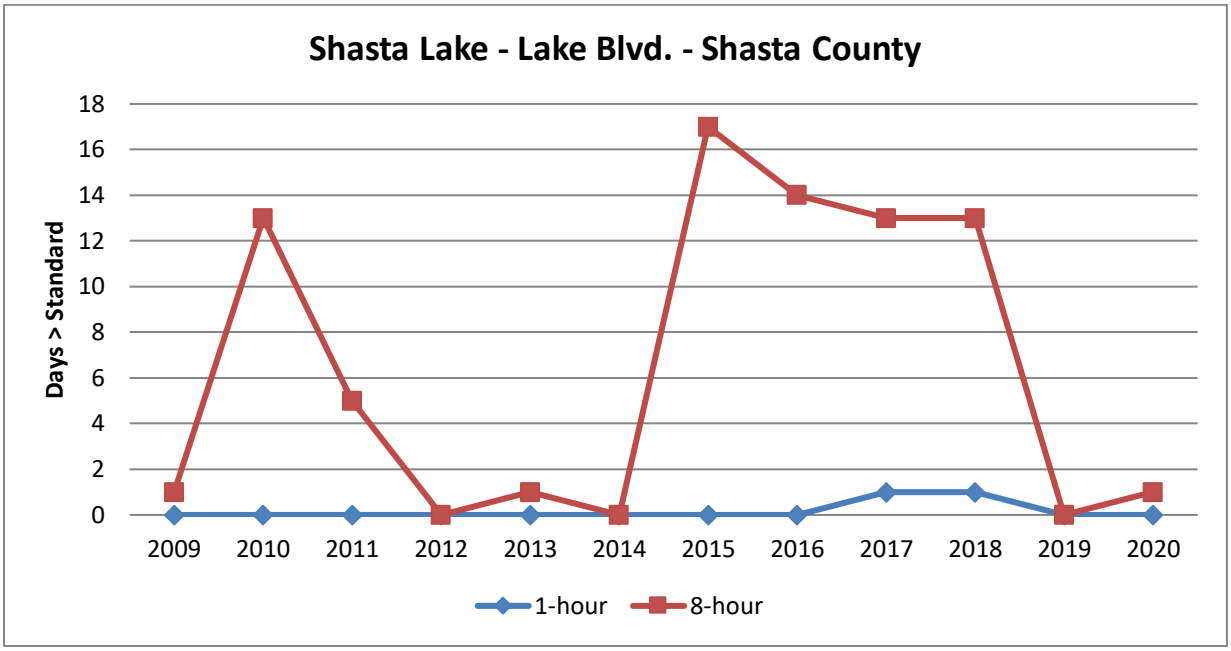
| Redding - Health Dept. - Shasta County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 0 | 0.08 | 0.070 | 0.07 | 0.065 | 0.073 | 0.066 |
| 2019 | 0 | 0 | 0.07 | 0.070 | 0.08 | 0.071 | 0.080 | 0.072 |
| 2018 | 0 | 1 | 0.09 | 0.077 | 0.08 | 0.077 | 0.084 | 0.077 |

| Shasta Lake - Lake Blvd. - Shasta County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 1 | 0.09 | 0.078 | 0.09 | 0.082 | 0.092 | 0.083 |
| 2019 | 0 | 0 | 0.07 | 0.068 | 0.10 | 0.085 | 0.095 | 0.085 |
| 2018 | 1 | 13 | 0.11 | 0.088 | 0.10 | 0.085 | 0.095 | 0.086 |




Lassen Park - Manzanita Lake - Shasta County
Days > Standard
16
14
12
10
8
6
4
2
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
1-hour
8-hour


Redding - Health Dept. - Shasta County
Days > Standard
14
12
10
8
6
4
2
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
1-hour
8-hour



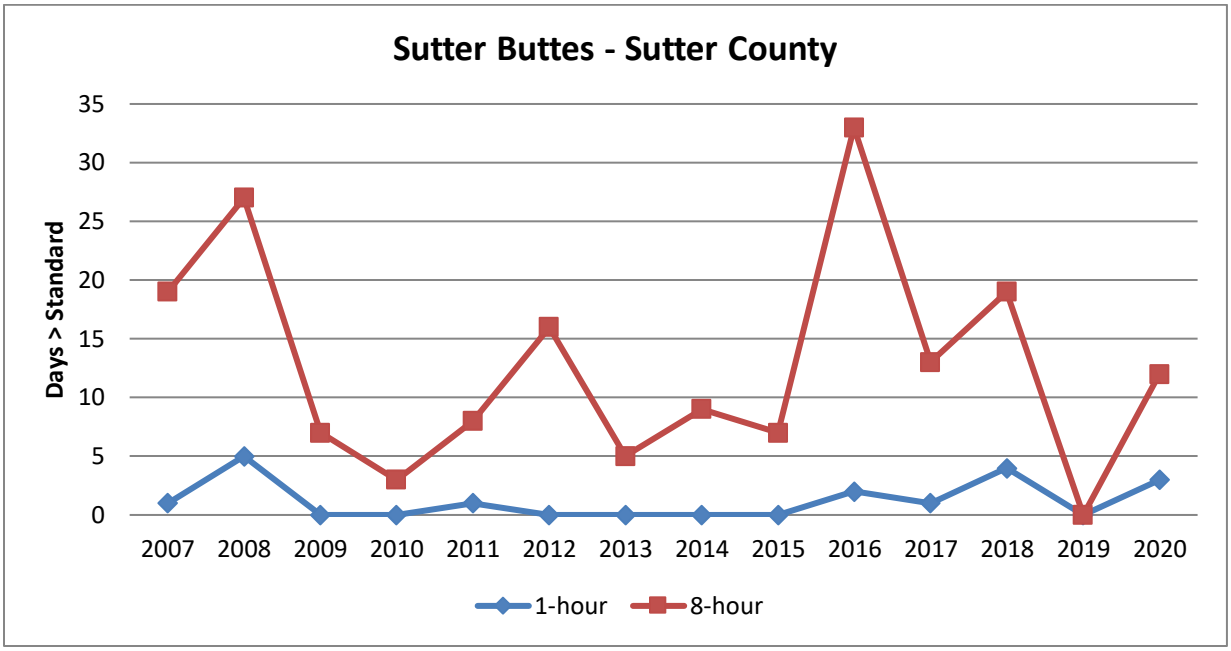

Sutter County Monitoring Stations

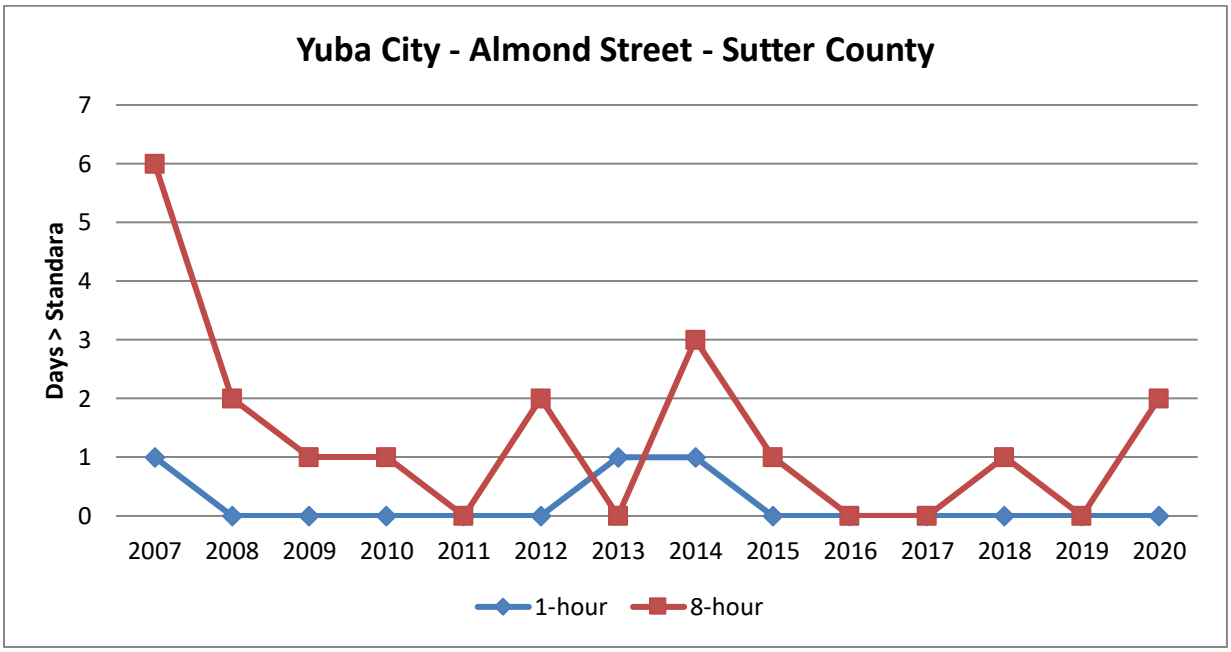
There were two ozone monitoring sites in Sutter County between 2018 and 2020. These sites are located on S. Butte Road at the Sutter Buttes and Almond Street in Yuba City. The Sutter Buttes site records transport ozone from the larger metropolitan areas to the south of the NSVPA. The Yuba City site is representative of air quality in Yuba and Sutter counties. There were seven days exceeding the 1-hour standard at the Sutter Buttes site and zero days exceeding the 1-hour standard at the Yuba City site between 2018 and 2020.

| Sutter Buttes - S. Butte Road - Sutter County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 3 | 12 | 0.11 | 0.091 | 0.10 | 0.089 | 0.099 | 0.089 |
| 2019 | 0 | 0 | 0.08 | 0.068 | 0.11 | 0.084 | * | * |
| 2018 | 4 | 19 | 0.11 | 0.084 | 0.11 | 0.084 | * | * |

| Yuba City - Almond Street - Sutter County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 2 | 0.09 | 0.083 | 0.08 | 0.070 | 0.081 | 0.071 |
| 2019 | 0 | 0 | 0.08 | 0.070 | 0.08 | 0.071 | 0.078 | 0.071 |
| 2018 | 0 | 1 | 0.09 | 0.072 | 0.08 | 0.071 | 0.078 | 0.071 |

* There was insufficient (or no) data available to determine the value.



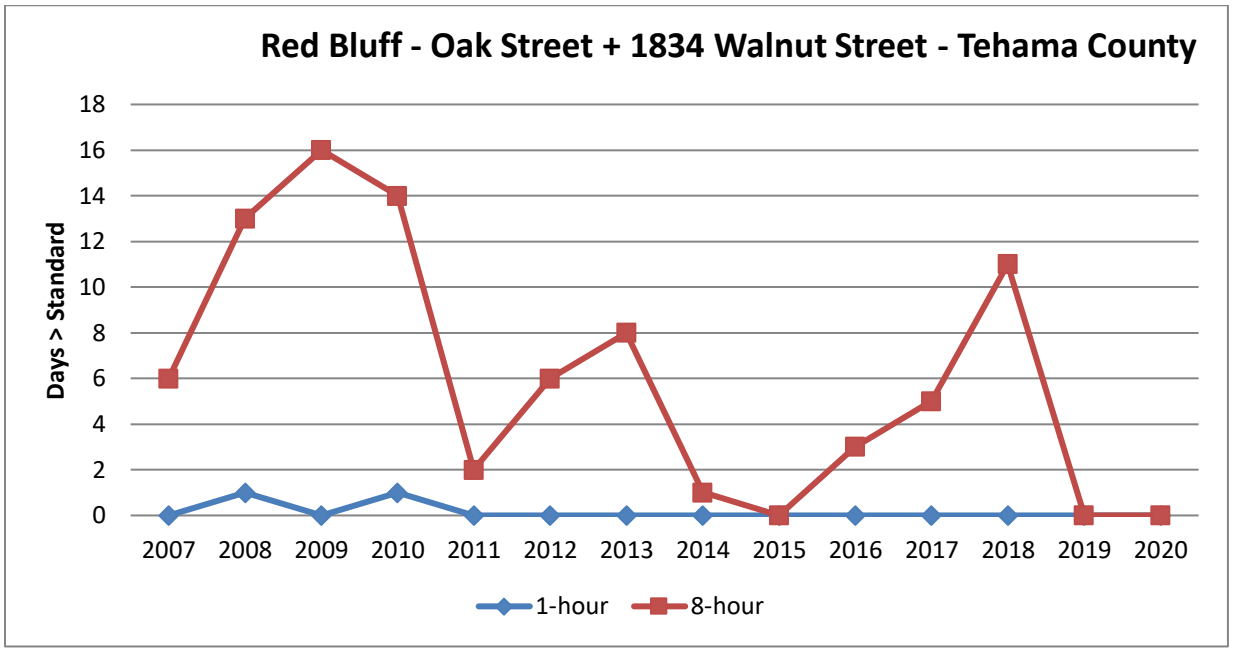

Tehama County Monitoring Stations

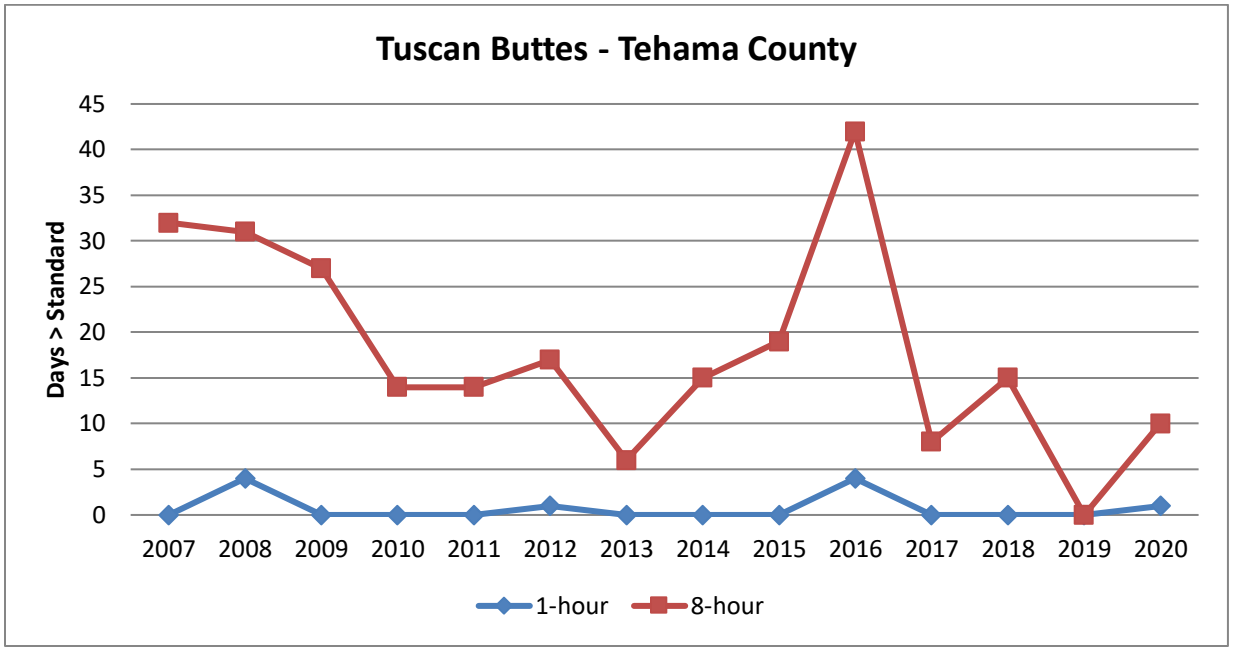
There were two monitoring sites in Tehama County between 2018 and 2020. The Oak Street site was relocated to 1834 Walnut Street early in 2015. The long-term trend shows a decreasing number of days exceeding the 8-hour standard. The Tuscan Buttes site recorded one day exceeding the 1-hour standard in 2020.

| Red Bluff - 1834 Walnut Street - Tehama County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 0 | 0 | 0.07 | 0.064 | 0.08 | 0.075 | 0.083 | 0.076 |
| 2019 | 0 | 0 | 0.08 | 0.067 | 0.09 | 0.078 | 0.087 | 0.079 |
| 2018 | 0 | 11 | 0.09 | 0.087 | 0.09 | 0.078 | 0.089 | 0.080 |

| Tuscan Buttes - Tehama County | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Days > Standard | | Maximums | | Designation Values | | Exp. Peak Day Conc. | |
| Year | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour | 1-hour | 8-hour |
| 2020 | 1 | 10 | 0.10 | 0.088 | 0.09 | 0.085 | 0.090 | 0.086 |
| 2019 | 0 | 0 | 0.08 | 0.069 | 0.09 | 0.083 | 0.087 | 0.084 |
| 2018 | 0 | 15 | 0.09 | 0.087 | 0.10 | 0.095 | 0.098 | 0.096 |

* There was insufficient (or no) data available to determine the value.






# CHAPTER III – EMISSION INVENTORY

The California Air Pollution Control and Air Quality Management Districts; as well as the CARB develop the emission inventory and associated emissions projections. The California Emission Forecasting System (CEFS) is the computer tool used to develop the projections and the emission estimates are based on the most currently available growth and control data. For mobile sources, CEFS integrates the emission estimates from the EMFAC model. The emission projections are based on the 2017

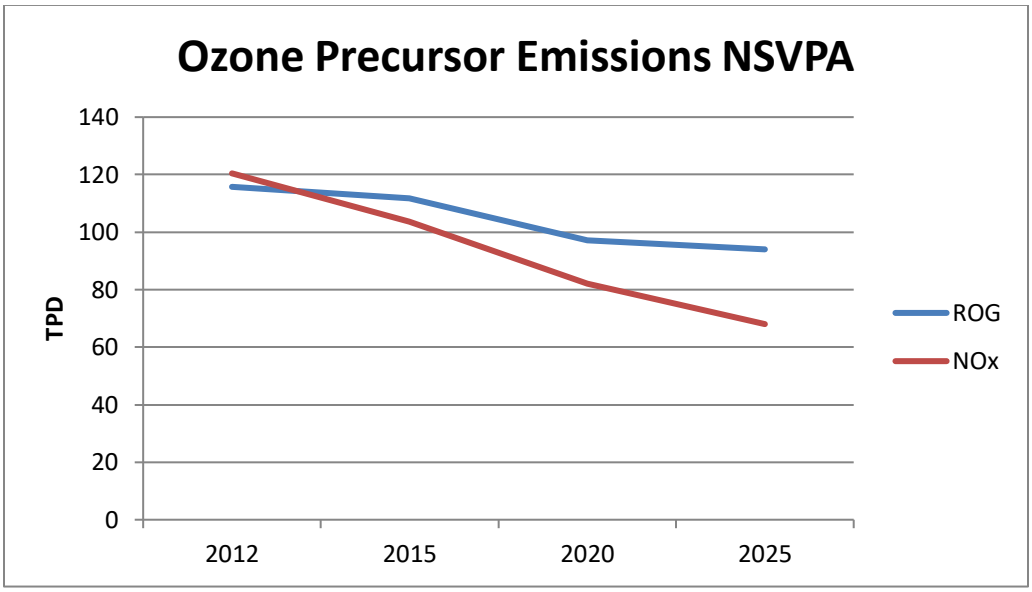
inventory. The air quality emissions inventory data contained in this Plan was provided by the CARB and is available at: https://www.arb.ca.gov/app/emsinv/2019ozsip/fcemssumcat_2019sip102.php.

In the following tables are forecast emissions for the NSVPA for ROG and NOx for several source categories. The annual average emissions are reported in tons per day for the years 2012, 2015, 2020 and 2025. In the NSVPA, ozone can be caused by stationary source emissions, such as from internal combustion engines or boilers, mobile sources such as cars, trucks, and trains, or area sources such as consumer products or wildfires.

Mobile sources comprise the majority of the NOx emission inventory in 2020, an estimated 68% of the total. Area-wide sources account for 42% of the ROG emission inventory in 2020.

The projected emissions show a downtrend for both ROG and NOx, which are the precursor emissions for ozone. The NOx emissions are forecasted to decrease by 44% and the ROG emissions are forecasted to decrease by 19% between 2012 and 2025.

**Figure III-1 Ozone Precursor Emissions NSVPA**



| Table III-1 NOx Emission Inventory Projections (tons/day) | | | | |
|---|---|---|---|---|
| **SUMMARY CATEGORY NAME** | **2012** | **2015** | **2020** | **2025** |
| **STATIONARY SOURCES** | **24.882** | **23.682** | **20.923** | **21.185** |
| Fuel Combustion | 20.469 | 18.558 | 16.793 | 16.703 |
| Waste Disposal | 0.084 | 0.077 | 0.080 | 0.083 |
| Cleaning and Surface Coating | 0.011 | 0.008 | 0.007 | 0.009 |
| Petroleum Production and Marketing | 2.187 | 2.198 | 1.693 | 1.463 |
| Industrial Processes | 2.131 | 2.841 | 2.350 | 2.927 |
| | | | | |
| **AREA-WIDE SOURCES** | **5.439** | **5.376** | **5.022** | **5.020** |
| Managed Burning and Disposal | 2.127 | 2.084 | 1.899 | 1.887 |
| Residential Fuel Combustion | 3.304 | 3.283 | 3.115 | 3.124 |
| Fires | 0.008 | 0.009 | 0.008 | 0.009 |
| | | | | |
| **MOBILE SOURCES** | **90.121** | **74.670** | **56.044** | **41.821** |
| On-Road Motor Vehicles | 53.820 | 41.505 | 27.462 | 18.422 |
| Other Mobile Sources | 36.301 | 33.165 | 28.582 | 23.399 |
| | | | | |
| **TOTAL NOx FOR NSVPA** | **120.442** | **103.728** | **81.989** | **68.026** |

| Table III-2 ROG Emission Inventory Projections (tons/day) | | | | |
|---|---|---|---|---|
| **SUMMARY CATEGORY NAME** | **2012** | **2015** | **2020** | **2025** |
| **STATIONARY SOURCES** | **25.981** | **26.408** | **23.684** | **26.031** |
| Fuel Combustion | 1.492 | 1.115 | 0.920 | 0.900 |
| Waste Disposal | 5.527 | 3.002 | 3.871 | 4.198 |
| Cleaning and Surface Coating | 6.025 | 6.698 | 5.454 | 7.770 |
| Petroleum Production and Marketing | 10.521 | 10.489 | 9.015 | 7.775 |
| Industrial Processes | 2.416 | 5.104 | 4.424 | 5.388 |
| | | | | |
| **AREA-WIDE SOURCES** | **40.665** | **43.064** | **40.680** | **40.599** |
| Solvent Evaporation | 19.418 | 21.398 | 21.139 | 22.399 |
| Managed Burning and Disposal | 4.401 | 4.615 | 4.899 | 4.891 |
| Farming Operations | 5.677 | 5.503 | 5.363 | 4.055 |
| Residential Fuel Combustion | 11.063 | 11.441 | 9.170 | 9.149 |
| Miscellaneous Processes Other | 0.106 | 0.107 | 0.109 | 0.105 |
| | | | | |
| **MOBILE SOURCES** | **49.120** | **42.217** | **32.858** | **27.389** |
| On-Road Motor Vehicles | 18.559 | 14.867 | 9.615 | 7.089 |
| Other Mobile Sources | 30.561 | 27.350 | 23.243 | 20.300 |
| | | | | |
| **TOTAL ROG FOR NSVPA** | **115.766** | **111.689** | **97.222** | **94.019** |

**Figure III-2 NOx Forecasted Emission Inventory**

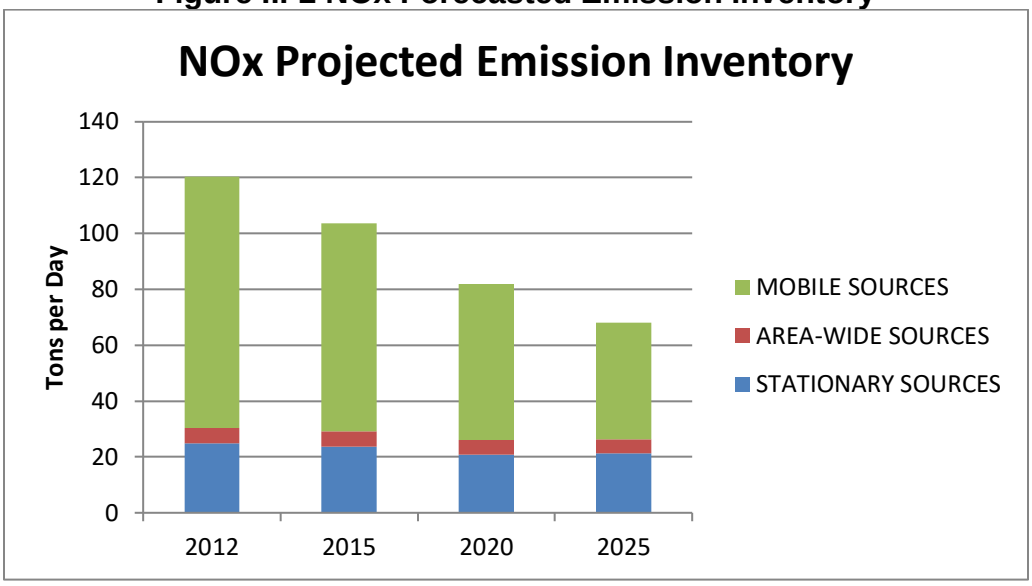



**Figure III-3 ROG Forecasted Emission Inventory**

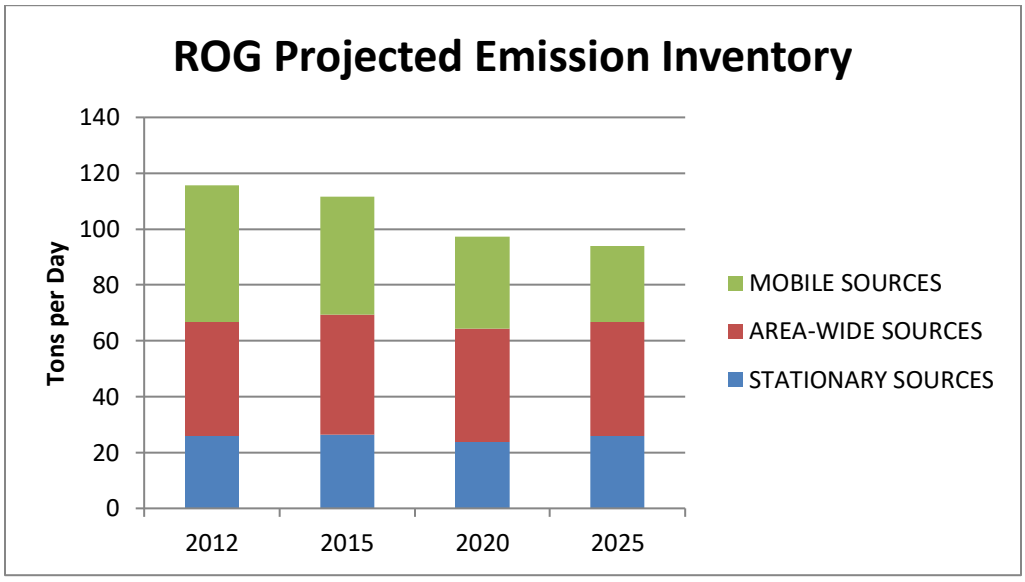


**Figure III-4**

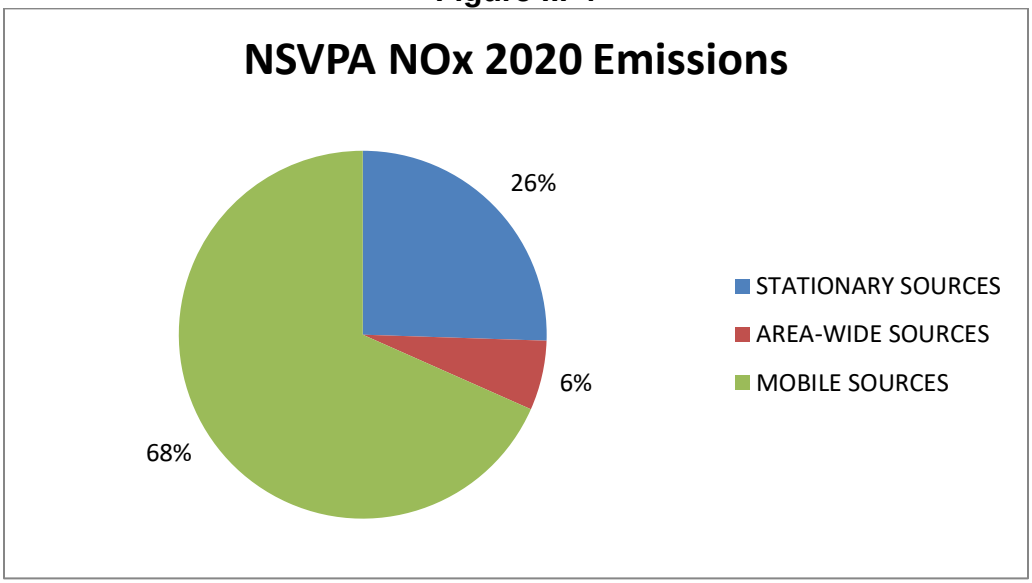
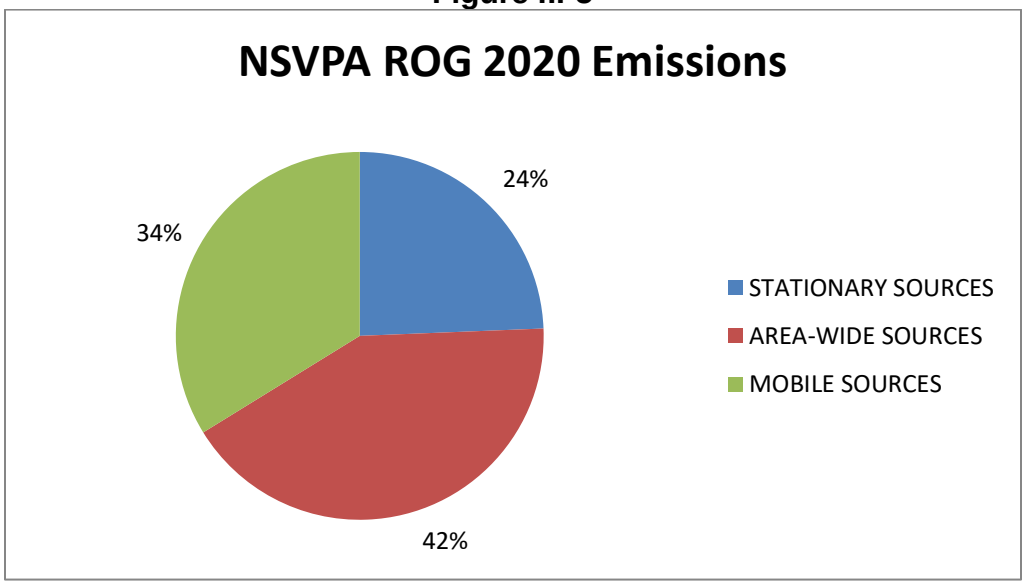



**Figure III-5**



# CHAPTER IV – STATIONARY SOURCE CONTROL MEASURES

To attain and maintain air quality standards, the Districts adopt control measures to limit the amount of air pollutant releases from sources. The Districts have regulatory authority over stationary sources of air pollutants and some area sources. Some common types of stationary sources regulated by the Districts include gas stations, internal combustion engines, natural gas wells, power plants, and asphalt plants. The Districts also have regulatory authority over some area sources and many have adopted control measures to reduce emissions from architectural coatings, solvents, and residential wood burning devices.

## IV.1 ALL FEASIBLE MEASURES

Under the CCAA, air districts are to develop plans to attain the State ambient air quality standard for ozone by the earliest practicable date. As part of this plan, the CCAA requires districts that are unable to achieve five percent annual emission reductions to demonstrate to the CARB's satisfaction that it has included every feasible measure and an expeditious adoption schedule. Since the CCAA did not define the term “every feasible measure” the CARB developed a tiered list of measures CARB considers feasible. Using the definition of “feasible” as used for the California Environmental Quality Act (CEQA) guidelines, CARB has determined that at a minimum, districts consider regulations that have been successfully implemented elsewhere.

Using this approach, CARB developed the document “Identification of Performance Standards for Existing Stationary Sources – A Resource Document.” This document identifies control measures and ranks them into three tiers, based on their emissions and emission reduction potential. As part of the Triennial Plan review, member air districts in the NSVPA reviewed the control measure lists and existing emission inventories to evaluate potential reductions and prioritize rule development efforts. Only those categories applicable to the NSVPA and showing promise for emission reductions were included. Table IV-1 identifies these feasible measures and the district’s status adopting them. Most of the feasible measures have been adopted as control measures by districts with applicable sources. In addition to the feasible measures table, the NSVPA districts are working to develop model rules and adopt CARB’s Suggested Control Measures for Automobile Coatings and Architectural Coatings.

**Table IV-1 Feasible Measures Considered for Adoption**

| Control Measure | Butte | Colusa | Feather River | Glenn | Shasta | Tehama |
|---|---|---|---|---|---|---|
| Adhesives and Sealants | C (03/08) | A (05/02) | NAS | C | A (05/13) | A (04/03) |
| Architectural Coatings | A (04/02) | A (07/02) | A (08/14) | C | A (05/13) | A (02/14) |
| Automobile Coatings | A (06/07) | A (03/98) | A (08/19) | A (05/99) | A (05/13) | A (11/98) |
| Cutback Asphalt | A (01/93) | A (07/97) | NAS | A (09/94) | A (06/95) | A (06/97) |
| Disposal of Organic Waste | A (03/03) | A (01/96) | A (08/11) | A (07/98) | A (06/95) | A (03/95) |
| Gas Turbines | NAS | A (03/98) | C | NAS | C | A (01/02) |
| Gasoline Terminals and Bulk Plants | A (06/05) | A (03/98) | A (06/14) | A (12/72) | A (06/97) | A (04/98) |
| Industrial Boilers | A (03/04) | A (01/96) | A (06/06) | A (07/98) | A (12/95) | A (01/02) |
| Internal Combustion Engines | A (12/04) | A (03/98) | A (08/21) | A (05/10) | A (04/97) | A (02/09) |
| Landfills | A (08/02) | NAS | A (06/97) | A (05/99) | A (04/97) | A (06/97) |
| Model Rule for Metal Parts and Products Coatings | A (12/17) | A (07/06) | C | A (07/98) | S (2021) | S (11/23) |
| Polyester Resin Operations | A (09/05) | A (01/96) | AC | A (07/98) | A (06/95) | A (03/95) |
| Residential Wood Combustion | A (12/08) | S (12/24) | A (10/09) | A (11/94) | A (03/94) | A (03/95) |
| Solvent Degreasing | A (09/05) | A (01/96) | A (08/16) | A (07/98) | A (06/95) | A (06/97) |
| Suggested Control Measure for Architectural Coatings (2007 Update) | S (12/21) | NAS | A (08/14) | C | C | C |
| Suggested Control Measure for Architectural Coatings (2019/2020) | - | - | S (10/21) | - | - | S (11/23) |
| Suggested Control Measure for Automotive Coatings (2005 Update) | S (12/21) | C | A (04/19) | C | C | S (11/23) |
| Vapor Recovery Systems for Gasoline Distributors | A (06/05) | A (01/89) | A (06/14) | A (11/98) | A (06/97) | A (04/98) |
| Wood Products Coatings | C | NAS | A (08/11) | C | A (05/13) | S (11/23) |

Notes:

A – Rule has been adopted by District, most recent adopted/amended date.
S – Scheduled date for consideration
C – Rule has been considered but determined not feasible at this time.
NAS – District does not have applicable sources
AC – Already complying in practice; no emission reductions would be achieved by rule adoption.

## IV.2 FEASIBLE MEASURES CONSIDERED FOR BASIN-WIDE MODEL RULES

Table IV-2 identifies control measures to be considered for model rule development by the NSVPA Districts. Due to the regional nature of the ozone non-attainment status in the NSVPA, it is anticipated

that adoption of the new regulations to address control measures will benefit air quality for all air districts within the NSVPA even though some of the sources affected by the control measures may not exist in each district within the NSVPA. The Districts of the NSVPA collectively work to develop model rules which then may be adopted by each District. The Sacramento Valley Air Quality Engineering and Enforcement Professionals (SVAQEEP) committee is tasked with developing the model rules.

**Table IV-2 Basin-wide Model Rules**

| Control Measure | Butte | Colusa | Feather River | Glenn | Shasta | Tehama |
|---|---|---|---|---|---|---|
| Graphic Arts | S | NAS | S | NAS | S | S |
| Use of Solvents | S | S | A (8/2016) | S | A (12/1995) | S |
| Small Boilers | S | S | A 10/2016 | S | S | S |

Notes:

A – District has already adopted a control measure applicable to these sources
S – District is scheduled to consider once model rule is complete
NAS – District has no applicable sources

Additional model rules that may be considered by the NSVPA include:

- A control measure to reduce VOC's from composting facilities
- A control measure to reduce fugitive VOC's emissions from oil and gas production

## IV.3 RULES ADOPTED SINCE 2018 TRIENNIAL AQAP

In the 2018 Triennial Update to the Air Quality Attainment Plan, the NSVPA the Districts committed to adopt specific control measures. Table IV-3 shows the control measures as identified in the 2018 Plan and their expected versus revised emission reductions as required by HSC §40924(b)(2).

**Table IV-3: 2018 Control Measure Commitments**

| District | Control Measure | Date to Adopt | Status | Expected vs. Revised Emissions | Notes |
|---|---|---|---|---|---|
| BCAQMD | Architectural Coatings | 2019 | Not Adopted | N/A | Adoption of SCM to be considered. |
| BCAQMD | Automotive Coatings (2005 Update) | 2019 | Not Adopted | N/A | Adoption of SCM to be considered. |
| CCAPCD | Residential Wood Coatings | 2018 | Not Adopted | N/A | Adoption of SCM to be considered. |
| FRAQMD | Metal Parts and Product Coatings | 2020 | Not Adopted | N/A | Control measure no longer being considered for adoption |
| TCAPCD | Architectural Coatings (2007 Update) | 2019 | Not Adopted | N/A | Adoption of SCM to be considered. |
| TCAPCD | Automotive Coatings (2005 Update) | 2020 | Not Adopted | N/A | Adoption of SCM to be considered. |
| TCAPCD | Wood Products Coatings | 2018 | Not Adopted | N/A | Adoption of SCM to be considered. |

# CHAPTER V – NON STATIONARY SOURCE MEASURES

## V.1 INCENTIVE PROGRAMS

The Districts of the NSVPA administer several grant programs that achieve emission reductions in addition to stationary source and area-wide control measures. These incentive programs are voluntary and often target mobile sources, of which comprise the majority of the NOx emission inventory, yet the Districts have no regulatory authority over.

### a. Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program[18] (Carl Moyer Program) provides grant funding for cleaner-than-required engines and equipment. Grants are administered by local air districts. ARB works collaboratively with the districts and other stakeholders to set Guidelines and ensure the Program reduces emissions and improves air quality for Californians. The Carl Moyer Program achieves reductions in emissions of key pollutants which are necessary for California to meet its clean air commitments under regulatory requirements. Eligible projects include cleaner on-road, off-road, marine, locomotive, lawn & garden, light duty passenger vehicles being scrapped and agricultural equipment.

**Table V-1 Carl Moyer Program**

| | Moyer Funding (20-22) | NOx Reductions (tons/year) | ROG Reductions (tons/year) |
|---|---|---|---|
| NSVPA Total | $4,840,192.59 | 80.48 | 9.15 |

### b. Vehicle Fee Programs

Sections 44220 through 44247 of the Health and Safety Code (AB 2766) authorize air pollution control districts to impose a $2 to $4 motor vehicle registration fee to provide funds for air districts to meet new responsibilities mandated under the California Clean Air Act. Section 44225 of the Health and Safety Code (AB 923), amended in 2004, authorized air pollution control districts to increase this motor vehicle registration fee to $6 per registered vehicle. Revenue from the AB 2766 fee is to be used to reduce air pollution from motor vehicles and for related planning, monitoring, enforcement, and technical studies necessary for the implementation of the California Clean Air Act of 1988. The AB 923 portion may be used for limited project types which include school bus replacements and retrofits according to the Lower Emission School Bus Program Guidelines and Carl Moyer eligible projects. Not all NSVPA district Board of Directors have authorized the collection of vehicle fees or directed staff to apply fee revenue towards grant programs.

**Table V-2 Vehicle Fees Allocated to Grants 2018-2020**

| | AB 2766 | AB 923 |
|---|---|---|
| NSVPA Total | $2,373,007.54 | $1,100,991.00 |

[18] http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm

**c. Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program**
In 2017, the State of California authorized $135 million to reduce emissions from the agricultural sector from Assembly Bill (AB) 134 (Committee on Budget, Chapter 254, Statutes of 2017) and AB 109 (Ting, Chapter 249, Statutes of 2017). The bills provided funding for agricultural harvesting equipment, heavy-duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations. This funding became the FARMER Program. Additional funding was authorized in 2018 and 2019.

**Table V-3 FARMER Program**

| | FARMER Funding (Years 1-3) | NOx Reductions (tons/year) | ROG Reductions (tons/year) |
|---|---|---|---|
| NSVPA Total | $10,870,183.95 | 201.24 | 22.12 |

**d. Community Air Protection Program**
The Community Air Protection Program (CAP Program was established in response to Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017). The Program's focus is to reduce exposure in communities most impacted by air pollution. The California Legislature appropriated funding to support early actions to address localized air pollution through targeted incentive funding to deploy cleaner technologies in these communities, as well as grants to support community participation in the AB 617 process. AB 617 also includes new requirements for accelerated retrofit of pollution controls on industrial sources, increased penalty fees, and greater transparency and availability of air quality and emissions data.

The incentives program established to support the CAP Program generates emission reductions by replacing older equipment with newer technologies in accordance with the Carl Moyer Program Guidelines. The CAP Incentives Program also established new funding categories for emission reductions at schools and stationary sources. The CAP administrative funding is used to implement the AB 617 program in the air districts.

**Table V-4 CAP Program**

| | CAP Admin Funds | CAP Incentives expended | NOx Reductions (tons/year) | ROG Reductions (tons/year) |
|---|---|---|---|---|
| NSVPA Total | $221,075.00 | $925,807.89 | 1.3 | 0.18 |

**e. Other Grant Programs**
BCAQMD participated in Year 2 (FY18-19) of the Woodsmoke Reduction Program. $147,478.99 was allocated for projects in Butte County and 33 vouchers were issued for the replacement of older wood-burning devices.

The Feather River AQMD expended $16,438.99 in Mini Grants between 2018 and 2020, for bicycle parking, May Is Bike Month events, and educational programs.

## V.2 PUBLIC EDUCATION PROGRAMS

Public education and information programs are important components of local and regional efforts to reduce air pollution. Section 40918(a)(6) of the California H&S Code states that, "Each District shall include provisions for public education programs to promote actions to reduce emissions from

transportation and area wide sources." Many of the public education programs and projects have been funded using Vehicle Registration Surcharge Fees (AB 2766). Each District conducts its own public education program. A summary of District public education programs is provided below.

Butte County AQMD

The Public Education Program includes a variety of activities as part of its clean air strategy. These activities include the following:

- Maintain the District's website at www.bcaqmd.org
- Forecast air quality index (AQI) and provide daily burn day information to the media
- Utilize EnviroFlash for email/text messaging service for real time air quality events and AQI
- Manage the "Check Before You Light" advisory program during November through February for residential wood burning
- Develop and distribute District brochures on various air quality issues
- Distribute CARB brochures and informational handbooks
- Provide presentations to schools, agricultural and business groups as requested
- Participate in community events
- Provide Press Releases and Public Service Announcements
- Respond to public inquires and requests for information
- Developed a print publication (published May 2021) summarizing local air quality issues and introducing community members to the District.

Colusa County APCD

The office sponsors a Public Education program which includes the following public outreach activities:

- Distribution of pamphlets and brochures
- Public service announcements/reports
- Presentations on air pollution and health effects to elementary through high school classes
- Presentation to agricultural and business groups
- Response to public inquiries
- School Flag Program (EPA) for air quality awareness at K-12 schools
- Presentations at High School Career Days

Feather River AQMD

The District office maintains current announcements for news and events, provides residents with opportunities to sign up for District mailing lists and air quality advisory alerts, and provides educational handouts regarding open burning regulations. The District office also has available brochures subject matter such as Air Quality Permits, Air Toxics Program, Enforcement Procedures, Agricultural Burning, and Residential Burning.

The District participates in local events to provide air quality information to the public, such as educational events at schools, Earth Day events, and May Is Bike Month activities. The District maintains a web site at http://www.fraqmd.org/, which provides updates on District events, grant programs, current ambient air quality readings, and educational materials available to the public to access 24 hours a day. The District responds to public and media questions and concerns received by telephone, e-mail, postal mail and in person. The District also provides information to the public through a Facebook and Twitter account.

Glenn County APCD
The office sponsors a public education program which may include the following outreach activities:

- Distribute and display pamphlets, brochures, and Fact Sheets in English and Spanish
- Newsletters
- Public Service Announcements/Reports
- Presentations on air pollution and health effects to school classes
- Presentations to Agricultural and Business Groups
- Presentations to the Board of Supervisors and other Government groups
- Public workshops
- Response to public inquiries
- Maintain District web site: http://www.countyofglenn.net/APCD
- Maintain Twitter Account: @GlennCountyAir
- Attend and judge the Science Fair
- Operate the County booth at the State Fair

Shasta County AQMD
The community education efforts include a broad spectrum of activities intended to increase public awareness of air quality issues and encourage people to reduce motor vehicle emissions. These activities include but are not limited to the following:

- Presentations in school classrooms
- Distribution of air quality pamphlets
- Bike trails brochures printed and distributed
- Press releases
- Response to public inquiries
- Operation of a smoking vehicle reporting program
- Public service announcements via radio and television
- Drive hybrid vehicles during inspections, complaints, meetings etc. during work hours
- Utilize the Enviro-Flash online program for the public to access the Daily Air Quality Index (AQI)
- Webpage allowing public to access real-time ambient air quality, the visibility camera, and most current Attainment Plan
- School Flag Program (EPA) for air quality awareness at K-12 schools

Tehama County APCD
The office also maintains a website: http://www.tehcoapcd.net. The District's public education activities include:

- Distribution of CARB brochures and instructional leaflets
- Presentations to business groups and agricultural groups
- Public service announcements
- Response to public inquiries
- The issuance of press releases

- Presentations in school classrooms
- Provide fliers on agricultural and residential burning and respond to questions and concerns about burning
- Provide air quality information whenever there is need for caution or concern
- Answer questions on diesel engine pollution and global warming
- Operate Carl Moyer Program and Equipment Replacement Program allowing for successful turnover of older stationary and mobile farm equipment

## V.3 REDUCTIONS FROM LAND USE PROGRAMS

The California Environmental Quality Act (CEQA) was adopted by the State legislature in 1970 and has been amended several times since. Some objectives of CEQA are to disclose to decision-makers and the public the significant environmental effects of proposed activities and to prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures.

An air district can have three primary roles under CEQA:

- Lead Agency: The District is the Lead Agency for adoption of air quality plans, rules, and regulations.
- Responsible Agency: The District is a Responsible Agency when it will issue a permit for a project and another agency, such as a city or county, is the Lead Agency.
- Commenting Agency: The District comments on the air quality impacts of projects where another public agency is the Lead Agency, but for which the District has no discretionary authority. CEQA requires Lead Agencies to consult with agencies that exercise authority over resources that may be affected by the project[19].

The District staff works with appropriate land use jurisdictions to assess the air quality impact of proposed land use projects and to incorporate appropriate mitigation measures for projects under CEQA. Through this process, the District can realize ROG and NOx reductions by encouraging project design features that promote walking, biking, and transit and which can help to reduce total VMT.

In addition, several Districts have adopted thresholds of significance and local guidance to further assist their local agencies with determining the significance of land use projects and how much mitigation is feasible. The following Districts have adopted guidance:

**Table V-5 Local CEQA Guidance**

| District | Title | Adopted or last amended | Located at |
|---|---|---|---|
| Butte County AQMD | CEQA Air Quality Handbook | 10/23/2014 | www.bcaqmd.org |
| Feather River AQMD | Indirect Source Review Guidelines | 6/7/2010 | www.fraqmd.org/CEQA%20Planning.html |
| Shasta County AQMD | CEQA Air Quality Handbook | 2012 | Available at District office. |
| Tehama County APCD | Planning & Permitting Air Quality Handbook | 04/2015 | http://tehcoapcd.net/PDF/CEQA%20Handbook%20Mar%202015%20Final.pdf |

[19] California Code of Regulations §15086 and §15073(b)

## V.4 AIR QUALITY FORECASTING

Several NSVPA air districts offer ozone forecasting and alert systems to their residents. This service is offered through a partnership with the local air district, ARB, US EPA and Sonoma Technologies. Residents can sign up at the website www.airnow.gov to receive daily air quality forecasts or alerts when air quality reaches unhealthy levels. The US EPA, National Oceanic and Atmospheric Administration, National Park Service, tribal, state, and local agencies developed the AirNow system to provide the public with easy access to national air quality information. The local air quality monitoring sites report the current air quality index (AQI) and the air district issues the forecasts.

## V.5 DISTRICT RULES APPLICABLE TO NEW DEVELOPMENT

The NSVPA air districts have adopted several control measures and programs that reduce emissions from new development either through the planning process or through control of specific sources of emissions. Local planning agencies should contact their applicable air district to ensure new development is in compliance with the measures listed on Table V-6.

**Table V-6 Rules and Programs Applicable to New Development**

| Control Measure Name/Program | Butte | Colusa | Feather River | Glenn | Shasta | Tehama |
|---|---|---|---|---|---|---|
| Air Quality Element | A (01/08) | C | A (6/10) | A (6/93) | A (04/94) | A (11/07) |
| Smoking Vehicle Program | A (10/01) | SVP | SVP | SVP | SVP | SVP |
| Wood Stoves and Fireplaces | A (12/08) | S (2020) | A (10/09) | A (11/94) | A (3/95) | A (3/95) |
| Backyard Residential Burning | A (2/11) | C | A (10/08) | C | A (3/04) | C |
| Architectural Coatings | A (4/02) | A (5/91) | A (8/14) | C | A (5/13) | A (8/02) |
| Fugitive Dust During Construction | A (5/10) | S (2020) | A (4/94) | C | A (11/07) | A (2/08) |

Notes:

A – Rule has been adopted by District, most recent adopted/amended date.
S – Scheduled date for consideration
C – Rule has been considered, but determined not feasible at this time.
SVP – District relies on ARB Smoking Vehicle Program

# CHAPTER VI – CONCLUSION

The California Clean Air Act (CCAA) requires air districts which have been designated as a nonattainment area for California Ambient Air Quality Standards (CAAQS) for ozone to prepare and submit a plan for attaining and maintaining the standards. The Air Pollution Control Districts and Air Quality Management Districts (Districts) for the
counties located in the northern portion of the Sacramento Valley together establish the
Northern Sacramento Valley Planning Area (NSVPA). The 2021 triennial update of the NSVPA Air Quality Attainment Plan (2021 Plan) assesses the progress made in implementing the previous triennial update and proposed modifications to the strategies necessary to attain the CAAQS by the earliest practicable date. The 2021 Plan includes an assessment of progress towards achieving the control measure commitments in the previous Triennial Plan, a summary of the last three years of ozone data, a comparison of the expected versus actual emission reductions for each measure committed to in the previous Triennial Plan, updated control measure commitments and growth rates of population, industry, and vehicle related emissions.

The 2018 through 2020 monitoring data shows a slight increase in the number of exceedances of the 1-hour ozone CAAQS. However, wildfires continue to be a major contributor to these exceedances and the data continues to show a downward trend in the number of exceedances of 8-hour ozone CAAQS. Two counties in the NSVPA (Glenn and Colusa) have been in attainment for the ozone CAAQS since 2013.

The projected emissions show a downtrend for both ROG and NOx, which are the precursor emissions for ozone. The NOx emissions are forecasted to reduce by 44% and the ROG emissions are forecasted to reduce by 19% between 2012 and 2025. Mobile sources comprise the majority of the NOx emission inventory in 2020, an estimated 68% of the total. Area-wide sources account for 42% of the ROG inventory in 2020.

The Carl Moyer and FARMER programs in the NSVPA have resulted in an estimated 281.72 tons of NOx and 31.27 tons of ROG reduced during the past three years. The NSVPA Districts also funded emission reduction projects through AB 617 Community Air Protection Programs, AB 2788/AB 923 Vehicle Fee Programs, Wood Stove Changeout Programs, and Off-Road Voucher Incentive Programs. The voluntary incentive programs, along with stationary source and area-wide control measures, CEQA review programs, and public education and outreach programs all achieve emission reductions that assist the NSVPA with attaining the ambient air quality standards and improving air quality for residents in the area.

# Appendix A: Emission Inventory

## A:1 REACTIVE ORGANIC GASES PROJECTED EMISSION INVENTORY
## 2012 Base Year - Annual Average – Grown and Controlled
## NORTHERN SACRAMENTO VALLEY AIR BASIN

| All emissions are represented in Tons per Day and reflect the most current data provided to ARB. | | | | |
|---|---|---|---|---|
| **SUMMARY CATEGORY NAME** | **2010** | **2012** | **2015** | **2020** |
| | | | | |
| **STATIONARY SOURCES TOTAL** | **12.889** | **13.285** | **13.208** | **13.116** |
| **FUEL COMBUSTION** | **2.047** | **2.011** | **1.945** | **1.845** |
| ELECTRIC UTILITIES | 0.089 | 0.121 | 0.114 | 0.120 |
| COGENERATION | 0.122 | 0.144 | 0.172 | 0.229 |
| OIL AND GAS PRODUCTION (COMBUSTION) | 0.848 | 0.841 | 0.787 | 0.704 |
| MANUFACTURING AND INDUSTRIAL | 0.350 | 0.353 | 0.350 | 0.351 |
| FOOD AND AGRICULTURAL PROCESSING | 0.321 | 0.222 | 0.186 | 0.098 |
| SERVICE AND COMMERCIAL | 0.107 | 0.113 | 0.114 | 0.116 |
| OTHER (FUEL COMBUSTION) | 0.211 | 0.217 | 0.222 | 0.228 |
| | | | | |
| **WASTE DISPOSAL** | **0.045** | **0.045** | **0.052** | **0.052** |
| SEWAGE TREATMENT | 0.000 | 0.000 | 0.000 | 0.000 |
| LANDFILLS | 0.000 | 0.000 | 0.000 | 0.000 |
| INCINERATORS | 0.000 | 0.000 | 0.000 | 0.000 |
| SOIL REMEDIATION | 0.001 | 0.001 | 0.001 | 0.001 |
| OTHER (WASTE DISPOSAL) | 0.044 | 0.044 | 0.051 | 0.051 |
| | | | | |
| **CLEANING AND SURFACE COATINGS** | **3.395** | **3.574** | **3.674** | **3.822** |
| LAUNDERING | 0.121 | 0.129 | 0.135 | 0.145 |
| DEGREASING | 1.472 | 1.537 | 1.573 | 1.627 |
| COATINGS AND RELATED PROCESS SOLVENTS | 1.363 | 1.442 | 1.505 | 1.590 |
| PRINTING | 0.060 | 0.065 | 0.067 | 0.072 |
| ADHESIVES AND SEALANTS | 0.238 | 0.264 | 0.218 | 0.199 |
| OTHER (CLEANING AND SURFACE COATINGS) | 0.142 | 0.168 | 0.177 | 0.190 |
| | | | | |
| **PETROLEUM PRODUCTION AND MARKETING** | **6.499** | **6.689** | **6.470** | **6.158** |
| OIL AND GAS PRODUCTION | 4.604 | 4.690 | 4.387 | 3.929 |
| PETROLEUM REFINING | 0.013 | 0.015 | 0.015 | 0.015 |
| PETROLEUM MARKETING | 1.700 | 1.799 | 1.877 | 2.017 |
| OTHER (PETROLEUM PRODUCTION AND MARKETING) | 0.182 | 0.185 | 0.190 | 0.197 |
| | | | | |
| **INDUSTRIAL PROCESSES** | **0.903** | **0.966** | **1.068** | **1.238** |
| CHEMICAL | 0.314 | 0.320 | 0.358 | 0.425 |
| FOOD AND AGRICULTURE | 0.009 | 0.010 | 0.010 | 0.011 |
| MINERAL PROCESSES | 0.534 | 0.587 | 0.648 | 0.745 |
| METAL PROCESSES | 0.000 | 0.000 | 0.000 | 0.000 |
| WOOD AND PAPER | 0.043 | 0.046 | 0.047 | 0.050 |
| OTHER (INDUSTRIAL PROCESSES) | 0.004 | 0.004 | 0.005 | 0.007 |

| ROG Projected Emission Inventory, Cont'd. | | | | |
|---|---|---|---|---|
| **SUMMARY CATEGORY NAME** | **2010** | **2012** | **2015** | **2020** |
| | | | | |
| **AREA-WIDE SOURCES TOTAL** | **29.587** | **30.053** | **30.040** | **30.394** |
| **SOLVENT EVAPORATION** | **14.223** | **14.511** | **14.543** | **14.966** |
| ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS | 2.171 | 2.301 | 2.376 | 2.518 |
| ASPHALT PAVING / ROOFING | 6.122 | 6.230 | 6.260 | 6.289 |
| CONSUMER PRODUCTS | 3.807 | 3.875 | 3.814 | 4.080 |
| PESTICIDES/FERTILIZERS | 2.123 | 2.106 | 2.094 | 2.079 |
| | | | | |
| **MISCELLANEOUS PROCESSES** | **15.364** | **15.542** | **15.496** | **15.429** |
| CONSTRUCTION AND DEMOLITION | 0.000 | 0.000 | 0.000 | 0.000 |
| COOKING | 0.105 | 0.109 | 0.113 | 0.120 |
| FARMING OPERATIONS | 3.992 | 4.054 | 4.054 | 4.055 |
| FIRES | 0.020 | 0.021 | 0.022 | 0.023 |
| FUGITIVE WINDBLOWN DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| MANAGED BURNING AND DISPOSAL | 5.519 | 5.468 | 5.437 | 5.390 |
| OTHER (MISCELLANEOUS PROCESSES) | 0.000 | 0.000 | 0.000 | 0.000 |
| PAVED ROAD DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| RESIDENTIAL FUEL COMBUSTION | 5.728 | 5.889 | 5.870 | 5.840 |
| UNPAVED ROAD DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | |
| **MOBILE SOURCES TOTAL** | **27.523** | **24.056** | **18.634** | **14.908** |
| **ON-ROAD MOTOR VEHICLES** | **14.886** | **12.369** | **8.140** | **5.867** |
| LIGHT DUTY PASSENGER (LDA) | 4.116 | 3.086 | 1.727 | 0.934 |
| LIGHT DUTY TRUCKS - 1 (LDT1) | 1.257 | 0.969 | 0.552 | 0.278 |
| LIGHT DUTY TRUCKS - 2 (LDT2) | 2.968 | 2.420 | 1.509 | 0.935 |
| MEDIUM DUTY TRUCKS (MDV) | 2.309 | 2.106 | 1.614 | 1.291 |
| LIGHT HEAVY DUTY GAS TRUCKS – 1 (LHDV1) | 1.115 | 0.984 | 0.754 | 0.611 |
| LIGHT HEAVY DUTY GAS TRUCKS – 2 (LHDV2) | 0.074 | 0.054 | 0.033 | 0.020 |
| MEDIUM HEAVY DUTY GAS TRUCKS (MHDV) | 0.127 | 0.240 | 0.134 | 0.058 |
| HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV) | 1.193 | 1.131 | 0.738 | 0.766 |
| LIGHT HEAVY DUTY DIESEL TRUCKS – 1 (LHDV1) | 0.281 | 0.265 | 0.229 | 0.184 |
| LIGHT HEAVY DUTY DIESEL TRUCKS – 2 (LHDV2) | 0.039 | 0.037 | 0.033 | 0.028 |
| MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV) | 0.127 | 0.121 | 0.076 | 0.053 |
| HEAVY HEAVY DUTY GAS TRUCKS (HHDV) | 0.070 | 0.051 | 0.024 | 0.011 |
| MOTORCYCLES (MCY) | 0.847 | 0.771 | 0.628 | 0.637 |
| MOTOR HOMES (MH) | 0.056 | 0.042 | 0.024 | 0.011 |
| HEAVY DUTY DIESEL URBAN BUSES (UB) | 0.008 | 0.008 | 0.008 | 0.007 |
| HEAVY DUTY GAS URBAN BUSES (UB) | 0.010 | 0.009 | 0.008 | 0.007 |
| SCHOOL BUSES - DIESEL (SBD) | 0.016 | 0.012 | 0.005 | 0.003 |
| SCHOOL BUSES - GAS (SBG) | 0.021 | 0.020 | 0.014 | 0.011 |
| OTHER BUSES MOTOR COACH (OBC) | 0.006 | 0.005 | 0.003 | 0.003 |
| ALL OTHER BUSES – GAS (OBG) | 0.040 | 0.035 | 0.026 | 0.019 |
| | | | | |
| **OTHER MOBILE SOURCES** | **12.638** | **11.687** | **10.494** | **9.041** |
| AIRCRAFT | 1.536 | 1.561 | 1.600 | 1.649 |
| TRAINS | 0.442 | 0.420 | 0.387 | 0.295 |
| RECREATIONAL BOATS | 3.827 | 3.510 | 3.122 | 2.579 |
| OFF-ROAD RECREATIONAL VEHICLES | 1.259 | 1.155 | 1.101 | 1.056 |
| OFF-ROAD EQUIPMENT | 2.937 | 2.746 | 2.480 | 2.237 |
| FARM EQUIPMENT | 2.266 | 1.972 | 1.531 | 0.998 |
| FUEL STORAGE AND HANDLING | 0.371 | 0.323 | 0.273 | 0.227 |
| | | | | |
| **TOTAL FOR NORTHERN SACRAMENTO VALLEY** | **70.000** | **67.394** | **61.882** | **58.418** |

## A: 2 OXIDES OF NITROGEN PROJECTED EMISSION INVENTORY
## 2012 Base Year - Annual Average – Grown and Controlled
## NORTHERN SACRAMENTO VALLEY AIR BASIN

| All emissions are represented in Tons per Day and reflect the most current data provided to ARB. | | | | |
|---|---|---|---|---|
| **SUMMARY CATEGORY NAME** | **2010** | **2012** | **2015** | **2020** |
| | | | | |
| **STATIONARY SOURCES TOTAL** | **23.331** | **23.896** | **23.471** | **23.342** |
| **FUEL COMBUSTION** | **19.723** | **20.230** | **19.743** | **19.588** |
| ELECTRIC UTILITIES | 2.148 | 2.822 | 2.728 | 2.910 |
| COGENERATION | 1.562 | 1.940 | 2.408 | 3.384 |
| OIL AND GAS PRODUCTION (COMBUSTION) | 4.047 | 4.119 | 3.853 | 3.476 |
| MANUFACTURING AND INDUSTRIAL | 3.409 | 3.533 | 3.509 | 3.466 |
| FOOD AND AGRICULTURAL PROCESSING | 3.777 | 2.823 | 2.218 | 1.247 |
| SERVICE AND COMMERCIAL | 3.445 | 3.587 | 3.621 | 3.683 |
| OTHER (FUEL COMBUSTION) | 1.335 | 1.406 | 1.406 | 1.421 |
| | | | | |
| **WASTE DISPOSAL** | **0.067** | **0.068** | **0.076** | **0.078** |
| SEWAGE TREATMENT | 0.000 | 0.000 | 0.000 | 0.000 |
| LANDFILLS | 0.010 | 0.010 | 0.011 | 0.012 |
| INCINERATORS | 0.017 | 0.018 | 0.019 | 0.020 |
| SOIL REMEDIATION | 0.040 | 0.040 | 0.046 | 0.046 |
| OTHER (WASTE DISPOSAL) | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | |
| **CLEANING AND SURFACE COATINGS** | **0.003** | **0.003** | **0.004** | **0.004** |
| LAUNDERING | 0.000 | 0.000 | 0.000 | 0.000 |
| DEGREASING | 0.000 | 0.000 | 0.000 | 0.000 |
| COATINGS AND RELATED PROCESS SOLVENTS | 0.003 | 0.003 | 0.003 | 0.003 |
| PRINTING | 0.000 | 0.000 | 0.000 | 0.000 |
| ADHESIVES AND SEALANTS | 0.000 | 0.000 | 0.000 | 0.000 |
| OTHER (CLEANING AND SURFACE COATINGS) | 0.001 | 0.001 | 0.001 | 0.001 |
| | | | | |
| **PETROLEUM PRODUCTION AND MARKETING** | **2.116** | **2.031** | **1.910** | **1.726** |
| OIL AND GAS PRODUCTION | 1.956 | 1.871 | 1.750 | 1.566 |
| PETROLEUM REFINING | 0.000 | 0.000 | 0.000 | 0.000 |
| PETROLEUM MARKETING | 0.158 | 0.158 | 0.158 | 0.158 |
| OTHER (PETROLEUM PRODUCTION AND MARKETING) | 0.002 | 0.002 | 0.002 | 0.002 |
| | | | | |
| **INDUSTRIAL PROCESSES** | **1.422** | **1.564** | **1.739** | **1.946** |
| CHEMICAL | 0.000 | 0.000 | 0.000 | 0.000 |
| FOOD AND AGRICULTURE | 0.013 | 0.013 | 0.014 | 0.015 |
| MINERAL PROCESSES | 1.237 | 1.376 | 1.516 | 1.719 |
| METAL PROCESSES | 0.000 | 0.000 | 0.000 | 0.000 |
| WOOD AND PAPER | 0.043 | 0.045 | 0.047 | 0.049 |
| OTHER (INDUSTRIAL PROCESSES) | 0.129 | 0.129 | 0.162 | 0.163 |

| SUMMARY CATEGORY NAME | 2010 | 2012 | 2015 | 2020 |
|---|---|---|---|---|
| **AREA-WIDE SOURCES TOTAL** | **5.353** | **5.376** | **5.381** | **5.404** |
| **MISCELLANEOUS PROCESSES** | **5.353** | **5.376** | **5.381** | **5.404** |
| CONSTRUCTION AND DEMOLITION | 0.000 | 0.000 | 0.000 | 0.000 |
| COOKING | 0.000 | 0.000 | 0.000 | 0.000 |
| FARMING OPERATIONS | 0.000 | 0.000 | 0.000 | 0.000 |
| FIRES | 0.007 | 0.007 | 0.007 | 0.008 |
| FUGITIVE WINDBLOWN DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| MANAGED BURNING AND DISPOSAL | 3.601 | 3.560 | 3.531 | 3.498 |
| PAVED ROAD DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| RESIDENTIAL FUEL COMBUSTION | 1.746 | 1.809 | 1.843 | 1.898 |
| UNPAVED ROAD DUST | 0.000 | 0.000 | 0.000 | 0.000 |
| SOLVENT EVAPORATION | 0.000 | 0.000 | 0.000 | 0.000 |
| ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS | 0.000 | 0.000 | 0.000 | 0.000 |
| ASPHALT PAVING/ROOFING | 0.000 | 0.000 | 0.000 | 0.000 |
| CONSUMER PRODUCTS | 0.000 | 0.000 | 0.000 | 0.000 |
| PESTICIDES/FERTILIZERS | 0.000 | 0.000 | 0.000 | 0.000 |
| OTHER (MISCELLANEOUS PROCESSES) | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | |
| **MOBILE SOURCES TOTAL** | **69.967** | **63.628** | **52.902** | **37.964** |
| **ON-ROAD MOTOR VEHICLES** | **44.380** | **39.275** | **30.520** | **19.880** |
| LIGHT DUTY PASSENGER (LDA) | 3.209 | 2.448 | 1.619 | 0.936 |
| LIGHT DUTY TRUCKS - 1 (LDT1) | 0.766 | 0.634 | 0.455 | 0.254 |
| LIGHT DUTY TRUCKS - 2 (LDT2) | 3.607 | 2.848 | 1.894 | 1.039 |
| MEDIUM DUTY TRUCKS (MDV) | 3.653 | 3.138 | 2.504 | 1.725 |
| LIGHT HEAVY DUTY GAS TRUCKS – 1 (LHDV1) | 1.249 | 1.165 | 1.024 | 0.843 |
| LIGHT HEAVY DUTY GAS TRUCKS – 2 (LHDV2) | 0.061 | 0.055 | 0.047 | 0.038 |
| MEDIUM HEAVY DUTY GAS TRUCKS (MHDV) | 0.209 | 0.176 | 0.132 | 0.086 |
| HEAVY HEAVY DUTY GAS TRUCKS (HHDV) | 0.080 | 0.083 | 0.082 | 0.073 |
| LIGHT HEAVY DUTY DIESEL TRUCKS – 1 (LHDV1) | 6.050 | 5.369 | 4.382 | 3.055 |
| LIGHT HEAVY DUTY DIESEL TRUCKS – 2 (LHDV2) | 0.880 | 0.778 | 0.645 | 0.461 |
| MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV) | 2.365 | 2.187 | 1.669 | 0.877 |
| HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV) | 21.127 | 19.246 | 15.020 | 9.598 |
| MOTORCYCLES (MCY) | 0.218 | 0.219 | 0.218 | 0.235 |
| MOTOR HOMES (MH) | 0.265 | 0.233 | 0.193 | 0.147 |
| HEAVY DUTY DIESEL URBAN BUSES (UB) | 0.170 | 0.165 | 0.161 | 0.152 |
| HEAVY DUTY GAS URBAN BUSES (UB) | 0.035 | 0.034 | 0.033 | 0.031 |
| SCHOOL BUSES – DIESEL (SBD) | 0.237 | 0.232 | 0.229 | 0.202 |
| SCHOOL BUSES – GAS (SBG) | 0.023 | 0.022 | 0.018 | 0.015 |
| OTHER BUSES MOTOR COACH – DIESEL (OBC) | 0.115 | 0.101 | 0.080 | 0.041 |
| OTHER BUSES GAS (OBG) | 0.077 | 0.070 | 0.057 | 0.040 |
| | | | | |
| **OTHER MOBILE SOURCES** | **25.587** | **24.353** | **22.383** | **18.083** |
| AIRCRAFT | 0.758 | 0.771 | 0.791 | 0.816 |
| TRAINS | 6.718 | 7.042 | 7.441 | 7.001 |
| RECREATIONAL BOATS | 0.718 | 0.693 | 0.684 | 0.676 |
| OFF-ROAD RECREATIONAL VEHICLES | 0.033 | 0.031 | 0.037 | 0.045 |
| OFF-ROAD EQUIPMENT | 5.977 | 5.699 | 5.216 | 4.114 |
| FARM EQUIPMENT | 11.384 | 10.117 | 8.214 | 5.431 |
| FUEL STORAGE AND HANDLING | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | |
| **TOTAL FOR NORTHERN SACRAMENTO VALLEY** | **98.651** | **92.901** | **81.754** | **66.709** |