

# *2022 Ozone Plan* for Attainment of the 2015 8-Hour Ozone Standard

June 1, 2022

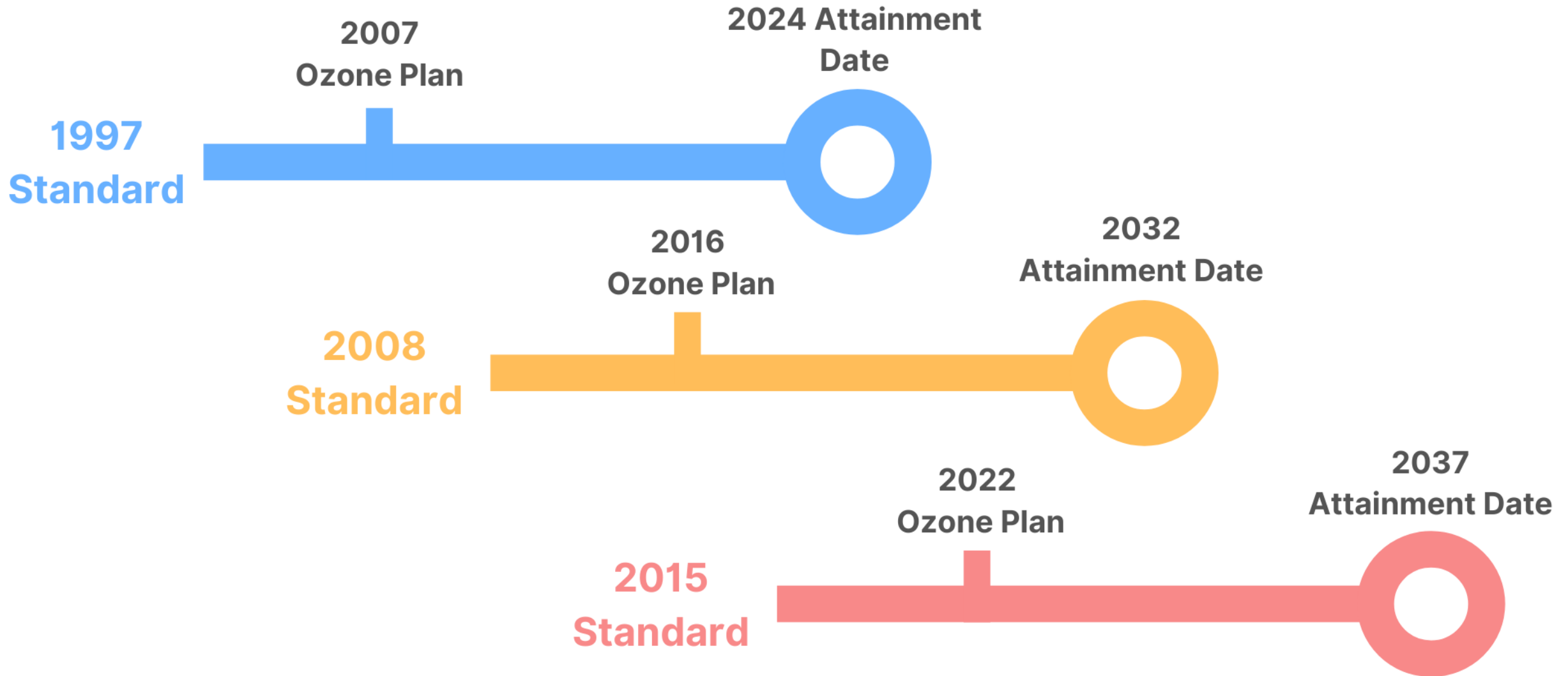
[webcast@valleyair.org](mailto:webcast@valleyair.org)

# Workshop Overview

- Background
  - In October 2015, EPA lowered 8-hr ozone standard from 75 ppb to 70 ppb
  - In 2018, EPA designated Valley as “Extreme” nonattainment for 70 ppb standard
  - District required to adopt new Ozone Plan with attainment deadline of 2037 (*2022 Ozone Plan*)
- Current Status of Plan Development
  - CARB modeling fully conducted and shows Valley will attain 70 ppb standard by 2037 attainment deadline
  - Initial draft chapters and appendices of *2022 Ozone Plan* published May 24, 2022 for public review
  - Proposed Plan tentatively scheduled to be published in July, ahead of late summer Public Hearing
- Next Steps

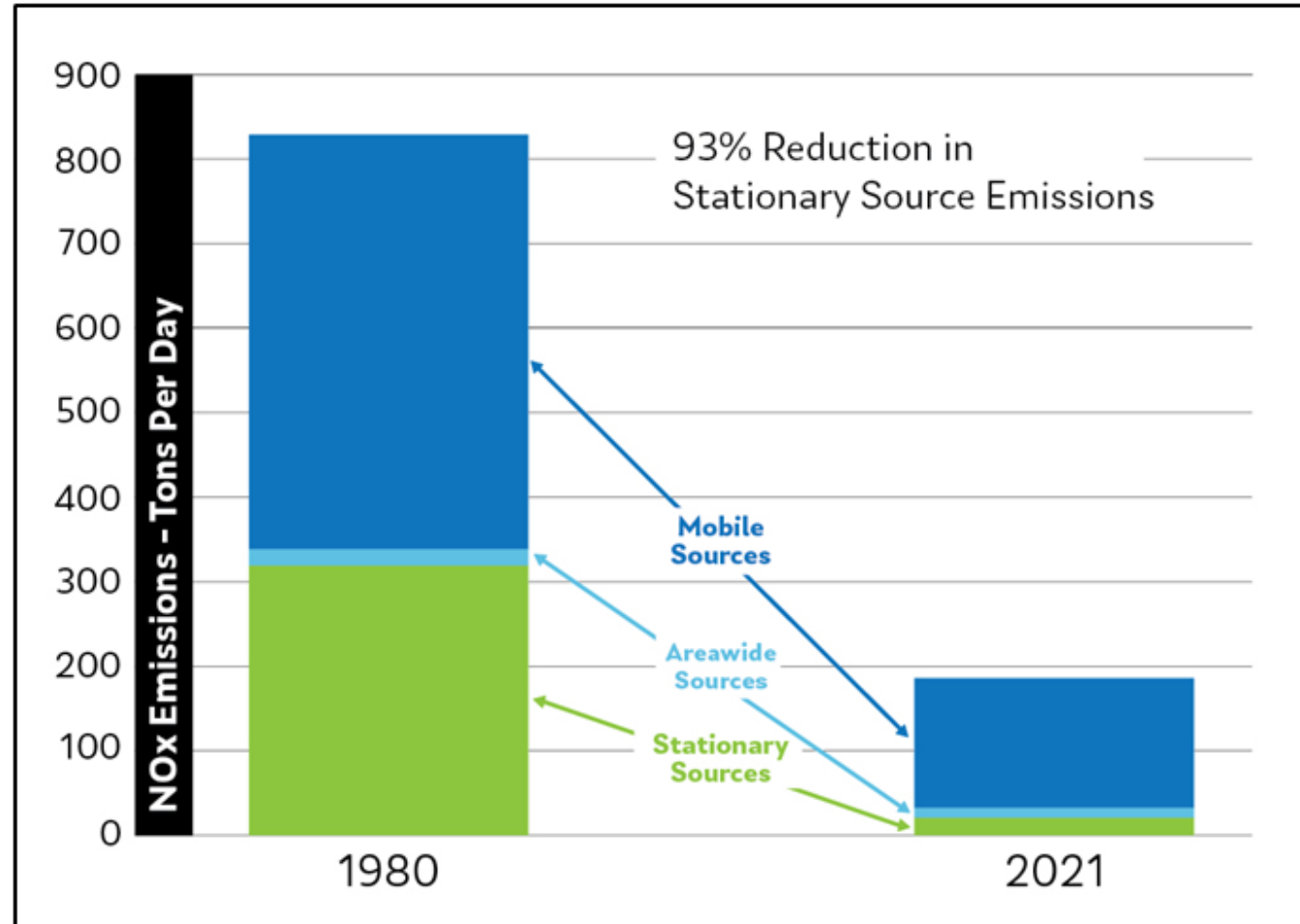
# Background

# Timeline of 8-hour Ozone Standards



# District's Regulatory Program

- Since 1992, District has adopted over 650 rules to implement aggressive on-going emission control strategy to meet federal mandates
- Through District and CARB efforts, Valley NOx emissions, key precursor to formation of both ozone and PM2.5, have been reduced significantly since 1980:
  - Over 75% reduction in overall NOx
  - Over 93% reduction in stationary source NOx

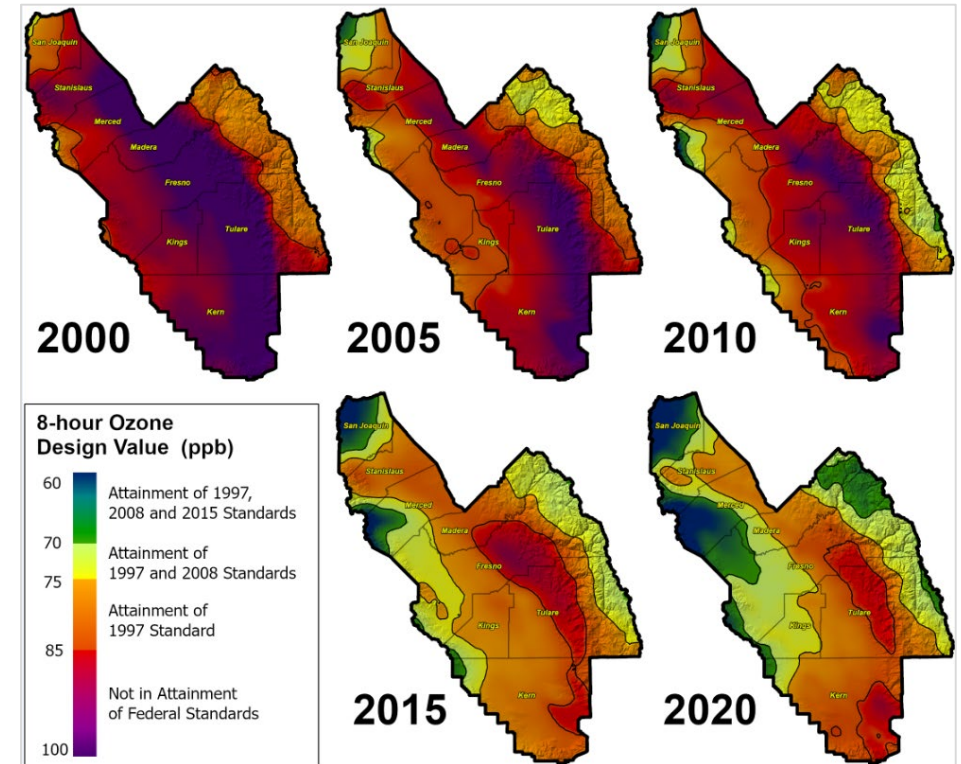


# 2022 Ozone Plan

- District required to adopt new *2022 Ozone Plan* for 2015 ozone standard (70 ppb)
  - Valley designated as “Extreme” nonattainment
  - Attainment deadline of 2037
- Builds upon *2007 Ozone Plan* (1997 NAAQS) and *2016 Ozone Plan* (2006 NAAQS) to address the 2015 NAAQS
  - District/CARB strategies are the nation’s toughest air quality program
  - Stationary source emissions reduced by over 90%
- Despite significant progress, substantial further reductions in NO<sub>x</sub> emissions needed to attain new 2015 federal 8-hour ozone standard
  - Concerted effort by District, CARB, and EPA to identify additional measures/funding for transformational transitions to new technologies
  - Over 80% of NO<sub>x</sub> emissions from mobile sources under state/federal jurisdiction

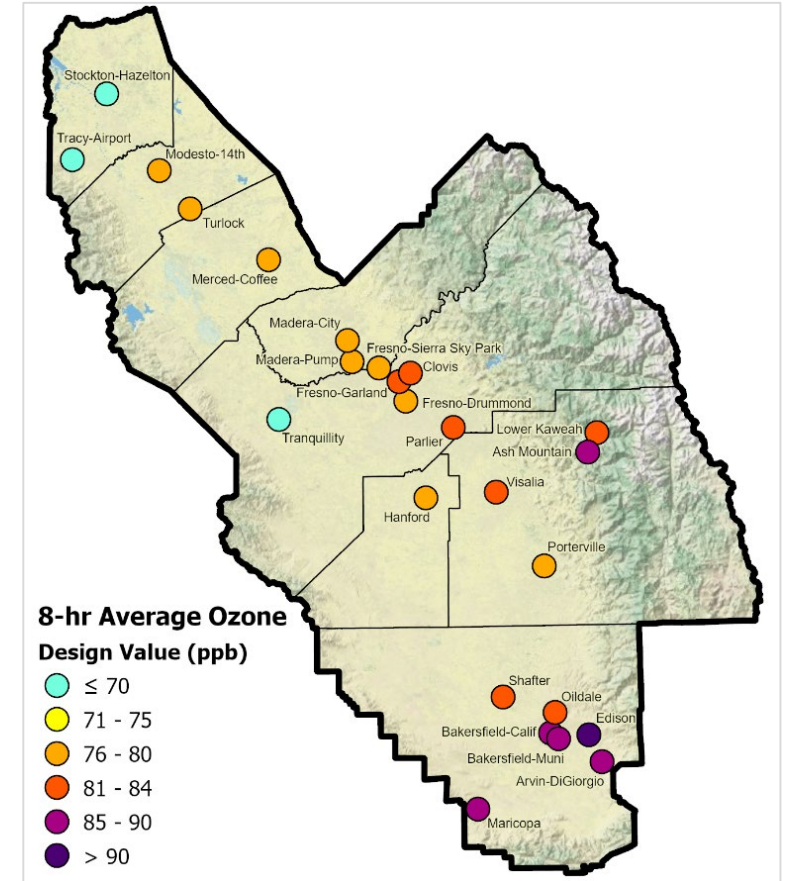
# Ongoing Planning Efforts

- District's numerous air quality plans (State Implementation Plans, or SIPs) have been a primary vehicle for improving air quality in the San Joaquin Valley
  - Each plan builds upon work of prior plans while establishing path for continued air quality improvements
  - After each plan adoption, District implements plan strategies through regulatory development, outreach, continued research, and incentive programs
  - Each attainment plan is just one checkpoint in this continuing effort to improve San Joaquin Valley air quality



# Ambient Air Quality Data

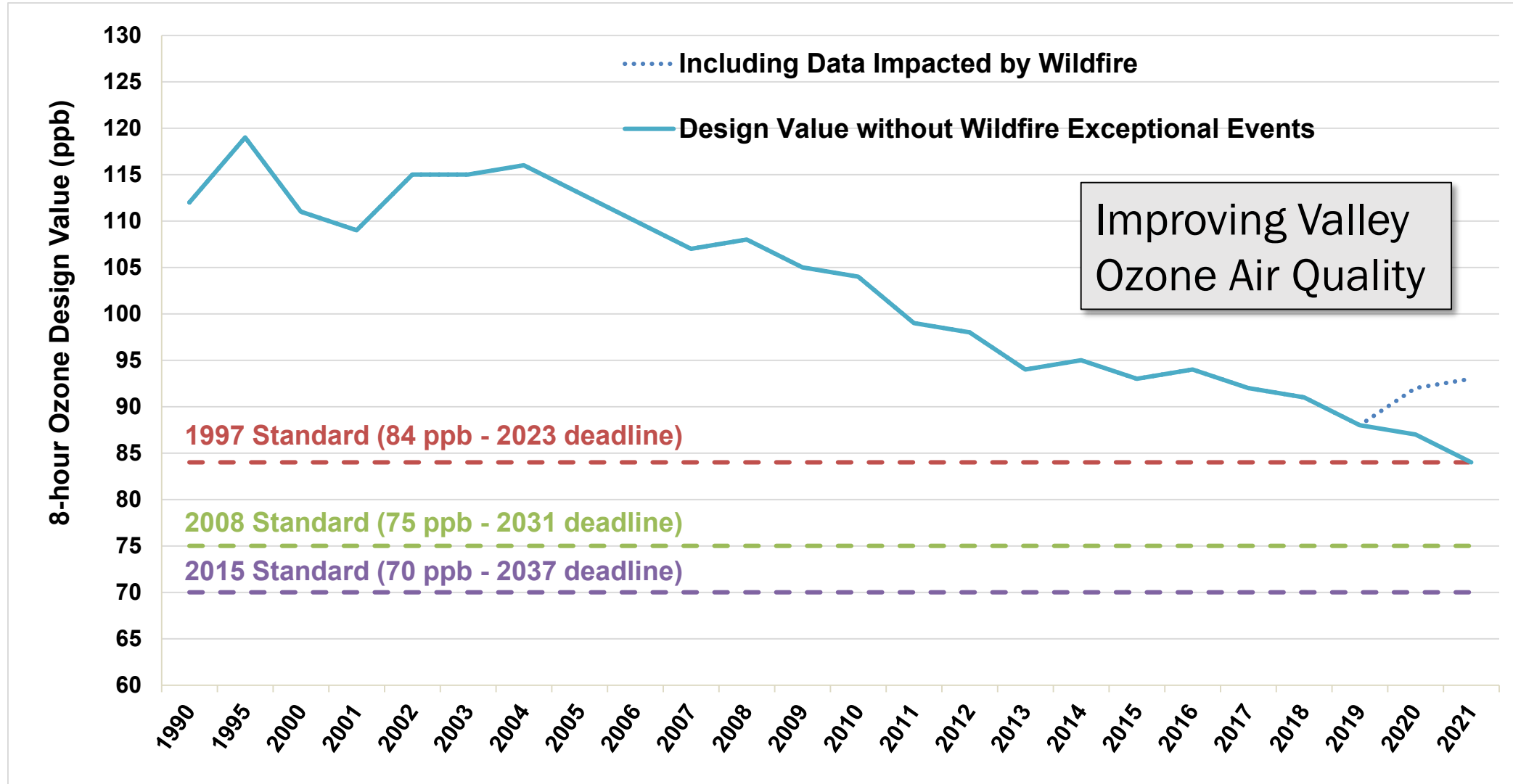
- District analyzed ambient air quality data to evaluate air quality improvements
  - From 2000-2004, Basin exceedances of 2015 standard occurred between 150-190 times per year
  - Within last 5 years, only about 100 exceedances each year with far less occurrence of exceedances in March-May
- Ongoing emissions reductions have continued to bring areas of region into attainment of 2015 standard
  - Progress is expected to continue into future years



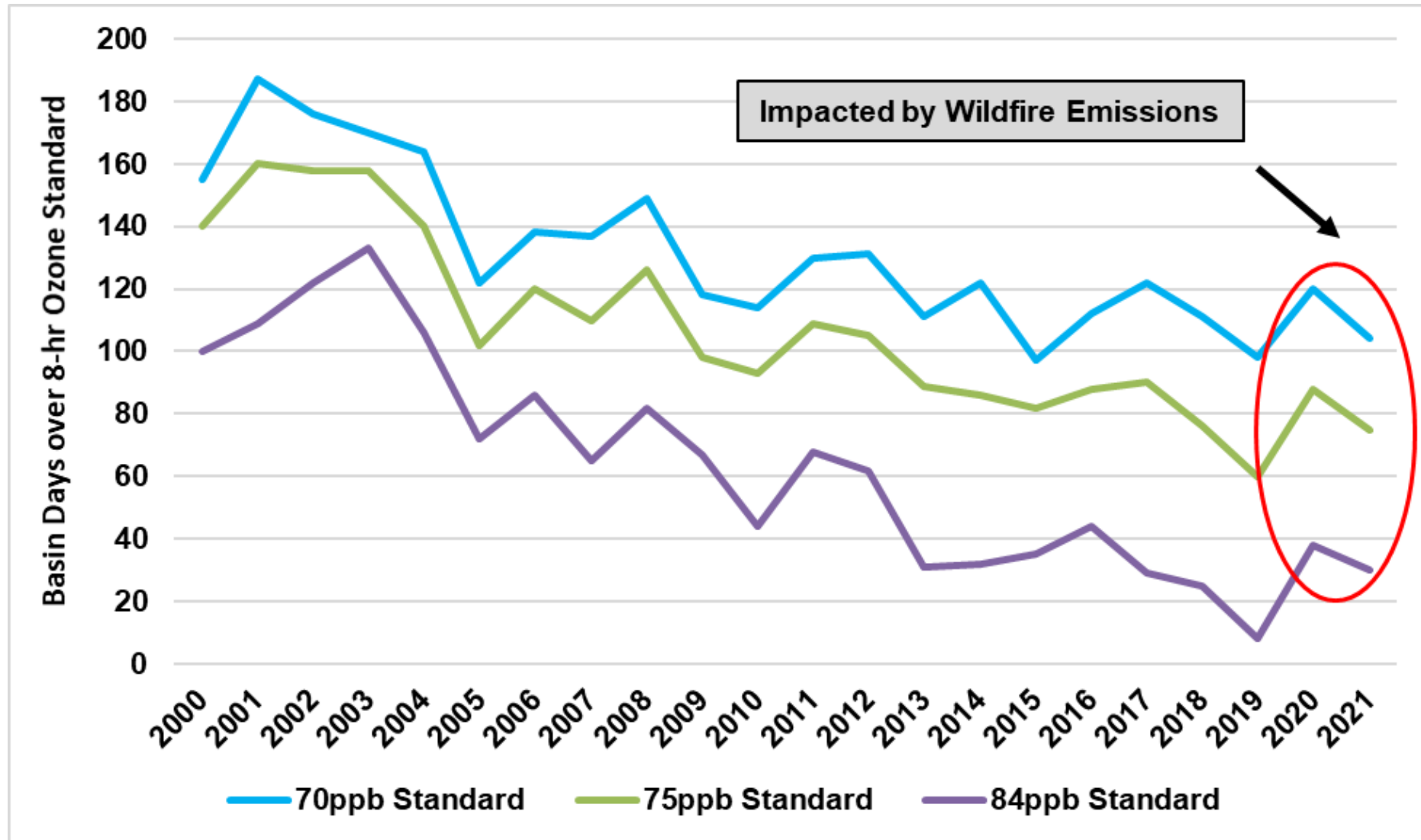
*Includes wildfire impacts*



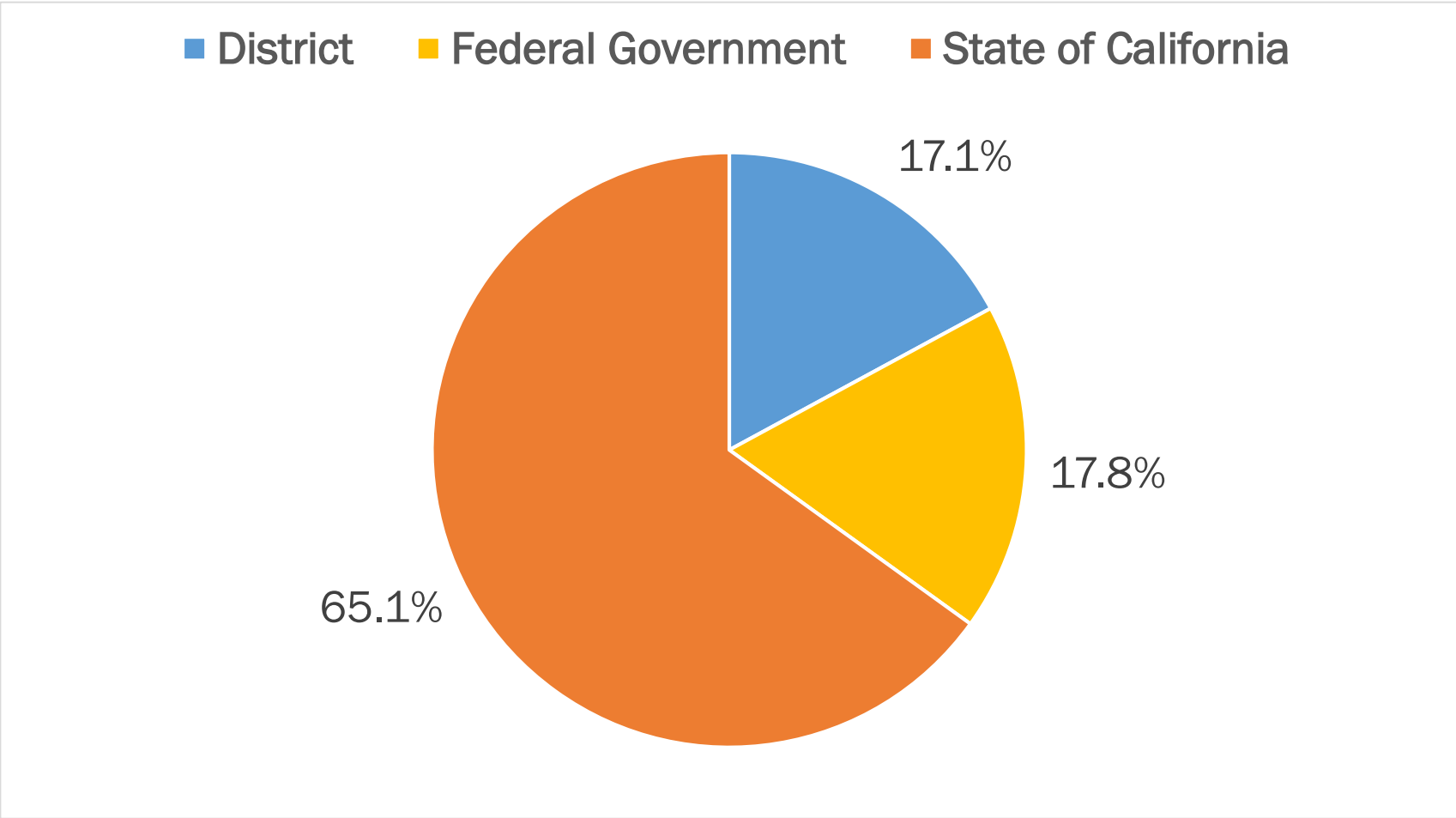
# Improving Valley Ozone Air Quality



# Number of Days Valley Exceeded the 8-hr Ozone Standard

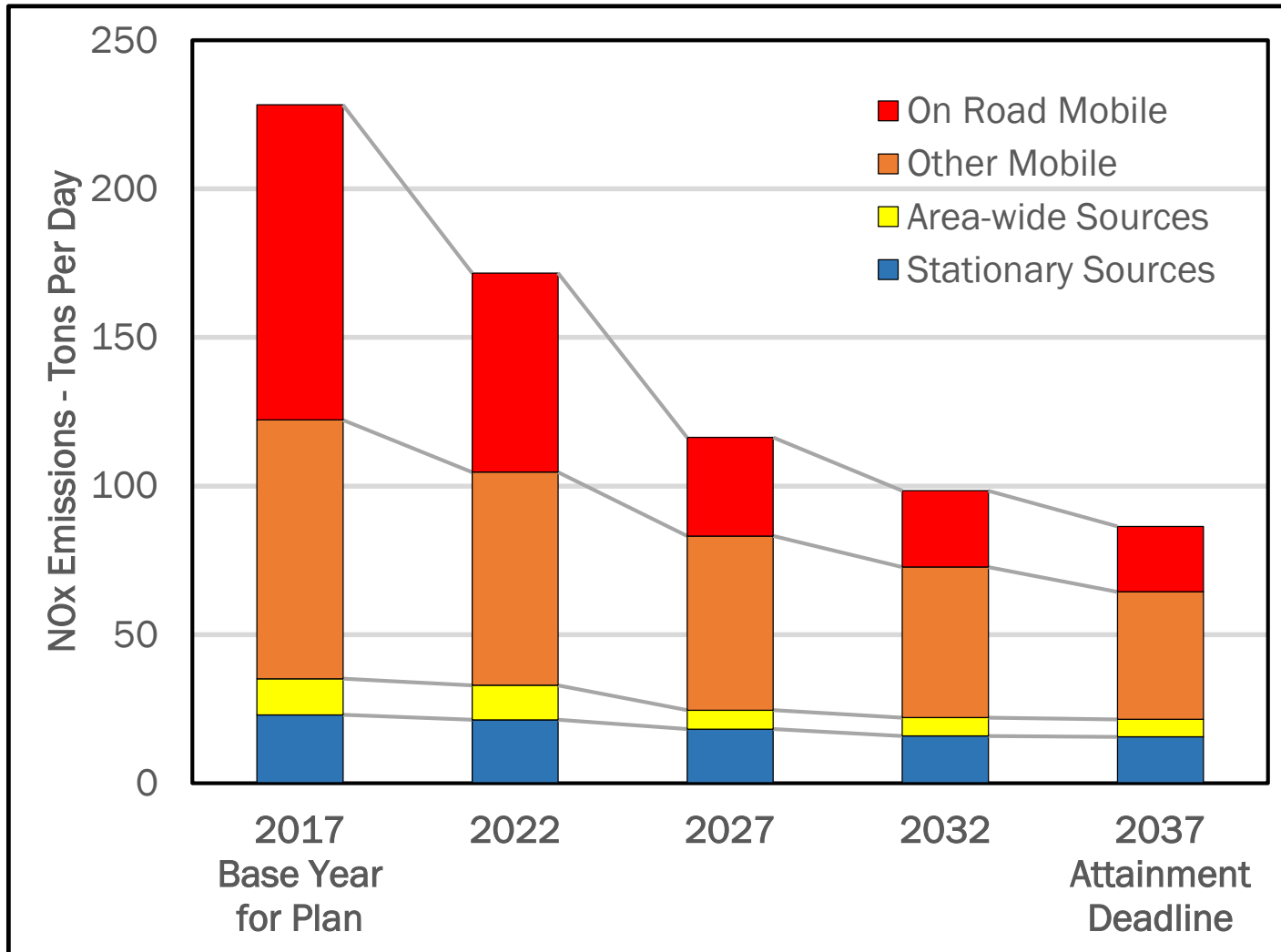


# 2022 NOx Emissions Inventory Jurisdictional Authority



*\*Based on 2022 summer average, CEPAM 2019 Ozone SIP v1.04*

# Emissions Inventory



- Plan presents a thorough and recently updated emissions inventory showing a 62% reduction in NOx emissions between 2017 - 2037, based on already-adopted measures

# Plan Elements

# Initial Draft Plan Sections for Public Review

- District published initial draft chapters and appendices of 2022 Ozone Plan for public review:
  - *Chapter 1 Introduction*
  - *Chapter 2 Air Quality in the Valley: Challenges and Progress*
  - *Appendix A Ambient Air Quality Data*
  - *Appendix B Emissions Inventory*
  - *Appendix H Weight of Evidence*
- Draft Plan sections available at <https://ww2.valleyair.org/plans/2022-ozone-plan-for-the-san-joaquin-valley/>
- Submit comments via email to [airqualityplanning@valleyair.org](mailto:airqualityplanning@valleyair.org) by June 21, 2022 at 5:00 PM

# Ozone SIP Modeling In The San Joaquin Valley: 70 ppb 8-hr Ozone Standard

Air Quality Planning & Science Division  
California Air Resources Board

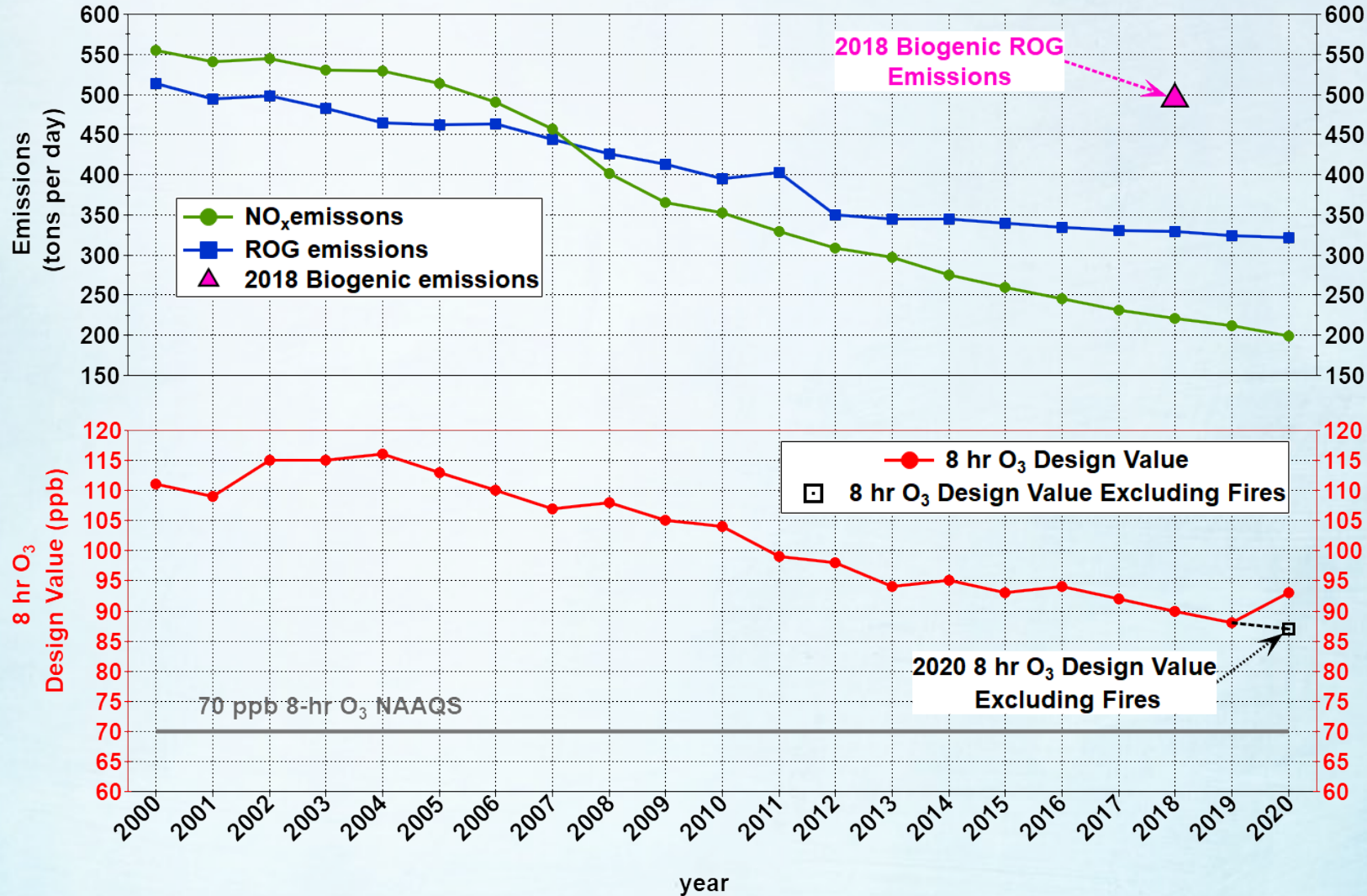
San Joaquin Valley Ozone SIP workshop 06/01/2022

# Outline

- Emission and ozone trends in SJV
- Weekend/weekday effect
- Use of model for attainment demonstration
- SJV ozone SIP modeling configuration
- Model performance evaluation
- Future year O<sub>3</sub> design values

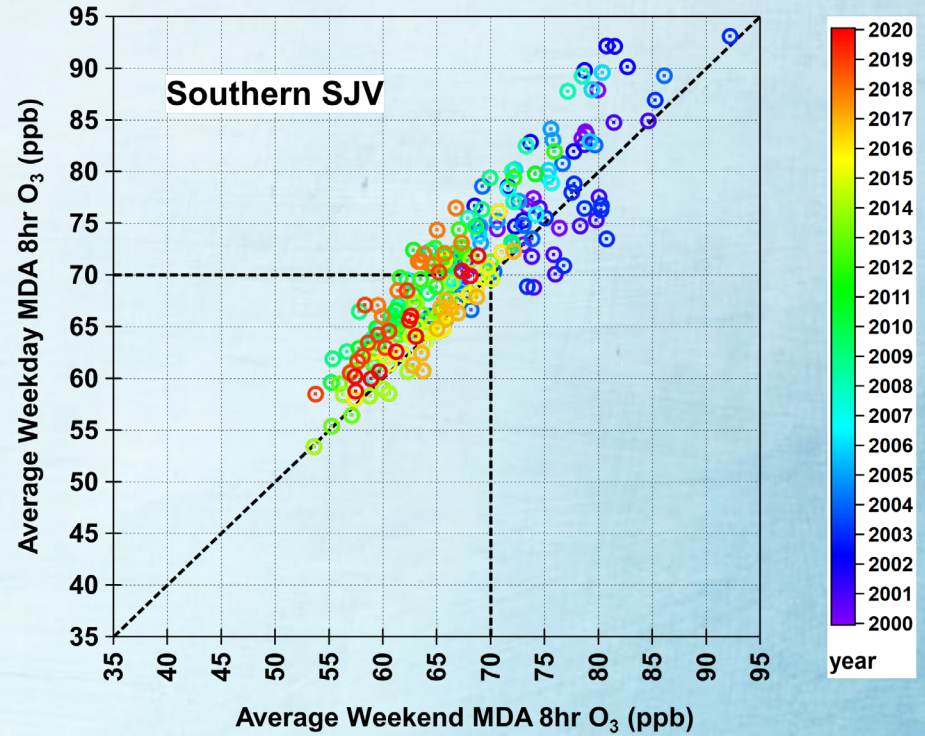
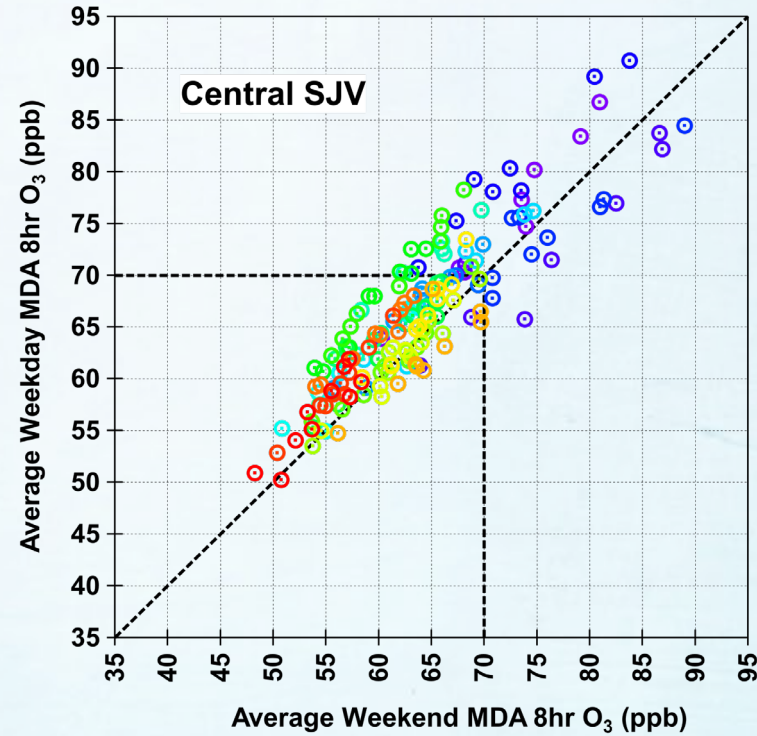
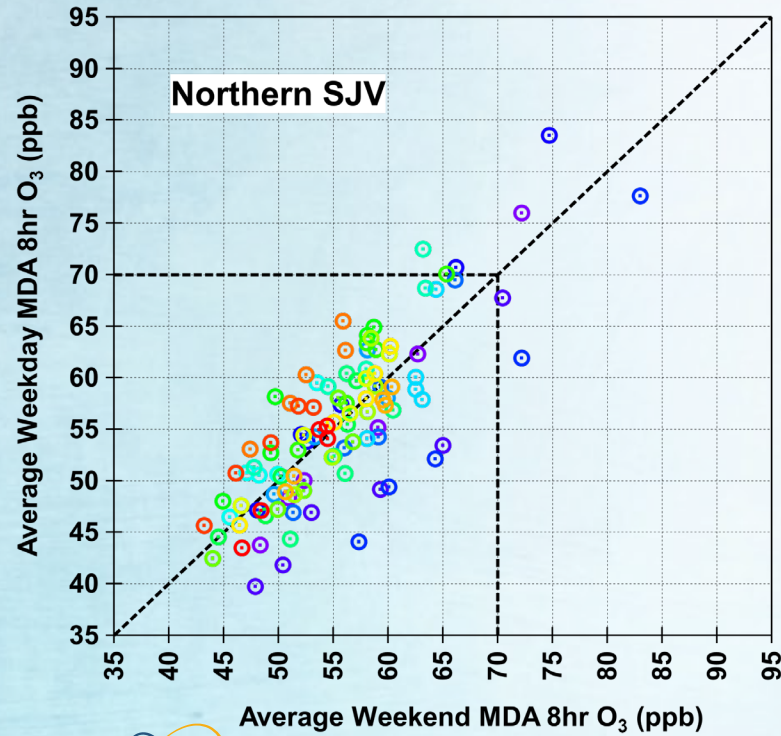


# Long Term Emission and Ozone Trends in SJV



# Weekend/Weekend Effect Over Time

- Early 2000s: many sites in the valley exhibit a NO<sub>x</sub>-disbenefit
- Southern and Central regions transitioned to NO<sub>x</sub> limited first followed by the North.
- In recent years, all the regions are generally NO<sub>x</sub> limited with some variabilities from year to year due to meteorology and biogenic emissions



# Model Attainment Demonstration

Observation and model based relative response approach:

DVB: Baseline O<sub>3</sub> design value (5-year weighted average of 4<sup>th</sup> highest O<sub>3</sub> from observation\*)

$$\text{RRF} = \frac{\text{Future average daily max. 8hr O}_3 \text{ (model-based)}}{\text{Base average daily max. 8hr O}_3}$$

RRF: Relative Response Factor (model based)

For a given monitoring site

$$\text{DVF} = \text{RRF} * \text{DVB}$$

DVF=Future O<sub>3</sub> design value

\* Since 2020 is an atypical year, 2020 data are excluded from DVB calculation for this SIP.

# SJV O<sub>3</sub> SIP Modeling Configuration

Base Year (2018): used to assess model performance

Reference year (2018): used to project future DV, same as base year simulation except no wildfire emissions

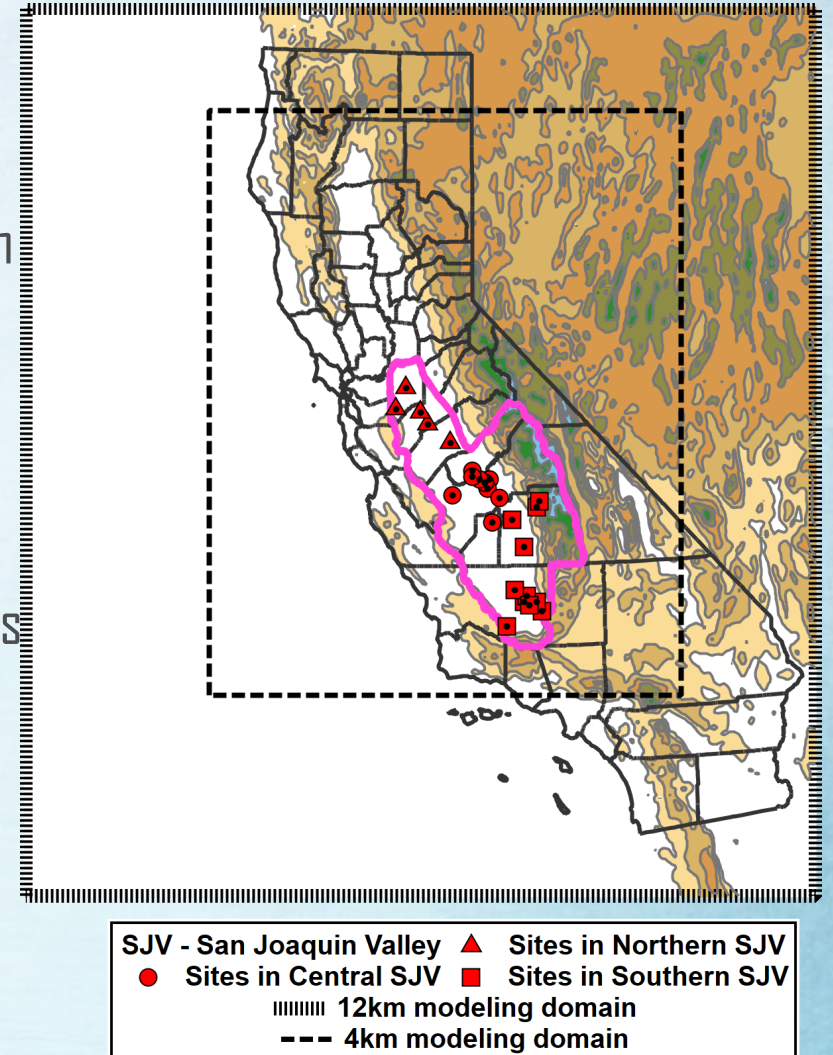
Future Year (2037): used to project future DV

Emission: 2019 CEPAM v1.03 adjusted to CEPAM v1.04

2037 emissions include benefits from CARB and District rules and commitments

**CARB: SORE rule, HD I/M, State SIP Strategy**

**District: recent rules (e.g. open burning, boilers, glass melting furnaces and internal combustion engines)**



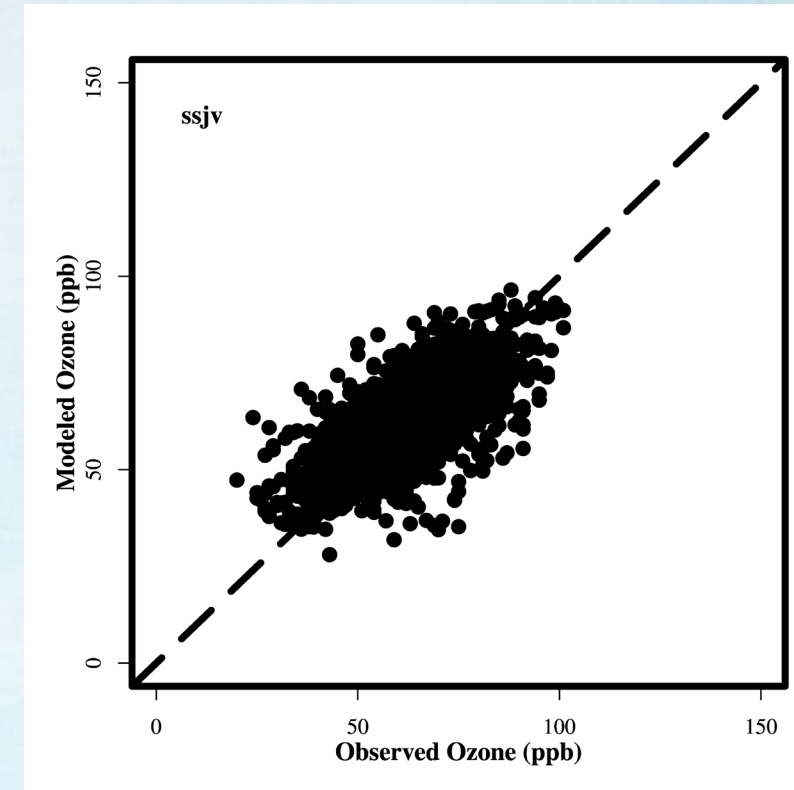
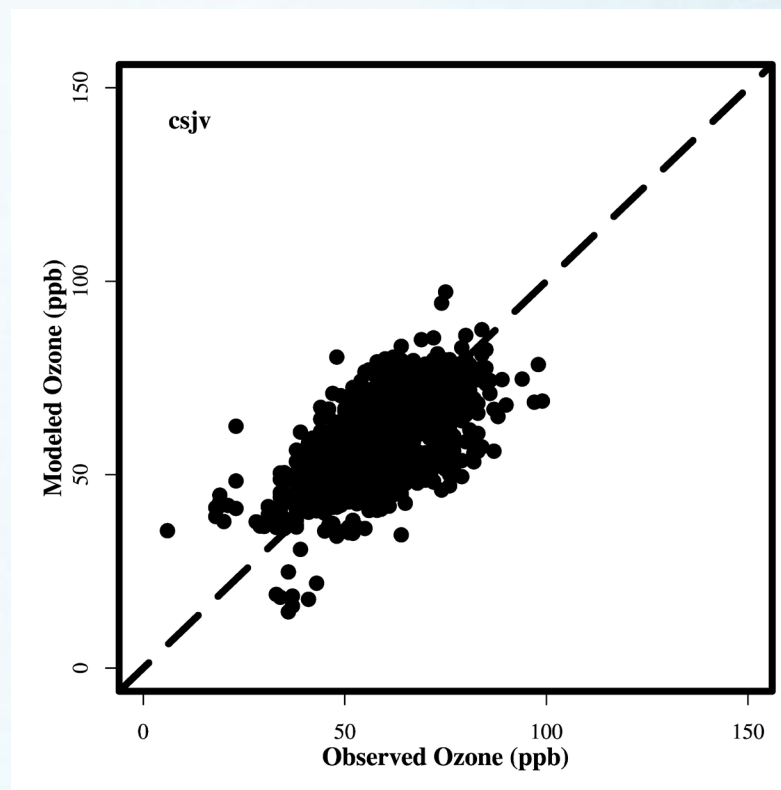
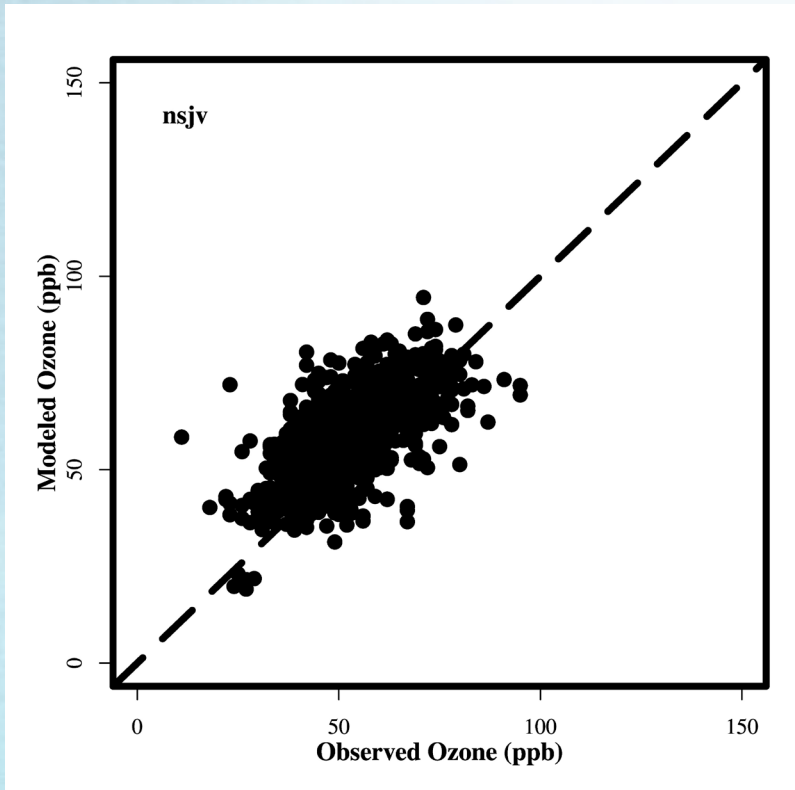
# Summer Anthropogenic Emissions of NO<sub>x</sub> and ROG in SJV

	CEPAM v1.04 with External Adjustment				With CARB Commitments	
	NO <sub>x</sub> (tpd)	ROG (tpd)	NO <sub>x</sub> (tpd)	ROG (tpd)	NO <sub>x</sub> (tpd)	ROG (tpd)
	2018	2018	2037	2037	2037	2037
Stationary	24.1	84.0	16.2	92.9	14.2	92.6
Area	7.7	157.1	3.6	159.2	3.6	159.2
On-road	93.4	31.2	20.9	13.4	13.1	11.2
Off-road	96.6	51.6	46.6	25.5	26.8	23.9
Total	221.8	323.9	87.3	290.9	57.8	286.9

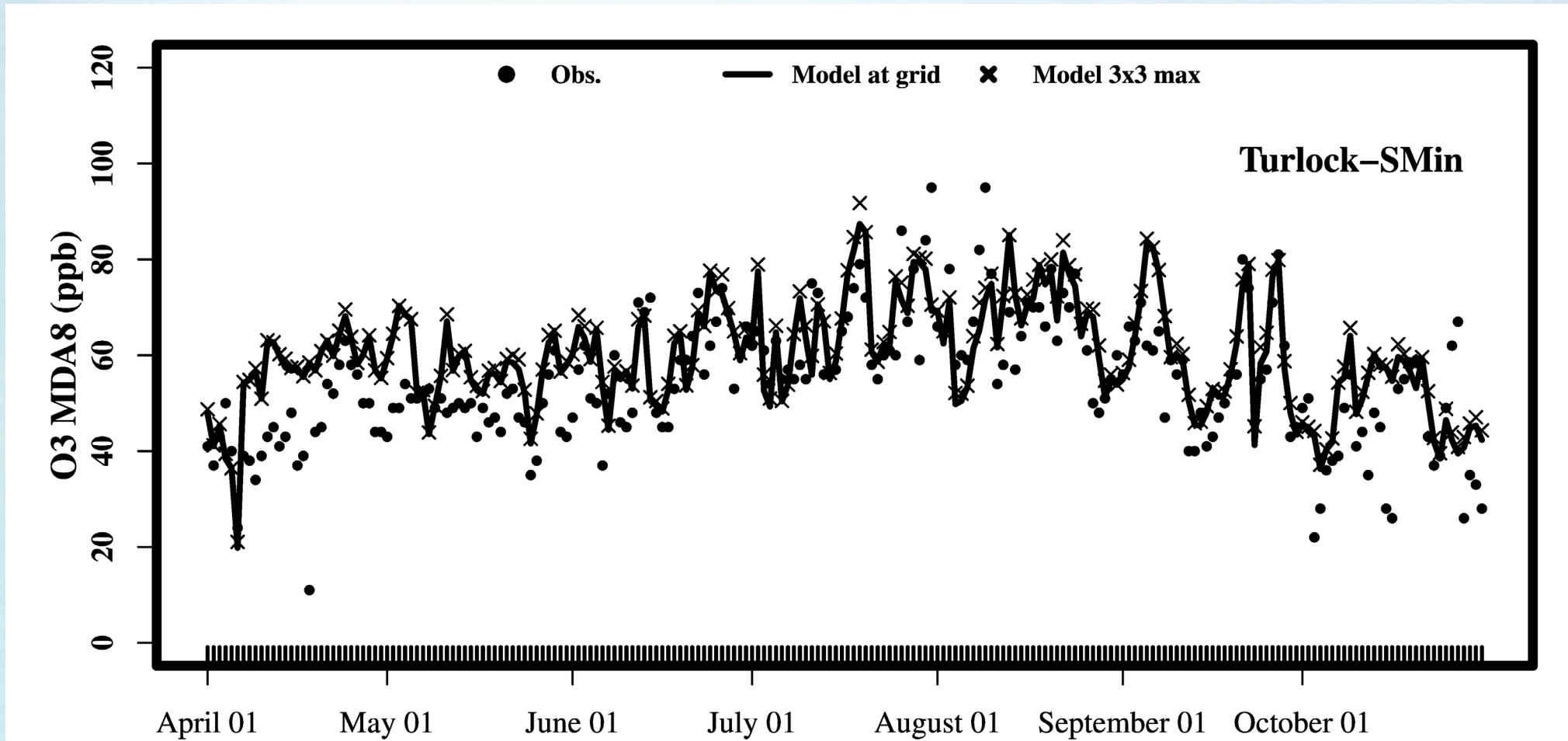
Additional emission from Emission Reduction Credit (ERC)

	NO <sub>x</sub> (tpd)	ROG (tpd)
	2037	2037
ERC	2.02	0

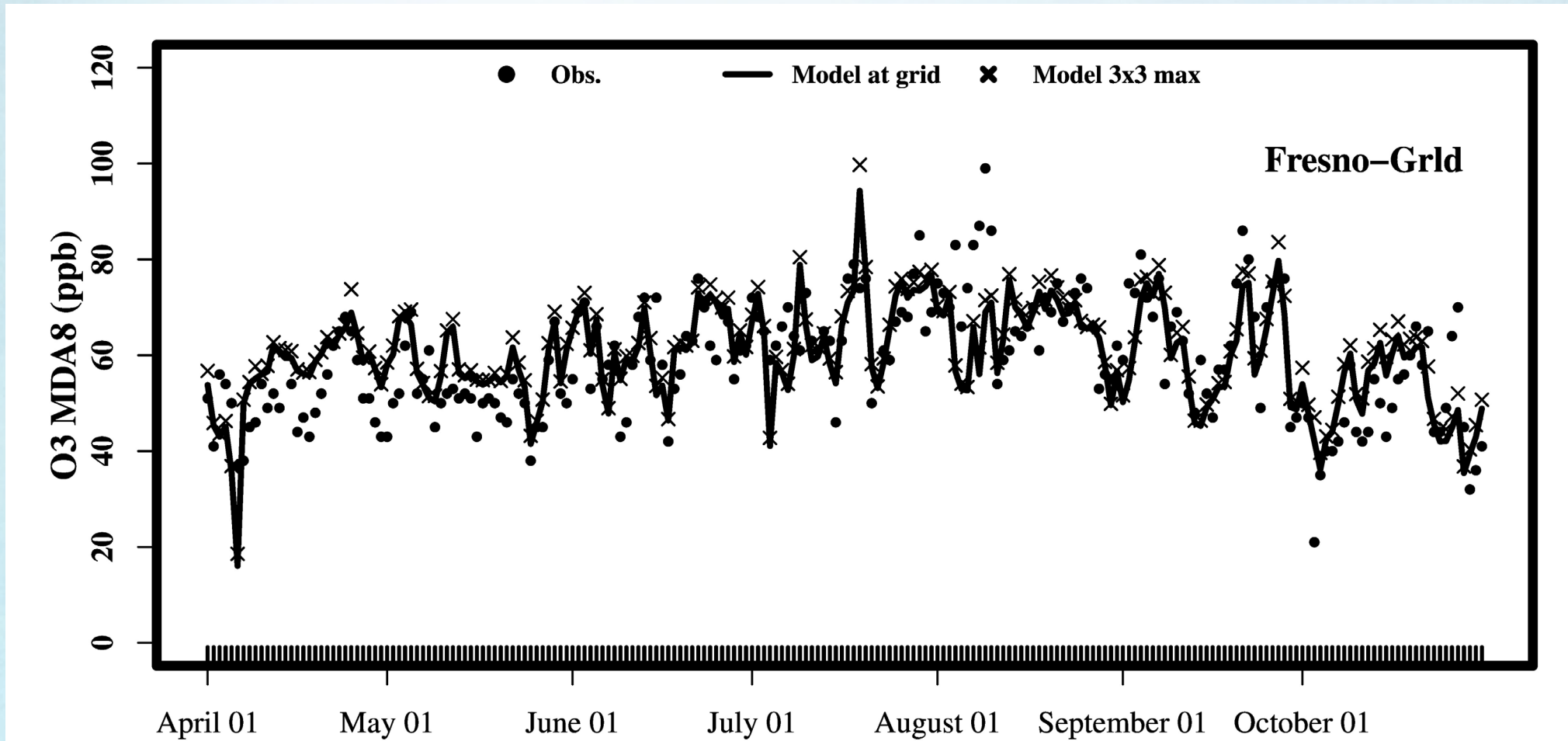
# Model Performance Evaluation



# Model Performance Evaluation

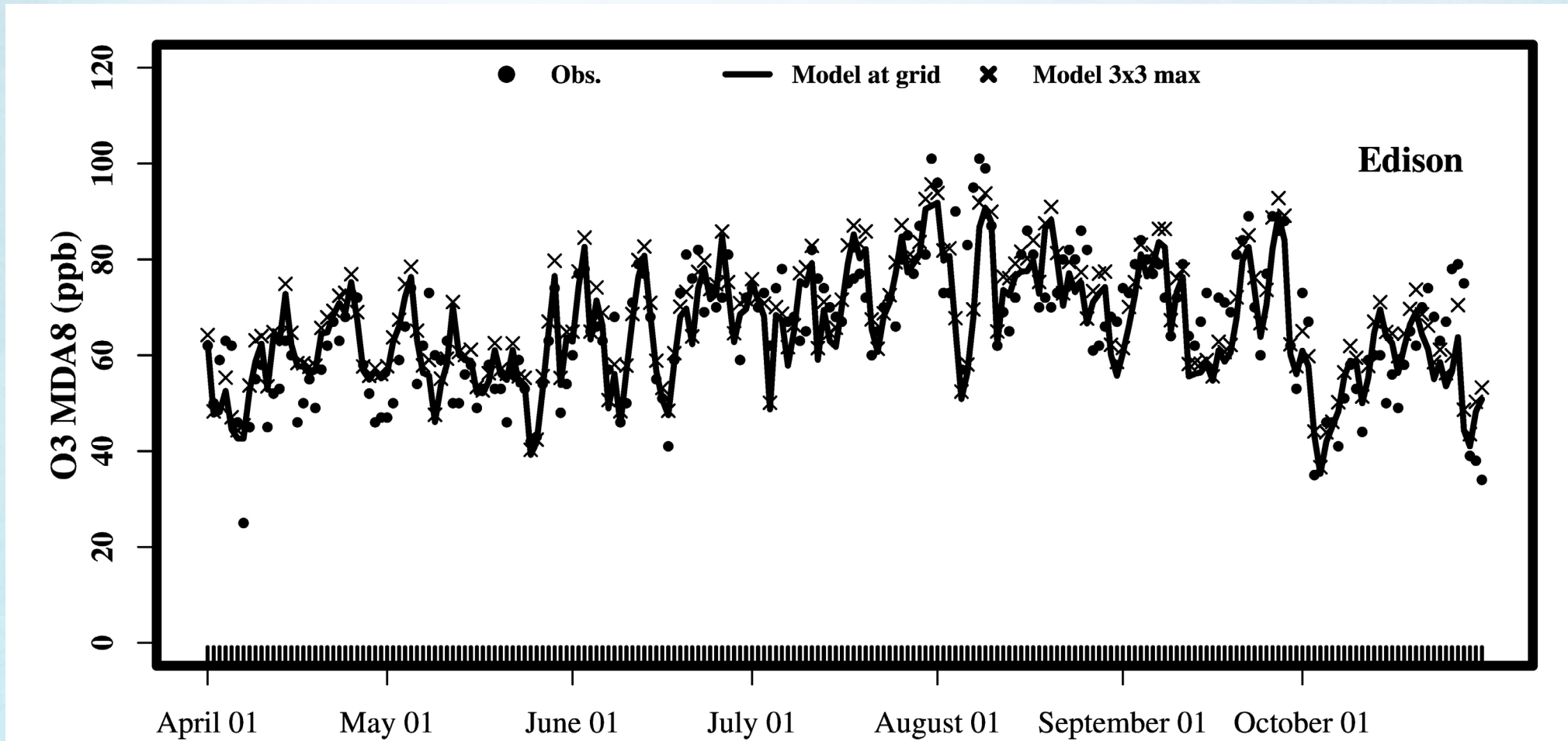


# Model Performance Evaluation





# Model Performance Evaluation



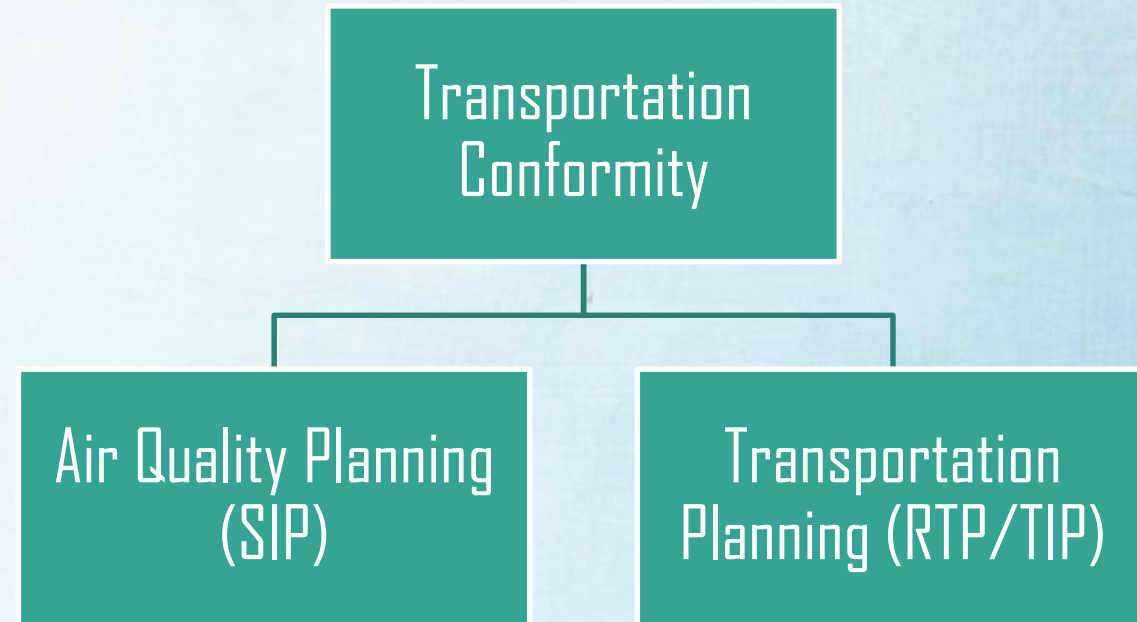
# O<sub>3</sub> Design Value in 2037

2015 O<sub>3</sub> standard: 70ppb

Site_Name	DVB	DV2037	DV2037t
Clovis	85.3	67.8	67
Fresno-Grld	85.7	67.6	67
Modesto-14th	79.3	65.8	65
Baker-5558Ca	87.3	65.7	65
Maricopa-Stn	83.7	65.6	65
Turlock-SMin	82.3	65.2	65
Fresno-Drmnd	82.0	65.0	65
Hanford-Irwn	80.0	64.6	64
Tracy_Air	73.7	64.0	64
Visalia-NChu	84.0	63.2	63
Parlier	84.3	63.1	63
Dildale-3311	83.0	62.8	62
Fresno-Sky#2	80.0	62.8	62
Shafter-Wlkr	79.7	62.1	62
Edison	89.0	61.6	61
Madera-Rd29	75.7	60.9	60
SequoKingCan	86.7	60.7	60
Arvin-DiG	88.0	60.6	60
Tranquility	72.7	60.5	60
Bakers_Muni	85.3	60.1	60
Madera-Avl4	77.7	59.7	59
Merced-SCofe	76.7	59.6	59
Seq_NP-Kawea	83.3	58.2	58
Stockton-Haz	66.0	58.0	58
Portrvlle-Ne	78.0	57.7	57

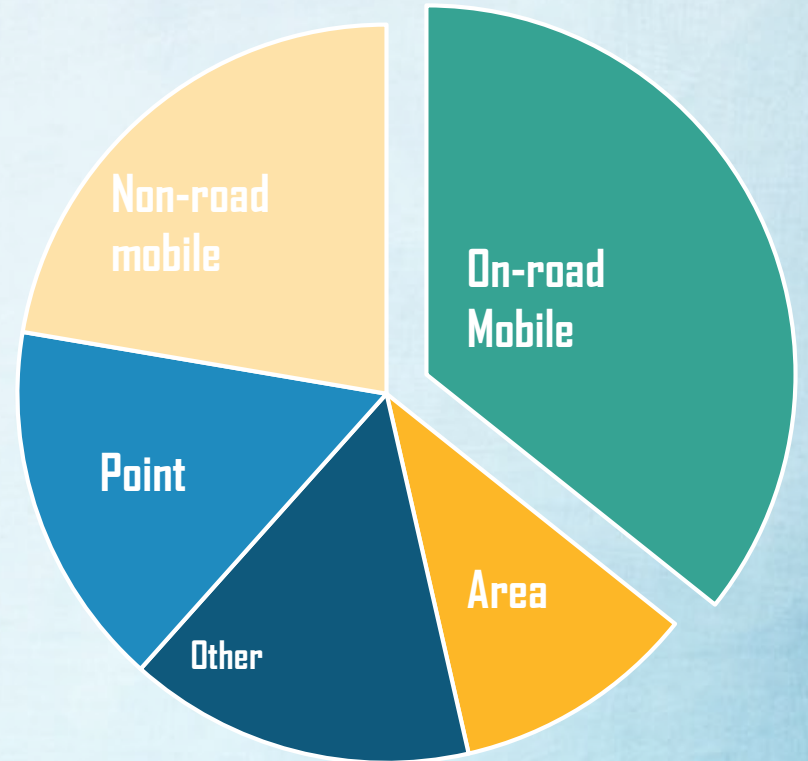
# Transportation Conformity

- Connects transportation and air quality planning process
- **M**otor **V**ehicle **E**missions **B**udget established in SIP
- Transportation activities must not
  - produce new air quality violations
  - worsen existing violations
  - delay timely attainment of NAAQS



# Motor Vehicle Emissions Budget

- Shows how much on-road emissions that region can have and still meet SIP's target
- Based on emission inventory and control measures
- Pollutants: VOC and NO<sub>x</sub>
- Established by CARB in California



# Methodology for Developing MVEB

- Use latest EPA-approved emission model, consistent with SIP inventories – EMFAC2017
  - Vehicle population & age distribution
- Vehicle activity (VMT and speed) must be based on the latest planning assumptions and network-based modeling
  - Land use, human population, employment
  - Travel cost, level of service, congestion
- Off-model adjustments for recently adopted (e.g., Low NO<sub>x</sub>, Standard, ACT, HD I/M) and under development (ACCII, ACF) regulations

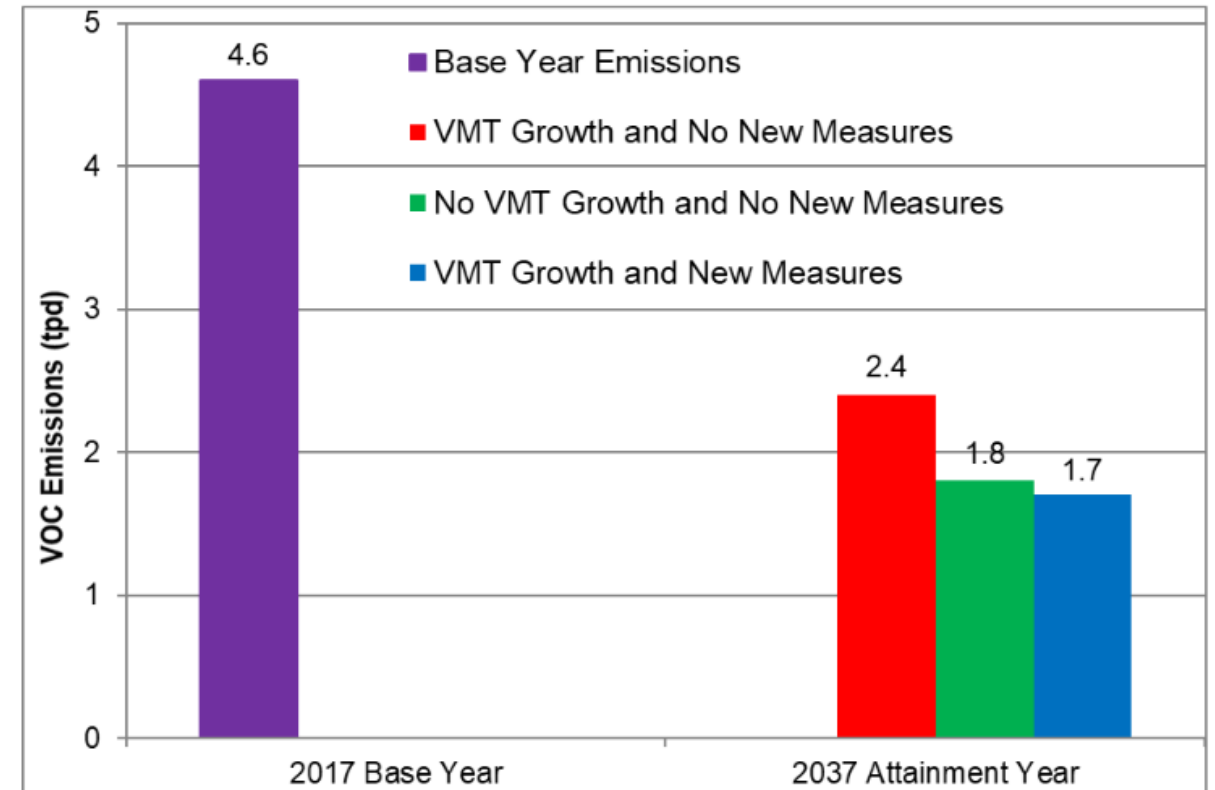
# Summary

- Transportation conformity ensures air and transportation agencies interact on a continuous basis
- Latest emission model and planning assumptions must be used
- MVEB must be consistent with emission inventory, RFP, and attainment demonstration

# VMT Offsets

- **Requirement:** Offset growth in emissions due to growth in vehicle miles travelled (VMT) through implementation of transportation control strategies and transportation control measures (TCMs)
- In July 2020, CARB submitted 70 ppb Ozone SIP Submittal to EPA, consisting of baseline emissions inventory and VMT emissions offset demonstration for Valley

San Joaquin Valley VMT Offset Demonstration\*



\* Does not include resting or diurnal loss emissions

Source: CARB 70 ppb Ozone SIP Submittal (May 2020)

# Reasonable Further Progress

- **Requirement:** Provide for annual incremental reductions in emissions for ensuring attainment of the NAAQS.

DRAFT

Year	2017	2023	2026	2029	2032	2035	2037
ROG emissions	325.68	305.82	296.80	292.03	290.20	290.10	291.06
Required % change since 2017		18%	27%	36%	45%	54%	60%
Target ROG Level		267.06	237.75	208.44	179.12	149.81	130.27
Shortfall (-)/ Surplus (+) in ROG		-38.76	-59.05	-83.59	-111.07	-140.28	-160.79
Shortfall (-)/ Surplus (+) in ROG, %		-12%	-18%	-26%	-34%	-43%	-49%
NOx emissions	232.39	157.80	125.60	111.35	100.25	92.40	87.32
Emission Reduction Credits (tons/day)	0.00	2.79	2.79	2.79	2.79	2.79	2.79
Maximum NOx Emissions	232.39	160.59	128.39	114.14	103.05	95.20	90.11
Change in NOx since 2017		71.80	103.99	118.24	129.34	137.19	142.27
Change in NOx since 2017, %		31%	45%	51%	56%	59%	61%
NOx reductions since 2017 used for ROG substitution in this milestone year, %		12%	18%	26%	34%	43%	49%
NOx reductions since 2017 surplus after meeting ROG substitution needs in this milestone year, %		19%	27%	25%	22%	16%	12%
RFP shortfall (-), if any		0%	0%	0%	0%	0%	0%
RFP Met?		YES	YES	YES	YES	YES	YES



# Control Measures

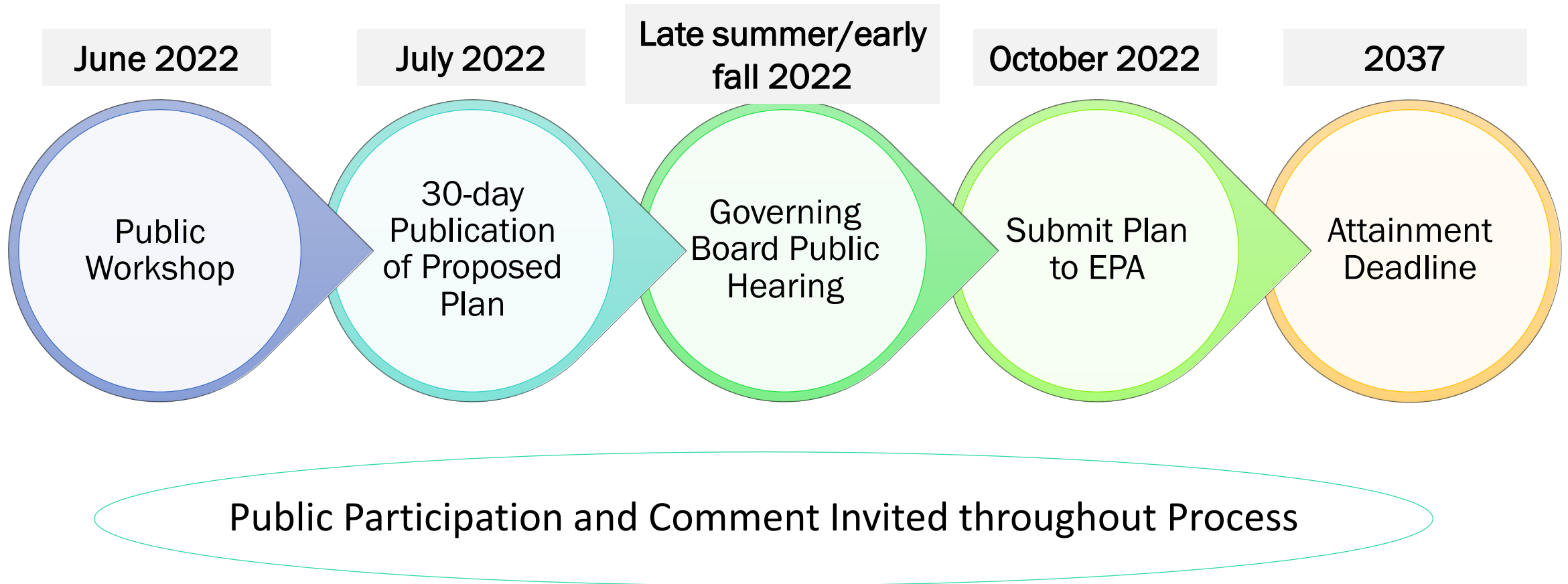
- **Requirement:** Provide for implementation of reasonably available control measures (RACM), including reasonably available control technologies (RACT), enforceable emission limitations, other control measures and techniques, and compliance schedules
- Plan to include robust control measure analyses for all NOx & VOC rules
- District 2020 RACT SIP (adopted June 18, 2020)
- Existing control measures and CARB's new State SIP measures provide substantial emissions reductions
- District is evaluating innovative measures to expedite ozone attainment and prepare for more stringent future NAAQS
  - Incentives, guidance, best practices, and other creative approaches
  - Locomotives, Lawn & Garden, Building Electrification

# Contingency Measures

- **Requirement:** Provide for implementation of specific measures if area fails to attain or meet a milestone for RFP or attainment
- Interpretation has changed in recent years due to litigation
- Contingency measures extremely challenging, given:
  - Nonattainment challenges under multiple NAAQS
  - Implementation of most stringent stationary and mobile source emissions requirements
  - Automatic implementation through “contingency trigger” – not feasible for most control technologies
  - Scarcity of measures meeting the highly-restrictive contingency definition
- 2022 Ozone Plan will identify appropriate contingency measures

# Next Steps

# Next Steps for *2022 Ozone Plan*



# Public Engagement Opportunities To-Date

Date	Meeting Topics
February 2020	Update to District Governing Board on upcoming planning efforts for attainment of the 2015 8-hour ozone NAAQS
February 2021	Update to District Governing Board to discuss next steps for attainment planning efforts for Federal PM2.5 and ozone standards
March 2021	Update to District's Citizens Advisory Committee to discuss next steps for attainment planning efforts for Federal PM2.5 and ozone standards
September 2021	Update to District Governing Board on attainment planning efforts for Federal PM2.5 and ozone standards
October 2021	Update to District's Citizens Advisory Committee on attainment planning efforts for Federal PM2.5 and ozone standards
April 2021	Public Workshop: General background of Plan requirements and development process
July 2021	Technical Working Group Public Meeting: Emissions inventory and modeling
October 2021	Technical Working Group Public Meeting: Stationary and Area source measures, RACM, State SIP Strategy
March 2022	Technical Working Group Public Meeting: Projected emissions inventory, modeling, and State SIP Strategy
June 2022	Public Workshop to present, discuss, and receive feedback on Plan elements

# Contact

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Visit <https://ww2.valleyair.org/about/sign-up/>  
to sign up for the District's Ozone Plans Listserv

# Comments/Questions

[webcast@valleyair.org](mailto:webcast@valleyair.org)