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

October 27, 2022

webcast@valleyair.org

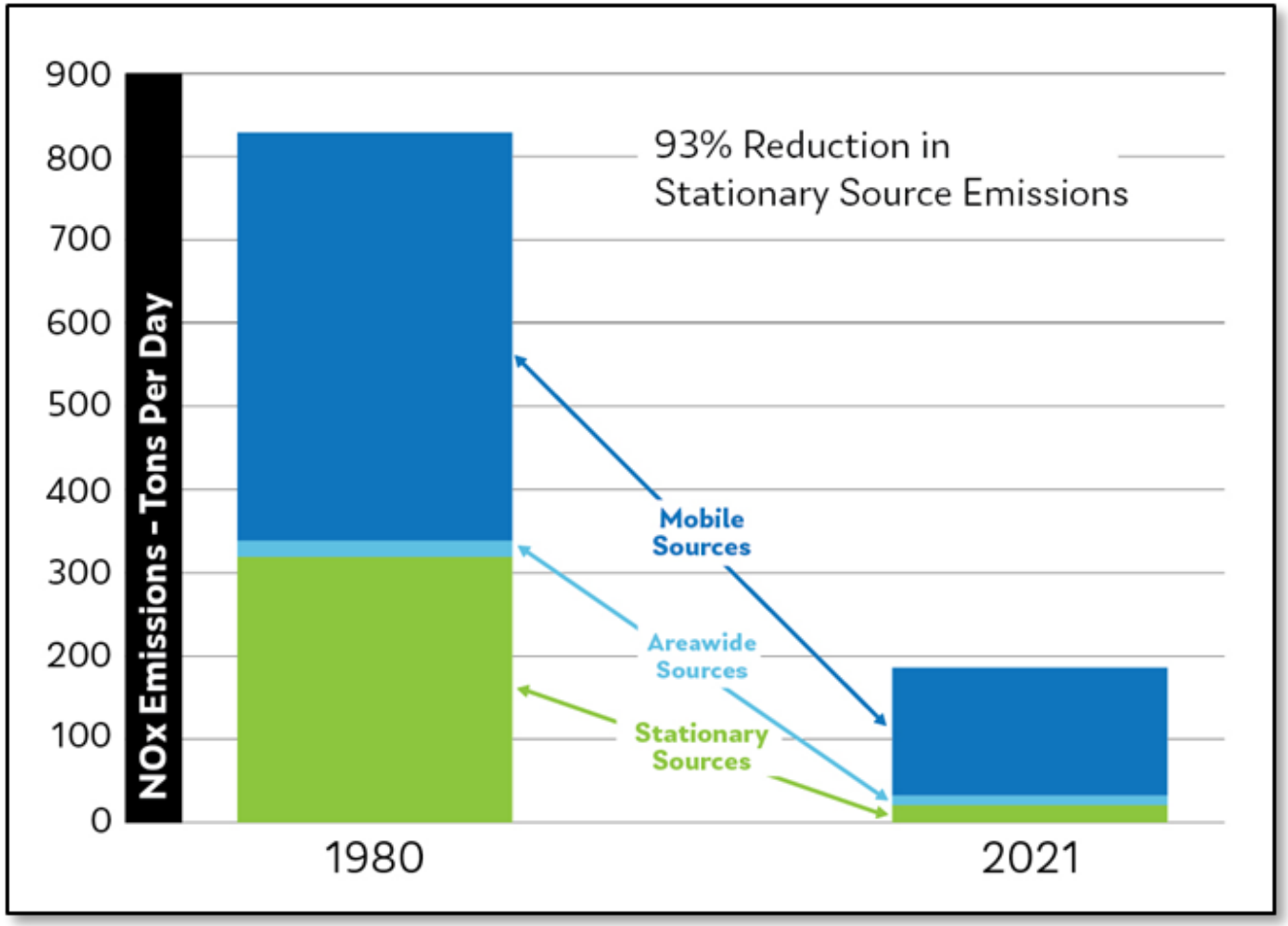
Workshop Overview

- 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
  - District’s existing strategies, coupled with CARB commitments, will bring Valley into attainment of 70 ppb standard by 2037 attainment deadline
  - District seeking public comment on Draft *2022 Ozone Plan* by Nov. 9, 2022
  - Proposed Plan tentatively scheduled to be published in November, ahead of December Public Hearing
- Next Steps

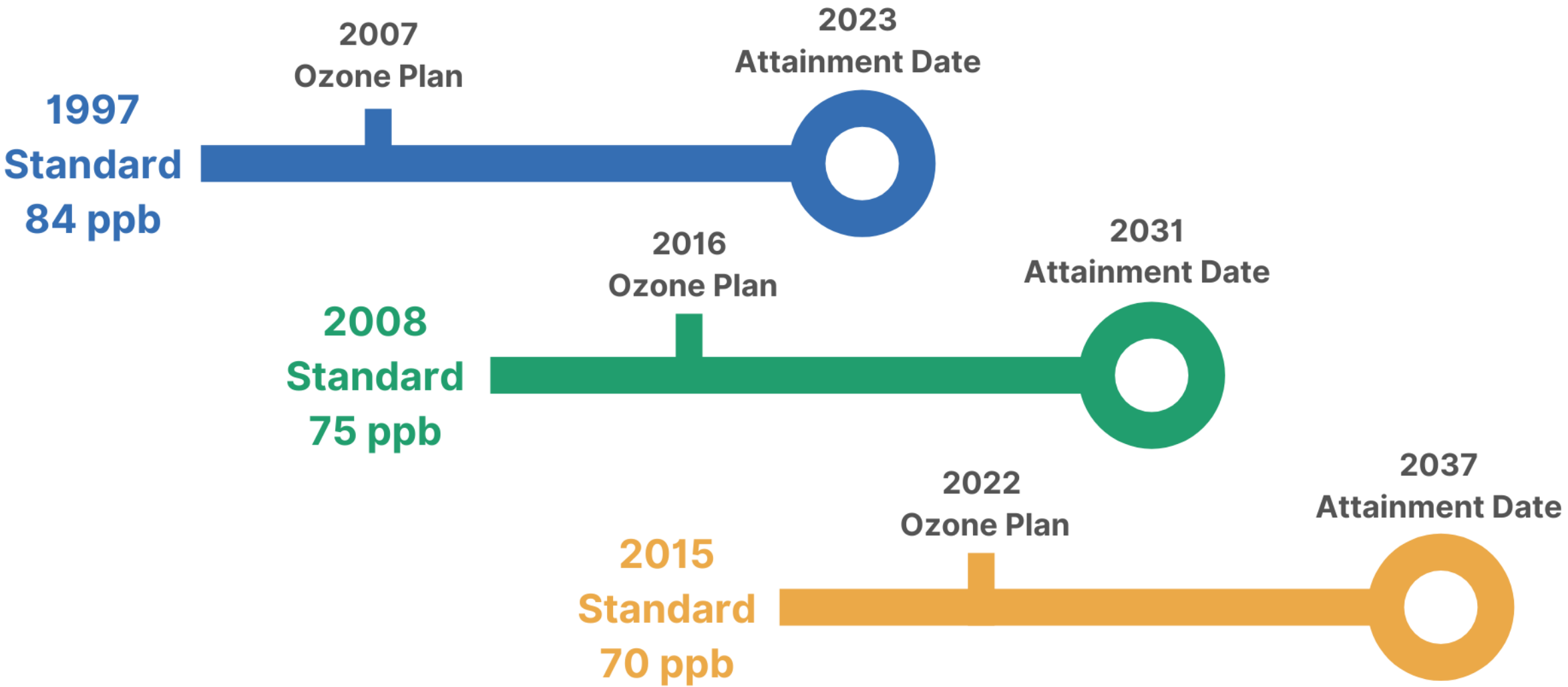
Background

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

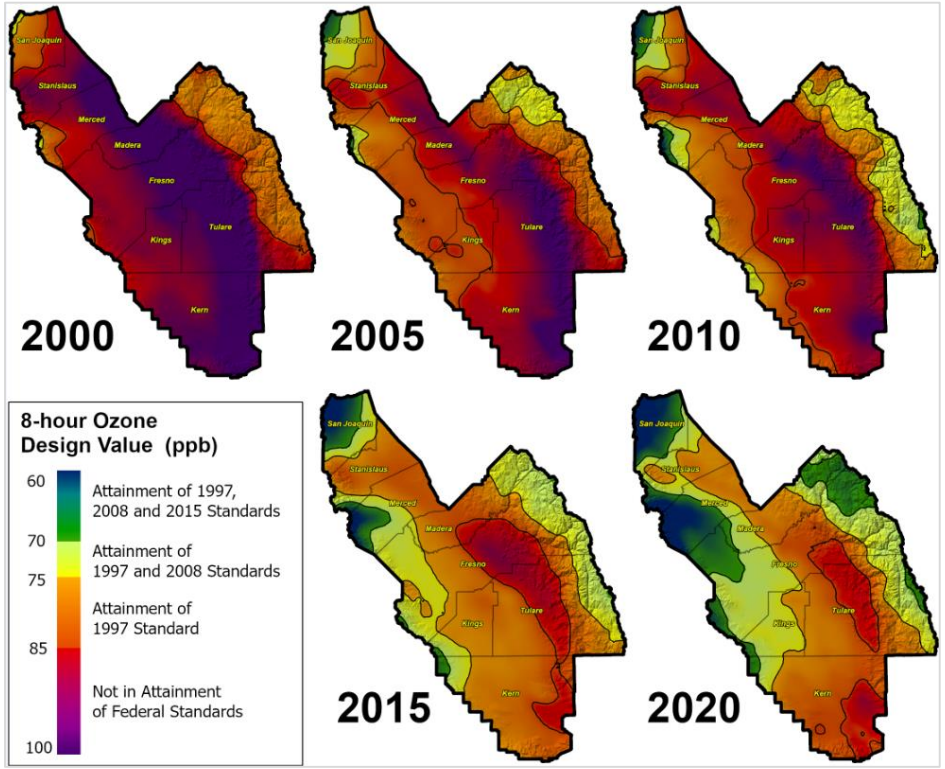


Timeline of 8-hour Ozone Standards



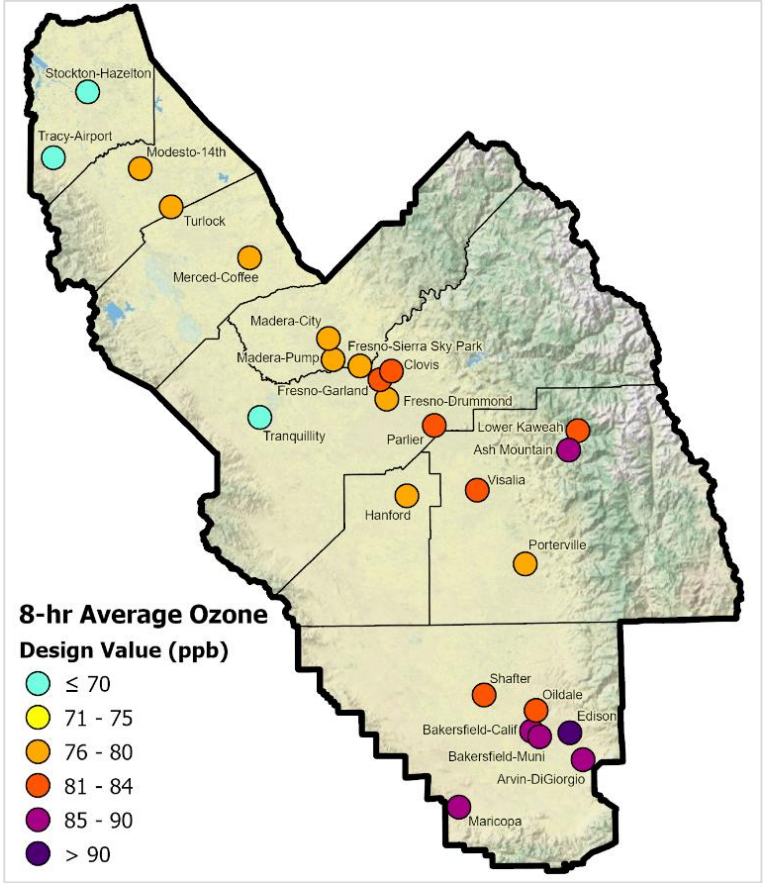
Ongoing Planning Efforts

- 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

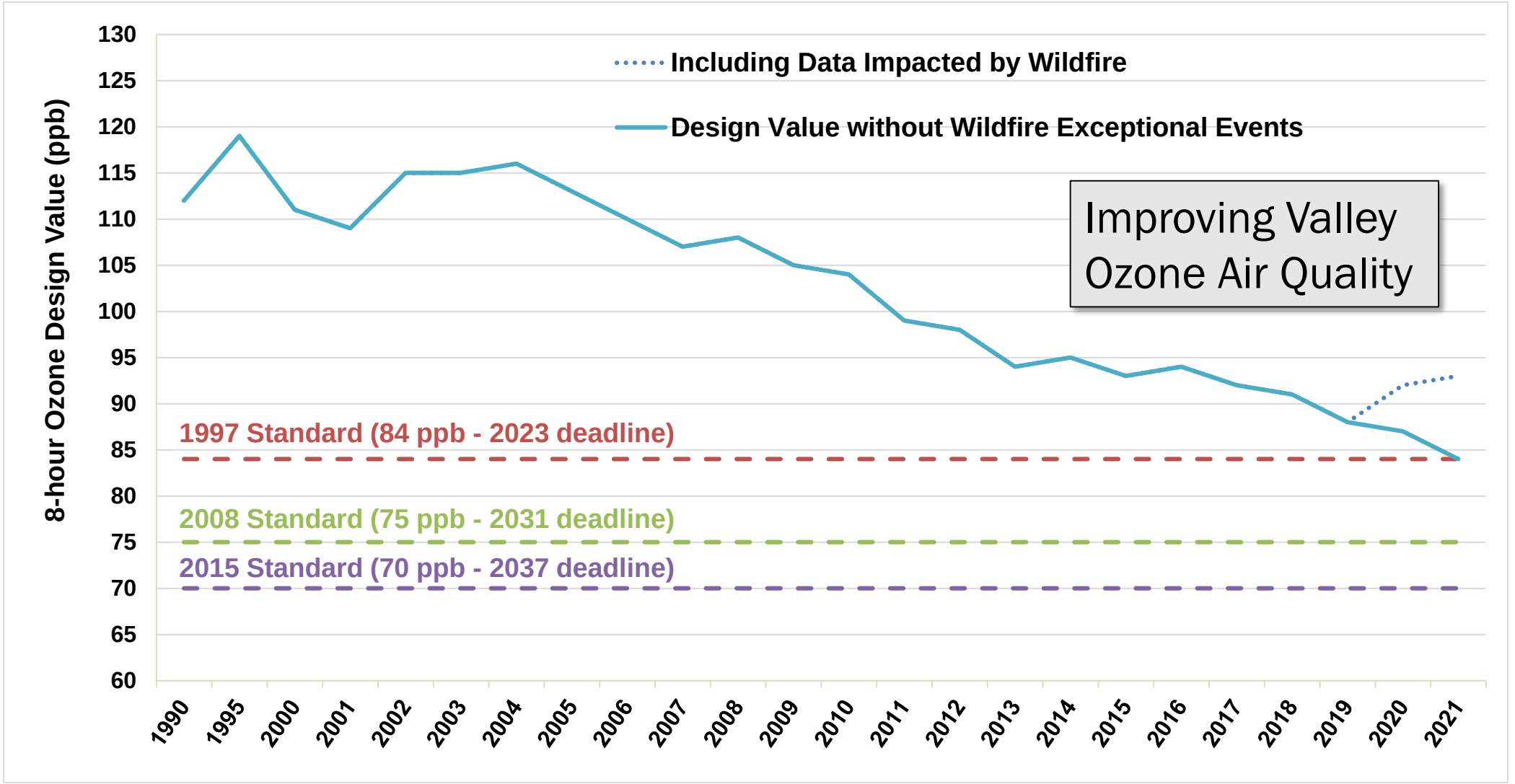


Includes wildfire impacts

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 worked collaboratively with CARB, South Coast AQMD, and Valley MPOs to develop attainment strategy for Valley
- Plan demonstrates attainment of the 2015 8-hour ozone standard by the attainment deadline of 2037
  - Significant emission reductions through current control strategy
  - Regulatory control measure commitments from CARB
  - Innovative further study measures from District

Improving Valley Ozone Air Quality



Plan Elements

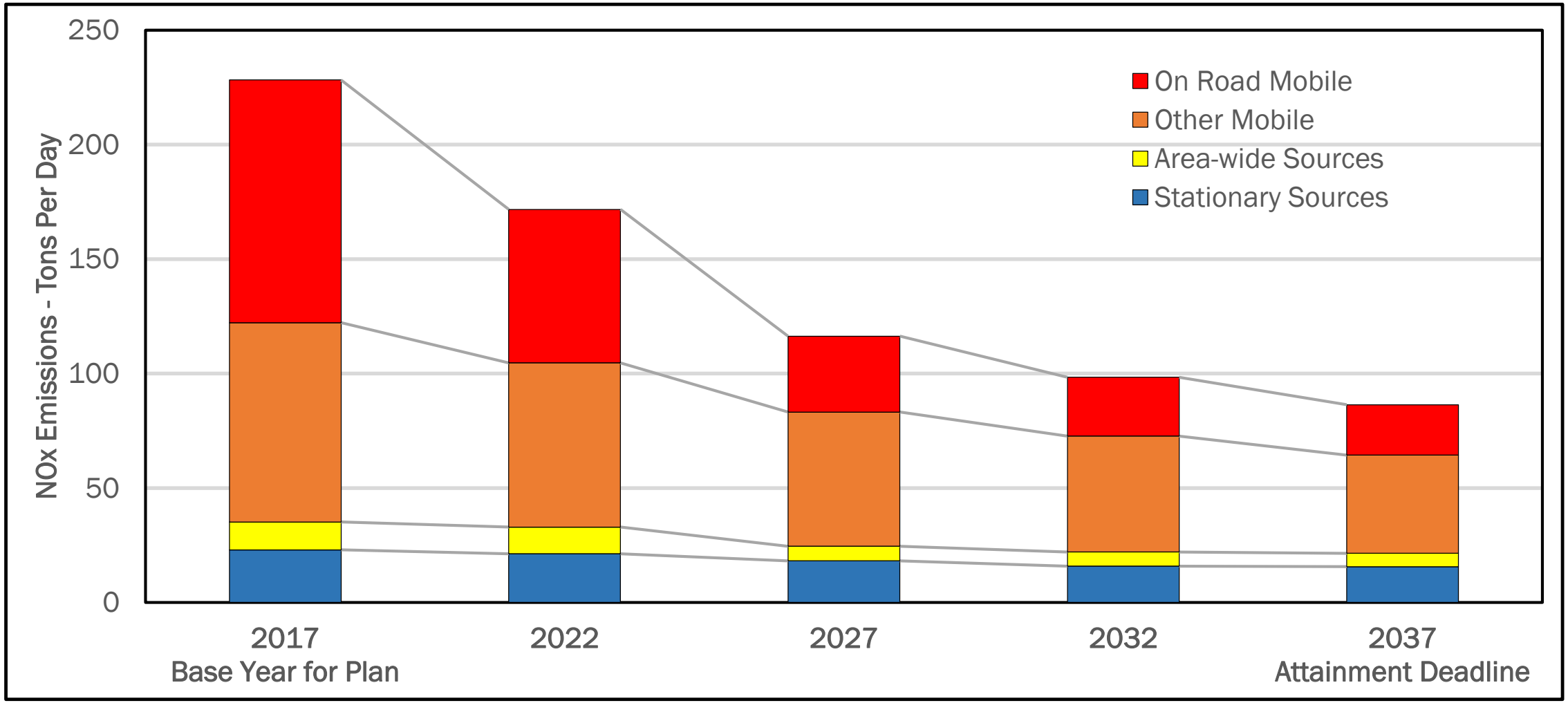
District's Recently Adopted Rules

- District Governing Board has taken number of recent regulatory actions that achieve ongoing emissions reductions
- 62% reduction in NOx from 2017-2037 through adopted control strategy

Measure	Approval Date	Implementation Begins	Reductions (tpd)
Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters)	Jun 2019	2019	0.04 NOx
Rule 4601 (Architectural Coatings)	Apr 2020	2022	0.295 VOC
Rule 4311 (Flares)	Dec 2020	2024	0.19 NOx 0.39 VOC
Rules 4306/4320 (Boilers, Steam Generators, and Process Heaters)	Dec 2020	2024	0.22 NOx 0.45 NOx
Rule 4702 (Internal Combustion Engines)	Aug 2021	2024	0.70 NOx 0.32 VOC
Rule 4103 (Ag Burn Phase-Out)	Nov 2021	2021-2025	0.988 NOx
Rule 4352 (Solid Fuel Fired Boilers, Steam Generators, and Process Heaters)	Dec 2021	2024	0.711 NOx
Rule 4354 (Glass Melting Furnaces)	Dec 2021	2024	1.67 NOx

**Table includes recent Governing Board actions 2019-2022. Other rules amended prior to 2019 contribute to progress toward attainment.*

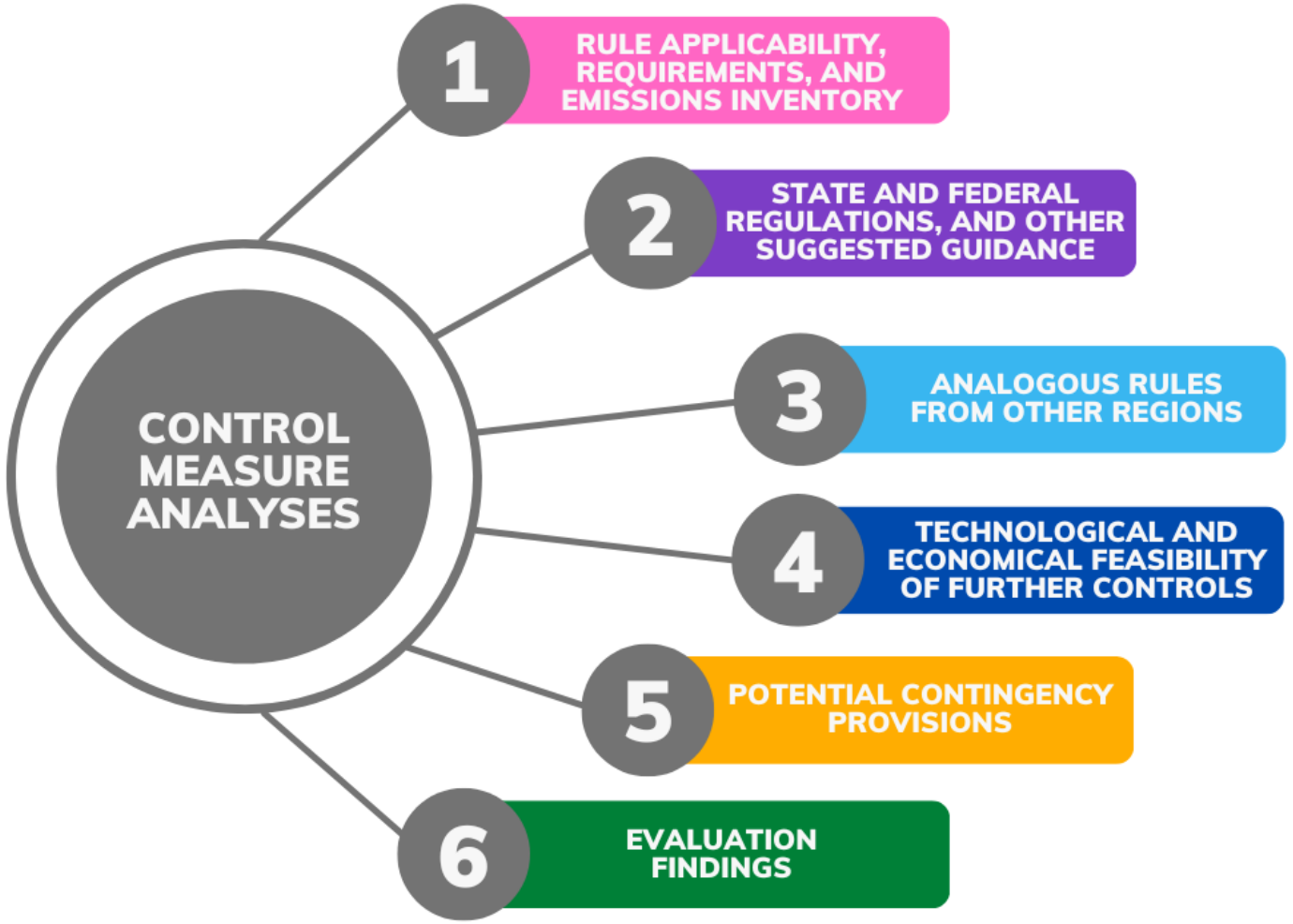
Valley Emissions Reductions During Plan Period



CEPAM2019v1.04 (Adjusted), Annual Average

District Control Measure Analyses

- Plan provides for implementation of all reasonably available control measures (RACM), including reasonably available control technologies (RACT)
- District conducted robust control measure analyses for all NOx and VOC rules
- Demonstrates that vast majority of District rules require most stringent measures that are technologically and economically feasible



District Regulatory Control Measure Commitments

- District control measure analysis indicates that rules for Leak Detection and Repair (LDAR) can be strengthened
- Emissions reductions not needed from these measures to demonstrate attainment, however District is including as SIP-strengthening measure

Regulatory Measures	Action Date
Rule 4401 Steam-Enhanced Crude Oil Production Well Vents	2023-2024
Rule 4409 Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities	2023-2024
Rule 4455 Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants	2023-2024
Rule 4623 Storage of Organic Liquids	2023-2024
Rule 4624 Transfer of Organic Liquid	2023-2024

District Innovative Measures for Further Studies

RESIDENTIAL AND COMMERCIAL COMBUSTION	• Evaluate current and upcoming work from CARB, South Coast AQMD, and other agencies • Evaluate feasibility of implementing zero emission or low-NOx requirements for sources in Valley
STATIONARY COMBUSTION SOURCES	• Currently implementing most stringent requirements • District will evaluate feasibility of emerging technologies as they become available through 2037 (attainment year)
ENERGY AND CLIMATE CHANGE PROGRAMS	• Identify opportunities to gain co-benefits from existing and future programs related to greenhouse gas reductions, energy efficiency, and energy usage • Seek incentives opportunities
STATIONARY SOURCE VOC MEASURES	• Evaluate opportunities to reduce emissions from VOC sources through regulatory and incentive-based measures • Identify and evaluate emerging technologies through 2037 (attainment year)
OTHER INNOVATIVE MEASURES	• Evaluate innovative, out of the box measures, such as enhanced public outreach and communication, and strategies for wildfire prevention • Opportunities for lawn and garden equipment, and locomotives

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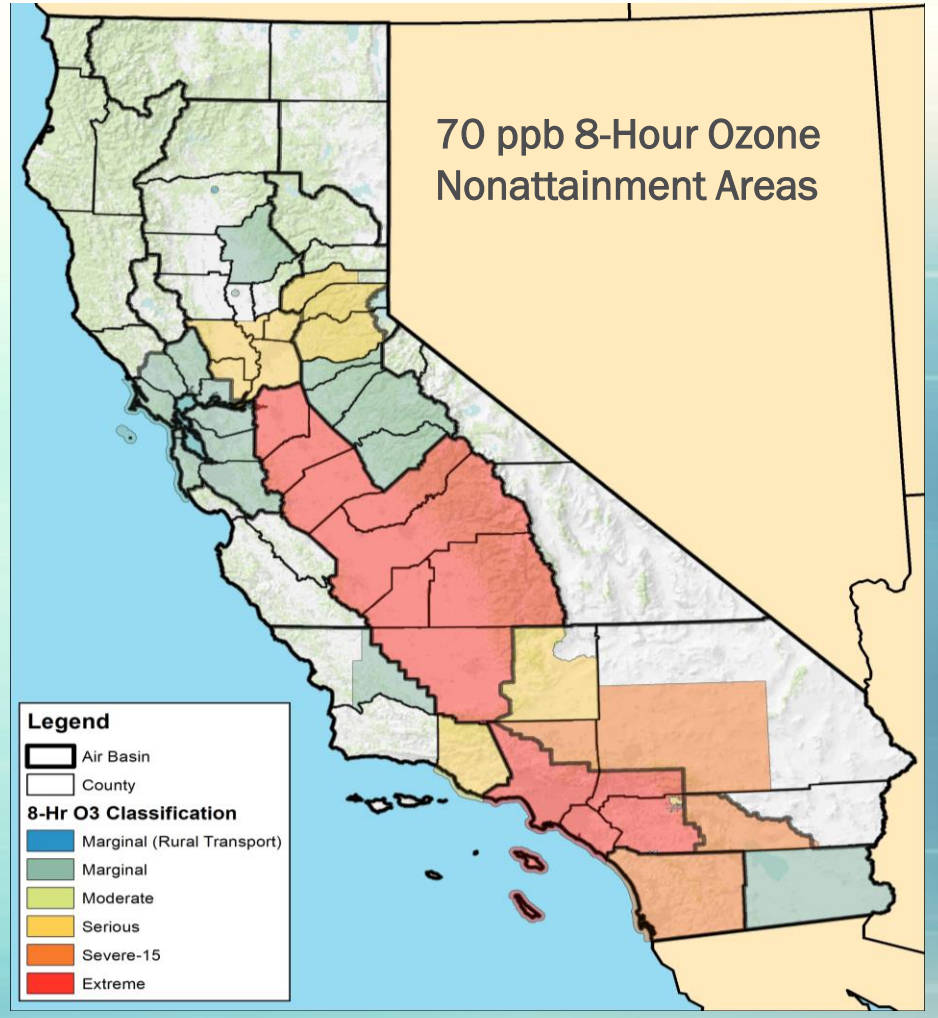
CARB 2022 State Strategy for the State Implementation Plan

Laura Carr, Air Quality Planning and Science Division

70 ppb Challenge Across the State

- EPA revised the 8-hour ozone standard to 70 ppb in 2015
- 19 nonattainment areas in California
  - Attainment years 2020-2037
- 10 areas classified Moderate+ and must submit SIPs
- San Joaquin Valley and South Coast most challenging
- 7 areas need new emission reduction commitments



CARB

2022 State SIP Strategy

- CARB approved on September 22, 2022
- Includes unprecedented variety of new State measures to reduce emissions using all mechanisms available
- Identifies the level of action needed to meet air quality standards and protect public health
- Drives pace and scale of CARB rulemakings
- San Joaquin Valley 23 tpd NOx emission reduction commitment

2022 State SIP Strategy Measures

On-Road

- Advanced Clean Fleets Regulation
- Zero-Emission Trucks
- On-Road Motorcycle New Emissions Standards
- Clean Miles Standard*
- Enhanced Regional Emission Analysis in State Implementation Plans

Off-Road

- Tier 5 Off-Road Engine Standard
- Amendments to In-Use Diesel-Fueled Fleets Regulation
- Zero-Emission TRU Part II
- Commercial Harbor Craft*
- Cargo Handling Equipment
- Off-Road Zero-Emission Targeted Manufacturer Rule
- Clean Off-Road Fleet Recognition Program
- Spark-Ignition Marine Engine Standards

Primarily Federally-Regulated

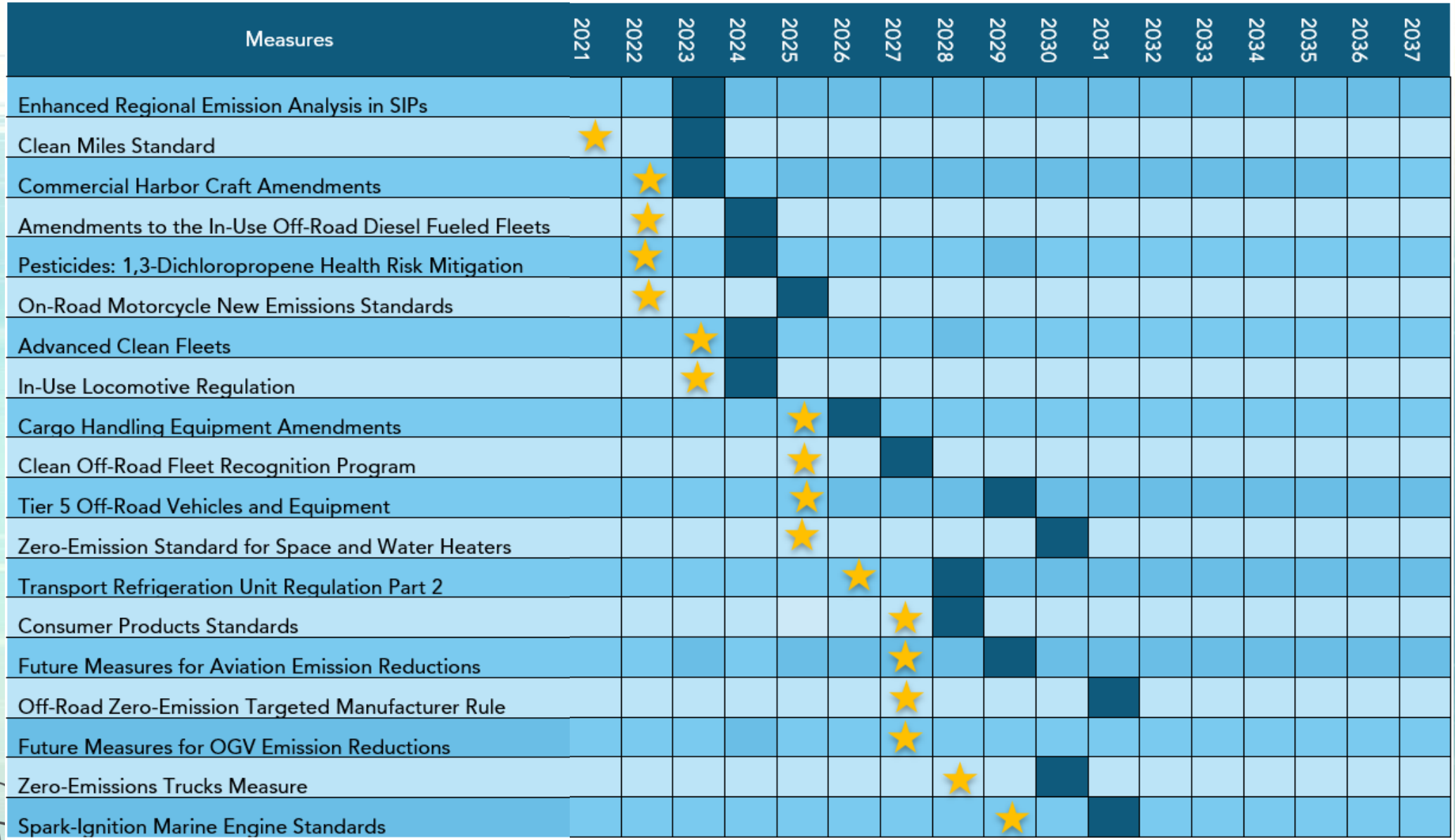
- In-Use Loco Regulation
- Future Measures for Aviation Emissions Reductions
- Future Measures for OGV Emissions Reductions

Other

- Consumer Products Regulation Amendments
- Zero-Emission Standard for Space and Water Heaters
- Pesticides: 1,3-D

CARB *Already adopted by Board

Approved Measure Schedule



State SIP Strategy Supporting San Joaquin Valley Attainment

Proposed Measure	2037 NOx (tpd)	2037 ROG (tpd)
On-Road Heavy-Duty		
Advanced Clean Fleets Regulation	5.9	0.4
Zero-Emissions Trucks Measure	NYQ	NYQ
Total On-Road Heavy-Duty Reductions	5.9	0.4
On-Road Light-Duty		
On-Road Motorcycle New Emissions Standards	0.3	0.6
Clean Miles Standard	<0.1	<0.1
Total On-Road Light-Duty Reductions	0.3	0.6
Off-Road Equipment		
Tier 5 Off-Road Vehicles and Equipment	1.4	NYQ
Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation	0.6	<0.1
Transport Refrigeration Unit Regulation Part 2	3.8	0.5
Commercial Harbor Craft Amendments	<0.1	<0.1
Cargo Handling Equipment Amendments	<0.1	<0.1
Off-Road Zero-Emission Targeted Manufacturer Rule	NYQ	NYQ
Clean Off-Road Fleet Recognition Program	NYQ	NYQ
Spark-Ignition Marine Engine Standards	0.3	0.6
Total Off-Road Equipment Reductions	6.1	1.2
Other		
Consumer Products Standards	-	NYQ
Zero-Emission Standard for Space and Water Heaters	NYQ	NYQ
Enhanced Regional Emission Analysis in State Implementation Plans	NYQ	NYQ
Pesticides: 1,3-Dichloropropene Health Risk Mitigation	--	NYQ
Total Other	NYQ	NYQ
Primarily-Federally and Internationally Regulated Sources – CARB Measures		
In-Use Locomotive Regulation	11.2	0.4
Future Measures for Aviation Emission Reductions	NYQ	NYQ
Total Primarily-Federally and Internationally Regulated Sources – CARB Measures Reductions	11.2	0.4
Aggregate Emissions Reductions	23.4	2.5

CARB

Stronger Pesticide Commitment

- 2022 State SIP includes DPR 1,3-D pesticide measure
- Public advocated for a stronger pesticide measure to the CARB Board in September
- CARB Chair Randolph committed to update 2022 State SIP by:
  - Quantifying 1,3-D emission reductions
  - More clearly state CARBs authority around pesticides
- Update will occur in CARB staff report that will be considered with SJV SIP in January

CARB

2022 State SIP Strategy

CARB Next Steps

- September 22, 2022:
  CARB Board Approval of Proposed 2022 State SIP Strategy
- January 2023:
  CARB Board Consideration of Valley SIP and State Emission Reduction Commitment
- Early 2023:
  Submit Valley SIP to U.S. EPA
- 2022 - 2037:
  2022 State SIP Strategy Ongoing Regulatory Development and Implementation

CARB

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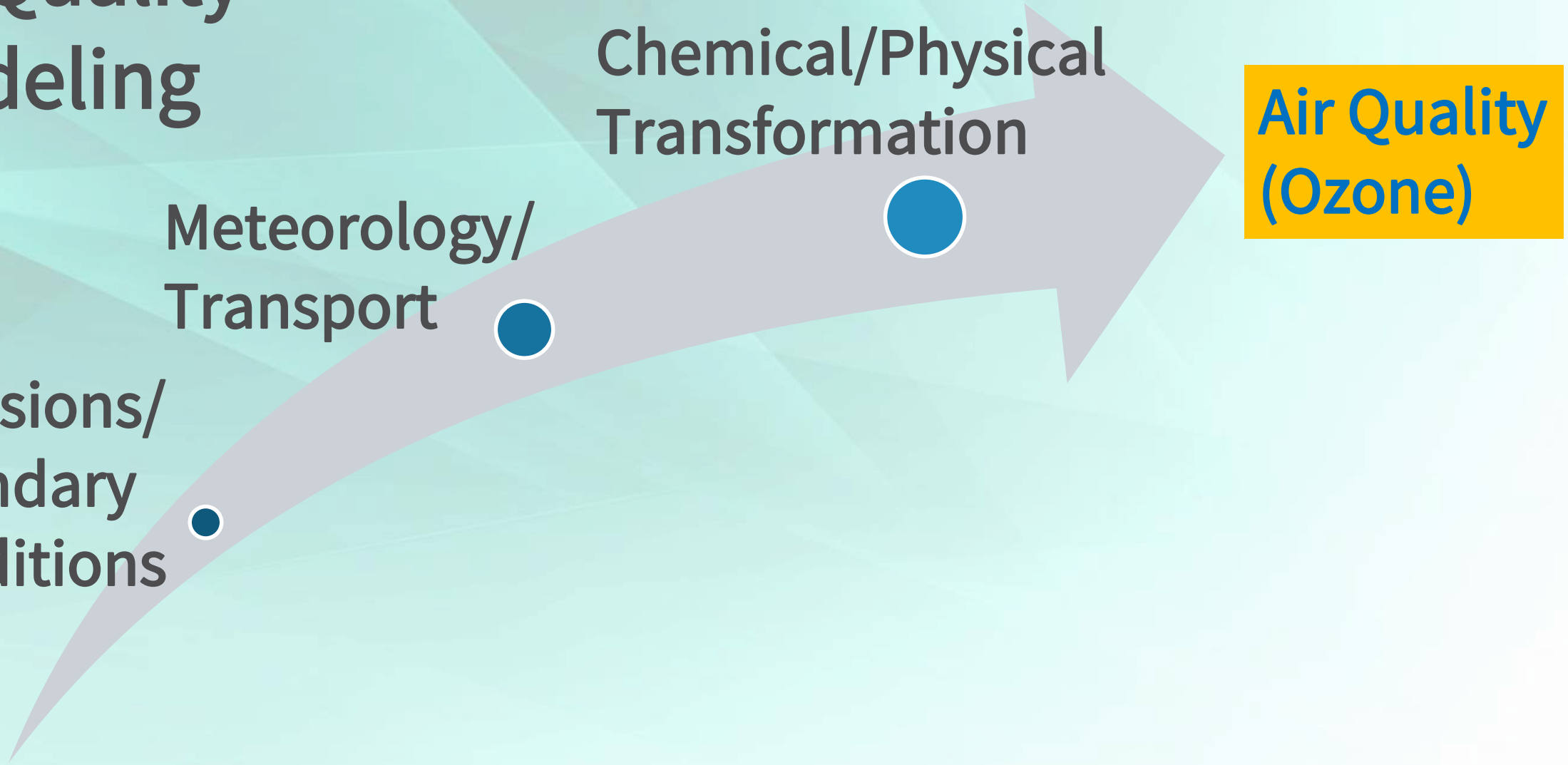
Air Quality Modeling in Support of the 2022 SJV 70 ppb 8-hr Ozone SIP

Jeremy Avise
Air Quality Planning and Science Division

Air Quality Modeling



CARB

Air Quality Modeling

Emissions/
Boundary
Conditions

VOC / ROG

NOx

CARB

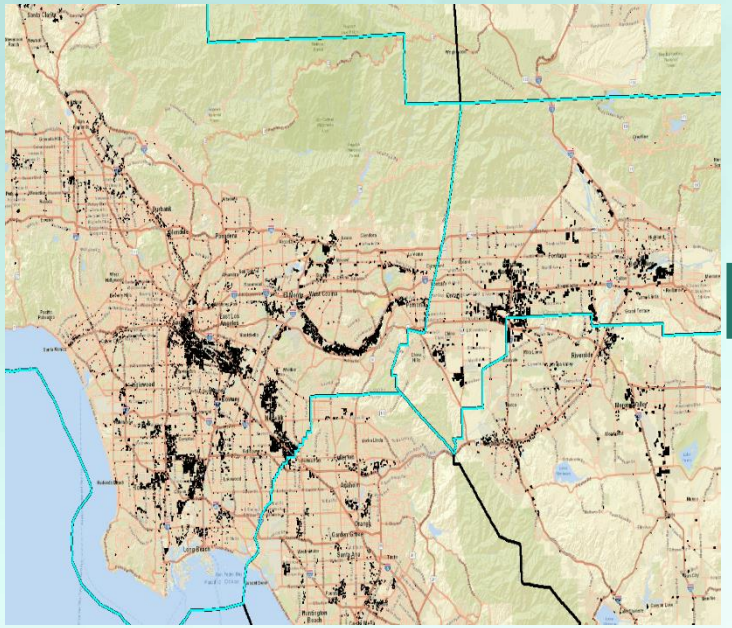
Air Quality Modeling

Distribute county emission totals to specific locations

Emissions/ Boundary Conditions

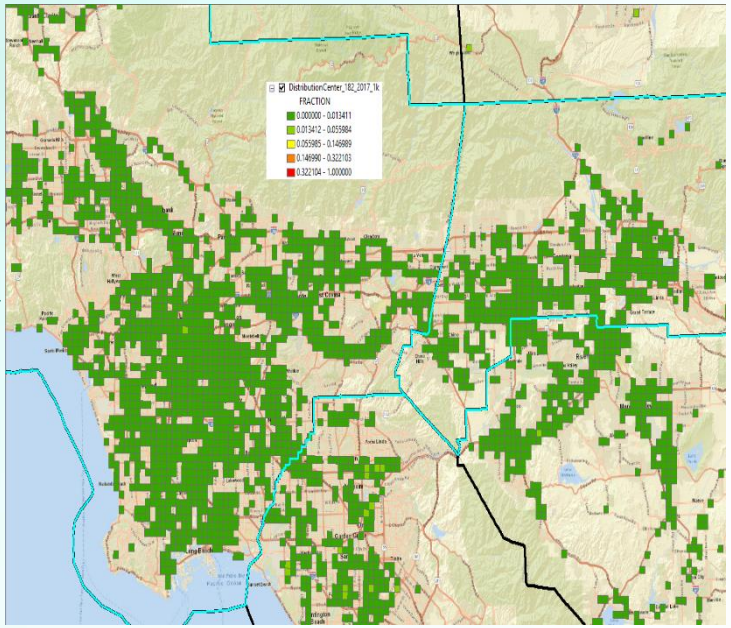
Annual <u>County</u> <u>Total</u> Emissions
(e.g., Distribution Centers)

Information on where sources are located



Polygon Shapefile

Spatially allocated to the modeling grid



Spatial Surrogate (1km resolution)

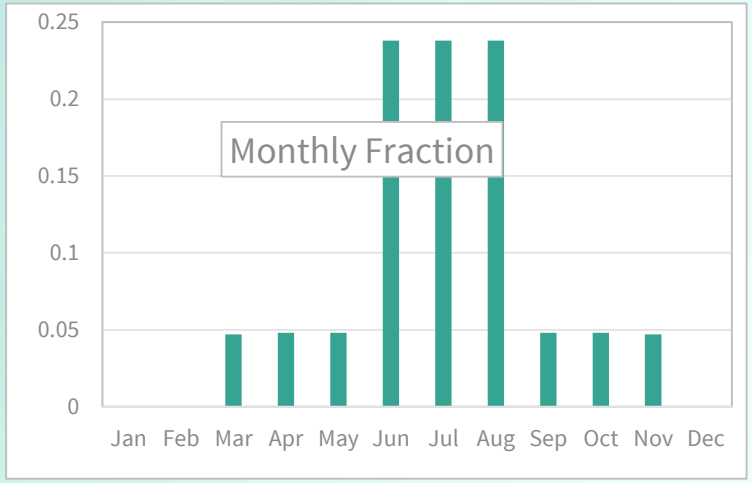
CARB

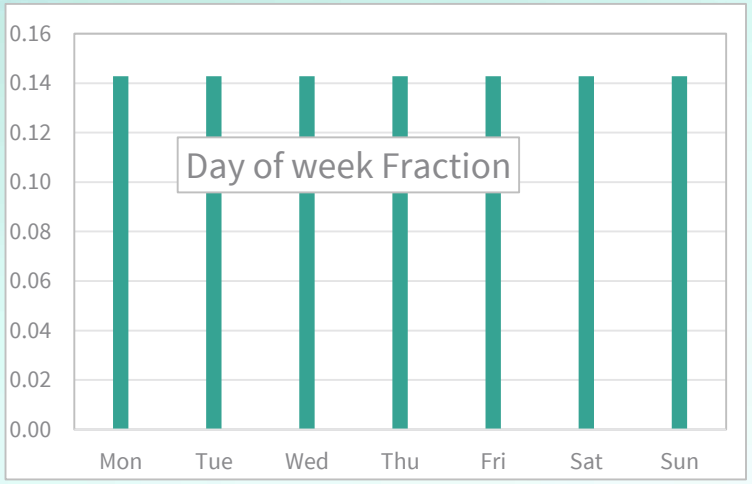
Air Quality Modeling

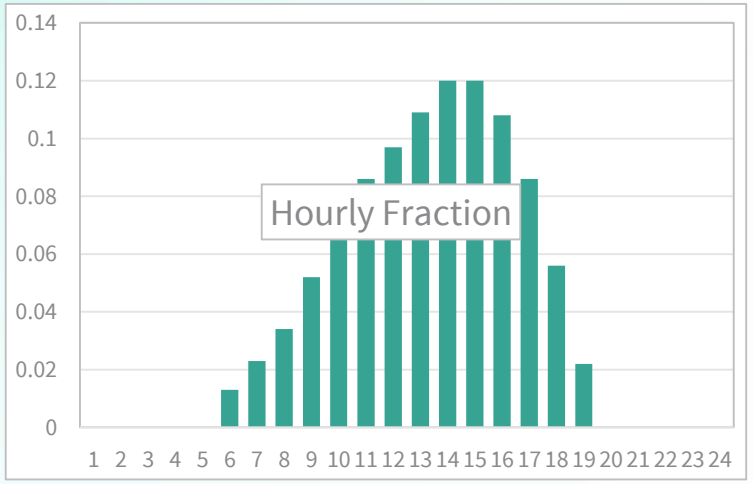
Emissions/ Boundary Conditions

Annual County Total Emissions

Distribute annual emission totals to specific hours







CARB

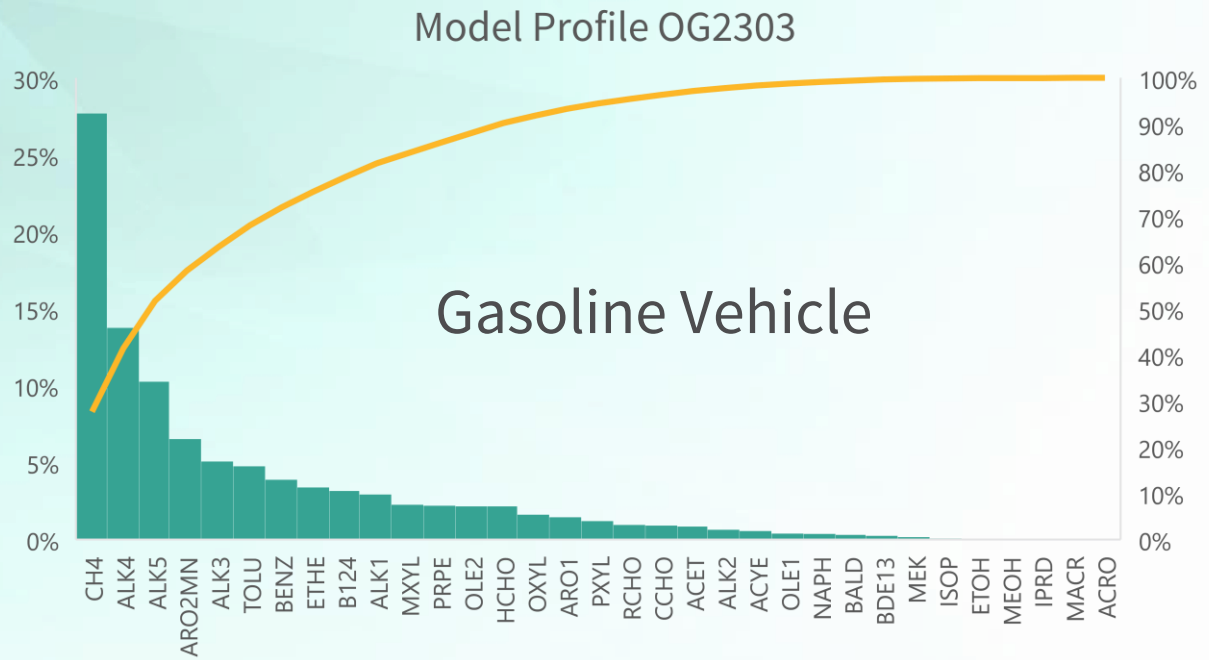
Air Quality Modeling

Emissions/ Boundary Conditions

Criteria Pollutants (NOx, VOC, SOx, NH_3, PM)

VOC →

Convert total VOC (and PM) emissions into individual chemical species



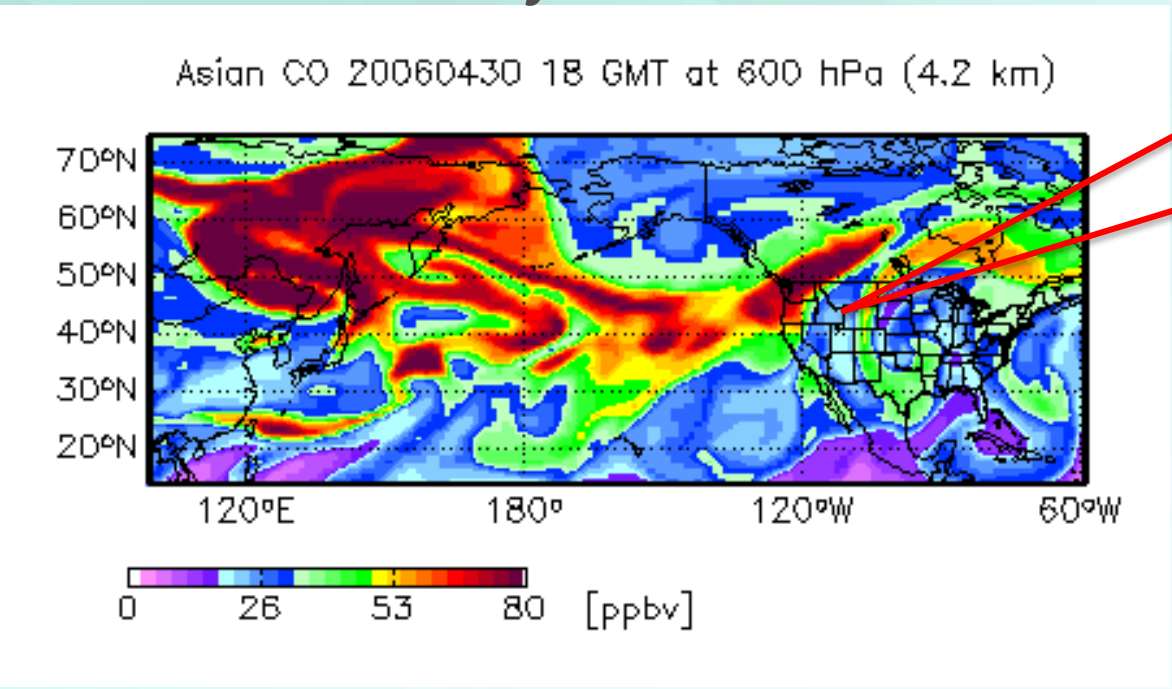
CARB

Air Quality Modeling

Emissions/
Boundary
Conditions

Estimated from a global air quality model

Boundary Conditions



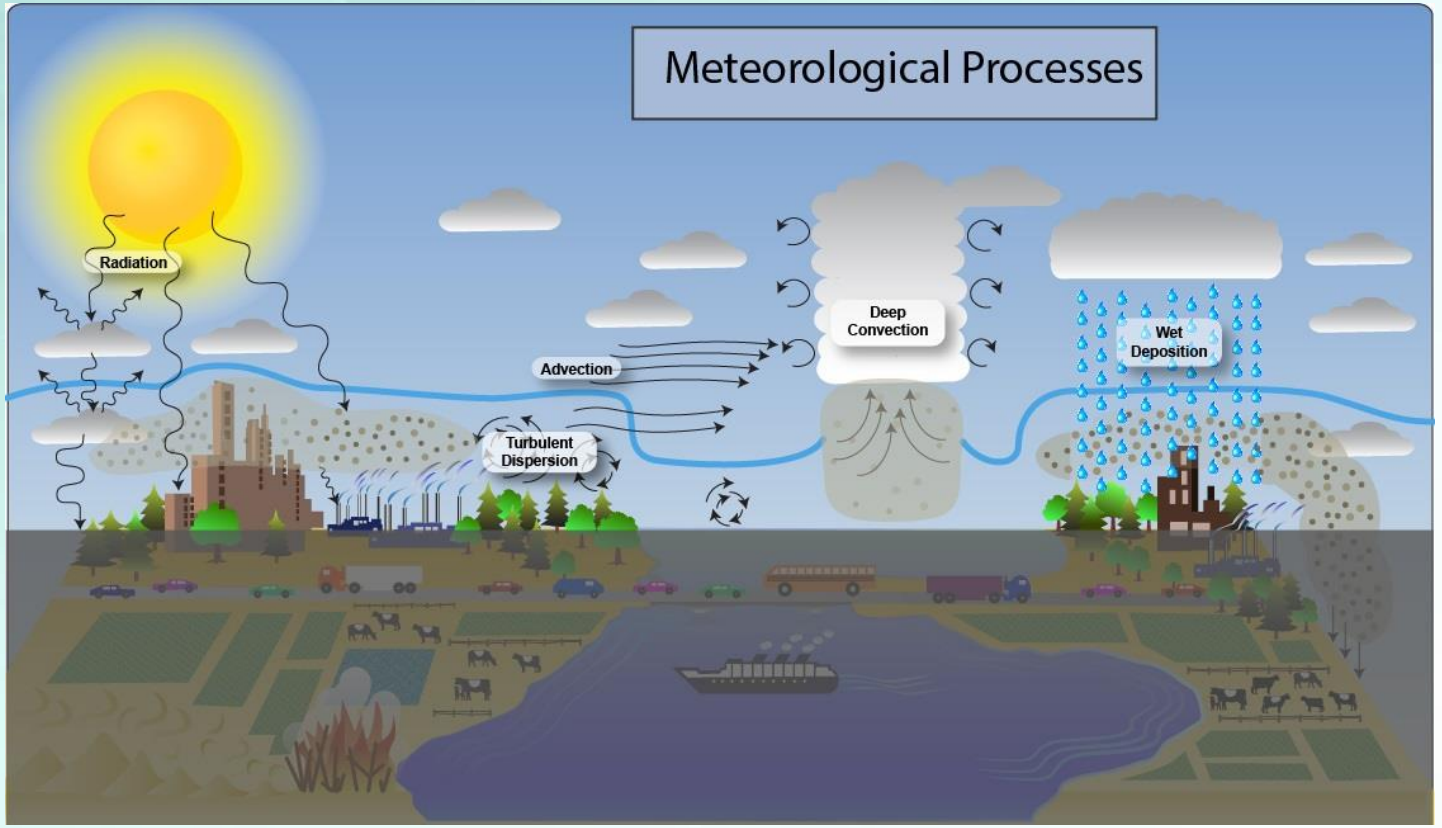
Long-range transport of pollution

CARB

Air Quality Modeling

Meteorology/ Transport

Meteorology estimated from a regional weather model



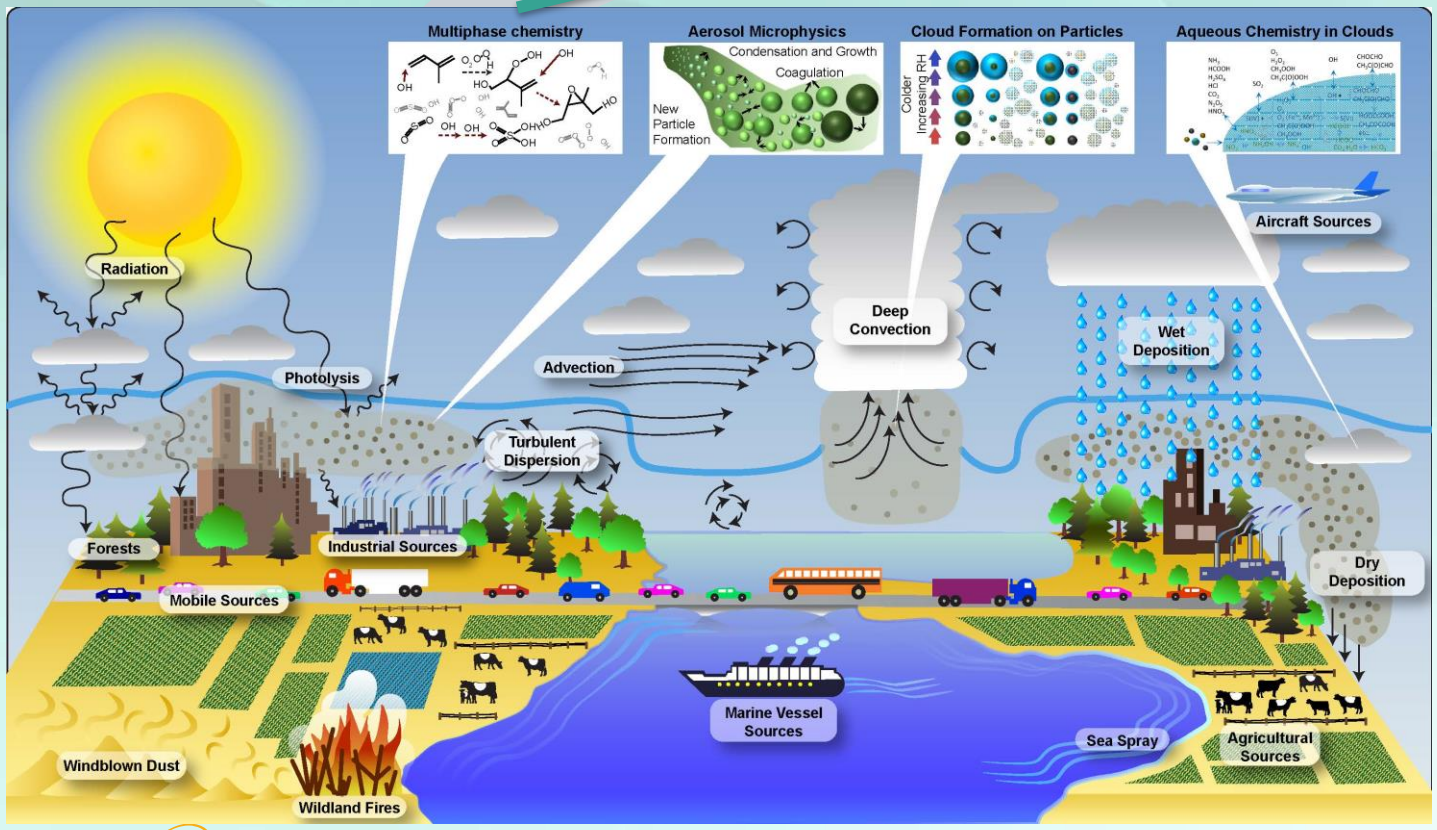
https://www.epa.gov/cmaq/meteorological-process-overview

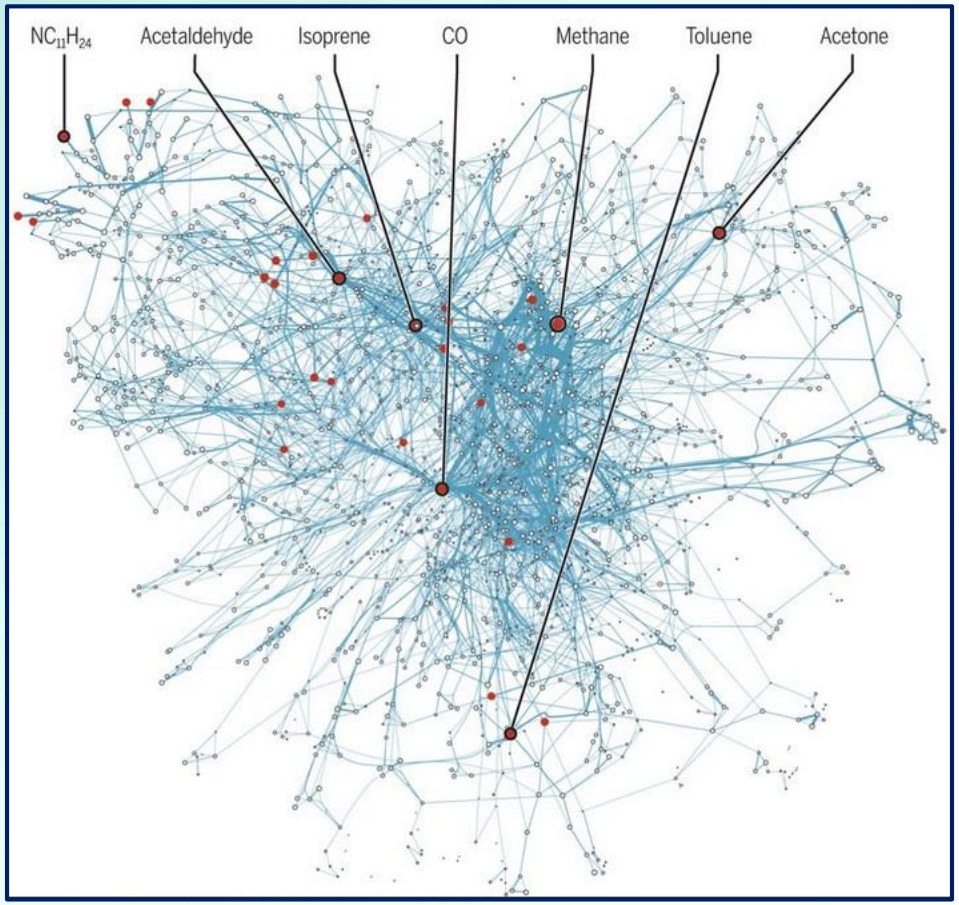
CARB

Air Quality Modeling

Chemical/Physical Transformation

Graphical representation of the gas-phase chemistry





https://www.epa.gov/cmaq/overview-science-processes-cmaq

Alastair Lewis, 2018: doi:10.1126/science.aar4925

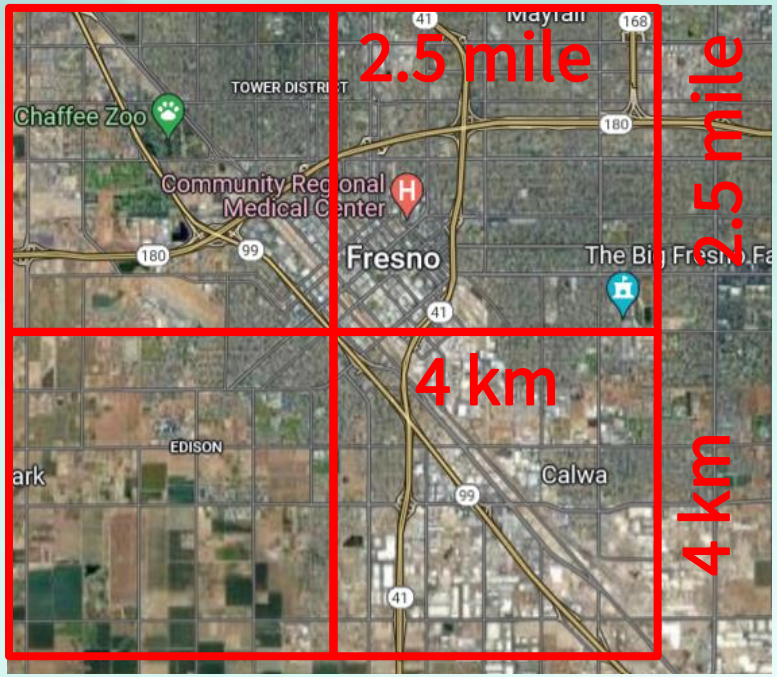
Air Quality Modeling

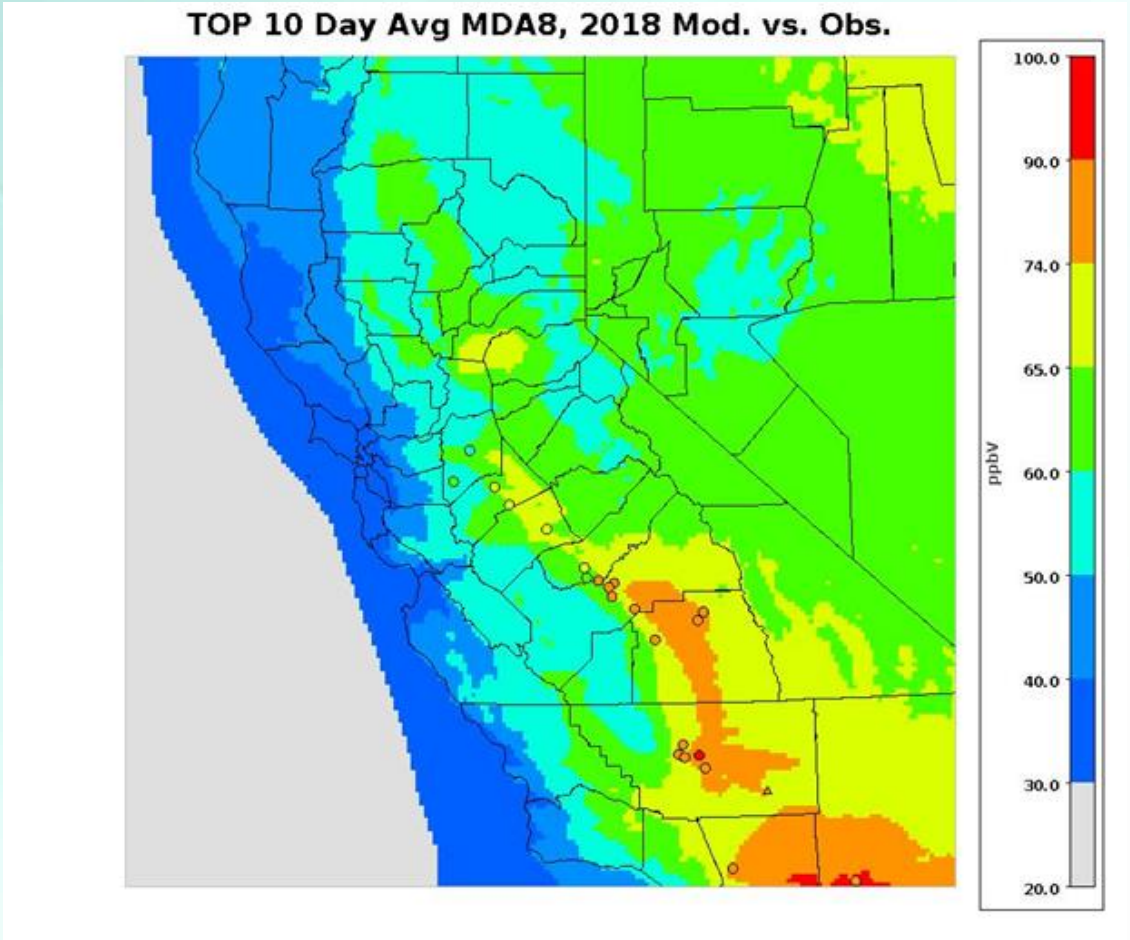
Chemical/Physical Transformation

Meteorology/Transport

Emissions/ Boundary Conditions

Air Quality (Ozone)





CARB

Air Quality Modeling

Chemical/Physical Transformation

Meteorology/ Transport

Emissions/ Boundary Conditions

Air Quality (Ozone)

$$DV_{2037} = DV_{2018} \times \frac{Modeled\ Ozone_{2037}}{Modeled\ Ozone_{2018}}$$

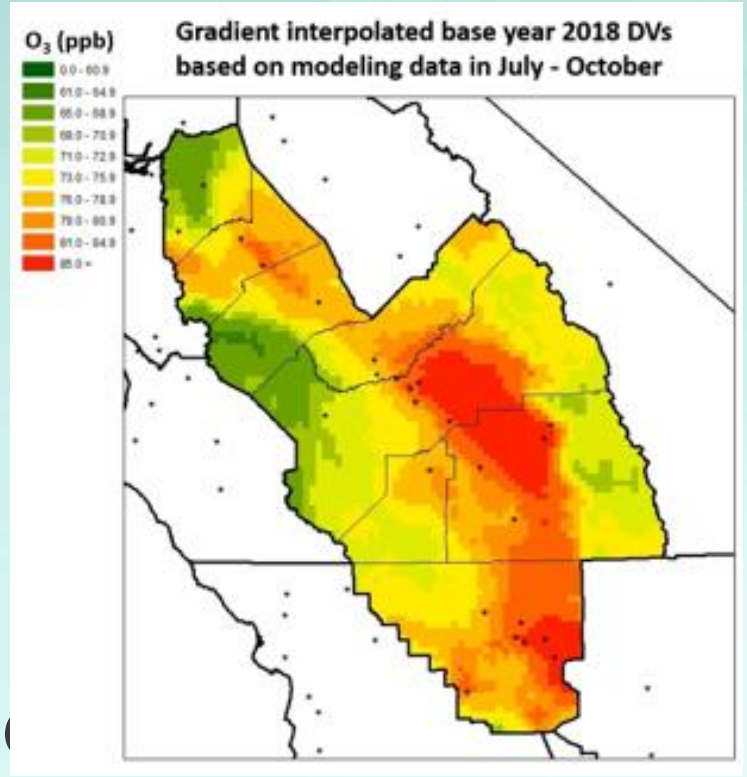
Future (2037) Predicted Ozone

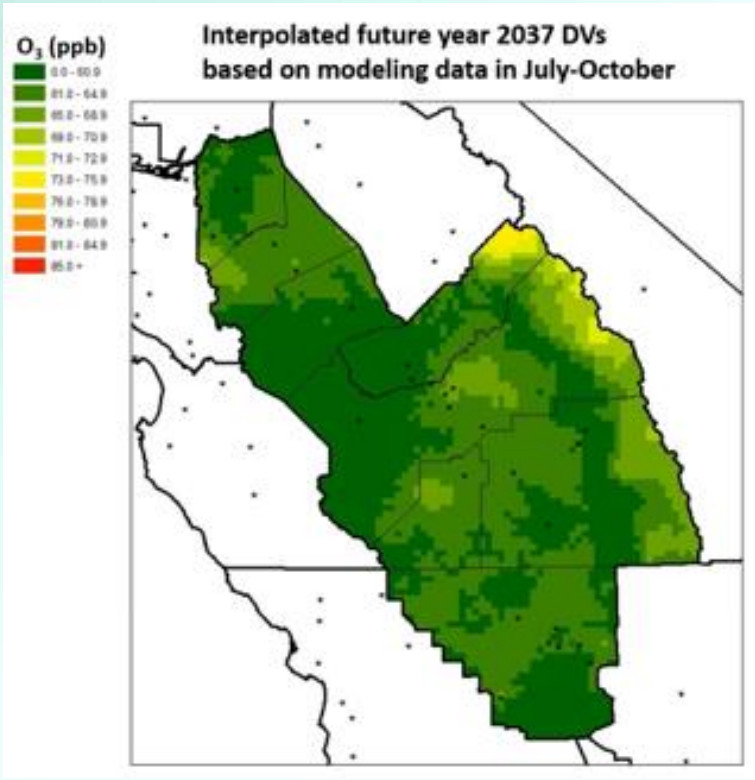
Present-day (2016-2019) Observed Ozone

CARB

Modeling Results

- Emissions
  - NOx: >70% reduction in emissions from 2018 to 2037
  - VOC: >10% reduction in emissions from 2018 to 2037
- Design Values
  - 85.7 ppb → **68 ppb** (Fresno-Garland and Clovis)
  - Note: these DVs include wildfire impacts in the 2018 average DV





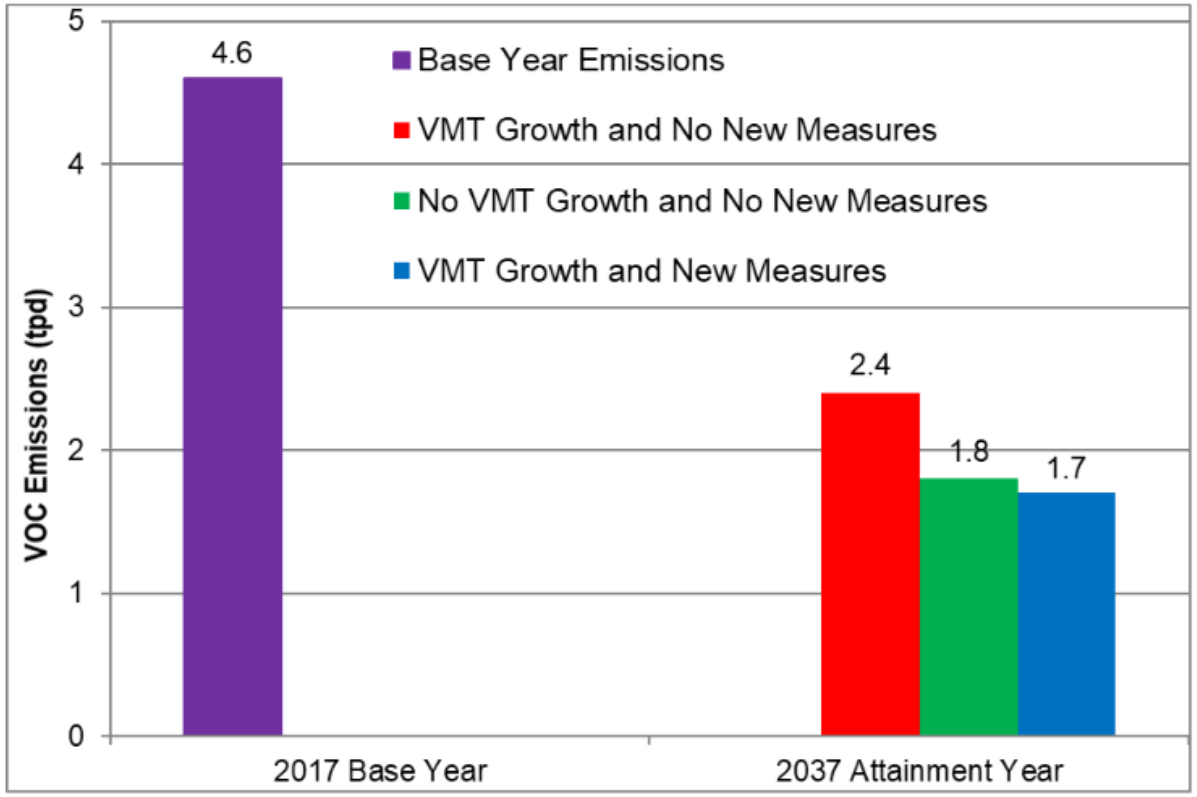
Transportation Conformity

- Metropolitan Planning Organizations (MPOs) conducted robust transportation control measure analysis
- New commitments from Valley MPOs to reduce vehicle miles traveled (VMT) throughout Valley, including measures under following categories:
  - Non-Motorized Use Facilities
  - Traffic Flow Improvements
  - Transit Improvements
  - Reduce Single Occupancy Vehicle (SOV) Travel
- Analysis and TCMs presented in Appendix D

VMT Offsets

- **Requirement:** Offset growth in emissions due to growth in VMT through implementation of transportation control strategies and (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)

Motor Vehicle Emissions Budgets

- CARB prepared motor vehicle emissions budget (MVEB) for Plan
  - Subsequent projects/plans produced by transportation planning agencies must conform to budgets by demonstrating that emissions from the project/plan do not exceed the MVEBs in the SIP
- Developed consistent with on-road emissions inventory and attainment demonstration, in consultation with Valley MPOs
- Detailed MVEBs for the Valley and each county included in Appendix D of Draft Plan

Table D-1 Summary MVEB for the 70 ppb Ozone Standard (Summer Season) for each MPO within the SJV Region (tons per day)

	2023		2026		2029		2032		2035		2037	
MVEB (tpd)	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Fresno (FCOG)	5.3	11.6	4.8	8.0	4.3	6.5	3.9	5.7	3.6	5.1	3.0	3.0
Kern (KCOG)	3.9	13.5	3.9	8.8	3.7	7.3	3.4	6.4	3.2	5.9	2.7	4.0
Kings (KCAG)	0.8	2.5	0.8	1.6	0.7	1.3	0.7	1.2	0.6	1.1	0.6	0.8
Madera (MCTC)	1.1	2.5	0.9	1.6	0.8	1.3	0.7	1.1	0.7	1.0	0.6	0.6
Merced (MCAG)	1.6	5.5	1.4	3.5	1.3	2.8	1.1	2.4	1.0	2.2	0.8	1.5
San Joaquin (SJCOG)	3.6	7.0	3.2	4.8	2.9	3.9	2.6	3.3	2.4	2.9	2.0	1.5
Stanislaus (StanCOG)	2.4	4.5	2.2	3.2	2.0	2.6	1.7	2.2	1.6	2.0	1.3	1.0
Tulare (TCAG)	2.3	4.2	2.0	2.9	1.8	2.3	1.6	1.9	1.4	1.7	1.2	0.8

Reasonable Further Progress

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

Year	2017	2023	2026	2029	2032	2035	2037
ROG Emissions	325.68	305.81	296.77	291.98	290.13	290.00	290.95
Emissions Reduction Credits (ERCs)*		0.00	0.00	0.00	0.00	0.00	0.00
MVEB Rounding Margin		0.34	0.42	0.41	0.22	0.43	0.28
ROG Emissions + ERCs + MVEB Rounding Margin		306.14	297.19	292.40	290.34	290.43	291.23
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		-39.08	-59.44	-83.96	-111.22	-140.62	-160.95
Shortfall (-)/ Surplus (+) in ROG, %		-12.0%	-18.3%	-25.8%	-34.1%	-43.2%	-49.4%
Year	2017	2023	2026	2029	2032	2035	2037
NOx Emissions	232.39	157.79	125.59	111.33	100.23	92.37	87.28
Emissions Reduction Credits (ERCs)*		2.43	2.43	2.43	2.43	2.43	2.43
MVEB Rounding Margin**		0.30	0.22	0.00	0.00	0.00	0.00
NOx Emissions + ERCs + MVEB Rounding Margin		160.52	128.24	113.76	102.66	94.80	89.71
Change in NOx since 2017		71.86	104.15	118.63	129.73	137.59	142.68
Change in NOx since 2017, %		30.9%	44.8%	51.0%	55.8%	59.2%	61.4%
NOx reductions since 2017 used for ROG substitution in this milestone year, %		12.0%	18.3%	25.8%	34.1%	43.2%	49.4%
NOx reductions since 2017 surplus after meeting ROG substitution needs in this milestone year, %		18.9%	26.6%	25.3%	21.7%	16.0%	12.0%
RFP shortfall (-), if any		0%	0%	0%	0%	0%	0%
RFP Met?		YES	YES	YES	YES	YES	YES

Contingency Measures

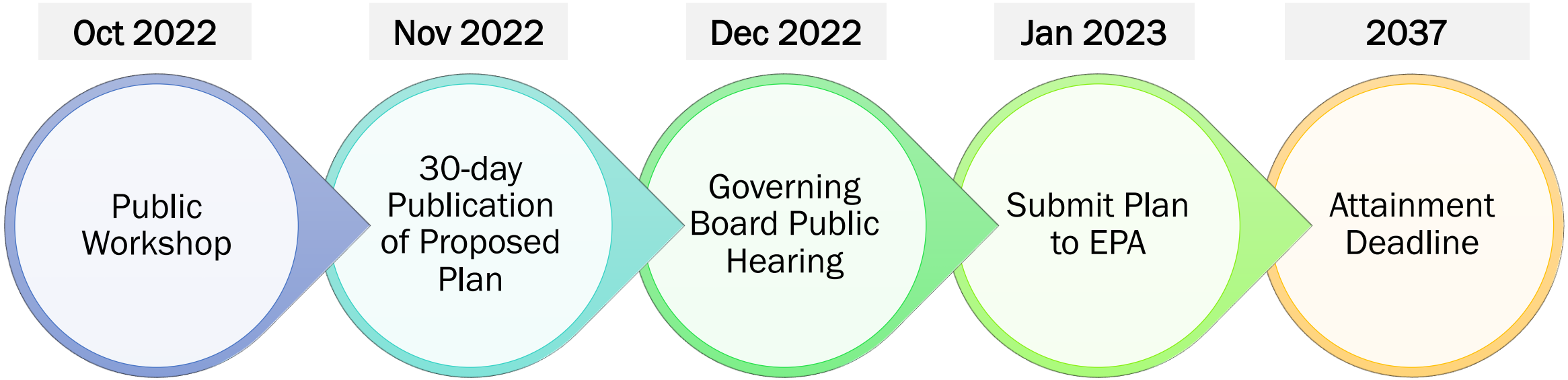
- **Requirement:** Provide for implementation of specific measures if area fails to attain or meet a milestone for RFP or attainment
- Interpretation has changed in recent years due to litigation
- Contingency measures extremely challenging, given:
  - Nonattainment challenges under multiple NAAQS
  - 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
- District working collaboratively with CARB and South Coast AQMD to address contingency requirements, awaiting needed EPA guidance

Call for Federal Action

- CAA is a system of "cooperative federalism," where regions, states, and federal agencies work together to improve air quality and public health
- District and CARB have implemented most stringent regulations for sources under their jurisdiction
- Given increasingly stringent air quality standards for Ozone and PM2.5, additional NOx reductions from federal mobile sources vital
- Number of critical opportunities for achieving significant additional emissions reductions from mobile sources exist, including:
  - Interstate heavy-duty trucks
  - Locomotives
  - Aircraft
  - Other mobile sources under EPA jurisdiction
  - Unprecedented funding (Bipartisan Infrastructure Law, Inflation Reduction Act)

Next Steps

Next Steps for *2022 Ozone Plan*



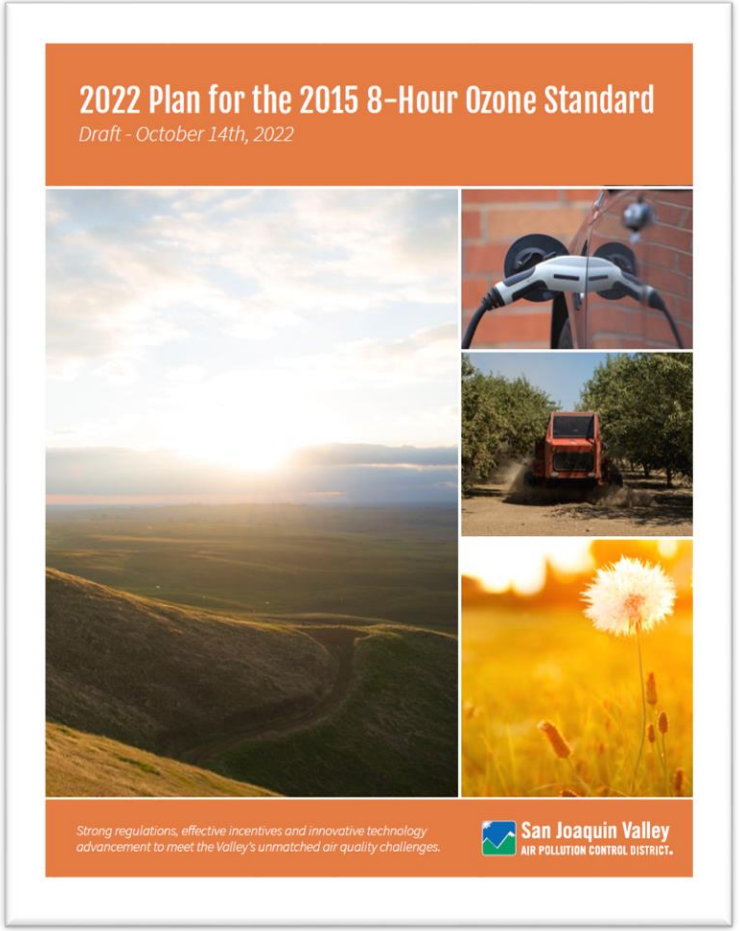
Public Participation and Comment Invited throughout Process

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
October 2022	**Public Workshop** to present, discuss, and receive feedback on Draft *2022 Ozone Plan*

Draft *2022 Ozone Plan* for Public Review

- Initial Draft *2022 Ozone Plan* published May 24, 2022
- District published draft *2022 Ozone Plan* for public review on October 14, 2022
- 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 by November 9, 2022, at 5:00 PM



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

Comments/Questions

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