The 2016 AQMP Attainment Demonstrations for Ozone and PM2.5

STMPR Meeting on Oct 26, 2016

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Air Quality Management District

Revisions in Emissions Since the Release of The Draft 2016 AQMP

- Aircraft Inventories based on the SCAG 2016 RTP
- On-Road Inventories based on SCAG EMFAC2014 inputs for its 2016 RTP conformity
- Emissions from Line-haul Locomotives updated by ARB
- ARB is reviewing inventories from Ports and OGV. The updates may not be finalized for inclusion for the current AQMP

Impacts on Baseline NOx Emissions

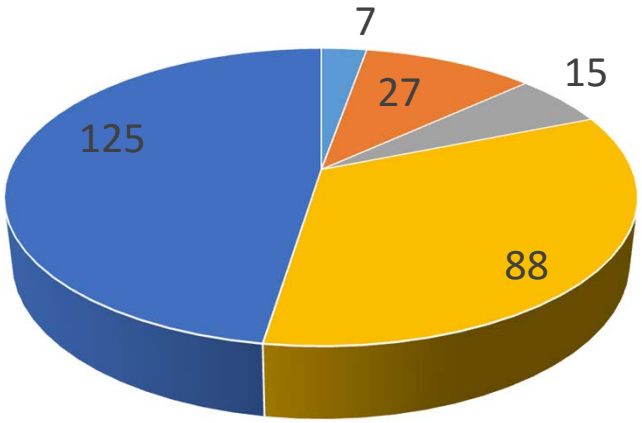
	2012	2023	2031
Aircraft Draft	13.4	15.5	17.1
Aircraft Now	13.8	17.3	20.2
Line-haul Locomotive Draft	14.6	15.4	12.0
Line-Haul Locomotive Now	13.0	7.8	3.1
On-Road Draft	297.1	90.8	67.7
On-Road Now	293.1	88.0	65.0
Total Draft	529	265	224
Total Now	522	255	214

Attainment Target Years

1. 8-hour Ozone 1997 standard (80 ppb) – 2023
2. 8-hour Ozone 2008 standard (75 ppb) – 2031
3. 1-hour Ozone 1979 standard (120 ppb) – 2022
4. Annual PM2.5 2012 standard (12.0 ug/m3) – 2025
5. 24-hour PM2.5 2006 standard (35 ug/m3) – 2019

Attainment Scenario for 80 ppb 8-hour Ozone in 2023

Baseline NOx: 262 TPD



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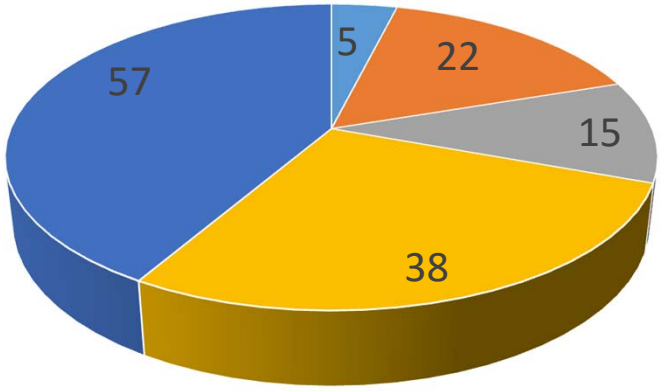
RECLAIM
On-road
Off-road

Remaining NOx : 141 TPD*



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(*includes 3 TPD for the Set-Aside Account)

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Controlled Emissions Projection Algorithm (CEPA)
1997 8-hour Ozone Standard (80ppb)

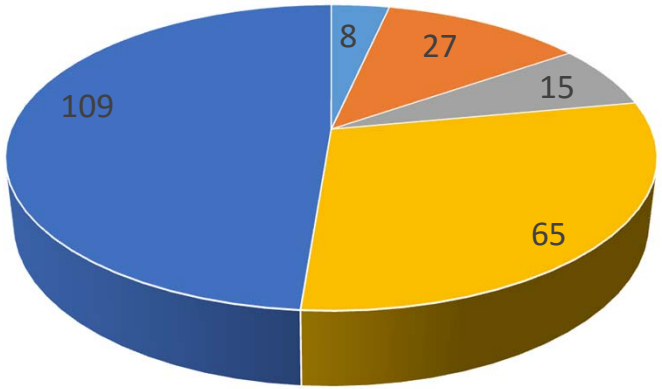
Measure	Name	VOC	NOx
BA-01	MOB-14 (Existing Projects) - School Buses - Diesel	0.00	0.17
BA-04	MOB-14 (Existing Projects) - Freight Locomotives (Prop1B/Moyer)	0.07	1.17
BA-06	MOB-14 (Existing Projects) - Offroad Equipment - Construction/Min	0.32	1.98
BA-07	MOB-14 (Existing Projects) - Harborcraft (Fishing Vessels)	0.22	2.28
ECC-02	Co-Benefits from Energy Efficiency Measures - Res/Comm Bldg	0.07	0.30
ECC-03	Additional Enhancement of Building Energy Efficiency	0.16	1.19
CMB-01	Zero and Near-Zero Emission Technologies at Stationary Sources	1.15	2.48
CMB-02	Commercial and Multi-Residential Space & Water Heating	0.13	1.12
CMB-03	Emission Reductions From Non-Refinery Flares	0.37	1.40
CMB-04	Emission Reductions From Restaurant Burners and Residential Cooki	0.06	0.80
FUG-01	Improved Leak Detection and Repair	2.00	0.00
CTS-01	Further Reduction from Coatings, Solvents, Adhesives & Lubricants	1.02	0.00
BCM-01	Further Emission Reductions from Commercial Cooking	0.00	0.00
BCM-10	Emission Reduction from Greenwaste Composting	1.50	0.00
ARB-LDV	On-Road Light Duty Vehicles	11.44	6.48
ARB-HDV	On-Road Heavy Duty Vehicles	4.10	38.01
ARB-OFRD	Offroad Equipment (All except Airc/Loco/OGV)	31.50	22.00
CP	Consumer Products	0.00	0.00
FIS-AIRC	Federal/International - Aircrafts	2.55	11.01
FIS-LOCO	Federal/International - Locomotives	0.51	10.63
FIS-OGV	Federal/International - Ocean Going Vessels	1.47	13.00
MOB-10	Extension of the SOON Provision	0.20	1.91
MOB-11	Extended Exchange Program	5.73	2.89
MOB-14a	MOB-14 (Future Project Funding) - School Buses	0.00	0.24
MOB-14c	MOB-14 (Future Project Funding) - Cargo Handling Equipment	0.04	0.18
MOB-14d	MOB-14 (Future Project Funding) - Freight Locomotives - Road Haul	0.01	0.25
MOB-14e	MOB-14 (Future Project Funding) - Heavy Duty Diesel Trucks (>1400	0.16	4.76
Grand Total (Net)		64.78	124.24

1997 8-hour Ozone Standard (80ppb)

Station	2012 Design Value	2023 Baseline	Attainment Scenario
AZUS	79.3	78.1	70.0
GLEN	92.7	93.9	83.4
WSLA	64.7	63.4	60.5
CELA	64.0	66.1	65.1
RESE	89.0	79.7	71.4
PICO	67.7	67.9	63.5
POMA	84.3	84.3	75.2
LAXH	61.0	60.1	57.0
SCLR	97.3	85.5	76.2
ANAH	65.0	68.1	64.5
MSVJ	72.0	70.0	63.6
LAHB	69.3	70.9	66.3
BNAP	95.3	89.9	79.0
INDI	84.3	77.6	73.6
PLSP	91.7	81.8	75.5
PERI	91.0	81.7	70.3
RIVR	96.3	90.9	78.3
MRLM	92.7	86.3	74.3
ELSI	85.3	75.3	65.2
CRES	103.0	95.1	81.0
UPLA	96.7	93.7	82.2
FONT	101.0	97.0	84.5
RDLD	104.7	96.5	82.6
SNBO	98.0	91.4	78.8

Attainment Scenario for 75 ppb 8-hour Ozone in 2031

NOx in the 2031 Baseline: 223 TPD



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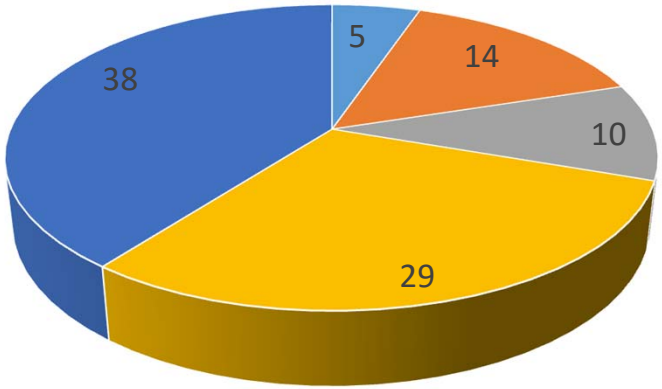
On-road Off-road

Remaining NOx : 96TPD*



Point source Area source RECLAIM
On-road Off-road

(*includes 1 TPD for the Set-Aside Account)

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Controlled Emissions Projection Algorithm (CEPA) Attainment Scenario for 75 ppb 8-hour Ozone for 2031

Measure	Name	VOC	NOx
BA-01	MOB-14 (Existing Projects) - School Buses - Diesel	0.00	0.07
BA-04	MOB-14 (Existing Projects) - Freight Locomotives (Prop1B/Moyer)	0.06	1.22
BA-06	MOB-14 (Existing Projects) - Offroad Equipment - Construction/Min	0.55	2.40
BA-07	MOB-14 (Existing Projects) - Harborcraft (Fishing Vessels)	0.00	0.00
ECC-02	Co-Benefits from Energy Efficiency Measures - Res/Comm Bldg	0.29	1.15
ECC-03	Additional Enhancement of Building Energy Efficiency	0.31	2.11
CMB-01	Zero and Near-Zero Emission Technologies at Stationary Sources	2.80	5.96
CMB-02	Commercial and Multi-Residential Space & Water Heating	0.36	2.80
CMB-03	Emission Reductions From Non-Refinery Flares	0.40	1.50
CMB-04	Emission Reductions From Restaurant Burners and Residential Cooki	0.12	1.60
FUG-01	Improved Leak Detection and Repair	2.00	0.00
CTS-01	Further Reduction from Coatings, Solvents, Adhesives & Lubricants	2.00	0.00
BCM-01	Further Emission Reductions from Commercial Cooking	0.00	0.00
BCM-10	Emission Reduction from Greenwaste Composting	1.80	0.00
ARB-LDV	On-Road Light Duty Vehicles	13.17	5.61
ARB-HDV	On-Road Heavy Duty Vehicles	2.43	27.02
ARB-OFRD	Offroad Equipment (All except Airc/Loco/OGV)	32.12	21.00
CP	Consumer Products	4.99	0.00
FIS-AIRC	Federal/International - Aircrafts	2.90	13.00
FIS-LOCO	Federal/International - Locomotives	0.71	15.00
FIS-OGV	Federal/International - Ocean Going Vessels	2.68	14.98
MOB-10	Extension of the SOON Provision	0.25	1.91
MOB-11	Extended Exchange Program	1.86	1.00
MOB-14a	MOB-14 (Future Project Funding) - School Buses	0.01	0.32
MOB-14c	MOB-14 (Future Project Funding) - Cargo Handling Equipment	0.06	0.25
MOB-14d	MOB-14 (Future Project Funding) - Freight Locomotives - Road Haul	0.01	0.15
MOB-14e	MOB-14 (Future Project Funding) - Heavy Duty Diesel Trucks (>1400	0.12	3.41
Grand Total (Net)		71.97	122.45

2008 8-hour Ozone Standard (75ppb)

Station	2012 Design Value	2031 Baseline	Attainment Scenario
AZUS	79.3	76.1	63.0
GLEN	92.7	91.4	74.4
WSLA	64.7	62.8	56.6
CELA	64.0	65.8	61.2
RESE	89.0	76.5	64.9
PICO	67.7	66.8	58.5
POMA	84.3	82.1	67.8
LAXH	61.0	59.7	53.0
SCLR	97.3	81.6	68.6
ANAH	65.0	67.7	60.0
MSVJ	72.0	68.6	58.5
LAHB	69.3	70.1	60.9
BNAP	95.3	86.7	71.2
INDI	84.3	75.9	70.0
PLSP	91.7	79.2	70.9
PERI	91.0	78.2	63.0
RIVR	96.3	87.6	69.5
MRLM	92.7	83.2	66.0
ELSI	85.3	72.2	59.0
CRES	103.0	91.4	72.4
UPLA	96.7	90.8	73.5
FONT	101.0	94.0	75.8
RDLD	104.7	92.7	73.1
SNBO	98.0	88.2	70.2

Emission Reductions for 1-hour Ozone Attainment in 2022

YEAR	VOC		NOx	
	Based on Adoption Date	Based on Implementation Date[a]	Based on Adoption Date	Based on Implementation Date[a]
2016				
2017	CTS-01 (1) **3.0**		MOB-10 (1.9) MOB-11 (2.9) MOB-14 (11) **15.8**	
2018	CMB-01 (1) CMB-03 (1.7) ECC-02 (0.07) ECC-03 (0.2) **3.0**		CMB-01 (2.5) CMB-02 (1.1) CMB-03 (1.4) CMB-04 (0.8) ECC-02 (0.3) ECC-03 (1.2) **7.3**	
2019	FUG-01 (2) BCM-10 (1.5) **3.5**			
2020		BCM-10 (1.5) CMB-03 (1.7) CTS-01 (1) **4.2**		CMB-03 (1.4) CMB-02 (1.1) **2.5**
2021				
2022		FUG-01 (2) ECC-02 (0.06)^ ECC-03 (0.17)^ CMB-01 (0.86)^ **3.1**		MOB-10 (1.9) CMB-04 (0.8) MOB-11 (2.5) ^ MOB-14 (9.5) ^ ECC-02 (0.26)^ ECC-03 (1.03)^ CMB-01 (2.15)^ **18.1**
TOTAL*	**7.5**	**7.3**	**23**	**21**

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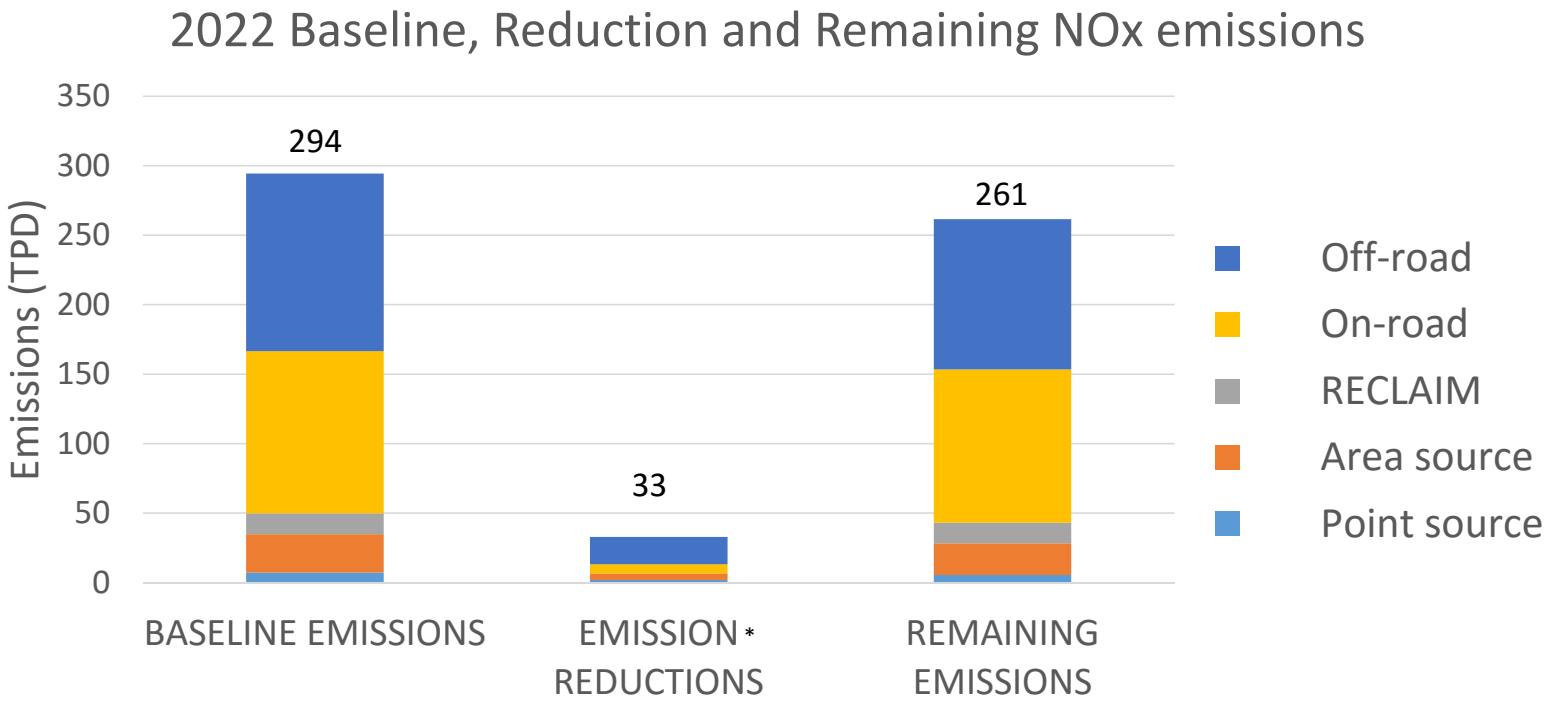
2022 Baseline, Reduction and Remaining Emissions



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* Includes NOx reductions of 10 TPD in Locomotive and 2 TPD in OGV At-Berth controls

1-hour Ozone Standard (120ppb)

Station	2012 Design Value	2022 Attainment
AZUS	112.7	102.0
GLEN	132.3	119.6
WSLA	93.7	89.1
CELA	89.3	88.0
RESE	125.0	103.6
CMPT	84.7	83.7
PICO	100.0	96.5
POMA	117.0	101.4
LAXH	81.3	80.4
SCLR	132.7	108.2
ANAH	86.0	86.8
CSTA	86.7	91.5
MSVJ	97.3	93.5
LAHB	98.3	92.3
INDI	97.3	87.7
PLSP	112.0	97.0
PERI	114.7	106.3
RIVR	124.3	106.7
MRLM	119.7	104.1
ELSI	108.3	91.6
CRES	132.7	118.5
UPLA	135.0	119.7
FONT	138.3	122.5
RDLD	133.3	118.5
SNBO	123.7	104.5

Annual PM2.5 Attainment in 2025

YEAR	PM2.5		NOx**	
	Based on Adoption Date	Based on Implementation Date[a]	Based on Adoption Date	Based on Implementation Date[a]
2016				
2017			MOB-10 (1.9) MOB-11 (2.9) MOB-14 (11) **15.8**	
2018	BCM-01 (3.3)		CMB-01 (2.5) CMB-02 (1.1) CMB-03 (1.4) CMB-04 (0.8) ECC-02 (0.3) ECC-03 (1.2) **7.3**	
2019	BCM-04 (0.2)$^{\Delta}$ BCM-10 (0.1)$^{\Delta}$			
2020		BCM-04 (0.2)$^{\Delta}$ BCM-10 (0.1)$^{\Delta}$		CMB-03 (1.4) CMB-02 (1.1) **2.5**
2021				
2022				CMB-04 (0.8)
2023				ECC-02 (0.3) ECC-03 (1.2) CMB-01 (2.5) MOB-10 (1.9) MOB-11 (2.9) MOB-14 (11) **19.8**
2024				
2025		BCM-01 (3.3)		
TOTAL	**3.3***	**3.3***	**23**	**23**

Annual PM2.5 Design Values at Mira Loma

	Description	Annual Average (12.0 ug/m3)
2012	Base Year Design Value	14.9*

2025 Baseline	Annual Attainment for Serious	12.8*
2025 Control	O3 Non-Black Box Measures Only	11.96
2023 Control	O3 Strategy	11.13

* Changes in the On-Road emission were not reflected

24-hour PM2.5 Design Values at Mira Loma

	Description	24-hr Average (35 ug/m3)
2012	Base Year Design Value	36.6*
2019 Baseline	24-hour Attainment	32.2*

* Changes in the On-Road emission were not reflected

Summary

- The 8-hour ozone standard of 80 ppb and 75 ppb are expected to attain in 2023 and 2031, respectively, with the proposed control measures (Ch. 4 of the 2016 AQMP)
- While 8-hour Ozone strategy for 2023 will ensure attainment of 1-hour standard by 2022, 1-hour ozone attainment was demonstrated only with non-182(e)(5) measures.
- While the 8-hour Ozone strategy will co-benefit attainment of the annual PM2.5 standard, attainment demonstration was conducted using only non-182(e)(5) measures.
- 24-hour PM2.5 will meet the standard by 2019 with no additional control.