

# **Appendix C**

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## **Revised Watercraft Emissions Calculations**



## CEPAM: 2016 SIP - Standard Emission Tool

### Emission Projection By Emission Inventory Code (EIC)

#### Oxides of Nitrogen

#### LAKE TAHOE AIR BASIN OTHER MOBILE SOURCES 840-RECREATIONAL BOATS

REPORT TYPE: GROWN AND CONTROLLED

SEASON: SUMMER

BASE YEAR: 2012

All emissions are represented in Tons per Day and reflect the most current data provided to ARB  
[Download this data as a comma delimited file.](#)

<i>EMISSIONS INVENTORY CATEGORY</i>	<b>2017</b>	<b>2035</b>
840-864-1100-6157 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6157-Vessel W/inboard Engine G4-CARB-15-Exhaust	0.000	0.000
840-864-1100-6158 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6158-Vessel W/inboard Engine G4-CARB-15-Evap.	0.000	0.000
840-864-1100-6159 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6159-Vessel W/inboard Engine G4-FI-15-Exhaust	0.000	0.000
840-864-1100-6161 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6161-Vessel W/inboard Engine G4-CARB-25-Exhaust	0.000	0.000
840-864-1100-6162 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6162-Vessel W/inboard Engine G4-CARB-25-Evap.	0.000	0.000
840-864-1100-6256 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6256-Vessel W/inboard Engine G4-FI-25-Exhaust	0.000	0.000

840-864-1100-6258  864-RECREATIONAL BOATS 1100-GASOLINE 6258-Vessel W/inboard Engine G4-CARB-50-Exhaust	0.000	0.000
840-864-1100-6259  864-RECREATIONAL BOATS 1100-GASOLINE 6259-Vessel W/inboard Engine G4-CARB-50-Evap.	0.000	0.000
840-864-1100-6260  864-RECREATIONAL BOATS 1100-GASOLINE 6260-Vessel W/inboard Engine G4-FI-50-Exhaust	0.001	0.001
840-864-1100-6262  864-RECREATIONAL BOATS 1100-GASOLINE 6262-Vessel W/inboard Engine G4-CARB-120-Exhaust	0.000	0.000
840-864-1100-6263  864-RECREATIONAL BOATS 1100-GASOLINE 6263-Vessel W/inboard Engine G4-CARB-120-Evap.	0.000	0.000
840-864-1100-6264  864-RECREATIONAL BOATS 1100-GASOLINE 6264-Vessel W/inboard Engine G4-FI-120-Exhaust	0.001	0.001
840-864-1100-6266  864-RECREATIONAL BOATS 1100-GASOLINE 6266-Vessel W/inboard Engine G4-CARB-175-Exhaust	0.000	0.000
840-864-1100-6267  864-RECREATIONAL BOATS 1100-GASOLINE 6267-Vessel W/inboard Engine G4-CARB-175-Evap.	0.000	0.000
840-864-1100-6268  864-RECREATIONAL BOATS 1100-GASOLINE 6268-Vessel W/inboard Engine G4-FI-175-Exhaust	0.002	0.002
840-864-1100-6270  864-RECREATIONAL BOATS 1100-GASOLINE 6270-Vessel W/inboard Engine G4-CARB-250-Exhaust	0.000	0.000
840-864-1100-6271  864-RECREATIONAL BOATS 1100-GASOLINE 6271-Vessel W/inboard Engine G4-CARB-250-Evap.	0.000	0.000
840-864-1100-6272  864-RECREATIONAL BOATS 1100-GASOLINE 6272-Vessel W/inboard Engine G4-FI-250-Exhaust	0.003	0.004

840-864-1100-6274  864-RECREATIONAL BOATS 1100-GASOLINE 6274-Vessel W/inboard Engine G4-CARB-500-Exhaust	0.000	0.000
840-864-1100-6275  864-RECREATIONAL BOATS 1100-GASOLINE 6275-Vessel W/inboard Engine G4-CARB-500-Evap.	0.000	0.000
840-864-1100-6276  864-RECREATIONAL BOATS 1100-GASOLINE 6276-Vessel W/inboard Engine G4-FI-500-Exhaust	0.005	0.006
840-864-1100-6278  864-RECREATIONAL BOATS 1100-GASOLINE 6278-Vessel W/inboard Engine G4-CARB-750-Exhaust	0.000	0.000
840-864-1100-6279  864-RECREATIONAL BOATS 1100-GASOLINE 6279-Vessel W/inboard Engine G4-CARB-750-Evap.	0.000	0.000
840-864-1100-6280  864-RECREATIONAL BOATS 1100-GASOLINE 6280-Vessel W/inboard Engine G4-FI-750-Exhaust	0.009	0.011
840-864-1100-6288  864-RECREATIONAL BOATS 1100-GASOLINE 6288-Vessel W/inboard Engine G2-FI-15-Exhaust	0.000	0.000
840-864-1100-6289  864-RECREATIONAL BOATS 1100-GASOLINE 6289-Vessel W/inboard Engine G2-FI-15-Evap.	0.000	0.000
840-864-1100-6292  864-RECREATIONAL BOATS 1100-GASOLINE 6292-Vessel W/inboard Engine G2-FI-25-Exhaust	0.000	0.000
840-864-1100-6293  864-RECREATIONAL BOATS 1100-GASOLINE 6293-Vessel W/inboard Engine G2-FI-25-Evap.	0.000	0.000
840-864-1100-6296  864-RECREATIONAL BOATS 1100-GASOLINE 6296-Vessel W/inboard Engine G2-FI-50-Exhaust	0.000	0.000
840-864-1100-6297  864-RECREATIONAL BOATS 1100-GASOLINE 6297-Vessel W/inboard Engine G2-FI-50-Evap.	0.000	0.000

840-864-1100-6300 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6300-Vessel W/inboard Engine G2-FI-120-Exhaust	0.000	0.000
840-864-1100-6301 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6301-Vessel W/inboard Engine G2-FI-120-Evap.	0.000	0.000
840-864-1100-6306 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6306-Vessel W/inboard Engine G2-FI-175-Exhaust	0.000	0.000
840-864-1100-6307 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6307-Vessel W/inboard Engine G2-FI-175-Evap.	0.000	0.000
840-864-1100-6310 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6310-Vessel W/inboard Engine G2-FI-250-Exhaust	0.000	0.000
840-864-1100-6311 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6311-Vessel W/inboard Engine G2-FI-250-Evap.	0.000	0.000
840-864-1100-6351 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6351-Vessel W/inboard Engine G2-FI-500-Exhaust	0.000	0.000
840-864-1100-6352 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6352-Vessel W/inboard Engine G2-FI-500-Evap.	0.000	0.000
840-864-1100-6355 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6355-Vessel W/inboard Engine G2-FI-750-Exhaust	0.001	0.000
840-864-1100-6356 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6356-Vessel W/inboard Engine G2-FI-750-Evap.	0.000	0.000
840-864-1100-6361 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6361-Vessel W/jet Engine G4-CARB-15-Exhaust	0.000	0.000
840-864-1100-6362 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6362-Vessel W/jet Engine G4-CARB-15-Evap.	0.000	0.000

840-864-1100-6363 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6363-Vessel W/jet Engine G4-FI-15-Exhaust	0.000	0.000
840-864-1100-6364 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6364-Vessel W/jet Engine G4-FI-15-Evap.	0.000	0.000
840-864-1100-6381 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6381-Vessel W/jet Engine G4-CARB-250-Exhaust	0.003	0.001
840-864-1100-6382 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6382-Vessel W/jet Engine G4-CARB-250-Evap.	0.000	0.000
840-864-1100-6383 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6383-Vessel W/jet Engine G4-FI-250-Exhaust	0.000	0.000
840-864-1100-6384 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6384-Vessel W/jet Engine G4-FI-250-Evap.	0.000	0.000
840-864-1100-6385 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6385-Vessel W/jet Engine G4-CARB-500-Exhaust	0.001	0.000
840-864-1100-6386 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6386-Vessel W/jet Engine G4-CARB-500-Evap.	0.000	0.000
840-864-1100-6387 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6387-Vessel W/jet Engine G4-FI-500-Exhaust	0.011	0.007
840-864-1100-6388 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6388-Vessel W/jet Engine G4-FI-500-Evap.	0.000	0.000
840-864-1100-6391 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6391-Vessel W/jet Engine G4-FI-750-Exhaust	0.000	0.000
840-864-1100-6392 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6392-Vessel W/jet Engine G4-FI-750-Evap.	0.000	0.000

840-864-1100-6519 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6519-Vessel W/outboard Engine G4-CARB-50-Exhaust	0.000	0.000
840-864-1100-6520 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6520-Vessel W/outboard Engine G4-CARB-50-Evap.	0.000	0.000
840-864-1100-6521 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6521-Vessel W/outboard Engine G4-FI-50-Exhaust	0.000	0.000
840-864-1100-6522 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6522-Vessel W/outboard Engine G4-FI-50-Evap.	0.000	0.000
840-864-1100-6523 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6523-Vessel W/outboard Engine G4-CARB-120-Exhaust	0.000	0.000
840-864-1100-6524 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6524-Vessel W/outboard Engine G4-CARB-120-Evap.	0.000	0.000
840-864-1100-6525 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6525-Vessel W/outboard Engine G4-FI-120-Exhaust	0.000	0.000
840-864-1100-6526 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6526-Vessel W/outboard Engine G4-FI-120-Evap.	0.000	0.000
840-864-1100-6529 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6529-Vessel W/outboard Engine G4-FI-175-Exhaust	0.000	0.000
840-864-1100-6530 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6530-Vessel W/outboard Engine G4-FI-175-Evap.	0.000	0.000
840-864-1100-6533 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6533-Vessel W/outboard Engine G4-FI-250-Exhaust	0.000	0.001
840-864-1100-6534 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6534-Vessel W/outboard Engine G4-FI-250-Evap.	0.000	0.000



840-864-1100-6660 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6660-Vessel W/outboard Engine G2-CARB-50-Exhaust	0.000	0.000
840-864-1100-6661 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6661-Vessel W/outboard Engine G2-CARB-50-Evap.	0.000	0.000
840-864-1100-6664 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6664-Vessel W/outboard Engine G2-CARB-120-Exhaust	0.000	0.000
840-864-1100-6665 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6665-Vessel W/outboard Engine G2-CARB-120-Evap.	0.000	0.000
840-864-1100-6666 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6666-Vessel W/outboard Engine G2-FI-120-Exhaust	0.000	0.000
840-864-1100-6667 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6667-Vessel W/outboard Engine G2-FI-120-Evap.	0.000	0.000
840-864-1100-6670 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6670-Vessel W/outboard Engine G2-FI-175-Exhaust	0.000	0.000
840-864-1100-6671 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6671-Vessel W/outboard Engine G2-FI-175-Evap.	0.000	0.000
840-864-1100-6674 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6674-Vessel W/outboard Engine G2-FI-250-Exhaust	0.001	0.001
840-864-1100-6675 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6675-Vessel W/outboard Engine G2-FI-250-Evap.	0.000	0.000
840-864-1100-6688 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6688-Vessel W/PWC G4-CARB-15-Exhaust	0.001	0.001
840-864-1100-6689 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6689-Vessel W/PWC G4-CARB-15-Evap.	0.000	0.000



840-864-1100-6692 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6692-Vessel W/PWC G4-CARB-25-Exhaust	0.001	0.000
840-864-1100-6693 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6693-Vessel W/PWC G4-CARB-25-Evap.	0.000	0.000
840-864-1100-6694 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6694-Vessel W/PWC G4-FI-25-Exhaust	0.001	0.001
840-864-1100-6695 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6695-Vessel W/PWC G4-FI-25-Evap.	0.000	0.000
840-864-1100-6696 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6696-Vessel W/PWC G4-CARB-50-Exhaust	0.002	0.001
840-864-1100-6697 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6697-Vessel W/PWC G4-CARB-50-Evap.	0.000	0.000
840-864-1100-6698 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6698-Vessel W/PWC G4-FI-50-Exhaust	0.003	0.005
840-864-1100-6699 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6699-Vessel W/PWC G4-FI-50-Evap.	0.000	0.000
840-864-1100-6702 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6702-Vessel W/PWC G4-FI-120-Exhaust	0.002	0.002
840-864-1100-6703 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6703-Vessel W/PWC G4-FI-120-Evap.	0.000	0.000
840-864-1100-6704 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6704-Vessel W/PWC G4-CARB-175-Exhaust	0.000	0.000
840-864-1100-6705 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6705-Vessel W/PWC G4-CARB-175-Evap.	0.000	0.000

840-864-1100-6706 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6706-Vessel W/PWC G4-FI-175-Exhaust	0.002	0.002
840-864-1100-6707 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6707-Vessel W/PWC G4-FI-175-Evap.	0.000	0.000
840-864-1100-6710 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6710-Vessel W/PWC G4-FI-250-Exhaust	0.003	0.005
840-864-1100-6711 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6711-Vessel W/PWC G4-FI-250-Evap.	0.000	0.000
840-864-1100-6724 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6724-Vessel W/PWC G2-CARB-15-Exhaust	0.001	0.000
840-864-1100-6725 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6725-Vessel W/PWC G2-CARB-15-Evap.	0.000	0.000
840-864-1100-6728 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6728-Vessel W/PWC G2-CARB-25-Exhaust	0.001	0.000
840-864-1100-6729 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6729-Vessel W/PWC G2-CARB-25-Evap.	0.000	0.000
840-864-1100-6732 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6732-Vessel W/PWC G2-CARB-50-Exhaust	0.002	0.000
840-864-1100-6733 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6733-Vessel W/PWC G2-CARB-50-Evap.	0.000	0.000
840-864-1100-6734 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6734-Vessel W/PWC G2-FI-50-Exhaust	0.000	0.001
840-864-1100-6735 <a href="#">i</a> 864-RECREATIONAL BOATS 1100-GASOLINE 6735-Vessel W/PWC G2-FI-50-Evap.	0.000	0.000

840-864-1100-6736  864-RECREATIONAL BOATS 1100-GASOLINE 6736-Vessel W/PWC G2-CARB-120-Exhaust	0.004	0.001
840-864-1100-6737  864-RECREATIONAL BOATS 1100-GASOLINE 6737-Vessel W/PWC G2-CARB-120-Evap.	0.000	0.000
840-864-1100-6738  864-RECREATIONAL BOATS 1100-GASOLINE 6738-Vessel W/PWC G2-FI-120-Exhaust	0.002	0.003
840-864-1100-6739  864-RECREATIONAL BOATS 1100-GASOLINE 6739-Vessel W/PWC G2-FI-120-Evap.	0.000	0.000
840-864-1100-6740  864-RECREATIONAL BOATS 1100-GASOLINE 6740-Vessel W/PWC G2-CARB-175-Exhaust	0.002	0.000
840-864-1100-6741  864-RECREATIONAL BOATS 1100-GASOLINE 6741-Vessel W/PWC G2-CARB-175-Evap.	0.000	0.000
840-864-1100-6742  864-RECREATIONAL BOATS 1100-GASOLINE 6742-Vessel W/PWC G2-FI-175-Exhaust	0.002	0.003
840-864-1100-6743  864-RECREATIONAL BOATS 1100-GASOLINE 6743-Vessel W/PWC G2-FI-175-Evap.	0.000	0.000
840-864-1100-6744  864-RECREATIONAL BOATS 1100-GASOLINE 6744-Vessel W/PWC G2-CARB-250-Exhaust	0.001	0.000
840-864-1100-6745  864-RECREATIONAL BOATS 1100-GASOLINE 6745-Vessel W/PWC G2-CARB-250-Evap.	0.000	0.000
840-864-1100-6746  864-RECREATIONAL BOATS 1100-GASOLINE 6746-Vessel W/PWC G2-FI-250-Exhaust	0.010	0.005
840-864-1100-6747  864-RECREATIONAL BOATS 1100-GASOLINE 6747-Vessel W/PWC G2-FI-250-Evap.	0.000	0.000

840-864-1100-6750  864-RECREATIONAL BOATS 1100-GASOLINE 6750-Vessel W/PWC G2-FI-500-Exhaust	0.003	0.003
840-864-1100-6751  864-RECREATIONAL BOATS 1100-GASOLINE 6751-Vessel W/PWC G2-FI-500-Evap.	0.000	0.000
840-864-1100-6756  864-RECREATIONAL BOATS 1100-GASOLINE 6756-Vessel W/PWC G4-CARB-2-Exhaust	0.001	0.001
840-864-1100-6757  864-RECREATIONAL BOATS 1100-GASOLINE 6757-Vessel W/PWC G4-CARB-2-Evap.	0.000	0.000
840-864-1100-6760  864-RECREATIONAL BOATS 1100-GASOLINE 6760-Vessel W/sterndrive G4-CARB-15-Exhaust	0.000	0.000
840-864-1100-6761  864-RECREATIONAL BOATS 1100-GASOLINE 6761-Vessel W/sterndrive G4-CARB-15-Evap.	0.000	0.000
840-864-1100-6774  864-RECREATIONAL BOATS 1100-GASOLINE 6774-Vessel W/sterndrive G4-FI-120-Exhaust	0.001	0.004
840-864-1100-6775  864-RECREATIONAL BOATS 1100-GASOLINE 6775-Vessel W/sterndrive G4-FI-120-Evap.	0.000	0.000
840-864-1100-6778  864-RECREATIONAL BOATS 1100-GASOLINE 6778-Vessel W/sterndrive G4-FI-175-Exhaust	0.011	0.007
840-864-1100-6779  864-RECREATIONAL BOATS 1100-GASOLINE 6779-Vessel W/sterndrive G4-FI-175-Evap.	0.000	0.000
840-864-1100-6782  864-RECREATIONAL BOATS 1100-GASOLINE 6782-Vessel W/sterndrive G4-FI-250-Exhaust	0.006	0.011
840-864-1100-6783  864-RECREATIONAL BOATS 1100-GASOLINE 6783-Vessel W/sterndrive G4-FI-250-Evap.	0.000	0.000

840-864-1100-6786 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6786-Vessel W/sterndrive G4-FI-500-Exhaust	0.000	0.001
840-864-1100-6787 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 6787-Vessel W/sterndrive G4-FI-500-Evap.	0.000	0.000
840-864-1100-7581 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7581-Vessel W/sterndrive G2-CARB-25-Exhaust	0.001	0.000
840-864-1100-7582 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7582-Vessel W/sterndrive G2-CARB-25-Evap.	0.000	0.000
840-864-1100-7585 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7585-Vessel W/sterndrive G2-CARB-50-Exhaust	0.002	0.000
840-864-1100-7586 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7586-Vessel W/sterndrive G2-CARB-50-Evap.	0.000	0.000
840-864-1100-7587 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7587-Vessel W/sterndrive G2-FI-50-Exhaust	0.003	0.001
840-864-1100-7588 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7588-Vessel W/sterndrive G2-FI-50-Evap.	0.000	0.000
840-864-1100-7589 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7589-Vessel W/sterndrive G2-CARB-120-Exhaust	0.000	0.000
840-864-1100-7590 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7590-Vessel W/sterndrive G2-CARB-120-Evap.	0.000	0.000
840-864-1100-7591 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7591-Vessel W/sterndrive G2-FI-120-Exhaust	0.012	0.002
840-864-1100-7592 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 7592-Vessel W/sterndrive G2-FI-120-Evap.	0.000	0.000

840-864-1100-8135 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8135-Sailboat Auxiliary Engine G4-CARB-15-Exhaust	0.000	0.000
840-864-1100-8136 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8136-Sailboat Auxiliary Engine G4-CARB-15-Evap.	0.000	0.000
840-864-1100-8137 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8137-Sailboat Auxiliary Engine G4-FI-15-Exhaust	0.000	0.000
840-864-1100-8141 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8141-Sailboat Auxiliary Engine G4-FI-25-Exhaust	0.000	0.000
840-864-1100-8203 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8203-Sailboat Auxiliary Engine G4-FI-50-Exhaust	0.000	0.000
840-864-1100-8205 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8205-Sailboat Auxiliary Engine G4-CARB-120-Exhaust	0.000	0.000
840-864-1100-8206 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8206-Sailboat Auxiliary Engine G4-CARB-120-Evap.	0.000	0.000
840-864-1100-8207 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8207-Sailboat Auxiliary Engine G4-FI-120-Exhaust	0.000	0.000
840-864-1100-8209 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8209-Sailboat Auxiliary Engine G4-CARB-175-Exhaust	0.000	0.000
840-864-1100-8210 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8210-Sailboat Auxiliary Engine G4-CARB-175-Evap.	0.000	0.000
840-864-1100-8211 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8211-Sailboat Auxiliary Engine G4-FI-175-Exhaust	0.001	0.000
840-864-1100-8293 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8293-Sailboat Auxiliary Engine G4-CARB-250-Exhaust	0.001	0.003

840-864-1100-8294 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8294-Sailboat Auxiliary Engine G4-CARB-250-Evap.	0.000	0.000
840-864-1100-8295 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8295-Sailboat Auxiliary Engine G4-FI-250-Exhaust	0.001	0.001
840-864-1100-8297 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8297-Sailboat Auxiliary Engine G4-CARB-500-Exhaust	0.007	0.006
840-864-1100-8298 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8298-Sailboat Auxiliary Engine G4-CARB-500-Evap.	0.000	0.000
840-864-1100-8331 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8331-Sailboat Auxiliary Engine G4-FI-500-Exhaust	0.002	0.001
840-864-1100-8333 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8333-Sailboat Auxiliary Engine G4-CARB-750-Exhaust	0.000	0.001
840-864-1100-8334 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8334-Sailboat Auxiliary Engine G4-CARB-750-Evap.	0.000	0.000
840-864-1100-8335 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8335-Sailboat Auxiliary Engine G4-FI-750-Exhaust	0.004	0.002
840-864-1100-8421 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8421-Sailboat Auxiliary Engine G2-FI-15-Exhaust	0.001	0.000
840-864-1100-8422 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8422-Sailboat Auxiliary Engine G2-FI-15-Evap.	0.000	0.000
840-864-1100-8565 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8565-Sailboat Auxiliary Engine G2-FI-175-Exhaust	0.012	0.003
840-864-1100-8566 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8566-Sailboat Auxiliary Engine G2-FI-175-Evap.	0.000	0.000



840-864-1100-8569 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8569-Sailboat Auxiliary Engine G2-FI-250-Exhaust	0.013	0.010
840-864-1100-8570 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8570-Sailboat Auxiliary Engine G2-FI-250-Evap.	0.000	0.000
840-864-1100-8655 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8655-Sailboat Auxiliary Engine G2-FI-500-Exhaust	0.002	0.000
840-864-1100-8656 ⓘ 864-RECREATIONAL BOATS 1100-GASOLINE 8656-Sailboat Auxiliary Engine G2-FI-500-Evap.	0.000	0.000
840-864-1210-7972 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 7972-Sailboat Auxiliary Engine D-15-Exhaust	0.000	0.000
840-864-1210-7973 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 7973-Sailboat Auxiliary Engine D-15-Evap.	0.000	0.000
840-864-1210-9558 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9558-Vessel W/inboard Engine D-15-Exhaust	0.000	0.000
840-864-1210-9559 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9559-Vessel W/inboard Engine D-15-Evap.	0.000	0.000
840-864-1210-9560 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9560-Vessel W/inboard Engine D-25-Exhaust	0.000	0.000
840-864-1210-9561 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9561-Vessel W/inboard Engine D-25-Evap.	0.000	0.000
840-864-1210-9562 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9562-Vesses W/inboard Engines D-50-Exhaust	0.000	0.000
840-864-1210-9563 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9563-Vesses W/inboard Engines D-50-Evap.	0.000	0.000

840-864-1210-9566 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9566-Vessel W/inboard Engine D-120-Exhaust	0.000	0.000
840-864-1210-9567 ⓘ 864-RECREATIONAL BOATS 1210-DIESEL (UNSPECIFIED) 9567-Vessel W/inboard Engine D-120-Evap.	0.000	0.000
<b>GRAND TOTAL FOR LAKE TAHOE</b>	0.161	0.121



Pursuant to the authority vested in California Air Resources Board by Health and Safety Code Sections 43013, 43018, 43101, 43102 and 43104; and

Pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

**IT IS ORDERED AND RESOLVED:** That the following new spark-ignition marine engine and emission control systems (ECS) produced by the manufacturer are certified as described below. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	FUEL TYPE	DISPLACEMENT (cc)	LEVEL OF CLEANLINESS
2018	JM9XM04.5CAT	Gasoline	4500	Super Ultra Low Emission ("Four Stars")
EQUIPMENT APPLICATION		ECS & SPECIAL FEATURES		ENGINE TYPE
Sterndrive		Sequential Multiport Fuel Injection, Heated Oxygen Sensor, Dual Three-way Catalytic Converter, On-Board Diagnostics-Marine System, Low Permeation Fuel Hose		4-Stroke
ENGINE MODELS (rated power in kilowatts, kW)	See Attachment			

**BE IT ORDERED AND RESOLVED:** That the listed engines are certified to a hydrocarbon plus oxides of nitrogen (HC+NOx) family emission limit (FEL) and carbon monoxide (CO) direct standard in accordance with a plan submitted by the manufacturer to, and approved by, the Executive Officer for compliance with the exhaust emission standards on a corporate average basis pursuant to Title 13, California Code of Regulations, (13 CCR) Section 2442(b). The HC+NOx FEL and the CO standard shall be the applicable emission standards for this engine family for determining compliance of any engine within this engine family pursuant to 13 CCR Sections 2444.1 (in-use compliance). The standards and certification emission levels in grams per kilowatt-hour (g/kW-hr) for this engine family are as follows. Engines in this engine family shall discharge no crankcase emissions into the ambient atmosphere in conformance with 13 CCR Section 2442(b).

*=not applicable	HC+NOx (g/kW-hr)	CO (g/kW-hr)
STANDARD	5.0	75.0
FAMILY EMISSION LEVEL	4.5	*
CERTIFICATION LEVEL	2.7	45.6

Compliance with the emission standards on a corporate average basis shall be determined pursuant to 13 CCR Section 2442(b) based on the sales-weighted average of all engines produced for sale in California that are included in the approved corporate average compliance plan for the model-year.

**BE IT FURTHER RESOLVED:** That for the listed engines, the manufacturer has submitted, and the Executive Officer hereby approves, the information and materials to demonstrate certification compliance with 13 CCR Sections 2443.1, 2443.2 and 2443.3 (emission control, consumer, and environmental labels), Section 2444.2 (on-board engine malfunction detection system), and Sections 2445.1 and 2445.2 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

**This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.**

Executed at El Monte, California on this 22nd day of December 2017.

FOR Annette Hebert, Chief  
Emissions Compliance, Automotive Regulations and Science Division





PLEASURECRAFT MARINE ENGINE  
COMPANY

EXECUTIVE ORDER U-W-013-0052  
New Spark-Ignition Marine Engines

Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Sections 43013, 43018, 43101, 43102 and 43104; and

Pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: That the following new spark-ignition marine engine and emission control systems (ECS) produced by the manufacturer are certified as described below. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	FUEL TYPE	DISPLACEMENT (cc)	LEVEL OF CLEANLINESS
2018	JPCMM06.0HO1	Gasoline	6000	Super Ultra Low Emission ("Four Stars")
EQUIPMENT APPLICATION		ECS & SPECIAL FEATURES		ENGINE TYPE
Inboard		Three Way Catalytic Converter Heated Oxygen Sensor Multiport Fuel Injection On-Board Diagnostics-Marine System Low Perm Fuel Line		4-Stroke
ENGINE MODELS (rated power in kilowatts, kW)	See Attachment			

The following are the hydrocarbon plus oxides of nitrogen (HC+NOx) and carbon monoxide (CO) exhaust emission standards (Title 13, California Code of Regulations, (13 CCR) Section 2442(b)) and certification emission levels in grams per kilowatt-hour (g/kW-hr) for this engine family. Engines in this engine family shall discharge no crankcase emissions into the ambient atmosphere in conformance with 13 CCR Section 2442(b). This engine family shall comply with the evaporative requirements of 13 CCR Section 2442(b).

*=not applicable	HC+NOx (g/kW-hr)	CO (g/kW-hr)
STANDARD	5.0	75.0
FAMILY EMISSION LEVEL	*	*
CERTIFICATION LEVEL	3.2	47.1


This engine family shall not be used to determine compliance through corporate averaging.

BE IT FURTHER RESOLVED: That for the listed engines, the manufacturer has submitted, and the Executive Officer hereby approves, the information and materials to demonstrate certification compliance with 13 CCR Sections 2443.1, 2443.2 and 2443.3 (emission control, consumer, and environmental labels), Section 2444.2 (on-board engine malfunction detection system), and Sections 2445.1 and 2445.2 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 10<sup>th</sup> day of October 2017.

  
Annette Hebert, Chief  
Emissions Compliance, Automotive Regulations and Science Division





Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Sections 43013, 43018, 43101, 43102 and 43104; and

Pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

**IT IS ORDERED AND RESOLVED:** That the following new spark-ignition marine engine and emission control systems (ECS) produced by the manufacturer are certified as described below. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	FUEL TYPE	DISPLACEMENT (cc)	LEVEL OF CLEANLINESS
2018	JYMXM1.832GA	Gasoline	1832	Ultra Low Emission ("Three Stars")
EQUIPMENT APPLICATION		ECS & SPECIAL FEATURES		ENGINE TYPE
Outboard		Multiport Fuel Injection		4-Stroke
ENGINE MODELS (rated power in kilowatts, kW)	See Attachment			

**BE IT ORDERED AND RESOLVED:** That the listed engines are certified to a hydrocarbon plus oxides of nitrogen (HC+NOx) family emission limit (FEL) and a carbon monoxide (CO) direct standard in accordance with a plan submitted by the manufacturer to, and approved by, the Executive Officer for compliance with the exhaust emission standards on a corporate average basis pursuant to Title 13, California Code of Regulations, (13 CCR) Section 2442(a). The HC+NOx FEL and the CO standard shall be the applicable emission standards for this engine family for determining compliance of any engine within this engine family pursuant to 13 CCR Sections 2444.1 (in-use compliance) and 2448 (audit testing). The standards and certification emission levels in grams per kilowatt-hour (g/kW-hr) for this engine family are as follows. Engines in this engine family shall have closed crankcases in conformance with Part I, Section 18(h) of the "California Exhaust Emission Standards and Test Procedures for 2001 Model-Year and Later Spark-Ignition Marine Engines."

*=not applicable	HC+NOx (g/kW-hr)	CO (g/kW-hr)
STANDARD	.	300.0
FAMILY EMISSION LEVEL	16.50	.
CERTIFICATION LEVEL	11.75	204.9

Compliance with the emission standards on a corporate average basis shall be determined pursuant to 13 CCR Section 2442(a) based on the sales-weighted average power of all engines produced for sale in California that are included in the approved corporate average compliance plan for the model-year.

**BE IT FURTHER RESOLVED:** That for the listed engines, the manufacturer has submitted, and the Executive Officer hereby approves, the information and materials to demonstrate certification compliance with 13 CCR Sections 2443.1, 2443.2 and 2443.3 (emission control, consumer, and environmental labels), and Sections 2445.1 and 2445.2 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

Quarterly reports of engines produced in this engine family for sale in California shall be submitted to the Executive Officer no later than 45 days after the end of each calendar quarter pursuant to 13 CCR Sections 2442(a)(2)(B) and 2446.

**This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.**

Executed at El Monte, California on this 29 day of December 2017.

Annette Hebert, Chief  
Emissions Compliance, Automotive Regulations, and Science Division



Model Year: 2018  
 Manufacturer Name: Yamaha Motor Co., Ltd.  
 Engine Family: JYMXM1.832GA  
 SI MARINE ENGINE SUPPLEMENTAL INFORMATION

page 3  
 Issued: 09/01/2017  
 Revised: \_\_\_\_\_  
 E.O.#: U-W-003-e375

**S11. MODEL SUMMARY** (Use an asterisk (\*) to identify worst-case engine model used for certification testing.)

S12 Engine Model	S13 Engine Code	S14 Sales Codes (Check All appropriate)			S15 Eng. Displ. (cc)	S16 Rated Power (kW)	S17 Rated Speed (RPM)	S18 Peak Torque (N-m)	S19 Peak Torque Speed (RPM)
		Calif. Only	49-State	50-State					
F115LB/ F115BETL	6EK			*	1832	86	5800	156	4000
* F115XB/ F115BETX	6EK			*	1832	86	5800	156	4000
F115JB/ F115BETJ	6EK			*	1832	86	5800	156	4000
LF115XB/ FL115BETX	6EL			*	1832	86	5800	156	4000
VF115LA/ F115CET1L	6FN			*	1832	92	6300	154	5500
VF115XA/ F115CET1X	6FN			*	1832	92	6300	154	5500
F130LA/ F130AETL	6EM			*	1832	95	6300	154	5500
F130XA/ F130AETX	6EM			*	1832	95	6300	154	5500

Pursuant to the authority vested in California Air Resources Board by Health and Safety Code Sections 43013, 43018, 43101, 43102 and 43104; and

Pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-14-012;

**IT IS ORDERED AND RESOLVED:** That the following new spark-ignition marine engine and emission control systems (ECS) produced by the manufacturer are certified as described below. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	FUEL TYPE	DISPLACEMENT (cc)	LEVEL OF CLEANLINESS
2019	KBCXM1.637GS	Gasoline	1630	Ultra Low Emission ("Three Stars")
EQUIPMENT APPLICATION		ECS & SPECIAL FEATURES		ENGINE TYPE
Personal Watercraft		Multiport Fuel Injection Supercharged with Water to Air Cooling		4-Stroke
<b>ENGINE MODELS</b> (rated power in kilowatts, kW)	See Attachment			

**BE IT ORDERED AND RESOLVED:** That the listed engines are certified to a hydrocarbon plus oxides of nitrogen (HC+NOx) family emission limit (FEL) and a carbon monoxide (CO) direct standard in accordance with a plan submitted by the manufacturer to, and approved by, the Executive Officer for compliance with the exhaust emission standards on a corporate average basis pursuant to Title 13, California Code of Regulations, (13 CCR) Section 2442(a). The HC+NOx FEL and the CO standard shall be the applicable emission standards for this engine family for determining compliance of any engine within this engine family pursuant to 13 CCR Sections 2444.1 (in-use compliance) and 2446 (audit testing). The standards and certification emission levels in grams per kilowatt-hour (g/kW-hr) for this engine family are as follows. Engines in this engine family shall have closed crankcases in conformance with Part I, Section 18(h) of the "California Exhaust Emission Standards and Test Procedures for 2001 Model-Year and Later Spark-Ignition Marine Engines."

*not applicable	HC+NOx (g/kW-hr)	CO (g/kW-hr)
<b>STANDARD</b>	*	300.0
<b>FAMILY EMISSION LEVEL</b>	15.00	*
<b>CERTIFICATION LEVEL</b>	12.41	220.9

Compliance with the emission standards on a corporate average basis shall be determined pursuant to 13 CCR Section 2442(a) based on the sales-weighted average power of all engines produced for sale in California that are included in the approved corporate average compliance plan for the model-year.

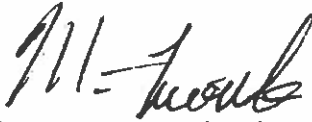
**BE IT FURTHER RESOLVED:** That for the listed engines, the manufacturer has submitted, and the Executive Officer hereby approves, the information and materials to demonstrate certification compliance with 13 CCR Sections 2443.1, 2443.2 and 2443.3 (emission control, consumer, and environmental labels), and Sections 2445.1 and 2445.2 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

Quarterly reports of engines produced in this engine family for sale in California shall be submitted to the Executive Officer no later than 45 days after the end of each calendar quarter pursuant to 13 CCR Sections 2442(a)(2)(B) and 2446.

**This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.**

Executed at El Monte, California on this 23<sup>RD</sup> day of July 2018.

  
 FO<sup>2</sup> Annette Hebert, Chief  
 Emissions Compliance, Automotive Regulations and Science Division



## Summary of Operational Emissions under the Shoreline Plan Alternatives

### Net Change in Mobile-Source Emissions under Alternative 1, Including Interim Years

Emissions Source	Peak-Day Emissions (lb/day)					units	source
	NOx	ROG	CO	PM10	PM2.5		
Existing Boating Activity (2017)	322	1,376	5,536	90	68	lb/day	wksht: WC Emiss Inventory CA
Boating Activity in 2024	299	992	5,413	66	51	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2024	3.7	3.6	40.1	0.4	0.2	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2024	-19	-380	-83	-23	-17	lb/day	calculation
Boating Activity in 2029	281	758	5,311	52	39	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2029	2.2	2.7	27.7	0.3	0.1	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2029	-39	-615	-197	-37	-29	lb/day	calculation
Boating Activity in 2034	273	624	5,427	42	31	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2034	1.5	1.8	21.3	0.2	0.1	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2034	-48	-750	-87	-47	-37	lb/day	calculation
Boating Activity in 2040	270	611	5,488	43	32	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2040	1.0	0.7	10.2	1.2	0.5	lb/day	wksht: On-Rd Veh Emiss
Net Change in 2040	-51	-765	-38	-46	-36	lb/day	calculation

#### Notes

- The emission estimates for the increase in on-road vehicle activity for years 2024, 2029, 2034, and buildout (2040) assume that all the new vehicle trips associated with all the new moorings and boat ramps would occur.

### Net Change in Mobile-Source Emissions under Alternative 2

Emissions Source	Peak-Day Emissions (lb/day)					units	source
	NOx	ROG	CO	PM10	PM2.5		
Existing Boating Activity (2017)	322	1,376	5,536	90	68	lb/day	wksht: WC Emiss Inventory CA
Boating Activity in 2040	344	777	6,985	54	40	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel	4.3	2.9	44.0	5.0	2.0	lb/day	wksht: On-Rd Veh Emiss
Net Change	26	-596	1,493	-31	-26	lb/day	calculation

### Net Change in Mobile-Source Emissions under Alternative 3

Emissions Source	Peak-Day Emissions (lb/day)					units	source
	NOx	ROG	CO	PM10	PM2.5		
Existing Boating Activity (2017)	322	1,376	5,536	90	68	lb/day	wksht: WC Emiss Inventory CA
Boating Activity in 2040	249	562	5,055	39	29	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel	0.7	0.5	6.8	0.8	0.3	lb/day	wksht: On-Rd Veh Emiss
Net Change	-72	-813	-474	-50	-39	lb/day	calculation

### Net Change in Mobile-Source Emissions under Alternative 4

Emissions Source	Peak-Day Emissions (lb/day)					units	source
	NOx	ROG	CO	PM10	PM2.5		
Existing Boating Activity (2017)	322	1,376	5,536	90	68	lb/day	wksht: WC Emiss Inventory CA
Boating Activity in 2040	240	542	4,876	38	28	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel	0.0	0.0	0.0	0.0	0.0	lb/day	wksht: On-Rd Veh Emiss
Net Change	-82	-834	-660	-52	-40	lb/day	calculation

### Net Change in Mobile-Source Emissions under Alternative 1, Including Interim Years, with Twice the Percentage Increase in Watercraft Activity

Emissions Source	Peak-Day Emissions (lb/day)					units	source
	NOx	ROG	CO	PM10	PM2.5		
Existing Boating Activity (2017)	322	1,376	5,536	90	68	lb/day	wksht: WC Emiss Inventory CA
Boating Activity in 2024	319	1,056	5,761	71	55	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2024	3.7	3.6	40.1	0.4	0.2	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2024	0	-317	265	-19	-13	lb/day	calculation
Boating Activity in 2029	304	821	5,749	57	42	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2029	2.2	2.7	27.7	0.3	0.1	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2029	-15	-552	240	-33	-25	lb/day	calculation
Boating Activity in 2034	302	690	6,001	47	35	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2034	1.5	1.8	21.3	0.2	0.1	lb/day	wksht: On-Rd Veh Emiss; See Note 1
Net Change in 2034	-19	-684	486	-43	-33	lb/day	calculation
Boating Activity in 2040	301	679	6,104	48	35	lb/day	wksht: WC Emiss Inventory CA
Increased On-Road Vehicle Travel in 2040	1.0	0.7	10.2	1.2	0.5	lb/day	wksht: On-Rd Veh Emiss
Net Change in 2040	-20	-696	578	-41	-32	lb/day	calculation

#### Notes

- The emission estimates for the increase in on-road vehicle activity for years 2024, 2029, 2034, and buildout (2040) assume that all the new vehicle trips associated with all the new moorings and boat ramps would occur.

## Projections of Recreational Boat Emissions

### Daily Emissions Inventory Projections for Recreational Boats in the Lake Tahoe Air Basin (without implementation of the Shoreline Plan)

Calendar Year	Peak Summer Day (ton/day)					Average Annual Day (ton/day)				
	NOx	ROG	CO	PM10	PM2.5	NOx	ROG	CO	PM10	PM2.5
Existing (2017)	0.161	0.688	2.768	0.045	0.034	0.115	0.490	1.977	0.032	0.024
2024	0.140	0.464	2.532	0.031	0.024	0.100	0.331	1.808	0.022	0.017
2029	0.129	0.348	2.437	0.024	0.018	0.092	0.248	1.740	0.017	0.013
2034	0.122	0.279	2.427	0.019	0.014	0.087	0.199	1.733	0.013	0.010
2035	0.120	0.271	2.436	0.019	0.014	0.086	0.193	1.740	0.013	0.010

Source: California Air Resources Board. 2017. CEPAM: 2016 SIP - Standard Emission Tool, Emission Projections By Summary Category, Base Year: 2012. Available: <https://www.arb.ca.gov/app/emsinv/fcemsumcat/fcemsumcat2016.php>. Accessed January 25, 2018. Web page last updated February 15, 2017.

#### Notes

- 1 This emissions inventory only accounts for boats registered in the California side of the Lake Tahoe Air Basin. Emission projections for future years take into account the projected increase in boat ownership in California, the turnover in the fleet of recreational boats over time, and the more stringent emissions standards to which new model-year recreational boats will be subject over time.
- 2 These emission projections do not account for boats registered in Nevada or other places outside of California.

### Daily Emissions Inventory Projections for Recreational Boats in the Lake Tahoe Air Basin (without implementation of the Shoreline Plan)

Calendar Year	Peak Summer Day (lb/day)				
	NOx	ROG	CO	PM10	PM2.5
Existing (2017)	322	1,376	5,536	90	68
2024	280	928	5,064	62	48
2029	258	696	4,874	48	36
2034	244	558	4,854	38	28
2035	240	542	4,872	38	28

Source: mass conversion calculation

	value	units	source	Annual Emissions Inventory Projections for Recreational Boats in the Lake Tahoe Air Basin					
				Annual Emissions (ton/year)					
mass conversion rate	2,000	lb/ton	wksh: Conv Rts	Calendar Year	NOx	ROG	CO	PM10	PM2.5
time conversion rate	365	days/year	wksh: Conv Rts	2017	42.0	178.9	721.6	11.7	8.8
				2035	31.4	70.4	635.1	4.7	3.7

Source: calculation using time conversion rate

### Growth in Boating Activity under the Shoreline Plan Alternatives (Baseline to 2040)

	Peak Day (summer) (boat-hour/day)				Annual (boat-hr/year)			
	2017 to 2024	2017 to 2029	2017 to 2034	2017 to 2035	2017 to 2024	2017 to 2029	2017 to 2034	2017 to 2035
Baseline + Alternative 1	6.9%	9.0%	11.8%	12.6%	5.9%	8.4%	12.1%	15.9%
Baseline + Alternative 2	—	—	—	43.4%	—	—	—	51.7%
Baseline + Alternative 3	—	—	—	3.8%	—	—	—	3.7%
Baseline + Alternative 4	—	—	—	0.1%	—	—	—	0.0%

Source: wksh: WC Activity Levels

### Adjusted Emissions Inventory Projections for Recreational Boats in the Lake Tahoe Air Basin

Buildout Scenario	Daily, Summer (lb/day)				
	NOx	ROG	CO	PM10	PM2.5
Alternative 1					
in 2024	299	992	5,413	66	51
in 2029	281	758	5,311	52	39
in 2034	273	624	5,427	42	31
in 2035	270	611	5,488	43	32
Alternative 2 in 2035	344	777	6,985	54	40
Alternative 3 in 2035	249	562	5,055	39	29
Alternative 4 in 2035	240	542	4,876	38	28

Source: These values are based on calculations that incorporate the additional growth in boating activity under the Shoreline Plan Alternatives (Baseline to 2040).

#### Notes

The estimates of emission levels generated by boating activity in 2040 are based on CARB's projected inventory for 2035, which is the latest calendar year for which CARB projects future emission levels. These estimates account for the expected growth in boating activity by boats registered in California as well as increases resulting from this alternative (as shown in Table 10-6).

### Growth in Boating Activity under the Shoreline Plan Alternatives (Baseline to 2040), With Twice the Percent Increase

	Peak Day (summer) (boat-hour/day)			
	2017 to 2024	2017 to 2029	2017 to 2034	2017 to 2035
Baseline + Alternative 1	13.8%	17.9%	23.6%	25.3%

Source: wksh: WC Activity Levels

### Adjusted Emissions Inventory Projections for Recreational Boats in the Lake Tahoe Air Basin

Buildout Scenario	Daily, Summer (lb/day)				
	NOx	ROG	CO	PM10	PM2.5
Alternative 1					
in 2024	319	1,056	5,761	71	55
in 2029	304	821	5,749	57	42
in 2034	302	690	6,001	47	35
in 2035	301	679	6,104	48	35

Source: These values are based on calculations that incorporate the additional growth in boating activity under the Shoreline Plan Alternatives (Baseline to 2040), and then doubled.

## Projected Boating Activity Levels

	Peak-Day Boating Activity											
	2024			2029			2034			2035		
	Baseline	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)			
Baseline Conditions	12,512	—	—	—	—	—	—	—	—			
Baseline + Alternative 1	13,374	6.9%	13,635	9.0%	13,990	11.8%	14,094	12.6%				
Baseline + Alternative 2	—	—	—	—	—	—	17,939	43.4%				
Baseline + Alternative 3	—	—	—	—	—	—	12,982	3.8%				
Baseline + Alternative 4	—	—	—	—	—	—	12,521	0.1%				

	Annual Boating Activity											
	2024			2029			2034			2035		
	Baseline	boat-hr/year	% change from Baseline (2017)	boat-hr/year	% change from Baseline (2017)	boat-hr/year	% change from Baseline (2017)	boat-hr/year	% change from Baseline (2017)			
Baseline Conditions	489,155	—	—	—	—	—	—	—				
Baseline + Alternative 1	517,895	5.9%	530,327	8.4%	548,539	12.1%	566,814	15.9%				
Baseline + Alternative 2	—	—	—	—	—	—	742,260	51.7%				
Baseline + Alternative 3	—	—	—	—	—	—	507,368	3.7%				
Baseline + Alternative 4	—	—	—	—	—	—	489,155	0.0%				

Source: Values from Project Description, Table 2-4; % change based on calculations; Values for interim years 2024, 2029, and 2034 are from wksht: Phased Release Alt 1

Peak-Day Boating Levels for interim years were only estimated fro Alternative 1.

## Projected Boating Activity Levels, Doubling the Percent Increase

	Peak-Day Boating Activity											
	2024			2029			2034			2035		
	Baseline	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)	boat-hr/day	% change from Baseline (2017)			
Baseline Conditions	12,512	—	—	—	—	—	—	—				
Baseline + Alternative 1	14,235	13.8%	14,757	17.9%	15,468	23.6%	15,676	25.3%				
Baseline + Alternative 2	—	—	—	—	—	—	17,939	43.4%				
Baseline + Alternative 3	—	—	—	—	—	—	12,982	3.8%				
Baseline + Alternative 4	—	—	—	—	—	—	12,521	0.1%				

Factor for doubling the percentage increase: 2

**Phased Release of Moorings for Alternative 1**

Year	2,116			new boat ramps	new slips	new lifts	new buoys	additional engine hours (peak day)	Total additional engine hours for yr 5, 10, 15, and 20 (peak day)	Existing+Additional		Percent Increase
	released/yr	total	% /yr							Existing:	Engine Hours on Peak Day	
0											12,512	
1	317	317	0.15		65	45	207	181				
2	270	587					270	135				
3	229	817					229	115				
4	195	1011					195	97				
5	166	1177		1			166	334	861.6		13,374	6.9%
6	141	1318					141	70				
7	120	1438					120	60				
8	102	1539					102	51				
9	86	1626					86	43				
10	74	1699					74	37	1122.7		13,635	9.0%
15	208	1908		1			208	355	1477.9		13,990	11.8%
20	208	2116					208	104	1582.0		14,094	12.6%

Source: TRPA and Joint Fact Finding Committee, August 2018



## On-Road Motor Vehicle Emissions

### On-Road Vehicle Activity Levels at Buildout (2040)

	Peak Day Activity			Annual Activity		
	VMT <i>mile/day</i>	Trips <i>trips/day</i>	Veh Involved <i>veh-days/day</i>	VMT <i>mile/year</i>	Trips <i>trips/year</i>	Veh Involved <i>veh-days/year</i>
Alternative 1	11,368	632	316	373,841	20,769	10,385
Alternative 2	49,007	2,723	1,362	1,662,124	92,340	46,170
Alternative 3	7,613	423	212	299,771	16,654	8,327
Alternative 4	0	0	0	0	0	0

#### Notes/Sources

- 1 On-road vehicle activity was determined by the traffic analysis.
- 2 The number of trips and VMT for Alternative 4 is zero
- 3 The estimates of VMT only include travel in the Tahoe Basin (both the California and Nevada sides). Some trips may include additional travel outside of the Lake Tahoe Basin; however, there is no reliable method for estimating this amount of travel.
- 4 It is conservatively assumed there is one vehicle-day associated for every two trips: 2

### Composite Emission Factors for On-Road Vehicles

<u>year</u>	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Source</u>
2024	<i>g/mile</i>	0.1455	1.5983	0.1487	326.2268	0.0164	0.0064	wksh On-Rd Comp Emfacs 2024
2029	<i>g/mile</i>	0.1074	1.1047	0.0893	271.4966	0.0111	0.0054	wksh On-Rd Comp Emfacs 2029
2034	<i>g/mile</i>	0.0735	0.8480	0.0599	238.5398	0.0079	0.0045	wksh On-Rd Comp Emfacs 2034
2040	<i>g/mile</i>	0.0272	0.4073	0.0402	213.7683	0.0463	0.0189	wksh On-Rd Comp Emfacs 2040

Source: wksh On-Rd Comp Emfacs 2017

	<u>value</u>	<u>units</u>	<u>source</u>
mass conversion rate	453.59	g/lb	wksh: Conversion Rates
mass conversion rate	907,185	g/ton	wksh: Conversion Rates
mass conversion rate	1,000,000	g/MT	wksh: Conversion Rates

### Peak-Day Emissions from On-Road Motor Vehicle Activity, 2040

	<u>units</u>	<u>ROG</u> lb/day	<u>CO</u> lb/day	<u>NOx</u> lb/day	<u>CO2</u> lb/day	<u>PM10</u> lb/day	<u>PM2.5</u> lb/day	<u>Source</u>
Alternative 1								
in 2024		3.6	40.1	3.7	8,176	0.4	0.2	See Note 1
in 2029		2.7	27.7	2.2	6,804	0.3	0.1	See Note 1
in 2034		1.8	21.3	1.5	5,978	0.2	0.1	See Note 1
in 2040		0.7	10.2	1.0	5,357	1.2	0.5	See Note 1
Alternative 2		2.9	44.0	4.3	23,096	5.0	2.0	
Alternative 3		0.5	6.8	0.7	3,588	0.8	0.3	
Alternative 4		0.0	0.0	0.0	0	0.0	0.0	

Source: calculation, and conversion calculation for totals

- 1 The emission estimates for years 2024, 2029, 2034, and buildout (2040) assume that all the new vehicle trips associated with all the new moorings and boat ramps would occur.

### Annual Emissions from On-Road Motor Vehicle Activity, 2040

	<u>units</u>	<u>ROG</u> ton/year	<u>CO</u> ton/year	<u>NOx</u> ton/year	<u>CO2</u> MT/year	<u>PM10</u> ton/year	<u>PM2.5</u> ton/year
Alternative 1		0.001	0.009	0.001	4.4	0.001	0.0004
Alternative 2		0.003	0.041	0.004	19.7	0.005	0.002
Alternative 3		0.0005	0.007	0.001	3.6	0.001	0.0003
Alternative 4		0.000	0.000	0.000	0.0	0.000	0.000

**On-Road Mobile-Source Emission Rates, Lake Tahoe Air Basin, 2017, Annual**

Vehicle Model Year: Aggregated

Speed: Aggregated

Fleet: Heavy trucks are not included. Only passenger vehicles and typically sized trucks used for towing are included.

**EMFAC Output**

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/trip</i>	<i>n/a</i>	<i>#</i>	<i>miles/day</i>	<i>trips/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
LDA	GAS	8,935	372,838	55,160	0.0318	0	0.353171108	0.230258109	0.514336101	0.125662844	0.219636582	1.291122333	0	4.363466671	0.113910881
LDA	DSL	105	4,288	625	0.0472	0	0	0	0	0	0	0.439112971	0	0	0.375150477
LDA	ELEC	60	3,879	392	0.0000	0	0	0.004883985	0	0.00127348	0.006411651	0	0	0	0
LDT1	GAS	1,724	46,629	9,860	0.1189	0	0.979415379	0.604338592	2.588927553	0.334944841	0.620418192	4.565728647	0	12.94182385	0.351848518
LDT1	DSL	9	185	49	0.1566	0	0	0	0	0	0	1.061633991	0	0	1.515513989
LDT1	ELEC	0	7	1	0.0000	0	0	0.004883985	0	0.001407833	0.006970088	0	0	0	0
LDT2	GAS	6,396	231,756	39,368	0.0403	0	0.462177743	0.256533063	1.036879283	0.141709528	0.244389797	1.787598832	0	6.079700097	0.236992046
LDT2	DSL	9	429	59	0.0296	0	0	0	0	0	0	0.253098339	0	0	0.161218747
LHDT1	GAS	798	25,318	11,892	0.2368	0.366328368	0.832839354	0.224828126	2.364162651	0.017134218	0.041615326	5.841820536	3.088080379	9.78046243	0.80102933
LHDT1	DSL	707	25,492	8,887	0.2475	0.109759705	0	0	0	0	0	1.18997743	0.909745076	0	5.373113546
MDV	GAS	5,253	151,853	31,899	0.0861	0	0.848753243	0.305563938	1.171629401	0.170517079	0.282977059	3.095381824	0	9.817831107	0.444189451
MDV	DSL	41	1,679	249	0.0296	0	0	0	0	0	0	0.354709501	0	0	0.130438166

Source: wksht EMFAC Output 2017

Totals: 24,037 864,353 158,440

**Composite Emission Factors (for all vehicle types)**

ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
0.0606	0.0154	0.5321	0.2599	1.0111	0.1463	0.2544	2.0358	0.1293	6.5458	0.3941

Source: calculations of weighted averages based on VMT/day, trips/day, or vehicle population

**Composite Emission Factors by Activity**

	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Crosscheck</u>
Combined per-VMT emissions	<i>g/mile</i>	0.0606	2.0358	0.3941	421.3050	0.0514	0.0227	522.5941
Combined per-trip emissions	<i>g/trip</i>	1.8032	6.5458	0.5632	81.1561	0.0037	0.0034	522.5941
Combined per-vehicle emissions	<i>g/vehicle/day</i>	0.4161	0.1293	0.0771	8.0249	0.0008	0.0008	100% Crosscheck Okay

	<u>value</u>	<u>units</u>	<u>source</u>
average trip length	18.0	miles/trip	traffic analysis
trips/vehicle-day	2.0	trips/veh-day	assumption

**Composite Emission Factors by VMT**

<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>
<i>g/mile</i>	0.1724	2.4030	0.4276	426.0366	0.0517	0.0229

NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/mile	g/mile	g/veh/day	g/trip	g/mile	g/mile
0	0.240181168	313.7298491	0	68.43448319	0.002418379	0	0.003720246	0.008000002	0.036750011	0.002225493	0	0.003429893	0.002000001	0.015750005
0	0	307.1698906	0	0	0.028081844	0	0	0.008000002	0.036750011	0.026867036	0	0	0.002000001	0.015750005
0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0	0	0.002000001	0.015750005
0	0.50632854	382.4119858	0	82.67965401	0.005248641	0	0.00828378	0.008000002	0.036750011	0.004835478	0	0.007651451	0.002000001	0.015750005
0	0	417.0373874	0	0	0.116842267	0	0	0.008000002	0.036750011	0.111787722	0	0	0.002000001	0.015750005
0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0	0	0.002000001	0.015750005
0	0.48213137	442.5901878	0	94.86546905	0.002259321	0	0.003125777	0.008000002	0.036750011	0.002078156	0	0.002877436	0.002000001	0.015750005
0	0	405.2302925	0	0	0.011717307	0	0	0.008000002	0.036750011	0.011210421	0	0	0.002000001	0.015750005
0.030549792	2.252852235	854.9339484	116.3298466	55.32392233	0.004567481	0	0.002954897	0.008000002	0.076440022	0.004202226	0	0.002721879	0.002000001	0.032760009
2.589759138	0	592.0324304	141.5938488	0	0.050569854	0.028549406	0	0.012000003	0.076440022	0.048382224	0.027314371	0	0.003000001	0.032760009
0	0.790892706	576.9103194	0	121.5026568	0.002716839	0	0.004195028	0.008000002	0.036750011	0.002500694	0	0.003865625	0.002000001	0.015750005
0	0	518.3569959	0	0	0.015444068	0	0	0.008000002	0.036750011	0.014775965	0	0	0.002000001	0.015750005

NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/mile	g/mile	g/veh/day	g/trip	g/mile	g/mile
0.0771	0.5632	421.3050	8.0249	81.1561	0.0042	0.0008	0.0037	0.0081	0.0391	0.0040	0.0008	0.0034	0.0020	0.0167

EMFAC2014 (v1.0.7) Emission Rates

Region Type: Air Basin

Region: Lake Tahoe

Calendar Year: 2017

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNE	ROG_IDLEX	ROG_STRE	ROG_HOTS	ROG_RUNL	ROG_RESTI	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNL	TOG_RESTI	TOG_DIUR
Lake Tahoe	2017	HHDT	Aggregatec	Aggregatec	GAS	6.337695	673.4604	126.8046	1.138093	0	3.044436	0.116408	0.513289	0.009781	0.018349	1.658826	0	3.333025	0.116408	0.513289	0.009781	0.018349
Lake Tahoe	2017	HHDT	Aggregatec	Aggregatec	DSL	181.7022	20152.32	0	0.166868	3.006841	0	0	0	0	0	0.189966	3.423059	0	0	0	0	0
Lake Tahoe	2017	LDA	Aggregatec	Aggregatec	GAS	8935.03	372837.6	55159.62	0.031783	0	0.353171	0.230258	0.514336	0.125663	0.219637	0.04382	0	0.38636	0.230258	0.514336	0.125663	0.219637
Lake Tahoe	2017	LDA	Aggregatec	Aggregatec	DSL	104.7788	4288.205	625.3244	0.047185	0	0	0	0	0	0	0.053717	0	0	0	0	0	0
Lake Tahoe	2017	LDA	Aggregatec	Aggregatec	ELEC	60.31106	3878.763	391.5045	0	0	0	0.004884	0	0.001273	0.006412	0	0	0	0.004884	0	0.001273	0.006412
Lake Tahoe	2017	LDT1	Aggregatec	Aggregatec	GAS	1723.549	46628.84	9859.765	0.118862	0	0.979415	0.604339	2.588928	0.334945	0.620418	0.161753	0	1.071128	0.604339	2.588928	0.334945	0.620418
Lake Tahoe	2017	LDT1	Aggregatec	Aggregatec	DSL	9.297967	184.7388	48.61327	0.156631	0	0	0	0	0	0	0.178314	0	0	0	0	0	0
Lake Tahoe	2017	LDT1	Aggregatec	Aggregatec	ELEC	0.143854	7.29612	0.903489	0	0	0	0.004884	0	0.001408	0.00697	0	0	0	0.004884	0	0.001408	0.00697
Lake Tahoe	2017	LDT2	Aggregatec	Aggregatec	GAS	6395.559	231755.8	39368.4	0.04026	0	0.462178	0.256533	1.036879	0.14171	0.24439	0.057727	0	0.505907	0.256533	1.036879	0.14171	0.24439
Lake Tahoe	2017	LDT2	Aggregatec	Aggregatec	DSL	9.456142	428.8747	59.08469	0.029616	0	0	0	0	0	0	0.033716	0	0	0	0	0	0
Lake Tahoe	2017	LHDT1	Aggregatec	Aggregatec	GAS	798.194	25318.07	11891.9	0.236842	0.366328	0.832839	0.224828	2.364163	0.017134	0.041615	0.340941	0.534059	0.911637	0.224828	2.364163	0.017134	0.041615
Lake Tahoe	2017	LHDT1	Aggregatec	Aggregatec	DSL	706.5285	25491.94	8887.239	0.24753	0.10976	0	0	0	0	0	0.281796	0.124954	0	0	0	0	0
Lake Tahoe	2017	LHDT2	Aggregatec	Aggregatec	GAS	70.56562	2623.544	1051.323	0.180439	0.37288	0.687539	0.170915	1.850871	0.014126	0.034229	0.263203	0.544095	0.752764	0.170915	1.850871	0.014126	0.034229
Lake Tahoe	2017	LHDT2	Aggregatec	Aggregatec	DSL	183.9437	7440.013	2313.78	0.198928	0.10976	0	0	0	0	0	0.226466	0.124954	0	0	0	0	0
Lake Tahoe	2017	MCY	Aggregatec	Aggregatec	GAS	1014.064	7365.376	2027.925	3.343116	0	3.647633	0.882014	4.07339	0.378446	0.841185	3.929214	0	3.962429	0.882014	4.07339	0.378446	0.841185
Lake Tahoe	2017	MDV	Aggregatec	Aggregatec	GAS	5253.486	151853.2	31898.77	0.086094	0	0.848753	0.305564	1.171629	0.170517	0.282977	0.120633	0	0.928905	0.305564	1.171629	0.170517	0.282977
Lake Tahoe	2017	MDV	Aggregatec	Aggregatec	DSL	40.62431	1679.293	249.3701	0.029586	0	0	0	0	0	0	0.033682	0	0	0	0	0	0
Lake Tahoe	2017	MH	Aggregatec	Aggregatec	GAS	203.5937	1685.875	20.36751	0.667411	0	1.362611	0.154295	4.453634	0.033232	0.096932	0.866525	0	1.487307	0.154295	4.453634	0.033232	0.096932
Lake Tahoe	2017	MH	Aggregatec	Aggregatec	DSL	49.08579	474.5728	4.908579	0.168215	0	0	0	0	0	0	0.191501	0	0	0	0	0	0
Lake Tahoe	2017	MHDT	Aggregatec	Aggregatec	GAS	53.26957	2478.714	1065.818	0.389013	0.774178	1.830951	0.174515	1.117009	0.016201	0.036479	0.553278	1.122573	2.00233	0.174515	1.117009	0.016201	0.036479
Lake Tahoe	2017	MHDT	Aggregatec	Aggregatec	DSL	309.5568	14525.27	0	0.251898	0.095467	0	0	0	0	0	0.286767	0.108682	0	0	0	0	0
Lake Tahoe	2017	OBUS	Aggregatec	Aggregatec	GAS	23.41876	1392.764	468.5626	0.28244	0.588186	1.250212	0.048271	0.670983	0.013647	0.034412	0.397873	0.851657	1.366063	0.048271	0.670983	0.013647	0.034412
Lake Tahoe	2017	OBUS	Aggregatec	Aggregatec	DSL	16.6943	1697.462	0	0.218444	1.600826	0	0	0	0	0	0.248682	1.822418	0	0	0	0	0
Lake Tahoe	2017	SBUS	Aggregatec	Aggregatec	GAS	3.443281	171.6206	13.77313	0.607268	8.036486	4.297506	0.274874	3.296407	0.017919	0.057483	0.886124	11.72682	4.705228	0.274874	3.296407	0.017919	0.057483
Lake Tahoe	2017	SBUS	Aggregatec	Aggregatec	DSL	16.88823	643.5279	0	0.195928	0.400806	0	0	0	0	0	0.223049	0.456287	0	0	0	0	0
Lake Tahoe	2017	UBUS	Aggregatec	Aggregatec	GAS	1.570819	255.4441	6.283276	5.673616	0	7.148466	0.59695	3.895702	0.025913	0.049597	8.266338	0	7.826211	0.59695	3.895702	0.025913	0.049597
Lake Tahoe	2017	UBUS	Aggregatec	Aggregatec	DSL	8.902789	1337.305	35.61115	1.317661	0	0	0	0	0	0	3.937149	0	0	0	0	0	0

CO_RUNEX	CO_IDLEX	CO_STREX	NOX_RUNE	NOX_IDLEX	NOX_STREX	CO2_RUNE	CO2_IDLEX	CO2_STREX	PM10_RUN	PM10_IDLEX	PM10_STREX	PM10_PMI	PM10_PMI	PM2_5_RUN	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PVI	PM2_5_PVI	SOX_RUNE	SOX_IDLEX	SOX_STREX
36.6101	0	56.84895	6.147946	0	6.920416	1865.256	0	147.87	0.000923	0	0.001493	0.02	0.06174	0.000849	0	0.001376	0.005	0.02646	0.019241	0	0.002469
0.683373	10.72256	0	5.569062	89.04985	0	1672.217	14957.15	0	0.045161	0.233455	0	0.035611	0.061072	0.043207	0.223356	0	0.008903	0.026174	0.015954	0.142698	0
1.291122	0	4.363467	0.113911	0	0.240181	313.7298	0	68.43448	0.002418	0	0.00372	0.008	0.03675	0.002225	0	0.00343	0.002	0.01575	0.003153	0	0.000763
0.439113	0	0	0.37515	0	0	307.1699	0	0	0.028082	0	0	0.008	0.03675	0.026867	0	0	0.002	0.01575	0.002932	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0
4.565729	0	12.94182	0.351849	0	0.506329	382.412	0	82.67965	0.005249	0	0.008284	0.008	0.03675	0.004835	0	0.007651	0.002	0.01575	0.003894	0	0.001061
1.061634	0	0	1.515514	0	0	417.0374	0	0	0.116842	0	0	0.008	0.03675	0.111788	0	0	0.002	0.01575	0.003981	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0
1.787599	0	6.0797	0.236992	0	0.482131	442.5902	0	94.86547	0.002259	0	0.003126	0.008	0.03675	0.002078	0	0.002877	0.002	0.01575	0.004448	0	0.001058
0.253098	0	0	0.161219	0	0	405.2303	0	0	0.011717	0	0	0.008	0.03675	0.01121	0	0	0.002	0.01575	0.003869	0	0
5.841821	3.08808	9.780462	0.801029	0.03055	2.252852	854.9339	116.3298	55.32392	0.004567	0	0.002955	0.008	0.07644	0.004202	0	0.002722	0.002	0.03276	0.008635	0.001225	0.000733
1.189977	0.909745	0	5.373114	2.589759	0	592.0324	141.5938	0	0.05057	0.028549	0	0.012	0.07644	0.048382	0.027314	0	0.003	0.03276	0.005652	0.001352	0
4.703894	3.135005	8.411258	0.537939	0.031139	1.86298	957.4885	135.1709	65.42506	0.003371	0	0.002402	0.008	0.08918	0.0031	0	0.002209	0.002	0.03822	0.009639	0.001414	0.000808
0.948805	0.909745	0	3.593752	2.582176	0	662.4718	226.5992	0	0.038177	0.027711	0	0.012	0.08918	0.036526	0.026512	0	0.003	0.03822	0.006324	0.002163	0
29.4923	0	13.75312	1.305291	0	0.365888	171.6161	0	51.14069	0.002609	0	0.007266	0.004	0.01176	0.002471	0	0.006914	0.001	0.00504	0.002291	0	0.000846
3.095382	0	9.817831	0.444189	0	0.790893	576.9103	0	121.5027	0.002717	0	0.004195	0.008	0.03675	0.002501	0	0.003866	0.002	0.01575	0.005811	0	0.001395
0.35471	0	0	0.130438	0	0	518.357	0	0	0.015444	0	0	0.008	0.03675	0.014776	0	0	0.002	0.01575	0.004949	0	0
27.4262	0	22.38151	1.424253	0	1.954183	1309.349	0	91.03887	0.005159	0	0.00465	0.012	0.13034	0.004784	0	0.00435	0.003	0.05586	0.013525	0	0.001305
0.64718	0	0	6.754573	0	0	1072.567	0	0	0.20181	0	0	0.016	0.13034	0.19308	0	0	0.004	0.05586	0.010239	0	0
10.46763	12.46573	32.70932	2.07742	0.064676	3.879376	1301.613	529.7898	122.8123	0.002458	0	0.004041	0.012	0.13034	0.002266	0	0.003755	0.003	0.05586	0.013173	0.005517	0.0018
0.687937	0.907747	0	4.199845	6.919342	0	1219.941	697.4648	0	0.109348	0.027611	0	0.012	0.13034	0.104618	0.026417	0	0.003	0.05586	0.011639	0.006654	0
7.573834	4.866309	20.92485	1.592827	0.048842	2.683701	1301.822	375.458	84.3191	0.001498	0	0.002539	0.012	0.13034	0.001383	0	0.002376	0.003	0.05586	0.013125	0.003849	0.001211
0.712301	7.107771	0	6.362114	58.97624	0	1666.948	6677.697	0	0.049755	0.096214	0	0.012	0.13034	0.047603	0.092051	0	0.003	0.05586	0.015903	0.063708	0
17.26033	67.29587	113.3547	3.16424	0.680591	5.099219	674.5143	2508.201	127.1327	0.004934	0	0.004879	0.008	0.7448	0.004537	0	0.004486	0.002	0.3192	0.007029	0.026435	0.00319
0.516565	3.131238	0	8.798037	50.10823	0	1309.571	3748.232	0	0.079347	0.115285	0	0.012	0.7448	0.075914	0.110298	0	0.003	0.3192	0.012494	0.03576	0
49.76031	0	157.3319	2.771925	0	4.730913	1702.003	0	309.1915	0.007665	0	0.009172	0.012	0.13034	0.007052	0	0.008437	0.003	0.05586	0.018011	0	0.005792
12.07291	0	0	23.60308	0	0	2365.997	0	0	0.388783	0	0	0.012	0.84182	0.371965	0	0	0.003	0.36078	0.016875	0	0

**On-Road Mobile-Source Emission Rates, Lake Tahoe Air Basin, 2024, Annual**

Vehicle Model Year: Aggregated

Speed: Aggregated

Fleet: Heavy trucks are not included. Only passenger vehicles and typically sized trucks used for towing are included.

**EMFAC Output**

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/trip</i>	<i>n/a</i>	<i>#</i>	<i>miles/day</i>	<i>trips/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
LDA	GAS	10,431	438,332	48,553	0.0156	0	0.34457519	0.125353722	0.259364456	0.072426112	0.116519545	0.891864754	0	2.972125357	0.061560141
LDA	DSL	135	5,647	627	0.0235	0	0	0	0	0	0	0.333790347	0	0	0.134892518
LDA	ELEC	257	13,102	1,280	0.0000	0	0	0.004888026	0	0.001293678	0.006495598	0	0	0	0
LDT1	GAS	1,867	65,926	8,106	0.0357	0	0.68156273	0.313805005	1.351033897	0.183833957	0.316678307	1.624686495	0	3.299388144	0.147922301
LDT1	DSL	1	22	5	0.1367	0	0	0	0	0	0	0.953481763	0	0	1.270179396
LDT1	ELEC	11	584	55	0.0000	0	0	0.004888026	0	0.001305907	0.006546426	0	0	0	0
LDT2	GAS	7,278	265,641	32,106	0.0287	0	0.646456907	0.234471553	0.893002746	0.144804156	0.220785675	1.368347118	0	4.018960511	0.150477114
LDT2	DSL	50	2,200	235	0.0228	0	0	0	0	0	0	0.232316546	0	0	0.072576755
LDT2	ELEC	56	2,051	278	0.0000	0	0	0.004888026	0	0.001303641	0.006537008	0	0	0	0
LHDT1	GAS	726	23,530	10,812	0.1580	0.451287305	0.193882618	0.231232243	2.544335048	0.017983561	0.040703516	3.992313345	3.701060165	2.708896912	0.49957293
MCY	GAS	1,042	7,114	2,084	2.9711	0	3.007241821	0.809154176	2.847207477	0.379167408	0.860571901	24.85579629	0	12.57864609	1.285251155
MDV	GAS	4,663	156,349	20,303	0.0339	0	0.794245266	0.255283028	0.896058866	0.161435511	0.236280649	1.475135385	0	4.875202317	0.166613399

Source: wksht EMFAC Output 2017

Totals: 26,517 980,499 124,444

**Composite Emission Factors (for all vehicle types)**

ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
0.0481	0.0124	0.5424	0.2052	0.8345	0.1250	0.2053	1.3925	0.1013	3.6528	0.1271

Source: calculations of weighted averages based on VMT/day, trips/day, or vehicle population

**Composite Emission Factors by Activity**

	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Crosscheck</u>
Combined per-VMT emissions	<i>g/mile</i>	0.0481	1.3925	0.1271	322.5731	0.0107	0.0040	397.8218
Combined per-trip emissions	<i>g/trip</i>	1.5821	3.6528	0.3883	64.0858	0.1005	0.0398	397.8218
Combined per-vehicle emissions	<i>g/vehicle/day</i>	0.3426	0.1013	0.0011	3.3610	0.0032	0.0078	100% Crosscheck Okay

	<u>value</u>	<u>units</u>	<u>source</u>
average trip length	18.0	miles/trip	traffic analysis
trips/vehicle-day	2.0	trips/veh-day	assumption

**Composite Emission Factors by VMT**

<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>
<i>g/mile</i>	0.1455	1.5983	0.1487	326.2268	0.0164	0.0064

NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile	PM2_5_RUNEX g/mile	PM2_5_IDLEX g/veh/day	PM2_5_STREX g/trip	PM2_5_PMTW g/mile	PM2_5_PMBW g/mile
0	0.228016031	252.6922944	0	54.56399604	0.003668513	0	0.072041038	0.001845327	0	0.002076135	0.008000002	0.036750011	0.00169671	0
0	0	209.3668211	0	0	0.001089612	0	0	0.010871614	0	0	0.008000002	0.036750011	0.010401312	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0	0.394780315	313.288113	0	68.84937671	0.007675205	0	0.122931959	0.002440102	0	0.003017218	0.008000002	0.036750011	0.002243636	0
0	0	494.232013	0	0	0.00635069	0	0	0.129737033	0	0	0.008000002	0.036750011	0.124124666	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0	0.475863133	348.5539014	0	77.36091369	0.006400383	0	0.122030897	0.001845379	0	0.002142557	0.008000002	0.036750011	0.001696763	0
0	0	297.0032015	0	0	0.001057875	0	0	0.006326978	0	0	0.008000002	0.036750011	0.006053275	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0.039567905	0.609696091	1026.553271	122.8054105	20.48343399	0.029351843	0.116396185	0.035852091	0.003531683	0	0.000672399	0.008000002	0.076440022	0.003247252	0
0	0.309852276	223.3462645	0	73.1316972	0.412192352	0	0.37334221	0.002235371	0	0.003497668	0.004000001	0.011760003	0.002098121	0
0	0.568033582	413.7213873	0	94.08052983	0.007375669	0	0.14401926	0.001904685	0	0.002421048	0.008000002	0.036750011	0.001751364	0

NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile	PM2_5_RUNEX g/mile	PM2_5_IDLEX g/veh/day	PM2_5_STREX g/trip	PM2_5_PMTW g/mile	PM2_5_PMBW g/mile
0.0011	0.3883	322.5731	3.3610	64.0858	0.0088	0.0032	0.1005	0.0020	0.0000	0.0021	0.0078	0.0398	0.0018	0.0000



EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air Basin

Region: LAKE TAHOE

Calendar Year: 2024

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNE	ROG_IDLE	ROG_STRE	ROG_HOT	ROG_RUNE	ROG_REST	ROG_DIUR	TOG_RUNE
LAKE TAHC	2024	HHDT	Aggregate	Aggregate	GAS	0.040454	10.01573	0.809399	0.233727	0	0.00389	0.010932	0.041721	0.001473	0.002964	0.341055
LAKE TAHC	2024	HHDT	Aggregate	Aggregate	DSL	268.0788	26115.48	2087.125	0.032214	4.991345	0	0	0	0	0	0.036673
LAKE TAHC	2024	LDA	Aggregate	Aggregate	GAS	10431.46	438332.3	48552.92	0.015565	0	0.344575	0.125354	0.259364	0.072426	0.11652	0.022713
LAKE TAHC	2024	LDA	Aggregate	Aggregate	DSL	135.1466	5647.143	626.6344	0.023459	0	0	0	0	0	0	0.026706
LAKE TAHC	2024	LDA	Aggregate	Aggregate	ELEC	256.8723	13102.05	1279.977	0	0	0	0.004888	0	0.001294	0.006496	0
LAKE TAHC	2024	LDT1	Aggregate	Aggregate	GAS	1866.714	65926.34	8106.064	0.035657	0	0.681563	0.313805	1.351034	0.183834	0.316678	0.05202
LAKE TAHC	2024	LDT1	Aggregate	Aggregate	DSL	1.491283	22.18601	4.844718	0.136727	0	0	0	0	0	0	0.155654
LAKE TAHC	2024	LDT1	Aggregate	Aggregate	ELEC	10.81417	584.1509	54.87818	0	0	0	0.004888	0	0.001306	0.006546	0
LAKE TAHC	2024	LDT2	Aggregate	Aggregate	GAS	7277.637	265641.2	32106.11	0.028743	0	0.646457	0.234472	0.893003	0.144804	0.220786	0.04194
LAKE TAHC	2024	LDT2	Aggregate	Aggregate	DSL	49.75486	2200.276	235.3415	0.022775	0	0	0	0	0	0	0.025928
LAKE TAHC	2024	LDT2	Aggregate	Aggregate	ELEC	55.66298	2050.58	278.1051	0	0	0	0.004888	0	0.001304	0.006537	0
LAKE TAHC	2024	LHDT1	Aggregate	Aggregate	GAS	725.7214	23529.98	10812.17	0.158018	0.451287	0.193883	0.231232	2.544335	0.017984	0.040704	0.230579
LAKE TAHC	2024	LHDT1	Aggregate	Aggregate	DSL	671.3784	23420.1	8445.096	0.208829	0.10976	0	0	0	0	0	0.237737
LAKE TAHC	2024	LHDT2	Aggregate	Aggregate	GAS	76.72246	2695.282	1143.05	0.080169	0.452396	0.161839	0.159804	1.444627	0.013171	0.028533	0.116982
LAKE TAHC	2024	LHDT2	Aggregate	Aggregate	DSL	216.2578	8086.365	2720.251	0.171985	0.10976	0	0	0	0	0	0.195794
LAKE TAHC	2024	MCY	Aggregate	Aggregate	GAS	1042.069	7114.338	2084.138	2.971148	0	3.007242	0.809154	2.847207	0.379167	0.860572	3.597787
LAKE TAHC	2024	MDV	Aggregate	Aggregate	GAS	4663.335	156348.6	20303.08	0.03385	0	0.794245	0.255283	0.896059	0.161436	0.236281	0.049346
LAKE TAHC	2024	MDV	Aggregate	Aggregate	DSL	129.7124	5352.228	601.8801	0.019324	0	0	0	0	0	0	0.021999
LAKE TAHC	2024	MDV	Aggregate	Aggregate	ELEC	29.76296	1147.452	150.9495	0	0	0	0.004888	0	0.001298	0.006513	0
LAKE TAHC	2024	MH	Aggregate	Aggregate	GAS	122.7348	1040.225	12.27839	0.13496	0	0.175969	0.11593	3.698113	0.024167	0.067256	0.196933
LAKE TAHC	2024	MH	Aggregate	Aggregate	DSL	55.18996	484.5108	5.518996	0.147221	0	0	0	0	0	0	0.167602
LAKE TAHC	2024	MHDT	Aggregate	Aggregate	GAS	46.68622	2322.476	934.0978	0.138381	1.001733	0.302305	0.14237	0.915689	0.011473	0.023731	0.201925
LAKE TAHC	2024	MHDT	Aggregate	Aggregate	DSL	355.8836	18023.25	2539.976	0.017042	0.118905	0	0	0	0	0	0.019401
LAKE TAHC	2024	OBUS	Aggregate	Aggregate	GAS	16.09087	765.8566	321.9462	0.131507	0.740254	0.21159	0.047818	0.692601	0.013347	0.030218	0.191895
LAKE TAHC	2024	OBUS	Aggregate	Aggregate	DSL	24.68683	1930.585	261.3923	0.016389	1.44195	0	0	0	0	0	0.018657
LAKE TAHC	2024	SBUS	Aggregate	Aggregate	GAS	1.853008	97.1266	7.412034	0.029783	10.62762	0.398371	0.034541	0.254605	0.003245	0.007704	0.043459
LAKE TAHC	2024	SBUS	Aggregate	Aggregate	DSL	29.72872	930.3538	343.0653	0.123695	0.26848	0	0	0	0	0	0.140817

TOG_IDLE	TOG_STRE	TOG_HOT	STOG_RUNI	TOG_RESTI	TOG_DIUR	CO_RUNEX	CO_IDLE	CO_STREX	NOx_RUNE	NOx_IDLE	NOx_STRE	CO2_RUNE	CO2_IDLE	CO2_STRE	PM10_RUN	PM10_IDLI
0	0.004259	0.010932	0.041721	0.001473	0.002964	23.3422	0	8.690747	2.71396	0	0.015965	1804.358	0	46.89571	0.055132	0
5.682266	0	0	0	0	0	0.27965	71.82537	0	3.162515	64.23204	2.779136	1404.727	11951.7	0	0.001496	0.231835
0	0.377266	0.125354	0.259364	0.072426	0.11652	0.891865	0	2.972125	0.06156	0	0.228016	252.6923	0	54.564	0.003669	0
0	0	0	0	0	0	0.33379	0	0	0.134893	0	0	209.3668	0	0	0.00109	0
0	0	0.004888	0	0.001294	0.006496	0	0	0	0	0	0	0	0	0	0	0
0	0.746224	0.313805	1.351034	0.183834	0.316678	1.624686	0	3.299388	0.147922	0	0.39478	313.2881	0	68.84938	0.007675	0
0	0	0	0	0	0	0.953482	0	0	1.270179	0	0	494.232	0	0	0.006351	0
0	0	0.004888	0	0.001306	0.006546	0	0	0	0	0	0	0	0	0	0	0
0	0.707789	0.234472	0.893003	0.144804	0.220786	1.368347	0	4.018961	0.150477	0	0.475863	348.5539	0	77.36091	0.0064	0
0	0	0	0	0	0	0.232317	0	0	0.072577	0	0	297.0032	0	0	0.001058	0
0	0	0.004888	0	0.001304	0.006537	0	0	0	0	0	0	0	0	0	0	0
0.658517	0.212277	0.231232	2.544335	0.017984	0.040704	3.992313	3.70106	2.708897	0.499573	0.039568	0.609696	1026.553	122.8054	20.48343	0.029352	0.116396
0.124954	0	0	0	0	0	1.014171	0.909745	0	3.336142	2.394777	0	572.0751	139.1762	0	0.0097	0.005098
0.660135	0.177193	0.159804	1.444627	0.013171	0.028533	2.032771	3.743364	2.221827	0.320745	0.039519	0.565166	1167.42	141.1757	22.44072	0.01553	0.122786
0.124954	0	0	0	0	0	0.842097	0.909745	0	1.990528	2.347452	0	636.9188	221.4873	0	0.007988	0.005098
0	3.269378	0.809154	2.847207	0.379167	0.860572	24.8558	0	12.57865	1.285251	0	0.309852	223.3463	0	73.1317	0.412192	0
0	0.869593	0.255283	0.896059	0.161436	0.236281	1.475135	0	4.875202	0.166613	0	0.568034	413.7214	0	94.08053	0.007376	0
0	0	0	0	0	0	0.348173	0	0	0.085607	0	0	387.1095	0	0	0.000898	0
0	0	0.004888	0	0.001298	0.006513	0	0	0	0	0	0	0	0	0	0	0
0	0.192664	0.11593	3.698113	0.024167	0.067256	4.68305	0	4.353742	0.762342	0	0.375386	1814.419	0	28.58445	0.028313	0
0	0	0	0	0	0	0.549711	0	0	5.527215	0	0	1050.738	0	0	0.006838	0
1.461727	0.330986	0.14237	0.915689	0.011473	0.023731	3.346678	14.98832	7.60754	0.999446	0.087738	0.479162	1741.864	540.7316	44.1093	0.027428	0.243768
0.135364	0	0	0	0	0	0.139807	3.9627	0	1.872495	9.45288	2.209016	1032.021	1323.004	0	0.000792	0.005523
1.080176	0.231664	0.047818	0.692601	0.013347	0.030218	3.205338	5.738245	5.156798	0.899138	0.064654	0.396693	1802.839	383.0512	29.8751	0.026133	0.187295
1.641551	0	0	0	0	0	0.168299	22.186	0	2.163788	18.50987	2.194814	1346.19	4081.767	0	0.000761	0.066975
15.5078	0.436166	0.034541	0.254605	0.003245	0.007704	0.590076	82.15648	13.61495	0.26746	0.925579	0.56169	810.2519	2428.835	54.63633	0.006325	2.496617
0.305645	0	0	0	0	0	0.310825	5.442933	0	9.486165	48.75474	0.698346	1140.157	3628.519	0	0.005745	0.01247

PM10_STR	PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_ST	PM2_5_PN	PM2_5_PN	SOx_RUNE	SOx_IDLEX	SOx_STREX							
0.000749	0.001146	0	0.000431	0.02	0.06174	0.001054	0	0.000397	0.005	0.02646	0.017856	0	0.000464	0.122645	0	0.000765	
0	0.027655	0.046015	0	0.035836	0.061458	0.026459	0.044025	0	0.008959	0.026339	0.013271	0.112914	0	0.220803	1.878641	0	
0.072041	0.001845	0	0.002076	0.008	0.03675	0.001697	0	0.001909	0.002	0.01575	0.002501	0	0.00054	0.005916	0	0.028601	
0	0.010872	0	0	0.008	0.03675	0.010401	0	0	0.002	0.01575	0.001979	0	0	0.03291	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.122932	0.00244	0	0.003017	0.008	0.03675	0.002244	0	0.002774	0.002	0.01575	0.0031	0	0.000681	0.010441	0	0.036124	
0	0.129737	0	0	0.008	0.03675	0.124125	0	0	0.002	0.01575	0.004672	0	0	0.077686	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.122031	0.001845	0	0.002143	0.008	0.03675	0.001697	0	0.00197	0.002	0.01575	0.003449	0	0.000766	0.010323	0	0.042259	
0	0.006327	0	0	0.008	0.03675	0.006053	0	0	0.002	0.01575	0.002808	0	0	0.046685	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.035852	0.003532	0	0.000672	0.008	0.07644	0.003247	0	0.000618	0.002	0.03276	0.010159	0.001215	0.000203	0.026815	0.00281	0.042454	
0	0.037472	0.027347	0	0.012	0.07644	0.035851	0.026164	0	0.003	0.03276	0.005408	0.001316	0	0.089922	0.021877	0	
0.03115	0.002432	0	0.000453	0.008	0.08918	0.002236	0	0.000417	0.002	0.03822	0.011553	0.001397	0.000222	0.019487	0.003024	0.042168	
0	0.029793	0.027595	0	0.012	0.08918	0.028504	0.026401	0	0.003	0.03822	0.006021	0.002094	0	0.100115	0.034815	0	
0.373342	0.002235	0	0.003498	0.004	0.01176	0.002098	0	0.003309	0.001	0.00504	0.00221	0	0.000724	0.071445	0	0.016898	
0.144019	0.001905	0	0.002421	0.008	0.03675	0.001751	0	0.002226	0.002	0.01575	0.004094	0	0.000931	0.01151	0	0.046037	
0	0.007158	0	0	0.008	0.03675	0.006849	0	0	0.002	0.01575	0.00366	0	0	0.060848	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.038892	0.002299	0	0.000462	0.012	0.13034	0.002114	0	0.000425	0.003	0.05586	0.017955	0	0.000283	0.040878	0	0.034327	
0	0.154168	0	0	0.016	0.13034	0.147499	0	0	0.004	0.05586	0.009933	0	0	0.165161	0	0	
0.051893	0.001648	0	0.000577	0.012	0.13034	0.001515	0	0.000531	0.003	0.05586	0.017237	0.005351	0.000436	0.042805	0.006196	0.029751	
0	0.009305	0.008583	0	0.012	0.13034	0.008903	0.008211	0	0.003	0.05586	0.00975	0.012499	0	0.162219	0.207958	0	
0.038492	0.001109	0	0.000305	0.012	0.13034	0.00102	0	0.000281	0.003	0.05586	0.017841	0.003791	0.000296	0.040252	0.00476	0.027062	
0	0.018382	0.006462	0	0.012	0.13034	0.017587	0.006182	0	0.003	0.05586	0.012718	0.038563	0	0.211602	0.641597	0	
0.072032	0.001497	0	0.000659	0.008	0.7448	0.001377	0	0.000605	0.002	0.3192	0.008018	0.024035	0.000541	0.017851	0.093411	0.05565	
0	0.050652	0.066441	0	0.012	0.7448	0.04846	0.063567	0	0.003	0.3192	0.010772	0.03428	0	0.179217	0.570353	0	

**On-Road Mobile-Source Emission Rates, Lake Tahoe Air Basin, 2029, Annual**

Vehicle Model Year: Aggregated

Speed: Aggregated

Fleet: Heavy trucks are not included. Only passenger vehicles and typically sized trucks used for towing are included.

**EMFAC Output**

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/trip</i>	<i>n/a</i>	<i>#</i>	<i>miles/day</i>	<i>trips/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
LDA	GAS	12,732	534,944	59,446	0.0079	0	0.213970609	0.085270341	0.205387287	0.04840159	0.075700446	0.627775946	0	2.464276299	0.037166513
LDA	DSL	160	6,730	749	0.0135	0	0	0	0	0	0	0.274705629	0	0	0.055269415
LDA	ELEC	528	26,292	2,583	0.0000	0	0	0.004888026	0	0.001281631	0.006445523	0	0	0	0
LDT1	GAS	1,769	64,108	7,745	0.0166	0	0.423293362	0.220386758	0.887582618	0.132150732	0.216299431	0.944422373	0	2.789529327	0.075491558
LDT1	DSL	0	11	2	0.0546	0	0	0	0	0	0	0.545882671	0	0	0.738514652
LDT1	ELEC	26	1,371	131	0.0000	0	0	0.004888026	0	0.001305998	0.006546804	0	0	0	0
LDT2	GAS	6,712	238,722	29,298	0.0174	0	0.481178334	0.212164481	0.802072605	0.13978956	0.205185972	0.981096703	0	3.559114713	0.092058084
LDT2	DSL	54	2,244	248	0.0219	0	0	0	0	0	0	0.236457075	0	0	0.05136784
LDT2	ELEC	115	3,998	563	0.0000	0	0	0.004888026	0	0.001296964	0.006509256	0	0	0	0
LHDT1	GAS	598	19,324	8,906	0.1048	0.419656864	0.168622213	0.251306444	3.297242998	0.017744026	0.039228524	2.667250887	3.70895874	2.602097024	0.386397122
MCY	GAS	981	6,516	1,962	2.8089	0	2.859820119	0.741303859	2.018487462	0.361656806	0.850230806	22.83338861	0	12.88385704	1.273855635
MDV	GAS	4,153	140,191	17,963	0.0198	0	0.575953661	0.236054874	0.851718698	0.160613955	0.230597699	1.014512	0	4.013235343	0.10189079

Source: wksht EMFAC Output 2017

Totals: 27,828 1,044,452 129,596

**Composite Emission Factors (for all vehicle types)**

ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>
0.0313	0.0090	0.3669	0.1616	0.7038	0.1014	0.1633	0.9340	0.0797	3.0318	0.0740

Source: calculations of weighted averages based on VMT/day, trips/day, or vehicle population

**Composite Emission Factors by Activity**

	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Crosscheck</u>
Combined per-VMT emissions	<i>g/mile</i>	0.0313	0.9340	0.0740	268.3924	0.0071	0.0030	331.6107
Combined per-trip emissions	<i>g/trip</i>	1.2323	3.0318	0.2766	54.5973	0.0703	0.0391	331.6107
Combined per-vehicle emissions	<i>g/vehicle/day</i>	0.2737	0.0797	0.0008	2.5572	0.0024	0.0079	100% Crosscheck Okay

	<u>value</u>	<u>units</u>	<u>source</u>
average trip length	18.0	miles/trip	traffic analysis
trips/vehicle-day	2.0	trips/veh-day	assumption

**Composite Emission Factors by VMT**

<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>
<i>g/mile</i>	0.1074	1.1047	0.0893	271.4966	0.0111	0.0054

NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0	0.170430074	222.9539122	0	47.45829664	0.002012833	0	0.048283248	0.001385815	0	0.001592476	0.008000002	0.036750011	0.001274206	0
0	0	183.9861291	0	0	0.000628949	0	0	0.004535953	0	0	0.008000002	0.036750011	0.00433973	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0	0.279812729	275.7810596	0	60.6325528	0.003769789	0	0.080790045	0.001665726	0	0.002104135	0.008000002	0.036750011	0.001531574	0
0	0	436.2282818	0	0	0.00253563	0	0	0.029065952	0	0	0.008000002	0.036750011	0.027808571	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0	0.360754894	300.0175159	0	67.9815594	0.004008197	0	0.093084366	0.001505003	0	0.001816657	0.008000002	0.036750011	0.001383794	0
0	0	264.1220253	0	0	0.001017493	0	0	0.005535585	0	0	0.008000002	0.036750011	0.005296118	0
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0
0.036786406	0.562532174	972.3273625	119.0443776	19.94013474	0.020159009	0.110637318	0.030953032	0.003284534	0	0.00062502	0.008000002	0.076440022	0.003020007	0
0	0.307392988	222.0811588	0	71.61454249	0.397497863	0	0.35705138	0.00227367	0	0.002860669	0.004000001	0.011760003	0.002126204	0
0	0.409821354	354.393531	0	82.11359844	0.004453234	0	0.106669891	0.001515058	0	0.002032201	0.008000002	0.036750011	0.00139304	0

NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0.0008	0.2766	268.3924	2.5572	54.5973	0.0056	0.0024	0.0703	0.0015	0.0000	0.0017	0.0079	0.0391	0.0014	0.0000

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air Basin

Region: LAKE TAHOE

Calendar Year: 2029

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNE	ROG_IDLE	ROG_STRE	ROG_HOT	ROG_RUNE	ROG_REST	ROG_DIUR	TOG_RUNE
LAKE TAHC	2029	HHDT	Aggregate	Aggregate	GAS	0.097771	18.94719	1.956208	0.280131	0	0.001722	0.027717	0.136258	0.003324	0.005905	0.408766
LAKE TAHC	2029	HHDT	Aggregate	Aggregate	DSL	273.9887	27276.61	2182.029	0.027402	5.154354	0	0	0	0	0	0.031195
LAKE TAHC	2029	LDA	Aggregate	Aggregate	GAS	12731.79	534944.2	59446.09	0.007893	0	0.213971	0.08527	0.205387	0.048402	0.0757	0.011517
LAKE TAHC	2029	LDA	Aggregate	Aggregate	DSL	160.3128	6729.858	748.9955	0.013541	0	0	0	0	0	0	0.015415
LAKE TAHC	2029	LDA	Aggregate	Aggregate	ELEC	527.8376	26292.39	2583.442	0	0	0	0.004888	0	0.001282	0.006446	0
LAKE TAHC	2029	LDT1	Aggregate	Aggregate	GAS	1769.084	64107.75	7744.825	0.016609	0	0.423293	0.220387	0.887583	0.132151	0.216299	0.024235
LAKE TAHC	2029	LDT1	Aggregate	Aggregate	DSL	0.391803	10.92669	1.596512	0.054591	0	0	0	0	0	0	0.062148
LAKE TAHC	2029	LDT1	Aggregate	Aggregate	ELEC	26.39966	1371.357	130.9117	0	0	0	0.004888	0	0.001306	0.006547	0
LAKE TAHC	2029	LDT2	Aggregate	Aggregate	GAS	6712.103	238722.1	29298.29	0.017441	0	0.481178	0.212164	0.802073	0.13979	0.205186	0.02545
LAKE TAHC	2029	LDT2	Aggregate	Aggregate	DSL	53.50207	2244.159	248.2733	0.021906	0	0	0	0	0	0	0.024939
LAKE TAHC	2029	LDT2	Aggregate	Aggregate	ELEC	114.825	3998.145	563.3323	0	0	0	0.004888	0	0.001297	0.006509	0
LAKE TAHC	2029	LHDT1	Aggregate	Aggregate	GAS	597.767	19323.58	8905.838	0.104838	0.419657	0.168622	0.251306	3.297243	0.017744	0.039229	0.15298
LAKE TAHC	2029	LHDT1	Aggregate	Aggregate	DSL	532.672	18192.74	6700.344	0.184822	0.10976	0	0	0	0	0	0.210408
LAKE TAHC	2029	LHDT2	Aggregate	Aggregate	GAS	62.16638	2227.629	926.1865	0.030302	0.416263	0.122848	0.136365	1.13563	0.011219	0.021955	0.044217
LAKE TAHC	2029	LHDT2	Aggregate	Aggregate	DSL	190.1895	6792.657	2392.345	0.161114	0.10976	0	0	0	0	0	0.183418
LAKE TAHC	2029	MCY	Aggregate	Aggregate	GAS	980.9613	6516.482	1961.923	2.80891	0	2.85982	0.741304	2.018487	0.361657	0.850231	3.451474
LAKE TAHC	2029	MDV	Aggregate	Aggregate	GAS	4153.117	140191.1	17962.53	0.019777	0	0.575954	0.236055	0.851719	0.160614	0.230598	0.028859
LAKE TAHC	2029	MDV	Aggregate	Aggregate	DSL	130.9912	5069.148	597.8838	0.014736	0	0	0	0	0	0	0.016776
LAKE TAHC	2029	MDV	Aggregate	Aggregate	ELEC	73.4994	2635.867	364.2156	0	0	0	0.004888	0	0.001295	0.006503	0
LAKE TAHC	2029	MH	Aggregate	Aggregate	GAS	82.96017	761.3324	8.299335	0.055338	0	0.157565	0.091952	2.426157	0.01933	0.049759	0.080748
LAKE TAHC	2029	MH	Aggregate	Aggregate	DSL	48.90063	414.8926	4.890063	0.138479	0	0	0	0	0	0	0.157649
LAKE TAHC	2029	MHDT	Aggregate	Aggregate	GAS	48.1287	2647.48	962.9591	0.05288	1.016436	0.244063	0.115321	0.6631	0.009244	0.017545	0.077163
LAKE TAHC	2029	MHDT	Aggregate	Aggregate	DSL	428.0005	20389.42	3166.728	0.013652	0.111101	0	0	0	0	0	0.015541
LAKE TAHC	2029	OBUS	Aggregate	Aggregate	GAS	13.16104	585.6078	263.326	0.074784	0.743558	0.206041	0.051706	0.78802	0.013124	0.028453	0.109125
LAKE TAHC	2029	OBUS	Aggregate	Aggregate	DSL	25.96095	1887.189	286.3394	0.017026	1.722781	0	0	0	0	0	0.019382
LAKE TAHC	2029	SBUS	Aggregate	Aggregate	GAS	2.848076	148.7278	11.3923	0.017433	10.64138	0.378481	0.039121	0.283778	0.003991	0.008539	0.025438
LAKE TAHC	2029	SBUS	Aggregate	Aggregate	DSL	24.99143	788.1445	288.3976	0.088894	0.253263	0	0	0	0	0	0.101199

TOG_IDLEX	TOG_STRE	TOG_HOT	STOG_RUNI	TOG_RESTI	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNE	NOx_IDLEX	NOx_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDL
0	0.001886	0.027717	0.136258	0.003324	0.005905	27.21602	0	6.082198	3.068168	0	0.007642	1718.154	0	41.4849	0.064417	0
5.86784	0	0	0	0	0	0.262576	75.21002	0	2.762931	64.39307	2.887015	1234.338	11281.01	0	0.001273	0.239406
0	0.234271	0.08527	0.205387	0.048402	0.0757	0.627776	0	2.464276	0.037167	0	0.17043	222.9539	0	47.4583	0.002013	0
0	0	0	0	0	0	0.274706	0	0	0.055269	0	0	183.9861	0	0	0.000629	0
0	0	0.004888	0	0.001282	0.006446	0	0	0	0	0	0	0	0	0	0	0
0	0.463453	0.220387	0.887583	0.132151	0.216299	0.944422	0	2.789529	0.075492	0	0.279813	275.7811	0	60.63255	0.00377	0
0	0	0	0	0	0	0.545883	0	0	0.738515	0	0	436.2283	0	0	0.002536	0
0	0	0.004888	0	0.001306	0.006547	0	0	0	0	0	0	0	0	0	0	0
0	0.52683	0.212164	0.802073	0.13979	0.205186	0.981097	0	3.559115	0.092058	0	0.360755	300.0175	0	67.98156	0.004008	0
0	0	0	0	0	0	0.236457	0	0	0.051368	0	0	264.122	0	0	0.001017	0
0	0	0.004888	0	0.001297	0.006509	0	0	0	0	0	0	0	0	0	0	0
0.612362	0.18462	0.251306	3.297243	0.017744	0.039229	2.667251	3.708959	2.602097	0.386397	0.036786	0.562532	972.3274	119.0444	19.94013	0.020159	0.110637
0.124954	0	0	0	0	0	0.912467	0.909745	0	2.357919	2.155532	0	540.3114	134.1414	0	0.008585	0.005098
0.60741	0.134503	0.136365	1.13563	0.011219	0.021955	0.695425	3.765123	1.880613	0.191452	0.036298	0.524089	1098.194	135.7305	21.34441	0.006641	0.116847
0.124954	0	0	0	0	0	0.809189	0.909745	0	1.444712	2.102709	0	602.9109	213.2663	0	0.007483	0.005098
0	3.110754	0.741304	2.018487	0.361657	0.850231	22.83339	0	12.88386	1.273856	0	0.307393	222.0812	0	71.61454	0.397498	0
0	0.630597	0.236055	0.851719	0.160614	0.230598	1.014512	0	4.013235	0.101891	0	0.409821	354.3935	0	82.1136	0.004453	0
0	0	0	0	0	0	0.317676	0	0	0.049312	0	0	342.011	0	0	0.000684	0
0	0	0.004888	0	0.001295	0.006503	0	0	0	0	0	0	0	0	0	0	0
0	0.172514	0.091952	2.426157	0.01933	0.049759	1.410047	0	3.656083	0.475566	0	0.418224	1692.98	0	26.58804	0.01327	0
0	0	0	0	0	0	0.506779	0	0	4.977813	0	0	1010.535	0	0	0.006432	0
1.483182	0.267218	0.115321	0.6631	0.009244	0.017545	1.211927	15.15933	5.831491	0.42298	0.08873	0.424837	1602.774	511.2252	39.29207	0.010985	0.262567
0.12648	0	0	0	0	0	0.132501	4.278294	0	1.745975	7.839978	2.269011	938.8337	1235.796	0	0.000634	0.00516
1.084999	0.225589	0.051706	0.78802	0.013124	0.028453	1.663626	5.757964	4.835026	0.609385	0.064869	0.40119	1668.537	369.4263	28.57249	0.015436	0.189871
1.961255	0	0	0	0	0	0.172991	26.2387	0	2.17847	21.66668	2.200978	1271.88	4480.599	0	0.000791	0.080019
15.52788	0.414389	0.039121	0.283778	0.003991	0.008539	0.335495	82.24007	12.59714	0.177456	0.926521	0.543882	763.5456	2300.193	51.14231	0.003871	2.506899
0.288321	0	0	0	0	0	0.251118	7.336954	0	6.566821	38.78972	1.178433	1056.322	3440.527	0	0.004129	0.011763

PM10_STR	PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_ST	PM2_5_PN	PM2_5_PN	SOx_RUNE	SOx_IDLEX	SOx_STREX							
0.000332	0.001153	0	0.000434	0.02	0.06174	0.00106	0	0.000399	0.005	0.02646	0.017003	0	0.000411	0.133435	0	0.000365	
0	0.024876	0.032856	0	0.035797	0.061392	0.0238	0.031435	0	0.008949	0.026311	0.011661	0.106577	0	0.194021	1.773217	0	
0.048283	0.001386	0	0.001592	0.008	0.03675	0.001274	0	0.001464	0.002	0.01575	0.002206	0	0.00047	0.0044	0	0.024161	
0	0.004536	0	0	0.008	0.03675	0.00434	0	0	0.002	0.01575	0.001739	0	0	0.02892	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.08079	0.001666	0	0.002104	0.008	0.03675	0.001532	0	0.001935	0.002	0.01575	0.002729	0	0.0006	0.006509	0	0.030103	
0	0.029066	0	0	0.008	0.03675	0.027809	0	0	0.002	0.01575	0.004124	0	0	0.068569	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.093084	0.001505	0	0.001817	0.008	0.03675	0.001384	0	0.00167	0.002	0.01575	0.002969	0	0.000673	0.007122	0	0.035044	
0	0.005536	0	0	0.008	0.03675	0.005296	0	0	0.002	0.01575	0.002497	0	0	0.041516	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.030953	0.003285	0	0.000625	0.008	0.07644	0.00302	0	0.000575	0.002	0.03276	0.009622	0.001178	0.000197	0.020748	0.002744	0.040298	
0	0.029942	0.026946	0	0.012	0.07644	0.028647	0.025781	0	0.003	0.03276	0.005108	0.001268	0	0.084929	0.021085	0	
0.024631	0.002075	0	0.000349	0.008	0.08918	0.001908	0	0.000321	0.002	0.03822	0.010868	0.001343	0.000211	0.012818	0.002963	0.040985	
0	0.027598	0.027849	0	0.012	0.08918	0.026404	0.026644	0	0.003	0.03822	0.0057	0.002016	0	0.094769	0.033522	0	
0.357051	0.002274	0	0.002861	0.004	0.01176	0.002126	0	0.002694	0.001	0.00504	0.002198	0	0.000709	0.07097	0	0.016797	
0.10667	0.001515	0	0.002032	0.008	0.03675	0.001393	0	0.001869	0.002	0.01575	0.003507	0	0.000813	0.00776	0	0.036842	
0	0.004474	0	0	0.008	0.03675	0.00428	0	0	0.002	0.01575	0.003233	0	0	0.053759	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.037275	0.001679	0	0.000352	0.012	0.13034	0.001544	0	0.000323	0.003	0.05586	0.016753	0	0.000263	0.028651	0	0.041238	
0	0.13313	0	0	0.016	0.13034	0.127371	0	0	0.004	0.05586	0.009553	0	0	0.158842	0	0	
0.044494	0.001442	0	0.000469	0.012	0.13034	0.001326	0	0.000431	0.003	0.05586	0.015861	0.005059	0.000389	0.021376	0.007307	0.031471	
0	0.008171	0.004039	0	0.012	0.13034	0.007817	0.003864	0	0.003	0.05586	0.00887	0.011675	0	0.147572	0.19425	0	
0.037366	0.001202	0	0.000265	0.012	0.13034	0.001106	0	0.000244	0.003	0.05586	0.016512	0.003656	0.000283	0.028706	0.004947	0.027867	
0	0.019361	0.007621	0	0.012	0.13034	0.018524	0.007292	0	0.003	0.05586	0.012016	0.04233	0	0.199922	0.704288	0	
0.069026	0.001499	0	0.000683	0.008	0.7448	0.001379	0	0.000628	0.002	0.3192	0.007556	0.022762	0.000506	0.014349	0.096073	0.054654	
0	0.037225	0.040514	0	0.012	0.7448	0.035615	0.038761	0	0.003	0.3192	0.00998	0.032504	0	0.166039	0.540803	0	



## On-Road Mobile-Source Emission Rates, Lake Tahoe Air Basin, 2034, Annual

Vehicle Model Year: Aggregated

Speed: Aggregated

Fleet: Heavy trucks are not included. Only passenger vehicles and typically sized trucks used for towing are included.

### EMFAC Output

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX
<i>g/trip</i>	<i>n/a</i>	<i>#</i>	<i>miles/day</i>	<i>trips/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>
LDA	GAS	14,906	607,468	69,291	0.0046	0	0.146576007	0.062110885	0.180912283	0.034048442	0.050384379	0.520930531
LDA	DSL	185	7,565	862	0.0093	0	0	0	0	0	0	0.244921524
LDA	ELEC	788	36,426	3,780	0.0000	0	0	0.004888026	0	0.001273804	0.006412991	0
LDT1	GAS	1,728	63,913	7,659	0.0074	0	0.244988209	0.137605134	0.50734952	0.085286293	0.12809871	0.619843401
LDT1	DSL	0	10	1	0.0388	0	0	0	0	0	0	0.393865384
LDT1	ELEC	41	1,970	200	0.0000	0	0	0.004888026	0	0.001305605	0.006545172	0
LDT2	GAS	6,366	225,088	27,798	0.0101	0	0.340040976	0.167010949	0.605756069	0.118582641	0.167344139	0.740227414
LDT2	DSL	56	2,228	255	0.0216	0	0	0	0	0	0	0.234761396
LDT2	ELEC	170	5,502	818	0.0000	0	0	0.004888026	0	0.001293562	0.006495115	0
LHDT1	GAS	507	16,880	7,557	0.0380	0.383383124	0.129199735	0.199031614	1.857146076	0.014639531	0.030742859	0.735864202
MCY	GAS	945	6,230	1,890	2.6995	0	2.758025451	0.696358983	1.586413665	0.344580854	0.83500486	21.45040787
MDV	GAS	3,912	134,098	16,961	0.0120	0	0.411875819	0.190958414	0.65263756	0.141007196	0.200378961	0.772994936

Source: wksht EMFAC Output 2017

Totals: 29,605 1,107,378 137,072

### Composite Emission Factors (for all vehicle types)

ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>
0.0223	0.0066	0.2529	0.1173	0.4477	0.0775	0.1227	0.6996

Source: calculations of weighted averages based on VMT/day, trips/day, or vehicle population

### Composite Emission Factors by Activity

	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Crosscheck</u>
Combined per-VMT emissions	<i>g/mile</i>	0.0223	0.6996	0.0481	235.8146	0.0050	0.0022	290.6611
Combined per-trip emissions	<i>g/trip</i>	0.8179	2.6375	0.2133	48.0784	0.0507	0.0386	290.6611
Combined per-vehicle emissions	<i>g/vehicle/day</i>	0.2068	0.0640	0.0006	1.9518	0.0018	0.0079	100%

	<u>value</u>	<u>units</u>	<u>source</u>
average trip length	18.0	miles/trip	traffic analysis
trips/vehicle-day	2.0	trips/veh-day	assumption

### Composite Emission Factors by VMT

<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>
<i>g/mile</i>	0.0735	0.8480	0.0599	238.5398	0.0079	0.0045

CO_IDLEX g/veh/day	CO_STREX g/trip	NOx_RUNEX g/mile	NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile
0	2.202949045	0.028025024	0	0.149995989	206.9433095	0	43.45809552	0.001295752	0	0.035628658	0.000996054	0
0	0	0.028838578	0	0	169.9737305	0	0	0.00042993	0	0	0.002174811	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	2.455844529	0.038414823	0	0.201412001	249.3253258	0	54.20709857	0.001859848	0	0.051534679	0.001121839	0
0	0	0.408402675	0	0	373.90328	0	0	0.0018036	0	0	0.017717165	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	3.191229684	0.055651381	0	0.272437026	262.339614	0	59.87330092	0.002468919	0	0.068640234	0.001110785	0
0	0	0.043138896	0	0	237.9734225	0	0	0.001004966	0	0	0.005294214	0
0	0	0	0	0	0	0	0	0	0	0	0	0
3.738062126	2.24474133	0.257610826	0.033520402	0.508343878	913.3181064	113.9252412	18.76064418	0.008413011	0.104857056	0.02492248	0.002652091	0
0	13.12866797	1.266165374	0	0.305206937	221.1524898	0	70.24301465	0.387590447	0	0.34532864	0.002369538	0
0	3.513019008	0.064766257	0	0.313230247	311.8990636	0	72.21856115	0.002804412	0	0.078804903	0.001104079	0

CO_IDLEX g/veh/day	CO_STREX g/trip	NOx_RUNEX g/mile	NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile
0.0640	2.6375	0.0481	0.0006	0.2133	235.8146	1.9518	48.0784	0.0040	0.0018	0.0507	0.0011	0.0000

Crosscheck Okay

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0.001162757	0.008000002	0.036750011	0.000915835	0
0	0.008000002	0.036750011	0.00208073	0
0	0.008000002	0.036750011	0	0
0.001421106	0.008000002	0.036750011	0.00103149	0
0	0.008000002	0.036750011	0.016950728	0
0	0.008000002	0.036750011	0	0
0.001392037	0.008000002	0.036750011	0.001021326	0
0	0.008000002	0.036750011	0.005065189	0
0	0.008000002	0.036750011	0	0
0.000450924	0.008000002	0.076440022	0.0024385	0
0.002559138	0.004000001	0.011760003	0.002211521	0
0.001547823	0.008000002	0.036750011	0.001015159	0

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0.0012	0.0079	0.0386	0.0010	0.0000

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air Basin

Region: LAKE TAHOE

Calendar Year: 2034

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNE	ROG_IDLE	ROG_STRE	ROG_HOT	ROG_RUNE	ROG_REST	ROG_DIUR	TOG_RUNE
LAKE TAHC	2034	HHDT	Aggregate	Aggregate	GAS	0.162648	25.8595	3.254268	0.307314	0	0.001063	0.043011	0.224704	0.005012	0.008565	0.448432
LAKE TAHC	2034	HHDT	Aggregate	Aggregate	DSL	286.9194	28877.27	2280.461	0.025226	5.161037	0	0	0	0	0	0.028718
LAKE TAHC	2034	LDA	Aggregate	Aggregate	GAS	14906.41	607468.1	69291.21	0.004635	0	0.146576	0.062111	0.180912	0.034048	0.050384	0.006763
LAKE TAHC	2034	LDA	Aggregate	Aggregate	DSL	184.9969	7565.045	862.003	0.009256	0	0	0	0	0	0	0.010537
LAKE TAHC	2034	LDA	Aggregate	Aggregate	ELEC	787.8022	36426.12	3779.85	0	0	0	0.004888	0	0.001274	0.006413	0
LAKE TAHC	2034	LDT1	Aggregate	Aggregate	GAS	1728.095	63913.21	7659.059	0.007369	0	0.244988	0.137605	0.50735	0.085286	0.128099	0.010754
LAKE TAHC	2034	LDT1	Aggregate	Aggregate	DSL	0.340865	9.799145	1.389948	0.03883	0	0	0	0	0	0	0.044206
LAKE TAHC	2034	LDT1	Aggregate	Aggregate	ELEC	41.2462	1969.821	199.7764	0	0	0	0.004888	0	0.001306	0.006545	0
LAKE TAHC	2034	LDT2	Aggregate	Aggregate	GAS	6366.306	225087.7	27797.57	0.010139	0	0.340041	0.167011	0.605756	0.118583	0.167344	0.014795
LAKE TAHC	2034	LDT2	Aggregate	Aggregate	DSL	55.63879	2228.369	255.0906	0.021636	0	0	0	0	0	0	0.024632
LAKE TAHC	2034	LDT2	Aggregate	Aggregate	ELEC	170.1955	5501.533	818.4018	0	0	0	0.004888	0	0.001294	0.006495	0
LAKE TAHC	2034	LHDT1	Aggregate	Aggregate	GAS	507.2163	16880.5	7556.767	0.037953	0.383383	0.1292	0.199032	1.857146	0.01464	0.030743	0.055381
LAKE TAHC	2034	LHDT1	Aggregate	Aggregate	DSL	432.709	14968.22	5442.934	0.160355	0.10976	0	0	0	0	0	0.182554
LAKE TAHC	2034	LHDT2	Aggregate	Aggregate	GAS	52.30712	1943.051	779.2981	0.011693	0.36964	0.087335	0.099687	0.605605	0.009403	0.01696	0.017062
LAKE TAHC	2034	LHDT2	Aggregate	Aggregate	DSL	168.9208	5905.713	2124.811	0.150727	0.10976	0	0	0	0	0	0.171593
LAKE TAHC	2034	MCY	Aggregate	Aggregate	GAS	945.0635	6229.827	1890.127	2.699493	0	2.758025	0.696359	1.586414	0.344581	0.835005	3.350355
LAKE TAHC	2034	MDV	Aggregate	Aggregate	GAS	3912.032	134097.6	16960.97	0.011955	0	0.411876	0.190958	0.652638	0.141007	0.200379	0.017444
LAKE TAHC	2034	MDV	Aggregate	Aggregate	DSL	130.0881	4876.162	587.5277	0.011175	0	0	0	0	0	0	0.012723
LAKE TAHC	2034	MDV	Aggregate	Aggregate	ELEC	115.091	3791.87	557.0916	0	0	0	0.004888	0	0.001294	0.006496	0
LAKE TAHC	2034	MH	Aggregate	Aggregate	GAS	61.24042	621.7248	6.126491	0.02413	0	0.135611	0.060942	1.0925	0.014126	0.032966	0.035211
LAKE TAHC	2034	MH	Aggregate	Aggregate	DSL	42.89533	361.3233	4.289533	0.126838	0	0	0	0	0	0	0.144397
LAKE TAHC	2034	MHDT	Aggregate	Aggregate	GAS	51.93123	3003.123	1039.04	0.023516	1.024678	0.201828	0.087607	0.465628	0.00773	0.013623	0.034315
LAKE TAHC	2034	MHDT	Aggregate	Aggregate	DSL	485.3462	22528.83	3654.041	0.011897	0.109281	0	0	0	0	0	0.013544
LAKE TAHC	2034	OBUS	Aggregate	Aggregate	GAS	11.9657	515.812	239.4097	0.053937	0.744293	0.199462	0.056016	0.835346	0.014147	0.030195	0.078705
LAKE TAHC	2034	OBUS	Aggregate	Aggregate	DSL	22.87537	1785.273	264.5171	0.017484	2.062469	0	0	0	0	0	0.019904
LAKE TAHC	2034	SBUS	Aggregate	Aggregate	GAS	3.887118	199.9927	15.54847	0.012086	10.64152	0.383027	0.050828	0.367029	0.00525	0.010913	0.017636
LAKE TAHC	2034	SBUS	Aggregate	Aggregate	DSL	21.5473	688.3601	248.6528	0.029494	0.257571	0	0	0	0	0	0.033576

TOG_IDLEX	TOG_STRE	TOG_HOT	STOG_RUNI	TOG_RESTI	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNE	NOx_IDLEX	NOx_STRE	CO2_RUNE	CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLI
0	0.001164	0.043011	0.224704	0.005012	0.008565	29.29388	0	5.38251	3.376396	0	0.005075	1633.536	0	38.9215	0.069765	0
5.875447	0	0	0	0	0	0.256983	75.75676	0	2.585484	63.17005	2.96997	1131.224	10418.05	0	0.001172	0.239717
0	0.160482	0.062111	0.180912	0.034048	0.050384	0.520931	0	2.202949	0.028025	0	0.149996	206.9433	0	43.4581	0.001296	0
0	0	0	0	0	0	0.244922	0	0	0.028839	0	0	169.9737	0	0	0.00043	0
0	0	0.004888	0	0.001274	0.006413	0	0	0	0	0	0	0	0	0	0	0
0	0.268231	0.137605	0.50735	0.085286	0.128099	0.619843	0	2.455845	0.038415	0	0.201412	249.3253	0	54.2071	0.00186	0
0	0	0	0	0	0	0.393865	0	0	0.408403	0	0	373.9033	0	0	0.001804	0
0	0	0.004888	0	0.001306	0.006545	0	0	0	0	0	0	0	0	0	0	0
0	0.372302	0.167011	0.605756	0.118583	0.167344	0.740227	0	3.19123	0.055651	0	0.272437	262.3396	0	59.8733	0.002469	0
0	0	0	0	0	0	0.234761	0	0	0.043139	0	0	237.9734	0	0	0.001005	0
0	0	0.004888	0	0.001294	0.006495	0	0	0	0	0	0	0	0	0	0	0
0.559432	0.141457	0.199032	1.857146	0.01464	0.030743	0.735864	3.738062	2.244741	0.257611	0.03352	0.508344	913.3181	113.9252	18.76064	0.008413	0.104857
0.124954	0	0	0	0	0	0.792616	0.909745	0	1.454707	1.840912	0	504.2676	127.1629	0	0.007448	0.005098
0.539377	0.095621	0.099687	0.605605	0.009403	0.01696	0.227735	3.776639	1.711112	0.111793	0.032199	0.459032	1029.151	128.5704	20.24593	0.003156	0.107507
0.124954	0	0	0	0	0	0.753991	0.909745	0	1.037923	1.822622	0	566.9466	203.5694	0	0.007001	0.005098
0	3.001382	0.696359	1.586414	0.344581	0.835005	21.45041	0	13.12867	1.266165	0	0.305207	221.1525	0	70.24301	0.38759	0
0	0.450952	0.190958	0.652638	0.141007	0.200379	0.772995	0	3.513019	0.064766	0	0.31323	311.8991	0	72.21856	0.002804	0
0	0	0	0	0	0	0.28147	0	0	0.030394	0	0	307.3442	0	0	0.000519	0
0	0	0.004888	0	0.001294	0.006496	0	0	0	0	0	0	0	0	0	0	0
0	0.148477	0.060942	1.0925	0.014126	0.032966	0.447691	0	3.101061	0.265137	0	0.44093	1569.46	0	24.39621	0.006794	0
0	0	0	0	0	0	0.450181	0	0	4.353727	0	0	967.2383	0	0	0.005891	0
1.495207	0.220977	0.087607	0.465628	0.00773	0.013623	0.504363	15.25532	4.494525	0.199761	0.089289	0.389085	1505.261	481.3278	35.20976	0.005353	0.273827
0.124408	0	0	0	0	0	0.129027	4.45885	0	1.686204	7.022591	2.298521	881.8441	1171.748	0	0.000553	0.005076
1.086071	0.218386	0.056016	0.835346	0.014147	0.030195	1.192348	5.762426	4.625145	0.442317	0.06492	0.393727	1549.562	355.4257	27.4245	0.011273	0.189429
2.347964	0	0	0	0	0	0.173548	31.14078	0	2.101491	25.4851	2.209228	1230.022	5027.736	0	0.000812	0.095796
15.52808	0.419367	0.050828	0.367029	0.00525	0.010913	0.21038	82.24088	12.33513	0.132275	0.92653	0.5485	735.8789	2224.075	49.67052	0.002815	2.504424
0.293225	0	0	0	0	0	0.140147	10.05912	0	2.562431	23.19124	1.836754	934.0867	3095.76	0	0.00137	0.011964

PM10_STR	PM10_PM	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_ST	PM2_5_PN	PM2_5_PN	SOx_RUNE	SOx_IDLEX	SOx_STREX							
0.000206	0.001158	0	0.000436	0.02	0.06174	0.001065	0	0.000401	0.005	0.02646	0.016165	0	0.000385	0.142524	0	0.000241	
0	0.023684	0.027334	0	0.035771	0.061347	0.022659	0.026151	0	0.008943	0.026291	0.010687	0.098425	0	0.177813	1.637572	0	
0.035629	0.000996	0	0.001163	0.008	0.03675	0.000916	0	0.001069	0.002	0.01575	0.002048	0	0.00043	0.003873	0	0.022707	
0	0.002175	0	0	0.008	0.03675	0.002081	0	0	0.002	0.01575	0.001607	0	0	0.026718	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.051535	0.001122	0	0.001421	0.008	0.03675	0.001031	0	0.001307	0.002	0.01575	0.002467	0	0.000536	0.004545	0	0.026126	
0	0.017717	0	0	0.008	0.03675	0.016951	0	0	0.002	0.01575	0.003535	0	0	0.058772	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.06864	0.001111	0	0.001392	0.008	0.03675	0.001021	0	0.00128	0.002	0.01575	0.002596	0	0.000592	0.005196	0	0.029659	
0	0.005294	0	0	0.008	0.03675	0.005065	0	0	0.002	0.01575	0.00225	0	0	0.037406	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.024922	0.002652	0	0.000451	0.008	0.07644	0.002438	0	0.000415	0.002	0.03276	0.009038	0.001127	0.000186	0.014237	0.002678	0.038572	
0	0.021778	0.026819	0	0.012	0.07644	0.020836	0.025659	0	0.003	0.03276	0.004767	0.001202	0	0.079264	0.019988	0	
0.018448	0.001996	0	0.000297	0.008	0.08918	0.001835	0	0.000273	0.002	0.03822	0.010184	0.001272	0.0002	0.008495	0.002821	0.03851	
0	0.024048	0.027471	0	0.012	0.08918	0.023008	0.026283	0	0.003	0.03822	0.00536	0.001924	0	0.089116	0.031998	0	
0.345329	0.00237	0	0.002559	0.004	0.01176	0.002212	0	0.002398	0.001	0.00504	0.002188	0	0.000695	0.07067	0	0.016681	
0.078805	0.001104	0	0.001548	0.008	0.03675	0.001015	0	0.001423	0.002	0.01575	0.003086	0	0.000715	0.005694	0	0.031254	
0	0.002832	0	0	0.008	0.03675	0.00271	0	0	0.002	0.01575	0.002906	0	0	0.04831	0	0	
0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0	0	0	0	
0.034709	0.001418	0	0.000303	0.012	0.13034	0.001303	0	0.000279	0.003	0.05586	0.015531	0	0.000241	0.019703	0	0.046307	
0	0.10949	0	0	0.016	0.13034	0.104754	0	0	0.004	0.05586	0.009144	0	0	0.152036	0	0	
0.039455	0.001409	0	0.000424	0.012	0.13034	0.001296	0	0.00039	0.003	0.05586	0.014896	0.004763	0.000348	0.013173	0.007982	0.032971	
0	0.007619	0.002417	0	0.012	0.13034	0.00729	0.002312	0	0.003	0.05586	0.008331	0.01107	0	0.138614	0.184182	0	
0.035964	0.001357	0	0.000287	0.012	0.13034	0.001248	0	0.000264	0.003	0.05586	0.015334	0.003517	0.000271	0.022282	0.005001	0.027632	
0	0.020622	0.009024	0	0.012	0.13034	0.01973	0.008633	0	0.003	0.05586	0.011621	0.0475	0	0.193342	0.79029	0	
0.070101	0.001535	0	0.0007	0.008	0.7448	0.001412	0	0.000643	0.002	0.3192	0.007282	0.022009	0.000492	0.012762	0.096408	0.055057	
0	0.01626	0.013295	0	0.012	0.7448	0.015557	0.01272	0	0.003	0.3192	0.008825	0.029247	0	0.146825	0.48661	0	

## On-Road Mobile-Source Emission Rates, Lake Tahoe Air Basin, 2040, Annual

Vehicle Model Year: Aggregated

Speed: Aggregated

Fleet: Heavy trucks are not included. Only passenger vehicles and typically sized trucks used for towing are included.

### EMFAC Output

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX
<i>g/trip</i>	<i>n/a</i>	<i>#</i>	<i>miles/day</i>	<i>trips/day</i>	<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>
LDA	GAS	14,729	620,411	92,381	0.0042	0	0.017185372	0.043270996	0.166021478	0.022444033	0.030874079	0.338773541
LDA	DSL	203	8,617	1,274	0.0066	0	0	0	0	0	0	0.209482291
LDA	ELEC	2,521	111,681	16,008	0.0000	0	0	0.004883985	0	0.001272816	0.00640889	0
LDT1	GAS	933	37,653	5,709	0.0049	0	0.03802789	0.07807609	0.291193541	0.050177182	0.068717127	0.36352877
LDT1	DSL	1	24	5	0.0319	0	0	0	0	0	0	0.319222792
LDT1	ELEC	0	17	2	0.0000	0	0	0.004883985	0	0.001293652	0.006495494	0
LDT2	GAS	6,260	249,981	38,589	0.0057	0	0.038062195	0.069092657	0.268136911	0.0549843	0.072789303	0.452922185
LDT2	DSL	14	550	84	0.0210	0	0	0	0	0	0	0.212883201
LHDT1	GAS	192	5,742	2,865	0.0114	0.291751325	0.337185467	0.186923205	0.912433372	0.01436237	0.024505608	0.21609104
LHDT1	DSL	227	7,851	2,853	0.1513	0.109759705	0	0	0	0	0	0.727031286
MDV	GAS	3,894	117,148	22,478	0.0098	0	0.150459105	0.179003114	0.522280863	0.133850241	0.173592664	0.615076205
MDV	DSL	90	3,219	559	0.0077	0	0	0	0	0	0	0.23854819

Source: wksht EMFAC Output 2040

Totals: 29,064 1,162,892 182,807

### Composite Emission Factors (for all vehicle types)

ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	CO_RUNEX
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/trip</i>	<i>g/veh/day</i>	<i>g/veh/day</i>	<i>g/mile</i>
0.0058	0.0028	0.0417	0.0643	0.2281	0.0430	0.0575	0.3601

Source: calculations of weighted averages based on VMT/day, trips/day, or vehicle population

### Composite Emission Factors by Activity

	<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>	<u>Crosscheck</u>
Combined per-VMT emissions	<i>g/mile</i>	0.0058	0.3601	0.0363	211.2082	0.0462	0.0188	260.0112
Combined per-trip emissions	<i>g/trip</i>	0.3341	0.8345	0.0640	45.2072	0.0012	0.0011	260.0112
Combined per-vehicle emissions	<i>g/vehicle/day</i>	0.1033	0.0275	0.0121	1.7507	0.0001	0.0001	100%

	<u>value</u>	<u>units</u>	<u>source</u>
average trip length	18.0	miles/trip	traffic analysis
trips/vehicle-day	2.0	trips/veh-day	assumption

### Composite Emission Factors by VMT

<u>units</u>	<u>ROG</u>	<u>CO</u>	<u>NOx</u>	<u>CO2</u>	<u>PM10</u>	<u>PM2.5</u>
<i>g/mile</i>	0.0272	0.4073	0.0402	213.7683	0.0463	0.0189

CO_IDLEX g/veh/day	CO_STREX g/trip	NOx_RUNEX g/mile	NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile
0	0.600171019	0.02604778	0	0.019831341	199.2018644	0	42.65737326	0.000917103	0	0.001260468	0.008000002	0.036750011
0	0	0.012522845	0	0	194.6015216	0	0	0.000983792	0	0	0.008000002	0.036750011
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011
0	0.864467749	0.029501919	0	0.036847273	214.6901068	0	47.60634747	0.000929233	0	0.001345701	0.008000002	0.036750011
0	0	0.270476208	0	0	237.9582649	0	0	0.012741548	0	0	0.008000002	0.036750011
0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011
0	0.895490639	0.033319778	0	0.043744606	250.7791232	0	55.19290863	0.000926782	0	0.001297055	0.008000002	0.036750011
0	0	0.038372929	0	0	244.2251436	0	0	0.004809892	0	0	0.008000002	0.036750011
3.077494475	3.164655609	0.150260906	0.026349652	1.55362347	804.7505374	111.5846389	55.85408463	0.002093301	0	0.001249903	0.008000002	0.076440022
0.909745076	0	1.14043054	1.527658311	0	528.8465454	129.7223706	0	0.016744719	0.017407846	0	0.012000003	0.076440022
0	2.160248041	0.056169501	0	0.156878294	338.3762241	0	78.38096918	0.001034265	0	0.001579789	0.008000002	0.036750011
0	0	0.013510529	0	0	317.5881933	0	0	0.001278304	0	0	0.008000002	0.036750011

CO_IDLEX g/veh/day	CO_STREX g/trip	NOx_RUNEX g/mile	NOx_IDLEX g/veh/day	NOx_STREX g/trip	CO2_RUNEX g/mile	CO2_IDLEX g/veh/day	CO2_STREX g/trip	PM10_RUNEX g/mile	PM10_IDLEX g/veh/day	PM10_STREX g/trip	PM10_PMTW g/mile	PM10_PMBW g/mile
0.0275	0.8345	0.0363	0.0121	0.0640	211.2082	1.7507	45.2072	0.0010	0.0001	0.0012	0.0080	0.0372

Crosscheck Okay



PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0.000843242	0	0.001158953	0.002000001	0.015750005
0.000941234	0	0	0.002000001	0.015750005
0	0	0	0.002000001	0.015750005
0.000854396	0	0.001237322	0.002000001	0.015750005
0.012190354	0	0	0.002000001	0.015750005
0	0	0	0.002000001	0.015750005
0.000852142	0	0.001192594	0.002000001	0.015750005
0.004601818	0	0	0.002000001	0.015750005
0.001924713	0	0.00114924	0.002000001	0.032760009
0.01602035	0.01665479	0	0.003000001	0.032760009
0.000950969	0	0.001452557	0.002000001	0.015750005
0.001223005	0	0	0.002000001	0.015750005

PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
<i>g/mile</i>	<i>g/veh/day</i>	<i>g/trip</i>	<i>g/mile</i>	<i>g/mile</i>
0.0009	0.0001	0.0011	0.0020	0.0159

EMFAC2014 (v1.0.7) Emission Rates

Region Type: Air Basin

Region: Lake Tahoe

Calendar Year: 2040

Season: Annual

<https://www.arb.ca.gov/emfac/2014/>

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	Mdlyr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HTSK	ROG_RUNLS	ROG_RESTL	ROG_DIURN
Lake Tahoe	2040	HHDT	Aggregatec	Aggregatec	GAS	3.126938	373.5623	62.56377	0.331503	0	0.906498	0.079744	0.400309	0.008274	
Lake Tahoe	2040	HHDT	Aggregatec	Aggregatec	DSL	268.9877	32994.77	0	0.073522	1.240693	0	0	0	0	
Lake Tahoe	2040	LDA	Aggregatec	Aggregatec	GAS	14729.17	620410.7	92381.13	0.004174	0	0.017185	0.043271	0.166021	0.022444	
Lake Tahoe	2040	LDA	Aggregatec	Aggregatec	DSL	202.5227	8616.505	1274.188	0.006556	0	0	0	0	0	
Lake Tahoe	2040	LDA	Aggregatec	Aggregatec	ELEC	2521.181	111681	16008.15	0	0	0	0.004884	0	0.001273	
Lake Tahoe	2040	LDT1	Aggregatec	Aggregatec	GAS	932.8471	37652.68	5709.346	0.00487	0	0.038028	0.078076	0.291194	0.050177	
Lake Tahoe	2040	LDT1	Aggregatec	Aggregatec	DSL	0.921832	24.24532	4.862377	0.031925	0	0	0	0	0	
Lake Tahoe	2040	LDT1	Aggregatec	Aggregatec	ELEC	0.387455	16.72668	2.434664	0	0	0	0.004884	0	0.001294	
Lake Tahoe	2040	LDT2	Aggregatec	Aggregatec	GAS	6259.739	249980.7	38588.64	0.005723	0	0.038062	0.069093	0.268137	0.054984	
Lake Tahoe	2040	LDT2	Aggregatec	Aggregatec	DSL	13.50262	550.1817	84.09248	0.021008	0	0	0	0	0	
Lake Tahoe	2040	LHDT1	Aggregatec	Aggregatec	GAS	192.2911	5741.502	2864.85	0.011372	0.291751	0.337185	0.186923	0.912433	0.014362	
Lake Tahoe	2040	LHDT1	Aggregatec	Aggregatec	DSL	226.8211	7851.323	2853.125	0.15132	0.10976	0	0	0	0	
Lake Tahoe	2040	LHDT2	Aggregatec	Aggregatec	GAS	30.90957	1361.274	460.5065	0.005968	0.218629	0.09381	0.044873	0.241223	0.0053	
Lake Tahoe	2040	LHDT2	Aggregatec	Aggregatec	DSL	77.82468	3394.63	978.9366	0.122884	0.10976	0	0	0	0	
Lake Tahoe	2040	MCY	Aggregatec	Aggregatec	GAS	991.921	6680.808	1983.644	2.638985	0	2.986582	0.634087	1.29768	0.321302	
Lake Tahoe	2040	MDV	Aggregatec	Aggregatec	GAS	3893.859	117147.7	22477.97	0.009756	0	0.150459	0.179003	0.522281	0.13385	
Lake Tahoe	2040	MDV	Aggregatec	Aggregatec	DSL	90.29432	3218.57	558.6195	0.007735	0	0	0	0	0	
Lake Tahoe	2040	MH	Aggregatec	Aggregatec	GAS	47.94036	486.0857	4.795953	0.01575	0	0.297233	0.036314	0.44681	0.009895	
Lake Tahoe	2040	MH	Aggregatec	Aggregatec	DSL	15.32224	148.7304	1.532224	0.095176	0	0	0	0	0	
Lake Tahoe	2040	MHDT	Aggregatec	Aggregatec	GAS	52.15805	2829.467	1043.578	0.013993	0.786736	0.455472	0.075532	0.382798	0.00781	
Lake Tahoe	2040	MHDT	Aggregatec	Aggregatec	DSL	919.0016	37282.45	0	0.046091	0.016032	0	0	0	0	
Lake Tahoe	2040	OBUS	Aggregatec	Aggregatec	GAS	15.75036	983.3668	315.1331	0.017442	0.590315	0.37302	0.023506	0.252744	0.007045	
Lake Tahoe	2040	OBUS	Aggregatec	Aggregatec	DSL	15.60043	2027.973	0	0.080674	0.80713	0	0	0	0	
Lake Tahoe	2040	SBUS	Aggregatec	Aggregatec	GAS	4.742857	233.4546	18.97143	0.011356	8.291075	0.939918	0.065111	0.458662	0.006599	
Lake Tahoe	2040	SBUS	Aggregatec	Aggregatec	DSL	17.19808	611.601	0	0.058847	0.087473	0	0	0	0	
Lake Tahoe	2040	UBUS	Aggregatec	Aggregatec	GAS	3.882165	662.5184	15.52866	0.022997	0	1.811585	0.08946	0.805445	0.007662	
Lake Tahoe	2040	UBUS	Aggregatec	Aggregatec	DSL	4.34164	726.5361	17.36656	0.162905	0	0	0	0	0	

ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNL	TOG_RESTI	TOG_DIURI	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNE	NOx_IDLEX	NOx_STRE	CO2_RUNE
0.013735	0.483728	0	0.992502	0.079744	0.400309	0.008274	0.013735	30.49822	0	52.70054	3.584459	0	3.926223	1610.498
0	0.0837	1.412435	0	0	0	0	0	0.432362	4.624384	0	1.315522	39.21756	0	1452.252
0.030874	0.006091	0	0.018816	0.043271	0.166021	0.022444	0.030874	0.338774	0	0.600171	0.026048	0	0.019831	199.2019
0	0.007463	0	0	0	0	0	0	0.209482	0	0	0.012523	0	0	194.6015
0.006409	0	0	0	0.004884	0	0.001273	0.006409	0	0	0	0	0	0	0
0.068717	0.007106	0	0.041636	0.078076	0.291194	0.050177	0.068717	0.363529	0	0.864468	0.029502	0	0.036847	214.6901
0	0.036345	0	0	0	0	0	0	0.319223	0	0	0.270476	0	0	237.9583
0.006495	0	0	0	0.004884	0	0.001294	0.006495	0	0	0	0	0	0	0
0.072789	0.008351	0	0.041673	0.069093	0.268137	0.054984	0.072789	0.452922	0	0.895491	0.03332	0	0.043745	250.7791
0	0.023916	0	0	0	0	0	0	0.212883	0	0	0.038373	0	0	244.2251
0.024506	0.016595	0.425723	0.369176	0.186923	0.912433	0.014362	0.024506	0.216091	3.077494	3.164656	0.150261	0.02635	1.553623	804.7505
0	0.172267	0.124954	0	0	0	0	0	0.727031	0.909745	0	1.140431	1.527658	0	528.8465
0.009133	0.008708	0.319023	0.10271	0.044873	0.241223	0.0053	0.009133	0.144193	3.155571	2.95093	0.045942	0.01964	0.613442	877.7537
0	0.139896	0.124954	0	0	0	0	0	0.554858	0.909745	0	0.170132	0.976517	0	576.6894
0.797584	3.296777	0	3.251464	0.634087	1.29768	0.321302	0.797584	20.53926	0	14.86578	1.263035	0	0.358152	182.8879
0.173593	0.014236	0	0.164734	0.179003	0.522281	0.13385	0.173593	0.615076	0	2.160248	0.05617	0	0.156878	338.3762
0	0.008805	0	0	0	0	0	0	0.238548	0	0	0.013511	0	0	317.5882
0.020589	0.022982	0	0.325432	0.036314	0.44681	0.009895	0.020589	0.292871	0	5.227045	0.164145	0	0.844552	1223.592
0	0.108352	0	0	0	0	0	0	0.30647	0	0	3.211522	0	0	1019.987
0.013071	0.020418	1.148004	0.498685	0.075532	0.382798	0.00781	0.013071	0.273928	12.53091	7.171956	0.130205	0.070888	0.994399	1214.466
0	0.052471	0.018251	0	0	0	0	0	0.241864	0.120428	0	1.216905	1.77864	0	1156.003
0.014301	0.025451	0.861386	0.40841	0.023506	0.252744	0.007045	0.014301	0.34193	4.847041	6.36839	0.152217	0.052979	0.983361	1214.671
0	0.091842	0.918856	0	0	0	0	0	0.476251	2.987393	0	1.64583	24.69253	0	1605.846
0.013362	0.016571	12.09832	1.029092	0.065111	0.458662	0.006599	0.013362	0.195022	68.2562	22.38094	0.103179	0.745087	0.985607	630.1938
0	0.066992	0.099582	0	0	0	0	0	0.305891	0.655688	0	1.390593	9.51838	0	1239.77
0.010821	0.033558	0	1.983457	0.08946	0.805445	0.007662	0.010821	0.425944	0	23.87758	0.396692	0	2.826277	1610.62
0	0.824949	0	0	0	0	0	0	3.823393	0	0	3.406161	0	0	2099.39

CO2_IDLEX	CO2_STRE	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PM1	PM10_PMI	PM2_5_RU	PM2_5_IDI	PM2_5_STI	PM2_5_PV	PM2_5_PV	SOx_RUNE	SOx_IDLE	SOx_STREX
0	128.2391	0.001144	0	0.001455	0.02	0.06174	0.001052	0	0.001338	0.005	0.02646	0.016568	0	0.002137
13372.77	0	0.005154	0.006916	0	0.035479	0.060846	0.004931	0.006617	0	0.00887	0.026077	0.013855	0.127582	0
0	42.65737	0.000917	0	0.00126	0.008	0.03675	0.000843	0	0.001159	0.002	0.01575	0.001994	0	0.000436
0	0	0.000984	0	0	0.008	0.03675	0.000941	0	0	0.002	0.01575	0.001858	0	0
0	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0
0	47.60635	0.000929	0	0.001346	0.008	0.03675	0.000854	0	0.001237	0.002	0.01575	0.002149	0	0.00049
0	0	0.012742	0	0	0.008	0.03675	0.01219	0	0	0.002	0.01575	0.002272	0	0
0	0	0	0	0	0.008	0.03675	0	0	0	0.002	0.01575	0	0	0
0	55.19291	0.000927	0	0.001297	0.008	0.03675	0.000852	0	0.001193	0.002	0.01575	0.002511	0	0.000566
0	0	0.00481	0	0	0.008	0.03675	0.004602	0	0	0.002	0.01575	0.002332	0	0
111.5846	55.85408	0.002093	0	0.00125	0.008	0.07644	0.001925	0	0.001149	0.002	0.03276	0.008037	0.001175	0.000618
129.7224	0	0.016745	0.017408	0	0.012	0.07644	0.01602	0.016655	0	0.003	0.03276	0.005049	0.001238	0
124.1847	64.73626	0.002187	0	0.001158	0.008	0.08918	0.002011	0	0.001064	0.002	0.03822	0.008764	0.001298	0.000696
199.737	0	0.010024	0.016741	0	0.012	0.08918	0.00959	0.016017	0	0.003	0.03822	0.005505	0.001907	0
0	43.70881	0.002539	0	0.003133	0.004	0.01176	0.002368	0	0.002929	0.001	0.00504	0.002245	0	0.000768
0	78.38097	0.001034	0	0.00158	0.008	0.03675	0.000951	0	0.001453	0.002	0.01575	0.003388	0	0.000821
0	0	0.001278	0	0	0.008	0.03675	0.001223	0	0	0.002	0.01575	0.003032	0	0
0	72.11977	0.001385	0	0.001116	0.012	0.13034	0.001274	0	0.001026	0.003	0.05586	0.012219	0	0.000812
0	0	0.052616	0	0	0.016	0.13034	0.05034	0	0	0.004	0.05586	0.009737	0	0
495.8463	108.0667	0.0014	0	0.001481	0.012	0.13034	0.001287	0	0.001362	0.003	0.05586	0.012127	0.00518	0.001206
628.507	0	0.003302	0.00018	0	0.012	0.13034	0.003159	0.000172	0	0.003	0.05586	0.011029	0.005996	0
352.0448	71.75234	0.001414	0	0.001127	0.012	0.13034	0.0013	0	0.001036	0.003	0.05586	0.012131	0.003615	0.000828
9607.097	0	0.004926	0.002381	0	0.012	0.13034	0.004713	0.002278	0	0.003	0.05586	0.015321	0.091656	0
2343.303	118.7746	0.001586	0	0.002597	0.008	0.7448	0.001458	0	0.002387	0.002	0.3192	0.006294	0.024815	0.001568
3404.552	0	0.003325	0.000758	0	0.012	0.7448	0.003181	0.000726	0	0.003	0.3192	0.011828	0.032481	0
0	291.6185	0.002374	0	0.003436	0.012	0.13034	0.002183	0	0.00316	0.003	0.05586	0.016084	0	0.003346
0	0	0.024859	0	0	0.012	0.84182	0.023783	0	0	0.003	0.36078	0.017059	0	0

EMFAC201 1 Veh & Tech	EMFAC201 1 Vehicle	Description	Source	EMFAC200 7 Vehicle	EMFAC200 7 Vehicle Code	Truck / Non-Truck Category	Truck 1 / Truck 2 / Non-Truck Category		
LDA - DSL	LDA	Passenger Cars	EMFAC201 1-LDV	LDA	PC	Non-Trucks	Non-Trucks		
LDA - GAS			EMFAC201 1-LDV			Non-Trucks	Non-Trucks		
LDT1 - DSL	LDT1	Light-Duty Trucks (GVWR <6000 lbs. and ETW <= 3750 lbs)	EMFAC201 1-LDV	LDT1	T1	Non-Trucks	Non-Trucks		
LDT1 - GAS			EMFAC201 1-LDV			Non-Trucks	Non-Trucks		
LDT2 - DSL	LDT2	Light-Duty Trucks (GVWR <6000 lbs. and ETW 3751- 5750 lbs)	EMFAC201 1-LDV	LDT2	T2	Non-Trucks	Non-Trucks		
LDT2 - GAS			EMFAC201 1-LDV			Non-Trucks	Non-Trucks		
LHD1 - DSL	LHD1	Light-Heavy-Duty Trucks (GVWR 8501-10000 lbs)	EMFAC201 1-LDV	LHDT1	T4	Trucks	Truck 1		
LHD1 - GAS			EMFAC201 1-LDV			Trucks	Truck 1		
LHD2 - DSL	LHD2	Light-Heavy-Duty Trucks (GVWR 10001-14000 lbs)	EMFAC201 1-LDV	LHDT2	T5	Trucks	Truck 1		
LHD2 - GAS			EMFAC201 1-LDV			Trucks	Truck 1		
MCY - GAS	MCY	Motorcycles	EMFAC201 1-LDV	MCY	MC	Non-Trucks	Non-Trucks		
MDV - DSL	MDV	Medium-Duty Trucks (GVWR 6000-8500 lbs)	EMFAC201 1-LDV	MDV	T3	Non-Trucks	Non-Trucks		
MDV - GAS			EMFAC201 1-LDV			Non-Trucks	Non-Trucks		
MH - DSL	MH	Motor Homes	EMFAC201 1-LDV	MH	MH	Non-Trucks	Non-Trucks		
MH - GAS			EMFAC201 1-LDV			Non-Trucks	Non-Trucks		
T6 Ag - DSL	T6 Ag	Medium-Heavy Duty Diesel Agriculture Truck	EMFAC201 1-HD	MHDT	T6	Trucks	Truck 2		
T6 CAIRP heavy - DSL	T6 CAIRP heavy	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 CAIRP small - DSL	T6 CAIRP small	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR<=26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 instate construction heavy - DSL	T6 instate construction heavy	Medium-Heavy Duty Diesel instate construction Truck with GVWR>26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 instate construction small - DSL	T6 instate construction small	Medium-Heavy Duty Diesel instate construction Truck with GVWR<=26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 instate heavy - DSL	T6 instate heavy	Medium-Heavy Duty Diesel instate Truck with GVWR>26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 instate small - DSL	T6 instate small	Medium-Heavy Duty Diesel instate Truck with GVWR<=26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 OOS heavy - DSL	T6 OOS heavy	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR>26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 OOS small - DSL	T6 OOS small	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR<=26000 lbs	EMFAC201 1-HD			Trucks	Truck 2		
T6 Public - DSL	T6 Public	Medium-Heavy Duty Diesel Public Fleet Truck	EMFAC201 1-HD			Trucks	Truck 2		
T6 utility - DSL	T6 utility	Medium-Heavy Duty Diesel Utility Fleet Truck	EMFAC201 1-HD			Trucks	Truck 2		
T6TS - GAS	T6TS	Medium-Heavy Duty Gasoline Truck	EMFAC201 1-LDV			Trucks	Truck 2		
T7 Ag - DSL	T7 Ag	Heavy-Heavy Duty Diesel Agriculture Truck	EMFAC201 1-HD					Trucks	Truck 2

EMFAC2011 Veh & Tech	EMFAC2011 Vehicle	Description	Source	EMFAC2007 Vehicle	EMFAC2007 Vehicle Code	Truck / Non-Truck Category	Truck 1 / Truck 2 / Non-Truck Category
T7 CAIRP - DSL	T7 CAIRP	Heavy-Heavy Duty Diesel CA International Registration Plan Truck	EMFAC2011-HD	HHDT	T7	Trucks	Truck 2
T7 CAIRP construction - DSL	T7 CAIRP construction	Heavy-Heavy Duty Diesel CA International Registration Plan Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 NNOOS - DSL	T7 NNOOS	Heavy-Heavy Duty Diesel Non-Neighboring Out-of-state Truck	EMFAC2011-HD			Trucks	Truck 2
T7 NOOS - DSL	T7 NOOS	Heavy-Heavy Duty Diesel Neighboring Out-of-state Truck	EMFAC2011-HD			Trucks	Truck 2
T7 other port - DSL	T7 other port	Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	EMFAC2011-HD			Trucks	Truck 2
T7 POAK - DSL	T7 POAK	Heavy-Heavy Duty Diesel Drayage Truck in Bay Area	EMFAC2011-HD			Trucks	Truck 2
T7 POLA - DSL	T7 POLA	Heavy-Heavy Duty Diesel Drayage Truck near South Coast	EMFAC2011-HD			Trucks	Truck 2
T7 Public - DSL	T7 Public	Heavy-Heavy Duty Diesel Public Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T7 Single - DSL	T7 Single	Heavy-Heavy Duty Diesel Single Unit Truck	EMFAC2011-HD			Trucks	Truck 2
T7 single construction - DSL	T7 single construction	Heavy-Heavy Duty Diesel Single Unit Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 SWCV - DSL	T7 SWCV	Heavy-Heavy Duty Diesel Solid Waste Collection Truck	EMFAC2011-HD			Trucks	Truck 2
T7 tractor - DSL	T7 tractor	Heavy-Heavy Duty Diesel Tractor Truck	EMFAC2011-HD			Trucks	Truck 2
T7 tractor construction - DSL	T7 tractor construction	Heavy-Heavy Duty Diesel Tractor Construction Truck	EMFAC2011-HD			Trucks	Truck 2
T7 utility - DSL	T7 utility	Heavy-Heavy Duty Diesel Utility Fleet Truck	EMFAC2011-HD			Trucks	Truck 2
T7IS - GAS	T7IS	Heavy-Heavy Duty Gasoline Truck	EMFAC2011-LDV			Trucks	Truck 2
PTO - DSL	PTO	Power Take Off	EMFAC2011-HD			Trucks	Truck 2
SBUS - DSL	SBUS	School Buses	EMFAC2011-HD	SBUS	SB	Non-Trucks	Non-Trucks
SBUS - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
UBUS - DSL	UBUS	Urban Buses	EMFAC2011-LDV	UBUS	UB	Non-Trucks	Non-Trucks
UBUS - GAS			EMFAC2011-LDV			Non-Trucks	Non-Trucks
Motor Coach - DSL	Motor Coach	Motor Coach	EMFAC2011-HD	OBUS	OB	Non-Trucks	Non-Trucks
OBUS - GAS	OBUS	Other Buses	EMFAC2011-LDV			Non-Trucks	Non-Trucks
All Other Buses - DSL	All Other Buses	All Other Buses	EMFAC2011-HD			Non-Trucks	Non-Trucks

This file contains a description for each vehicle category in EMFAC2011.

It describes which module is used to calculate each category, as well as how the categories are grouped into the EMFAC2007 and Other categorization schemes

For more information contact msej@arb.ca.gov

**Exhaust Emission Standards for Recreational Watercraft**

**EPA Emission Standards for Marine Spark-Ignition Engines and Vehicles: Exhaust Emission Standards**  
 where P stands for the maximum engine power in kilowatts (kW).

Model Year	HC + NOx (g/kW-hr)		CO (g/kW-hr)	
	P<=4.3 kW	P>4.3 kW	P<=4.3 kW	P>4.3 kW
1998	278	$(0.917 * (151 + 557 / P^{0.9})) + 2.44$	—	—
1999	253	$(0.833 * (151 + 557 / P^{0.9})) + 2.89$	—	—
2000	228	$(0.75 * (151 + 557 / P^{0.9})) + 3.33$	—	—
2001	204	$(0.667 * (151 + 557 / P^{0.9})) + 3.78$	—	—
2002	179	$(0.583 * (151 + 557 / P^{0.9})) + 4.22$	—	—
2003	155	$(0.5 * (151 + 557 / P^{0.9})) + 4.67$	—	—
2004	130	$(0.417 * (151 + 557 / P^{0.9})) + 5.11$	—	—
2005	105	$(0.333 * (151 + 557 / P^{0.9})) + 5.56$	—	—
2006-2009	81	$(0.25 * (151 + 557 / P^{0.9})) + 6$	—	—
2010 and newer	30	$2.1 + 0.09 * (151 + 557 / P^{0.9})$	500-5.0*P	300

Source: EPA. 2016 (March). Marine Spark-Ignition Engines and Vehicles: Exhaust Emission Standards. EPA-420-B-16-026. Available: <https://nepis.epa.gov/Exec/zyPDF.cgi?Dockey=P1000A0G.pdf>. Accessed February 2, 2018.

	value	units	source
power conversion rate	0.75	kW/hp	wksh: Conversion Rates
load factor	40%	%	
mass conversion rate	453.59	g/lb	wksh: Conversion Rates

**Federal Exhaust Emission Standards for Spark-Ignition Personal Watercraft and Outdoor Marine Engines of 50, 100, and 200 Horsepower**

Model Year	HC + NOx (g/kW-hr)		
	37	75	149
Engine Power (kW)	37	75	149
Engine Power (hp)	50	100	200
1998	161	151	147
1999	147	138	134
2000	133	125	121
2001	119	112	109
2002	105	99	96
2003	91	86	83
2004	77	73	71
2005	63	60	58
2006-2009	49	47	45
2010 and newer	18	17	16
Percent reduction from 1998 to 2010	89%	89%	89%
Factor of increased level of stringency from 1998 model year to 2010 model year	9.1	9.1	9.0

Source: calculations  
 This shows that emission standard become more stringent the later the engine model year.

**Federal Exh Emiss Standards for Spark-Ignition Personal Watercraft and Marine Engines of 50, 100, and 200 hp**

Model Year	HC + NOx (lb/hr)		
	37	75	149
Engine Power (kW)	37	75	149
Engine Power (hp)	50	100	200
1998	0.14	0.13	0.13
1999	0.13	0.12	0.12
2000	0.12	0.11	0.11
2001	0.10	0.10	0.10
2002	0.09	0.09	0.08
2003	0.08	0.08	0.07
2004	0.07	0.06	0.06
2005	0.06	0.05	0.05
2006-2009	0.04	0.04	0.04
2010 and newer	0.02	0.01	0.01

Source: conversion calculations

**CARB Emission Standards for Marine Spark-Ignition Engines and Vehicles: Exhaust Emission Standards**  
 where P stands for the maximum engine power in kilowatts (kW).

Model Year	HC + NOx (g/kW-hr)		CO (g/kW-hr)	
	P<=4.3 kW	P>4.3 kW	P<=4.3 kW	P>4.3 kW
2001-2003	81.00	$(0.25 * (151 + 557 / P^{0.9})) + 6.0$	—	—
2004-2007	64.80	$(0.20 * (151 + 557 / P^{0.9})) + 4.8$	—	—
2008 +	30.00	$(0.09 * (151 + 557 / P^{0.9})) + 2.1$	—	—
2009 +			500-5.0*P	300

Source: 13 CCR 2442, Emission Standards. Available at: [https://govt.westlaw.com/calregs/Document/DF97161C458740979280AFCDDB1CFDE0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/DF97161C458740979280AFCDDB1CFDE0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)). Accessed February 7, 2018.

**CARB Exhaust Emission Standards for Spark-Ignition Personal Watercraft and Outdoor Marine Engines of 50, 100, and 200 Horsepower**

Model Year	HC + NOx (g/kW-hr)		
	37	75	149
Engine Power (kW)	37	75	149
Engine Power (hp)	50	100	200
2001-2003	49	47	45
2004-2007	39	37	36
2008 +	18	17	16
Percent reduction from 1998 federal standard to 2008 CARB standard	89%	89%	89%
Increased level of stringency from 1998 model year to 2008 model year	9.1	9.1	9.0

Source: calculations  
 This shows that emission standard become more stringent the later the engine model year.

**CARB Exhaust Emission Standards for Spark-Ignition Personal Watercraft and Outdoor Marine Engines of 50, 100, and 200 Horsepower**

Model Year	HC + NOx (g/kW-hr)		
	37	75	149
Engine Power (kW)	37	75	149
Engine Power (hp)	50	100	200
2001-2003	0.04	0.04	0.04
2004-2007	0.03	0.03	0.03
2008 +	0.02	0.01	0.01

## Conversion Rates

### Mass Conversion Rates

<u>value</u>	<u>units</u>	<u>source</u>
1,000,000	g/MT	onlineconversion.com
2,000	lb/ton	onlineconversion.com
1,000	g/kg	onlineconversion.com
453.59237	g/lb	onlineconversion.com
907,184.74	g/ton	onlineconversion.com

### Time Conversions Rates

<u>rate</u>	<u>units</u>	<u>source</u>
365	days/year	The Sun

### Power

	<u>units</u>	<u>source</u>
0.7457	kW/hp	<a href="https://www.rapidtables.com/convert/power/hp-to-kw.html">https://www.rapidtables.com/convert/power/hp-to-kw.html</a>