AIR EMISSIONS GUIDE FOR AIR FORCE MOBILE SOURCES

METHODS FOR ESTIMATING EMISSIONS OF AIR POLLUTANTS FOR MOBILE SOURCES AT UNITED STATES AIR FORCE INSTALLATIONS

Air Force Civil Engineer Center
Compliance Technical Support Branch
2261 Hughes Ave., Ste 155
JBSA Lackland TX 78236-9853

XXX 2024

DRAFT

This page intentionally left blank.

DRAFT

AIR EMISSIONS GUIDE FOR AIR FORCE MOBILE SOURCES

METHODS FOR ESTIMATING EMISSIONS OF AIR POLLUTANTS FOR MOBILE SOURCES AT U.S. AIR FORCE INSTALLATIONS

Prepared for:

FRANK CASTANEDA, III., P.E., GS-14, DAF
Air Quality Subject Matter Expert
Air Force Civil Engineer Center,
Compliance Technical Support Branch
(AFCEC/CZTQ)
2261 Hughes Ave., Ste 155
JBSA Lackland TX 78236-9853

Prepared By:

Solutio Environmental, Inc.
407 8th St
San Antonio, TX 78215
http://www.solutioenv.com

Based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Signed: Solutio Environmental Inc.

DRAFT

This page intentionally left blank.

Table of Contents

ACRONYMS i
BREVITY CODES iii
ABBREVIATIONS vii
1.0 INTRODUCTION 1
1.1 Background and Purpose 1
1.2 Mobile Sources 2
1.3 Air Emissions Inventories (AEIs) 2
1.3.1 Title II – Emission Standards for Moving Sources 3
1.3.2 Implementation Plans 4
1.3.3 General Conformity 4
1.3.4 National Environmental Policy Act (NEPA) 4
1.3.5 Other Inventory Uses 5
1.4 Emissions Inventory Methodologies 5
1.5 Pollutants 6
1.5.1 Criteria Pollutants 6
1.5.2 Hazardous Air Pollutants (HAPs) 9
1.5.3 Greenhouse Gases (GHGs) 9
1.6 Document Organization 11
1.7 References 12
2.0 AIRCRAFT FLIGHT OPERATIONS (AOPS) 15
2.1 Introduction 15
2.2 Mixing Zone Height and Region of Influence 16
2.2.1 Mixing Height 16
2.2.2 Region of Influence (ROI) 17
2.3 Aircraft Flight Operations 20
2.3.1 Fixed-Wing Aircraft Flight Operations 20
2.3.2 Rotary (Helicopter) Aircraft Flight Operations 23
2.4 Jet Fuel 26
2.4.1 Synthetic Aviation Fuel 26
2.5 Emission Factors 27

2.6 Emissions Calculations 27
2.6.1 Fixed-Wing Aircraft Emissions 27
2.6.2 Auxiliary Power Unit Emissions 30
2.6.3 Trim Pad and On-Wing Testing 31
2.6.4 Rotary Aircraft Emissions 32
2.6.5 Calculating SO_2 Emissions 33
2.6.6 Calculating HAP Emissions 36
2.6.7 Lead (Pb) Emissions 36
2.6.8 Greenhouse Gas (GHG) Emissions 36
2.6.9 HAP Speciation 37
2.6.10 International Civil Aviation Organization (ICAO) Emission Factors 37
2.7 Information Resources 40
2.8 Example Calculations 41
2.8.1 Problem 1 – Landing and Takeoff Cycle Emissions 41
2.8.2 Problem 2 – Auxiliary Power Unit Emissions 42
2.8.3 Problem 3 – On-Wing Engine Testing 43
2.8.4 Problem 4 – Flight Cycle Emissions 46
2.9 References 141
3.0 FLIGHTLINE GROUND SUPPORT EQUIPMENT (AGE) 145
3.1 Introduction 145
3.2 Emission Factors 146
3.3 Emissions Calculation 146
3.3.1 Sortie/LTO Method (Preferred Method) 146
3.3.2 Horsepower/Load Factor Method 147
3.3.3 Fuel Consumption Method 148
3.3.4 Calculating SO_2 Emissions 149
3.3.5 Calculating Emissions from Synthetic Aviation Fuel 150
3.4 Information Resources 150
3.5 Example Calculations 151
3.5.1 Problem 1 – Sortie/LTO Method 151
3.5.2 Problem 2 – Horsepower/Load Factor Method 153

131 3.5.3 Problem 3 – Fuel Consumption Method 154
132 3.5.4 Problem 4 – Estimating SO_2 Emissions 154
133 3.6 References 176
134 4.0 NONROAD ENGINES AND EQUIPMENT (NRDE) 179
135 4.1 Introduction 179
136 4.2 Emission Factors 180
137 4.2.1 Alternative Fuels and Emissions Reduction 181
138 4.3 Emissions Calculation 182
139 4.3.1 Emissions Estimation Using the EPA NONROAD Model 182
140 4.3.2 Horsepower/Load Factor Method 183
141 4.3.3 Fuel Consumption Method 183
142 4.3.4 VOC and HAP Speciation 184
143 4.4 Information Resources 185
144 4.5 Example Calculations 186
145 4.5.1 Problem 1 – Estimating Emissions Using the Horsepower/Load Factor Method 186
146 4.5.2 Problem 2 – Estimating Emissions Using Fuel Consumption 187
147 4.5.3 Problem 3 – Estimating SO_X Emissions 188
148 4.5.4 Problem 4 – Estimating Emissions from the Use of B20 189
149 4.6 References 245
150 5.0 ON-ROAD VEHICLES (VEHE) 247
151 5.1 Introduction 247
152 5.1.1 Vehicle Categories 249
153 5.1.2 Vehicle Fleet Characterization 250
154 5.1.3 Tactical Vehicles 250
155 5.2 Emission Factors 254
156 5.2.1 Vehicle Exhaust Emissions 254
157 5.2.2 Fugitive Particulate Matter (PM) Emissions 259
158 5.3 Emission Calculations 263
159 5.3.1 Vehicle Exhaust Emissions – Typical Vehicle Operation 263
160 5.3.2 Vehicle Exhaust Emissions – Idling 270
161 5.3.3 Fugitive PM Emissions 272

5.3.4 VOC Speciation 272
5.4 Information Resources 273
5.5 Example Problems 274
5.5.1 Problem 1 – Calculating POV and GOV Emissions Using Method 1 274
5.5.2 Problem 2 – Calculating GOV Emissions Using Method 2 276
5.5.3 Problem 3 – Calculate POV Emissions Using Method 2 279
5.5.4 Problem 4 – Calculating POV Emissions Using Method 3 283
5.5.5 Problem 5 – Calculating Fugitive PM Emissions 286
5.6 References 467
6.0 FUEL TRANSFER (FDSP, FLD) – EXCLUDES ON-ROAD VEHICLE REFUELING 470
6.1 Introduction 470
6.2 Emission Factors 478
6.3 Control and Capture Efficiencies 479
6.4 Emission Calculations 481
6.4.1 VOC Emissions Calculations (Preferred Method) 481
6.4.2 VOC Emissions Calculations (Emission Factor Alternative Method) 482
6.4.3 HAP Emissions Calculation 483
6.5 Information Resources 485
6.6 Example Problems 485
6.6.1 Problem 1 – Preferred Method 485
6.6.2 Problem 2 – Emission Factor Method 488
6.7 References 489
Appendix A – EPA HAP List 492

List of Tables

Table 1-1. Global Warming Potentials 11
Table 2-1. Fuel Emission Reduction Factors (FERFs) for JP-8/Synthetic Fuel Blends 27
Table 2-2. Average Sulfur Content of JP-8 35
Table 2-3. GHG Emission Factors for Aircraft Engines 36
Table 2-4. Comparison of Commercial and Military Fixed-Wing LTO Cycle Modes 48
Table 2-5. Default Time-in-Mode for Various Aircraft Categories 49
Table 2-6. Military Airframe/Engine/APU Combinations 50
Table 2-7. Military Helicopter/Engine/APU Combinations 61
Table 2-8. Commercial Airframe/Engine/APU Combinations 64
Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants 69
Table 2-10. VOC and HAP Emission Factors for Select Engines 115
Table 2-11. HAP Mass Fractions in Aircraft Engine Exhaust 138
Table 2-12. Criteria Pollutant and GHG Emission Factors for APUs 139
Table 3-1. Fuel Data 150
Table 3-2. Military Aircraft and GSE Assignments 156
Table 3-3. Military Aircraft GSE Emission Factors 166
Table 3-4. Typical Commercial Aircraft GSE Assignments 169
Table 3-5. Common GSE Operating Parameters 170
Table 3-6. Common GSE Emission Factors 173
Table 3-7. Speciated HAP Emission Factors for Uncontrolled Diesel Reciprocating Internal Combustion Engines 175
Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2023 191
Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2024 201
Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2025 211
Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2026 221
Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2027 231
Table 4-6. Pre-1998 Non-Road CI Engine Criteria Pollutant Emission Factors (Power Rating > 50 hp) 242
Table 4-7. Weight Percent Speciation of VOC Emissions for Non-Road Engines 244
Table 5-1. Air Force On-Road Vehicle Categories 251
Table 5-2. Typical Air Force POV & GOV Mix 252
Table 5-3. GOV Tactical and Non-Tactical Vehicle Mix 253
Table 5-4. MOVES4 Model Inputs and Default Values 255
Table 5-5. EMFAC2021 Model Inputs and Default Values 256
Table 5-6. Idling Emission Factors for On-Road Vehicles 257
Table 5-7. Alternative Fuel Emission Reduction Factors (FERFs) 259
Table 5-8. Fugitive PM Emission Factors 260
Table 5-9. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2024 POV 289

Table 5-10. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2025 POV 290
Table 5-11. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2026 POV 291
Table 5-12. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2027 POV 292
Table 5-13. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2028 POV 293
Table 5-14. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2024 GOV 294
Table 5-15. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2025 GOV 295
Table 5-16. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2026 GOV 296
Table 5-17. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2027 GOV 297
Table 5-18. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2028 GOV 298
Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 299
Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 306
Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 313
Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 320
Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 327
Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 334
Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 342
Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 350
Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 358
Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 366
Table 5-29. EMFAC County-Specific On-Road Vehicle Composite EFs – 2024 POV 374
Table 5-30. EMFAC County-Specific On-Road Vehicle Composite EFs – 2025 POV 375
Table 5-31. EMFAC County-Specific On-Road Vehicle Composite EFs – 2026 POV 376
Table 5-32. EMFAC County-Specific On-Road Vehicle Composite EFs – 2027 POV 377
Table 5-33. EMFAC County-Specific On-Road Vehicle Composite EFs – 2028 POV 378
Table 5-34. EMFAC County-Specific On-Road Vehicle Composite EFs – 2024 GOV 379
Table 5-35. EMFAC County-Specific On-Road Vehicle Composite EFs – 2025 GOV 380
Table 5-36. EMFAC County-Specific On-Road Vehicle Composite EFs – 2026 GOV 381
Table 5-37. EMFAC County-Specific On-Road Vehicle Composite EFs – 2027 GOV 382
Table 5-38. EMFAC County-Specific On-Road Vehicle Composite EFs – 2028 GOV 383
Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 384
Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 392

Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 400
Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 408
Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 416
Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 424
Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 432
Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 440
Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 448
Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 456
Table 5-49. OCONUS On-Road Composite Vehicle Emission Factors – POV 464
Table 5-50. OCONUS On-Road Composite Vehicle Emission Factors – GOV 464
Table 5-51. On-Road Vehicle Speciated VOC Weight Fractions 465
Table 6-1. Fuel Loading Saturation Factors 478
Table 6-2. Vapor Pressures for Various Fuels 479
Table 6-3. Typical Fuel Truck Capture Efficiencies 480
Table 6-4. Typical Fuel Transfer Control Efficiencies 480
Table 6-5. VOC Emission Factors for Fuel Dispensing/Loading 481
Table 6-6. Weight Percent of HAPs in Fuels commonly used at Air Force Installations 484
Table 6-7. Fuel Properties 485

List of Figures

Figure 2-1. ROI 18
Figure 2-2. Multiple ROIs 18
Figure 2-3. Fixed-Wing LTO Cycle 22
Figure 2-4. Fixed-Wing CP Cycle 22
Figure 2-5. Fixed-Wing LFP Cycle 23
Figure 2-6. Rotary LTO Cycle 24
Figure 2-7. Rotary CP Cycle 25
Figure 2-8. Rotary LFP Cycle 26
Figure 5-1. Mean Number of Days in the Year with Precipitation of 0.01 Inches or More 262
Figure 6-1. Simple Fuel Dispensing Control Volume 471
Figure 6-2. Splash Loading, Submerged Fill Pipe, and Bottom Loading Methods 471
Figure 6-3. Typical On-Base Fuel Transfer Activities and Destinations 472
Figure 6-4. Fuel Transfer Control Volume – Preferred Method 482
Figure 6-5. Fuel Transfer Control Volume – Emission Factor Method 482

ACRONYMS

(Words formed from the initial letters of a name or parts of a series of words.)

AAFES	Army & Air Force Exchange Service
ACAM	Air Conformity Applicability Model
AFCEC	Air Force Civil Engineer Center
AFMAN	Air Force Manual
AGE	Aerospace Ground Equipment
ALAPCO	Association of Local Air Pollutant Control Officials
AMX	Aircraft Maintenance Squadron
APIMS	Air Program Information Management System
ARAR	Applicable or Relevant and Appropriate Requirements
BEE	Bioenvironmental Engineer
BOOS	Burners Out of Service
CAIR	Clean Air Interstate Rule
CALMIM	California Landfill Methane Inventory Model
CARB	California Air Resource Board
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CONUS	Continental United States
DAC	Defense Ammunition Center
DODIC	Department of Defense Identification Codes
ECOM	External Combustion Engine
EESOH-MIS	Enterprise Environmental, Safety and Occupational Health Management Information System
EIAP	Environmental Impact Analysis Process
EPAct	Energy Policy Act
EPCRA	Emergency Planning and Community Right-to-Know Act
FESOP	Federally Enforceable State Operating Permit
FIRE	Factor Information Retrieval System
HAP	Hazardous Air Pollutant
HAZMART	Hazardous Materials Pharmacy
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating, and Air Conditioning
ICAO	International Civil Aviation Organization
ICOM	Internal Combustion Engine
LAER	Lowest Achievable Emissions Rate
LandGEM	Landfill Gas Emissions Model
MAJCOM	Major Command
MEM	Mass of Energetic Material

342	MIDAS	Munitions Items Disposition Action System
343	NAAQS	National Ambient Air Quality Standards
344	NAICS	North American Industry Classification System
345	NASA	National Aeronautics and Space Administration
346	NEPA	National Environmental Policy Act
347	NESHAP	National Emission Standards for Hazardous Air Pollutants
348	NEW	Net Explosive Weight
349	OCONUS	Outside Continental United States
350	OTAQ	Office of Transportation and Air Quality
351	PEMS	Predictive Emissions Monitoring System
352	RCRA	Resource Conservation and Recovery Act
353	SAR	Second Assessment Report
354	SAW	Submerged Arc Welding
355	SIC	Standard Industrial Classification
356	SIP	State Implementation Plan
357	SMAW	Shielded Metal Arc Welding
358	SME	Subject Matter Expert
359	STAPPA	State and Territorial Air Pollution Program Administrators
360	TIM	Time in Mode
361	USAF	United States Air Force
362	VIN	Vehicle Identification Number

363

BREVITY CODES

(Shortened form of a frequently used group of words, phrase, or sentence consisting of entirely upper-case letters. Each letter is spoken individually.)

AB	Afterburner
AEI	Air Emissions Inventory
AERR	Air Emissions Reporting Requirements
AFB	Air Force Base
AFI	Air Force Instruction
AFPMB	Armed Forces Post Management Board
AFRL	Air Force Research Laboratory
APU	Auxiliary Power Unit
BFB	Bubbling Fluidized Bed
BMP	Best Management Practices
BSFC	Brake-Specific Fuel Consumption
CAA	Clean Air Act
CAAA	Clean Air Act Amendments (of 1990)
CE	Civil Engineering
CEMS	Continuous Emission Monitoring System
CEV	Civil Engineering Environmental
CFB	Circulating Fluidized Bed
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CI	Compression Ignition
CNG	Compressed Natural Gas
DLA	Defense Logistics Agency
DoD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EDMS	Emissions and Dispersion Modeling System
EF	Emission Factor
EGBE	Ethylene Glycol Butyl Ether
EIIP	Emissions Inventory Improvement Program
EIP	Emissions Inventory Plan
EIR	Emissions Inventory Report
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESP	Electrostatic Precipitator

ESTCP	Environmental Security Technology Certification Program
FAA	Federal Aviation Administration
FBC	Fluidized Bed Combustor
FCAW	Flux-Cored Arc Welding
FF	Fabric Filter
FFR	Fuel Flow Rate
FFV	Flexible Fuel Vehicles
FGD	Flue Gas Desulphurization
FGR	Flue Gas Recirculation
GHG	Greenhouse Gas
GMAW	Gas Metal Arc Welding
GOV	Government Owned Vehicle
GSA	General Services Administration
GSE	Ground Support Equipment
GVW	Gross Vehicle Weight
GWP	Global Warming Potential
HBFC	Hydrobromofluorocarbon
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbon
HCP	Hard Chrome Plating
HEI	High Explosive Incendiary
HEV	Hybrid Electric Vehicle
HHV	High Heat Value
HMA	Hot Mix Asphalt
HVLP	High Volume Low Pressure
HVOF	High Velocity Oxy-Fuel
IC	Internal Combustion
IPCC	Intergovernmental Panel on Climate Change
IPCT	Industrial Process Cooling Towers
IRP	Installation Restoration Program
LDF	Liquid Drift Factors
LEL	Lower Explosive Limit
LFB	Low Flyby
LFP	Low Flight Pattern
LGRVM	Vehicle Management Flight Vehicle Maintenance
LNB	Low NOx Burner
LPG	Liquified Petroleum Gas
LTO	Landing and Takeoff
MEK	Methyl Ethyl Ketone
MM	Minutemen Missiles

444	MPF	Military Personnel Flight
445	MPO	Metropolitan Planning Office
446	MSDS	Material Safety Data Sheet
447	MSW	Municipal Solid Waste
448	NACAA	National Association of Clean Air Agencies
449	NC	Nameplate Capacity
450	NDI	Non-destructive Inspection
451	NEI	National Emission Inventory
452	NMHC	Non-Methane Hydrocarbon
453	NMOC	Non-Methane Organic Compound
454	NMTOC	Non-Methane Total Organic Compound
455	NSCR	Nonselective Catalytic Reduction
456	NSPS	New Source Performance Standards
457	NSR	New Source Review
458	OBOD	Open Burning/Open Detonation
459	OBODM	Open Burning/Open Detonation Model
460	OCA	Off-Site Consequences Analysis
461	ODC	Ozone Depleting Chemical
462	ODP	Ozone Depletion Potential
463	ODS	Ozone Depleting Substances
464	OIAI	Once In Always In
465	OLVIMS	On-line Vehicle Interactive Management System
466	P2	Pollution Prevention
467	PAH	Polycyclic Aromatic Hydrocarbon
468	PBT	Persistent Bioaccumulative and Toxic
469	PM	Particulate Matter – Aerodynamic diameter unspecified
470	PM10	Particulate Matter – Aerodynamic diameter < 10 micrometers
471	PM2.5	Particulate Matter – Aerodynamic diameter < 2.5 micrometers
472	POL	Petroleum, Oil, and Lubricant
473	POTW	Publicly Owned Treatment Works
474	POV	Privately Owned Vehicles
475	PSD	Prevention of Significant Deterioration
476	PTE	Potential to Emit
477	RMP	Risk Management Plan
478	RVP	Reid Vapor Pressure
479	SCC	Source Classification Code
480	SDS	Safety Data Sheet
481	SCR	Selective Catalytic Reduction
482	SF	Spillage Factor
483	SI	Spark Ignition

SNCR	Selective Non-Catalytic Reduction
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TGO	Touch-and-Go
THC	Total Hydrocarbons
TLG	Total Landfill Gas
TNMOC	Total Non-Methane Organic Compounds
TO	Technical Order
TOC	Total Organic Compounds
TOG	Total Organic Gases
TRI	Toxic Release Inventory
TSD	Treatment, Storage, & Disposal
TSP	Total Suspended Particulate
ULSD	Ultra-Low Sulfur Diesel
US	United States
USDA	United States Department of Agriculture
UST	Underground Storage Tanks
UV	Ultraviolet
VKT	Vehicle Kilometers Traveled
VMIF	Vehicle Maintenance Index File
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

ABBREVIATIONS

(Shortened form of a word or phrase)

µg	Microgram(s)
A-hr	Ampere-hours
A/ft^2	Ampere per square foot
Btu	British Thermal Unit
°C	Degrees Celsius
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
Co	Cobalt
Cr	Chromium
Cr^{+6}	Hexavalent Chromium
Cr_2O_3	Chromium Oxide
EtO	Ethylene Oxide
°F	Degrees Fahrenheit
ft	Foot (Feet)
g	Grams
g/L	Grams per Liter
gal	Gallon(s)
HCl	Hydrochloric Acid
hp	Horsepower
hr	Hour(s)
kg	Kilogram(s)
kW	Kilowatt(s)
L	Liter
lb	Pound(s)
Mg	Megagram(s) [i.e., metric ton]
mg	Milligram(s)
MMBtu	Million British Thermal Units
Mn	Manganese
NH_3	Ammonia
Ni	Nickel
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
O_3	Ozone
Pb	Lead
PERC	Perchloroethylene

PFC	Perfluorocarbon
ppm	Parts per Million
ppmv	Parts per Million by Volume
ppmw	Parts per Million by Weight
psi	Pounds per Square Inch
psia	Pounds per Square Inch Absolute
°R	Degrees Rankin
scf	Standard Cubic Foot
SF_6	Sulfur Hexafluoride
SO_2	Sulfur Dioxide
SO_X	Sulfur Oxides
TNT	Trinitrotoluene
tpy	Tons per Year
yr	Year(s)

1.0 INTRODUCTION

1.1 Background and Purpose

The Clean Air Act (CAA) established the requirements to quantify and report air pollutant emissions from mobile and stationary sources. The purpose of the CAA is to protect public health by addressing the risks posed by certain air pollutants. The United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) which require facility managers to always know if they comply with air regulations. The EPA regulates most mobile sources of air pollution (e.g., automobiles at 40 Code of Federal Regulations (CFR) 85-86, and airplanes at 40 CFR 87, etc.) under Title II of the CAA. Performance standards issued by the EPA limit the emission of certain pollutants from these sources. Fuel-related requirements under Title II at 40 CFR 79-80 are designed to further reduce emissions from mobile sources.

For an installation, such as an Air Force base, the total air pollutant emissions are determined by conducting an Air Emissions Inventory (AEI). An air emissions inventory is the sum of all air pollutant emissions from each source over a stated period of time, typically one year. Air quality regulations vary from region to region and the local regulatory agency should be consulted prior to conducting an AEI since some local agencies have specific data reporting requirements and/or protocols that the installation must obey. An AEI must be periodically updated as required by federal, state, and local regulations. **Each installation must calculate and record all collected data in the Air Program Information Management System (APIMS).** AEIs must be updated any time there is a change in mission, equipment, and/or operating procedures that result in a substantial change (approximately 5%) in air emissions.

The purpose of this guide is to provide authoritative documentation for National Environmental Policy Act (NEPA) and General Conformity analyses, *not* for conducting AEIs comprised solely of mobile emissions sources (Mobile AEIs). Mobile source AEIs are primarily conducted to provide data during the development of State Implementation Plan (SIP) budgets. However, since the SIP only accounts for criteria and precursor pollutants, it is unnecessary to calculate emissions for other pollutants though emission factors (EFs) may be provided in this guide. It is still imperative that the USAF adopts a uniform approach to calculating air pollutant emissions for the most common mobile sources found at USAF installations. This guide serves this purpose by being the USAF's single authoritative resource for mobile source emission estimating algorithms and EFs; no other algorithms or EFs shall be used unless mandated by a legally enforceable regulatory requirement (e.g., permit stipulates) or approved by Air Force Civil Engineer Center/Environmental Quality Technical Support Branch (AFCEC/CZTQ) that is reviewed on a case-by-case basis.

Any questions concerning this guide, or requests for additional information pertaining to Air Force AEIs, should be directed to the Air Quality Subject Matter Expert; AFCEC Compliance Technical Support Branch located at, 2261 Hughes Ave., Ste 155 JBSA Lackland TX 78236-9853.

1.2 Mobile Sources

This guide only addresses mobile emission sources typically found on USAF installations. A mobile source is defined as any type of non-stationary equipment that may emit an air pollutant subject to regulation by the CAA. These mobile sources include aircraft and aircraft support equipment, on-road vehicles, and non-road engines. The description of stationary sources contributing to air emissions and the methods for calculating these emissions may be found in the *Air Emissions Guide for Air Force Stationary Sources*. It should be noted that certain districts may classify non-road engines as a stationary source rather than a mobile source, therefore it is important to consult with the local air quality district for clarification as needed.

1.3 Air Emissions Inventories (AEIs)

AFMAN 32-7002, Environmental Compliance and Pollution Prevention, states the following regarding AEIs:

> 4.5.1. Air Emissions Inventory (AEI). The Installation Environmental Element must prepare and periodically update an AEI, using APIMS, for all installation stationary air emission sources in accordance with applicable state or local requirements promulgated per 40 CFR Part 51, Subpart A and current AF AEI guidance from AFCEC/CZ. **(T-0)**.
>
> 4.5.1.1. Regulatory-required stationary AEIs are completed at the frequency specified by federal, state, and local regulations.
>
> 4.5.1.2. Comprehensive stationary AEIs (applicable to all installations, including overseas) include all emissions sources (i.e., both permitted and non-permitted sources). The Installation Environmental Element will annually review/validate APIMS to ensure currency of the AEI (i.e., sources and consumption data is representative of the current base conditions). **(T-1)**. A comprehensive review of all sources and associated consumption data for the AEI will be conducted at least every three years (five years for overseas and remotely located facilities) to accurately reflect current emissions. **(T-1)**.

4.5.1.3. Stationary source AEIs include all criteria pollutants, Hazardous Air Pollutants, and greenhouse gases and reflect the installation's current actual and PTE emissions. Annual regulatory emissions reports, a subset of the comprehensive AEI, are provided to federal, state, and local (including Metropolitan Planning Organization or other regional) regulatory agencies as required. Greenhouse gas reporting mandated by E.O. 13834, is accomplished by SAF/IEE in conjunction with the Annual Energy Management and Resilience reporting process.

4.5.1.4. For installations that exceed the greenhouse gas reporting threshold, the Installation Environmental Element shall accomplish greenhouse gas reporting mandated by 40 CFR Part 98. **(T-0)**. Recommend other installations within 10% of the greenhouse gas reporting threshold accomplish greenhouse gas estimates in accordance with the nondirective Guide to the Mandatory Greenhouse Gas Reporting Rule and Greenhouse Gas Tailoring Rule, issued by AFCEC/CZ. Results will be reported to AFCEC/CZ via APIMS. **(T-1)**. Greenhouse gas reporting mandated by E.O. 13834 is accomplished by SAF/IEE in conjunction with the Annual Energy Management and Resilience reporting processes.

This guide describes the recommended methodologies for calculating actual emissions (i.e., from existing sources) and projected emissions (i.e., from projected federal actions). AEIs of these emissions may be required to fulfill a requirement for reporting for a certain period and frequency (e.g., reported for the previous calendar year on an annual basis). AEIs are usually accomplished to meet one or more regulatory requirement(s). The most common regulatory requirements for conducting a mobile source AEI are summarized below.

1.3.1 Title II – Emission Standards for Moving Sources

The EPA regulates most mobile sources of air pollution under Title II of the CAA which sets the standards for motor vehicle and aircraft emissions. Under Title II, the standards are set to control emissions that may endanger public health and welfare. Title II goes on to state that for motor vehicles, it is the manufacturer's responsibility to establish and perform tests which evaluate the emissions from the device. All testing results are to be maintained/documented and must be made available to any agent of the enforcement authority when requested. Similarly, Title II of the CAA states that the Secretary of Transportation will work to ensure that all aircraft emissions comply with the established air pollution standards.

1.3.2 Implementation Plans

As specified under Section 110 of the Clean Air Act, all States are required to submit a SIP to the EPA which provides for the protection and enhancement of air quality to promote public health and welfare. The SIP provides details for implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS). For areas in the State that are classified as nonattainment with any NAAQS, the SIP must provide strategies for obtaining attainment. For areas in the State that are already classified as being in attainment, the SIP must provide strategies for maintaining attainment status. All SIPs and SIP revisions must be reviewed and approved by the EPA. If the EPA considers a SIP to be incomplete or inadequate, they may issue their own plan called a Federal Implementation Plan (FIP).

Historically, most control strategies incorporated into implementation plans have targeted stationary sources. However, due to the constant increase in the number of air pollution sources, the issuance of new ambient air quality standards, and the fact that mobile sources emit most of the overall emissions, more control strategies targeting mobile sources are now being incorporated into implementation plans. Since AEIs are typically used to assess the effect of control strategies, an increase in the number of control strategies pertaining to mobile sources will result in an increase in requirements to conduct mobile source AEIs.

1.3.3 General Conformity

Section 176(c) of the CAA prohibits federal activities from taking various actions in nonattainment or maintenance areas unless they first demonstrate conformance with their respective State Implementation Plan (SIP). "A Federal Agency must make a determination that a Federal action conforms to the applicable implementation plan in accordance with the requirements of this Subpart **before the action is taken**" (40 CFR 93.150(b)). A conformity review is a multi-step process used to determine and document whether a proposed action meets the conformity rule. There are two main components to this process: an **applicability analysis** first establishes if a full-scale conformity determination is required and, if it is, a **conformity determination** assesses whether the action conforms to the SIP. The general conformity program requires all federal actions in nonattainment and maintenance areas to comply with the appropriate SIP. An emissions inventory is usually required as part of the conformity determination to identify/quantify air emissions from the proposed federal actions.

1.3.4 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) requires Federal agencies to evaluate the environmental impacts associated with major actions that they either fund, support, permit, or implement. There are as many as three levels of analysis:

- **Categorical Exclusion Determination** – A proposed action may be categorically excluded from a detailed environmental analysis if the action meets certain criteria which a previous agency has determined to have no significant environmental impact.

- **Environmental Assessment (EA)** – An EA is an evaluation to determine if a proposed action that was not categorically excluded would significantly affect the environment. If effects are not significant, the agency issues a Finding of No Significant Impact (FONSI). If the EA concludes the action results in a significant environmental impact, an Environmental Impact Statement must be prepared.

- **Environmental Impact Statement (EIS)** – An EIS is a detailed evaluation of the proposed action, and its alternatives. A draft EIS is filed with the EPA and the EPA publishes a "Notice of Availability" in the Federal Register. Publication of the "Notice of Availability" begins a 45-day public comment period and mandatory 30-day waiting period before the agency can decide on the proposed action.

1.3.5 Other Inventory Uses

Complying with environmental regulations is not the only reason AEIs are conducted. An AEI can be a useful tool in helping industrial facilities implement various environmental programs. The most common program that may involve mobile source emission inventories is summarized below.

1.3.5.1 Pollution Prevention (P2) Opportunities

An AEI can be a useful tool in identifying air related P2 opportunities on military installations. The inventory identifies the types of air pollution sources on base and their accompanying emissions. Due to the large amount of emissions produced from mobile sources, as well as emerging technologies/strategies for reducing mobile source emissions, implementing P2 opportunities for mobile sources is becoming more commonplace.

1.4 Emissions Inventory Methodologies

When conducting an AEI, the quantity of regulated pollutants emitted from all emission sources located on an Air Force installation (except those sources that are specifically exempt) must be determined. Several methods can be used to quantify air pollutants from emission sources. Data from source-specific emission tests or continuous emission monitoring systems (CEMS) are usually preferred for estimating a source's emissions. The CEMS data provides the best representation of the tested source's emissions. However, source-specific emission tests or continuous emission monitoring of mobile sources at a large installation, such as an Air Force

base, may be impractical. Therefore, EFs and/or mass balance calculations are frequently the best or only method available for estimating emissions, despite their limitations.

An EF is a representative value that attempts to relate the quantity of a pollutant emitted with an activity. These factors are usually expressed as the mass of pollutant released per a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., pounds of a pollutant emitted per 1,000 pounds of fuel burned). In most cases, these factors are simply an average of all available data of acceptable quality and are generally assumed to be representative of long-term averages for all processes in the source category (i.e., a population average).

The general equation for emission estimation using an EF is:

$$\boldsymbol{E = A \times EF \times N}$$

Equation 1-1

Where,

- $\boldsymbol{E}$ = Total emissions
- $\boldsymbol{A}$ = Activity rate
- $\boldsymbol{EF}$ = Emission factor
- $\boldsymbol{N}$ = Number of engines/aircraft/equipment

For some sources, a mass balance approach may provide a better, more accurate estimate of emissions than emission tests would. In general, mass balances are appropriate for use in situations where a high percentage of material is lost to the atmosphere (e.g., sulfur in fuel). As the term implies, all the materials going into and coming out of the process must be considered to allow an emission estimation to be credible.

1.5 Pollutants

Although there are several types (groups/classes) of federal and state regulated pollutants which may be addressed in an AEI, this guide focuses on criteria pollutants, Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs), and Greenhouse Gases (GHGs).

1.5.1 Criteria Pollutants

In 1971, the EPA established National Ambient Air Quality Standards (NAAQS) for six pollutants which are termed criteria pollutants. These include particulate matter (PM), ozone (O_3), carbon monoxide (CO), sulfur oxides (SO_X), nitrogen oxides (NO_X), and lead (Pb). The NAAQS were established to regulate the emissions of the criteria pollutants using human health-

based and/or environmentally based criteria for setting permissible levels. The criteria pollutants are described in more detail below:

Particle Pollution – often referred to as Particulate Matter (PM):

- PM includes the very-fine dust, soot, smoke, and droplets formed from chemical reactions and incomplete burning of fuels.
- The fine particles of PM can get deep into the lungs, causing increased respiratory illnesses and tens of thousands of deaths each year.
- PM is defined as any particle with an equivalent aerodynamic diameter of less than or equal to 10 microns (**PM_{10}**) and is further subdivided to include a separate standard for particles with an equivalent aerodynamic diameter of less than or equal to 2.5 microns (**$PM_{2.5}$**).

Ground-Level Ozone (O_3):

- O_3 is a primary component of smog that causes human health problems and damage to forests and agricultural crops.
- Repeated exposure to O_3 can make people more susceptible to respiratory infections and lung inflammation.
- Though there is a NAAQS, **O_3 is not emitted directly into the air.**
- Two types of compounds that are the main ingredients (precursors) in forming ground-level O_3 in the presence of ultraviolet (UV) light include:
  - **Volatile Organic Compounds (VOCs):** Defined as "any compound of carbon, excluding carbon monoxide (CO), carbon dioxide (CO_2), carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions" (40 CFR 51.100). Note that 40 CFR 51.100 also exempts compounds based on their negligible photochemical reactivity. Examples of these exempt compounds include methane, ethane, acetone, et al. Common sources of VOCs include gas and diesel-fueled automobiles, fuel storage containers, and solvents used in paints and degreasers.
  - **Nitrogen oxides (NO_X):** Provides the reddish-brown tint in smog. These are produced from the burning of fossil fuels (e.g., gasoline, coal, or oil).

Carbon Monoxide (CO):

- CO is produced when fossil fuel burns incompletely because of insufficient oxygen (O_2).
- Wood, coal, and charcoal fires and gasoline engines always produce CO.
- In the United States, particularly in urban areas, most CO air emissions are from mobile sources.

- CO can cause harmful health effects by reducing O_2 delivery to the body's organs (like the heart and brain) and tissues.

Sulfur Oxides (SO_X):

- Sulfur Oxides are a group of molecules made of sulfur and oxygen atoms, such as Sulfur Dioxide (SO_2), and Sulfur Trioxide (SO_3).
- Since SO_2 is the most common form of the sulfur oxides, the EPA uses it as an indicator for the larger group of SO_X.
- SO_2 in the ambient air is just one of several sulfur oxides that contribute to air quality issues.
- SO_X emissions are produced from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent)
- SO_X is linked to several adverse effects on the respiratory system.

Nitrogen Oxides (NO_X):

- Nitric Oxide (NO), Nitrogen Dioxide (NO_2), and nitrate radicals (NO_3) are collectively called Nitrogen Oxides (NO_X)
- NO_2 is a subgroup of nitrogen oxides and is the most environmentally concerning component. It also acts as an indicator for the presence of the larger group of NO_X.
- NO_X forms quickly from vehicle, power plant, and off-road equipment emissions.
- NO_X contributes to the formation of ground-level O_3 and fine particle pollution.
- NO_X causes airway inflammation and can increase breathing problems for people with compromised respiratory systems (e.g., asthma).

Lead (Pb):

- Pb is a metal found naturally in the environment as well as in manufactured products.
- Prior to 1980, the major sources of Pb were on-road vehicles. As a result, the EPA removed Pb from motor vehicle gasoline, resulting in a 95% decline in Pb emissions between 1980 and 1999.
- Today, the major sources of Pb are ore and metals processing (e.g., lead smelters).
- Depending on the level of exposure, Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system.

1.5.2 Hazardous Air Pollutants (HAPs)

According to the EPA (USEPA 2016), "Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects." HAPs include the toxic compounds regulated under Section 112(b) of the CAA. The EPA has been charged with continually analyzing available data on HAPs and revising the regulated list of HAPs. The EPA has also established procedures for both "listing" and "delisting" HAPs. A total of 189 compounds were on the original HAP list, though four compounds have since been removed from this list. These compounds include hydrogen sulfide, in December 1991, caprolactam in June 1996 (61FR30816), ethylene glycol monobutyl ether (EGBE) in November 2004 (69FR69320), and methyl ethyl ketone (MEK) in December 2005 (70FR75047). Changes to the HAPs list are found in 40 CFR Part 63, Subpart C. Since the information contained within this document is for NEPA and General Conformity, the inclusion of HAP emissions is purely informational.

1.5.3 Greenhouse Gases (GHGs)

The emissions of GHGs have garnered more attention in recent years as their potential impact on global climate change has been explored in greater detail. Consequently, the world population's contribution to GHG emission has been under increased scrutiny. Some GHGs, such as carbon dioxide (CO_2), occur naturally and are emitted into the atmosphere through natural processes as well as human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The principal GHGs that enter the atmosphere because of human activities are CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorinated gases.

- CO_2 enters the atmosphere through the burning of fossil fuels, (which include oil, natural gas, and coal), solid waste, trees and wood products, and through other chemical reactions (e.g., cement manufacturing). CO_2 is removed (or sequestered) from the atmosphere when it is absorbed by plants and the ocean as part of the global carbon cycle.
- CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are powerful, synthetic GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting chemicals (i.e., CFCs, HCFCs, and halons).

GHGs are assigned a Global Warming Potential (GWP), a measurement of how much heat the gas traps in the atmosphere calculated over a specific time interval, typically 100 years. The higher the GWP, the greater the potential for the gas to trap heat, and the more harmful the gas is regarded. CO_2 is used as the baseline gas and is assigned a GWP of 1. GHG emissions are converted into equivalent CO_2 (CO_2e) by taking the product of the emissions of each GHG and its respective GWP. Table A-1 of 40 CFR 98 provides the GWPs for several GHGs and is shown in Table 1-1. The GWP values used to calculate GHG emissions throughout this document are subject to change due to new data becoming available but are considered current as of May 2021. The total GHG emissions are calculated by summing all emissions from each gas and are generally derived using the following equation:

$$\boldsymbol{E(CO_2e)} = \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} [\boldsymbol{E(GHG)_i} \times \boldsymbol{GWP(GHG)_i}]$$

Equation 1-2

Where,

$E(CO_2e)$	=	Greenhouse gas emissions expressed as CO_2 equivalent (CO_2e)
$E(GHG)_i$	=	Emissions of individual GHG species i
$GWP(GHG)_i$	=	Global warming potential for GHG species i
i	=	GHG species, most commonly CO_2, CH_4, and N_2O

Table 1-1. Global Warming Potentials

Name	Chemical Formula	Global Warming Potential (100 yr.)
Carbon dioxide	CO_2	1
Methane	CH_4	25
Nitrous oxide	N_2O	298
HFC-23	CHF_3	14,800
HFC-32	CH_2F_2	675
HFC-41	CH_3F	92
HFC-125	C_2HF_5	3,500
HFC-134	$C_2H_2F_4$	1,100
HFC-134a	CH_2FCF_3	1,430
HFC-143	$C_2H_3F_3$	353
HFC-143a	$C_2H_3F_3$	4,470
HFC-152	CH_2FCH_2F	53
HFC-152a	CH_3CHF_2	124
HFC-161	CH_3CH_2F	12
HFC-227ea	C_3HF_7	3,220
HFC-236cb	$CH_2FCF_2CF_3$	1,340
HFC-236ea	CHF_2CHFCF_3	1,370
HFC-236fa	$C_3H_2F_6$	9,810
HFC-245ca	$C_3H_3F_5$	693
HFC-245fa	$CHF_2CH_2CF_3$	1,030
HFC-365mfc	$CH_3CF_2CH_2CF_3$	794
HFC-43-10mee	$CF_3CFHCFHCF_2CF_3$	1,640
Sulfur hexafluoride	SF_6	22,800
Trifluoromethyl sulphur pentafluoride	SF_5CF_3	17,700
Nitrogen trifluoride	NF_3	17,200
PFC-14 (Perfluoromethane)	CF_4	7,390
PFC-116 (Perfluoroethane)	C_2F_6	12,200
PFC-218 (Perfluoropropane)	C_3F_8	8,830
Perfluorocyclopropane	$C\text{-}C_3F_6$	17,340
PFC-3-1-10 (Perfluorobutane)	C_4F_{10}	8,860
PFC-318 (Perfluorocyclobutane)	$C\text{-}C_4F_8$	10,300
PFC-4-1-12 (Perfluoropentane)	C_5F_{12}	9,160
PFC-5-1-14 (Perfluorohexane, FC-72)	C_6F_{14}	9,300
PFC-9-1-18	$C_{10}F_{18}$	7,500
HCFE-235da2 (Isoflurane)	$CHF_2OCHClCF_3$	350

Name	Chemical Formula	Global Warming Potential (100 yr.)
HFE-43-10pccc (H-Galden 1040x, HG-11)	$CHF_2OCF_2OC_2F_4OCHF_2$	1,870
HFE-125	CHF_2OCF_3	14,900
HFE-134 (HG-00)	CHF_2OCHF_2	6,320
HFE-143a	CH_3OCF_3	756
HFE-227ea	$CF_3CHFOCF_3$	1,540
HFE-236ca12 (HG-10)	$CHF_2OCF_2OCHF_2$	2,800
HFE-236ea2 (Desflurane)	$CHF_2OCHFCF_3$	989
HFE-236fa	$CF_3CH_2OCF_3$	487
HFE-245cb2	$CH_3OCF_2CF_3$	708
HFE-245fa1	$CHF_2CH_2OCF_3$	286
HFE-245fa2	$CHF_2OCH_2CF_3$	659
HFE-254cb2	$CH_3OCF_2CHF_2$	359
HFE-263fb2	$CF_3CH_2OCH_3$	11
HFE-329mcc2	$CF_3CF_2OCF_2CHF_2$	919
HFE-338mcf2	$CF_3CF_2OCH_2CF_3$	552
HFE-338pcc13 (HG-01)	$CHF_2OCF_2CF_2OCHF_2$	1,500
HFE-347mcc3 (HFE-7000)	$CH_3OCF_2CF_2CF_3$	575
HFE-347mcf2	$CF_3CF_2OCH_2CHF_2$	374
HFE-347pcf2	$CHF_2CF_2OCH_2CF_3$	580
HFE-356mec3	$CH_3OCF_2CHFCF_3$	101
HFE-356pcc3	$CH_3OCF_2CF_2CHF_2$	110
HFE-356pcf2	$CHF_2CH_2OCF_2CHF_2$	265
HFE-356pcf3	$CHF_2OCH_2CF_2CHF_2$	502
HFE-365mcf3	$CF_3CF_2CH_2OCH_3$	11
HFE-374pc2	$CH_3CH_2OCF_2CHF_2$	557
HFE-449s1 (HFE-7100)	$C_4F_9OCH_3$	297
HFE-569sf2 (HFE-7200)	$C_4F_9OC_2H_5$	59
Sevoflurane (HFE-347mmz1)	$CH_2FOCH(CF_3)_2$	216
HFE-356mmz1	$(CF_3)_2CHOCH_3$	27
HFE-338mmz1	$CHF_2OCH(CF_3)_2$	380
(Octafluorotetramethy-lene) hydroxymethyl group	$X\text{-}(CF_2)_4CH(OH)\text{-}X$	73
HFE-347mmy1	$CH_3OCF(CF_3)_2$	343
Bis(trifluoromethyl)-methanol	$(CF_3)_2CHOH$	195
2,2,3,3,3-pentafluoropropanol	$CF_3CF_2CH_2OH$	42
PFPMIE (HT-70)	$CF_3OCF(CF_3)CF_2OCF_2OCF_3$	10,300

SOURCE: Table A-1 to Subpart A of Part 98 of Title 40 in Code of Federal Regulations

1.6 Document Organization

This document is organized into chapters which are specifically related to facilities or processes typically found at Air Force installations. Chapter topics may or may not correspond directly to source types identified in EPA, State, or local guidance documents, but the intent is to consider sources usually associated with a process. This document specifically addresses mobile sources of air emissions. Guidance for addressing stationary or transitory sources of air pollutants may be found in the *Air Emissions Guide for Air Force Stationary Sources* or *Air Emissions Guide for Air Force Transitory Sources*.

1.7 References

40 CFR 63, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 63-Standards for Hazardous Air Pollutants," U.S. Environmental Protection Agency

40 CFR 98, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 98-Mandatory Greenhouse Gas Reporting," U.S. Environmental Protection Agency

40 CFR 85, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 85-Control of Air Pollution from Mobile Sources," U.S. Environmental Protection Agency

40 CFR 86, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 86-Control of Emissions from New and In-Use Highway Vehicles and Engines," U.S. Environmental Protection Agency,

40 CFR 87, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 87-Control of Air Pollution fron Aircraft and Aircraft Engines," U.S. Environmental Protection Agency,

40 CFR 79, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 79-Registration of Fuel and Fuel additives," U.S. Environmental Protection Agency

40 CFR 80, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 80-Regulation of Fuel and Fuel Additives," U.S. Environmental Protection Agency

AFMAN 2020, Air Force Manual 32-7002, “Environmental Complaince and Pollution Prevention,” Current 4 February 2020

CAA 1990, “List of Hazardous Air Pollutants,” Clean Air Act Section 112 (b), 1990

CAA 2005, “Transformation and Conformity Regulations,” Clean Air Act Section 176 (c), August 2005

E.O. 2009, “Federal Leadership in Environmental, Energy, and Economic Performance,” Executive Order 13514, October 2009

962 FR 2004, "List of Hazardous Air Pollutants, Petition Process, Lesser Quantity Designations,
963 Source Category List; Petition To Delist of Ethylene Glycol Monobutyl Ether: Final Rule," 69
964 FR 69320, November 2004

965 FR 1996, "Deletion of Caprolactam From the List of Hazardous Air Pollutants: Final Rule," 61
966 FR 30816, June 1996

967 FR 2005, "List of Hazardous Air Pollutants, Petition Process, Lesser Quantity Designations,
968 Source Category List-methyl ethyl ketone: Final Rule," 70 FR 75047, December 2005

969 USEPA 2000, "Taking Toxics Out of the Air." United States Environmental Protection Agency,
970 Office of Air Quality, Planning and Standards, August 2000

971

This page intentionally left blank.

2.0 AIRCRAFT FLIGHT OPERATIONS (AOPS)

2.1 Introduction

Generally speaking, there are two types of aircraft: fixed-wing or rotary. A fixed-wing aircraft, also known as planes, are heavier-than-air flying machines that are capable of flight by using wings to generate lift via the aircraft's forward airspeed and the shape of the wings. Rotary aircraft, also known as helicopters, are heavier-than-air flying machines that use rotary wings or blades to generate lift. These wings or blades are mounted on a mast, known as a rotor, which they revolve around. Rotorcraft generally include aircraft where one or more motors provide lift throughout the entire flight.

Emissions from stationed aircraft and transient aircraft operations typically account for the bulk of the mobile source emissions associated with an Air Force Base. Emissions from aircraft flight operations include emissions from aircraft training and mission flight operations, engine testing, and emissions from each aircraft's associated Auxiliary Power Units (APUs). Aircraft flight operations result in the release of criteria pollutants, GHGs, and HAPs to the atmosphere.

Aircraft engine emissions can be classified as either stationary or mobile in nature depending upon whether the engine is physically attached to the aircraft (mobile) or removed from the aircraft and secured to a stationary device such as a test stand (stationary). Emissions from USAF aircraft training and mission flight operations, as well as trim pad and on-wing engine testing, are considered mobile in nature because the engine is secured to the aircraft (which is considered a mobile source). Operations in which the engine is removed from the aircraft and secured to a non-mobile device (i.e., in engine test cells or on outdoor test pads) result in emissions that are considered stationary. Calculations of these stationary emissions are described in the *Air Emissions Guide for Air Force Stationary Sources*.

Additionally, some aircraft are outfitted with small turbine engines known as APUs that provide auxiliary power to the aircraft while on the ground, and occasionally through takeoff and climb out modes. APUs are sources of air pollution and, similarly to aircraft engines, are regarded as mobile sources unless operating after being removed from the aircraft and secured to a stationary stand.

Finally, it is important to note that the modelling input parameters (e.g., power settings, EFs, and fuel flow rates) are derived from engine testing on the ground and intended for aircraft engine test cells (a stationary source that is regulated) and are indirectly applied to in-flight and ground operations. Therefore, be aware of the relatively poor resulting data quality of any estimate of any aircraft flight operation.

2.2 Mixing Zone Height and Region of Influence

2.2.1 Mixing Height

Under the EPA procedures, an emissions inventory for aircraft operations focuses only on pollutants emitted in the vertical column of air (generally bound by the perimeter of the base) referred to as the "mixing zone." The mixing zone is the lower layer of atmosphere where air pollutant mixing occurs (and, therefore, chemical reactions occur) and above which there is a negligible effect on ground-level air pollutant concentrations. This mixing zone portion of the atmosphere begins at the earth's surface and ranges from several hundred to several thousand feet in altitude. The default mixing zone height (mixing height) defined by the EPA is 3,000 feet (ft) Above Ground Level (AGL) [see 40 CFR 93.153 (c) (2) (xxii)] which shall be used for air quality models. However, for proposed actions in nonattainment/maintenance areas where the default mixing height results in total net emissions above the de minimis thresholds, a lower location-specific mixing height can be used if the location-specific mixing height will result in de minimis emissions (i.e., the location-specific mixing height must be less than the 3,000 ft AGL default). Generally, the default mixing zone height of 3,000 feet AGL should be used unless a specific height is prescribed in an applicable State Implementation Plan (SIP).

2.2.1.1 Air Impact Assessments Mixing Height for Criteria Pollutants

For air impact assessments under NEPA and General Conformity, a locally calculated mixing height may be used to demonstrate insignificant (de minimis) air quality impacts associated with a proposed action. In accordance with General Conformity, 40 CFR 93.153(c)(2)(xxii), a "Federal agency can use 3,000 feet above ground level as a default mixing height, unless the agency demonstrates that use of a different mixing height is appropriate because the change in emissions at and above that height caused by the Federal action is de minimis." Additionally, in accordance with the 40 CFR 93 Preamble, EPA "added regulatory language to sub-paragraph (xxii) to allow federal agencies to use a different mixing height if they can demonstrate that emissions at and above that height are de minimis." Therefore, a calculated local mixing height would only be used for air impact assessments (NEPA and General Conformity assessments) and only if it would result in a de minimis level of emissions. In other words, the default 3,000 feet mixing height will always be used initially and, if an action's emissions are not de minimis, the calculated local average mixing height may be used if (and only if) the adjustment in emission would result in the action being de minimis. Therefore, the local average mixing height should never be used in areas where the average calculated local average mixing height is greater than 3,000 ft.

The *USAF Air Quality Environmental Impact Analysis Processes (EIAP) Guide* should be consulted for more details on the specific use of local average mixing height. Additionally, to ensure proper use and to refine emissions estimates, contact the AFCEC Air Quality Subject

Matter Expert to obtain approval and location-specific data for seasonal or annual average mixing heights.

2.2.1.2 Air Impact Assessments Mixing Height for Greenhouse Gasses (GHGs)

Unlike criteria pollutants, the impact of GHGs is at a global-scale and therefore the impact of GHGs at the microscale (local area) is scientifically incalculable. Both the current EPA method for estimating aircraft flight operations emissions (EPA 420-R-92-009) and the General Conformity Rule (40 CFR 93 Subpart B) call for only including criteria pollutant emissions below the mixing height. Given, the mixing height is only associated with microscale air quality criteria pollutant modeling, use of the mixing height for GHG emissions modeling could be considered inadequate. Therefore, logically, if flight-specific fuel consumption data can be reasonably foreseeably predicted, aircraft flight operations GHG emissions used for the "relative comparison analysis" should be calculated using the flight-specific fuel consumption data.

As a result, the Air Force methodology for estimating criteria pollutants, emissions below the mixing height, should NOT be used as a standardized methodology for performing a relative comparison analysis for GHGs. GHG emissions should be estimated for the full extent of aircraft movements as part of the projected net change in GHG emissions and with no altitude restriction (not constrained by the mixing height). Therefore, flight-specific fuel consumption data will be derived from site-specific representative GHG TIMs or TIPs must be used for all impact assessments or emission inventories (default TIMs may only be used for planning purposes).

Note: Due to the complexity and highly technical nature of the methodology of deriving TIMs/TIPs and the need for standardization across the Air Force, only AFCEC/CZTQ may derive site-specific representative GHG TIMs or TIPs.

2.2.2 Region of Influence (ROI)

For air quality impacts assessments, a Region of Influence (ROI) for an action is a three-dimensional vertical column of air within the mixing zone (i.e., up to the mixing height) where pollutant emissions associated with a proposed action will occur. There may be more than one ROI due to the physical and spatial distribution of the emissions sources associated with the proposed action. Each non-contiguous area, nonattainment area, and maintenance area must be considered as a separate ROI. Each ROI requires a separate air quality EIAP assessment which must have a conclusion of air quality impacts for the ROI.

Note: Due to the complex nature, ROI determination must be established by AFCEC/CZTQ for all assessments involving flight operations within any nonattainment or maintenance area.

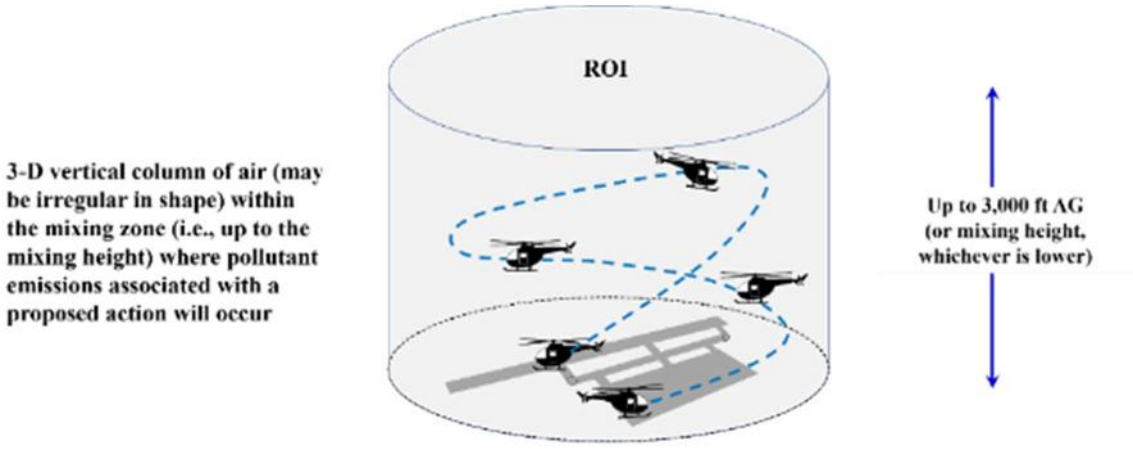


Figure 2-1. ROI

Additionally, for ROIs within areas that are classified as nonattainment or maintenance for any National Ambient Air Quality Standard (NAAQS), a separate General Conformity assessment for each nonattainment or maintenance area must be performed in tandem with the ROI's overall air quality EIAP assessment (this is generally automated in the Air Conformity Applicability Model [ACAM] if the nonattainment and maintenance areas are selected).

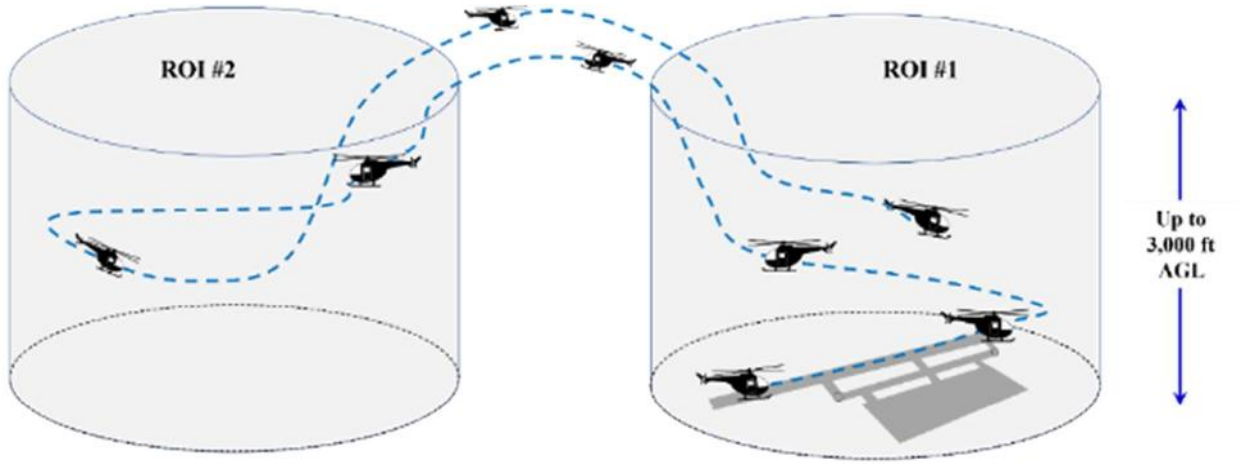


Figure 2-2. Multiple ROIs

All emissions from new aircraft operations associated with a proposed action within the mixing zone must be included in a ROI's air quality EIAP assessment. The mixing zone is the lower layer of atmosphere where air pollutant chemical reactions occur and above which there is a

negligible effect on ground-level air pollutant concentrations. This mixing zone portion of the atmosphere begins at the earth's surface and ranges from several hundred to several thousand feet in altitude. The default mixing zone height (mixing height) defined by the EPA is 3,000 feet (ft) Above Ground Level (AGL) [see 40 CFR 93.153 (c) (2) (xxii)] which shall be used for air quality models. However, for proposed actions in nonattainment/maintenance areas where the default mixing height results in total net emissions above the de minimis thresholds, a lower location-specific mixing height can be used if the location-specific mixing height will result in de minimis emissions (i.e., the location-specific mixing height must be less than the 3,000 ft AGL default). Therefore, initially only air emissions produced below the default 3,000 ft AGL mixing height are considered when assessing ROIs heights and air quality impacts. There are three aircraft operations that will potentially occur below the mixing height: Landing and Takeoff cycles, Closed Pattern cycles (Touch and Goes) and Low Flight Patterns. For estimating the total emissions associated with each type of aircraft operation, a reasonably foreseeable typical flight pattern [in terms of Time-in-Mode (TIM) for fixed-wing or Time-in-Phase (TIP) for rotary] for a specific aircraft operation is multiplied by the reasonably foreseeable worst-case number of the specific aircraft operation per year. Additionally, any reasonably foreseeable Trim Tests and Engine Test Cell activities associated with the proposed action (preferred action and alternatives) must be included in the air quality EIAP assessment.

2.3 Aircraft Flight Operations

Fixed-wing aircraft and rotary aircraft are both heavier-than-air flying machines that are capable of flight by using mechanical powered engines. A fixed-wing aircraft (planes) fly using wings to generate lift via forward airspeed; while a rotary aircraft (helicopters) fly using rotary wings or blades to generate lift. Fixed-wing aircraft require runways to take off, while rotary-wing aircraft can take off from any level surface. Therefore, aircraft flight operations for both are quite different.

Flight operations for aircraft are broken down into "flight cycles" for estimating air emissions. A "flight cycle" is one complete repetitive sequence of flight operations which consists of various "flight modes" (and their corresponding engine "power settings") for fixed-wing aircraft or "flight phases" (idle, taxi, takeoff, flight, and landing phases) for rotary aircraft.

There are three basic flight cycles:

- **Landing and Takeoff (LTO) Cycle:** A flight operation consisting of one complete repetitive takeoff and landing cycle.

- **Closed Pattern (CP) Cycle:** A flight operation consisting of one complete repetitive flight maneuver that involves practice landing on a runway by briefly touching the landing gear to the runway, or coming very close, and transitioning immediately into climb out and associated flying to maneuver into another practice landing.

- **Low Flight Pattern (LFP) Cycle:** A flight operation consisting of one complete repetitive flight cycle below the mixing height that does not include any part of a LTO or CP cycle.

2.3.1 Fixed-Wing Aircraft Flight Operations

2.3.1.1 Fixed-Wing LTO Cycle

The EPA has established formal procedures for calculating exhaust emissions associated with fixed-wing aircraft operations based on a Landing and Takeoff (LTO) cycle (USEPA 1992). Under the EPA procedures, an emissions inventory for aircraft operations focuses only on pollutants emitted in the vertical column of air (generally bound by the perimeter of the base) referred to as the "mixing zone." Exhaust emissions occurring within this area are calculated for one complete LTO cycle for each aircraft type by applying aircraft engine-specific emission factors.

A sortie may include any number of aircraft flight patterns but only one takeoff and only one return landing. Given this, the number of sorties equates to the number of LTO cycles. Since an LTO cycle is only a fraction of a sortie (that only includes the very short beginning and very

short ending) an LTO cycle corresponds to two aircraft operations – one arrival and one departure. Therefore, one LTO cycle represents a pair of arrival and departure operations.

Each LTO cycle for fixed-wing aircraft is comprised of four flight modes: taxi/idle, takeoff, climb out, and approach. Each of these modes has a corresponding engine power setting/mode. Engine power modes are aircraft engine operational settings defined by the percent of total engine thrust. The engine power modes for a specific engine are defined by the percent of total thrust the engine was tested at as required by 40 CFR 87, *Control of Air Pollution from Aircraft and Aircraft Engines*. Engine power modes are considered interchangeable with aircraft flight modes because during each aircraft flight mode of operation, the aircraft engines operate at a standard power setting for a given aircraft category. The four flight modes and corresponding engine power settings are:

- **Idle (Taxi) Mode**: The engine idle portion of an LTO Cycle which includes all on-ground idle portions of a flight cycle which includes both the engine startup/warmup time before taxiing for departure and the engine cooldown/shutdown time period. The Taxi Mode portion of an LTO Cycle also includes the total time the plane spends taxiing. Taxi time includes taxiing times from the parking area to the takeoff/landing area (Taxi Out) and, upon landing, taxiing from the takeoff/landing area to the parking area (Taxi In). The Idle flight mode is performed in the "Idle" engine power setting.
- **Takeoff Mode**: Characterized by full engine thrust, the time it takes the aircraft to reach 500 feet Above Ground Level (AGL). Equates to both the "Military" and/or "Afterburner" engine power setting, dependent on engine capability and local flight requirement.
- **Climb Out Mode**: Starts with the initial aircraft ascent from 500 ft AGL through the aircraft exiting the mixing zone (default is 3,000 ft). The Climb Out flight mode is performed in the "Climb Out" (also known as "Intermediate") engine power settings.
- **Approach Mode**: Commences with the aircraft return and descent, starting when the aircraft enters the mixing zone to 0 ft AGL (touchdown). The Approach flight mode is performed in the "Approach" engine power setting.

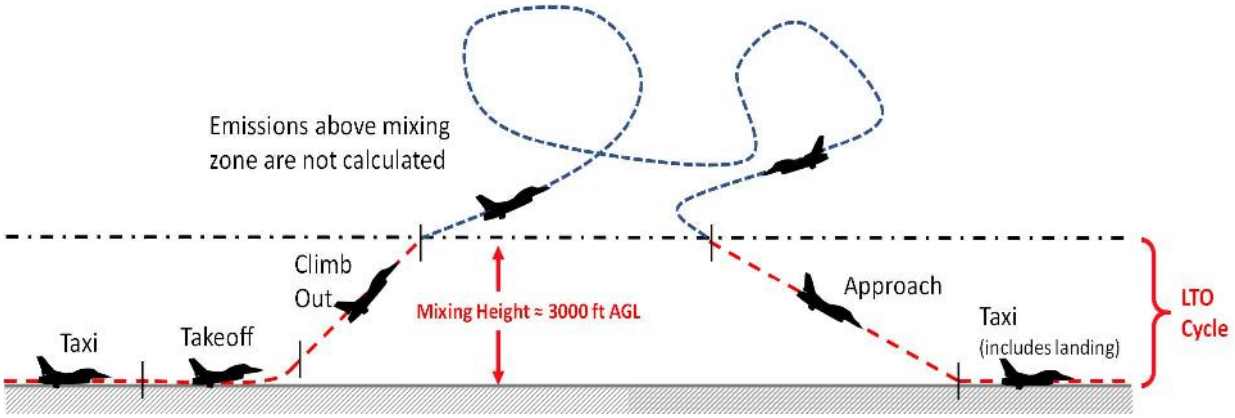


Figure 2-3. Fixed-Wing LTO Cycle

2.3.1.2 Fixed-Wing CP Cycle

A Fixed-Wing CP cycle, also known as a Touch and Go (TGO), is a flight maneuver that involves practice landing on a runway by briefly touching the landing gear to the runway, or coming very close, and transitioning immediately into climb out and associated flying to maneuver into another practice landing (See Table 2-9). A CP cycle is effectively a combination of one LTO cycle (specific to the CP cycle) and one LFP for the portion of the return flight below the mixing height.

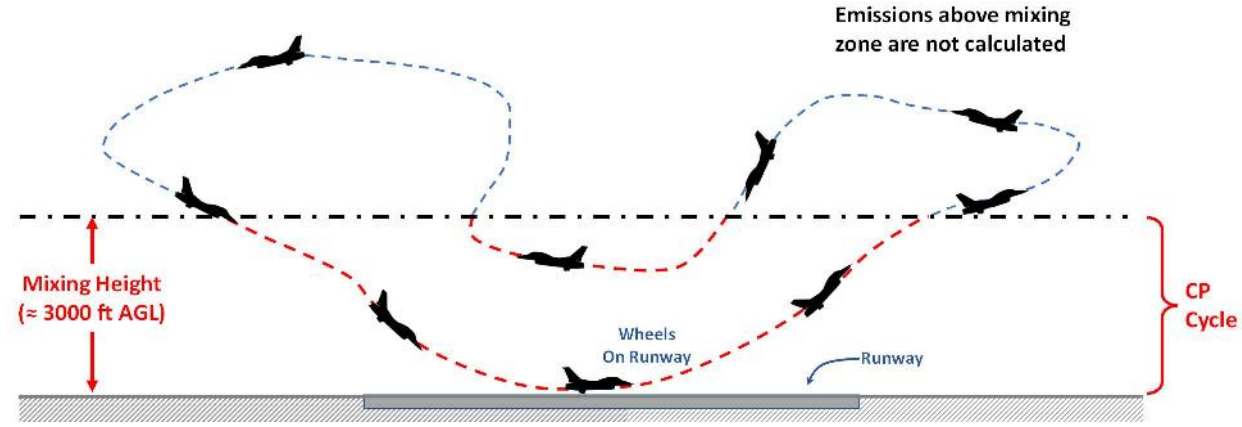


Figure 2-4. Fixed-Wing CP Cycle

2.3.1.3 Fixed-Wing LFP Cycle

A Fixed-Wing LFP cycle is a flight maneuver that occurs below the mixing height (EPA default = 3,000 ft AGL) that is not part of an LTO or CP cycle. Generally, LFPs are flown only in the "Intermediate" and/or "Approach" engine power modes. If the aircraft is level or ascending the aircraft is generally flying in the "Intermediate" engine power setting and if the aircraft is descending the aircraft is generally flying in the "Approach" engine power setting.

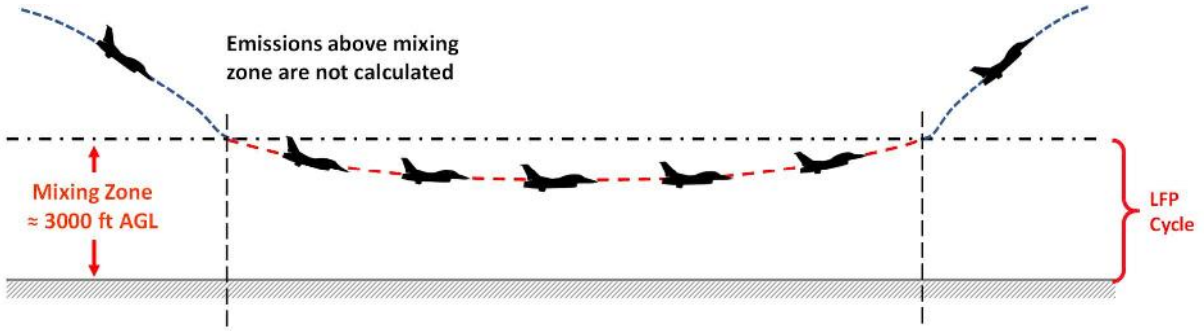


Figure 2-5. Fixed-Wing LFP Cycle

2.3.2 Rotary (Helicopter) Aircraft Flight Operations

Fixed-wing aircraft and rotary aircraft are both heavier-than-air flying machines that are capable of flight by using mechanical powered engines; however, the difference in means of flight also dictates different flight operations. A fixed-wing aircraft generally uses runways to take off and land, while rotary-wing aircraft can take off from any level surface and flies at much lower altitudes. Therefore, rotary aircraft flight patterns are described in terms of "flying phases" rather than "flight modes" (as with fixed-wing aircraft). As with flight modes, flying phases correspond to specific engine power thrust settings:

- **Idle Phase:** Is the flying phase portion of an LTO Cycle which includes all on-ground idle portions of a flight cycle. The Idle Phase is performed in the "Idle" engine power setting.
- **Taxi Phase:** Is the flying phase portion of an LTO Cycle which includes the total time the helicopter spends taxiing. The Taxi Phase is performed in the "Taxi" engine power setting.
- **Takeoff Phase:** Is the flying phase portion of an LTO Cycle which includes the vertical and horizontal ascent from a specified takeoff point. The Takeoff Phase is performed in the "Takeoff" engine power setting.
- **Landing Phase:** Is the flying phase portion of an LTO Cycle which includes the vertical and horizontal descent to a specified landing point. The Landing Phase is performed in the "Landing" engine power setting.
- **Flight Phase:** Is the flying phase portion of a LFP or CP, which includes the portions of flying between 1,000 ft AGL and the mixing height. The Flight Phase excludes all portions of an LTO Cycle. The Flight Phase is performed in the "Flight" engine power setting.

2.3.2.1 Rotary LTO Cycle

Because rotary aircraft fly at lower altitudes, the LTO cycle only accounts for takeoff and landings below 1,000 ft AGL. Therefore, rotary aircraft do not follow a Fixed-Wing LTO Cycle and have an independent LTO Cycle (a Rotary LTO Cycle, which reflects only flight below 1,000 ft AGL).

A Rotary LTO Cycle is one complete takeoff and landing cycle, consisting of the time duration in four of the five flying phases (i.e., Time In Phase or TIP). "Time In Phase" or "TIP" is the time spent, during a representative flight cycle, in each of the flying phases: idle, taxi, takeoff, and landing phases:

- **Idle Phase:** Is the flying phase portion of an LTO Cycle which includes all on-ground idle portions of a flight cycle which includes both the engine startup/warmup time before taxiing for departure and the engine cooldown/shutdown time period.
- **Taxi Phase:** Is the flying phase portion of an LTO Cycle which includes the total time the helicopter spends taxiing. Taxi time includes taxiing times from the parking area to the takeoff area and, upon landing, taxiing from the landing area to the parking area.
- **Takeoff Phase:** Is the flying phase portion of an LTO Cycle which includes the vertical and horizontal ascent from a specified takeoff point. It is assumed the takeoff phase starts on the ground and ends at 1,000 ft AGL.
- **Landing Phase:** Is the flying phase portion of an LTO Cycle which includes the vertical and horizontal descent to a specified landing point. It is assumed the landing phase starts at 1,000 ft AGL and time is in general equal to the takeoff TIP. Therefore, TIP for landing ($TIP_{Landing}$) is equal to the TIP for takeoff ($TIP_{Takeoff}$).

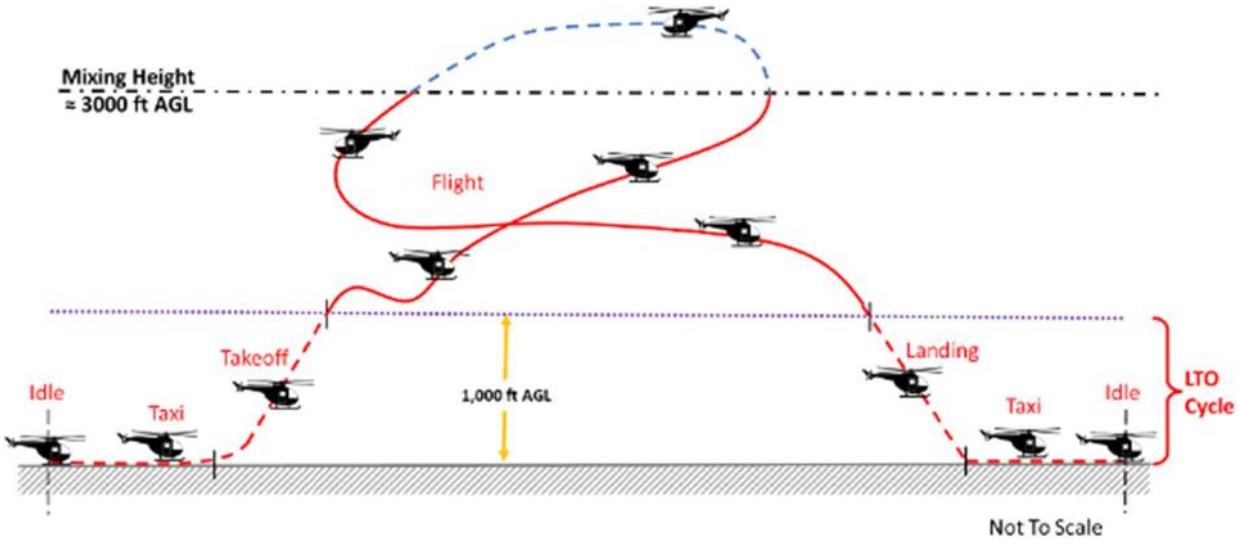


Figure 2-6. Rotary LTO Cycle

A Rotary LTO does not include any flight time above the 1,000 feet AGL. A "representative Rotary LTO Cycle" is a single departure and arrival cycle that is statistically characteristic of all Rotary LTO cycles flown in an average calendar year. A representative Rotary LTO Cycle is derived through frequency weighted averaging all significant departure and arrival cycles within an average calendar year.

2.3.2.2 Rotary CP Cycle

A Rotary CP cycle (also known as a Touch and Go [TGO] cycle) is a flight maneuver that involves practice landing on a runway by briefly touching the landing gear to the runway, or coming very close, and transitioning immediately into climb out and associated flying to maneuver into another practice landing (See Figure 2-7. Rotary CP Cycle). A CP cycle is simply a combination of one LTO cycle (specific to the CP cycle) and one LFP for the portion of the return flight below the mixing height.

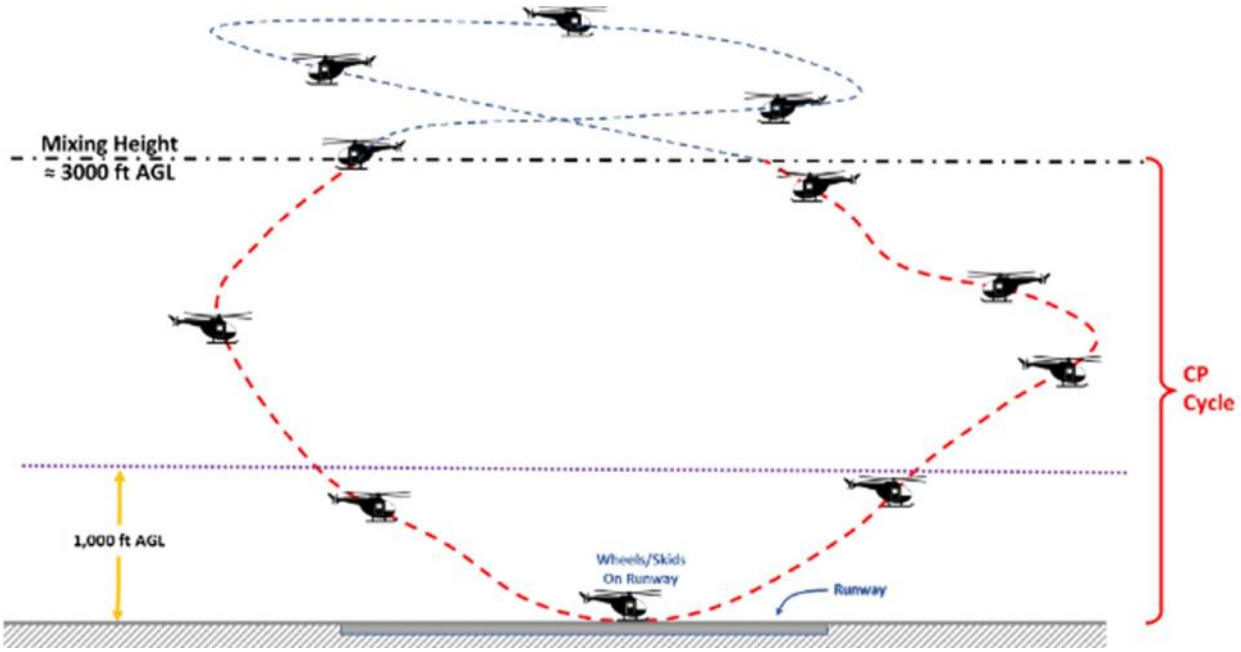


Figure 2-7. Rotary CP Cycle

2.3.2.3 Rotary LFP Cycle

A LFP flying cycle only occurs below the mixing height (EPA default = 3,000 ft AGL) and does not include any part of an LTO or CP cycles. Generally, LFPs are flown only in the flight "Flying Phase" engine power mode. Rotary LFP are often attributed to trips to and from mission destinations.

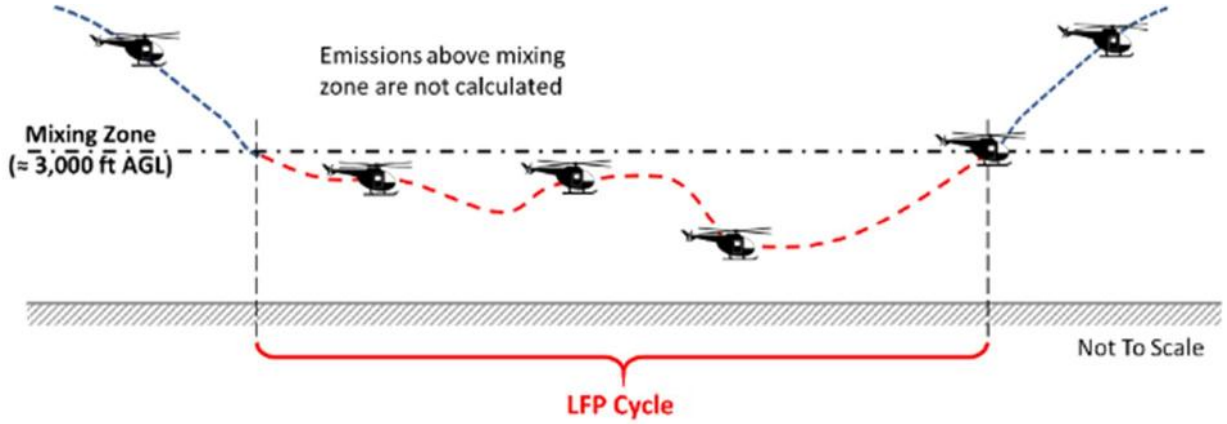


Figure 2-8. Rotary LFP Cycle

2.4 Jet Fuel

Both military aircraft engines (either fixed-wing or rotary) and APUs consume JP-8 fuel, while their commercial counterparts consume a nearly identical fuel known as Jet-A. While most aircraft operations involve engines that use either JP-8 or Jet-A fuel, small, piston engine-driven aircraft that consume aviation grade gasoline, or AVGAS, may periodically operate on a USAF installation. Additionally, recent Air Force and commercial initiatives are expected to result in the increased use of so-called synthetic aviation fuel or "synfuel" over the next several years. These "synfuels" are derived from either coal or natural gas using the Fischer-Tropsch (FT) process and burn much cleaner than fuels produced from crude oil. Regardless of fuel type, emissions of concern from aircraft operations and engine testing include the criteria pollutants (VOC, CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2), and HAPs (including, but not limited to benzene, naphthalene, and 1,3-butadiene) that are commonly associated with fuel combustion processes.

2.4.1 Synthetic Aviation Fuel

Currently, there are on-going Department of Defense (DoD) and USAF initiatives to reduce dependency on foreign petroleum sources. This includes development of battlefield fuels with essentially no sulfur and reduced aromatic content using FT gasification technology on domestic energy sources such as coal and natural gas. These "synthetic" fuels will increasingly be used to offset conventional JP-8 and diesel fuels in Air Force equipment, particularly aircraft. Testing and certification of 50-50 blends of petroleum- and FT-based JP-8 in B-52s has already been completed by the Air Force Research Laboratory (AFRL). The data indicates that the 50-50 blend reduces SO_2, CO_2, and PM emissions considerably (USAF 2007). When estimating emissions from aircraft operations in which a synthetic fuel blended with petroleum JP-8 was used, the following emission reduction factors should be applied:

Table 2-1. Fuel Emission Reduction Factors (FERFs) for JP-8/Synthetic Fuel Blends

Pollutant	Reduction Factor (%)
PM	35
SO_2	50
CO_2	1.8

SOURCE: USAF Alternative Fuels Program, AFRL/WS//06-0078. 22nd Annual UC Symposium on Aviation Noise and Air Quality. March 2007.

2.5 Emission Factors

Air pollutant EFs for aircraft operations include emissions from aircraft engines (either fixed-wing or rotary) and APUs used on the airframe. The EFs have been developed through testing by either the manufacturers themselves or another party. Though the EFs were developed for stationary jet engine testing and are most suited for this application, it is considered acceptable to use them for estimating emissions from aircraft flight operations. Criteria pollutant and GHG EFs for each engine are provided in Table 2-9 while speciated VOC and HAP EFs for select engines and APUs are provided in Table 2-10. Criteria pollutants for some APUs are provided in Table 2-12. The aircraft engine EFs presented in Table 2-9 are provided for each power setting which correspond to the flight operating cycle in an LTO cycle. Note that, in several instances, a surrogate engine may have been used to fill data gaps.

2.6 Emissions Calculations

Emissions calculation procedures for aircraft operations under various operational cycles are described in the following paragraphs. EFs and power settings for specific aircraft engines are provided in Table 2-9. For engine models not listed in Table 2-9, contact the Air Quality SME for assistance in selecting a representative surrogate engine.

2.6.1 Fixed-Wing Aircraft Emissions

The EFs listed have been determined through testing and may be found in a variety of sources. It is important to note that some sources, such as the Airport Air Quality Manual and International Civil Aviation Organization (ICAO), do not provide PM_{10} and $PM_{2.5}$ EFs directly (ICAO 2011). For those sources, the total PM was calculated and was conservatively assumed to be equal to PM_{10}. A similarly conservative estimate was made for $PM_{2.5}$ by assuming that 90% of the total PM_{10} value is composed of $PM_{2.5}$. These assumptions are noted in the appropriate tables. Additionally, there are several engines for which some EF data may have been missing. For these engines, either the EFs from a surrogate were used or the missing data was interpolated or

extrapolated. These values are clearly marked in the tables with an (S) for EFs in which a surrogate was used, or a (C) when the values were calculated. The engines used as surrogates are provided in the notes. Common airframe/engine combinations for military fixed-wing, rotary, and commercial aircraft are provided in Table 2-6, Table 2-7, and Table 2-8.

2.6.1.1 LTO Emissions

LTO emissions are calculated based on the type of aircraft, the engine model and number per airframe, the operational mode and TIM for each mode, and the power setting associated with each operational mode. The fuel flow rate associated with each power setting, engine specific EFs, the mixing zone height, and the number of LTO cycles conducted during the year are also considered in the LTO emissions calculation. As TIM and fuel flow rate for each power setting vary among aircraft engines and airframes, the calculation procedure will need to be repeated for individual aircraft types. A description of the operating modes for commercial and military aircraft and the default TIMs are provided in Table 2-4 and Table 2-5 respectively.

Aircraft engine emissions per airframe based on an LTO cycle account only for those emissions occurring below the mixing height and are calculated as follows:

$$E(Pol)_{Aircraft} = \sum_{i=1}^{n}\left[\frac{TIM_i}{60} \times \frac{FFR_i}{1{,}000} \times EF(Pol)_i \times \frac{FERF(Pol)}{100}\right] \times N \times C \qquad \textbf{Equation 2-1}$$

Where,

E(Pol)Aircraft	=	Annual pollutant emissions per engine on airframe being evaluated (lb/yr)
N	=	Number of units (engines) per airframe being evaluated
60	=	Factor to convert minutes to hours
1000	=	Factor to convert lb fuel burned to 10^3 lb fuel burned (lb/10^3 lb)
i	=	Mode identifier. 1 = Idle in/out, 2 = Takeoff, 3 = Afterburner Takeoff, 4 = Climb out, and 5 = Approach
TIMi	=	Time spent in each mode, referred as "Power Setting" in Table 2-9 and Table 2-10, in per LTO cycle (min/cycle)
FFRi	=	Fuel flow rate during operational mode per aircraft engine (lb/hr)
EF(Pol)i	=	Pollutant emission factor for specified mode (lb/10^3 lb fuel burned)
FERF(Pol)	=	Fuel emission reduction factor, if applicable (%). In cases where alternative fuel is not used, then a value of 100% must be used.
100	=	Factor to convert percent to a fraction (%)
C	=	Number of annual LTO Cycles (cycle/yr)

Default TIMs may only be used for planning purposes. Site-specific TIMs must be used for all impact assessments and emissions inventories. Due to the complexity and highly technical nature of the methodology of deriving site-specific TIMs and the need for standardization across the Air Force, only AFCEC/CZTQ may derive site-specific TIMs.

Note that when calculating the emissions for each LTO, the pollutant EF for the appropriate power setting must be selected from Table 2-9. For engines equipped with afterburner, 50% of the total time in "takeoff" is assumed to be in the "military" power setting and 50% in the "afterburner" power setting. Also, some aircraft may utilize a different power setting during a flight mode than what is given in Table 2-4 (e.g., an engine may be in the "military" power setting during the "climb out" phase of the LTO). Typically, however, the engine power settings correspond to the flight modes and should be selected when calculating emissions for an LTO.

Some of the data required to calculate aircraft emissions per LTO cycle may be found in the following tables:

- FERF, if synthetic fuel blends are used, are provided in Table 2-1
- Regional sulfur content of JP-8, if required for enhanced accuracy, is provided in Table 2-2
- TIM spent in each LTO cycle mode is found in Table 2-5
- Power settings and fuel flow rates for each LTO cycle mode and associated engine specific EFs are found in Table 2-9 and Table 2-10

2.6.1.2 CP Emissions

Used primarily for NEPA/General Conformity air impact studies under EIAP assessments, Touch and Go (TGO) and Low Fly By (LFB) training operations may dictate the need to conduct aircraft operations that deviate from a standard LTO cycle. A TGO cycle is a common flight maneuver that involves practice landing on a runway by briefly touching (or simulating the touching of) the landing gear to the runway and transitioning immediately into climb out. During a LFB, the aircraft generally drops below the mixing height and returns to a higher altitude without touching (or simulating the touching of) the landing gear to the runway. TGO and LFB emissions are calculated in essentially the same manner as LTO emissions; however, only some modes of a complete LTO are considered. For TGO emissions estimating, generally only the default TIMs for approach, takeoff, and climb out are used. For LFB emissions estimating, one half of the default TIMs for approach and climb out are used.

2.6.1.3 LFP Emissions

Another training operation primarily used for NEPA/General Conformity air impact studies under EIAP is a Low Flight Pattern (LFP), which is any aircraft maneuver below the mixing zone height and not associated with an LTO, TGO, or LFB. When calculating emissions in this manner, one must know both the number of LFPs per year and the average time of the LFP. Generally, for LFP emissions estimating, use only the intermediate power setting for the entire time of the LFP.

2.6.2 Auxiliary Power Unit Emissions

APU emissions are based on the APU model associated with each aircraft type, EFs, and the length of time the APU was operating during an LTO cycle. The EFs for APUs are presented in units of lb/hr, so the operating time for each APU must be known or approximated. Common aircraft/APU combinations and typical APU operating times are found in Table 2-6, Table 2-7, and Table 2-8. Criteria pollutant and GHG EFs for APUs can be found in Table 2-12.

APU emissions are calculated using a two-step approach that consists of the following:

1) Calculate pollutant emissions for each APU per LTO; and
2) Multiply the emissions per LTO by the total number of LTO cycles per year.

These steps are simplified by the following equation:

$$E(Pol)_{APU} = L \times N \times \frac{OT}{60} \times EF(Pol) \times \frac{FERF(Pol)}{100}$$

Equation 2-2

Where,

$E(Pol)_{APU}$	=	Annual pollutant emissions produced by the APU for the aircraft being evaluated (lb/yr)
L	=	Number of LTO cycles per year (cycle/yr)
N	=	Number of units (APUs) per airframe being evaluated
OT	=	Operating time per LTO cycle (min/cycle)
60	=	Factor to convert minutes to hours (min/hr)
EF(Pol)	=	APU-specific emission factor for each pollutant (lb/hr)
FERF(Pol)	=	Fuel emission reduction factor, if applicable (%). In cases where alternative fuel is not used, then a value of 100% must be used.
100	=	Factor to convert percent to a fraction (%)

Some of the data required to calculate emissions from APU operations may be found in the following tables:

- Typical airframe/APU combinations and operating times are provided for military fixed-wing, rotary, and commercial aircraft in Table 2-6, Table 2-7, and Table 2-8, respectively.
- Criteria and GHG EFs are provided in Table 2-12
- Speciated VOC and HAP EFs for select APUs are provided in Table 2-10

2.6.3 Trim Pad and On-Wing Testing

Emissions associated with trim pad and on-wing testing are based on the type of aircraft, engine model, testing times, the power settings and associated fuel flow rates, and engine-specific EFs. Estimating emissions from aircraft engine testing may be challenging since the data required for calculations may be difficult to obtain. Emissions are calculated by multiplying the fuel flow rate at the selected power setting by the amount of time the engine is operated at that power setting and applying pollutant specific EFs. After the emissions are calculated for a pollutant at each power setting, the values are summed to obtain the total annual emissions of that pollutant. Aircraft engine emissions from trim pad and on-wing testing may be calculated using a three-step approach that consists of the following:

1) Determine the engine operating mode based on the aircraft fuel flow rate at each test setting.
2) Calculating pollutant emissions using the appropriate EF and total time spent within each operating mode.
3) Summing emissions from each mode to obtain annual emissions for that engine.

These steps are simplified by the following equation:

$$E(Pol)_{Testing} = \sum_{i=1}^{n}\left[\frac{TIM_i}{60} \times \frac{FFR_i}{1000} \times EF(Pol)_i \times \frac{FERF(Pol)}{100}\right]$$

Equation 2-3

Where,

$E(Pol)_{Testing}$ = Annual pollutant emissions produced by the engine being evaluated (lb/yr)
60 = Factor to convert minutes to hours
1000 = Factor to convert lb fuel burned to 10^3 lb fuel burned (lb/10^3 lb)
i = Mode identifier. 1 = Idle in/out, 2 = Takeoff, 3 = Afterburner Takeoff, 4 = Climb out, and 5 = Approach.
TIM_i = Time spent in the fuel flow rate range specified for the entire year (min/yr)
FFR_i = Fuel flow rate during operational mode (lb/hr)
$EF(Pol)_i$ = Pollutant emission factor for specified mode (lb/10^3 lb fuel burned)
FERF(Pol) = Fuel emission reduction factor, if applicable (%). In cases where alternative fuel is not used, then a value of 100% must be used.
100 = Factor to convert percent to a fraction (%)

Note that the TIM_i refers to the total time spent within the fuel flow rate range corresponding to an operating mode, and <u>not</u> the aircraft default TIMs as these apply to aircraft flight patterns.

The fuel flow rate and engine specific EFs required to calculate emissions using Equation 2-3 may be found in Table 2-9 and Table 2-10. The appropriate EF is determined by the engine's fuel flow rate and, ideally, the fuel flow rates and operating times for each test profile are recorded by a data logger. Since the fuel flow rate will vary from each test and operating mode, the EFs developed for each mode on each aircraft engine are deemed suitable across a range of fuel flow rates. This means that while the following tables provide an EF for a specific engine at a precise fuel flow rate, that EF is valid for a range of fuel flow rates and should be used for emissions calculations. The tables in this guide only provide the specific fuel flow rates and corresponding EF at which the engine was tested. To find the range of fuel flow rates and appropriate EF, refer to the "Aircraft Engine Testing" section of the *Air Emissions Guide for Air Force Stationary Sources* since off-wing engine testing is more common and a stationary source of emissions (and therefore subject to more regulation).

The fuel flow rate ranges provided in the *Air Emissions Guide for Air Force Stationary Sources* for most power settings were determined by taking the midpoint of the fuel flow rates between power settings at which the engine was tested. The exception to this method is for the afterburner (AB) setting since the AB setting uses more fuel and combustion efficiency is drastically different from the other operating modes. For those engines equipped with AB, the engine is assumed to operate at 100% power when in the military setting, so any fuel flow rate greater than that of the military operating mode for which the engine was tested is assumed to be in AB and the appropriate AB EF should be selected. Refer to the tables in the *Air Emissions Guide for Air Force Stationary Sources* for additional information.

2.6.4 Rotary Aircraft Emissions

Rotary aircraft (helicopter) flight operations emissions are estimated based on multiplying the emissions from a single representative flying phase cycle with the average number of annual flight operations. The annual flight operations emissions are calculated in a three-step approach that consists of the following:

1. Calculate pollutant emissions for each flight phase of the representative flight cycle,
2. Sum the emissions for each phase to obtain the flying phase cycle emission values, and
3. Multiply the flying phase cycle emission values by the number of annual Flight Cycles.

These steps are simplified by the following equation:

$$\boldsymbol{E(Pol) = \sum_{i=1}^{n} \left[\frac{TIP_i}{60} \times \frac{FFR_i}{1000} \times EF(Pol)_i \right] \times N \times C}$$

Equation 2-4

Where,

E(Pol)	=	Annual pollutant emissions from flight operations (ton/yr)
TIP_i	=	Time In Phase or time spent in "i" flight phase, referred as "Power Setting" in Table 2-9 and Table 2-10 (min/cycle)
i	=	Phase identifier (1 = idle, 2 = taxi, 3 = takeoff, 4 = flight, and 5 = landing)
60	=	Factor for converting minutes into hours (min/hr)
FFR_i	=	Fuel flow rate per engine for the flight phase (lb fuel/hr)
1000	=	Factor for converting lb fuel to 1,000 lb fuel
$EF(Pol)_i$	=	Pollutant-specific emission factor for flight phase (lb/1,000 lb fuel)
N	=	Number of engines the aircraft has
C	=	Number of annual Flight Cycles (cycle/yr)

Site-specific TIPs must always be used. Due to the complexity and highly technical nature of the methodology of deriving site-specific TIPs and the need for standardization across the Air Force, only AFCEC/CZTQ may derive site-specific TIPs.

2.6.5 Calculating SO_2 Emissions

SO_2 emissions are created when sulfur in the fuel reacts and combines with oxygen during the combustion process. Fuels with higher sulfur content will produce higher amounts of SO_2 than low-sulfur fuels. It is generally assumed that during combustion, all sulfur in the fuel reacts to form SO_2 or sulfates. The sulfur content in commercial jet fuel is limited to 0.3 weight percent (wt. %); however, the sulfur content for most in-use fuel is significantly less than this limit. For air impact assessments under NEPA and General Conformity, the use of a national average sulfur content is appropriate for estimating sulfur emissions from aircraft operations. For JP-8 fuel, the weighted national average was calculated using data obtained from the Defense Logistics Agency (DLA), Defense Energy Support Center, *Petroleum Quality Information System Fuels Data* (1997-2013). **Using this national weighted average, a national EF was derived and should be used as the default value for all aircraft engines within the continental United States when estimating SO_X emissions**. For enhanced accuracy, regional averages have also been calculated. The default national average and regional averages are provided in Table 2-2.

The sulfur content in fuel varies significantly by the region in which the fuel is obtained. For a more accurate accounting of SO_X emissions from aircraft flight operations, a base-specific SO_X EF may be estimated using the weight percent sulfur content of the fuel as provided by the fuel supplier. Assuming all the sulfur in the fuel is converted to SO_2 during the combustion process, a base-specific SO_X EF may be calculated according to the following equation:

$$\boldsymbol{EF(SO_X) = S \times 20}$$

Equation 2-5

Where,

EF(SO_X) = SO_X emission factor (lb $SO_2/10^3$ lb fuel burned)

S = Weight percent sulfur content of the fuel

20 = Conversion factor derived by converting the weight percent of sulfur to a weight fraction, converting this into units of lb/1,000 lb, and then multiplying by the ratio of the molecular weight of SO_2 to the molecular weight of sulfur

Table 2-2. Average Sulfur Content of JP-8

Geographic Region	States or Countries	Weighted-Average Sulfur Content (Weight %)	Emission Factor (lb/10^3 lb fuel)
National Average		**0.054**	**1.07**
1. East Coast U.S.	ME, VT, NH, MA, RI, CT, NY, PA, NJ, DE, MD, VA, WV, NC, SC, GA, FL	0.110	2.19
2. East Central U.S.	ND, SD, MN, IA, NE, WI, MI, OH, KY, TN, IN, IL, MO, KS, OK	0.067	1.35
3. Gulf Coast U.S.	AL, MS, AR, LA, TX, NM	0.053	1.05
4. West Central U.S.	MT, ID, WY, UT, CO	0.028	0.56
5. West Coast U.S.	WA, OR, CA, NV, AZ	0.053	1.07
Middle East	Kuwait, Bahrain, Pakistan, United Arab Emirates	0.069	1.39
European	Europe, Israel, Turkey	0.118	2.37
Pacific	Korea, Japan, HI, AK, Australia, Russia, Singapore	0.096	1.91
Caribbean	Coastal Aruba	0.045	0.89

Source: *Petroleum Quality Information System Fuels Data*. Defense Logistics Agency, Defense Energy Support Center, 1997-2013. Values were calculated using the weight percent sulfur for years 1997 – 2013. Emission factors were calculated using Equation 2-5, though note that the values may not be exactly 20 times the weighted average due to rounding.

2.6.6 Calculating HAP Emissions

Since the information contained within this document is for NEPA and General Conformity, the inclusion of HAP emissions is purely for informational purposes. Despite the limited information available, there are aircraft engine-specific and APU-specific HAP EFs provided in Table 2-10.

2.6.7 Lead (Pb) Emissions

Prolonged exposure to high levels of Pb may result in harmful health effects, especially in young children. Though Pb is a criteria pollutant, this document does not provide any Pb EFs for aircraft and APUs because of the transition to unleaded aviation fuel.

2.6.8 Greenhouse Gas (GHG) Emissions

Since GHG emissions are becoming increasingly more important, it is common to record the carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions produced when measuring emissions from mobile and stationary sources. It is also common practice to report GHG emissions in terms of equivalent CO_2 (CO_2e). This document provides a total GHG composite EF consisting of CO_2, CH_4, and N_2O presented in CO_2e for aircraft in Table 2-3 and Table 2-12 for select APUs. For more guidance on the calculation of GHG emissions, refer to the *USAF Guide to the Mandatory Greenhouse Gas Reporting Rule*.

Table 2-3. GHG Emission Factors for Aircraft Engines

Vehicle Type	Fuel Type	Emission Factors (lb/1000lb fuel)			
		Greenhouse Gas Species			
		CH_4	N_2O	CO_2	CO_2e [b]
Aircraft	Jet Fuel [a]	0.1347	0.02628	3203.44	3214.64
	AVGAS	0.1323	0.02572	3053.40	3064.37

Notes for Table 2-3:

Emission Factors calculated and verified 05/2023

a. JP-8 emission factors were used as representative Jet Fuel.

b. Equivalent CO2 (CO2e) emission factors are the total of the product of CO2, CH4, and N2O and their respective Global Warming Potentials (GWP). GWP used are 1 for CO2, 25 for CH4, and 298 for N2O. JP-8 with a density of 6.71 lb/gal was used for unit conversion. AVGAS with a density of 6 lb/gal was used for unit conversion.

2.6.9 HAP Speciation

Though HAP emissions have been speciated for some engines, there is little data available for most aircraft engines likely found at USAF installations. If speciated HAP data for an engine is unavailable, it is recommended that a surrogate engine is used. If there is no suitable surrogate data available, speciated HAP emissions may be estimated using the total VOC emissions and mass fraction of the speciated HAP. The mass fractions for several HAPs are provided in Table 2-11 and those recommended by the EPA as stated in the document *Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines*. Emissions of a speciated HAP are calculated by first converting the total VOC emissions to Total Organic Gases (TOG) and multiplying this by the mass fraction of the speciated HAP of interest. This calculation is shown in the following equation:

$$E(Pol) = \frac{E(VOC)}{0.99} \times MF(Pol)$$

Equation 2-6

Where,

E(Pol) = Emissions of speciated HAP (lb/yr)
E(VOC) = Emissions of total VOC (lb/yr)
0.99 = Factor converting VOC to TOG
MF(Pol) = Mass fraction of the HAP of interest as provided in Table 2-11

2.6.10 International Civil Aviation Organization (ICAO) Emission Factors

The ICAO is a United Nations specialized agency that was created in 1944 with the goal of encouraging the safe and orderly development of international civil aviation. The organization develops and maintains safety standards, practices, and procedures for a safe and efficient air transport network that supports global, social, and economic priorities. As the need to develop aviation security policies and measures arose in the late 1960's, ICAO developed enhanced, uniform security measures, policies, and guidelines to address any acts of unlawful interference within the aviation system. All security initiatives placed by ICAO rely on the cooperation and commitment among member states.

To make advances in environmental stewardship, ICAO has developed additional standards, policies, and guidance material to specifically address aircraft noise and engine emissions. Most of ICAO's work within the environmental field is undertaken by the ICAO Committee on Aviation Environmental Protection (CAEP), including the collection of aircraft exhaust data from engine manufacturers for engines that have entered production. Many of these engines are used on military aircraft found at USAF bases and are often given a military designation to differentiate them from their civilian engine counterparts. Military-sponsored emissions tests have not been conducted on these engines and EFs have not been developed for them. The data

collected by CAEP may be utilized to assist in the calculation of aircraft engine emissions. This document includes EFs that have been developed from various studies as well as those provided by ICAO. This section of the document serves to briefly describe how the ICAO EFs were calculated so they may be used to calculate emissions from aircraft flight operations.

The aircraft exhaust data gathered by CAEP has been standardized per engine based on percent engine thrust. These values are used with the emission data sheets provided by ICAO to calculate aircraft engine emissions. ICAO emissions data sheets provide NO_X and CO emission indices, but do not provide VOC or PM emission indices directly. ICAO provides hydrocarbon (HC) emission indices which are multiplied by a scaling factor of 1.15 to estimate VOCs. This scaling factor is provided by a combined FAA and EPA report titled *Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines (May 2009)*.

ICAO does not directly provide PM emissions, but describes three types of PM, and outlines a method to calculate each. The first type of PM consists mainly of black carbon and is designated as non-volatile ($EI(PM)_{nvol}$). The second type of PM is designated volatile sulfate ($EI(PM)_{vol\text{-}FSC}$) and is dependent on the sulfur content of the fuel burned in the engine. The last type of PM is designated organic volatiles ($EI(PM)_{vol\text{-}FuelOrganics}$) and results from the incomplete combustion of fuel. The sum of these three values is assumed to represent PM_{10}, with $PM_{2.5}$ assumed to equal 90% of the PM_{10} total.

When calculating the non-volatile portion of the PM emissions indices, the first step is to verify that a smoke number (SN), which acts as a surrogate or indicator of plume opacity, has been provided for each mode. If not, the *ICAO Airport Air Quality Manual* may be consulted to estimate those SNs that are missing. Next, calculate the carbon index, which is "a measure of the black carbon mass per standard volume of flow" (ICAO 2011). Depending on the value of the SN, two different equations are used to calculate Carbon Index. For those SNs less than or equal to 30, the first equation is used, while the second is used for those SNs greater than 30.

$$\boldsymbol{CI = 0.06949(SN)^{1.234}} \qquad SN \leq 30$$

$$\boldsymbol{CI = 0.0297(SN)^2 - 1.803(SN) + 31.94} \qquad SN > 30$$

Where,

CI = Carbon Index (mg/m^3)

SN = Smoke Number

The volumetric flow rate (Q_{Core} or Q_{Mixed}) is calculated according to the engine type reported on the ICAO data sheet, or in the database. For engines listed as turbofan (TF), Q_{Core} is calculated using the first equation below. For those listed as mixed turbofan (MTF), Q_{Mixed} may be calculated using the second equation. The Air-Fuel Ratio (AFR) used in calculations is usually

proprietary information, but ICAO has developed average AFR values that may be used, which are provided in the *ICAO Airport Air Quality Manual* (ICAO 2011).

$$Q_{Core} = 0.776(AFR) + 0.877 \qquad \text{For Turbofan Engines}$$

$$Q_{Mixed} = 0.7769(AFR)(1 + BPR) + 0.877 \qquad \text{For Mixed Turbofan Engines}$$

Where,

Q_{Core} = Volumetric flow rate for TF engine (m^3/kg)
Q_{Mixed} = Volumetric flow rate for MTF engine (m^3/kg)
AFR = Air-fuel ratio as given in ICAO
BPR = Bypass Ratio as provided on ICAO datasheet or in ICAO database

Finally, the emission index (EI) for non-volatile PM ($EI(PM)_{nvol}$) is calculated by multiplying the Carbon Index by the volumetric flow rate as shown below.

$$\boldsymbol{EI(PM)_{nvol} = CI \times Q}$$

Where,

$EI(PM)_{nvol}$ = Emission Index for non-volatile PM (mg/kg)
Q = Volumetric flow rate; either Q_{Core} or Q_{Mixed}

The volatile PM sulfate portion of the PM emission index ($EI(PM)_{vol\text{-}FSC}$) is a function of the fuel sulfur content and the fuel sulfur conversion efficiency. If the sulfur content is unknown, the national average weight percent as given in Table 2-2 may be used in the calculations. Similarly, if the fuel sulfur conversion efficiency is unknown, ICAO recommends that a median value of 2.4 wt.% be used. The following equation is used to determine $EI(PM)_{vol\text{-}FSC}$.

$$\boldsymbol{EI(PM)_{vol-FSC} = (10)^6 \times \left[\frac{\left(FSC/100\right) \times \left(\varepsilon/100\right) \times 96}{32}\right]}$$

Where,

$EI(PM)_{vol\text{-}FSC}$ = Emission index for volatile sulfate PM (mg/kg)
FSC = Fuel sulfur content. **Use Table 2-2 if unknown (%)**
$(10)^6$ = Factor for converting units to mg/kg
100 = Factor converting percent to a fraction (%)
ε = Fuel sulfur conversion efficiency. **Use 2.4 if unknown (%)**
96 = Molecular weight of sulfate (g/mol)
32 = Molecular weight of sulfur (g/mol)

Finally, the organic volatiles ($EI(PM)_{vol\text{-}FuelOrganics}$) portion of the PM EI is calculated by taking the product of the HC EI and the ratio of $EI(PM)_{vol\text{-}FuelOraganics}$ to the HC EI of a reference engine. ICAO uses the CFM56-2-C1 as the reference engine for this ratio. The calculation of $EI(PM)_{vol\text{-}FuelOragnics}$ is shown in the following equation:

$$EI(PM)_{vol-FuelOrganics} = \delta \times EI_{HC}$$

Where,

$EI(PM)_{vol\text{-}FuelOrganics}$ = Emission index for PM from fuel organics (mg/kg)
δ = Ratio of $EI_{PMvol\text{-}FuelOrganics}$ to EI_{HC} for the CFM56-2-C1 engine
EI_{HC} = Hydrocarbon emission index of the engine

After $EI(PM)_{nvol}$, $EI(PM)_{vol\text{-}FSC}$, and $EI(PM)_{vol\text{-}FuelOrganics}$ are calculated, the emission index for PM_{10} is estimated by summing these values and converting into the correct units as shown:

$$EI(PM_{10}) = \frac{[EI(PM)_{nvol} + EI(PM)_{vol-FSC} + EI(PM)_{vol-FuelOrganics}]}{1000}$$

Where,

$EI(PM_{10})$ = Emission index for PM_{10} (g/kg)
$EI(PM)_{nvol}$ = Emission index for non-volatile PM (mg/kg)
$EI(PM)_{vol\text{-}FSC}$ = Emission index for volatile sulfate PM (mg/kg)
$EI(PM)_{vol\text{-}FuelOrganics}$ = Emission index for volatile fuel organic PM (mg/kg)
1000 = Factor to convert units from mg to g (mg/g)

$PM_{2.5}$ may then be determined from PM_{10} by assuming $PM_{2.5}$ is equal to 90% of the PM_{10} value.

$$EI(PM_{2.5}) = EI(PM_{10}) \times 0.90$$

Where,

$EI(PM_{2.5})$ = Emission index for $PM_{2.5}$ (g/kg)
$EI(PM_{10})$ = Emission index for PM_{10} (g/kg)
0.90 = Fraction of total $PM_{2.5}$ to PM_{10}

EFs have been calculated using ICAO data for engines that are most likely to be found at USAF installations. These have been added to EFs that have already been developed from government-subsidized studies. For any engine without a listed EF, if ICAO emissions data is available, the EFs may be calculated as described in this section as needed.

2.7 Information Resources

The Flightline Operations Group and aircraft pilots should be contacted to obtain the information required to calculate emissions from aircraft flying operations (i.e., the number of LTOs, TGOs, LFBs, TIM, etc.). The Aircraft Maintenance Squadron (AMX) should be contacted to obtain the information needed to calculate emissions from on-wing engine testing operations. This includes the types of engines tested, the number of tests conducted during the year on each engine type, the average time spent at each power setting during a typical test, and the associated fuel flow rate at each power setting. Additionally, the base's Weather Department should be contacted to

obtain the average mixing zone height for the base.

2.8 Example Calculations

The following section provides example calculations for aircraft operations.

2.8.1 Problem 1 – Landing and Takeoff Cycle Emissions

For planning purposes, a USAF installation needs to calculate the annual CO emissions from LTO operations associated with their F-15D aircraft. The following information was obtained from the base:

Aircraft Model: F-15D
Engine Model: F100-PW-220
Number of Engines: 2
Number of Annual LTOs: 2,500

Given this is only for planning purposes, the TIM data from Table 2-5 and the mode-specific fuel flow rates and EFs from Table 2-9 for the F100-PW-220 engine are presented in the following table:

LTO Mode	Average TIM (min.)	Typical Power Setting	Average Fuel Flow Rate (lb/hr)	CO Emission Factor (lb/1000 lb fuel)
Taxi/Idle-out	18.50	Idle	2,084	35.32
Takeoff	0.40*	Military	9,679	0.86
		Afterburner	41,682	11.87
Climb out	0.80	Intermediate	5,770	0.86
Approach	3.50	Approach	3,837	1.92
Taxi/Idle-in	11.30	Idle	2,084	35.32

* Since this engine has afterburner capability, it is assumed that the duration of the Takeoff mode is 50% Afterburner and 50% Military.

The annual CO emissions from F-15D LTO cycles are calculated using Equation 2-1 as shown:

$$E(Pol)_{Aircraft} = \sum_{i=1}^{n}\left[\frac{TIM_i}{60} \times \frac{FFR_i}{1{,}000} \times EF(Pol)_i \times \frac{FERF(Pol)}{100}\right] \times N$$

<u>Step 1</u> – Calculate CO pollutant emissions for each engine in each mode in the LTO cycle.

$$E(Pol)_{mode} = \frac{TIM_i}{60} \times \frac{FFR_i}{1{,}000} \times EF(Pol)_i \times \frac{FERF(Pol)}{100}$$

$$\boldsymbol{E(CO)_{Idle-Out}} = \frac{18.50}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{2084}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 35.32\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{22.7\frac{lb}{cycle}}$$

$$\boldsymbol{E(CO)_{Approach}} = \frac{3.50}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{3837}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 1.92\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{0.43\frac{lb}{cycle}}$$

$$\boldsymbol{E(CO)_{Takeoff(Mil)}} = \frac{0.20}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{9679}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 0.86\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{0.03\frac{lb}{cycle}}$$

$$\boldsymbol{E(CO)_{Takeoff(AB)}} = \frac{0.20}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{41682}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 11.87\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{1.65\frac{lb}{cycle}}$$

$$\boldsymbol{E(CO)_{Climb\ out}} = \frac{0.80}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{5770}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 0.86\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{0.07\frac{lb}{cycle}}$$

$$\boldsymbol{E(CO)_{Idle-in}} = \frac{11.30}{60}\frac{\cancel{min}/_{cycle}}{\cancel{min}/_{\cancel{hr}}} \times \frac{2084}{1{,}000}\frac{\cancel{lb}/_{\cancel{hr}}}{\cancel{lb}/_{\cancel{10^3 lb}}} \times 35.32\frac{lb}{\cancel{10^3\text{-}lb\text{-}fuel}} = \boldsymbol{13.86\frac{lb}{cycle}}$$

<u>Step 2</u> – Calculate the total CO emissions for a single F-15D LTO.

$$E(Pol)_{LTO} = \sum_{i=1}^{n}\left[E(Pol)_{Mode_i} + \cdots + E(Pol)_{Mode_n}\right] \times 2$$

$$\boldsymbol{E(CO)_{LTO}} = (22.7 + 0.43 + 0.03 + 1.65 + 0.07 + 13.86)\frac{lb}{cycle} \times 2 = \boldsymbol{77.48\frac{lb}{cycle}}$$

<u>Step 3</u> – Determine the total CO emissions from annual F-15D operations.

$$E(CO)_{Aircraft} = 77.48\frac{lb}{\cancel{cycle}} \times 2500\frac{\cancel{cycle}}{yr}$$

$$\boxed{\boldsymbol{E(CO)_{Total} = 193{,}700\frac{lb}{yr}}}$$

2.8.2 Problem 2 – Auxiliary Power Unit Emissions

For planning purposes, a USAF installation also needs to calculate the annual NO_X emissions associated with the operation of the APUs on their aircraft. The following information was obtained:

APU Model	GTCP165-1
# APU per aircraft	1
Power Setting	Constant
Operating Time per LTO	15 minutes
Total LTO per year	1300

The annual NO_X emissions from APU use is calculated using Equation 2-2 as shown:

$$E(Pol)_{APU} = L \times N \times \frac{OT}{60} \times EF(Pol) \times \frac{FERF}{100}$$

Step 1 – Calculate the NO_X emissions for a single LTO cycle. Note that Table 2-12 lists the NO_X EF for the GTCP165-1 as **1.22 lb/hr**.

$$\boldsymbol{E(NO_X)_{LTO}} = \frac{15\left(\cancel{min}/_{cycle}\right)}{60\left(\cancel{min}/\cancel{hr}\right)} \times 1.22\left(\frac{lb}{\cancel{hr}}\right) = \mathbf{0.305}\,\frac{\boldsymbol{lb}}{\boldsymbol{cycle}}$$

Step 2 – Calculate the NO_X pollutant emissions from annual APU operations.

$$E(Pol)_{APU} = L \times N \times E(Pol)_{LTO}$$

$$E(NO_X)_{APU} = 1300\left(\frac{\cancel{cycle}}{yr}\right) \times 1 \times 0.305\left(\frac{lb}{\cancel{cycle}}\right)$$

$$\boxed{\boldsymbol{E(NO_X)_{APU} = 396.5\,\frac{lb}{yr}}}$$

2.8.3 Problem 3 – On-Wing Engine Testing

A USAF installation performs on-wing evaluations of the F110-GE-100 engines used on their F-16D aircraft. The base must calculate CO and SO_X emissions from on-wing testing operations. The base and the fuel supplier are in Louisiana, and the base wants the SO_X emissions specific for Louisiana sulfur content. Approximately 30 on-wing engine tests following similar procedures were conducted during the year. For these similar on-wing tests, the procedure, average fuel flow rate (FFR), and average operating times are summarized as follows:

Procedure	Avg FFR (lb/hr)	Avg Operating Time (min)
Stabilize at Idle	809.33	5
Accelerate and Hold	4,147.78	5
Stabilize at Idle	981.21	1

Accelerate and Hold	8,170.88	5
Decelerate and Hold	1,232.67	5
Accelerate and Hold	12,223.02	2
Decelerate and Hold	1,187.40	2
Accelerate and Hold	17,959.14	0.25
Decelerate and Hold	2,201.55	2
Stabilize at Idle	1,205.45	5
Shut down engine	---	---

Step 1 – Determine the engine power mode for each test setting. The operating mode encompasses a range of fuel flow rates. Select the operating mode by finding where the average fuel flow rate in the table above falls within the fuel flow rate range for the operating mode. Typically, this is simply by finding the numerically closest fuel flow rate in Table 2-9 to the average rates recorded in the table above, however, refer to the appropriate tables for the latest version of the *Air Emissions Guide for Air Force Stationary Sources* for assistance as needed. The operating modes are as follows:

Procedure	Avg FFR (lb/hr)	Avg Operating Time (min)	Engine Power Mode
Stabilize at Idle	809.33	5	Idle
Accelerate and Hold	4,147.78	5	Approach
Stabilize at Idle	981.21	1	Idle
Accelerate and Hold	8,170.88	5	Intermediate
Decelerate and Hold	1,232.67	5	Idle
Accelerate and Hold	12,223.02	2	Military
Decelerate and Hold	1,187.40	2	Idle
Accelerate and Hold	17,959.14	0.25	Afterburner
Decelerate and Hold	2,201.55	2	Idle
Stabilize at Idle	1,205.45	5	Idle

Step 2 – Calculate CO and SO_X emissions for each operating mode. In this example, calculating the emissions while operating in the "idle" modes is the most complicated since the engine is tested in that mode at several points and at different fuel flow rates. Note also that this example states that the base conducted 30 "similar" tests, and without calculating emissions using data from each test, the following method is an approximation. It is up to the base to determine the level of precision required when estimating emissions from on-wing engine testing. The emission factors for CO and SO_X for fuel flow rates corresponding to a flight mode are provided in Table 2-9.

$$E(Pol)_{mode} = \sum_{i=1}^{n}\left[\frac{TIM_i}{60} \times \frac{FFR_i}{1000} \times EF(Pol)_i \times \frac{FERF(Pol)}{100}\right]$$

$$\boldsymbol{E(CO)_{Idle}} = \left[\left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{809.33\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{1\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{981.21\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1232.67\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{2\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1187.40\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{2\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{2201.55\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1205.45\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right)\right] \times 24.11 \frac{lb}{10^3 lb\ fuel} \times 30 \frac{tests}{yr} = \boldsymbol{289.28\ \frac{lb}{yr}}$$

$$\boldsymbol{E(SO_X)_{Idle}} = \left[\left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{809.33\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{1\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{981.21\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1232.67\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{2\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1187.40\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{2\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{2201.55\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right) + \left(\frac{5\ {}^{min}/_{test}}{60\ {}^{min}/_{hr}} \times \frac{1205.45\ {}^{lb}/_{hr}}{1000\ {}^{lb}/_{10^3\ lb}}\right)\right] \times 1.07 \frac{lb}{10^3 lb\ fuel} \times 30 \frac{tests}{yr} = \boldsymbol{12.84\ \frac{lb}{yr}}$$

CO and SO_X emissions for other modes are similarly calculated and is summarized as follows:

Mode	CO Emissions (min lb fuel lb/hr 10^3 lb fuel yr)	SO_X Emissions (min lb fuel lb/hr 10^3 lb fuel yr)
Idle	289.28	12.84
Approach	59.83	11.10
Intermediate	70.88	21.86
Military	41.31	13.08
Afterburner	151.33	2.40

Step 3 – Determine the total CO and SO_X emissions.

$$E(Pol)_{Aircraft} = \sum_{i=1}^{n} E(POL)_{Mode}$$

$$E(CO)_{Aircraft} = (289.28 + 59.83 + 70.88 + 41.31 + 151.33)\left(\frac{lb}{yr}\right)$$

$$\boxed{\boldsymbol{E(CO)_{Aircraft} = 612.63\ \frac{lb}{yr}}}$$

$$E(SO_X)_{Aircraft} = (12.84 + 11.10 + 21.86 + 13.08 + 2.40)\left(\frac{lb}{yr}\right)$$

$$\boxed{E(SO_X)_{Aircraft} = 61.27\,\frac{lb}{yr}}$$

Note that the *Air Emissions Guide for Air Force Stationary Sources* provides an example of how to estimate emissions for jet engine testing. The two examples show a slightly different but virtually identical method for estimating emissions from both processes.

2.8.4 Problem 4 – Flight Cycle Emissions

For planning purposes, an AFB is receiving ten new Sikorsky Black Hawks (UH-60) that will perform 1,000 flight cycles annually. The UH-60 is equipped with two T700-GE-700 engines. Given the time spent in each phase given below, determine the total annual NO_X emissions from this action.

Idle TIP (TIP_{Idle}) = 5.5 min
Site-specific taxi time (TIP_{Taxi}) = 7.6 min
Takeoff TIP ($TIP_{Takeoff}$) = Landing TIP ($TIP_{Landing}$) =0.68 min
Flight TIP (TIP_{Flight}) = 7.45 min

Step 1 – Determine the FFR and NO_X EF for each flight phase. This data is provided in Table 2-7 and provided in the table below:

Flight Phase	Fuel Flow (lb/hr)	Emission Factor (lb/1,000 lb fuel)						
		NOx	SOx	CO	VOC	HAPs	PM_{10}	$PM_{2.5}$
Idle	134	3.36	1.07	46.24	0.50	0.33	1.48	1.33
Taxi	469	10.95	1.07	5.12	0.02	0.01	1.26	1.13
Takeoff or Landing	626	11.87	1.07	3.51	0.01	0.00	2.22	2.00
Flight	725	11.43	1.07	2.81	0.01	0.01	2.61	2.33

Step 2 – Calculate the total NO_X emissions. Using Equation 2-4 and the data provided above, the total NO_X emissions are calculated as follows:

$$E(Pol) = \sum_{i=1}^{n}\left[\frac{TIP_i}{60} \times \frac{FFR_i}{1000} \times EF(Pol)_i\right] \times \boldsymbol{N} \times \boldsymbol{C}$$

$$E(NO_X) = \sum\left[\left(\frac{5.5\ min}{60^{min}/_{hr}} \times \frac{134\ ^{lb}/_{hr}}{1000\ ^{lb}/_{10^3 lb}} \times 3.36\ \frac{lb}{10^3 lb}\right) + \left(\frac{7.6\ min}{60^{min}/_{hr}} \times \frac{469\ ^{lb}/_{hr}}{1000\ ^{lb}/_{10^3 lb}} \times 10.95\ \frac{lb}{10^3 lb}\right) + \left(\frac{0.68\ min}{60^{min}/_{hr}} \times \frac{626^{lb}/_{hr}}{1000\ ^{lb}/_{10^3 lb}} \times 11.87\ \frac{lb}{10^3 lb}\right) + \left(\frac{0.68\ min}{60^{min}/_{hr}} \times \frac{626\ ^{lb}/_{hr}}{1000\ ^{lb}/_{10^3 lb}} \times 11.87\ \frac{lb}{10^3 lb}\right) + \left(\frac{7.45\ min}{60^{min}/_{hr}} \times \frac{725\ ^{lb}/_{hr}}{1000\ ^{lb}/_{10^3 lb}} \times 11.43\ \frac{lb}{10^3 lb}\right)\right] \times 2 \times \frac{1000}{yr}$$

1910 $E(NO_X) = \sum[(0.04\ lb) + (0.65\ \text{lb}) + (0.08\ \text{lb}) + (0.08\ \text{lb}) + (1.03\ \text{lb})] \times 2 \times \frac{1000}{yr}$

1911 $\boxed{\boldsymbol{E(NO_X) = 3,760\ \frac{lb}{yr}}}$

1912

1913 **Table 2-4. Comparison of Commercial and Military Fixed-Wing LTO Cycle Modes**
1914

Engine Type	Commercial LTO Cycle Modes	Military LTO Cycle Modes	Typical Engine Power Setting(%)
Turbofan	Taxi/Idle-out	Idle	7
	Takeoff	Military or Afterburner (AB)	100 or 110-150 [a]
	Climb out	Intermediate	70-85 [a]
	Approach	Approach	30
	Taxi/Idle-in	Idle	7
Turboprop	Taxi/Idle-out	Idle	7
	Takeoff	Military	90
	Climb out	Intermediate	70-85 [a]
	Approach	Approach	30
	Taxi/Idle-in	Idle	7

1915
1916 SOURCE (unless otherwise noted): *Airport Air Quality Manual*, International Civil Aviation Organization, 2011.
1917 a. Power setting percentage from *Air Emissions Factor Guide to Air Force Mobile Sources*, 2009 which cites Emissions and
1918 Dispersion Modeling System (EDMS) as the original source. For military aircraft equipped with afterburner (AB), it should
1919 be generally assumed that the duration of Takeoff mode is 50% AB and 50% military.
1920
1921

1922 **Table 2-5. Default Time-in-Mode for Various Aircraft Categories**

Aircraft Type	Typical Duration by Mode (Minutes)				
	Taxi-in/Taxi-out	Takeoff [a]	Climb out	Approach	Total
Military Aircraft					
Combat:					
USAF	29.80	0.40	0.80	3.50	34.50
USAF F-35 [b]	29.80	1.065 (Military) 0.013 (AB)	0.012	2.501	33.391
USN	13.00	0.40	0.50	1.60	15.50
Trainer - Turbine: [c]					
USAF T-7	9.74	0.43 (Military) 0.37 (AB)	0.95	1.67	13.16
USAF T-38	19.20	0.40	0.90	3.80	24.30
USAF General	11.20	0.50	1.40	4.00	17.10
USN	13.00	0.40	0.50	1.60	15.50
Transport - Turbine: [c]					
USAF general	15.90	0.40	1.20	5.10	22.60
USN	26.00	0.50	2.50	4.50	33.50
USAF B-52 and KC-135	47.70	0.70	1.60	5.20	55.20
Military - Piston	13.00	0.60	5.00	4.60	23.20
Civilian Aircraft					
Commercial Carrier:					
Jumbo, Long and Medium range jet	26.00	0.70	2.20	4.00	32.90
General Aviation:					
Business Jet	13.00	0.40	0.50	1.60	15.50
Turboprop	26.00	0.50	2.50	4.50	33.50
Piston	16.00	0.30	5.00	6.00	27.30

1923
1924 SOURCE (unless otherwise noted): *Procedures for Emission Inventory Preparation Volume IV: Mobile Sources*, EPA420-R-92-
1925 009, December 1992. USAF – United States Air Force. USN – United States Navy
1926 a. For military aircraft equipped with afterburner (AB), it should be generally assumed that the duration of Takeoff mode is
1927 50% AB and 50% military.
1928 b. SOURCE: *F-35A/B/C Flight Profiles (Karnes 3.2) for US Air Force, US Navy, and US Marine Corps Airfield Noise and Air*
1929 *Studies*, June 2015. Note that the duration of "Takeoff" mode is the total of the TIM in military and AB for each takeoff.
1930 c. Turbines include both turbofan and turboprop engines.
1931 d. SOURCE: Air Emissions Factor Guide to Air Force Mobile Sources, December 2009. This document cites Emissions and
1932 Dispersion Modeling System (EDMS) as the original source.
1933

1934 **Table 2-6. Military Airframe/Engine/APU Combinations**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
A-3A	Combat: USN	J57-P-6B (2)	---	---	c, h(1)
A-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
A-4	Combat: USN	J52-P-2 (1)	---	---	c, h(4)
		J52-P-8 (1)	---	---	c, h(4)
		J65-W-2 (1)	---	---	c, h(4)
		J65-W-4 (1)	---	---	c, h(4)
A-4C	Combat: USN	J65-W-16A (1)	---	---	c, h(1)
		J65-W-20 (1)	---	---	h(3)
A-4E	Combat: USN	J52-P-6A (1)	---	---	c, h(1)
		J52-P-8A, -8B (1)	---	---	c, h(1)
A-4F	Combat: USN	J52-P-8A , -8B (1)	---	---	c, h(1)
A-4L	Combat: USN	J65-W-20 (1)	---	---	h(1)
A-4M	Combat: USN	J52-P-408 (1)	---	---	h(1)
A-6A	Combat: USN	J52-P-6A, -6B (2)	---	---	c, h(1), h(3)
		J52-P-8A, -8B (2)	---	---	c, h(1)
A-6B	Combat: USN	J52-P-6A (2)	---	---	c, h(1)
		J52-P-8A (2)	---	---	c, h(1)
A-6C	Combat: USN	J52-P-8A (2)	---	---	c, h(1)
A-6E	Combat: USN	J52-P-8A, -8B (2)	---	---	c, h(1)
A-6F	Combat: USN	F404-GE-400D (2)	---	---	c, h(1)
A-7A	Combat: USN	TF30-P-6B (1)	---	---	h(3)
A-7B, -7C	Combat: USN	TF30-P-8 (1)	---	---	c, h(1)
		TF30-P-408 (1)	---	---	c, h(1)
A-7D, -7K	Combat: USAF	TF41-A-1 (1)	---	---	h(1), h(5)
A-7E	Combat: USN	TF41-A-2 (1)	---	---	h(1)
A-10	Combat: USAF	TF34-GE-100A (2)	---	---	h(2)
		TF34-GE-400 (2)	---	---	h(3)
A-10A	Combat: USAF	TF34-GE-100 (2)	GTCP 36-50 (1)	1.00	b, c, h(1)
A-10C	Combat: USAF	TF34-GE-100 (2)	---	---	h(6)
A-29	Combat: USAF	PT6A-68C (1)	---	---	h(17)
A-37	Combat: USAF	J69-T-25 (2)	---	---	h(3)
A-37A, -37B	Combat: USAF	J85-GE-17A (2)	---	---	h(4)
AC-130A	Transport - Turbine: USAF general	T56-A-1A (4)	---	---	h(1)
		T56-A-9 (4)	---	---	h(1)
AC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	c, e, h(1), i(1)
AC-130J	Transport - Turbine: USAF general	AE2100D3 (4)	---	---	c, h(6)
AC-130U, -130W	Transport - Turbine: USAF general	T56-A-15 (4)	---	---	h(1), h(6)
AT-6B	Trainer - Turbine: USAF General	PT6A-68D (1)	---	---	h(14)
AT-38B	Trainer - Turbine: USAF T-38	J85-GE-5, -5A, -5G, -5J (2)	---	---	c, h(1)
AU-24	Combat: USAF	PT6A-27 (1)	---	---	h(3)
AV-8B	Combat: USN	F402-RR-406 (1)	---	---	h(7)
		F402-RR-408A (1)	---	---	h(7)
BAMS-D	Combat: USN	AE3700N (1)	---	---	c, h(7)
B-1A	Combat: USAF	F101-GE-100 (4)	---	---	h(5)
B-1B	Combat: USAF	F101-GE-102 (4)	GTCP 165-9 (1)	2.00	b, c, h(1)
B-2A	Combat: USAF	F118-GE-100 (4)	131-3A (2)	4.00	b, c, h(1)

1935
1936

1937 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
B-52D	Transport - Turbine: USAF B-52	J57-P-19W (8)	---	---	h(5)
		J57-P/F-43WB (8)	---	---	h(5)
B-52G	Transport - Turbine: USAF B-52	J57-P-22 (8)	---	---	h(3)
B-52H	Transport - Turbine: USAF B-52	TF33-P-3 (8)	---	---	h(3)
		TF33-P-5 (8)	---	---	h(3)
		TF33-P-7 (8)	---	---	h(3)
		TF33-P-103 (8)	---	---	h(6)
C-1	General Aviation: Piston	R-1820-82 (2)	---	---	h(3)
C-1A	General Aviation: Piston	R-1820-82, -82A (2)	---	---	c, h(1)
C-2	Transport - Turbine: USN	T56-A-7 (2)	---	---	h(3)
C-2A	Transport - Turbine: USN	T56-A-8, -8A, -8B (2)	---	---	c, h(1)
		T56-A-425 (2)	---	---	c, h(7)
C-5A	Transport - Turbine: USAF general	TF39-GE-1, -1A, -1C (4)	GTCP 85-98d (1)	8.00	c, e, h(1), h(3), h(9), i(1)
C-5B, -5C	Transport - Turbine: USAF general	TF39-GE-1C (4)	GTCP 85-98d (1)	8.00	e, h(1), i(1)
C-5M	Transport - Turbine: USAF general	CF6-80C2L1F (4)	---	---	c, h(1)
		F138-GE-100 (4)	---	---	c, h(1), l(2)
C-9	Transport - Turbine: USAF general	JT8D-17 (2)	---	---	g, h(3)
C-9A	Transport - Turbine: USAF general	JT8D-9A (2)	GTCP 85-98d (1)	6.00	h(1), i(1)
C-9B	Transport - Turbine: USN	JT8D-9A (2)	---	---	c, h(1)
C-9C	Transport - Turbine: USAF general	JT8D-9A (2)	---	---	c, h(1)
C-11A	General Aviation: Business Jet	F113-RR-100 (2)	---	---	h(1), k, l(1)
		SPEY Mk511-8 (2)	---	---	c, h(1)
C-12	General Aviation: Turboprop	PT6A-27 (2)	---	---	h(3)
C-12A	General Aviation: Turboprop	PT6A-38 (2)	---	---	h(1)
		PT6A-41 (2)	---	---	h(3)
C-12C, -12D, -12L	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
C-12F, -12R, -12T, -12U	General Aviation: Turboprop	PT6A-42 (2)	---	---	h(1), h(6)
C-12J	General Aviation: Turboprop	PT6A-65B (2)	---	---	c, h(6)
C-12S	General Aviation: Turboprop	PT6A-60A (2)	---	---	h(1)
C-17A	Transport - Turbine: USAF general	F117-PW-100 (4)	331 250G (1)	0.50	b, h(1)
		PW2040 (4)	331 250G (1)	0.50	b, h(1), l(2)
C-18B	Transport - Turbine: USAF general	JT3D-7 (4)	T41M-9A (1)	0.50	b, c, h(1)
C-20A	General Aviation: Business Jet	F113-RR-100 (2)	GTCP 36-100 (1)	0.50	b, h(1), l(1)
		SPEY Mk511-8 (2)	GTCP 36-100 (1)	0.50	b, c, h(1)
C-20B, -20C, -20D, -20E, -20J	General Aviation: Business Jet	F113-RR-100 (2)	---	---	h(1), k, l(1)
		SPEY Mk511-8 (2)	---	---	c, h(1)
C-20F, -20G, -20H	General Aviation: Business Jet	TAY Mk611-8 (2)	---	---	h(1)
C-21A	General Aviation: Business Jet	TFE731-2-2B (2)	---	---	h(1)
C-22A	Transport - Turbine: USAF general	JT8D-7A (3)	GTCP 85-98ck (1)	1.00	c, h(1), i(1)
C-22B	Transport - Turbine: USAF general	JT8D-7 (3)	GTCP 85-98ck (1)	1.00	h(1), i(1)
C-23A	General Aviation: Turboprop	PT6A-45R (2)	---	---	c, h(1)
C-23B, -23C	General Aviation: Turboprop	PT6A-65AR (2)	---	---	c, h(1)
C-26A	General Aviation: Turboprop	TPE331-11U (2)	---	---	c, h(1)
C-26B, -26D	General Aviation: Turboprop	TPE331-12UA-701G (2)	---	---	c, h(1)
C-27J	Transport - Turbine: USAF general	AE2100D2 (2)	---	---	c, h(6)
C-28A	General Aviation: Piston	GTSIO-520-M (2)	---	---	h(1)

1938
1939

1940 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
C-32A	Transport - Turbine: USAF general	F117-PW-100 (2)	331-49-7081 (1)	3.00	b, h(1), k
		PW2040 (2)	331-49-7081 (1)	3.00	b, h(1)
C-37A	General Aviation: Business Jet	BR700-710A1-10 (2)	---	---	h(6)
C-37B	General Aviation: Business Jet	BR700-710C4-11 (2)	---	---	h(7)
C-38A	General Aviation: Business Jet	TFE731-40 (2)	---	---	c, h(1)
C-40A	Transport - Turbine: USN	CFM56-7B24 (2)	---	---	d, h(1)
C-40B	Transport - Turbine: USAF general	CFM56-7B27 (2)	131-9 (1)	0.50	b, c, h(1)
		CFM56-7B3 (2)	131-9 (1)	0.50	b, c, h(1)
C-40C	Transport - Turbine: USAF general	CFM56-7B3 (2)	---	---	c, d, h(1)
		CFM56-7B27 (2)	---	---	d, h(1)
C-123K	Transport - Turbine: USAF general	J85-GE-17 (2)	---	---	c, h(1)
		R-2800-99W (2)	---	---	h(1)
C-130A, -130D	Transport - Turbine: USAF general	T56-A-9, -9A, -9B (4)	GTCP 85L (1)	1.00	b, c, h(1)
C-130B	Transport - Turbine: USAF general	T56-A-7, -7A (4)	GTCP71/71A (1)	1.00	b, c, h(1)
C-130E	Transport - Turbine: USAF general	T56-A-7, -7A (4)	GTCP71/71A (1)	1.00	b, c, h(1)
C-130F	Transport - Turbine: USN	T56-A-7, -7A (4)	GTCP71/71A (1)	1.00	b, c, h(1)
C-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	c, e, h(1), i(1)
C-130J	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85L (1)	1.00	b, h(1)
		AE2100D3 (4)	---	---	c, h(6)
C-130T	Transport - Turbine: USN	T56-A-16 (4)	---	---	h(1)
C-135A	Transport - Turbine: USAF general	J57-P/F-59W (4)	T41M-9A (1)	1.00 to 2.00	b, c, h(5)
			ASHG70-1 (1)	1.00 to 2.00	b, c, h(5)
C-135B, -135C	Transport - Turbine: USAF general	J57-P/F-59W (4)	T41M-9A (1)	1.00 to 2.00	b, c, h(5)
			ASHG70-1 (1)	1.00 to 2.00	b, c, h(5)
		TF33-P-5 (4)	T41M-9A (1)	1.00 to 2.00	b, c, h(1)
			ASHG70-1 (1)	1.00 to 2.00	b, c, h(1)
C-135E	Transport - Turbine: USAF general	TF33-P-102 (4)	T41M-9A (1)	1.00 to 2.00	b, c, h(1)
			ASHG70-1 (1)	1.00 to 2.00	b, c, h(1)
C-137B, -137C	Transport - Turbine: USAF general	JT3D-3B (4)	---	---	h(1)
C-140A	General Aviation: Business Jet	J60-P-5A, -5B (4)	---	---	h(5)
C-140B	General Aviation: Business Jet	J60-P-5 (4)	---	---	c, h(6)
C-141	Transport - Turbine: USAF general	TF33-P-3 (4)	GTCP 165-1 (1)	3.00	h(3), i(2)
		TF33-P-5 (4)	GTCP 165-1 (1)	3.00	h(3), i(2)
C-141A, -141B, -141C	Transport - Turbine: USAF general	TF33-P-7 (4)	GTCP85-106/106A (1)	3.00	b, c, h(1), h(3)
C-145A	Trainer - Turbine: USAF General	PT6A-65B (2)	---	---	c, h(6)
C-146A	Transport - Turbine: USAF general	PW119C (2)	---	---	c, h(6)
CMV-22B	Transport - Turbine: USN	AE1107C (2)	---	---	f, h(7)
CT-1B	General Aviation: Business Jet	JT15D-5 (2)	---	---	d, h(1)
CT-39A	General Aviation: Business Jet	J60-P-3, -3A (2)	---	---	c, h(1)
CT-39E, -39G	General Aviation: Business Jet	JT12A-8 (2)	---	---	c, h(1)
CT-43A	Transport - Turbine: USAF general	JT8D-9A (2)	---	---	h(1)
CT-49A	Transport - Turbine: USAF general	JT3D-7 (4)	---	---	d, h(1)
CV-22, -22A	Transport - Turbine: USAF general	AE1107C (2)	---	---	f, h(1)
		T406-AD-400 (2)	---	---	f, h(1), l(2)
CV-22B	Transport - Turbine: USN	AE1107C (2)	---	---	f, h(7)
DC-130A	Transport - Turbine: USAF general	T56-A-9, -9A (4)	---	---	c, h(1)

1941
1942

1943 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
DF-8L	Combat: USN	J57-P-4A (1)	---	---	c, h(1)
DT-2B	Trainer - Turbine: USN	J60-P-6 (2)	---	---	c, h(1)
E-1B	General Aviation: Piston	R-1820-82A (2)	---	---	c, h(1)
E-2	Transport - Turbine: USN	T56-A-7 (2)	---	---	h(3)
E-2B	Transport - Turbine: USN	T56-A-8, -8A, -8B (2)	---	---	c, h(1)
E-2C	Transport - Turbine: USN	T56-A-422 (2)	---	---	c, h(1)
		T56-A-427 (2)	---	---	c, h(10)
E-2D	Transport - Turbine: USN	T56-A-427 (2)	---	---	c, h(10)
E-3A	Transport - Turbine: USAF general	TF33-P-3 (4)	---	---	d, h(3)
		TF33-P-5 (4)	---	---	d, h(3)
		TF33-P-7 (4)	---	---	d, h(3)
		TF33-P-100A (4)	---	---	c, d, h(1)
E-3B, -3C	Transport - Turbine: USAF general	TF33-P-100A (4)	GTCP 165-1 (1)	2.00	c, h(1), i(1)
E-4A	Transport - Turbine: USAF general	F103-GE-100 (4)	---	---	h(5)
E-4B	Transport - Turbine: USAF general	CF6-50E2 (4)	GTCP 660-4 (1)	2.00	h(6), i(1)
E-6B	Transport - Turbine: USN	CFM56-2A-2 (4)	---	---	c, h(7)
E-8C	Transport - Turbine: USAF general	JT3D-3B (4)	GTCP 85 (1)	2.00	e, h(1), k
		TF33-PW-102C (4)	GTCP 85 (1)	2.00	c, e, h(1)
E-9A	Transport - Turbine: USAF general	PW120A (2)	---	---	c, h(6)
EA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
EA-4F	Combat: USN	J52-P-6A, -6B (1)	---	---	c, h(1)
		J52-P-8A (1)	---	---	c, h(1)
EA-6A	Combat: USN	J52-P-8A, -8B (2)	---	---	c, h(1)
EA-6B	Combat: USN	J52-P-8A, -8B (2)	---	---	c, h(1)
		J52-P-408 (2)	---	---	h(1)
EA-7L	Combat: USN	TF41-A-2 (1)	---	---	h(1)
		TF30-P-408 (1)	---	---	c, h(1)
EA-18G	Combat: USN	F414-GE-400 (2)	---	---	h(7)
EB-57B	Combat: USAF	J65-W-5, -5B (2)	---	---	c, h(1)
EC-18B, -18D	Transport - Turbine: USAF general	JT3D-7 (4)	---	---	h(1)
EC-24A	Transport - Turbine: USN	JT3D-3B (4)	---	---	h(1)
EC-37B	Transport - Turbine: USAF general	BR700-710C4-11 (2)	---	---	h(15)
EC-130E	Transport - Turbine: USAF general	T56-A-7, -7A (4)	---	---	c, h(1)
		T56-A-15 (4)	---	---	h(6)
EC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	h(1), i(1)
EC-130J, -130SJ	Transport - Turbine: USAF general	AE2100D3 (4)	---	---	c, h(6)
EC-130Q	Transport - Turbine: USAF general	T56-A-423 (4)	---	---	c, h(1)
EC-130V	Transport - Turbine: USN	T56-A-15 (4)	---	---	d, h(1)
EC-135A, -135G, -135L	Transport - Turbine: USAF general	J57-P/F-59W (4)	---	---	h(1), h(5)
EC-135B	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
EC-135C, -135J	Transport - Turbine: USAF general	TF33-P-9 (4)	---	---	h(1)
EC-135E	Transport - Turbine: USAF general	TF33-P-102 (4)	---	---	h(1)
EC-135H, -135K, -135P	Transport - Turbine: USAF general	J57-P/F-59W (4)	---	---	h(1), k
		TF33-P-102 (4)	---	---	h(5)
EC-135N	Transport - Turbine: USAF general	J57-P/F-43WB (4)	---	---	h(1)

1944
1945

1946 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
EC-135Y	Transport - Turbine: USAF general	J57-P/F-43WB (4)	---	---	h(1)
		J57-P/F-59W (4)	---	---	h(1)
EC-137D	Transport - Turbine: USAF general	JT3D-3B (4)	---	---	h(1)
EF-4J	Combat: USN	J79-GE-8B (2)	---	---	c, h(1)
EF-111A	Combat: USAF	TF30-P-109 (2)	---	---	h(1)
EKA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
EP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
EP-3B, -3E, -3J	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1), h(7)
ERA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
ES-2D	General Aviation: Piston	R-1820-82A (2)	---	---	c, h(1)
F-4	Combat: USN	J79-GE-10 (2)	---	---	c, h(3)
F-4B, -4N	Combat: USN	J79-GE-8B, -8C (2)	---	---	c, h(1)
F-4C, -4D	Combat: USAF	J79-GE-15 (2)	---	---	h(1)
F-4E, -4G	Combat: USAF	J79-GE-17 (2)	---	---	h(1)
F-4J	Combat: USN	J79-GE-8B (2)	---	---	c, h(1)
F-4S	Combat: USN	J79-GE-10B (2)	---	---	c, h(1)
F-5A, -5B	Combat: USAF	J85-GE-13 (2)	---	---	d, h(3)
F-5E, -5F	Combat: USAF	J85-GE-21 (2)	---	---	d, h(1)
F-8	Combat: USN	J57-P-22 (1)	---	---	c, h(3)
F-8J	Combat: USN	J57-P-420 (1)	---	---	h(1)
F-8K	Combat: USN	J57-P-16, -16B (1)	---	---	c, h(1)
F-14A	Combat: USN	TF30-P-412 (2)	---	---	c, h(1)
		TF30-P-414A (2)	---	---	c, h(7)
F-14C	Combat: USN	TF30-P-412 (2)	---	---	c, h(1)
F-14B, -14D	Combat: USN	F110-GE-400 (2)	---	---	h(1)
F-15A, -15B	Combat: USAF	F100-PW-100 (2)	---	---	h(1)
F-15C, -15D	Combat: USAF	F100-PW-100 (2)	---	---	h(1)
		F100-PW-220 (2)	---	---	h(1)
		F100-PW-229 (2)	---	---	h(6)
F-15E	Combat: USAF	F100-PW-220 (2)	---	---	h(1)
		F100-PW-229 (2)	---	---	h(1)
F-16	Combat: USAF	F100-PW-100 (1)	T-62T-40-8 (1)	1.00	b, c, h(3)
F-16A, -16B	Combat: USAF	F100-PW-200 (1)	T-62T-40-8 (1)	1.00	b, c, h(1)
		F100-PW-220 (1)	T-62T-40-8 (1)	1.00	b, c, h(7)
F-16C, -16D	Combat: USAF	F100-PW-200 (1)	T-62T-40-8 (1)	1.00	b, c, h(1)
		F100-PW-220 (1)	T-62T-40-8 (1)	1.00	b, c, h(6)
		F100-PW-229 (1)	T-62T-40-8 (1)	1.00	b, c, h(1)
		F110-GE-100 (1)	T-62T-40-8 (1)	1.00	b, c, h(1)
		F110-GE-129 (1)	T-62T-40-8 (1)	1.00	b, c, h(1)
F-16N	Combat: USN	F110-GE-100 (1)	---	---	h(1)
F-22A, -22B	Combat: USAF	F119-PW-100 (2)	---	---	h(1)
F-35A	Combat: USAF	F135-PW-100 (1)	---	---	c, h(1)
F-35B	Combat: USN	F135-PW-600 (1)	---	---	c, d, h(11)
F-35C	Combat: USN	F135-PW-100 (1)	---	---	c, h(7)
F-100	Combat: USAF	J57-P-22 (1)	---	---	c, h(3)
F-106A, -106B	Combat: USAF	J75-P-17 (1)	---	---	h(1)

1947
1948

Table 2-6. Military Airframe/Engine/APU Combinations (cont.)

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
F-111, -111F	Combat: USAF	TF30-P-100 (2)	---	---	h(1), h(3)
F-111A	Combat: USAF	TF30-P-3 (2)	---	---	h(1)
F-111D, -111E	Combat: USAF	TF30-P-3 (2)	---	---	h(1)
		TF30-P-9 (2)	---	---	h(5)
F-111G	Combat: USAF	TF30-P-107 (2)	---	---	h(1)
F-117A	Combat: USAF	F404-GE-F1D2 (2)	3800100-4 (1)	2.00	b, c, h(8)
F/A-18A, -18B	Combat: USN	F404-GE-400 (2)	---	---	h(1), h(7)
F/A-18C, -18D	Combat: USN	F404-GE-400 (2)	---	---	h(1)
		F404-GE-402 (2)	---	---	c, h(7)
F/A-18E, -18F	Combat: USN	F404-GE-400 (2)	---	---	h(7)
		F414-GE-400 (2)	---	---	c, h(7)
FA-22A	Combat: USAF	F119-PW-100 (2)	---	---	h(1)
FB-22A	Combat: USAF	F119-PW-100 (2)	---	---	h(1)
FB-111A	Combat: USAF	TF30-P-7 (2)	---	---	h(1)
HC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	e, h(1), i(1)
HC-130J	Transport - Turbine: USAF general	AE2100D3 (4)	---	---	c, h(6)
HC-130P/N	Transport - Turbine: USAF general	T56-A-15 (4)	---	---	h(6)
HV-22A, -22B	Transport - Turbine: USN	AE1107C (2)	---	---	f, h(1), k
		T406-AD-400 (2)	---	---	f, h(1), l(2)
JA-6A	Combat: USN	J52-P-6A, -6B (2)	---	---	c, h(1)
		J52-P-8A, -8B (2)	---	---	c, h(1)
KA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
KA-6D	Combat: USN	J52-P-6A (2)	---	---	c, h(1)
		J52-P-8A (2)	---	---	c, h(1)
KC-10, -10A	Transport - Turbine: USAF general	CF6-50C2 (3)	TSCP 700-4B (1)	6.00	h(1), i(1)
		F103-GE-100 (3)	TSCP 700-4B (1)	6.00	h(5), i(1)
		F103-GE-101 (3)	TSCP 700-4B (1)	6.00	h(12), i(1)
KC-46A	Transport - Turbine: USAF general	PW4062 (2)	GTCP 331-200 (1)	0.87	e, h(6), j
			GTCP 331-200ER (1)	0.87	e, h(6), j
KC-130F, -130R, -130T	Transport - Turbine: USN	T56-A-16 (4)	---	---	h(1)
KC-135	Transport - Turbine: USAF KC-135	J57-P-22 (4)	---	---	h(3)
KC-135A	Transport - Turbine: USAF KC-135	J57-P/F-43WB (4)	---	---	h(1)
		J57-P/F-59W (4)	---	---	h(1)
KC-135D, -135Q	Transport - Turbine: USAF KC-135	J57-P/F-59W (4)	---	---	h(1), h(5)
KC-135E	Transport - Turbine: USAF KC-135	TF33-P-102 (4)	GTCP 85-180L (1)	1.00	c, e, h(1), i(1)
KC-135J	Transport - Turbine: USAF KC-135	AE2100D3 (4)	---	---	c, h(7)
KC-135R, -135T	Transport - Turbine: USAF KC-135	CFM56-2B-1 (4)	---	---	h(1), k
		F108-CF-100 (4)	---	---	h(1), l(2)
KC-767A	Transport - Turbine: USAF general	CF6-80C2B6F (2)	---	---	h(13)
		CF6-80C2B7F (2)	---	---	h(13)
		PW4062 (2)	---	---	h(13)
KS-3A	Combat: USN	TF34-GE-2 (2)	---	---	c, h(1)
LC-130F, -130R	Transport - Turbine: USN	T56-A-16 (4)	---	---	h(1)
LC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	---	---	h(1)
MC-12W	General Aviation: Turboprop	PT6A-60 (2)	---	---	c, h(6)

1952 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
MC-130E	Transport - Turbine: USAF general	T56-A-7 (4)	---	---	h(1)
		T56-A-15, -15A (4)	---	---	c, h(1), h(6)
MC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	e, h(1), i(1)
MC-130J	Transport - Turbine: USAF general	AE2100D3 (4)	---	---	c, h(6)
MC-130P, -130W	Transport - Turbine: USAF general	T56-A-15 (4)	---	---	h(1), h(6)
MQ-1B	Military - Piston	Rotax 914F (1)	---	---	h(6)
MQ-1C	Military - Piston	TAE-125 (1)	---	---	h(13)
MQ-4C	Combat: USN	AE3007H (1)	---	---	h(7)
MQ-9	Combat: USAF	TPE331-10GD (1)	---	---	c, h(6)
MQ-25	Combat: USN	AE3007H (1)	---	---	h(7)
MV-22A, -22B	Transport - Turbine: USN	AE1107C (2)	---	---	f, h(1), k
		T406-AD-400 (2)	---	---	f, h(1), l(2)
NA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
NA-4E	Combat: USN	J52-P-6A (1)	---	---	c, h(1)
		J52-P-8A, -8B (1)	---	---	c, h(1)
NA-4F	Combat: USN	J52-P-8A (1)	---	---	c, h(1)
NA-4M	Combat: USN	J52-P-408 (1)	---	---	h(1)
NA-6A	Combat: USN	J52-P-6A, -6B (2)	---	---	c, h(1)
		J52-P-8A, -8B (2)	---	---	c, h(1)
NA-6E	Combat: USN	J52-P-8B (2)	---	---	h(1)
NA-7A	Combat: USN	TF30-P-6 (1)	---	---	c, h(1)
NA-7C	Combat: USN	TF30-P-8 (1)	---	---	c, h(1)
NA-7E	Combat: USN	TF41-A-2 (1)	---	---	h(1)
NB-52B	Transport - Turbine: USAF B-52	J57-P-19W (8)	---	---	h(1)
NC-12B	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
NC-21A	General Aviation: Business Jet	TFE731-2-2B (2)	---	---	h(1)
NC-37B	General Aviation: Business Jet	BR700-710C4-11 (2)	---	---	h(7)
NC-130A	Transport - Turbine: USAF general	T56-A-9, -9A, -9B (4)	---	---	c, h(1)
NC-130B, -130E	Transport - Turbine: USAF general	T56-A-7, -7A (4)	---	---	c, h(1)
NC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	c, e, h(1), i(1)
NC-135A	Transport - Turbine: USAF general	J57-P/F-43WB (4)	---	---	h(5)
NC-135W	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
NC-141A	Transport - Turbine: USAF general	TF33-P-7 (4)	GTCP 85-106/106A (1)	3.00	b, c, h(1)
NF-4D	Combat: USAF	J79-GE-15 (2)	---	---	h(1)
		J79-GE-17 (2)	---	---	h(1)
NF-14B	Combat: USN	F401-PW-400 (2)	---	---	c, h(1)
NF-14D	Combat: USN	F110-GE-400 (2)	---	---	h(1)
NF-16A	Combat: USAF	F100-PW-200 (1)	---	---	h(1)
NF-16D	Combat: USAF	F100-PW-200 (1)	---	---	h(1)
		F100-PW-229 (1)	---	---	h(1)
		F110-GE-100 (1)	---	---	h(1)
		F110-GE-129 (1)	---	---	h(1)
NF-106B	Combat: USAF	J75-P-17 (1)	---	---	h(5)
NF/A-18A, -18B, -18C, -18D	Combat: USN	F404-GE-400 (2)	---	---	h(1)
NKC-135A	Transport - Turbine: USAF KC-135	J57-P/F-43WB (4)	---	---	h(1)
		J57-P/F-59W (4)	---	---	h(1)

1953
1954

1955 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
NKC-135E	Transport - Turbine: USAF KC-135	TF33-P-102 (4)	GTCP 85-180L (1)	2.00	c, h(1), i(1)
NP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
NP-3C, -3D	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
NRA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
NT-33A	Trainer - Turbine: USAF General	J33-A-35 (1)	---	---	h(1)
NT-34C	General Aviation: Piston	PT6A-25 (1)	---	---	c, h(1)
NT-39A	General Aviation: Business Jet	J60-P-3, -3A (2)	---	---	c, h(1)
NTA-4F, -4J	Combat: USN	J52-P-6A (1)	---	---	c, h(1)
NUP-3A	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
O-1	General Aviation: Piston	O-470C (1)	---	---	h(3)
O-2A, -2B	General Aviation: Piston	IO-360-C (2)	---	---	h(1), h(3)
		IO-360-D (2)	---	---	h(3)
OA-4M	Combat: USN	J52-P-6A, -6B (1)	---	---	c, h(1)
		J52-P-8A (1)	---	---	c, h(1)
OA-10A	Combat: USAF	TF34-GE-100 (2)	---	---	h(1)
OA-37B	Combat: USAF	J85-GE-17A (2)	---	---	h(1)
OC-135B	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
OT-47B	General Aviation: Business Jet	JT15D-5D (2)	---	---	c, h(1)
OV-10A	General Aviation: Turboprop	T76-G-10A (2)	---	---	c, g, h(1)
		T76-G-12A (2)	---	---	c, g, h(1)
		T76-G-418 (2)	---	---	g, h(1)
		T76-G-419 (2)	---	---	g, h(1)
P-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
P-3B	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
P-3C	Transport - Turbine: USN	T56-A-7 (4)	---	---	h(3)
		T56-A-14 (4)	---	---	h(1)
P-8A	Transport - Turbine: USN	CFM56-7B27/3 (2)	---	---	h(9)
QF-4B	Combat: USN	J79-GE-8B, -8C (2)	---	---	c, h(1)
QF-4E	Combat: USAF	J79-GE-10 (2)	---	---	c, h(1)
		J79-GE-17 (2)	---	---	h(1)
QF-4G	Combat: USAF	J79-GE-15 (2)	---	---	h(1)
		J79-GE-17 (2)	---	---	h(1)
QF-106A, -106B	Combat: USAF	J75-P-17 (1)	---	---	h(1)
QRF-4C	Combat: USAF	J79-GE-10 (2)	---	---	c, h(1)
		J79-GE-17 (2)	---	---	h(1)
QT-33A	Trainer - Turbine: USN	J33-A-35 (1)	---	---	h(1)
RA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
RA-5C	Combat: USN	J79-GE-8B, -8C (2)	---	---	c, h(1)
		J79-GE-10 (2)	---	---	c, h(1)
RC-12D, -12G, -12H	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
RC-12F, -12M	General Aviation: Turboprop	PT6A-42 (2)	---	---	h(1)
RC-12K, -12N, -12P, -12Q	General Aviation: Turboprop	PT6A-67 (2)	---	---	h(1)
RC-135M, -135X	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1), h(5), h(6)
RC-135S	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
		CFM56-2B-1 (4)	---	---	h(6), k
		F108-CF-201 (4)	---	---	h(6), l(2)

1956
1957

1958 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
RC-135T	Transport - Turbine: USAF general	TF33-P-102 (4)	---	---	h(5)
RC-135U	Transport - Turbine: USAF general	TF33-P-9 (4)	---	---	h(1)
		CFM56-2B-1 (4)	---	---	h(6), k
		F108-CF-201 (4)	---	---	h(6), k(2)
RC-135V, -135W	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
		CFM56-2B-1 (4)	---	---	h(6), k
		F108-CF-201 (4)	---	---	h(6), k(2)
RF-4B	Combat: USN	J79-GE-8B, -8C (2)	---	---	c, h(1)
RF-4C	Combat: USAF	J79-GE-15 (2)	---	---	h(1)
RF-5E	Combat: USAF	J85-GE-21 (2)	---	---	h(1)
RF-8G	Combat: USN	J57-P-22 (1)	---	---	c, h(1)
RF/A-18A	Combat: USN	F404-GE-400 (2)	---	---	h(1)
RP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
RP-3D	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
RQ-4	Combat: USAF	AE3007H (1)	---	---	c, h(1)
		F137-RR-100 (1)	---	---	c, h(6)
RQ-4A	Combat: USAF	AE3007 (1)	---	---	c, h(1)
		F137-RR-100 (1)	---	---	c, h(6)
RQ-4B	Combat: USAF	AE3007H (1)	---	---	c, h(1)
RU-21A, -21D, -21E, -21H	General Aviation: Turboprop	PT6A-20 (2)	---	---	c, h(1)
RU-21B, -21C	General Aviation: Turboprop	PT6A-30 (2)	---	---	c, h(1)
RU-21J	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
S-2, -2G	General Aviation: Piston	R-1820-82 (2)	---	---	h(1), h(3)
S-2D, -2E	General Aviation: Piston	R-1820-82A (2)	---	---	c, h(1)
S-3A	Combat: USN	TF34-GE-400 (2)	---	---	h(3)
SV-22A	Transport - Turbine: USN	AE1107C (2)	---	---	f, h(1), k
		T406-AD-400 (2)	---	---	f, h(1), k(2)
T-1A	Trainer - Turbine: USAF general	JT15D-5B (2)	---	---	h(1)
T-2	Trainer - Turbine: USN	J85-GE-5F (2)	---	---	h(3)
T-2B	Trainer - Turbine: USN	J60-P-6 (2)	---	---	c, h(1)
T-2C	Trainer - Turbine: USN	J85-GE-4, -4A (2)	---	---	c, h(1)
T-6A	Trainer - Turbine: USAF general	PT6A-68 (1)	---	---	g, h(1)
T-7A	Trainer-Turbine: USAF general	F404-GE-102 (1)	150108/C (1)	0.25	h(18)
T-28	General Aviation: Piston	R-1820-82 (1)	---	---	h(3)
T-28B, -28C	General Aviation: Piston	R-1820-86A (1)	---	---	c, h(1)
T-34A	Trainer - Turbine: USAF general	J33-A-35 (1)	---	---	h(2)
T-34	General Aviation: Piston	O-470C (1)	---	---	h(3)
T-34A, -34B	General Aviation: Piston	IO-470-4 (1)	---	---	c, h(1)
T-34C	General Aviation: Turboprop	PT6A-37 (1)	---	---	h(3)
		PT6A-25 (1)	---	---	c, h(7)
T-37, -37B	Trainer - Turbine: USAF general	J69-T-25 (2)	---	---	h(1), h(3)
T-38	Trainer - Turbine: USAF T-38	J85-GE-5F (2)	---	---	h(3)
T-38A	Trainer - Turbine: USAF T-38	J85-GE-5, -5A, -5G, -5J, -5M (2)	---	---	c, h(1)
T-38C	Trainer - Turbine: USAF T-38	J85-GE-5, -5A, -5G, -5J, -5R (2)	---	---	c, h(1)
T-38N	Trainer - Turbine: USAF T-38	J85-GE-5H, -5N (2)	---	---	c, h(1)
T-39A, -39D	General Aviation: Business Jet	J60-P-3A (2)	---	---	h(1), h(5)

1959
1960

1961 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
T-39B	General Aviation: Business Jet	J60-P-3, -3A (2)	---	---	c, h(1)
T-39G, -39N	General Aviation: Business Jet	JT12A-8 (2)	---	---	c, h(1)
T-41	General Aviation: Piston	IO-360-C (1)	---	---	h(3)
T-41A	General Aviation: Piston	IO-300-D (1)	---	---	c, h(1)
T-41B	General Aviation: Piston	IO-360-D (1)	---	---	h(1)
T-41C, -41D	General Aviation: Piston	IO-360-D34 (1)	---	---	h(1)
T-43A	Transport - Turbine: USAF general	JT8D-9 (2)	---	---	h(1)
T-44	Trainer - Turbine: USN	PT6A-27 (2)	---	---	h(3)
		PT6A-34B (2)	---	---	c, h(7)
T-45A, -45C	Trainer - Turbine: USN	F405-RR-401 (1)	---	---	h(7)
T-45B	Trainer - Turbine: USN	Mk-851-49	---	---	c, h(1)
T-47A	General Aviation: Business Jet	JT15D-5 (2)	---	---	h(1)
T-50A	Trainer - Turbine: USAF general	F404-GE-102 (1)	---	---	h(16)
TA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
TA-4B	Combat: USN	J65-W-20 (1)	---	---	h(1)
TA-4F	Combat: USN	J52-P-6A, -6B (1)	---	---	c, h(1)
		J52-P-8A (1)	---	---	c, h(1)
TA-4J	Combat: USN	J52-P-6A (1)	---	---	c, h(8)
TA-7C	Combat: USN	TF30-P-8 (1)	---	---	c, h(1)
TC-18E	Transport - Turbine: USAF general	TF33-P-100A (4)	---	---	c, h(1)
TC-18F	Transport - Turbine: USAF general	JT3D-3B (4)	---	---	h(1)
TC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	---	---	h(1)
TC-135S, -135W	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
TE-2A, -2C	Transport - Turbine: USN	T56-A-8, -8A, -8B (2)	---	---	c, h(1)
TE-8A	Transport - Turbine: USAF general	JT3D-3B (4)	---	---	h(1)
TF-16N	Combat: USN	F110-GE-100 (1)	---	---	h(1)
TF-18A	Combat: USN	F404-GE-400 (2)	---	---	h(1)
TF/A-18A	Combat: USN	F404-GE-400 (2)	---	---	h(1)
TP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
TS-2A	General Aviation: Piston	R-1820-82 (2)	---	---	h(1)
TU-2R, -2S	Combat: USAF	F118-GE-101 (1)	---	---	c, h(6)
U-2S	Combat: USAF	F118-GE-101 (1)	---	---	c, h(6)
U-21	General Aviation: Turboprop	PT6A-27 (2)	---	---	h(3)
U-21A, -21G	General Aviation: Turboprop	PT6A-20 (2)	---	---	c, h(1)
U-21F	General Aviation: Turboprop	PT6A-28 (2)	---	---	c, h(1)
U-21J	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
U-28A	General Aviation: Turboprop	PT6A-67B (1)	---	---	h(6)
UA-3B	Combat: USN	J57-P-10 (2)	---	---	h(1)
UC-12B	General Aviation: Turboprop	PT6A-41 (2)	---	---	h(1)
UC-12F, -12M	General Aviation: Turboprop	PT6A-42 (2)	---	---	h(1)
UC-12W	General Aviation: Turboprop	PT6A-60A (2)	---	---	h(1)
UC-26C	General Aviation: Turboprop	TPE331-7 (2)	---	---	c, h(1)
UC-35A, -35C	General Aviation: Business Jet	JT15D-5D (2)	---	---	c, h(1)
UC-35D	General Aviation: Business Jet	PW535A (2)	---	---	c, h(7)
UC-123K	Transport - Turbine: USAF general	J85-GE-17 (2)	---	---	c, h(1)

1962
1963

1964 **Table 2-6. Military Airframe/Engine/APU Combinations (cont.)**

Aircraft Model(s)	Time-In-Mode Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO [b]	Notes:
UP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
UP-3B	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
US-2A, -2B, -2C	General Aviation: Piston	R-1820-82 (2)	---	---	h(1)
US-2D	General Aviation: Piston	R-1820-82A (2)	---	---	c, h(1)
UV-18A	Transport - Turbine: USAF general	PT6A-20 (2)	---	---	c, h(1)
UV-18B	Transport - Turbine: USAF general	PT6A-27 (2)	---	---	h(1)
UV-20A	General Aviation: Turboprop	PT6A-27 (2)	---	---	h(1)
VC-25A	Transport - Turbine: USAF general	CF6-80C2B1 (4)	GTCP 660-4 (1)	8.00	e, h(1)
VC-137B, -137C	Transport - Turbine: USAF general	JT3D-3B (4)	---	---	h(8)
VC-140B	General Aviation: Business Jet	J60-P-5A, -5B (4)	---	---	h(5)
WC-130E	Transport - Turbine: USAF general	T56-A-7 (4)	---	---	h(5)
		T56-A-15 (4)	---	---	h(5)
WC-130H	Transport - Turbine: USAF general	T56-A-15 (4)	GTCP 85-180L (1)	1.00	c, e, h(1), i(1)
WC-130J	Transport - Turbine: USAF general	AE2100D3 (4)	---	---	c, h(6)
WC-135B, -135W	Transport - Turbine: USAF general	TF33-P-5 (4)	---	---	h(1)
WC-135C	Transport - Turbine: USAF general	TF33-P-9 (4)	---	---	h(1)
WP-3A	Transport - Turbine: USN	T56-A-10W (4)	---	---	c, h(1)
X-29A	Combat: USAF	F404-GE-400 (1)	---	---	g, h(1)
X-31A	Combat: USN	F404-GE-400 (1)	---	---	h(1)
X-44A	Combat: USAF	F119-PW-100 (2)	---	---	h(1)
YA-7D	Combat: USAF	TF41-A-1 (1)	---	---	h(1)
YC-14A	Transport - Turbine: USAF general	CF6-50A (2)	---	---	h(1)
YE-2C	Transport - Turbine: USN	T56-A-8, -8A, -8B (2)	---	---	c, h(1)
YF-4J	Combat: USN	J79-GE-8B (2)	---	---	c, h(1)
YF-15A, -15B	Combat: USAF	F100-PW-100 (2)	---	---	h(1)
YF-16A, -16B	Combat: USAF	F100-PW-200 (1)	---	---	h(1)
YOV-10D	General Aviation: Turboprop	T76-G-10, -10A (2)	---	---	c, h(1)
		T76-G-12, -12A (2)	---	---	c, h(1)
YP-3C	Transport - Turbine: USN	T56-A-14 (4)	---	---	h(1)
YS-2G	General Aviation: Piston	R-1820-82 (2)	---	---	h(1)
YT-2B	Trainer - Turbine: USN	J60-P-6 (2)	---	---	c, h(1)
YT-34C	General Aviation: Piston	PT6A-25 (1)	---	---	c, h(1)

1965
1966 Notes for Table 2-6 follow Table 2-7.
1967

1968 **Table 2-7. Military Helicopter/Engine/APU Combinations**

Aircraft Model(s)	Time-In-Phase Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [b]	Notes:
AH-1G	Military - Helicopter	T53-L-11D (1)	---	---	h(3)
		T53-L-13, -13A, -13B (1)	---	---	c, h(1)
AH-1J	Military - Helicopter	T400-CP-400 (1)	---	---	h(1)
AH-1W, -1Z	Military - Helicopter	T700-GE-401C (2)	---	---	h(7)
AH-64A	Military - Helicopter	T700-GE-700 (2)	---	---	h(1)
CH-3B	Military - Helicopter	T58-GE-8B (2)	---	---	c, h(1)
CH-3E	Military - Helicopter	T58-GE-5 (2)	---	---	h(8)
CH-46	Military - Helicopter	T58-GE-5 (2)	---	---	h(3)
CH-46A	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
CH-46E	Military - Helicopter	T58-GE-16 (2)	---	---	h(1)
CH-47F	Military - Helicopter	T55-GA-714A (2)	---	---	h(1)
CH-53A	Military - Helicopter	T64-GE-6B (2)	---	---	h(1)
CH-53D	Military - Helicopter	T64-GE-413 (2)	---	---	h(1)
CH-53E	Military - Helicopter	T64-GE-416 (3)	---	---	h(7)
CH-53K	Military - Helicopter	T408-GE-400 (3)	---	---	c, h(7)
EH-1H	Military - Helicopter	T53-L-13 (1)	---	---	h(1)
EH-1X	Military - Helicopter	T53-L-13 (1)	---	---	h(1)
EH-60A	Military - Helicopter	T700-GE-700 (2)	---	---	h(1)
HH-1H	Military - Helicopter	T53-L-13B (1)	---	---	h(1)
HH-1K	Military - Helicopter	T53-L-13, -13A, -13B (1)	---	---	c, h(1)
HH-1N	Military - Helicopter	T400-CP-400 (2)	---	---	h(7)
HH-2D	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
HH-3A	Military - Helicopter	T58-GE-8F (2)	---	---	h(1)
HH-3E	Military - Helicopter	T58-GE-5 (2)	---	---	h(8)
HH-3F	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
HH-43	Military - Helicopter	T53-L-11D (1)	---	---	h(3)
HH-46A	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
HH-52	Military - Helicopter	T58-GE-5 (2)	---	---	h(3)
HH-52A	Military - Helicopter	T58-GE-8B (1)	---	---	c, h(1)
HH-53	Military - Helicopter	T64-GE-6B (2)	---	---	h(3)
HH-60G	Military - Helicopter	T700-GE-700 (2)	---	---	h(6)
		T700-GE-701C (2)	---	---	h(6)
MH-53E	Military - Helicopter	T64-GE-416 (3)	---	---	c, h(1)
		T64-GE-419 (3)	---	---	c, h(7)
MH-53J	Military - Helicopter	T64-GE-415 (2)	T-62T-27 (1)	4.00	h(1), i(1)
MH-53M	Military - Helicopter	T64-GE-100 (2)	---	---	h(6)
MH-60A, -60G	Military - Helicopter	T700-GE-700 (2)	---	---	h(1)
MH-60R, -60S	Military - Helicopter	T700-GE-401C (2)	---	---	h(7)

1969
1970

1971 **Table 2-7. Military Helicopter/Engine/APU Combinations**

Aircraft Model(s)	Time-In-Phase Category [a]	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [b]	Notes:
MH-139	Military - Helicopter	PT6C-67C (2)	---	---	h(11)
NCH-46A	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
NRH-53D	Military - Helicopter	T64-GE-415 (2)	---	---	h(1)
NSH-3A	Military - Helicopter	T58-GE-8B (2)	---	---	c, h(1)
NUH-1E	Military - Helicopter	T53-L-11D (1)	---	---	h(1)
NUH-1N	Military - Helicopter	T400-CP-400 (2)	---	---	h(1)
NVH-3A	Military - Helicopter	T58-GE-8F (2)	---	---	h(1)
OH-6A	Military - Helicopter	T63-A-5A (1)	---	---	h(3)
OH-58	Military - Helicopter	T63-A-5A (1)	---	---	h(3)
RH-53D	Military - Helicopter	T64-GE-415A (2)	---	---	c, h(1)
SH-2D	Military - Helicopter	T58-GE-5 (2)	---	---	h(3)
		T58-GE-8B (2)	---	---	c, h(1)
SH-2F	Military - Helicopter	T58-GE-5 (2)	---	---	h(3)
		T58-GE-8F (2)	---	---	h(1)
SH-3A	Military - Helicopter	T58-GE-8B (2)	---	---	c, h(1)
SH-3G	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
SH-60	Military - Helicopter	T700-GE-700 (2)	---	---	h(7)
TH-1L	Military - Helicopter	T53-L-13, -13A, -13B (1)	---	---	c, h(1)
TH-53A	Military - Helicopter	T64-GE-100 (2)	---	---	h(13)
TH-57	Military - Helicopter	250-C20BJ (1)	---	---	h(7)
TH-67	Military - Helicopter	250-C20J (1)	---	---	c, h(7)
TH-73A	Military - Helicopter	PT6B-37A (1)	---	---	h(7)
UH-1E	Military - Helicopter	T53-L-11D (1)	---	---	h(1)
UH-1H	Military - Helicopter	T53-L-11D (1)	---	---	h(3)
		T53-L-13 (1)	---	---	h(1)
UH-1L	Military - Helicopter	T53-L-13, -13A, -13B (1)	---	---	c, h(1)
UH-1N	Military - Helicopter	T400-CP-400 (2)	---	---	h(6)
UH-1V	Military - Helicopter	T53-L-13 (1)	---	---	h(1)
UH-1Y	Military - Helicopter	T700-GE-401C (2)	---	---	h(7)
UH-2C	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
UH-3A	Military - Helicopter	T58-GE-8B (2)	---	---	c, h(1)
UH-46A	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)
UH-60A	Military - Helicopter	T700-GE-700 (2)	T-62T-40-1 (1)	1.00	c, b, h(1)
UH-60C	Military - Helicopter	T700-GE-700 (2)	---	---	h(1)
UH-60Q	Military - Helicopter	T700-GE-700 (2)	---	---	h(1)
UH-72	Military - Helicopter	Arriel 1E2 (2)	---	---	h(7)
VH-3D	Military - Helicopter	T58-GE-400B (2)	---	---	c, h(7)
VH-60N	Military - Helicopter	T700-GE-401 (2)	---	---	h(7)
YSH-2E	Military - Helicopter	T58-GE-8B, -8F (2)	---	---	c, h(1)

1972
1973 Notes for Table 2-6 and Table 2-7 on following page.

Notes for Table 2-6 and Table 2-7.

Note that some Aircraft model/engine/Auxiliary Power Unit (APU) combinations may be missing due to unverified sources and/or missing emission factors for either engine(s) and/or APU(s).

a. Time-in-Mode category selected for the aircraft based on that aircraft's expected flight pattern and not based on its mission designation.
b. SOURCE: Flightline Emission Factors – Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment, IERA-RS-BR-SR-2005-0001, December 2004. This reference cites survey responses as source of data.
c. This document does not have emission factors for at least one engine/APU listed for this aircraft.
d. Time-in-Mode category for this aircraft was selected as the recommended category for calculating emissions though this aircraft is operated by another military branch.
e. APU operating time is an estimate based on similar APUs on similar aircraft.
f. Aircraft may also be operated as a military helicopter. If the aircraft is primarily operated in this mode at the installation, then use the appropriate Time-in-Mode category.
g. This aircraft is operated by multiple military branches.
h. The Airframe/Engine combination source was reported in the following documents:
    (1) SOURCE: Model Designation of Military Aerospace Vehicles, Department of Defense May 2004.
    (2) SOURCE: Air Force Reserve Website (www.afreserve.com).
    (3) SOURCE: Air Pollutant Emission Factors for Military and Civil Aircraft, EPA-450/3-78-117, October 1978.
    (4) SOURCE: Smithsonian National Air and Space Museum website (www.airandspace.si.edu).
    (5) SOURCE: Aircraft Engine Emissions Estimator, AFESC, November 1985.
    (6) SOURCE: US Air Force fact sheets accessed via official Air Force website (www.af.mil).
    (7) SOURCE: US Navy fact sheets accessed via official Navy website (www.navy.mil).
    (8) SOURCE: National Museum of the Air Force accessed via official website (www.nationalmuseum.af.mil).
    (9) SOURCE: GE Aviation website (www.geaviation.com).
    (10) SOURCE: Northrop Grumman website (www.northropgrumman.com).
    (11) SOURCE: Pratt and Whitney website (www.pw.utc.com).
    (12) SOURCE: Energy and Environmental Viability of Select Alternative Jet Fuel Pathways, Carter, Nicholas A., et al. AIAA 2011-5968. 2011.
    (13) SOURCE: Flightline Emission Factors-Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment, IERA-RS-BR-SR-2005-0001, December 2004.
    (14) SOURCE: Beechcraft website (www.beechcraft.com).
    (15) SOURCE: Gulfstream website (www.gulfstream.com).
    (16) SOURCE: Airforce Monthly website (www.airforcemonthly.com)
    (17) SOURCE: Embraer website (www.embraer.com)
    (18) SOURCE: Airframe/engine/APU combination and run times collected from field data.
i. The Airframe/APU combination was reported in the following documents:
    (1) SOURCE: Air Emissions Factor Guide to Air Force Mobile Sources, AFCEC 2009.
    (2) SOURCE: EDMS input from Paine Field.
j. According to the source document, the actual APU operating time may range between 0.23-0.26 if there is gate power or 0.87 if there is no gate power. The most conservative value of 0.87 is listed here.
k. This engine is not explicitly listed in the source document as the engine in this aircraft. It is listed here, however, because it is an alternate designation of an engine listed in the source document.
l. This is the military designation of a civilian engine listed for the aircraft in the source document. The source for the military designation of the civilian engine is:
    (1) SOURCE: Air Force One, Robert F. Dorr, 2002.
    (2) The Federal Business Opportunities website (www.fbo.gov)

"---" – Indicates either no APU for that aircraft or no data available.

2022

Table 2-8. Commercial Airframe/Engine/APU Combinations

Aircraft Model(s)	Time-In-Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [a] [Without Gate Power]	Notes:
A300 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-50A, -50C, -50C1, -50C2 (2) CF6-80C2A1, -80C2A3, -80C2A5 (2) JT9D-7R4H1 (2) PW4158 (2)	GTCP 331-250 (1)	0.23 - 0.26 [1.0 - 1.5]	b, c(2), c(3), d(2)
A310 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-80A3, -80C2A2(2) JT9D-7R4D1, -7R4E1 (2) PW4152 (2) PW4156A (2)	GTCP 331-250 (1)	0.23 - 0.26 [1.0 - 1.5]	b, c(2), c(3), d(2)
A318 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-5B8, -5B9 (2) PW6122A (2) PW6124A (2)	GTCP 36-300 (1)	0.23 - 0.26 [0.87]	b, c(3), c(4), d(2)
A319 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-5A4, -5A5, -5B5, -5B6, -5B7 (2) V2522-A5 (2) V2524-A5 (2) V2527-A5 (2)	GTCP 36-300 (1)	0.23 - 0.26 [0.87]	b, c(3), c(4), c(5), d(2)
A320 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-5-A1, -5A3, -5B4, -5B5, -5B6 (2) V2500-A1 (2) V2527-A5 (2)	GTCP 36-300 (1)	0.23 - 0.26 [0.87]	b, c(3), c(4), c(5), d(2)
A321 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-5B1, -5B2, 5B3 (2) V2533-A5 (2) V2530-A5 (2)	GTCP 36-300 (1)	0.23 - 0.26 [0.87]	b, c(3), c(4), c(5), d(2)
A330 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-80E1, -E1A1, -E1A3, -E1A4 (2) PW4164 (2) PW4168, PW4168A (2) PW4170 (2) Trent 768-60 (2) Trent 772-60 (2)	GTCP 331-250 (1)	0.23 - 0.26 [1.0 - 1.5]	b, c(3), c(4), c(5), d(2)
A340 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-5C2, -5C2/4, -5C2/F, -5C2/F4, -5C2/G, -5C2/G4, -5C2/P (4) CFM56-5C3/F, -5C3/F4, 5C3/G, -5C3/G4, -5C3/P (4) CFM56-5C4, -5C4/1, -5C4/P, -5C4/1P (4) Trent 553-61, -553A2-61 (4) Trent 556-61, -556A2-61 (4)	---	---	b, c(4), c(5)
A380 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	GP7270 (4) Trent 970B-84 (4) Trent 972B-84 (4)	---	---	b, c(2), c(4)
ACJ318	**General Aviation:** Business Jet	CFM56-5B9/3 (2)	---	---	c(5)
ACJ319	**General Aviation:** Business Jet	CFM56-5B7/3 (2)	---	---	c(5)
ACJ320	**General Aviation:** Business Jet	CFM56-5B4/3 (2)	---	---	c(5)
ACJ330	**General Aviation:** Business Jet	Trent 772B-60 (2)	---	---	b, c(5)
ACJ340	**General Aviation:** Business Jet	Trent 553-61 (4)	---	---	c(5)
ACJ380	**General Aviation:** Business Jet	Trent 970-84 (4)	---	---	c(5)
B707 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	JT3D-3, -3B (4) JT3D-7 (4)	GTCP 85 (1)	0.23 - 0.26 [0.87]	b, c(1), c(2), c(6), d(1)
B717 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	BR700-715A1-30, -715C1-30 (2)	---	---	c(2)

2023
2024

2025

Table 2-8. Commercial Airframe/Engine/APU Combinations

Aircraft Model(s)	Time-In-Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [a] [Without Gate Power]	Notes:
B727 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	JT8D-7, -7A, -7B (3) JT8D-9, -9A (3) JT8D-11 (3) JT8D-15, -15A (3) JT8D-17, -17A, -17AR, -17R (3)	GTCP 85-98 (1)	0.23 - 0.26 [0.87]	b, c(1), c(2), c(6), d(1)
B737 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-3-B1, -3B-2, -3C-1 (2) CMF56-7B18/3, -7B20, -7B20/2, -7B20/3, -7B20E (2) CFM56-7B22, -7B22/2, -7B22/3, -7B22E (2) CFM56-7B24, -7B24/2, -7B24/3, -7B24/3B1, -7B24E, -7B24E/B1 (2) CFM56-7B26, -7B26E/B1, -7B26E/B2, -7B26E/B2F, -7B26/2, 7B26/3, -7B26/3F, -7B26E, -7B26E/F (2) CFM56--7B27, -7B27/2, -7B27/3, 7B27/3F, -7B27E, -7B27E/F, -7B27/3B1, -7B27/3B1F, -7B27E/B1, -7B27E/B1F, -7B27/3B3, -7B27E/B3 (2) JT8D-7, -7A, -7B (2) JT8D-9A (2) JT8D-15, -15A (2) JT8D-17, -17A (2)	GTCP 85-129 (1)	0.23 - 0.26 [0.87]	b, c(4), d(3)
B747 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-50E, -50E1, -50E2 (4) CF6-80C2B1, -80C2B1F, -80C2B5F (4) Genx-2B67, -2B67B (4) JT9D-7, -7A, -7F, -7J, 7Q, -7Q3, -7R4G2 (4) JT9D-70A (4) PW4056 (4) RB211-524D4-19, -524D4-39, -524B2-19, -524C2-19, -524G2-19, -524G3-19, -524H2-19 (4) RB211-524G2-T-19, -524G3-T-19, -524H2-T-19 (4)	GTCP 660-4 (1) PW901A (1)	0.23 - 0.26 [1.0 - 1.5]	b, c(2), c(4), d(3)
B757 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	RB211-535C-37, -535E4-B-37, -535E4-37, -535E4-C-37 (2) PW2037 (2) PW2040 (2)	GTCP 331-200ER (1)	0.23 - 0.26 [0.87]	b, c(2), c(4), d(3)
B767 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-80A, -80A2, -80C2B2, -80C2B2F, -80C2B4, -80C2B4F, -80C2B6, -80C2B6F, -80C2B7F, -80C2B8F (2) JT9D-7R4D, -7R4E, -7R4E4 (2) PW4056, PW4060, PW4060A, PW4060C, PW4062 (2) RB211-524H36, -524H-T-36 (2)	GTCP 331-200 (1) GTCP 331-200ER (1)	0.23 - 0.26 [0.87]	b, c(2), c(4), d(1), d(3)
B777 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	GE90-76B, -77B, -85B,-90B, -94B, -110B1, -110B1L, -115B, -115BL (2) PW4074, -4074D, -4077, -4077D, -4084, -4084D, -4090, -4090-3, -4098 (2) Trent 875, -877, -884, -884B, -892, -892B, -895 (2)	GTCP 331-500 (1)	0.23 - 0.26 [1.0 - 1.5]	b, c(2), c(4), c(6), d(3)
B787 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	Genx-1B64, -1B64/P1, -1B67, -1B67/P1, -1B70, -1B70/P1, -1B70/75/P1 (2) Trent 1000-A, -1000-C, -1000-E (2)	---	---	b, c(2), c(4)
BAe 146-100A, -200A	**General Aviation:** Business Jet	ALF 502R-3, -3A, -5 (4)	---	---	b, c(2)
BAe 146-300A	**General Aviation:** Business Jet	ALF 502R-3A, -5 (4)	---	---	b, c(2)
BAe Avro 146-RJ100A	**General Aviation:** Business Jet	LF507-1F (4)	---	---	c(2)
BAe Avro 146-RJ70A	**General Aviation:** Business Jet	LF507-1F (4)	---	---	c(2)
BAe Avro 146-RJ85A	**General Aviation:** Business Jet	LF507-1F (4)	---	---	c(2)
BD-100-1A10	**General Aviation:** Business Jet	AS907-1-1A (2)	---	---	c(2)
BD-700-1A10, -1A11	**General Aviation:** Business Jet	BR700-710A2-20 (2)	---	---	c(2)
Beechcraft 76	**General Aviation:** Turboprop	PT6A-27 (2)	---	---	c(1)
Beechcraft 99A, -99B, -A99A, -B99	**General Aviation:** Turboprop	PT6A-27 (2)	---	---	c(2)
BH.125 Series 400A	**General Aviation:** Business Jet	TFE731-3, -3R (2)	---	---	b, c(2)
BH.125 Series 600A	**General Aviation:** Business Jet	TFE731-3, -3R (2)	---	---	b, c(2)

2026
2027

2028

Table 2-8. Commercial Airframe/Engine/APU Combinations

Aircraft Model(s)	Time-In-Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [a] [Without Gate Power]	Notes:
Cessna 150, -150A, -150B, -150C, -150D, -150E, -150F, -150G, -150H, -150J, -150K, -150L, -150M	**General Aviation:** Piston	O-200-A (1)	---	---	b, c(2)
Cessna 172I, -172K, -172L, -172M	**General Aviation:** Piston	O-320-E2D (1)	---	---	b, c(2)
Cessna 172N	**General Aviation:** Piston	O-320-H2AD (1)	---	---	b, c(2)
Cessna 172P	**General Aviation:** Piston	O-320-D2J (1)	---	---	b, c(2)
Cessna 336	**General Aviation:** Piston	IO-360-A (2) TSIO-360-C (2)	---	---	b, c(1), c(2), c(6)
Cessna 337, -337A, -337B	**General Aviation:** Piston	IO-360-C, -360-CB, -360-D, -360-DB, -360-G, -360-GB (2)	---	---	b, c(2)
Cessna 337C, -337D, -337E, -337F, -337G	**General Aviation:** Piston	IO-360-C, -360-CB, -360-G, -360-GB (2)	---	---	b, c(2)
Cessna 337H	**General Aviation:** Piston	IO-360-G, -360-GB (2)	---	---	b, c(2)
Cessna Citation I	**General Aviation:** Business Jet	JT15D-1, -1A, -1B (2)	---	---	c(1), c(3)
Cessna Citation II, -II/S	**General Aviation:** Business Jet	JT15D-4, -4B (2)	---	---	c(3)
Cessna Citation Ultra	**General Aviation:** Business Jet	JT15D-5D (2)	---	---	b, c(3)
Cessna Citation V	**General Aviation:** Business Jet	JT15D-5A (2)	---	---	c(3)
Cessna M337B	**General Aviation:** Piston	IO-360-D, -360-DB (2)	---	---	b, c(2)
Cessna P337H	**General Aviation:** Piston	TSIO-360-C, -360-CB (2)	---	---	b, c(2)
Cessna T337B	**General Aviation:** Piston	TSIO-360-A, -360-AB, -360-B, -360-BB (2)	---	---	b, c(2)
Cessna T337C, -T337D, -T337E, -T337F	**General Aviation:** Piston	TSIO-360-A, -360-AB (2)	---	---	b, c(2)
Cessna T337H	**General Aviation:** Piston	IO-360-G, -360-GB (2) TSIO-360-JB (2)	---	---	b, c(2)
Cheyenne III, -IIIA	**General Aviation:** Turboprop	PT6A-41 (2)	---	---	c(3)
CL-600-1A11	**General Aviation:** Business Jet	ALF 502L, -502L-2 (2)	---	---	b, c(2)
CL-600-2A12	**General Aviation:** Business Jet	CF34-3A, -3A2 (2)	---	---	b, c(2)
CL-600-2B16	**General Aviation:** Business Jet	CF34-3A, -3A1, -3A2, -3B (2)	---	---	b, c(2)
CL-600-2B19	**General Aviation:** Business Jet	CF34-3A1, -3B1 (2)	---	---	b, c(2)
CL-600-2C10	**General Aviation:** Business Jet	CF34-8C1, -8C5B1 (2)	---	---	c(2)
CL-600-2D15	**General Aviation:** Business Jet	CF34-8C5, -8C5A1 (2)	---	---	c(2)
CL-600-2D24	**General Aviation:** Business Jet	CF34-8C5, -8C5A1 (2)	---	---	c(2)
CL-600-2E25	**General Aviation:** Business Jet	CF34-8C5, -8C5A1, -8C5A2 (2)	---	---	c(2)
DC-10 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-6D, -6D1, -6D1A, -6K, -6K2 (3) CF6-50A, -50C, -50C1, -50C2, -50C2B, -50C2R, -50CA (3) JT9D-20, -20J, -59A (3)	TSCP 700-4B (1)	0.23 - 0.26 [1.0- 1.5]	b, c(1), c(2), d(2)
DC-8 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	CFM56-2-C1, -2-C3, -2-C5 (4) JT3D-3, -3B, -7 (4)	---	---	b, c(2)
DC-9 Series	**Commercial Carrier:** Jumbo, long, and medium range jet	JT8D-7, -7A, -7B, -9, -9A (2) JT8D-11, -15, 15A, -17, -17A (2) JT8D-209, -217, -217A, -217C, -219 (2)	GTCP 85-98D (1)	0.23 - 0.26 [0.87]	b, c(1), c(2), d(1), d(2)
DH.125 Series 1A, -3A, -3A/RA, -400A	**General Aviation:** Business Jet	TFE731-3, -3R (2)	---	---	b, c(2)
DHC-6-300, -400	**General Aviation:** Turboprop	PT6A-27 (2)	---	---	c(2)
F.27 Mark 100, -200, -300, -400, -600, -700	**General Aviation:** Turboprop	SPEY Mk511, -Mk511-7E (2)	---	---	b, c(2)
F.28 Mark 0070	**General Aviation:** Business Jet	TAY Mk650-15 (2)	---	---	c(2)
F.28 Mark 0100	**General Aviation:** Business Jet	TAY Mk620-15 (2) TAY Mk650-15 (2)	---	---	c(2)
F.28 Mark 1000, -2000	**General Aviation:** Business Jet	SPEY MK555-15 (2)	---	---	b, c(2)
F.28 Mark 3000, -4000	**General Aviation:** Business Jet	SPEY Mk555-15H (2)	---	---	b, c(2)

2029
2030

2031

Table 2-8. Commercial Airframe/Engine/APU Combinations

Aircraft Model(s)	Time-In-Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [a] [Without Gate Power]	Notes:
Falcon 20	**General Aviation:** Business Jet	CF700-2D (2)	---	---	c(1)
G-1159, -1159A, -1159B	**General Aviation:** Business Jet	SPEY Mk511-8 (2)	GTCP 36-6 (1)	0.23 - 0.26 [0.87]	b, c(2), d(2)
G200	**General Aviation:** Business Jet	PW306A (2)	---	---	c(3)
G-21	**General Aviation:** Turboprop	PT6A-27 (2)	---	---	c(1)
G280	**General Aviation:** Business Jet	AS907-2-1G (2)	---	---	c(2)
GIV	**General Aviation:** Business Jet	TAY Mk611-8 (2)	---	---	c(2)
GIV-X	**General Aviation:** Business Jet	TAY Mk611-8C (2)	---	---	b, c(2)
GV	**General Aviation:** Business Jet	BR700-710A1-10 (2)	---	---	c(2)
GVI	**General Aviation:** Business Jet	BR725A1-12 (2)	---	---	c(2)
GV-SP	**General Aviation:** Business Jet	BR700-710C4-11 (2)	---	---	c(2)
Hawker 4000	**General Aviation:** Business Jet	PW308A (2)	---	---	c(3)
Hawker 400A, -400XP	**General Aviation:** Business Jet	JT15D-5, -5R (2)	---	---	b, c(3)
HS.125 Series 403B, -600A, -700A, -700B, -F3B, -F3B/RA, -F400B, -F600B	**General Aviation:** Business Jet	TFE731-3, -3R (2)	---	---	b, c(2)
JetStar 1329-25	**General Aviation:** Business Jet	TFE731-3-1F (4)	---	---	b, c(2)
King Air B200	**General Aviation:** Turboprop	PT6A-41 (2)	---	---	c(3)
L-1011-385-1	**Commercial Carrier:** Jumbo, long, and medium range jet	RB211-22C-02, -22B-02 (3)	---	---	b, c(2)
L-1011-385-1-14	**Commercial Carrier:** Jumbo, long, and medium range jet	RB211-22B-02, -524B-02, -524B4-02, -524B3-02 (3)	---	---	b, c(2)
L-1011-385-1-15	**Commercial Carrier:** Jumbo, long, and medium range jet	RB211-22B-02, -22B4D-02, -524B-02, -524B4-02, -524B3-02 (3)	---	---	b, c(2)
Learjet 31, -31A	**General Aviation:** Business Jet	TFE731-2-3B (2)	---	---	b, c(2)
Learjet 35, -36	**General Aviation:** Business Jet	TFE731-2, -2-2B (2)	---	---	c(1)
Learjet 35A, -36A	**General Aviation:** Business Jet	TFE731-2-2B (2)	---	---	c(1)
Learjet 55	**General Aviation:** Business Jet	TFE731-3A-2B1, -3A-2B, -3AR-2B1, -3AR-2B (2)	---	---	b, c(2)
Learjet 55B	**General Aviation:** Business Jet	TFE731-3AR-2B1, -3AR-2B (2)	---	---	b, c(2)
Learjet 55C	**General Aviation:** Business Jet	TFE731-3AR-3B1, -3AR-3B, -3AR-2B1, -3AR-2B (2)	---	---	b, c(2)
MD-10-10F	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-6D, -6K (3)	TSCP 700-4B (1)	0.23 - 0.26 [1.0 - 1.5]	c(2), d(2)
MD-10-30F	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-50C2 (3)	TSCP 700-4B (1)	0.23 - 0.26 [1.0 - 1.5]	c(2), d(2)
MD-11, -11F	**Commercial Carrier:** Jumbo, long, and medium range jet	CF6-80C2D1F (3) PW4460 (3)	TSCP 700-4 (1)	0.23 - 0.26 [1.0 - 1.5]	c(2), d(2)
MD-88	**Commercial Carrier:** Jumbo, long, and medium range jet	JT8D-217A, -217C, -219 (2)	---	---	c(2)
MD-90, -90-30	**Commercial Carrier:** Jumbo, long, and medium range jet	V2525-D5 (2) V2528-D5 (2)	---	---	c(2)
MU-300, -300-10	**General Aviation:** Business Jet	JT15D-4, -4D (2)	---	---	b, c(2)
NA-265-80	**General Aviation:** Business Jet	CF700-2D-2 (2)	---	---	b, c(2)
PA-18A	**General Aviation:** Piston	O-320 (1)	---	---	c(2)
PA-23, -23-160	**General Aviation:** Piston	O-320 (2)	---	---	c(2)
PA-28-140	**General Aviation:** Piston	O-320-E2A (1)	---	---	b, c(2)
PA-28-150	**General Aviation:** Piston	O-320-A2B, -E2A (1)	---	---	b, c(2)
PA-28-151	**General Aviation:** Piston	O-320-E3D (1)	---	---	b, c(2)

2032
2033

Table 2-8. Commercial Airframe/Engine/APU Combinations

Aircraft Model(s)	Time-In-Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU hours of Operation Per LTO [a] [Without Gate Power]	Notes:
PA-28-160	**General Aviation:** Piston	O-320-B2B, -D2A (1)	---	---	b, c(2)
PA-28-161	**General Aviation:** Piston	O-320-D2A, -D3G (1)	---	---	b, c(2)
PA-28-201T	**General Aviation:** Piston	TSIO-360-FB (1)	---	---	b, c(2)
PA-28R-180	**General Aviation:** Piston	IO-360-B1E (1)	---	---	b, c(2)
PA-28R-200	**General Aviation:** Piston	IO-360-C1C, -C1C6 (1)	---	---	b, c(2)
PA-28R-201, -28RT-201	**General Aviation:** Piston	IO-360-C1C6 (1)	---	---	b, c(2)
PA-28R-201T	**General Aviation:** Piston	TSIO-360-F, -360-FB (1)	---	---	b, c(2)
PA-28RT-201T	**General Aviation:** Piston	TSIO-360-FB (1)	---	---	b, c(2)
PA-28S-160	**General Aviation:** Piston	O-320-D2A (1)	---	---	b, c(2)
PA-31	**General Aviation:** Piston	TIO-540, -540-A1A, -540-A1B, -540-A2A, -540-A2B, -540-A2C (2)	---	---	b, c(1)
PA-31-325	**General Aviation:** Piston	TIO-540-F2BD (2)	---	---	b, c(2)
PA-31-350	**General Aviation:** Piston	TIO-540-J2BD, -540-J2B (2)	---	---	b, c(2)
PA-32-301T	**General Aviation:** Piston	TIO-540-S1AD (1)	---	---	b, c(2)
PA-32-301XTC	**General Aviation:** Piston	TIO-540-AH1A (1)	---	---	b, c(2)
PA-32R-301T	**General Aviation:** Piston	TIO-540-S1AD, 540-AH1A (1)	---	---	b, c(2)
PA-32RT-300T	**General Aviation:** Piston	TIO-540-S1AD (1)	---	---	b, c(2)
PA-36-285	**General Aviation:** Turboprop	6-285-B, -285-BA, -285-C, -285-CA (1)	---	---	b, c(2)
PA-42	**General Aviation:** Turboprop	PT6A-41 (2)	---	---	c(2)
PA-46-350P, -46R-350T	**General Aviation:** Turboprop	TIO-540-AE2A (1)	---	---	b, c(2)
SA226-AT	**General Aviation:** Turboprop	TPE331-3U-303G, -3U-304G, -3UW-303G (2)	---	---	b, c(2)
SA226-T	**General Aviation:** Turboprop	TPE331-3U-303G, -3U-304G (2)	---	---	b, c(2)
SA226-TC	**General Aviation:** Turboprop	TPE331-3U-303G, -3U-304G, -3UW-303G, -3UW-304G (2)	---	---	b, c(2)
SC-7	**General Aviation:** Turboprop	TPE331-2-201A (2)	---	---	b, c(1)
Super King Air A100-1, -200, -200C, -200CT, -200T, -A200, -A200C, -A200CT, -B200, -B200C, -B200CT, -B200T	**General Aviation:** Turboprop	PT6A-41 (2)	---	---	c(2)
TU-154-B	**Commercial Carrier:** Jumbo, long, and medium range jet	NK-8-2U (3)	---	---	c(7)
Twin Commander 685	**General Aviation:** Piston	GTSIO-520-F, -520-K (2)	---	---	b, c(2)

Note that some Aircraft model/engine/APU combinations may be missing due to unverified sources and/or missing emission factors for either engine(s) and/or APU(s).

a. SOURCE: *Airport Air Quality Manual*, International Civil Aviation Organization, 2011. ICAO provides a range for both narrow body and wide body aircraft. The values given out of the brackets assume gate power while the bracketed values are in instances where there is no gate power.

b. This document does not have emission factors for at least one engine/APU listed for this aircraft.

c. The Aircraft/Engine combination source was reported in one of the following documents:

(1) SOURCE: *Air Pollutant Emission Factors for Military and Civil Aircraft*, EPA-450/3-78-117, October 1978.

(2) SOURCE: The Federal Aviation Administration (FAA) Type Certificate Data Sheet (TCDS) for the airframe model listed.

(3) SOURCE: Pratt & Whitney website (www.pw.utc.com).

(4) SOURCE: The European Aviation Safety Agency (EASA) TCDS for the airframe model listed.

(5) SOURCE: Airbus website (www.airbus.com).

(6) SOURCE: Boeing website (www.boeing.com).

(7) SOURCE: Tupolev website (www.tupolev.ru/english/).

d. Airframe/APU combination source was reported in one of the following:

(1) SOURCE: Emissions and Dispersion Modeling System Input from Paine Field

(2) SOURCE: FAA TCDS for the listed airframe

(3) SOURCE: EASA TCDS for the listed airframe

2053 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
6-285-B	Idle (Taxi)	72	0.46	1.07	363.70	12.33	0.76 **(S)**	0.68 **(S)**
	Approach	84	4.72	1.07	1022.63	18.50	0.12 **(S)**	0.11 **(S)**
	Climb out	166	5.50	1.07	668.07	9.63	0.30 **(S)**	0.27 **(S)**
	Takeoff	153	5.88	1.07	998.04	13.38	0.31 **(S)**	0.28 **(S)**
Notes: c(1), d(5) - PM_{10} and $PM_{2.5}$ data at all power settings, e, h, i, k(8)								
AE1107C	Idle	362	4.15	1.07	8.35	0.10	1.58	1.42
	Flight Idle	663	6.05	1.07	3.47	0.02	1.58	1.42
	Intermediate	948	7.87	1.07	1.82	0.02	1.58	1.42
	Max Continuous	2507	18.03	1.07	0.29	0.01	1.58	1.42
Notes: c(6) - This is the commercial designation of the T406-AD-400 engine, h, k(4)								
AE3007A	Idle (Taxi)	389	3.83	1.07	17.35	2.89	0.05	0.05
	Approach	929	7.79	1.07	3.28	0.74	0.07	0.07
	Climb out	2500	17.47	1.07	0.92	0.33	0.06	0.05
	Takeoff	2992	20.54	1.07	0.75	0.29	0.08	0.07
Notes: c(2), e, f, h, k(5)								
ALF 502L-2	Idle (Taxi)	379	3.38	1.07	45.63	7.65	0.10	0.09
	Approach	930	6.47	1.07	3.97	0.21	0.11	0.10
	Climb out	2568	12.03	1.07	0.30	0.03	0.11	0.09
	Takeoff	3174	13.43	1.07	0.40	0.02	0.07	0.07
Notes: c(2), e, f, h, k(8)								
ALF 502R-3	Idle (Taxi)	343	3.30	1.07	44.67	7.49	0.09	0.08
	Approach	815	6.15	1.07	8.43	0.33	0.09	0.08
	Climb out	2286	9.94	1.07	0.50	0.06	0.10	0.09
	Takeoff	2759	11.20	1.07	0.43	0.06	0.10	0.09
Notes: c(2), e, f, h, k(8)								
ALF 502R-5	Idle (Taxi)	324	3.78	1.07	40.93	6.20	0.09	0.08
	Approach	821	6.60	1.07	7.10	0.25	0.09	0.08
	Climb out	2345	10.56	1.07	0.25	0.06	0.11	0.10
	Takeoff	2842	13.35	1.07	0.30	0.07	0.11	0.10
Notes: c(2), e, f, h, k(8)								
AS907-1-1A	Idle (Taxi)	381	3.91	1.07	33.24	1.45	0.10	0.09
	Approach	825	8.81	1.07	6.28	0.14	0.06	0.05
	Climb out	2286	16.17	1.07	0.63	0.07	0.31	0.28
	Takeoff	2754	17.90	1.07	0.56	0.06	0.36	0.33
Notes: c(2), e, f, h, k(1)								
AS907-2-1G	Idle (Taxi)	389	3.97	1.07	30.48	1.14	0.11	0.10
	Approach	849	8.96	1.07	6.07	0.14	0.06	0.06
	Climb out	2444	16.44	1.07	0.60	0.07	0.31	0.28
	Takeoff	2952	18.43	1.07	0.57	0.06	0.36	0.33
Notes: c(2), e, f, h, k(1)								

2054
2055

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
BR700-710A1-10	Idle (Taxi)	706	4.69	1.07	27.82	1.25	0.06	0.05
	Approach	1698	7.68	1.07	4.78	0.06	0.05	0.04
	Climb out	4714	15.07	1.07	0.93	0.02	0.35	0.31
	Takeoff	5659	18.79	1.07	1.04	0.02	0.37	0.33
Notes: c(2), e, f, h, k(8)								
BR700-710A2-20	Idle (Taxi)	706	4.67	1.07	28.00	1.29	0.06	0.05
	Approach	1698	7.67	1.07	4.81	0.06	0.05	0.04
	Climb out	4722	15.03	1.07	0.93	0.02	0.34	0.31
	Takeoff	5667	18.73	1.07	1.04	0.02	0.37	0.33
Notes: c(2), e, f, h, k(8)								
BR700-710C4-11	Idle (Taxi)	659	4.50	1.07	31.57	2.63	0.06	0.06
	Approach	1706	7.71	1.07	4.92	0.06	0.05	0.04
	Climb out	4897	15.43	1.07	0.92	0.02	0.35	0.32
	Takeoff	5929	19.52	1.07	1.04	0.02	0.37	0.33
Notes: c(2), e, f, h, k(8)								
BR700-715A1-30	Idle (Taxi)	762	5.37	1.07	16.27	0.24	0.07	0.06
	Approach	1944	11.19	1.07	3.76	0.01	0.06	0.06
	Climb out	5476	18.65	1.07	0.75	0.02	0.09	0.08
	Takeoff	6635	23.97	1.07	0.78	0.00	0.10	0.09
Notes: c(2), e, f, h, k(8)								
BR700-715C1-30	Idle (Taxi)	833	4.28	1.07	17.85	0.07	0.04	0.04
	Approach	2159	9.23	1.07	3.23	0.02	0.07	0.06
	Climb out	6389	20.05	1.07	0.64	0.07	0.13	0.12
	Takeoff	7810	27.92	1.07	0.80	0.01	0.13	0.12
Notes: c(2), e, f, h, k(8)								
BR725A1-12	Idle (Taxi)	675	3.38	1.07	41.90	3.45	0.06	0.05
	Approach	1754	7.81	1.07	5.93	0.00	0.04	0.03
	Climb out	5159	13.32	1.07	0.32	0.00	0.13	0.12
	Takeoff	6262	16.92	1.07	0.40	0.00	0.11	0.10
Notes: c(2), e, f, h, k(8)								
CF6-6D	Idle (Taxi)	1371	4.50	1.07	54.20	24.15	0.20	0.18
	Approach	3841	11.40	1.07	6.50	0.81	0.10	0.09
	Climb out	11357	32.60	1.07	0.50	0.35	0.07	0.07
	Takeoff	13778	40.00	1.07	0.50	0.35	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF6-6D1A	Idle (Taxi)	1397	4.60	1.07	52.00	22.89	0.19	0.17
	Approach	3921	11.80	1.07	5.50	0.69	0.09	0.08
	Climb out	11921	33.90	1.07	0.50	0.35	0.07	0.07
	Takeoff	14381	41.60	1.07	0.50	0.35	0.09	0.08
Notes: c(2), e, f, h, k(1)								

2059 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF6-6K	Idle (Taxi)	1371	4.50	1.07	54.20	24.15	0.20	0.18
	Approach	3841	11.40	1.07	6.50	0.81	0.10	0.09
	Climb out	11357	32.60	1.07	0.50	0.35	0.07	0.07
	Takeoff	13778	40.00	1.07	0.50	0.35	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF6-6K2	Idle (Taxi)	1397	4.60	1.07	52.00	22.89	0.19	0.17
	Approach	3921	11.80	1.07	5.50	0.69	0.09	0.08
	Climb out	11921	33.90	1.07	0.50	0.35	0.07	0.07
	Takeoff	14381	41.60	1.07	0.50	0.35	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF6-50A	Idle (Taxi)	1294	3.40	1.07	24.04	3.13	0.06	0.06
	Approach	4960	9.72	1.07	4.35	0.36	0.06	0.06
	Climb out	14183	23.27	1.07	0.49	0.16	0.11	0.10
	Takeoff	17206	27.17	1.07	0.43	0.17	0.11	0.10
Notes: c(2), e, f, h, k(1)								
CF6-50C	Idle (Taxi)	1683	3.50	1.07	62.30	26.45	0.22	0.20
	Approach	5103	9.40	1.07	5.20	1.15	0.11	0.10
	Climb out	15199	29.00	1.07	0.50	0.81	0.10	0.09
	Takeoff	18881	35.00	1.07	0.50	0.69	0.12	0.11
Notes: c(2), e, f, h, k(1)								
CF6-50C1, -50C2	Idle (Taxi)	1706	3.60	1.07	61.80	25.07	0.21	0.19
	Approach	5238	9.50	1.07	4.30	1.15	0.11	0.10
	Climb out	15675	29.70	1.07	0.50	0.81	0.10	0.09
	Takeoff	19738	36.30	1.07	0.50	0.69	0.12	0.11
Notes: c(2) - CF6-50C2 is the commercial designation of the F103-GE-101 engine, e, f, h, k(1)								
CF6-50C2B	Idle (Taxi)	1294	3.40	1.07	24.04	3.13	0.06	0.06
	Approach	5294	10.49	1.07	3.42	0.30	0.06	0.06
	Climb out	15849	26.34	1.07	0.44	0.17	0.11	0.10
	Takeoff	19127	29.59	1.07	0.46	0.15	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CF6-50C2R	Idle (Taxi)	1683	3.50	1.07	62.30	26.45	0.22	0.20
	Approach	5103	9.40	1.07	5.20	1.15	0.11	0.10
	Climb out	15199	29.00	1.07	0.50	0.81	0.10	0.09
	Takeoff	18881	35.00	1.07	0.50	0.69	0.12	0.11
Notes: c(2), e, f, h, k(1)								
CF6-50CA	Idle (Taxi)	1294	3.40	1.07	24.04	3.13	0.06	0.06
	Approach	5087	10.09	1.07	3.99	0.33	0.06	0.06
	Climb out	14881	24.30	1.07	0.46	0.16	0.11	0.10
	Takeoff	18103	28.03	1.07	0.44	0.16	0.10	0.09
Notes: c(2), e, f, h, k(1)								

2060
2061

2062 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF6-50E, -50E1	Idle (Taxi)	1294	3.40	1.07	24.04	3.13	0.06	0.06
	Approach	5262	10.16	1.07	3.71	0.32	0.06	0.06
	Climb out	15397	25.50	1.07	0.45	0.17	0.11	0.10
	Takeoff	18738	28.97	1.07	0.45	0.16	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CF6-50E2	Idle (Taxi)	1706	3.60	1.07	61.80	25.07	0.21	0.19
	Approach	5238	9.50	1.07	4.30	1.15	0.11	0.10
	Climb out	15675	29.70	1.07	0.50	0.81	0.10	0.09
	Takeoff	19738	36.30	1.07	0.50	0.69	0.12	0.11
Notes: c(2) - CF6-50E2 is the commercial designation of the F103-GE-100 engine, e, f, h, k(1)								
CF6-80A	Idle (Taxi)	1190	3.40	1.07	28.20	7.23	0.09	0.08
	Approach	4881	10.30	1.07	3.10	0.54	0.08	0.07
	Climb out	14246	25.60	1.07	1.10	0.33	0.11	0.10
	Takeoff	17024	29.80	1.07	1.00	0.33	0.13	0.11
Notes: c(2), e, f, h, k(1)								
CF6-80A2, -80A3	Idle (Taxi)	1190	3.40	1.07	28.20	7.22	0.09	0.08
	Approach	5087	10.80	1.07	2.80	0.52	0.07	0.07
	Climb out	14960	26.60	1.07	1.10	0.43	0.11	0.10
	Takeoff	17889	29.60	1.07	1.00	0.35	0.13	0.11
Notes: c(2), e, f, h, k(1)								
CF6-80C2A1	Idle (Taxi)	1579	3.99	1.07	42.24	10.57	0.12	0.11
	Approach	5048	9.76	1.07	2.19	0.23	0.06	0.06
	Climb out	15500	24.85	1.07	0.54	0.10	0.07	0.06
	Takeoff	19048	32.22	1.07	0.56	0.09	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80C2A2	Idle (Taxi)	1500	3.95	1.07	46.01	12.05	0.13	0.11
	Approach	4603	9.44	1.07	2.94	0.26	0.06	0.06
	Climb out	13849	20.69	1.07	0.55	0.12	0.06	0.06
	Takeoff	16802	27.93	1.07	0.57	0.09	0.07	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80C2A3	Idle (Taxi)	1603	3.92	1.07	41.51	10.28	0.12	0.10
	Approach	5151	9.93	1.07	2.07	0.22	0.06	0.06
	Climb out	15897	25.46	1.07	0.56	0.09	0.07	0.06
	Takeoff	19500	34.50	1.07	0.58	0.07	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80C2A5	Idle (Taxi)	1643	3.79	1.07	41.65	10.34	0.12	0.10
	Approach	5452	9.11	1.07	1.93	0.23	0.06	0.06
	Climb out	16524	22.86	1.07	0.52	0.09	0.07	0.06
	Takeoff	20484	34.38	1.07	0.52	0.08	0.08	0.07
Notes: c(2), e, f, h, k(1)								

2063
2064

2065 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF6-80C2A5F	Idle (Taxi)	1746	4.90	1.07	16.96	1.36	0.05	0.04
	Approach	5484	12.64	1.07	1.92	0.13	0.04	0.04
	Climb out	16714	21.27	1.07	0.04	0.05	0.06	0.06
	Takeoff	20873	28.11	1.07	0.05	0.06	0.07	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80C2B1	Idle (Taxi)	1556	3.73	1.07	43.22	10.88	0.12	0.11
	Approach	4889	8.83	1.07	2.37	0.24	0.06	0.06
	Climb out	14865	21.26	1.07	0.55	0.10	0.06	0.06
	Takeoff	18135	28.11	1.07	0.58	0.09	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80C2B1F	Idle (Taxi)	1579	4.73	1.07	19.23	1.77	0.05	0.04
	Approach	5159	12.47	1.07	2.13	0.13	0.04	0.04
	Climb out	15738	19.72	1.07	0.04	0.06	0.06	0.05
	Takeoff	19222	24.94	1.07	0.04	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B2	Idle (Taxi)	1508	4.45	1.07	22.41	2.27	0.05	0.05
	Approach	4643	11.79	1.07	2.61	0.14	0.05	0.04
	Climb out	13937	18.25	1.07	0.05	0.06	0.05	0.05
	Takeoff	16857	22.02	1.07	0.04	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B2F	Idle (Taxi)	1492	4.52	1.07	21.56	2.14	0.05	0.05
	Approach	4706	11.80	1.07	2.64	0.14	0.05	0.04
	Climb out	14103	18.09	1.07	0.06	0.06	0.05	0.05
	Takeoff	17048	21.55	1.07	0.04	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B4	Idle (Taxi)	1595	4.68	1.07	19.76	1.83	0.05	0.04
	Approach	5087	12.37	1.07	2.12	0.14	0.05	0.04
	Climb out	15595	20.17	1.07	0.04	0.06	0.06	0.05
	Takeoff	19119	25.93	1.07	0.05	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B4F	Idle (Taxi)	1579	4.73	1.07	19.23	1.77	0.05	0.04
	Approach	5159	12.47	1.07	2.13	0.13	0.04	0.04
	Climb out	15738	19.72	1.07	0.04	0.06	0.06	0.05
	Takeoff	19302	25.08	1.07	0.04	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B5F	Idle (Taxi)	1635	4.91	1.07	17.45	1.51	0.05	0.04
	Approach	5532	12.74	1.07	1.83	0.13	0.04	0.04
	Climb out	17159	21.76	1.07	0.04	0.06	0.06	0.06
	Takeoff	21310	28.58	1.07	0.05	0.06	0.07	0.07
Notes: c(2), e, f, h, k(1)								

2066
2067

2068 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF6-80C2B6	Idle (Taxi)	1627	4.76	1.07	18.89	1.70	0.05	0.04
	Approach	5333	12.53	1.07	1.91	0.13	0.04	0.04
	Climb out	16635	21.69	1.07	0.04	0.06	0.07	0.06
	Takeoff	20476	28.57	1.07	0.06	0.05	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B6F	Idle (Taxi)	1611	4.81	1.07	18.42	1.64	0.05	0.04
	Approach	5413	12.63	1.07	1.93	0.13	0.04	0.04
	Climb out	16699	21.05	1.07	0.04	0.06	0.06	0.06
	Takeoff	20587	27.38	1.07	0.05	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B7F	Idle (Taxi)	1611	4.81	1.07	18.42	1.64	0.05	0.04
	Approach	5413	12.63	1.07	1.93	0.13	0.04	0.04
	Climb out	16699	21.05	1.07	0.04	0.06	0.06	0.06
	Takeoff	20587	27.38	1.07	0.05	0.06	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2B8F	Idle (Taxi)	1627	4.59	1.07	16.69	1.31	0.05	0.04
	Approach	5437	12.42	1.07	1.69	0.10	0.04	0.04
	Climb out	16714	20.84	1.07	0.02	0.05	0.06	0.05
	Takeoff	20500	26.85	1.07	0.03	0.05	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CF6-80C2D1F	Idle (Taxi)	1556	3.80	1.07	41.78	10.38	0.12	0.11
	Approach	5214	9.16	1.07	1.94	0.23	0.06	0.06
	Climb out	16389	24.02	1.07	0.52	0.09	0.07	0.06
	Takeoff	20603	32.65	1.07	0.52	0.08	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CF6-80E1A1	Idle (Taxi)	1794	4.47	1.07	43.24	11.13	0.10	0.09
	Approach	5667	9.84	1.07	1.70	0.16	0.05	0.04
	Climb out	17452	27.11	1.07	0.34	0.08	0.07	0.07
	Takeoff	21445	37.87	1.07	0.38	0.06	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF6-80E1A2	Idle (Taxi)	1810	4.53	1.07	42.67	10.78	0.10	0.09
	Approach	5746	9.91	1.07	1.61	0.16	0.05	0.04
	Climb out	17818	28.02	1.07	0.34	0.08	0.08	0.07
	Takeoff	21960	39.29	1.07	0.38	0.06	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF6-80E1A3	Idle (Taxi)	1802	4.69	1.07	37.02	10.96	0.10	0.09
	Approach	5992	10.29	1.07	1.23	0.21	0.05	0.04
	Climb out	18945	31.74	1.07	0.31	0.08	0.08	0.08
	Takeoff	23722	45.63	1.07	0.34	0.08	0.09	0.08
Notes: c(2), e, f, h, k(1)								

2069
2070

2071 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF6-80E1A4	Idle (Taxi)	1802	4.62	1.07	38.09	11.90	0.10	0.09
	Approach	5905	10.13	1.07	1.33	0.21	0.05	0.04
	Climb out	18548	30.30	1.07	0.30	0.08	0.08	0.07
	Takeoff	23048	43.15	1.07	0.34	0.07	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CF34-3A, -3A1	Idle (Taxi)	394	3.82	1.07	42.60	4.54	0.09	0.08
	Approach	944	6.86	1.07	1.90	0.15	0.06	0.06
	Climb out	2653	10.14	1.07	0.00	0.07	0.09	0.08
	Takeoff	3230	11.61	1.07	0.00	0.07	0.16	0.14
Notes: c(2), e, f, h, k(4)								
CF34-3B	Idle (Taxi)	388	3.72	1.07	47.59	5.39	0.09	0.08
	Approach	921	6.63	1.07	1.88	0.15	0.06	0.06
	Climb out	2610	9.68	1.07	0.00	0.06	0.09	0.08
	Takeoff	3167	11.28	1.07	0.00	0.07	0.14	0.12
Notes: c(2), e, f, h, k(1)								
CF34-8C1	Idle (Taxi)	548	4.31	1.07	24.92	0.09	0.04	0.04
	Approach	1334	11.10	1.07	2.91	0.07	0.04	0.04
	Climb out	3921	12.82	1.07	0.50	0.02	0.04	0.04
	Takeoff	4795	14.67	1.07	0.41	0.02	0.06	0.05
Notes: c(2), e, f, h, k(1)								
CF34-8C5	Idle (Taxi)	508	4.60	1.07	18.25	0.15	0.04	0.04
	Approach	1421	10.75	1.07	4.24	0.07	0.04	0.04
	Climb out	4206	12.60	1.07	0.57	0.02	0.05	0.04
	Takeoff	5143	14.69	1.07	0.64	0.02	0.07	0.07
Notes: c(2), e, f, h, k(1)								
CF34-8C5A1	Idle (Taxi)	516	4.65	1.07	17.85	0.15	0.04	0.04
	Approach	1452	10.87	1.07	4.17	0.07	0.04	0.04
	Climb out	4310	12.82	1.07	0.57	0.02	0.05	0.04
	Takeoff	5278	15.09	1.07	0.66	0.02	0.08	0.08
Notes: c(2), e, f, h, k(1)								
CF34-8C5A2	Idle (Taxi)	524	4.70	1.07	17.30	0.15	0.04	0.04
	Approach	1492	11.06	1.07	4.05	0.07	0.04	0.04
	Climb out	4468	13.15	1.07	0.57	0.02	0.05	0.05
	Takeoff	5484	15.81	1.07	0.71	0.02	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CF34-8C5B1	Idle (Taxi)	500	4.50	1.07	19.52	0.18	0.04	0.04
	Approach	1357	10.42	1.07	4.44	0.08	0.04	0.04
	Climb out	3944	12.03	1.07	0.58	0.03	0.04	0.04
	Takeoff	4810	13.89	1.07	0.60	0.02	0.06	0.05
Notes: c(2), e, f, h, k(1)								

2072
2073

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CF700-2D	Idle (Taxi)	460	0.89	1.07	155.00	20.70	3.0E-03 **(S)**	2.7E-03 **(S)**
	Approach	919	1.80	1.07	62.00	1.61	0.01 **(S)**	0.01 **(S)**
	Climb out	2322	4.30	1.07	11.34	0.11	0.01 **(S)**	0.01 **(S)**
	Takeoff	2607	5.60	1.07	9.98	0.11	0.02 **(S)**	0.02 **(S)**
Notes: c(1), d(8) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
CFM56-2A Series	Idle (Taxi)	1032	4.30	1.07	23.50	1.30	0.06	0.05
	Approach	2524	8.70	1.07	3.40	0.09	0.06	0.05
	Climb out	7230	17.30	1.07	0.90	0.05	0.06	0.05
	Takeoff	8841	20.40	1.07	0.90	0.05	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CFM56-2B-1	Idle (Taxi)	1136	3.88	1.07	23.65	0.19	2.07	1.86
	Approach	2547	5.73	1.07	8.57	0.06	1.55	1.40
	Intermediate	5650	11.04	1.07	2.32	0.03	0.65	0.58
	Military	6458	12.05	1.07	0.36	0.03	1.59	1.43
Notes: c(3) - CFM56-2B-1 is the commercial designation of the F108-CF-100 engine, h, k(5)								
CFM56-2-C5	Idle (Taxi)	1016	4.00	1.07	30.70	2.10	0.07	0.06
	Approach	2468	8.20	1.07	4.20	0.09	0.06	0.05
	Climb out	6500	16.00	1.07	0.90	0.06	0.05	0.05
	Takeoff	7818	18.50	1.07	0.90	0.05	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CFM56-3-B1	Idle (Taxi)	905	3.90	1.07	34.40	2.62	0.07	0.06
	Approach	2302	8.30	1.07	3.80	0.09	0.06	0.05
	Climb out	6286	15.50	1.07	0.95	0.06	0.05	0.05
	Takeoff	7508	17.70	1.07	0.90	0.05	0.06	0.05
Notes: c(2), e, f, h, k(1)								
CFM56-3B-2	Idle (Taxi)	944	4.10	1.07	30.10	2.01	0.06	0.06
	Approach	2492	8.70	1.07	3.40	0.08	0.06	0.05
	Climb out	6968	16.70	1.07	0.90	0.05	0.05	0.05
	Takeoff	8381	19.40	1.07	0.90	0.04	0.07	0.06
Notes: c(2), e, f, h, k(1)								
CFM56-3C-1	Idle (Taxi)	984	4.30	1.07	26.80	1.63	0.06	0.06
	Approach	2667	9.10	1.07	3.10	0.08	0.06	0.05
	Climb out	7571	17.80	1.07	0.90	0.05	0.06	0.05
	Takeoff	9159	20.70	1.07	0.90	0.03	0.07	0.07
Notes: c(2), e, f, h, k(1)								
CFM56-5-A1	Idle (Taxi)	802	4.00	1.07	17.60	1.61	0.06	0.06
	Approach	2310	8.00	1.07	2.50	0.46	0.09	0.08
	Climb out	6841	19.60	1.07	0.90	0.26	0.13	0.12
	Takeoff	8341	24.60	1.07	0.90	0.26	0.14	0.13
Notes: c(2), e, f, h, k(1)								

2077 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CFM56-5A3	Idle (Taxi)	829	4.10	1.07	16.20	1.50	0.07	0.06
	Approach	2437	8.30	1.07	2.40	0.35	0.09	0.08
	Climb out	7341	21.10	1.07	0.90	0.23	0.13	0.12
	Takeoff	8976	26.40	1.07	0.90	0.23	0.14	0.13
Notes: c(2), e, f, h, k(1)								
CFM56-5A4	Idle (Taxi)	754	4.04	1.07	20.30	2.01	0.07	0.06
	Approach	2071	8.51	1.07	3.10	0.58	0.09	0.08
	Climb out	5873	19.11	1.07	1.10	0.26	0.11	0.10
	Takeoff	7119	22.64	1.07	1.10	0.26	0.13	0.12
Notes: c(2), e, f, h, k(1)								
CFM56-5A5	Idle (Taxi)	778	4.29	1.07	18.50	1.76	0.07	0.06
	Approach	2190	8.94	1.07	2.80	0.52	0.09	0.08
	Climb out	6341	19.98	1.07	1.10	0.26	0.12	0.11
	Takeoff	7714	24.79	1.07	1.10	0.26	0.13	0.12
Notes: c(2), e, f, h, k(1)								
CFM56-5B1	Idle (Taxi)	929	4.60	1.07	28.40	3.69	0.06	0.05
	Approach	2889	10.80	1.07	1.57	0.14	0.05	0.04
	Climb out	8833	27.20	1.07	0.50	0.12	0.10	0.09
	Takeoff	10786	35.10	1.07	0.50	0.12	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CFM56-5B2	Idle (Taxi)	944	4.70	1.07	27.40	3.50	0.06	0.05
	Approach	2984	11.00	1.07	1.40	0.14	0.05	0.04
	Climb out	9191	28.50	1.07	0.50	0.12	0.10	0.09
	Takeoff	11318	37.80	1.07	0.50	0.12	0.08	0.08
Notes: c(2), e, f, h, k(1)								
CFM56-5B4	Idle (Taxi)	849	4.30	1.07	31.90	4.45	0.06	0.06
	Approach	2587	10.00	1.07	2.33	0.15	0.05	0.04
	Climb out	7627	23.30	1.07	0.50	0.12	0.10	0.09
	Takeoff	9254	28.70	1.07	0.50	0.12	0.09	0.08
Notes: c(2), e, f, h, k(1)								
CFM56-5B4/3, -5B7/3	Idle (Taxi)	810	4.22	1.07	32.07	2.21	0.06	0.06
	Approach	2508	8.85	1.07	3.24	0.06	0.05	0.05
	Climb out	7452	17.23	1.07	0.16	0.02	0.09	0.08
	Takeoff	9064	21.57	1.07	0.25	0.02	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CFM56-5B9/3	Idle (Taxi)	754	3.92	1.07	38.80	3.46	0.07	0.06
	Approach	2206	8.26	1.07	4.42	0.08	0.05	0.05
	Climb out	6294	14.76	1.07	0.17	0.03	0.08	0.07
	Takeoff	7587	17.54	1.07	0.16	0.02	0.09	0.08
Notes: c(2), e, f, h, k(1)								

2078
2079

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CFM56-5C2	Idle (Taxi)	933	4.19	1.07	34.00	6.53	0.12	0.11
	Approach	2824	10.00	1.07	1.75	0.09	0.08	0.07
	Climb out	8540	25.80	1.07	0.80	0.01	0.34	0.31
	Takeoff	10381	32.60	1.07	0.93	0.01	0.41	0.37
Notes: c(2), e, f, h, k(1)								
CFM56-5C2/P	Idle (Taxi)	865	3.90	1.07	35.10	6.67	0.12	0.11
	Approach	2714	9.30	1.07	2.10	0.00	0.07	0.07
	Climb out	8214	23.80	1.07	0.70	0.00	0.34	0.30
	Takeoff	9937	29.70	1.07	0.80	0.00	0.39	0.35
Notes: c(2), e, f, h, k(1)								
CFM56-5C3/P	Idle (Taxi)	889	4.00	1.07	33.40	6.21	0.12	0.11
	Approach	2817	9.60	1.07	1.90	0.00	0.07	0.07
	Climb out	8611	25.10	1.07	0.70	0.00	0.36	0.32
	Takeoff	10445	31.60	1.07	0.80	0.00	0.43	0.38
Notes: c(2), e, f, h, k(1)								
CFM56-5C4	Idle (Taxi)	984	4.28	1.07	30.93	5.75	0.12	0.11
	Approach	3064	10.67	1.07	1.40	0.07	0.08	0.07
	Climb out	9484	29.05	1.07	0.85	0.01	0.39	0.35
	Takeoff	11556	37.67	1.07	1.00	0.01	0.46	0.42
Notes: c(2), e, f, h, k(1)								
CFM56-5C4/P	Idle (Taxi)	913	4.10	1.07	31.60	5.75	0.12	0.11
	Approach	2937	9.90	1.07	1.60	0.00	0.07	0.07
	Climb out	9071	26.70	1.07	0.70	0.00	0.38	0.34
	Takeoff	11072	34.10	1.07	0.80	0.00	0.44	0.39
Notes: c(2), e, f, h, k(1)								
CFM56-7B18/3	Idle (Taxi)	730	3.65	1.07	46.64	5.19	0.08	0.07
	Approach	2032	7.78	1.07	5.54	0.09	0.05	0.05
	Climb out	5571	13.00	1.07	0.28	0.03	0.07	0.06
	Takeoff	6683	14.81	1.07	0.17	0.03	0.07	0.07
Notes: c(2), e, f, h, k(1)								
CFM56-7B20	Idle (Taxi)	794	4.30	1.07	25.90	3.57	0.06	0.05
	Approach	2175	9.50	1.07	3.20	0.12	0.04	0.04
	Climb out	6040	17.40	1.07	0.50	0.12	0.08	0.07
	Takeoff	7246	20.50	1.07	0.60	0.12	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CFM56-7B20/2	Idle (Taxi)	810	3.75	1.07	49.71	9.33	0.09	0.08
	Approach	2206	9.39	1.07	11.37	0.41	0.07	0.06
	Climb out	5984	10.81	1.07	11.38	0.26	0.06	0.05
	Takeoff	7167	13.25	1.07	4.26	0.08	0.05	0.04
Notes: c(2), e, f, h, k(1)								

2083 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CFM56-7B20/3, -7B20E	Idle (Taxi)	746	3.77	1.07	43.31	4.42	0.08	0.07
	Approach	2127	7.98	1.07	5.03	0.09	0.05	0.05
	Climb out	5921	13.53	1.07	0.23	0.03	0.07	0.06
	Takeoff	7111	15.61	1.07	0.15	0.03	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CFM56-7B22	Idle (Taxi)	833	4.50	1.07	22.80	2.88	0.05	0.05
	Approach	2365	10.00	1.07	2.50	0.12	0.04	0.04
	Climb out	6698	19.00	1.07	0.60	0.12	0.10	0.09
	Takeoff	8103	23.10	1.07	0.50	0.12	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CFM56-7B22/2	Idle (Taxi)	833	3.94	1.07	45.35	8.35	0.09	0.08
	Approach	2405	6.37	1.07	30.87	6.97	0.38	0.34
	Climb out	6643	12.16	1.07	6.58	0.12	0.05	0.04
	Takeoff	8000	15.08	1.07	2.18	0.07	0.05	0.04
Notes: c(2), e, f, h, k(1)								
CFM56-7B22/3, -7B22E	Idle (Taxi)	786	3.95	1.07	37.90	3.25	0.07	0.06
	Approach	2310	8.35	1.07	4.18	0.08	0.05	0.05
	Climb out	6603	14.67	1.07	0.17	0.03	0.08	0.07
	Takeoff	7968	17.40	1.07	0.16	0.02	0.08	0.07
Notes: c(2), e, f, h, k(1)								
CFM56-7B24	Idle (Taxi)	865	4.40	1.07	22.00	2.76	0.05	0.05
	Approach	2508	10.10	1.07	2.20	0.12	0.04	0.04
	Climb out	7222	20.50	1.07	0.60	0.12	0.10	0.09
	Takeoff	8754	25.30	1.07	0.40	0.12	0.11	0.10
Notes: c(2), e, f, h, k(1)								
CFM56-7B24/2	Idle (Taxi)	865	4.08	1.07	42.72	7.53	0.08	0.07
	Approach	2484	6.72	1.07	30.32	6.91	0.38	0.34
	Climb out	7159	13.23	1.07	4.30	0.08	0.05	0.04
	Takeoff	8643	16.63	1.07	1.38	0.06	0.05	0.04
Notes: c(2), e, f, h, k(1)								
CFM56-7B24/3	Idle (Taxi)	817	4.09	1.07	34.71	2.65	0.07	0.06
	Approach	2444	8.60	1.07	3.68	0.07	0.05	0.05
	Climb out	7103	15.60	1.07	0.15	0.03	0.08	0.07
	Takeoff	8619	18.93	1.07	0.18	0.02	0.09	0.09
Notes: c(2), e, f, h, k(1)								
CFM56-7B24E, -7B24E/B1	Idle (Taxi)	794	4.10	1.07	34.70	2.65	0.07	0.06
	Approach	2381	8.60	1.07	3.70	0.12	0.06	0.05
	Climb out	7143	15.60	1.07	0.20	0.00	0.08	0.07
	Takeoff	8730	18.90	1.07	0.20	0.00	0.09	0.09
Notes: c(2), e, f, h, k(1)								

2084
2085

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
CFM56-7B26	Idle (Taxi)	897	4.70	1.07	18.80	2.19	0.05	0.05
	Approach	2683	10.80	1.07	1.60	0.12	0.04	0.04
	Climb out	7929	22.50	1.07	0.60	0.12	0.11	0.10
	Takeoff	9691	28.80	1.07	0.20	0.12	0.12	0.11
Notes: c(2), e, f, h, k(1)								
CFM56-7B26/2	Idle (Taxi)	897	4.27	1.07	39.93	6.76	0.08	0.07
	Approach	2651	7.26	1.07	26.07	5.44	0.31	0.28
	Climb out	7849	14.77	1.07	2.51	0.07	0.05	0.04
	Takeoff	9548	19.20	1.07	0.77	0.03	0.04	0.04
Notes: c(2), e, f, h, k(1)								
CFM56-7B26/3, -7B26E, -7B26E/B1, -7B26E/B2, -7B26E/B2F, -7B26E/F	Idle (Taxi)	857	4.27	1.07	30.94	2.01	0.06	0.06
	Approach	2627	8.93	1.07	3.07	0.06	0.05	0.05
	Climb out	7825	17.08	1.07	0.16	0.02	0.09	0.08
	Takeoff	9627	21.79	1.07	0.20	0.02	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CFM56-7B27	Idle (Taxi)	921	4.80	1.07	17.90	1.96	0.05	0.04
	Approach	2770	11.00	1.07	1.40	0.12	0.04	0.04
	Climb out	8278	23.70	1.07	0.50	0.12	0.11	0.10
	Takeoff	10191	30.90	1.07	0.20	0.12	0.12	0.11
Notes: c(2), e, f, h, k(1)								
CFM56-7B27/2	Idle (Taxi)	913	4.36	1.07	38.73	6.39	0.08	0.07
	Approach	2786	7.53	1.07	24.28	4.84	0.28	0.25
	Climb out	8198	15.59	1.07	1.97	0.07	0.05	0.04
	Takeoff	10040	20.81	1.07	0.54	0.06	0.05	0.04
Notes: c(2), e, f, h, k(1)								
CFM56-7B27/3, -7B27E, -7B27E/B1, -7B27E/B1F, -7B27E/B3, -7B27E/F	Idle (Taxi)	873	4.36	1.07	29.39	1.77	0.06	0.06
	Approach	2722	9.09	1.07	2.82	0.06	0.05	0.05
	Climb out	8183	17.89	1.07	0.17	0.02	0.10	0.09
	Takeoff	10262	23.94	1.07	0.31	0.03	0.10	0.09
Notes: c(2), e, f, h, k(1)								
CT7-5	Idle (Taxi)	131	2.20	1.07	35.33	3.78	0.18	0.16
	Approach	364	6.88	1.07	5.29	1.42	0.37	0.33
	Climb out	756	13.17	1.07	2.59	0.95	0.57	0.51
	Takeoff	809	13.77	1.07	2.59	0.95	0.69	0.62
Notes: c(13), j, k(8)								
F100-PW-100	Idle (Taxi)	1127	4.64	1.07	49.58	3.79	3.13	2.82
	Approach	2765	12.52	1.07	3.99	1.06	1.57	1.41
	Intermediate	7685	27.09	1.07	0.72	0.14	0.72	0.65
	Military	10996	35.01	1.07	0.70	0.12	1.24	1.12
	Afterburner-1	54007	6.62	1.07	9.57	0.13	0.87	0.78
Notes: c(14), h, k(5)								

2089 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
F100-PW-200	Idle (Taxi)	1006	6.21	1.07	24.06	2.05	2.47	2.22
	Approach	3251	17.93	1.07	1.22	0.05	2.37	2.13
	Intermediate	5651	26.55	1.07	0.38	0.07	1.58	1.42
	Military	8888	34.32	1.07	0.56	0.11	1.66	1.49
	Afterburner-5	40123	6.63	1.07	10.42	0.69	3.07	2.76
Notes: c(5), h, k(5)								
F100-PW-220	Idle (Taxi)	2084	4.61	1.07	35.32	7.94	0.67	0.60
	Approach	3837	12.50	1.07	1.92	5.12	0.70	0.63
	Intermediate	5770	22.20	1.07	0.86	2.89	0.70	0.63
	Military	9679	29.60	1.07	0.86	2.08	0.91	0.82
	Afterburner-5	41682	8.20	1.07	11.87	1.60	0.38	0.35
Notes: c(17), e, g, h, k(5)								
F100-PW-229	Idle (Taxi)	1087	3.80	1.07	10.17	0.45	0.67 **(S)**	0.60 **(S)**
	Approach	3098	15.08	1.07	1.17	0.24	0.70 **(S)**	0.63 **(S)**
	Intermediate	5838	17.54	1.07	0.15	0.35	0.70 **(S)**	0.63 **(S)**
	Military	11490	29.29	1.07	0.33	0.31	0.91 **(S)**	0.82 **(S)**
	Afterburner-1	20793	14.30	1.07	21.51	5.26	0.38 **(S)**	0.35 **(S)**
Notes: c(3), d(2) - $PM_{2.5}$ and PM_{10} data at all power settings, e, h, k(5)								
F101-GE-100	Idle (Taxi)	476	7.30	1.07	120.10	28.98	0.09	0.08
	Approach	4533 **(S)**	9.16 **(S)**	1.07	1.03 **(S)**	0.02 **(S)**	4.21 **(S)**	3.74 **(S)**
	Intermediate	6557 **(S)**	13.15 **(S)**	1.07	0.85 **(S)**	0.04 **(S)**	1.35 **(S)**	0.72 **(S)**
	Military	10000	2.30	1.07	7.60	0.46	0.03	0.03
	Afterburner	66747	4.60	1.07	16.70	0.12	0.05	0.05
Notes: c(7), d(3) - All pollutants and fuel flow rates at Approach and Intermediate power settings, e, h, k(8)								
F101-GE-102	Idle (Taxi)	1117	4.10	1.07	24.46	0.16	2.18	1.96
	Approach	4533	9.16	1.07	1.03	0.02	4.21	3.79
	Intermediate	6557	13.15	1.07	0.85	0.04	1.35	1.21
	Military	7828	12.83	1.07	0.83	0.12	1.68	1.51
	Afterburner-1	15314	16.92	1.07	43.49	1.46	2.87	2.58
Notes: c(3), h, k(5)								
F103-GE-100, -101	Idle (Taxi)	1706	3.60	1.07	61.80	25.07	0.21	0.19
	Approach	5238	9.50	1.07	4.30	1.15	0.11	0.10
	Climb out	15675	29.70	1.07	0.50	0.81	0.10	0.09
	Takeoff	19738	36.30	1.07	0.50	0.69	0.12	0.11
Notes: c(2) - F103-GE-100 is the military designation of the CF6-50E2 engine and F103-GE-101 is the military designation of the CF6-50C2 engine, e, f, h, k(1)								
F108-CF-100, -201	Idle (Taxi)	1136	3.88	1.07	23.65	0.19	2.07	1.86
	Approach	2547	5.73	1.07	8.57	0.06	1.55	1.40
	Intermediate	5650	11.04	1.07	2.32	0.03	0.65	0.58
	Military	6458	12.05	1.07	0.36	0.03	1.59	1.43
Notes: c(3) - F108-CF-100 is the military designation of the CFM56-2B-1 engine, this engine used as a surrogate at all settings for F108-CF-201 engine, h, k(5)								
F110-GE-100	Idle (Taxi)	1111	3.77	1.07	24.11	0.22	2.60	2.34
	Approach	5080	9.78	1.07	5.77	0.03	1.37	1.23
	Intermediate	7332	16.92	1.07	3.47	0.05	0.58	0.52
	Military	11358	29.00	1.07	3.38	0.04	0.14	0.13
	Afterburner-1	18088	14.26	1.07	67.41	1.21	3.35	3.01
Notes: c(3), h, k(5)								

2090
2091

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
F110-GE-129	Idle (Taxi)	961	2.62	1.07	45.04	4.90	2.60 **(S)**	2.34 **(S)**
	Approach	4832	13.42	1.07	1.93	0.03 **(S)**	1.37 **(S)**	1.23 **(S)**
	Intermediate	6939	17.82	1.07	1.53	0.05 **(S)**	0.58 **(S)**	0.52 **(S)**
	Military	8611	20.34	1.07	1.17	0.93	0.14 **(S)**	0.13 **(S)**
	Afterburner-1	15564	7.09	1.07	63.28	53.46	3.35 **(S)**	3.01 **(S)**
Notes: c(3), d(4) - VOC at Approach and Intermediate settings and PM_{10} and $PM_{2.5}$ at all power settings, e, k(5)								
F110-GE-400	Idle (Taxi)	1287	2.76	1.07	16.57	3.48	0.02	0.02
	Approach	5809	12.41	1.07	0.96	0.44	0.02	0.02
	Climb out	11868	58.57	1.07	0.84	0.38	0.26	0.23
	Takeoff	11833	28.47	1.07	0.84	0.38	0.31	0.28
Notes: c(13), j, k(8)								
F113-RR-100	Idle (Taxi)	1008	3.60	1.07	31.77	4.24	0.16	0.15
	Approach	2206	7.20	1.07	2.65	0.21	0.22	0.20
	Climb out	5762	17.30	1.07	0.63	0.14	0.24	0.22
	Takeoff	7071	22.70	1.07	0.12	0.10	0.23	0.21
Notes: c(2) - F113-RR-100 is the military designation of the SPEY Mk511 engine, e, f, h, k(8)								
F117-PW-100	Idle (Taxi)	978	3.76	1.07	22.70	0.37	10.67	9.60
	Approach	4645	15.49	1.07	0.51	0.05	5.53	4.98
	Intermediate	10408	32.72	1.07	0.32	0.04	2.31	2.08
	Takeoff	13905 **(S)**	35.04 **(S)**	1.07	0.32 **(S)**	0.01 **(S)**	0.06 **(S)**	0.05 **(S)**
Notes: c(3) - F117-PW-100 is the military designation of the PW2040 engine, d(1) - HAPs at Takeoff setting only, d(16) - All remaining pollutants at Takeoff setting, h								
F118-GE-100	Idle (Taxi)	1097	4.30	1.07	20.98	0.29	1.25	1.12
	Approach	3773	11.09	1.07	2.02	0.05	4.70	4.23
	Intermediate	6350	18.01	1.07	0.85	0.03	3.05	2.75
	Military	10887	33.12	1.07	0.65	0.03	1.64	1.48
Notes: c(3), h, k(5)								
F119-PW-100	Idle (Taxi)	1377	3.01	1.07	48.15	1.67	2.42	1.76
	Approach	2740	6.59	1.07	7.92	0.05	1.96	1.73
	Intermediate	10110	12.40	1.07	2.14	0.03	1.40	1.09
	Military	18612	19.81	1.07	0.75	0.01	1.12	0.97
	Afterburner	50170	7.37	1.07	16.10	1.8E-03 **(C)**	0.85 **(C)**	0.75 **(C)**
Notes: c(4), d(1) - VOC, HAP, PM_{10}, and $PM_{2.5}$ pollutants at Afterburner setting only, k(5)								
F135-PW-100	Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors							
F402-RR-406A	Idle (Taxi)	1251	1.80	1.07	106.08	18.75	0.49	0.44
	Approach	3735	4.99	1.07	21.46	1.05	0.30	0.27
	Intermediate	7125	9.48	1.07	8.35	0.43	0.30	0.27
	Military	8094	10.78	1.07	6.93	0.43	0.32	0.29
Notes: c(13), j, k(8)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
F402-RR-408	Idle (Taxi)	1449	2.20	1.07	39.72	2.41	0.16	0.14
	Approach	3974	5.02	1.07	16.57	0.46	0.19	0.17
	Intermediate	7290	7.55	1.07	9.79	0.20	0.02	0.02
	Military	8494	8.38	1.07	8.58	0.20	0.21	0.19
Notes: c(13), j, k(8)								
F404-GE-102	Proprietary Information. Contact Air Quality Subject Matter Expert for More Information regarding this engine's Emission Factors							
F404-GE-400	Idle (Taxi)	685	1.70	1.07	110.18	3.39	4.47	4.02
	Approach	3111	7.86	1.07	2.02	0.04	1.46	1.31
	Intermediate	6464	17.03	1.07	1.54	0.07	1.57	1.42
	Military	7739	25.83	1.07	1.48	0.02	1.61	1.45
	Afterburner-3	15851	5.43	1.07	50.31	1.85	3.57	3.21
Notes: c(3), h, k(5)								
F404-GE-402	Ground Idle	624	1.16	1.07	137.34	66.91	13.79	13.79
	Flight Idle	815	2.01	1.07	123.52	51.18	12.38	12.38
	Average Intermediate	10467	25.16	1.07	1.05	0.36	2.81	2.81
	Max Afterburner	31764	9.22	1.07	23.12	0.15	1.49 **(C)**	1.34 **(C)**
Notes: c(18), d(1), e, k(4)								
F404-GE-F1D2	Idle (Taxi)	685	1.70	1.07	110.18	3.39	4.47	4.02
	Approach	3111	7.86	1.07	2.02	0.04	1.46	1.31
	Intermediate	6464	17.03	1.07	1.54	0.07	1.57	1.42
	Military	7739	25.83	1.07	1.48	0.02	1.61	1.45
Notes: c(3), h, k(5)								
F405-RR-401	Idle (Taxi)	498	0.27	1.07	151.21	39.12	8.94	8.94
	Approach	1495	2.68	1.07	19.54	1.71	8.11	8.11
	Climb out	3826	8.33	1.07	3.72	0.23	4.92	4.92
	Takeoff	4559	10.10	1.07	3.27	0.17	3.65	3.65
Notes: c(20), e, k(4)								
F414-GE-400	Ground Idle	695	3.18	1.07	98.18	75.13	12.64	12.64
	Flight Idle	821	3.47	1.07	77.90	48.65	12.37	12.37
	Intermediate	11768	38.17	1.07	0.70	0.14	2.78	2.78
	Max Afterburner	35763	9.67	1.07	275.00	5.60	1.52 **(C)**	1.37 **(C)**
Notes: c(19), d(1), e, g, k(4)								
GE90-76B	Idle (Taxi)	2048	5.10	1.07	34.12	3.69	0.07	0.06
	Approach	5857	13.76	1.07	2.77	0.08	0.05	0.04
	Climb out	18103	32.43	1.07	0.32	0.03	0.04	0.04
	Takeoff	22191	40.25	1.07	0.31	0.03	0.04	0.04
Notes: c(2), e, f, h, k(1)								

2098 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
GE90-77B	Idle (Taxi)	2064	5.12	1.07	33.81	3.63	0.07	0.06
	Approach	5913	13.87	1.07	2.71	0.08	0.05	0.04
	Climb out	18326	32.78	1.07	0.32	0.03	0.04	0.04
	Takeoff	22460	40.83	1.07	0.31	0.03	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GE90-85B	Idle (Taxi)	2151	5.33	1.07	31.34	3.22	0.06	0.06
	Approach	6381	14.77	1.07	2.16	0.07	0.05	0.04
	Climb out	20262	36.35	1.07	0.31	0.03	0.04	0.04
	Takeoff	24849	45.54	1.07	0.30	0.05	0.05	0.04
Notes: c(2), e, f, h, k(1)								
GE90-90B	Idle (Taxi)	2310	6.00	1.07	13.21	0.49	0.06	0.05
	Approach	6968	16.94	1.07	1.16	0.06	0.06	0.05
	Climb out	21691	39.50	1.07	0.13	0.05	0.05	0.05
	Takeoff	26572	52.48	1.07	0.12	0.05	0.06	0.05
Notes: c(2), e, f, h, k(1)								
GE90-94B	Idle (Taxi)	2349	6.09	1.07	12.69	0.47	0.06	0.05
	Approach	7206	17.38	1.07	1.07	0.06	0.06	0.05
	Climb out	22603	41.74	1.07	0.12	0.05	0.05	0.05
	Takeoff	27889	56.41	1.07	0.12	0.05	0.06	0.05
Notes: c(2), e, f, h, k(1)								
GE90-110B1	Idle (Taxi)	2937	5.11	1.07	40.59	5.23	0.07	0.07
	Approach	8571	15.78	1.07	2.29	0.07	0.05	0.04
	Climb out	27540	33.85	1.07	0.07	0.03	0.05	0.04
	Takeoff	34286	44.44	1.07	0.07	0.03	0.05	0.05
Notes: c(2), e, f, h, k(1)								
GE90-115B	Idle (Taxi)	3016	5.19	1.07	39.11	4.88	0.07	0.06
	Approach	8968	16.50	1.07	1.98	0.07	0.05	0.04
	Climb out	29127	35.98	1.07	0.07	0.03	0.05	0.04
	Takeoff	37222	50.34	1.07	0.08	0.05	0.06	0.05
Notes: c(2), e, f, h, k(1)								
GEnx-1B64	Idle (Taxi)	1579	4.24	1.07	21.62	0.93	0.04	0.04
	Approach	4794	9.03	1.07	2.99	0.07	0.08	0.07
	Climb out	14770	14.61	1.07	0.38	0.02	0.04	0.04
	Takeoff	17976	24.82	1.07	0.18	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GEnx-1B64/P1	Idle (Taxi)	1667	4.37	1.07	19.73	0.74	0.04	0.04
	Approach	4905	9.11	1.07	2.91	0.07	0.07	0.06
	Climb out	14889	15.36	1.07	0.36	0.02	0.04	0.04
	Takeoff	18079	25.74	1.07	0.18	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								

2099
2100

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
GEnx-1B67	Idle (Taxi)	1611	4.30	1.07	20.70	0.83	0.04	0.04
	Approach	4960	9.29	1.07	2.76	0.07	0.08	0.07
	Climb out	15397	16.26	1.07	0.30	0.02	0.04	0.04
	Takeoff	18794	28.56	1.07	0.17	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GEnx-1B67/P1	Idle (Taxi)	1698	4.43	1.07	18.94	0.67	0.04	0.04
	Approach	5071	9.39	1.07	2.68	0.07	0.08	0.07
	Climb out	15508	17.04	1.07	0.29	0.02	0.04	0.04
	Takeoff	18889	29.34	1.07	0.18	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GEnx-1B70, -1B70/P1, -1B70/75/P1	Idle (Taxi)	1738	4.50	1.07	18.05	0.60	0.04	0.04
	Approach	5270	9.73	1.07	2.42	0.06	0.08	0.07
	Climb out	16278	19.30	1.07	0.24	0.02	0.04	0.04
	Takeoff	19881	34.61	1.07	0.17	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GEnx-2B67	Idle (Taxi)	1714	4.43	1.07	18.95	0.66	0.04	0.04
	Approach	5564	9.58	1.07	2.53	0.07	0.08	0.07
	Climb out	15968	17.94	1.07	0.28	0.02	0.04	0.04
	Takeoff	19453	31.20	1.07	0.17	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GEnx-2B67B	Idle (Taxi)	1611	4.66	1.07	16.39	0.67	0.04	0.04
	Approach	4183	9.27	1.07	2.81	0.07	0.04	0.04
	Climb out	12333	11.54	1.07	1.73	0.02	0.04	0.04
	Takeoff	14921	17.22	1.07	0.32	0.02	0.04	0.04
Notes: c(2), e, f, h, k(1)								
GP7270	Idle (Taxi)	1857	5.24	1.07	33.58	4.65	0.09	0.08
	Approach	5643	12.90	1.07	1.27	0.08	0.05	0.05
	Climb out	17214	31.37	1.07	0.09	0.03	0.06	0.05
	Takeoff	20929	41.73	1.07	0.11	0.03	0.06	0.05
Notes: c(2), e, f, h, k(1)								
GTSIO-520-F	Idle (Taxi)	25	0.04	1.07	1293.70	78.29	0.50	0.45
	Approach	99	1.39	1.07	1261.60	15.39	0.40	0.36
	Climb out	205	0.24	1.07	1470.90	19.12	0.70	0.63
	Takeoff	260	0.36	1.07	1442.10	14.21	0.10	0.09
Notes: c(16), e, g, h, k(8)								
GTSIO-520-H	Idle (Taxi)	22	0.88	1.07	720.50	47.31	0.50 **(S)**	0.45 **(S)**
	Pattern	102	7.70	1.07	697.40	7.52	0.40 **(S)**	0.36 **(S)**
	Climb out	145	9.76	1.07	728.75	7.04	0.70 **(S)**	0.63 **(S)**
	Takeoff	256	1.03	1.07	1045.66	11.66	0.10 **(S)**	0.09 **(S)**
Notes: c(8), d(13) - PM_{10} and $PM_{2.5}$ at all power settings, e, i, k(8)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
GTSIO-520-K, -520-M	Idle (Taxi)	25	0.04	1.07	1293.70	78.29	0.50	0.45
	Approach	99	1.39	1.07	1261.60	15.39	0.40	0.36
	Climb out	205	0.24	1.07	1470.90	19.12	0.70	0.63
	Takeoff	260	0.36	1.07	1442.10	14.21	0.10	0.09
Notes: c(16), e, g, h, k(8)								
IO-360-A	Idle (Taxi)	11	0.40	1.07	956.24	278.09	0.76	0.68
	Approach	22	10.62	1.07	727.75	85.31	0.12	0.11
	Climb out	85	17.65	1.07	840.53	55.11	0.30	0.27
	Takeoff	85	18.08	1.07	842.50	52.09	0.31	0.28
Notes: c(16), e, g, h, k(7)								
IO-360-B	Idle (Taxi)	8	1.16	1.07	897.40	56.58	0.76 **(S)**	0.68 **(S)**
	Approach	37	10.16	1.07	691.26	11.15	0.12 **(S)**	0.11 **(S)**
	Climb out	72	4.59	1.07	983.26	9.38	0.30 **(S)**	0.27 **(S)**
	Takeoff	103	1.99	1.07	1199.03	11.50	0.31 **(S)**	0.28 **(S)**
Notes: c(1), d(5) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
IO-360-B1E, -360-C, -360-C1C	Idle (Taxi)	11	0.40	1.07	956.24	278.09	0.76	0.68
	Approach	22	10.62	1.07	727.75	85.31	0.12	0.11
	Climb out	85	17.65	1.07	840.53	55.11	0.30	0.27
	Takeoff	85	18.08	1.07	842.50	52.09	0.31	0.28
Notes: c(16), e, g, h, k(7)								
IO-360-C1C6	Idle (Taxi)	12	0.28	1.07	882.98	263.40	0.30	0.27
	Approach	26	3.36	1.07	938.16	123.88	0.06	0.06
	Climb out	81	6.63	1.07	753.23	53.27	0.09	0.08
	Takeoff	81	7.48	1.07	757.17	47.22	0.10	0.09
Notes: c(16), e, g, h, k(7)								
IO-360-CB	Idle (Taxi)	11	0.40	1.07	956.24	278.09	0.76	0.68
	Approach	22	10.62	1.07	727.75	85.31	0.12	0.11
	Climb out	85	17.65	1.07	840.53	55.11	0.30	0.27
	Takeoff	85	18.08	1.07	842.50	52.09	0.31	0.28
Notes: c(16), e, g, h, k(7)								
IO-360-D	Idle (Taxi)	30	1.10	1.07	848.00	166.75	60.00	54.00
	Approach	50	4.00	1.07	912.45	54.17	47.95	43.16
	Intermediate	70	6.60	1.07	972.00	20.01	40.00	36.00
	Military	90	5.80	1.07	1030.00	25.88	20.00	18.00
Notes: c(7), e, h, k(8)								
IO-360-D34, -360-DB, -360-G, -360-GB	Idle (Taxi)	11	0.40	1.07	956.24	278.09	0.76	0.68
	Approach	22	10.62	1.07	727.75	85.31	0.12	0.11
	Climb out	85	17.65	1.07	840.53	55.11	0.30	0.27
	Takeoff	85	18.08	1.07	842.50	52.09	0.31	0.28
Notes: c(16), e, g, h, k(7)								

2107 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
J33-A-35	Idle (Taxi)	1190	1.50	1.07	127.00	22.43	0.73	0.66
	Approach	1984	1.90	1.07	84.60	7.48	0.57	0.51
	Intermediate	4762	2.70	1.07	49.10	1.50	0.02	0.02
	Military	5556	3.60	1.07	31.30	0.58	0.02	0.02
Notes: c(7), e, g, h, k(8)								
J52-P-6B	Idle (Taxi)	714	2.07	1.07	86.37	27.46	19.94	17.95
	3000lb Thrust	2301	3.91	1.07	16.57	0.94	0.18 **(S)**	0.16 **(S)**
	75% Thrust	3977	5.84	1.07	6.00	0.75	0.18 **(S)**	0.16 **(S)**
	Military	6328	9.00	1.07	3.01	0.38	7.75	6.98
Notes: c(9), d(6) - PM_{10} and $PM_{2.5}$ at 3000lb and 75% thrust power settings only, e, g, h, j - Percent thrust for 3000lb setting assumes maximum thrust of 8500lb for								
J52-P-8B	Idle (Taxi)	680	1.79	1.07	63.78	48.53	0.18 **(S)**	0.16 **(S)**
	3000lb Thrust	2300	6.34	1.07	10.54	1.98	0.18 **(S)**	0.16 **(S)**
	75% Thrust	4320	10.10	1.07	3.00	0.67	0.13 **(S)**	0.12 **(S)**
	Military	7370	13.05	1.07	0.71	1.07	0.13 **(S)**	0.12 **(S)**
Notes: c(9), d(6) - PM_{10} and $PM_{2.5}$ at all power settings, e, j - Percent thrust for 3000lb setting assumes maximum thrust of 9300lb for this engine, k(8)								
J52-P-408	Idle (Taxi)	1466	2.79	1.07	50.10	3.62	0.18	0.16
	Approach	3325	7.25	1.07	16.07	0.29	0.18	0.16
	Intermediate	6502	7.53	1.07	7.70	0.03	0.13	0.12
	Military	6483	7.53	1.07	7.70	0.03	0.13	0.12
Notes: c(13), e, j, k(8)								
J57-P-10	Idle (Taxi)	1100	1.87	1.07	80.52	111.09	0.16 **(S)**	0.14 **(S)**
	75% Thrust	5670	7.40	1.07	3.21	0.87	0.93 **(S)**	0.84 **(S)**
	Normal Rated	7250	9.00	1.07	1.79	1.15	1.92 **(S)**	1.73 **(S)**
	Military	8370	10.37	1.07	1.16	0.99	1.72 **(S)**	1.55 **(S)**
Notes: c(9), d(7) - PM_{10} and $PM_{2.5}$ at all power settings, e, j - Assumes 100% thrust at Military setting, k(8)								
J57-P-19W	Idle (Taxi)	952	2.20	1.07	79.00	88.55	0.16	0.14
	Approach	3333	5.80	1.07	7.90	1.61	0.93	0.84
	Intermediate	6508	9.50	1.07	2.40	0.23	1.92	1.73
	Military	7460	11.00	1.07	1.90	0.12	1.72	1.55
Notes: c(7), e, g, h, k(8)								
J57-P-22	Idle (Taxi)	1087	2.48	1.07	59.25	59.03	7.64	6.87
	Approach	1693	2.95	1.07	23.51	14.26	5.32 **(C)**	4.79 **(C)**
	Climb out	8358	11.16	1.07	1.78	0.74	1.44	1.29
	Takeoff	8358	11.16	1.07	1.78	0.74	1.44	1.29
Notes: c(1), d(1), e, g, h, k(8)								
J57-P-420	Idle (Taxi)	1322	1.53	1.07	80.74	87.93	0.16 **(S)**	0.14 **(S)**
	30% Thrust	3413	4.45	1.07	14.83	5.22	0.93 **(S)**	0.84 **(S)**
	75% Thrust	5767	6.99	1.07	4.32	1.25	1.92 **(S)**	1.73 **(S)**
	Intermediate	10570	12.97	1.07	0.34	0.56	1.72 **(S)**	1.55 **(S)**
	Afterburner	39721	5.16	1.07	14.20	2.92	3.10 **(C)**	2.80 **(C)**
Notes: c(9), d(1) - PM_{10} and $PM_{2.5}$ at Afterburner power setting only, d(7) - PM_{10} and $PM_{2.5}$ at all other power settings, e, j, k(8)								

2108
2109

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
J57-P/F-43WB	Idle (Taxi)	952	2.20	1.07	78.00	86.25	0.14	0.13
	Approach	1825	4.45	1.07	16.85	6.33	0.41	0.37
	Intermediate	6667	9.90	1.07	2.30	0.12	1.23	1.11
	Military	7778	11.00	1.07	1.50	0.12	1.74	1.57
Notes: c(7), e, g, h, k(8)								
J57-P/F-59W	Idle (Taxi)	1270	2.40	1.07	65.00	60.84	0.13	0.12
	Approach	1825	3.30	1.07	32.50	16.33	0.22	0.20
	Intermediate	3889	6.10	1.07	8.90	1.27	0.60	0.54
	Military	7937	11.30	1.07	2.40	0.23	0.84	0.76
Notes: c(7), e, g, h, k(8)								
J60-P-3A	Idle (Taxi)	556	1.50	1.07	70.00	10.58	0.02	0.02
	Approach	556	1.70	1.07	50.50	6.44	0.02	0.02
	Intermediate	1429	4.00	1.07	5.80	0.23	0.23	0.21
	Military	3413	4.60	1.07	4.00	0.12	0.17	0.15
Notes: c(7), e, g, h, k(8)								
J60-P-5A, -5B	Idle (Taxi)	476	1.50	1.07	70.00	10.58	0.02	0.02
	Approach	556	1.70	1.07	50.50	6.44	0.02	0.02
	Intermediate	1429	4.00	1.07	5.80	0.23	0.23	0.21
	Military	2460	4.60	1.07	4.00	0.12	0.17	0.15
Notes: c(7), e, g, h, k(8)								
J65-W-5F	Idle (Taxi)	1320	2.46	1.07	47.16	11.25	0.18 **(S)**	0.16 **(S)**
	7450 rpm	4370	7.30	1.07	12.61	1.09	0.18 **(S)**	0.16 **(S)**
	8000 rpm	5970	5.71	1.07	7.39	0.83	0.13 **(S)**	0.12 **(S)**
	8300 rpm	7040	5.15	1.07	4.57	0.38	0.13 **(S)**	0.12 **(S)**
	Military	6946	5.23	1.07	5.31	0.70	0.13 **(S)**	0.12 **(S)**
Notes: c(9), d(6) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
J65-W-20	Idle (Taxi)	1333	2.78	1.07	50.19	4.31	0.18 **(S)**	0.16 **(S)**
	75% rpm	2346	4.82	1.07	21.82	1.57	0.18 **(S)**	0.16 **(S)**
	85% rpm	3260	7.27	1.07	16.13	0.32	0.18 **(S)**	0.16 **(S)**
	90% rpm	3951	7.97	1.07	14.30	0.15	0.18 **(S)**	0.16 **(S)**
	Intermediate (Mil)	6421	7.55	1.07	7.72	0.04	0.13 **(S)**	0.12 **(S)**
Notes: c(1), d(6) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
J69-T-25	Idle (Taxi)	167	0.80	1.07	160.08	2.33	3.15	2.83
	Approach	568 **(C)**	1.71 **(C)**	1.07	56.03 **(C)**	0.14 **(C)**	1.52 **(C)**	1.37 **(C)**
	Intermediate	872	2.92	1.07	38.27	0.06	0.94	0.84
	Military	1085	4.53	1.07	32.86	0.03	0.67	0.61
Notes: c(3), d(1) - All pollutants at Approach power setting only, g, h, k(5)								
J75-P-17	Idle (Taxi)	1700	1.29	1.07	76.18	65.41	0.47	0.42
	Approach	11300	11.90	1.07	1.40	0.11	0.10	0.09
	Intermediate	12386 **(C)**	9.79 **(C)**	1.07	0.94 **(C)**	0.20 **(C)**	0.64 **(C)**	0.58 **(C)**
	Military	13200	8.20	1.07	0.60	0.26	1.05	0.95
	Afterburner	53700	4.10	1.07	12.00	0.14	1.73 **(C)**	1.57 **(C)**
Notes: c(1), d(1) - PM_{10} and $PM_{2.5}$ at Afterburner power setting only, e, g, h, j - Assumes military setting has maximum percent thrust of 100%, k(8)								

2113 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
J79-GE-8D	Idle (Taxi)	1325	2.36	1.07	55.59	16.14	0.44	0.40
	75% rpm	1550	2.97	1.07	30.55	4.20	0.90	0.81
	87% rpm	8310	8.44	1.07	2.56	0.12	0.15	0.14
	Military	9544	10.42	1.07	2.56	0.12	0.18	0.16
	Afterburner	34647	4.71	1.07	8.14	0.19	0.56	0.50
Notes: c(13), e, j, k(8)								
J79-GE-10D	Idle (Taxi)	1375	1.33	1.07	111.18	37.37	0.88	0.79
	Approach	3490	4.22	1.07	20.00	2.80	0.63	0.57
	Intermediate	7674	8.24	1.07	4.69	1.34	0.72	0.65
	Military	10097	10.24	1.07	2.83	1.34	0.72	0.65
	Afterburner	35339	4.50	1.07	8.63	1.01	0.37	0.33
Notes: c(13), e, j, k(8)								
J79-GE-15	Idle (Taxi)	1111	2.50	1.07	57.00	13.80	0.50	0.45
	Approach	3492	4.80	1.07	9.40	1.27	1.80	1.62
	Intermediate	5397	5.60	1.07	4.60	0.35	2.80	2.52
	Military	8889	8.90	1.07	2.20	0.23	2.20	1.98
	Afterburner	32223	9.10	1.07	4.00	0.01	0.15	0.14
Notes: c(7), e, g, h, k(8)								
J79-GE-17	Idle (Taxi)	1032	2.70	1.07	66.00	26.57	0.18	0.16
	Approach	3492	4.50	1.07	15.40	0.58	0.51	0.46
	Intermediate	6984	5.80	1.07	7.80	0.12	0.72	0.65
	Military	9841	10.60	1.07	5.20	0.12	0.92	0.83
	Afterburner	34921	8.10	1.07	4.00	0.01	0.15	0.14
Notes: c(7), e, g, h, k(8)								
J85-GE-5A	Idle (Taxi)	434	1.34	1.07	250.22	2.00	4.70	4.23
	Approach	875 **(C)**	1.45 **(C)**	1.07	115.08 **(C)**	1.31 **(C)**	2.42 **(C)**	2.17 **(C)**
	Intermediate	950	1.47	1.07	104.02	0.92	1.79	1.61
	Military	2740	2.64	1.07	32.91	0.12	1.13	1.01
	Afterburner-1	8138	1.98	1.07	13.46	0.05	0.25	0.23
Notes: c(3), d(1) - All pollutants at Approach power setting only, h, k(5)								
J85-GE-5F	Idle (Taxi)	524	1.34	1.07	178.05	34.46	4.70 **(S)**	4.02 **(S)**
	75% rpm	798	2.13	1.07	78.20	2.59	3.01 **(C)**	1.84 **(C)**
	85% rpm	1098	2.73	1.07	58.01	1.36	2.15 **(C)**	1.20 **(C)**
	Intermediate	1297	2.31	1.07	43.02	3.99	1.79 **(S)**	0.69 **(S)**
	Afterburner	8470	2.60	1.07	29.00	0.92	0.25 **(S)**	0.09 **(S)**
Notes: c(1), d(1) - PM_{10} and $PM_{2.5}$ at 75% rpm and 85% rpm power settings, d(10) - PM_{10} and $PM_{2.5}$ for remaining power settings, e, k(8)								
J85-GE-5H	Idle (Taxi)	434	1.14	1.07	211.97	39.12	4.70	4.02
	Approach	875 **(C)**	1.64 **(C)**	1.07	148.04 **(C)**	6.56 **(C)**	2.42 **(C)**	2.17 **(C)**
	Intermediate	950	1.74	1.07	123.43	6.51	1.79	0.69
	Military	2740	2.92	1.07	36.40	0.67	1.13	0.04
	Afterburner	8138	2.09	1.07	14.19	2.63	0.25	0.09
Notes: c(10), d(1) - All pollutants at Approach setting, g, h, k(8)								
J85-GE-5M	Idle (Taxi)	525	0.79	1.07	191.41	4.01	7.02	6.32
	Approach	703 **(C)**	1.09 **(C)**	1.07	110.79 **(C)**	1.50 **(C)**	8.83 **(C)**	7.94 **(C)**
	Intermediate	1045	1.81	1.07	48.90	0.54	12.30	11.07
	Military	2550	1.65	1.07	25.35	0.04	4.25	3.83
	Afterburner	7695	1.21	1.07	10.19	0.05 **(S)**	0.25 **(S)**	0.09 **(S)**
Notes: c(10), d(1) - All pollutants at Approach setting, d(10) - VOC, HAPs, PM_{10} and $PM_{2.5}$ at Afterburner power setting only, h, k(6)								

2114
2115

2116 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
J85-GE-5R	Idle (Taxi)	520	1.08	1.07	177.45	16.80	4.70 **(S)**	4.23 **(S)**
	Approach	689 **(C)**	0.91 **(C)**	1.07	119.23 **(C)**	7.96 **(C)**	2.42 **(S)**	2.17 **(S)**
	Intermediate	1030	0.70	1.07	65.07	2.78	1.79 **(S)**	1.61 **(S)**
	Military	2220	1.92	1.07	30.99	0.75	1.13 **(S)**	1.01 **(S)**
	Afterburner	7695	6.23	1.07	53.43	6.97	0.25 **(S)**	0.23 **(S)**
Notes: c(10), d(1) - Fuel flow, NO_X, CO, and VOC at Approach setting, d(10) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(6)								
J85-GE-13	Idle (Taxi)	556	1.30	1.07	178.00	34.50	3.0E-03	2.7E-03
	Approach	1230	2.05	1.07	58.30	5.69	0.01	0.01
	Intermediate	2222	2.30	1.07	43.00	4.03	0.01	0.01
	Military	2778	2.60	1.07	29.00	0.92	0.02	0.02
	Afterburner	8968	2.00	1.07	26.00	0.08	0.01	0.01
Notes: c(7), e, g, h, i, k(8)								
J85-GE-17A	Idle (Taxi)	556	1.30	1.07	178.00	34.50	3.0E-03 **(S)**	2.7E-03 **(S)**
	Approach	1230	2.05	1.07	58.30	5.69	0.01 **(S)**	0.01 **(S)**
	Intermediate	2222	2.30	1.07	43.00	4.03	0.01 **(S)**	0.01 **(S)**
	Military	3810	2.60	1.07	29.00	0.92	0.02 **(S)**	0.02 **(S)**
Notes: c(7), d(8) - PM_{10} and $PM_{2.5}$ for all power settings, e, g, h, k(8)								
J85-GE-21	Idle (Taxi)	400	1.25	1.07	159.00	27.89	3.0E-03 **(S)**	2.7E-03 **(S)**
	75% rpm	700	2.00	1.07	92.14	14.29	0.01 **(S)**	0.01 **(S)**
	85% rpm	1200	2.92	1.07	46.17	2.97	0.01 **(S)**	0.01 **(S)**
	Intermediate (Military)	3200	5.00	1.07	21.56	0.29	0.02 **(S)**	0.02 **(S)**
	Afterburner	10650	5.60	1.07	36.40	0.12	0.01 **(S)**	0.01 **(S)**
Notes: c(1), d(8) - PM_{10} and $PM_{2.5}$ at all power settings, e, g, h, k(8)								
JT3D-3B	Idle (Taxi)	1071	2.50	1.07	98.00	128.80	0.91	0.82
	Approach	2746	4.80	1.07	24.50	4.60	0.41	0.37
	Climb out	7397	9.90	1.07	2.80	2.30	0.80	0.72
	Takeoff	9318	12.10	1.07	1.50	4.60	1.28	1.15
Notes: c(2), e, f, h, k(1)								
JT3D-7 Series	Idle (Taxi)	1016	2.20	1.07	138.99	141.45	0.97	0.87
	Approach	3087	5.30	1.07	19.50	2.42	0.29	0.26
	Climb out	8191	9.59	1.07	1.90	0.46	0.58	0.52
	Takeoff	9952	12.69	1.07	0.89	0.58	0.76	0.68
Notes: c(2), e, f, h, k(1)								
JT8D-7 Series	Idle (Taxi)	1025	2.70	1.07	35.50	12.19	0.23	0.20
	Approach	2271	5.50	1.07	10.50	1.84	0.22	0.20
	Climb out	6439	13.50	1.07	2.00	0.58	0.31	0.28
	Takeoff	7851	17.10	1.07	1.50	0.46	0.32	0.28
Notes: c(2), e, f, h, k(1)								
JT8D-9 Series	Idle (Taxi)	1048	2.90	1.07	34.50	11.50	0.23	0.20
	Approach	2365	5.64	1.07	9.43	1.99	0.24	0.21
	Climb out	6714	14.21	1.07	1.66	0.54	0.31	0.28
	Takeoff	8254	17.92	1.07	1.24	0.54	0.33	0.30
Notes: c(2), e, f, h, k(1)								

2117
2118

2119 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
JT8D-9A	Idle (Taxi)	1155	2.89	1.07	14.11	2.95	0.21	0.19
	Approach	2409	5.99	1.07	2.14	0.57	0.25	0.23
	Intermediate	6794	14.47	1.07	1.07	0.16	0.27	0.24
	Military	8334	19.26	1.07	1.07	0.16	0.27	0.24
Notes: c(13), j, k(8)								
JT8D-11	Idle (Taxi)	1155	2.75	1.07	35.00	11.50	0.23	0.20
	Approach	2650	5.80	1.07	9.40	1.61	0.22	0.19
	Climb out	7251	14.60	1.07	1.90	0.52	0.31	0.28
	Takeoff	8897	18.90	1.07	1.20	0.46	0.32	0.29
Notes: c(2), e, f, h, k(1)								
JT8D-15	Idle (Taxi)	1172	3.00	1.07	35.20	12.65	0.24	0.21
	Approach	2701	5.90	1.07	9.60	1.90	0.24	0.21
	Climb out	7500	15.00	1.07	1.00	0.29	0.31	0.28
	Takeoff	9349	19.10	1.07	0.70	0.29	0.32	0.29
Notes: c(2), e, f, h, k(1)								
JT8D-15A	Idle (Taxi)	1089	3.10	1.07	12.93	2.14	0.13	0.12
	Approach	2476	6.60	1.07	2.90	0.75	0.14	0.12
	Climb out	7107	13.90	1.07	1.20	0.38	0.22	0.19
	Takeoff	8849	18.10	1.07	1.08	0.29	0.22	0.20
Notes: c(2), e, f, h, k(1)								
JT8D-17	Idle (Taxi)	1170	3.20	1.07	10.46	1.44	0.13	0.12
	Approach	2810	8.00	1.07	2.67	0.60	0.14	0.12
	Climb out	7913	15.70	1.07	1.10	0.31	0.22	0.20
	Takeoff	9881	20.60	1.07	0.95	0.25	0.23	0.20
Notes: c(2), e, f, h, k(1)								
JT8D-17A	Idle (Taxi)	1112	3.20	1.07	12.46	7.59	0.17	0.15
	Approach	2622	6.70	1.07	2.88	0.74	0.14	0.13
	Climb out	7416	14.30	1.07	1.16	0.35	0.22	0.20
	Takeoff	9310	19.10	1.07	1.07	0.29	0.23	0.21
Notes: c(2), e, f, h, k(1)								
JT8D-17AR	Idle (Taxi)	1172	3.20	1.07	10.70	1.53	0.15	0.13
	Approach	2837	8.00	1.07	2.68	0.63	0.15	0.13
	Climb out	8310	16.00	1.07	1.08	0.31	0.25	0.22
	Takeoff	10833	24.50	1.07	0.93	0.24	0.25	0.23
Notes: c(2), e, f, h, k(1)								
JT8D-17R	Idle (Taxi)	1230	3.30	1.07	9.43	1.09	0.15	0.13
	Approach	2980	8.40	1.07	2.54	0.61	0.15	0.13
	Climb out	8754	17.60	1.07	1.03	0.31	0.25	0.22
	Takeoff	11246	25.30	1.07	0.95	0.24	0.25	0.23
Notes: c(2), e, f, h, k(1)								

2120
2121

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
JT8D-209	Idle (Taxi)	1034	3.50	1.07	14.10	4.63	0.13	0.12
	Approach	2851	8.80	1.07	4.37	1.94	0.19	0.17
	Climb out	7800	19.00	1.07	1.40	0.58	0.21	0.19
	Takeoff	9452	22.80	1.07	1.03	0.40	0.21	0.19
Notes: c(2), e, f, h, k(1)								
JT8D-217, -217A	Idle (Taxi)	1089	4.57	1.07	15.31	0.00	0.07	0.06
	Approach	3042	7.66	1.07	3.54	0.00	0.06	0.06
	Climb out	8556	13.54	1.07	0.47	0.00	0.10	0.09
	Takeoff	10476	17.54	1.07	0.42	0.00	0.10	0.09
Notes: c(2), e, f, h, k(1)								
JT8D-217C	Idle (Taxi)	1087	4.05	1.07	17.89	0.00	0.04	0.03
	Approach	2881	7.65	1.07	3.79	0.00	0.06	0.05
	Climb out	8294	13.02	1.07	0.49	0.00	0.08	0.07
	Takeoff	10175	16.49	1.07	0.42	0.00	0.10	0.09
Notes: c(2), e, f, h, k(1)								
JT8D-219	Idle (Taxi)	1067	3.60	1.07	12.63	4.00	0.16	0.14
	Approach	3029	9.13	1.07	4.07	1.83	0.20	0.18
	Climb out	8611	20.80	1.07	1.20	0.48	0.25	0.22
	Takeoff	10746	27.00	1.07	0.73	0.31	0.25	0.22
Notes: c(2), e, f, h, k(1)								
JT9D-7	Idle (Taxi)	1667	3.10	1.07	84.10	41.98	0.27	0.24
	Approach	4833	7.60	1.07	7.80	1.50	0.13	0.11
	Climb out	14000	27.70	1.07	0.00	0.12	0.09	0.08
	Takeoff	16532	37.90	1.07	0.00	0.12	0.10	0.09
Notes: c(2), e, f, h, k(1)								
JT9D-7A	Idle (Taxi)	1675	3.10	1.07	83.60	41.52	0.27	0.24
	Approach	4913	7.60	1.07	7.60	1.50	0.13	0.11
	Climb out	14199	28.50	1.07	0.00	0.12	0.09	0.08
	Takeoff	16659	38.70	1.07	0.00	0.12	0.11	0.09
Notes: c(2), e, f, h, k(1)								
JT9D-7F	Idle (Taxi)	1841	3.20	1.07	68.60	29.79	0.24	0.21
	Approach	4952	9.10	1.07	5.80	0.69	0.10	0.09
	Climb out	14119	31.50	1.07	0.90	0.00	0.11	0.10
	Takeoff	17151	41.70	1.07	0.90	0.00	0.11	0.10
Notes: c(2), e, f, h, k(1)								
JT9D-7J	Idle (Taxi)	1889	3.30	1.07	66.70	28.18	0.23	0.21
	Approach	5389	9.40	1.07	5.50	0.58	0.10	0.09
	Climb out	15095	34.90	1.07	0.90	0.00	0.11	0.10
	Takeoff	18373	44.90	1.07	0.90	0.00	0.11	0.10
Notes: c(2), e, f, h, k(1)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
JT9D-7Q	Idle (Taxi)	1881	3.00	1.07	53.00	13.80	0.13	0.12
	Approach	5400	7.80	1.07	1.70	0.35	0.07	0.06
	Climb out	15870	25.60	1.07	0.20	0.23	0.09	0.08
	Takeoff	19380	31.60	1.07	0.20	0.23	0.09	0.08
Notes: c(2), e, f, h, k(1)								
JT9D-7R4D, -7R4D1	Idle (Taxi)	1630	4.10	1.07	8.84	1.44	0.06	0.05
	Approach	5233	9.80	1.07	1.36	0.15	0.05	0.05
	Climb out	13318	30.00	1.07	0.48	0.14	0.06	0.06
	Takeoff	16310	38.50	1.07	0.51	0.17	0.07	0.07
Notes: c(2), e, f, h, k(1)								
JT9D-7R4E, -7R4E1	Idle (Taxi)	1754	4.10	1.07	8.27	1.28	0.06	0.05
	Approach	5182	10.40	1.07	1.23	0.15	0.05	0.05
	Climb out	13683	34.20	1.07	0.53	0.15	0.07	0.06
	Takeoff	16810	41.60	1.07	0.57	0.18	0.08	0.07
Notes: c(2), e, f, h, k(1)								
JT9D-7R4E4	Idle (Taxi)	1750	3.50	1.07	16.00	3.85	0.07	0.06
	Approach	5079	8.50	1.07	1.46	0.25	0.06	0.05
	Climb out	14516	29.70	1.07	0.67	0.15	0.06	0.06
	Takeoff	17603	36.90	1.07	0.67	0.17	0.07	0.06
Notes: c(2), e, f, h, k(1)								
JT9D-7R4G2	Idle (Taxi)	1777	3.80	1.07	11.82	1.78	0.06	0.06
	Approach	5230	8.80	1.07	1.40	0.21	0.06	0.05
	Climb out	14921	29.50	1.07	0.63	0.16	0.08	0.07
	Takeoff	19278	41.30	1.07	0.74	0.17	0.08	0.07
Notes: c(2), e, f, h, k(1)								
JT9D-7R4H1	Idle (Taxi)	1948	3.80	1.07	11.63	1.70	0.06	0.06
	Approach	5736	8.90	1.07	1.39	0.21	0.06	0.06
	Climb out	15865	30.00	1.07	0.63	0.16	0.08	0.07
	Takeoff	19937	45.20	1.07	0.74	0.17	0.09	0.08
Notes: c(2), e, f, h, k(1)								
JT9D-20	Idle (Taxi)	1675	3.10	1.07	83.60	41.52	0.27	0.24
	Approach	4913	7.60	1.07	7.60	1.50	0.13	0.11
	Climb out	14199	28.50	1.07	0.00	0.12	0.09	0.08
	Takeoff	16659	38.70	1.07	0.00	0.12	0.11	0.09
Notes: c(2), e, f, h, k(2)								
JT9D-20J	Idle (Taxi)	1889	3.30	1.07	66.70	28.18	0.23	0.21
	Approach	5389	9.40	1.07	5.50	0.58	0.10	0.09
	Climb out	15095	34.90	1.07	0.90	0.00	0.11	0.10
	Takeoff	18373	44.90	1.07	0.90	0.00	0.11	0.10
Notes: c(2), e, f, h, k(1)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
JT9D-59A, -70A	Idle (Taxi)	1881	3.00	1.07	53.00	13.80	0.13	0.12
	Approach	5400	7.80	1.07	1.70	0.35	0.07	0.06
	Climb out	15870	25.60	1.07	0.20	0.23	0.09	0.08
	Takeoff	19380	31.60	1.07	0.20	0.23	0.09	0.08
Notes: c(2), e, f, h, k(1)								
JT15D-1 Series	Idle (Taxi)	183	1.75	1.07	132.00	58.08	0.39	0.35
	Approach	405	3.44	1.07	40.50	5.09	0.32	0.29
	Climb out	984	6.77	1.07	3.50	0.01	0.11	0.10
	Takeoff	1175	7.60	1.07	2.65	0.01	0.11	0.10
Notes: c(2), e, f, h, k(2)								
JT15D-4 Series	Idle (Taxi)	207	2.63	1.07	97.00	46.00	0.32	0.29
	Approach	468	5.29	1.07	32.00	5.92	0.36	0.32
	Climb out	1135	8.56	1.07	3.18	0.22	0.12	0.11
	Takeoff	1347	9.23	1.07	2.10	0.10	0.11	0.10
Notes: c(2), e, f, h, k(2)								
JT15D-5, -5A, -5B	Idle (Taxi)	235	1.66	1.07	119.20	136.97	0.82	0.74
	Approach	524	4.93	1.07	38.60	13.46	0.73	0.66
	Climb out	1371	10.08	1.07	1.15	1.50	0.23	0.21
	Takeoff	1630	11.13	1.07	0.00	0.00	0.13	0.12
Notes: c(2), e, f, h, k(2)								
LF507-1F	Idle (Taxi)	360	3.28	1.07	37.83	5.43	0.13	0.12
	Approach	860	6.39	1.07	4.43	0.14	0.09	0.09
	Climb out	2350	12.02	1.07	0.30	0.01	0.09	0.08
	Takeoff	2840	14.52	1.07	0.20	0.01	0.08	0.08
Notes: c(2), e, f, h, k(8)								
NK-8-2U	Idle (Taxi)	1905	2.70	1.07	116.00	119.37	0.82	0.74
	Approach	4603	5.40	1.07	21.00	5.75	0.43	0.39
	Climb out	9286	12.90	1.07	6.00	0.63	0.35	0.31
	Takeoff	13889	13.90	1.07	5.50	0.52	0.36	0.33
Notes: c(2), e, f, h, k(8)								
O-200	Idle (Taxi)	8	1.58	1.07	644.42	33.36	0.55 **(S)**	0.49 **(S)**
	Approach	26	1.14	1.07	1187.84	38.20	0.13 **(S)**	0.12 **(S)**
	Climb out	45	4.87	1.07	974.10	23.93	0.17 **(S)**	0.16 **(S)**
	Takeoff	45	4.87	1.07	974.10	23.93	0.21 **(S)**	0.19 **(S)**
Notes: c(1), d(25) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
O-200A	Idle (Taxi)	9	0.93	1.07	969.24	198.77	0.55	0.49
	Approach	26	3.81	1.07	926.54	55.21	0.13	0.12
	Climb out	49	4.70	1.07	1047.01	56.02	0.17	0.16
	Takeoff	53	3.90	1.07	1033.41	55.30	0.21	0.19
Notes: c(16), e, g, h, k(7)								

2131 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
O-320	Idle (Taxi)	9	0.52	1.07	1077.00	42.46	0.47 **(S)**	0.42 **(S)**
	Approach	47	0.95	1.07	1221.51	22.13	0.27 **(S)**	0.24 **(S)**
	Climb out	67	3.97	1.07	989.51	14.24	0.20 **(S)**	0.18 **(S)**
	Takeoff	89	2.19	1.07	1077.44	13.55	0.20 **(S)**	0.18 **(S)**
Notes: c(1), d(9) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
O-320-A2B, -320-B2B, -320-D2A	Idle (Taxi)	10	1.63	1.07	766.81	111.03	0.47	0.42
	Approach	34	7.25	1.07	769.65	45.56	0.27	0.24
	Climb out	81	7.96	1.07	904.75	40.87	0.20	0.18
	Takeoff	81	7.96	1.07	904.75	40.87	0.20	0.18
Notes: c(16), e, g, h, k(7)								
O-320-D2J	Idle (Taxi)	8	1.94	1.07	707.12	127.12	0.02	0.02
	Approach	34 **(S)**	7.25 **(S)**	1.07	769.65 **(S)**	45.56 **(S)**	0.27 **(S)**	0.24 **(S)**
	Climb out	81 **(S)**	7.96 **(S)**	1.07	904.75 **(S)**	40.87 **(S)**	0.20 **(S)**	0.18 **(S)**
	Takeoff	81 **(S)**	7.96 **(S)**	1.07	904.75 **(S)**	40.87 **(S)**	0.20 **(S)**	0.18 **(S)**
Notes: c(16), d(9) - All fuel flow rates and pollutants at Approach, Climb out, and Takeoff power settings, e, g, h, k(7)								
O-320-D3G	Idle (Taxi)	9	1.19	1.07	771.19	79.91	0.21	0.19
	Approach	27	14.03	1.07	599.45	49.43	0.09	0.08
	Climb out	82	19.46	1.07	649.65	51.31	0.12	0.11
	Takeoff	82	19.46	1.07	649.65	51.31	0.12	0.11
Notes: c(16), e, g, h, k(7)								
O-320-E2A	Idle (Taxi)	10	1.64	1.07	689.60	18.34	0.05	0.05
	Approach	38	19.44	1.07	695.60	15.74	0.04	0.04
	Climb out	63	6.92	1.07	836.60	17.32	0.07	0.06
	Takeoff	79	6.68	1.07	815.50	14.50	0.10	0.09
Notes: c(16), e, g, h, k(7)								
O-320-E2D	Idle (Taxi)	10	1.49	1.07	756.45	118.10	0.39	0.35
	Approach	33	4.62	1.07	836.50	45.72	0.42	0.38
	Climb out	83	4.43	1.07	1020.21	35.43	0.16	0.14
	Takeoff	83	4.43	1.07	1020.21	35.43	0.16	0.14
Notes: c(16), e, g, h, k(7)								
O-320-E3D	Idle (Taxi)	7	0.59	1.07	706.42	197.76	0.19	0.17
	Approach	29	2.55	1.07	762.97	50.07	0.20	0.18
	Climb out	82	5.60	1.07	941.15	46.63	0.29	0.26
	Takeoff	82	5.60	1.07	941.15	46.63	0.29	0.26
Notes: c(16), e, g, h, k(7)								
O-320-H2AD	Idle (Taxi)	10	3.45	1.07	713.64	103.42	0.18	0.16
	Approach	44	7.94	1.07	718.04	39.68	0.30	0.27
	Climb out	69	3.95	1.07	941.82	41.35	0.16	0.15
	Takeoff	69	3.95	1.07	941.82	41.35	0.16	0.15
Notes: c(16), e, g, h, k(7)								

2132
2133

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
O-470C	Idle (Taxi)	11	1.91	1.07	592.20	159.00	0.50	0.45
	Approach	61	3.77	1.07	995.10	13.01	0.40	0.36
	Climb out	99	4.32	1.07	960.80	10.98	0.07	0.06
	Takeoff	133	2.71	1.07	1082.00	10.55	0.10	0.09
Notes: c(16), e, g, h, k(8)								
PT6A-27	Idle (Taxi)	115	2.43	1.07	64.00	57.70	0.50 **(S)**	0.45 **(S)**
	Approach	215	8.37	1.07	23.26	2.51	0.10 **(S)**	0.09 **(S)**
	Climb out	400	7.00	1.07	1.20	0.00	0.25 **(S)**	0.23 **(S)**
	Takeoff	425	7.81	1.07	1.01	0.00	0.24 **(S)**	0.22 **(S)**
Notes: c(1), d(15) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
PT6A-38	Idle (Taxi)	103	2.09	1.07	82.44	2.09	0.50	0.45
	Approach	275	4.79	1.07	7.29	9.6E-05	0.10	0.09
	Climb out	450	6.69	1.07	2.17	9.6E-05	0.25	0.23
	Takeoff	489	7.08	1.07	2.05	9.6E-05	0.24	0.22
Notes: c(13), j, k(8)								
PT6A-41	Idle (Taxi)	147	1.97	1.07	115.31	116.88	0.50 **(S)**	0.45 **(S)**
	Approach	273	4.65	1.07	34.80	26.12	0.10 **(S)**	0.09 **(S)**
	Climb out	473	7.57	1.07	6.49	2.33	0.25 **(S)**	0.23 **(S)**
	Takeoff	510	7.98	1.07	5.10	2.01	0.24 **(S)**	0.22 **(S)**
Notes: c(1), d(15) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
PT6A-42	Idle (Taxi)	103	2.16	1.07	76.55	16.61	0.45	0.41
	Approach	275	4.89	1.07	6.89	9.6E-05	0.10	0.09
	Intermediate	466	6.88	1.07	1.95	9.6E-05	0.24	0.22
	Military	513	7.28	1.07	1.95	9.6E-05	0.23	0.21
Notes: c(13), j, k(8)								
PT6A-60A	Idle (Taxi)	480	2.98	1.07	42.18	166.43	0.09	0.08
	Approach	340 **(S)**	4.59 **(S)**	1.07	20.86 **(S)**	3.31 **(S)**	0.74 **(S)**	0.67 **(S)**
	Climb out	571 **(S)**	6.69 **(S)**	1.07	6.72 **(S)**	0.72 **(S)**	0.29 **(S)**	0.26 **(S)**
	Takeoff	633 **(S)**	7.08 **(S)**	1.07	5.36 **(S)**	0.53 **(S)**	0.26 **(S)**	0.23 **(S)**
Notes: c(16), d(11) - All fuel flow rates and pollutants at Approach, Climb out, and Takeoff power settings, e, g, h, k(1)								
PT6A-65	Idle (Taxi)	131	1.89	1.07	166.43	53.66	1.23	1.11
	Approach	340	4.59	1.07	20.86	3.31	0.74	0.67
	Intermediate	571	6.69	1.07	6.72	0.72	0.29	0.26
	Military	633	7.08	1.07	5.36	0.53	0.26	0.23
Notes: c(13), j, k(8)								
PT6A-67B	Idle (Taxi)	143	1.83	1.07	183.80	61.52	1.38	1.24
	Approach	364	4.59	1.07	20.96	3.24	0.72	0.65
	Intermediate	619	6.59	1.07	6.12	0.61	0.32	0.29
	Military	681	6.98	1.07	5.73	0.45	0.25	0.23
Notes: c(13), j, k(8)								

2137 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
PT6A-67D	Idle (Taxi)	149	1.83	1.07	177.91	57.94	1.31	1.18
	Approach	372	4.69	1.07	19.76	2.93	0.66	0.59
	Intermediate	643	6.69	1.07	5.35	0.50	0.28	0.25
	Military	713	7.18	1.07	5.09	0.35	0.24	0.22
Notes: c(13), j, k(8)								
PT6A-68	Ground Idle	156	1.77	1.07	117.85	7.89	3.95	3.56
	Flight Idle	180	1.95	1.07	94.99	1.33	4.18	3.76
	Descend	328	5.03	1.07	33.69	3.29	4.15	3.73
	Approach	449	4.73	1.07	10.91	0.71	3.34	3.01
	Max. Continuous	612	8.18	1.07	3.88	0.20	4.30	3.87
Notes: c(11), h, j - Percent hp calculated assuming maximum hp of 1250 per manufacturer's stated specifications, k(6)								
PW306A	Idle (Taxi)	335	4.26	1.07	36.35	5.01	0.07	0.06
	Approach	773	11.87	1.07	7.11	0.00	0.04	0.03
	Climb out	2096	19.26	1.07	2.51	0.00	0.05	0.05
	Takeoff	2517	20.08	1.07	2.27	0.00	0.08	0.07
Notes: c(2), e, f, h, k(2)								
PW308A	Idle (Taxi)	353	3.65	1.07	38.21	7.61	0.14	0.12
	Approach	980	8.03	1.07	4.08	0.02	0.11	0.10
	Climb out	2374	14.06	1.07	1.06	0.00	0.44	0.39
	Takeoff	2860	16.74	1.07	0.83	0.00	0.39	0.35
Notes: c(2), e, f, h, k(1)								
PW2037	Idle (Taxi)	1206	4.10	1.07	22.36	2.21	0.06	0.05
	Approach	3635	9.77	1.07	1.95	0.13	0.06	0.06
	Climb out	10373	23.96	1.07	0.34	0.02	0.09	0.08
	Takeoff	12468	29.41	1.07	0.33	0.02	0.06	0.06
Notes: c(2), e, f, h, k(1)								
PW2040	Idle (Taxi)	978	3.76	1.07	22.70	0.37	10.67	8.75
	Approach	4645	15.49	1.07	0.51	0.05	5.53	5.10
	Intermediate	10408	32.72	1.07	0.32	0.04	2.31	1.42
	Takeoff	13905	35.04	1.07	0.32	0.01	0.06	0.05
Notes: c(2) - Pollutants at Takeoff power setting, c(3) - PW2040 is the commercial designation of the F117-PW-100 engine, d(1) - HAPs at Takeoff power setting only								
PW2041	Idle (Taxi)	1388	4.49	1.07	23.05	2.13	0.15	0.14
	Approach	4184	10.98	1.07	2.49	0.15	0.13	0.12
	Climb out	12345	28.94	1.07	0.20	0.03	0.12	0.11
	Takeoff	15362	36.92	1.07	0.20	0.03	0.12	0.11
Notes: c(13), j, k(8)								
PW4056	Idle (Taxi)	1492	5.00	1.07	11.60	0.76	0.08	0.07
	Approach	5135	11.60	1.07	0.90	0.29	0.08	0.07
	Climb out	15722	24.60	1.07	0.14	0.20	0.12	0.11
	Takeoff	19437	32.50	1.07	0.08	0.13	0.12	0.11
Notes: c(2), e, f, h, k(1)								

2138
2139

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
PW4060	Idle (Taxi)	1635	3.72	1.07	44.46	13.37	0.11	0.10
	Approach	5524	11.91	1.07	2.04	0.12	0.05	0.04
	Climb out	16159	25.03	1.07	0.49	0.07	0.07	0.06
	Takeoff	20373	31.74	1.07	0.58	0.09	0.08	0.07
Notes: c(2), e, f, h, k(1)								
PW4062	Idle (Taxi)	1667	3.78	1.07	42.61	12.49	0.11	0.10
	Approach	5698	12.17	1.07	1.93	0.10	0.05	0.04
	Climb out	16865	25.98	1.07	0.50	0.08	0.07	0.06
	Takeoff	21627	34.36	1.07	0.61	0.09	0.08	0.07
Notes: c(2), e, f, h, k(1)								
PW4074	Idle (Taxi)	1810	4.20	1.07	21.00	3.68	0.06	0.05
	Approach	6310	11.00	1.07	0.40	0.23	0.05	0.05
	Climb out	18794	31.50	1.07	0.10	0.12	0.06	0.05
	Takeoff	23008	38.10	1.07	0.10	0.12	0.07	0.07
Notes: c(2), e, f, h, k(1)								
PW4074D	Idle (Taxi)	2421	3.80	1.07	26.34	3.59	0.06	0.05
	Approach	6897	11.35	1.07	0.96	0.05	0.04	0.04
	Climb out	19611	32.71	1.07	0.35	0.02	0.05	0.04
	Takeoff	24143	42.46	1.07	0.30	0.02	0.06	0.05
Notes: c(2), e, f, h, k(1)								
PW4077	Idle (Taxi)	1841	4.20	1.07	20.20	3.45	0.06	0.05
	Approach	6476	11.30	1.07	0.40	0.23	0.05	0.05
	Climb out	19460	32.50	1.07	0.10	0.12	0.06	0.05
	Takeoff	23960	39.80	1.07	0.10	0.12	0.08	0.07
Notes: c(2), e, f, h, k(1)								
PW4077D	Idle (Taxi)	1937	3.83	1.07	32.62	5.36	0.07	0.06
	Approach	6627	12.10	1.07	0.60	0.08	0.05	0.04
	Climb out	19897	35.82	1.07	0.25	0.05	0.05	0.05
	Takeoff	24460	44.74	1.07	0.22	0.03	0.06	0.05
Notes: c(2), e, f, h, k(1)								
PW4084	Idle (Taxi)	1921	4.40	1.07	18.73	3.11	0.06	0.05
	Approach	6944	12.00	1.07	0.40	0.23	0.05	0.05
	Climb out	21341	35.50	1.07	0.10	0.12	0.07	0.06
	Takeoff	27072	45.00	1.07	0.10	0.12	0.10	0.09
Notes: c(2), e, f, h, k(1)								
PW4084D	Idle (Taxi)	2048	4.08	1.07	25.74	3.78	0.06	0.05
	Approach	7198	12.70	1.07	0.48	0.07	0.05	0.04
	Climb out	21992	39.47	1.07	0.24	0.03	0.05	0.05
	Takeoff	27865	53.02	1.07	0.18	0.03	0.06	0.06
Notes: c(2), e, f, h, k(1)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
PW4090	Idle (Taxi)	2683	4.48	1.07	11.94	0.79	0.04	0.04
	Approach	7770	12.74	1.07	0.55	0.05	0.04	0.04
	Climb out	23778	41.17	1.07	0.31	0.02	0.06	0.05
	Takeoff	31159	57.52	1.07	0.27	0.02	0.09	0.08
Notes: c(2), e, f, h, k(1)								
PW4098	Idle (Taxi)	2548	7.78	1.07	6.48	0.00	0.04	0.03
	Approach	8532	14.89	1.07	0.70	0.00	0.05	0.05
	Climb out	25754	36.45	1.07	0.21	0.00	0.07	0.07
	Takeoff	32841	51.29	1.07	0.16	0.00	0.06	0.06
Notes: c(2), e, f, h, k(1)								
PW4152	Idle (Taxi)	1405	4.90	1.07	12.76	0.85	0.07	0.07
	Approach	4706	11.10	1.07	1.09	0.17	0.07	0.06
	Climb out	14167	22.70	1.07	0.17	0.18	0.11	0.10
	Takeoff	17278	26.90	1.07	0.12	0.15	0.11	0.10
Notes: c(2), e, f, h, k(1)								
PW4156	Idle (Taxi)	1492	5.00	1.07	11.60	0.76	0.08	0.07
	Approach	5135	11.60	1.07	0.90	0.29	0.08	0.07
	Climb out	15722	24.60	1.07	0.14	0.20	0.12	0.11
	Takeoff	19437	32.50	1.07	0.08	0.13	0.12	0.11
Notes: c(2), e, f, h, k(1)								
PW4158	Idle (Taxi)	1675	4.80	1.07	20.99	2.05	0.07	0.06
	Approach	5413	11.80	1.07	1.88	0.16	0.06	0.05
	Climb out	15905	23.70	1.07	0.54	0.02	0.07	0.07
	Takeoff	19691	30.20	1.07	0.40	0.10	0.08	0.07
Notes: c(2), e, f, h, k(1)								
PW4164	Idle (Taxi)	1667	4.03	1.07	26.67	5.13	0.07	0.06
	Approach	5984	14.10	1.07	1.86	0.18	0.05	0.05
	Climb out	17294	31.66	1.07	0.79	0.05	0.05	0.05
	Takeoff	20841	38.57	1.07	0.69	0.03	0.05	0.05
Notes: c(2), e, f, h, k(1)								
PW4164-1D	Idle (Taxi)	1929	3.79	1.07	17.13	1.66	0.05	0.04
	Approach	6151	12.10	1.07	1.55	0.07	0.04	0.04
	Climb out	17770	20.97	1.07	0.17	0.00	0.06	0.05
	Takeoff	21595	26.31	1.07	0.16	0.00	0.06	0.05
Notes: c(2), e, f, h, k(1)								
PW4168, -4168A	Idle (Taxi)	1754	4.15	1.07	23.51	3.78	0.06	0.05
	Approach	6333	14.66	1.07	1.75	0.17	0.05	0.05
	Climb out	18468	33.91	1.07	0.74	0.05	0.05	0.05
	Takeoff	22508	42.39	1.07	0.72	0.03	0.06	0.05
Notes: c(2), e, f, h, k(1)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
PW4168-1D, -4168A-1D	Idle (Taxi)	2000	4.08	1.07	14.78	1.09	0.04	0.04
	Approach	6492	12.39	1.07	1.26	0.06	0.04	0.04
	Climb out	19032	22.31	1.07	0.18	0.00	0.06	0.06
	Takeoff	23310	30.15	1.07	0.17	0.00	0.06	0.05
Notes: c(2), e, f, h, k(1)								
PW4170	Idle (Taxi)	2024	4.18	1.07	14.04	0.95	0.04	0.04
	Approach	6611	12.49	1.07	1.17	0.06	0.04	0.04
	Climb out	19445	22.84	1.07	0.18	0.00	0.06	0.06
	Takeoff	23960	31.40	1.07	0.18	0.00	0.06	0.05
Notes: c(2), e, f, h, k(1)								
PW4460	Idle (Taxi)	1690	4.90	1.07	20.32	1.91	0.07	0.06
	Approach	5579	12.00	1.07	1.78	0.16	0.06	0.05
	Climb out	16548	24.70	1.07	0.51	0.03	0.07	0.07
	Takeoff	21008	32.80	1.07	0.37	0.12	0.08	0.08
Notes: c(2), e, f, h, k(1)								
PW6122A	Idle (Taxi)	865	3.08	1.07	24.68	0.01	0.10	0.09
	Approach	2413	5.95	1.07	3.99	1.2E-03	0.08	0.07
	Climb out	6825	13.40	1.07	0.72	1.2E-03	0.14	0.12
	Takeoff	8310	17.04	1.07	0.74	0.00	0.13	0.12
Notes: c(2), e, f, h, k(1)								
PW6124A	Idle (Taxi)	905	3.58	1.07	25.19	2.3E-03	0.09	0.08
	Approach	2579	6.88	1.07	3.69	1.2E-03	0.08	0.07
	Climb out	7452	15.85	1.07	0.81	2.3E-03	0.15	0.13
	Takeoff	9278	21.03	1.07	0.68	0.00	0.15	0.13
Notes: c(2), e, f, h, k(1)								
R-1820-82	Idle (Taxi)	89	0.00	1.07	474.16	173.15	0.10 **(S)**	0.09 **(S)**
	Approach	323	6.50	1.07	384.83	6.41	0.10 **(S)**	0.09 **(S)**
	Climb out	862	2.09	1.07	435.03	55.77	0.10 **(S)**	0.09 **(S)**
	Takeoff	1166	1.72	1.07	531.73	108.89	0.10 **(S)**	0.09 **(S)**
Notes: c(1), d(12) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
R-2800-99W	Idle (Taxi)	8	22.00	1.07	1294.00	42.48	0.10	0.09
	Approach	175	13.64	1.07	1262.00	14.81	0.10	0.09
	Climb out	356	2.38	1.07	499.99	18.78	0.10	0.09
	Takeoff	1780	0.99	1.07	35.91	3.70	0.10	0.09
Notes: c(16), e, g, h, k(7)								
RB211-22B	Idle (Taxi)	1786	2.86	1.07	88.99	77.91	0.50	0.45
	Approach	4492	8.18	1.07	20.65	6.85	0.47	0.43
	Climb out	12270	26.89	1.07	1.68	0.29	0.17	0.15
	Takeoff	14897	37.33	1.07	0.78	0.17	0.17	0.16
Notes: c(2), e, f, h, k(8)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
RB211-524B Series	Idle (Taxi)	2159	3.53	1.07	82.20	58.19	0.36	0.32
	Approach	5500	9.75	1.07	20.00	5.73	0.33	0.30
	Climb out	15389	33.00	1.07	2.82	0.46	0.14	0.12
	Takeoff	18913	47.00	1.07	1.83	0.60	0.19	0.17
Notes: c(2), e, f, h, k(8)								
RB211-524C2	Idle (Taxi)	2381	3.37	1.07	81.00	62.33	0.38	0.34
	Approach	5873	10.40	1.07	18.90	5.08	0.30	0.27
	Climb out	16032	32.30	1.07	1.63	0.25	0.11	0.10
	Takeoff	19683	41.90	1.07	0.66	0.00	0.11	0.10
Notes: c(2), e, f, h, k(8)								
RB211-524D4	Idle (Taxi)	2381	4.11	1.07	73.80	53.43	0.33	0.30
	Approach	5873	9.65	1.07	16.90	5.52	0.32	0.29
	Climb out	15952	41.00	1.07	1.18	0.48	0.11	0.10
	Takeoff	19921	56.90	1.07	0.51	0.00	0.09	0.08
Notes: c(2), e, f, h, k(8)								
RB211-524G	Idle (Taxi)	2064	4.63	1.07	13.74	1.02	0.05	0.04
	Approach	5556	9.56	1.07	1.01	0.43	0.11	0.10
	Climb out	16508	40.54	1.07	0.43	0.31	0.13	0.12
	Takeoff	20794	58.71	1.07	0.59	0.45	0.13	0.12
Notes: c(2), e, f, h, k(8)								
RB211-524G-T	Idle (Taxi)	2064	4.00	1.07	28.82	4.54	0.08	0.07
	Approach	5873	9.68	1.07	1.17	0.00	0.09	0.08
	Climb out	16667	21.80	1.07	0.14	0.03	0.15	0.14
	Takeoff	20794	28.43	1.07	0.16	0.00	0.14	0.12
Notes: c(2), e, f, h, k(8)								
RB211-524H	Idle (Taxi)	2064	4.78	1.07	11.75	0.85	0.05	0.04
	Approach	5635	10.26	1.07	0.99	0.41	0.11	0.10
	Climb out	17222	46.31	1.07	0.38	0.38	0.13	0.12
	Takeoff	21667	65.84	1.07	0.87	0.39	0.13	0.11
Notes: c(2), e, f, h, k(8)								
RB211-524H-T	Idle (Taxi)	2064	4.16	1.07	26.17	3.81	0.07	0.07
	Approach	6111	9.91	1.07	1.05	0.00	0.09	0.08
	Climb out	17619	23.19	1.07	0.14	0.02	0.15	0.14
	Takeoff	22302	31.19	1.07	0.18	0.00	0.14	0.12
Notes: c(2), e, f, h, k(8)								
RB211-535C	Idle (Taxi)	1587	3.44	1.07	18.79	1.66	0.06	0.06
	Approach	4286	6.37	1.07	0.48	0.51	0.09	0.08
	Climb out	11667	24.89	1.07	0.27	0.16	0.08	0.07
	Takeoff	14286	33.71	1.07	0.70	0.29	0.10	0.09
Notes: c(2), e, f, h, k(8)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
RB211-535E4	Idle (Taxi)	1429	4.40	1.07	20.33	0.31	0.05	0.05
	Approach	4127	8.38	1.07	2.72	0.05	0.05	0.05
	Climb out	11905	17.56	1.07	0.29	0.00	0.19	0.17
	Takeoff	14683	22.31	1.07	0.26	0.03	0.19	0.17
Notes: c(2), e, f, h, k(8)								
Rotax 912	Idle (Taxi)	10	0.80	1.07	1206.17	21.03	1.0E-03	9.0E-04
	Approach	14	14.28	1.07	569.47	12.76	1.0E-03	9.0E-04
	Climb out	25	10.29	1.07	760.18	14.53	2.0E-03	1.8E-03
	Takeoff	30	12.71	1.07	700.69	14.08	3.0E-03	2.7E-03
Notes: c(16), e, g, h, k(8)								
Rotax 914	Idle (Taxi)	14	5.00	1.07	994.00	38.60	1.0E-03	9.0E-04
	Approach	23	14.00	1.07	776.00	16.00	1.0E-03	9.0E-04
	Climb out	44	18.00	1.07	664.00	12.30	2.0E-03	1.8E-03
	Takeoff	57	6.00	1.07	1020.00	15.00	3.0E-03	2.7E-03
Notes: c(16), e, g, h, k(8)								
Spey Mk511	Idle (Taxi)	1008	3.60	1.07	31.77	4.24	0.16	0.15
	Approach	2206	7.20	1.07	2.65	0.21	0.22	0.20
	Climb out	5762	17.30	1.07	0.63	0.14	0.24	0.22
	Takeoff	7071	22.70	1.07	0.12	0.10	0.23	0.21
Notes: c(2) - Spey MK511 is the commercial designation of the F113-RR-100 engine, e, f, h, k(8)								
Spey Mk555	Idle (Taxi)	762	3.70	1.07	29.30	2.14	0.18	0.16
	Approach	1754	6.80	1.07	3.70	0.33	0.35	0.32
	Climb out	4698	16.50	1.07	0.70	0.17	0.35	0.32
	Takeoff	5833	21.90	1.07	0.30	0.33	0.32	0.29
Notes: c(2), e, f, h, k(8)								
T53-L-11D	Ground Idle	145	1.58	1.07	31.51	66.80	1.44 **(S)**	1.30 **(S)**
	Flight Idle	222	2.53	1.07	37.79	15.61	2.95 **(S)**	2.66 **(S)**
	Normal Rated	645	6.43	1.07	6.83	0.66	0.31 **(S)**	0.28 **(S)**
	Military	685	6.34	1.07	3.34	0.30	0.36 **(S)**	0.32 **(S)**
	Takeoff	690	7.75	1.07	3.85	0.31	0.36 **(S)**	0.32 **(S)**
Notes: c(9), d(17) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
T53-L-13	Idle (Taxi)	160	1.58	1.07	31.45	64.28	1.44	1.30
	Approach	227	2.52	1.07	37.71	15.02	2.95	2.66
	Climb out	694	6.33	1.07	3.59	0.30	0.31	0.28
	Takeoff	696	7.73	1.07	3.59	0.30	0.36	0.32
Notes: c(13), j, k(8)								
T56 Series I	Idle (Taxi)	829	7.33	1.07	5.73	0.86	0.12	0.11
	Approach	1036	7.12	1.07	4.70	0.61	0.22	0.20
	Intermediate	1824	9.61	1.07	2.84	0.31	0.28	0.25
	Military	2059	9.87	1.07	2.82	0.31	0.28	0.25
Notes: c(13), j, k(8)								

2155 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
T56 Series III	Idle (Taxi)	986	6.05	1.07	6.50	0.90	0.12	0.11
	Approach	1262	9.10	1.07	2.79	0.44	0.19	0.17
	Intermediate	2210	12.19	1.07	1.47	0.26	0.24	0.22
	Military	2476	12.76	1.07	1.47	0.26	0.26	0.23
Notes: c(13), j, k(8)								
T56-A-7	Idle (Taxi)	724	7.58	1.07	5.06	0.08	3.64	3.28
	Approach	880	7.54	1.07	3.89	0.06	3.85	3.47
	Intermediate	1742	9.15	1.07	1.94	0.02	1.46	1.31
	Military	2262	12.46	1.07	2.30	0.01	1.22	1.10
Notes: c(3), h, k(5)								
T56-A-9	Idle	794	3.90	1.07	32.00	24.15	0.83	0.75
	Approach	1423 **(C)**	4.40	1.07	22.20	14.26	0.97	0.87
	Intermediate	1825	9.20	1.07	2.40	0.58	0.51	0.46
	Military	1905	9.30	1.07	2.10	0.46	0.50	0.45
Notes: c(7), d(1), e, k(4)								
T56-A-14	Idle (Taxi)	324	3.72	1.07	30.39	15.85	0.43	0.39
	Approach	839	6.79	1.07	3.49	0.92	0.28	0.25
	Intermediate	1409	10.30	1.07	1.07	0.04	0.17	0.15
	Military	1563	12.05	1.07	0.95	0.04	0.16	0.14
Notes: c(13), k(8)								
T56-A-15	Idle (Taxi)	794	3.90	1.07	32.00	24.15	0.83	0.75
	Approach	1423 **(C)**	4.40	1.07	22.20	14.26	0.97	0.87
	Intermediate	1825	9.20	1.07	2.40	0.58	0.51	0.46
	Military	2302	9.30	1.07	2.10	0.46	0.50	0.45
Notes: c(7), d(1), e, h, k(8)								
T56-A-16	Ground Idle	756	6.35	1.07	5.65	1.40	0.83 **(S)**	0.75 **(S)**
	Flight Idle	836	6.52	1.07	4.54	1.09	0.97 **(S)**	0.87 **(S)**
	75%	1996	9.93	1.07	0.42	0.20	0.51 **(S)**	0.46 **(S)**
	100%	2136	10.29	1.07	0.68	0.14	0.50 **(S)**	0.45 **(S)**
	Military	2219	10.45	1.07	0.65	0.16	0.50 **(S)**	0.45 **(S)**
Notes: c(9), d(18) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
T58-GE-5	Idle	133	1.50	1.07	169.17	111.54	0.75	0.68
	Normal Cruise	757	6.34	1.07	7.66	1.82	0.79	0.71
	Intermediate (Military)	821	6.70	1.07	6.82	3.78	0.97	0.88
	Power Takeoff	886	7.22	1.07	5.64	0.91	0.90	0.81
Notes: c(1), e, k(4)								
T58-GE-8F	Idle	132	1.43	1.07	178.44	149.98	0.75 **(S)**	0.68 **(S)**
	Approach	581	4.47	1.07	17.28	1.29	0.79 **(S)**	0.71 **(S)**
	Cruise	627	4.68	1.07	14.13	0.92	0.79 **(S)**	0.71 **(S)**
	Max Continuous	685	4.90	1.07	12.96	0.84	0.79 **(S)**	0.71 **(S)**
	Takeoff	786	5.47	1.07	9.03	0.46	0.97 **(S)**	0.88 **(S)**
Notes: c(9), d(19) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								

2156
2157

2158 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
T58-GE-16	Ground Idle	150	3.03	1.07	139.73	47.05	0.75 **(S)**	0.68 **(S)**
	60% Normal	656	7.88	1.07	14.56	0.44	0.79 **(S)**	0.71 **(S)**
	75% Normal	779	9.47	1.07	10.89	0.72	0.79 **(S)**	0.71 **(S)**
	90% Normal	890	10.07	1.07	9.10	0.96	0.90 **(S)**	0.81 **(S)**
	Military	1020	11.60	1.07	7.73	1.52	0.90 **(S)**	0.81 **(S)**
Notes: c(9), d(19) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(4)								
T63-A-5A	Ground Idle	61	1.42	1.07	79.15	23.35	0.83 **(S)**	0.75 **(S)**
	Flight Idle	70	1.89	1.07	61.83	12.02	0.83 **(S)**	0.75 **(S)**
	30%	105	2.90	1.07	38.59	3.76	0.97 **(S)**	0.87 **(S)**
	60%	157	4.11	1.07	20.79	0.78	0.51 **(S)**	0.46 **(S)**
	Military	215	5.07	1.07	7.54	0.09	0.50 **(S)**	0.45 **(S)**
Notes: c(9), d(18) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
T64-GE-6B	Idle	337	3.86	1.07	48.66	15.01	0.30	0.27
	75% hp	1039	8.95	1.07	4.72	0.89	0.58	0.52
	Normal Rated	1257	10.42	1.07	2.86	0.82	0.72	0.64
	Intermediate (Military)	1390	11.15	1.07	2.30	0.74	0.79	0.71
Notes: c(1), e, k(8)								
T64-GE-100	Ground Idle	298	1.11	1.07	76.46	1.26	2.36	2.12
	75% Normal	941	6.85	1.07	7.85	0.05	1.97	1.77
	Normal	1698	9.46	1.07	2.21	0.01	1.61	1.45
	Military	1848	11.30	1.07	2.17	0.01	0.92	0.82
Notes: c(3), e, h, k(5)								
T64-GE-413	Idle	260	2.62	1.07	51.83	19.87	2.36 **(S)**	2.12 **(S)**
	75% hp	1287	8.54	1.07	1.94	0.40	1.97 **(S)**	1.77 **(S)**
	Normal Rated	1511	9.65	1.07	1.20	0.38	1.61 **(S)**	1.45 **(S)**
	Intermediate	1661	10.92	1.07	0.67	0.39	1.61 **(S)**	1.45 **(S)**
	Maximum	1721	11.42	1.07	0.49	0.31	1.61 **(S)**	1.45 **(S)**
Notes: c(9), d(20) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
T64-GE-415	Idle	269	2.12	1.07	74.33	28.00	2.36 **(S)**	2.12 **(S)**
	75%	1493	8.09	1.07	2.10	0.15	1.61 **(S)**	1.45 **(S)**
	Normal Rated	1730	9.29	1.07	1.50	0.09	1.61 **(S)**	1.45 **(S)**
	Military	1916	9.99	1.07	1.29	0.32	0.92 **(S)**	0.82 **(S)**
	Max. Rated	2005	10.83	1.07	1.47	0.22	0.92 **(S)**	0.82 **(S)**
Notes: c(9), d(20) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
T76-G-10	Idle (Taxi)	238	7.40	1.07	23.80	8.51	0.38	0.34
	Approach	476	8.50	1.07	17.20	0.92	0.50	0.45
	Intermediate	794	9.90	1.07	5.90	0.12	0.63	0.57
	Military	873	10.30	1.07	2.30	0.12	0.71	0.64
Notes: c(7), e, g, h, k(8)								
T76-G-12	Idle (Taxi)	397	7.40	1.07	23.80	8.51	0.38	0.34
	Approach	476	8.50	1.07	17.20	0.92	0.50	0.45
	Intermediate	794	9.90	1.07	5.90	0.12	0.63	0.57
	Military	857 **(C)**	10.30	1.07	2.30	0.12	0.71	0.64
Notes: c(7), d(1), e, g, h, k(8)								

2159
2160

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
T76-G-418	Idle (Taxi)	238	7.40	1.07	23.80	8.51	0.38	0.34
	Approach	476	8.50	1.07	17.20	0.92	0.50	0.45
	Intermediate	794	9.90	1.07	5.90	0.12	0.63	0.57
	Military	873	10.30	1.07	2.30	0.12	0.71	0.64
Notes: c(7), e, g, h, k(8)								
T76-G-419	Idle (Taxi)	397	7.40	1.07	23.80	8.51	0.38	0.34
	Approach	476	8.50	1.07	17.20	0.92	0.50	0.45
	Intermediate	794	9.90	1.07	5.90	0.12	0.63	0.57
	Military	857 **(C)**	10.30	1.07	2.30	0.12	0.71	0.64
Notes: c(7), d(1), e, g, h, k(8)								
T400-CP-400	Ground Idle	136	2.21	1.07	27.94	10.99	0.44	0.40
	Flight Idle	141	2.84	1.07	29.08	8.97	0.41 **(C)**	0.37 **(C)**
	Cruise	279	4.66	1.07	1.79	0.00	0.36	0.32
	Intermediate (Military)	406	5.91	1.07	0.00	0.00	0.25	0.22
	Maximum	1069	11.51	1.07	0.00	0.22	0.28	0.25
Notes: c(1), d(1) - PM_{10} and $PM_{2.5}$ at Flight Idle power setting only, e, k(8)								
T406-AD-400	Idle	362	4.15	1.07	8.35	0.10	1.58	1.42
	Flight Idle	663	6.05	1.07	3.47	0.02	1.58	1.42
	Intermediate	948	7.87	1.07	1.82	0.02	1.58	1.42
	Max Continuous	2507	18.03	1.07	0.29	0.01	1.58	1.42
Notes: c(6) - T406-AD-400 is the military designation of the AE1107C engine, h, k(4)								
T700-GE-401, -401C	Idle	432	5.36	1.07	10.46	0.54	0.12	0.11
	Approach	348	5.36	1.07	10.46	0.54	0.21	0.19
	Climb out	443	5.60	1.07	10.11	0.53	0.46	0.41
	Takeoff	442	5.59	1.07	10.15	0.53	0.53	0.48
Notes: c(13), k(8)								
T700-GE-700	Ground Idle	134	3.36	1.07	46.24	0.50	1.48	1.33
	Flight Idle	469	10.95	1.07	5.12	0.02	1.26	1.13
	Flight Max	626	11.87	1.07	3.51	0.01	2.22	2.00
	Overspeed	725	11.43	1.07	2.81	0.01	2.61	2.33
Notes: c(3), h, k(5)								
TAE-125-01	Idle (Taxi)	2	16.91	1.07	24.80	9.78	0.05	0.05
	Approach	20	26.96	1.07	16.06	3.29	0.04	0.04
	Climb out	40	22.78	1.07	6.65	1.25	0.07	0.06
	Takeoff	51	20.01	1.07	7.51	1.05	0.10	0.09
Notes: c(16), e, g, h, k(8)								
TAY Mk611-8	Idle (Taxi)	873	2.50	1.07	24.10	3.91	0.16	0.15
	Approach	1825	5.70	1.07	3.90	1.04	0.52	0.47
	Climb out	5000	16.80	1.07	0.80	0.35	0.48	0.43
	Takeoff	6032	21.10	1.07	0.70	0.92	0.56	0.50
Notes: c(2), e, f, h, k(8)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
TAY Mk611-8C	Idle (Taxi)	810	2.53	1.07	24.40	1.71	0.05	0.05
	Approach	1706	5.31	1.07	2.89	0.75	0.08	0.07
	Climb out	4794	15.40	1.07	0.95	0.06	0.10	0.09
	Takeoff	5802	19.30	1.07	0.50	0.03	0.11	0.10
Notes: c(2), e, f, h, k(8)								
TAY Mk620-15	Idle (Taxi)	873	2.50	1.07	24.10	3.91	0.16	0.15
	Approach	1825	5.70	1.07	3.90	1.04	0.52	0.47
	Climb out	5000	16.80	1.07	0.80	0.35	0.48	0.43
	Takeoff	6032	21.10	1.07	0.70	0.92	0.56	0.50
Notes: c(2), e, f, h, k(8)								
TAY Mk650-15	Idle (Taxi)	944	1.70	1.07	33.77	3.78	0.06	0.06
	Approach	2016	4.55	1.07	6.54	1.01	0.14	0.12
	Climb out	5675	16.47	1.07	2.01	0.47	0.41	0.37
	Takeoff	6937	19.81	1.07	1.74	0.43	0.42	0.38
Notes: c(2), e, f, h, k(8)								
TF30-P-3	Idle (Taxi)	873	2.30	1.07	72.00	71.30	0.01	0.01
	Approach	2064	4.80	1.07	9.20	2.42	0.05	0.05
	Intermediate	4921	9.40	1.07	1.30	0.12	0.45	0.41
	Military	6191	12.00	1.07	0.80	0.03	0.40	0.36
	Afterburner	38413	3.10	1.07	4.06	0.01	0.15	0.14
Notes: c(7), e, g, h, k(8)								
TF30-P-6B	Idle (Taxi)	689	1.31	1.07	68.21	21.53	0.02 **(S)**	0.02 **(S)**
	75% Thrust	3550	6.68	1.07	6.31	3.40	0.12 **(S)**	0.11 **(S)**
	Normal Rated	4700	8.06	1.07	5.55	1.61	0.44 **(S)**	0.40 **(S)**
	Intermediate (Military)	6835	12.04	1.07	3.09	1.16	0.35 **(S)**	0.32 **(S)**
Notes: c(1), d(21) - PM_{10} and $PM_{2.5}$ at all power settings, e, j - Assumes 100% thrust at Intermediate setting, k(8)								
TF30-P-7	Idle (Taxi)	952	3.00	1.07	53.00	34.50	0.02	0.02
	Approach	2064	6.10	1.07	11.50	3.68	0.12	0.11
	Intermediate	5714	14.00	1.07	1.20	0.23	0.44	0.40
	Military	7222	20.00	1.07	0.80	0.12	0.35	0.32
	Afterburner	38413	3.10	1.07	4.00	0.01	0.15	0.14
Notes: c(7), e, g, h, k(8)								
TF30-P-9	Idle (Taxi)	952	3.00	1.07	53.00	34.50	0.02	0.02
	Approach	2064	6.10	1.07	11.50	3.68	0.12	0.11
	Intermediate	5714	14.00	1.07	1.20	0.23	0.44	0.40
	Military	8730	20.00	1.07	0.80	0.12	0.35	0.32
	Afterburner	54525	3.10	1.07	4.00	0.01	0.15	0.14
Notes: c(7), e, k(8)								
TF30-P-100	Idle (Taxi)	1260	2.86	1.07	47.62	21.72	26.27	23.64
	Approach	4562 **(C)**	10.95 **(C)**	1.07	1.70 **(C)**	0.41 **(C)**	24.88 **(C)**	22.39 **(C)**
	Intermediate	6650	20.00	1.07	0.71	0.12	24.00	21.60
	Military	7120	28.01	1.07	0.70	0.11	8.34	7.51
	Afterburner	42850	4.47	1.07	24.80	2.30	5.36	4.82
Notes: c(1), d(1) - All pollutants at Approach power setting, e, j - Assumes 100% thrust at Takeoff power setting, k(8)								

2167 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
TF30-P-103	Idle (Taxi)	827	4.00	1.07	100.00	88.44	0.51	0.46
	30%	2003	7.00	1.07	36.20	12.54	0.82	0.74
	75%	4119	15.10	1.07	5.50	0.36	0.20	0.18
	100%	5541	20.10	1.07	2.10	0.10	16.34	14.70
	Afterburner-1	14292	11.20	1.07	77.20	32.20	35.69 **(C)**	31.84 **(C)**
Notes: c(15), d(1) - PM_{10} and $PM_{2.5}$ at Afterburner power setting only, e, f, h, k(3)								
TF30-P-109	Idle (Taxi)	761	2.93	1.07	48.49	7.44	1.24	1.11
	Approach	1727	6.19	1.07	20.73	2.35	1.52	1.37
	Intermediate	2921	9.58	1.07	5.17	0.80	1.64	1.47
	Military	6263	23.63	1.07	0.71	0.87	0.92	0.82
	Afterburner-5	38460	4.89	1.07	6.19	2.50	0.51	0.46
Notes: c(12), h, k(5)								
TF30-P-412A	Idle (Taxi)	999	2.40	1.07	68.17	44.20	26.53	23.87
	75% rpm	1448	3.66	1.07	38.60	11.12	24.03	21.63
	90% rpm	3597	9.62	1.07	6.34	0.19	15.01	13.51
	Intermediate (Military)	7394	16.66	1.07	2.12	0.11	8.34	7.51
	Afterburner	40000	6.75	1.07	15.00	1.15	17.33	15.60
Notes: c(1), e, k(8)								
TF33-P-3, -P-5	Idle (Taxi)	846	1.77	1.07	88.53	105.76	5.20	4.68
	Approach	3797	7.30	1.07	9.01	4.36	13.98	12.59
	Climb out	7323	9.00	1.07	1.80	0.46	14.00	12.60
	Takeoff	9979	11.00	1.07	1.30	0.35	8.00	7.20
Notes: c(1), e, h, j, k(8)								
TF33-P-7	Idle (Taxi)	1093	0.78	1.07	134.96	5.32	6.13	5.51
	Approach	4884	7.12	1.07	9.67	0.24	3.68	3.31
	Intermediate	6356	8.10	1.07	4.16	0.06	5.28	4.76
	Military	8264	10.29	1.07	1.49	0.02	3.58	3.22
Notes: c(3), e, h, k(5)								
TF33-P-9	Idle (Taxi)	1120	1.39	1.07	95.06	90.91	4.98	4.48
	Approach	4140	6.37	1.07	5.24	1.37	3.55	3.20
	Intermediate	8960	7.88	1.07	2.11	1.50	3.15	2.84
	Military	9630	12.08	1.07	0.00	0.55	3.67	3.30
Notes: c(6), e, h, k(4)								
TF33-P-100	Idle (Taxi)	1108	1.50	1.07	136.96	131.16	6.13	5.52
	Approach	2794	6.22	1.07	14.60	3.62	5.46	4.91
	Intermediate	8069	8.47	1.07	2.96	0.39	5.29	4.76
	Military	10856	11.49	1.07	1.19	0.25	2.93	2.64
Notes: c(6), h, k(8)								
TF33-P-102	Idle (Taxi)	1114	1.39	1.07	95.02	3.42	4.96	4.46
	Approach	4737	6.37	1.07	5.24	0.11	3.55	3.20
	Intermediate	5782	7.88	1.07	2.11	0.06	3.15	2.84
	Military	7561	12.08	1.07	0.00	0.02	2.52	2.26
Notes: c(3), e, h, k(5)								

2168
2169

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
TF33-P-102A	Idle (Taxi)	1065	1.80	1.07	117.03	106.96	4.98	4.48
	Approach	3912	5.84	1.07	12.37	1.74	3.55	3.20
	Intermediate	6985	8.74	1.07	2.01	0.95	3.15	2.84
	Military	8756	12.39	1.07	0.45	0.53	3.67	3.30
Notes: c(6), h, j, k(8)								
TF33-P-103	Idle (Taxi)	900	1.39	1.07	95.06	90.91	4.98	4.48
	Approach	3800	6.37	1.07	5.24	1.37	3.55	3.20
	Intermediate	6240	7.88	1.07	2.11	1.50	3.15	2.84
	Military	7440	12.08	1.07	0.00	0.55	3.67	3.30
Notes: c(6), e, h, k(4)								
TF34-GE-100	Idle (Taxi)	390	2.10	1.07	106.70	39.45	8.13 **(S)**	7.32 **(S)**
	Approach	920	5.70	1.07	16.30	2.19	6.21 **(S)**	5.59 **(S)**
	Intermediate	460	2.60	1.07	78.00	23.35	8.93 **(S)**	8.04 **(S)**
	Military	2710	10.70	1.07	2.20	0.12	2.66 **(S)**	2.39 **(S)**
Notes: c(7), d(22) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
TF34-GE-100A	Idle (Taxi)	498	0.32	1.07	65.62	2.24	8.13	7.32
	Approach	933	3.09	1.07	27.92	1.44	6.21	5.59
	Intermediate	1512	5.61	1.07	8.88	0.13	8.93	8.04
	Military	2628	9.11	1.07	3.94	0.07	2.66	2.39
Notes: c(3), h, k(5)								
TF34-GE-400	Idle (Taxi)	458	1.69	1.07	90.98	17.24	8.13 **(S)**	3.60 **(S)**
	Approach	1201 **(C)**	2.98 **(C)**	1.07	72.08 **(C)**	13.51 **(C)**	6.21 **(S)**	2.12 **(S)**
	Intermediate	2686 **(C)**	5.57 **(C)**	1.07	34.29 **(C)**	6.05 **(C)**	2.66 **(S)**	1.68 **(S)**
	Military	3800	7.51	1.07	5.95	0.45	2.66 **(S)**	1.68 **(S)**
Notes: c(9), d(1) - Fuel flow rates, NO_X, CO, and VOC at Approach and Intermediate power settings, d(22) - PM_{10} and $PM_{2.5}$ at all power settings, e, k(8)								
TF39-GE-1C	Idle (Taxi)	1448	3.37	1.07	58.43	3.44	2.80	2.52
	Approach	10477	24.91	1.07	0.77	0.03	1.20	1.08
	Intermediate	12541	28.16	1.07	1.53	0.03	0.89	0.80
	Military	13862	32.66	1.07	1.29	0.03	1.18	1.06
Notes: c(3), h, k(5)								
TF41-A-1	Idle (Taxi)	1032	1.50	1.07	119.00	105.80	0.15	0.14
	Approach	3492	6.80	1.07	10.20	2.53	0.36	0.32
	Intermediate	5873	12.00	1.07	3.70	0.46	0.52	0.47
	Military	8413	21.00	1.07	1.80	0.23	0.67	0.60
Notes: c(7), e, k(8)								
TF41-A-2	Idle (Taxi)	1047	4.00	1.07	176.00	114.54	0.65	0.59
	30%	2704	8.90	1.07	45.00	11.62	0.73	0.66
	75%	5810	23.80	1.07	4.70	0.10	16.94	15.25
	100%	8086	32.90	1.07	3.20	0.09	28.60	25.74
Notes: c(15), e, f, h, k(3)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
TFE731-2, -2A	Idle (Taxi)	206	3.50	1.07	47.80	8.54	0.13 **(S)**	0.12 **(S)**
	Approach	571	6.90	1.07	15.56	1.41	0.13 **(S)**	0.12 **(S)**
	Intermediate	1476	16.08	1.07	1.62	0.07	0.09 **(S)**	0.09 **(S)**
	Military	1786	19.15	1.07	1.13	0.06	0.09 **(S)**	0.08 **(S)**
Notes: c(6), d(14) - PM_{10} and $PM_{2.5}$ at all power settings, k(8)								
TFE731-2-2B	Idle (Taxi)	190	2.82	1.07	58.60	23.05	0.13 **(S)**	0.12 **(S)**
	Approach	532	5.90	1.07	22.38	4.90	0.09 **(S)**	0.08 **(S)**
	Climb out	1373	13.08	1.07	2.03	0.15	0.09 **(S)**	0.08 **(S)**
	Takeoff	1627	15.25	1.07	1.39	0.13	0.08 **(S)**	0.08 **(S)**
Notes: c(2), d(14) - PM_{10} and $PM_{2.5}$ at all power settings, e, f, h, k(8)								
TFE731-3	Idle (Taxi)	206	3.72	1.07	47.70	10.40	0.13 **(S)**	0.12 **(S)**
	Approach	571	6.92	1.07	15.56	1.62	0.09 **(S)**	0.08 **(S)**
	Climb out	1476	16.02	1.07	1.62	0.08	0.09 **(S)**	0.08 **(S)**
	Takeoff	1786	19.15	1.07	1.13	0.07	0.08 **(S)**	0.08 **(S)**
Notes: c(2), d(14) - PM_{10} and $PM_{2.5}$ at all power settings, e, f, h, k(8)								
TIO-540-A1A, -540-A1B, -540-A1B, -540-A2A, -540-A2B, - 540-A2C, -540-AE2A, -540-AH1A, -540-F2BD, -540-J2B	Idle (Taxi)	25	0.04	1.07	1293.70	78.29	0.50	0.45
	Approach	99	1.39	1.07	1261.60	15.39	0.40	0.36
	Climb out	205	0.24	1.07	1470.90	19.12	0.70	0.63
	Takeoff	260	0.36	1.07	1442.10	14.21	0.10	0.09
Notes: c(16), e, g, h, k(8)								
TIO-540-J2B2	Idle (Taxi)	25	0.39	1.07	1293.70	78.29	0.50 **(S)**	0.45 **(S)**
	Approach	99	1.39	1.07	1261.57	15.38	0.40 **(S)**	0.36 **(S)**
	Climb out	205	0.24	1.07	1470.90	19.12	0.70 **(S)**	0.63 **(S)**
	Takeoff	260	0.36	1.07	1442.05	14.21	0.10 **(S)**	0.09 **(S)**
Notes: c(1), d(13) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
TIO-540-J2BD, -540-S1AD	Idle (Taxi)	25	0.04	1.07	1293.70	78.29	0.50	0.45
	Approach	99	1.39	1.07	1261.60	15.39	0.40	0.36
	Climb out	205	0.24	1.07	1470.90	19.12	0.70	0.63
	Takeoff	260	0.36	1.07	1442.10	14.21	0.10	0.09
Notes: c(16), e, g, h, k(8)								
TPE331-2	Idle (Taxi)	105	2.57	1.07	64.10	104.92	2.68 **(S)**	2.41 **(S)**
	Approach	220	8.27	1.07	16.59	3.08	2.40 **(S)**	2.16 **(S)**
	Climb out	372	9.92	1.07	1.37	0.46	1.47 **(S)**	1.32 **(S)**
	Takeoff	405	10.22	1.07	0.94	0.45	1.75 **(S)**	1.57 **(S)**
Notes: c(1), d(23) - PM_{10} and $PM_{2.5}$ at all power settings, e, j, k(8)								
TPE331-3	Idle (Taxi)	112	2.86	1.07	61.52	90.97	2.68	2.41
	Approach	250	9.92	1.07	6.96	0.74	2.40	2.16
	Climb out	409	11.86	1.07	0.98	0.17	1.47	1.32
	Takeoff	458	12.36	1.07	0.76	0.13	1.75	1.57
Notes: c(1), e, h, j, k(8)								

2176 **Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants**

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
Trent 553-61	Idle (Taxi)	1825	5.96	1.07	10.50	0.16	0.04	0.04
	Approach	4762	11.37	1.07	0.66	0.05	0.05	0.05
	Climb out	13730	30.98	1.07	0.44	0.01	0.06	0.05
	Takeoff	16746	40.55	1.07	0.18	0.02	0.06	0.05
Notes: c(2), e, f, h, k(8)								
Trent 556-61	Idle (Taxi)	1825	6.09	1.07	9.96	0.15	0.04	0.04
	Approach	4921	11.68	1.07	0.54	0.05	0.05	0.05
	Climb out	14524	33.25	1.07	0.38	0.01	0.06	0.05
	Takeoff	17778	44.77	1.07	0.17	0.02	0.06	0.05
Notes: c(2), e, f, h, k(8)								
Trent 768	Idle (Taxi)	2056	4.46	1.07	26.94	3.67	0.06	0.06
	Approach	6198	10.12	1.07	1.71	0.05	0.05	0.05
	Climb out	18849	24.90	1.07	0.49	0.01	0.07	0.07
	Takeoff	23072	32.01	1.07	0.35	0.00	0.06	0.06
Notes: c(2), e, f, h, k(8)								
Trent 772	Idle (Taxi)	2143	4.66	1.07	23.97	2.83	0.06	0.05
	Approach	6516	10.42	1.07	1.56	0.05	0.06	0.05
	Climb out	20079	26.82	1.07	0.49	0.01	0.07	0.07
	Takeoff	24913	35.56	1.07	0.21	0.01	0.06	0.06
Notes: c(2), e, f, h, k(8)								
Trent 875	Idle (Taxi)	2222	4.64	1.07	19.66	2.05	0.05	0.05
	Approach	6984	10.43	1.07	0.86	0.00	0.05	0.05
	Climb out	20397	26.55	1.07	0.16	0.00	0.06	0.05
	Takeoff	24603	33.32	1.07	0.19	0.00	0.06	0.05
Notes: c(2), e, f, h, k(8)								
Trent 877	Idle (Taxi)	2222	4.75	1.07	18.42	1.78	0.05	0.05
	Approach	7143	10.59	1.07	0.80	0.00	0.05	0.05
	Climb out	21111	27.59	1.07	0.16	0.00	0.06	0.05
	Takeoff	25476	34.76	1.07	0.20	0.00	0.05	0.05
Notes: c(2), e, f, h, k(8)								
Trent 884	Idle (Taxi)	2460	5.04	1.07	15.19	1.15	0.05	0.04
	Approach	7698	11.07	1.07	0.65	0.00	0.05	0.05
	Climb out	22937	30.63	1.07	0.18	0.00	0.06	0.05
	Takeoff	28254	40.05	1.07	0.24	0.00	0.05	0.05
Notes: c(2), e, f, h, k(8)								
Trent 892	Idle (Taxi)	2381	5.33	1.07	13.07	0.81	0.05	0.04
	Approach	7937	11.58	1.07	0.57	0.00	0.05	0.05
	Climb out	24603	33.30	1.07	0.20	0.00	0.06	0.05
	Takeoff	31032	45.70	1.07	0.28	0.01	0.05	0.05
Notes: c(2), e, f, h, k(8)								

2177
2178

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
Trent 895	Idle (Taxi)	2619	5.11	1.07	14.71	1.02	0.05	0.04
	Approach	8333	11.39	1.07	0.54	0.00	0.05	0.05
	Climb out	25318	34.29	1.07	0.19	0.00	0.06	0.05
	Takeoff	31984	47.79	1.07	0.27	0.02	0.05	0.05
Notes: c(2), e, f, h, k(8)								
Trent 970-84	Idle (Taxi)	2381	5.10	1.07	15.10	0.23	0.04	0.04
	Approach	5556	11.40	1.07	1.40	0.00	0.05	0.05
	Climb out	17460	29.10	1.07	0.20	0.00	0.06	0.05
	Takeoff	20638	37.20	1.07	0.40	0.00	0.05	0.05
Notes: c(2), e, f, h, k(8)								
Trent 972-84	Idle (Taxi)	2048	5.51	1.07	13.00	0.05	0.04	0.04
	Approach	5833	12.23	1.07	1.10	0.08	0.06	0.06
	Climb out	17540	30.36	1.07	0.31	0.13	0.07	0.07
	Takeoff	21206	39.78	1.07	0.32	0.01	0.06	0.06
Notes: c(2), e, f, h, k(8)								
Trent 1000-A	Idle (Taxi)	1881	5.40	1.07	8.73	0.07	0.04	0.04
	Approach	4960	13.29	1.07	0.77	0.00	0.06	0.05
	Climb out	14897	35.87	1.07	0.45	0.00	0.05	0.05
	Takeoff	18111	46.67	1.07	0.53	0.00	0.05	0.04
Notes: c(2), e, f, h, k(8)								
Trent 1000-C	Idle (Taxi)	1952	5.66	1.07	7.66	0.05	0.04	0.04
	Approach	5302	13.86	1.07	0.68	0.00	0.06	0.05
	Climb out	16254	40.33	1.07	0.48	0.00	0.05	0.05
	Takeoff	19905	53.54	1.07	0.51	0.00	0.05	0.04
Notes: c(2), e, f, h, k(8)								
Trent 1000-E	Idle (Taxi)	1762	5.06	1.07	10.63	0.10	0.04	0.04
	Approach	4524	12.54	1.07	0.92	0.00	0.05	0.05
	Climb out	13167	30.55	1.07	0.43	0.00	0.06	0.05
	Takeoff	15929	39.17	1.07	0.47	0.00	0.05	0.05
Notes: c(2), e, f, h, k(8)								
TSIO-360-A, -360-AB, -360-B, -360-BB, -360-C, -360-CB, -360-F, -360-FB, -360-JB	Idle (Taxi)	11	1.91	1.07	592.20	159.00	0.05	0.05
	Approach	61	3.77	1.07	995.10	13.01	0.04	0.04
	Climb out	99	4.32	1.07	960.80	10.98	0.07	0.06
	Takeoff	133	2.71	1.07	1082.00	10.55	0.10	0.09
Notes: c(16), e, g, h, k(8)								
V2500-A1	Idle (Taxi)	984	5.91	1.07	7.76	0.25	0.08	0.07
	Approach	2651	13.45	1.07	0.77	0.17	0.08	0.07
	Climb out	7333	30.82	1.07	0.55	0.13	0.12	0.11
	Takeoff	8833	37.13	1.07	0.55	0.12	0.12	0.11
Notes: c(2), e, f, h, k(1)								

Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants

Aircraft Engine	Power Setting [a]	Fuel Flow Rate (lb/hr)	Emission Factors (lb/1000lb fuel)					
			NO_X	SO_X [b]	CO	VOC	PM_{10}	$PM_{2.5}$
V2522-A5	Taxi (Idle)	937	4.50	1.07	13.42	0.12	0.15	0.13
	Approach	2468	8.70	1.07	2.60	0.07	0.19	0.17
	Climb out	6484	20.80	1.07	0.67	0.05	0.24	0.21
	Takeoff	7706	24.50	1.07	0.57	0.05	0.16	0.14
Notes: c(2), e, f, h, k(1)								
V2524-A5	Idle (Taxi)	976	4.70	1.07	12.64	0.12	0.15	0.13
	Approach	2603	9.00	1.07	2.37	0.07	0.20	0.18
	Climb out	6889	22.00	1.07	0.63	0.05	0.23	0.20
	Takeoff	8270	26.20	1.07	0.54	0.05	0.15	0.14
Notes: c(2), e, f, h, k(1)								
V2525-D5	Taxi (Idle)	1016	4.70	1.07	12.43	0.12	0.15	0.13
	Approach	2532	8.90	1.07	2.44	0.07	0.20	0.18
	Climb out	6984	22.30	1.07	0.62	0.05	0.23	0.20
	Takeoff	8357	26.50	1.07	0.53	0.05	0.15	0.14
Notes: c(2), e, f, h, k(1)								
V2527-A5	Idle (Taxi)	1016	4.70	1.07	12.43	0.12	0.15	0.13
	Approach	2532	8.90	1.07	2.44	0.07	0.20	0.18
	Climb out	6984	22.30	1.07	0.62	0.05	0.23	0.20
	Takeoff	8357	26.50	1.07	0.53	0.05	0.15	0.14
Notes: c(2), e, f, h, k(1)								
V2528-D5	Taxi (Idle)	1063	4.90	1.07	11.53	0.12	0.13	0.12
	Approach	2802	9.60	1.07	2.03	0.07	0.20	0.18
	Climb out	7905	25.10	1.07	0.56	0.05	0.20	0.18
	Takeoff	9595	30.50	1.07	0.47	0.05	0.14	0.13
Notes: c(2), e, f, h, k(1)								
V2530-A5	Idle (Taxi)	1095	5.00	1.07	10.95	0.12	0.13	0.12
	Approach	2992	10.10	1.07	1.81	0.06	0.21	0.18
	Climb out	8548	27.10	1.07	0.52	0.05	0.19	0.17
	Takeoff	10564	33.80	1.07	0.45	0.05	0.14	0.13
Notes: c(2), e, f, h, k(1)								
V2533-A5	Taxi (Idle)	1082	5.24	1.07	9.32	0.12	0.13	0.12
	Approach	3096	10.83	1.07	1.65	0.06	0.21	0.19
	Climb out	9085	28.67	1.07	0.52	0.05	0.19	0.17
	Takeoff	11318	36.48	1.07	0.46	0.05	0.13	0.12
Notes: c(2), e, f, h, k(1)								

Notes for Table 2-9:

a. Power Settings included for both Fixed-wing and Rotary aircraft.

b. The emission factors for sulfur oxides assumes JP-8 used as the fuel. The value provided is the national average for sulfur content in JP-8, though when conducting an air emissions inventory (AEI), the sulfur content should be obtained directly from the fuel supplier.

c. The emission factors were found in the following sources:

(1) SOURCE: *Air Pollutant Emission Factors for Military and Civil Aircraft*, EPA-450/3-78-117, October 1978.

(2) SOURCE *Airport Air Quality Manual*, International Civil Aviation Organization, 2011 version 24 datasheets.

(3) SOURCE: *Aircraft Engine and Auxiliary Power Unit Emissions* Volume I-III, March 1999, IERA-RS-BR-TR-1999-0006.

(4) SOURCE: *Aircraft Engine and Auxiliary Power Unit Emissions: Testing Final Report Addendum F119-PW-100* June 2002, IERA-RS-BR-SR-2002-0006.

(5) SOURCE: *Engine and Hush House Emissions from a F100-PW-200 Jet Engine Tested at Kelly AFB, TX* Final Volume I February 1997.

(6) SOURCE: *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations* January 2002, IERA-RS-BR-SR-2001-0010.

(7) SOURCE: *Aircraft Engine Emissions Estimator*, AFESC, September 1985.

(8) SOURCE: *Collection and Assessment of Aircraft Emissions*, US EPA, October 1971.

(9) SOURCE: *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines*, Aircraft Environmental Support Office.

(10) SOURCE: *Clean Air Act Emission Testing of the T-38C Aircraft Engines* September 2002, IERA-RS-BR-SR-2003-001.

(11) SOURCE: *PT6A-68 Emissions Measurement Program Summary*, September 2002, IERA-RS-BR-SR-2003-0003.

(12) SOURCE: *Engine and Hush House Emissions from a TF30-P-109 Jet Engine Tested at Canon AFB, NM* Final Volume I June 1996.

(13) SOURCE: *Air Emissions Factor Guide to Air Force Mobile Sources*, December 2009.

(14) SOURCE: *Engine and Hush House Emissions from a F100-PW-100 Jet Tested at Langley Air Force Base, VA*, November 1996.

(15) SOURCE: *Aircraft Emissions Characterization: TF41-A2, TF30-P-103, and TF30-P-109 Engines*, December 1987.

(16) SOURCE: *Exhaust Emissions from In-Use General Aviation Aircraft*, The National Academies of Sciences Engineering Medicine. The National Academies Press, 2016.

(17) SOURCE: *Source Sampling of Aerospace Ground Equipment and Jet Engines Technical Report*, Environmental Quality Management, Inc. 1996.

(18) SOURCE: *Fuel Flows and Emission Indexes of the F404-GE-402 Engine Burning JP-5*, AESO Memorandum Report No. 2003-01 Revision A, September 2016.

(19) SOURCE: *Fuel Flows and Emission Indexes of the F414-GE-400 Engines Burning JP-5*, AESO Memorandum Report No. 9725 Revision E, September 2016.

(20) SOURCE: *Fuel Flows and Emission Indexes of the F405-RR-401 Engine Using JP-5*, AESO Memorandum Report No. 2006-03 Revision B, June 2017.

(21) SOURCE: *Guidance on the Determination of Helicopter Emissions,* Federal Office of Civil Aviations, FOCA, March 2009.

d. Surrogate data was used for this engine. The surrogate data was found in the following sources:

(1) Data was calculated using values provided in the source document.

(2) F100-PW-220

(3) F101-GE-102

(4) F110-GE-100

(5) IO-360-A

(6) J52-P-408

(7) J57-P-19W

(8) J85-GE-13

(9) O-320-A2B

(10) J85-GE-5A

(11) PT6A-65
(12) R-1820-82
(13) TIO-540-A1A
(14) LF507-1F
(15) PT6A-38
(16) PW2040
(17) T53-L-13
(18) T56-A-15
(19) T58-GE-5
(20) T64-GE-100
(21) TF30-P-7
(22) TF34-GE-100A
(23) TPE331-3
(24) F404-GE-F1D2
(25) O-200A

e. Source document provided emission factors for total hydrocarbons (THC) or non-methane organic gas (NMOG). These values converted to volatile organic compounds (VOCs) using the following equations: VOC=1.15*THC or VOC=NMOG*0.99 based on the document *Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines*, FAA 2009.
f. PM data calculated using smoke numbers and the ICAO method. The PM calculated was assumed to be PM_{10}.
g. PM reported in the source document was assumed to be PM_{10}.
h. $PM_{2.5}$ calculated as 90% of PM_{10}.
i. For at least one setting, the emission factors reported are an average of values provided in the source document.
j. Percent thrust is an estimate based on tables provided in the source document.
k. Fuel used for emission testing:
(1) Jet A
(2) Jet A-1
(3) JP-4
(4) JP-5
(5) JP-8
(6) JP-8+100
(7) AVGAS
(8) No data on fuel used in tests, assumed to use Kerosene-Type Jet Fuel

"(**S**)" – Indicates that this emission factor is from a recommended surrogate engine. See note 4 for details.
"(**C**)" – Indicates that this value was calculated using data provided by the source document.
"---" Indicates No Data Available

Table 2-10. VOC and HAP Emission Factors for Select Engines

F100-PW-100

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-5
Fuel Flowrate (lb/hr)			1127	2765	7685	10996	54007
Percent Thrust/hp			3%	13%	45%	100%	134%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.35E-01	1.50E-01	1.00E-02	1.00E-02	1.00E-02
Acrolein	107-02-8	X	1.11E-01	6.00E-02	ND	ND	ND
Benzaldehyde	100-52-7		2.40E-02	1.00E-02	ND	ND	ND
Benzene	71-43-2	X	4.50E-02	2.45E-03	5.25E-04	5.01E-04	2.85E-04
1,3-Butadiene	106-99-0	X	2.93E-02	ND	ND	ND	ND
2-Butanone (MEK)	78-93-3		9.00E-03	2.00E-02	0.00E+00	0.00E+00	0.00E+00
Crotonaldehyde	4170-30-3		3.40E-02	2.00E-02	ND	ND	ND
Ethylbenzene	100-41-4	X	5.93E-03	4.44E-04	ND	3.99E-04	8.38E-05
Formaldehyde	50-00-0	X	8.61E-01	6.10E-01	2.00E-02	1.00E-02	1.00E-02
Hexanal	66-25-1		2.50E-02	3.00E-02	3.00E-02	1.00E-02	0.00E+00
Naphthalene	91-20-3	X	9.50E-02	7.49E-04	4.91E-04	3.43E-04	5.40E-04
Phenol	108-95-2	X	3.99E-02	ND	ND	ND	3.38E-03
Propanal	123-38-6	X	3.90E-02	2.00E-02	1.00E-02	4.00E-02	0.00E+00
Styrene	100-42-5	X	4.09E-03	ND	ND	ND	ND
Toluene	108-88-3	X	2.20E-02	1.73E-03	9.55E-04	9.24E-04	2.98E-04
Xylenes (mixed isomers)	1330-20-7	X	5.10E-02	7.35E-03	1.92E-03	4.55E-03	9.42E-04

Notes for F100-PW-100

SOURCE: Engine and Hush House Emission from F100-PW-100 Jet Engine Tested at Langley Air Force Base, VA Volumes I-III, November 1996.

"X" Indicates that compound is a HAP.

"---" Indicates No Data Available

ND – Compound not detected at the detection limit. Compound may be present at a value less than the detection limit

Table 2-10. VOC and HAP Emission Factors for Select Engines

F100-PW-200

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-5
Fuel Flowrate (lb/hr)			1006	3251	5651	8888	40123
Percent Thrust/hp			3%	13%	45%	100%	134%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.41E-01	ND	7.00E-03	1.30E-02	1.60E-02
Acrolein	107-02-8	X	8.40E-02	ND	ND	ND	ND
Benzaldehyde	100-52-7		ND	ND	ND	ND	ND
Benzene	71-43-2	X	4.73E-02	3.87E-04	1.89E-04	4.90E-04	1.82E-04
1,3-Butadiene	106-99-0	X	1.04E-02	ND	ND	ND	ND
2-Butanone (MEK)	78-93-3		4.00E-02	ND	7.00E-03	6.00E-03	8.00E-03
Crotonaldehyde	4170-30-3		3.20E-02	ND	ND	ND	ND
Ethylbenzene	100-41-4	X	2.99E-03	1.93E-04	2.70E-04	3.44E-04	4.01E-05
Formaldehyde	50-00-0	X	7.77E-01	ND	ND	2.00E-03	2.00E-02
Hexanal	66-25-1		ND	ND	ND	ND	ND
Naphthalene	91-20-3	X	3.42E-02	2.13E-04	3.96E-04	4.01E-04	4.12E-04
Phenol	108-95-2	X	1.35E-02	ND	ND	2.68E-04	1.04E-03
Propanal	123-38-6	X	4.90E-02	ND	8.00E-03	6.00E-03	7.00E-03
Styrene	100-42-5	X	5.02E-04	ND	2.78E-04	ND	ND
Toluene	108-88-3	X	1.65E-02	7.62E-04	4.34E-04	1.08E-03	8.75E-04
Xylenes (mixed isomers)	1330-20-7	X	1.83E-02	1.68E-03	1.78E-03	2.58E-03	3.17E-04

Notes for F100-PW-200 Engine:

SOURCE: *Engine and Hush House Emissions from F100-PW-200 Jet Engine Tested at Kelly Air Force Base, TX* Volumes I-III, February 1997

"X" Indicates that compound is a HAP.

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F101-GE-102

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-1
Fuel Flowrate (lb/hr)			1117	4533	6557	7828	15314
Percent Thrust/hp			5%	47%	66%	77%	106%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	ND	ND	ND	ND	1.77E-02
Acrolein	107-02-8	X	ND	ND	ND	ND	8.23E-02
Benzaldehyde	100-52-7		ND	ND	ND	1.93E-03	4.98E-02
Benzene	71-43-2	X	1.18E-02	7.89E-04	1.32E-03	5.48E-03	2.28E-01
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.28E-03	ND	ND	ND	3.30E-02
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	3.59E-02
Ethylbenzene	100-41-4	X	ND	ND	ND	ND	8.60E-02
Formaldehyde	50-00-0	X	1.04E-01	5.12E-03	4.64E-03	4.43E-03	3.89E-02
Hexanal	66-25-1		ND	ND	ND	ND	1.80E-02
Naphthalene	91-20-3	X	1.79E-03	AA	ND	ND	1.27E-01
Phenol	108-95-2	X	2.29E-03	1.22E-03	ND	ND	2.71E-02
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	1.08E-03	ND	3.36E-04	ND	1.21E-02
Toluene	108-88-3	X	5.55E-03	1.50E-03	1.69E-03	1.29E-03	1.26E-01
Xylenes (mixed isomers)	1330-20-7	X	9.22E-04	4.34E-04	6.65E-04	2.45E-03	2.24E-01

Notes for F101-GE-102 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F108-CF-100

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			1136	2547	5650	6458	---
Percent Thrust/hp			9%	30%	70%	78%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	AA	ND	ND	ND	---
Acrolein	107-02-8	X	ND	ND	ND	ND	---
Benzaldehyde	100-52-7		ND	ND	ND	4.09E-03	---
Benzene	71-43-2	X	1.39E-02	3.39E-03	8.30E-04	5.10E-04	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		5.35E-03	ND	ND	ND	---
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	---
Ethylbenzene	100-41-4	X	6.84E-04	5.53E-04	ND	ND	---
Formaldehyde	50-00-0	X	9.51E-02	1.50E-02	5.58E-03	7.01E-03	---
Hexanal	66-25-1		ND	9.66E-03	ND	ND	---
Naphthalene	91-20-3	X	2.90E-03	AA	ND	ND	---
Phenol	108-95-2	X	ND	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	1.48E-03	ND	ND	ND	---
Toluene	108-88-3	X	8.97E-03	6.23E-03	1.42E-03	1.11E-03	---
Xylenes (mixed isomers)	1330-20-7	X	1.65E-03	1.61E-03	5.42E-04	3.36E-04	---

Notes for F108-CF-100 Engine

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F110-GE-100

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-1
Fuel Flowrate (lb/hr)			1111	5080	7332	11358	18088
Percent Thrust/hp			3%	44%	66%	100%	113%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	6.62E-03	ND	1.65E-04	1.44E-04	1.24E-02
Acrolein	107-02-8	X	ND	ND	ND	ND	3.90E-02
Benzaldehyde	100-52-7		3.48E-02	ND	4.26E-03	3.06E-03	7.13E-02
Benzene	71-43-2	X	2.93E-02	1.77E-03	1.59E-03	1.61E-03	1.88E-01
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.44E-03	ND	ND	4.55E-04	2.02E-02
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	6.08E-02
Ethylbenzene	100-41-4	X	2.00E-03	3.93E-04	3.68E-04	1.69E-04	4.47E-02
Formaldehyde	50-00-0	X	1.01E-01	1.00E-02	1.94E-02	1.53E-02	1.53E-02
Hexanal	66-25-1		ND	ND	ND	ND	1.14E-02
Naphthalene	91-20-3	X	3.31E-03	AA	AA	3.31E-04	9.73E-02
Phenol	108-95-2	X	2.95E-03	ND	ND	ND	6.63E-02
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	3.69E-03	2.98E-04	4.91E-04	2.65E-04	5.71E-03
Toluene	108-88-3	X	1.10E-02	1.34E-03	1.90E-03	7.41E-04	1.40E-01
Xylenes (mixed isomers)	1330-20-7	X	4.22E-03	1.12E-03	9.70E-04	5.07E-04	8.89E-02

Notes for F110-GE-100 Engine:

SOURCE: *Aircraft Engine and APU Emissions* Testing Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F117-PW-100

Power Setting			Idle	Approach	Intermediate	Takeoff	---
Fuel Flowrate (lb/hr)			978	4645	10408	13905 **(S)**	---
Percent Thrust/hp			4%	31%	68%	---	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.20E-02	ND	ND	4.27E-04 **(C)**	---
Acrolein	107-02-8	X	ND	ND	ND	2.45E-04 **(C)**	---
Benzaldehyde	100-52-7		ND	3.16E-03	3.68E-03	---	---
Benzene	71-43-2	X	2.25E-02	8.90E-04	6.25E-04	1.68E-04 **(C)**	---
1,3-Butadiene	106-99-0	X	---	---	---	1.69E-04 **(C)**	---
2-Butanone (MEK)	78-93-3		ND	ND	ND	---	---
Crotonaldehyde	4170-30-3		1.20E-02	ND	ND	---	---
Ethylbenzene	100-41-4	X	2.82E-03	ND	ND	1.74E-05 **(C)**	---
Formaldehyde	50-00-0	X	2.36E-01	1.65E-02	9.50E-03	1.23E-03 **(C)**	---
Hexanal	66-25-1		ND	ND	ND	---	---
Naphthalene	91-20-3	X	2.39E-03	ND	ND	5.41E-05 **(C)**	---
Phenol	108-95-2	X	3.79E-03	ND	ND	7.26E-05 **(C)**	---
Propanal	123-38-6	X	---	---	---	7.27E-05 **(C)**	---
Styrene	100-42-5	X	1.55E-03	ND	ND	3.09E-05 **(C)**	---
Toluene	108-88-3	X	6.68E-03	1.41E-03	1.12E-03	6.42E-05 **(C)**	---
Xylenes (mixed isomers)	1330-20-7	X	3.27E-03	6.21E-04	5.47E-04	4.48E-05 **(C)**	---

Notes for F117-PW-100 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"**S**" Indicates a surrogate engine was used for this data.

"**C**" indicates this value was calculated. For VOC and HAP emission factors, these values were calculated taking the product of the VOC emission factor at the specified power setting and the mass fraction for this pollutant as given in Table 2-10

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F118-GE-100

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			1097	3773	6350	10887	---
Percent Thrust/hp			---	---	---	---	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	7.86E-03	ND	ND	ND	---
Acrolein	107-02-8	X	ND	ND	ND	ND	---
Benzaldehyde	100-52-7		6.59E-03	1.59E-03	1.65E-03	1.94E-03	---
Benzene	71-43-2	X	2.70E-02	8.58E-04	3.71E-04	3.38E-04	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		3.01E-03	ND	ND	ND	---
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	---
Ethylbenzene	100-41-4	X	1.23E-03	3.72E-04	ND	ND	---
Formaldehyde	50-00-0	X	1.80E-01	1.22E-02	1.17E-02	6.55E-03	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	AA	ND	ND	ND	---
Phenol	108-95-2	X	1.20E-03	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	2.25E-03	ND	ND	ND	---
Toluene	108-88-3	X	9.88E-03	1.35E-03	2.98E-04	3.85E-04	---
Xylenes (mixed isomers)	1330-20-7	X	5.26E-03	1.96E-03	2.87E-04	2.05E-04	---

Notes for F118-GE-100 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F119-PW-100

Power Setting			Idle	Approach	Intermediate	Military	Afterburner
Fuel Flowrate (lb/hr)			1377	2740	10110	18612	50170
Percent Thrust/hp			10%	20%	70%	100%	150%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.11E-01	6.75E-03	2.61E-03	8.33E-04	7.69E-05 **(C)**
Acrolein	107-02-8	X	3.60E-02	ND	ND	ND	4.41E-05 **(C)**
Benzaldehyde	100-52-7		4.15E-02	ND	ND	ND	---
Benzene	71-43-2	X	1.06E-01	3.33E-03	6.86E-04	4.88E-04	3.03E-05 **(C)**
1,3-Butadiene	106-99-0	X	4.99E-02	ND	4.27E-04	ND	3.04E-05 **(C)**
2-Butanone (MEK)	78-93-3		3.33E-02	ND	ND	ND	---
Crotonaldehyde	4170-30-3		2.66E-02	ND	ND	ND	---
Ethylbenzene	100-41-4	X	1.64E-02	2.55E-04	4.99E-04	1.34E-04	3.13E-06 **(C)**
Formaldehyde	50-00-0	X	9.95E-01	3.56E-02	2.44E-02	7.58E-03	2.22E-04 **(C)**
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	---	---	---	---	9.74E-06 **(C)**
Phenol	108-95-2	X	---	---	---	---	1.31E-05 **(C)**
Propanal	123-38-6	X	1.60E-02	ND	9.78E-04	4.10E-04	1.31E-05 **(C)**
Styrene	100-42-5	X	3.12E-02	2.55E-04	ND	ND	5.56E-06 **(C)**
Toluene	108-88-3	X	6.37E-02	2.68E-04	AA	AA	1.16E-05 **(C)**
Xylenes (mixed isomers)	1330-20-7	X	6.71E-02	8.81E-04	4.89E-04	3.77E-04	8.06E-06 **(C)**

Notes for F119-PW-100 Engine:

SOURCE: *Aircraft Engine and Auxiliary Power Unit Emissions Testing* Final Report Addendum F119-PW-100 June 2002, IERA-RS-BR-SR-2002-0006

"X" Indicates that compound is a HAP.

"**C**" indicates this value was calculated. For VOC and HAP emission factors, these values were calculated taking the product of the VOC emission factor at the specified power setting and the mass fraction for this pollutant as given in Table 2-11

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

F404-GE-400, -F1D2 (excluding AB for the -F1D2)

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-3
Fuel Flowrate (lb/hr)			685	3111	6464	7739	15851
Percent Thrust/hp			6%	38%	79%	91%	114%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	5.69E-02	ND	ND	ND	3.38E-02
Acrolein	107-02-8	X	1.71E-01	ND	ND	ND	1.44E-01
Benzaldehyde	100-52-7		1.31E-01	ND	1.70E-03	ND	1.32E-01
Benzene	71-43-2	X	5.12E-01	7.56E-04	6.45E-04	7.38E-04	3.70E-01
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.31E-02	ND	ND	ND	2.74E-02
Crotonaldehyde	4170-30-3		9.14E-02	ND	ND	ND	8.45E-02
Ethylbenzene	100-41-4	X	7.48E-02	4.84E-04	3.53E-04	ND	4.86E-02
Formaldehyde	50-00-0	X	1.14E+00	1.67E-02	2.17E-02	9.02E-03	3.74E-02
Hexanal	66-25-1		ND	ND	ND	ND	1.26E-02
Naphthalene	91-20-3	X	1.31E-01	3.10E-04	7.04E-05	1.03E-04	7.32E-02
Phenol	108-95-2	X	1.15E-01	ND	ND	ND	6.69E-02
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	8.66E-02	ND	ND	ND	4.90E-03
Toluene	108-88-3	X	2.60E-01	8.73E-04	1.07E-03	6.61E-04	1.78E-01
Xylenes (mixed isomers)	1330-20-7	X	2.49E-01	2.64E-03	1.97E-03	1.01E-03	1.42E-01

Notes for F404-GE-400, -F1D2 Engines:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

The F404-GE-F1D2 is a non-afterburning version of the F404-GE-400 and has the same emissions (without the afterburner setting) as the F404-GE-400.

Table 2-10. VOC and HAP Emission Factors for Select Engines

GTCP85-180

		Power Setting	**Constant**	**---**	**---**	**---**	**---**
		Fuel Flowrate (lb/hr)	270	---	---	---	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.09E-03	---	---	---	---
Acrolein	107-02-8	X	3.04E-04	---	---	---	---
Benzaldehyde	100-52-7		ND	---	---	---	---
Benzene	71-43-2	X	1.50E-02	---	---	---	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		9.96E-04	---	---	---	---
Crotonaldehyde	4170-30-3		5.25E-04	---	---	---	---
Ethylbenzene	100-41-4	X	1.20E-04	---	---	---	---
Formaldehyde	50-00-0	X	2.03E-02	---	---	---	---
Hexanal	66-25-1		ND	---	---	---	---
Naphthalene	91-20-3	X	AA	---	---	---	---
Phenol	108-95-2	X	1.44E-04	---	---	---	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	1.91E-04	---	---	---	---
Toluene	108-88-3	X	2.94E-03	---	---	---	---
Xylenes (mixed isomers)	1330-20-7	X	2.65E-03	---	---	---	---

Notes for GTCP85-180 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

GTCP165-1

		Power Setting	**Constant**	**---**	**---**	**---**	**---**
		Fuel Flowrate (lb/hr)	273	---	---	---	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	5.61E-03	---	---	---	---
Acrolein	107-02-8	X	1.21E-02	---	---	---	---
Benzaldehyde	100-52-7		1.26E-02	---	---	---	---
Benzene	71-43-2	X	3.79E-02	---	---	---	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.77E-03	---	---	---	---
Crotonaldehyde	4170-30-3		5.83E-03	---	---	---	---
Ethylbenzene	100-41-4	X	8.63E-04	---	---	---	---
Formaldehyde	50-00-0	X	1.88E-02	---	---	---	---
Hexanal	66-25-1		ND	---	---	---	---
Naphthalene	91-20-3	X	5.54E-03	---	---	---	---
Phenol	108-95-2	X	4.48E-03	---	---	---	---
Propanal	123-38-6	X	--	---	---	---	---
Styrene	100-42-5	X	2.24E-03	---	---	---	---
Toluene	108-88-3	X	1.87E-02	---	---	---	---
Xylenes (mixed isomers)	1330-20-7	X	6.01E-03	---	---	---	---

Notes for GTCP165-1 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

J69-T-25

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			167	568 **(C)**	872	1085	---
Percent Thrust/hp			4%	30%	63%	84%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	9.76E-02	5.98E-03 **(C)**	2.12E-03	ND	---
Acrolein	107-02-8	X	1.96E-01	3.43E-03 **(C)**	ND	ND	---
Benzaldehyde	100-52-7		1.04E-01	---	ND	ND	---
Benzene	71-43-2	X	1.89E-01	2.35E-03 **(C)**	3.47E-03	1.86E-03	---
1,3-Butadiene	106-99-0	X	---	2.36E-03 **(C)**	---	---	---
2-Butanone (MEK)	78-93-3		2.41E-02	---	8.70E-04	8.79E-04	---
Crotonaldehyde	4170-30-3		1.22E-01	---	ND	ND	---
Ethylbenzene	100-41-4	X	2.03E-02	2.44E-04 **(C)**	ND	ND	---
Formaldehyde	50-00-0	X	9.16E-01	1.72E-02 **(C)**	2.72E-02	1.16E-02	---
Hexanal	66-25-1		ND	---	ND	ND	---
Naphthalene	91-20-3	X	3.54E-02	7.57E-04 **(C)**	3.41E-04	2.22E-04	---
Phenol	108-95-2	X	2.85E-02	1.02E-03 **(C)**	9.86E-04	ND	---
Propanal	123-38-6	X	---	1.02E-03 **(C)**	---	---	---
Styrene	100-42-5	X	2.72E-02	4.33E-04 **(C)**	ND	ND	---
Toluene	108-88-3	X	1.12E-01	8.99E-04 **(C)**	1.56E-03	8.29E-04	---
Xylenes (mixed isomers)	1330-20-7	X	8.96E-02	6.27E-04 **(C)**	2.79E-03	4.94E-04	---

Notes for J69-T-25 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"**C**" indicates this value was calculated. For VOC and HAP emission factors, these values were calculated taking the product of the VOC emission factor at the specified power setting and the mass fraction for this pollutant as given in Table 2-11

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

J85-GE-5A

Power Setting			Idle	Approach	Intermediate	Military	Afterburner-1
Fuel Flowrate (lb/hr)			434	875 **(C)**	950	2740	8138
Percent Thrust/hp			4%	13% **(C)**	15%	88%	116%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.18E-01	5.60E-02 **(C)**	ND	ND	ND
Acrolein	107-02-8	X	2.70E-01	3.21E-02 **(C)**	ND	ND	ND
Benzaldehyde	100-52-7		1.10E-01	---	ND	ND	ND
Benzene	71-43-2	X	1.48E-01	2.20E-02 **(C)**	1.34E-01	1.14E-02	6.84E-03
1,3-Butadiene	106-99-0	X	---	2.21E-02 **(C)**	---	---	---
2-Butanone (MEK)	78-93-3		2.88E-02	---	9.09E-03	ND	3.27E-04
Crotonaldehyde	4170-30-3		1.34E-01	---	ND	ND	ND
Ethylbenzene	100-41-4	X	3.06E-02	2.28E-03 **(C)**	8.80E-03	3.75E-04	5.24E-04
Formaldehyde	50-00-0	X	2.26E-01	1.61E-01 **(C)**	5.45E-01	7.37E-02	2.40E-02
Hexanal	66-25-1		ND	---	ND	ND	ND
Naphthalene	91-20-3	X	9.65E-02	7.09E-03 **(C)**	1.28E-02	1.27E-03	8.16E-04
Phenol	108-95-2	X	7.17E-02	9.51E-03 **(C)**	1.24E-02	1.52E-03	9.39E-04
Propanal	123-38-6	X	---	9.52E-03 **(C)**	---	---	---
Styrene	100-42-5	X	4.17E-02	4.05E-03 **(C)**	1.29E-02	5.02E-04	2.85E-04
Toluene	108-88-3	X	1.67E-01	8.41E-03 **(C)**	4.91E-02	3.23E-03	1.74E-03
Xylenes (mixed isomers)	1330-20-7	X	1.37E-01	5.87E-03 **(C)**	3.62E-02	1.78E-03	2.78E-03

Notes for J85-GE-5A Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"**C**" indicates this value was calculated. For VOC and HAP emission factors, these values were calculated taking the product of the VOC emission factor at the specified power setting and the mass fraction for this pollutant as given in Table 2-11

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

J85-GE-5M

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			525	703 **(C)**	1045	2550	---
Percent Thrust/hp			---	---	---	---	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.44E-01	6.41E-02 **(C)**	1.91E-02	1.57E-03	---
Acrolein	107-02-8	X	3.14E-01	3.67E-02 **(C)**	1.24E-02	1.18E-03	---
Benzaldehyde	100-52-7		7.81E-02	---	1.24E-02	1.18E-03	---
Benzene	71-43-2	X	3.05E-02	2.52E-02 **(C)**	2.34E-02	2.56E-03	---
1,3-Butadiene	106-99-0	X	1.20E-02	2.53E-02 **(C)**	6.02E-03	ND	---
2-Butanone (MEK)	78-93-3		3.94E-02	---	6.77E-03	9.29E-04	---
Crotonaldehyde	4170-30-3		1.18E-01	---	1.24E-02	1.18E-03	---
Ethylbenzene	100-41-4	X	7.36E-03	2.61E-03 **(C)**	2.38E-03	8.21E-05	---
Formaldehyde	50-00-0	X	2.27E+00	1.85E-01 **(C)**	3.48E-01	2.39E-02	---
Hexanal	66-25-1		7.81E-02	---	1.24E-02	1.18E-03	---
Naphthalene	91-20-3	X	8.29E-02	8.12E-03 **(C)**	ND	ND	---
Phenol	108-95-2	X	---	1.09E-02 **(C)**	---	---	---
Propanal	123-38-6	X	7.81E-02	1.09E-02 **(C)**	1.24E-02	1.18E-03	---
Styrene	100-42-5	X	7.88E-03	4.64E-03 **(C)**	2.44E-03	1.08E-04	---
Toluene	108-88-3	X	2.76E-02	9.63E-03 **(C)**	1.14E-02	9.14E-04	---
Xylenes (mixed isomers)	1330-20-7	X	4.04E-02	6.72E-03 **(C)**	1.25E-02	6.65E-04	---

Notes for J85-GE-5M Engine:

SOURCE: *Clean Air Act Emissions Testing of the T-38C Aircraft Engines* September 2002, IERA-RS-BR-SR-2003-0001

"X" Indicates that compound is a HAP.

"**C**" indicates this value was calculated. For VOC and HAP emission factors, these values were calculated taking the product of the VOC emission factor at the specified power setting and the mass fraction for this pollutant as given in Table 2-11

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

PT6A-68

Power Setting			Ground Idle	Flight Idle	Descend	Approach	Max. Continuous
Fuel Flowrate (lb/hr)			156	180	328	449	612
Percent Thrust/hp			2%	3%	19%	46%	88%
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.99E-01	3.47E-01	8.78E-02	1.04E-02	2.17E-03
Acrolein	107-02-8	X	7.16E-01	6.00E-01	5.06E-02	ND	ND
Benzaldehyde	100-52-7		2.34E-02	1.73E-01	4.45E-02	8.01E-03	ND
Benzene	71-43-2	X	1.67E-01	5.22E-01	8.49E-02	1.04E-02	8.63E-04
1,3-Butadiene	106-99-0	X	1.49E-01	2.67E-01	1.10E-02	ND	ND
2-Butanone (MEK)	78-93-3		3.71E-01	ND	2.65E-03	ND	ND
Crotonaldehyde	4170-30-3		2.08E-01	1.73E-01	ND	ND	ND
Ethylbenzene	100-41-4	X	4.76E-02	4.94E-02	2.52E-03	2.09E-04	1.07E-04
Formaldehyde	50-00-0	X	4.81E+00	5.27E+00	2.93E+00	6.73E-01	2.21E-02
Hexanal	66-25-1		1.56E-01	ND	ND	ND	ND
Naphthalene	91-20-3	X	ND	1.16E-02	ND	ND	7.68E-02
Phenol	108-95-2	X	---	---	---	---	---
Propanal	123-38-6	X	1.30E-01	1.08E-01	ND	ND	ND
Styrene	100-42-5	X	4.68E-02	3.80E-02	8.05E-03	ND	ND
Toluene	108-88-3	X	1.65E-01	2.42E-01	2.46E-02	2.37E-03	5.18E-04
Xylenes (mixed isomers)	1330-20-7	X	1.73E-01	1.97E-01	8.95E-03	8.60E-04	1.44E-03

Notes for PT6A-68 Engine:

SOURCE: *PT6A-68 Emissions Measurement Program Summary* September 2002, IERA-RS-BR-SR-2003-0003

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

T56-A-7

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			724	880	1742	2262	---
Percent Thrust/hp			5%	15%	61%	90%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.04E-02	AA	5.43E-04	1.64E-04	---
Acrolein	107-02-8	X	ND	ND	ND	ND	---
Benzaldehyde	100-52-7		1.13E-03	8.76E-04	4.67E-04	ND	---
Benzene	71-43-2	X	4.77E-03	4.45E-03	1.34E-03	7.84E-04	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		4.63E-04	3.62E-04	ND	1.75E-04	---
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	---
Ethylbenzene	100-41-4	X	ND	4.06E-04	2.07E-04	1.80E-04	---
Formaldehyde	50-00-0	X	4.10E-02	3.34E-02	9.30E-03	3.81E-04	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	1.16E-03	1.03E-03	1.77E-04	1.34E-04	---
Phenol	108-95-2	X	ND	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	7.09E-04	3.67E-04	ND	ND	---
Toluene	108-88-3	X	2.71E-03	2.29E-03	9.61E-04	2.53E-05	---
Xylenes	1330-20-7	X	1.33E-03	1.05E-03	5.82E-04	8.75E-04	---

Notes for T56-A-7 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing Volumes I-III* March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

T64-GE-100

Power Setting			Ground Idle	75% Normal	Normal	Military	---
Fuel Flowrate (lb/hr)			298	941	1698	1848	---
Percent Thrust/hp			2%	34%	81%	90%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	5.07E-02	1.20E-03	ND	ND	---
Acrolein	107-02-8	X	1.14E-01	1.37E-03	ND	ND	---
Benzaldehyde	100-52-7		5.90E-02	1.86E-03	ND	ND	---
Benzene	71-43-2	X	2.16E-01	1.26E-02	4.00E-03	3.88E-03	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.96E-02	2.33E-04	ND	ND	---
Crotonaldehyde	4170-30-3		5.07E-02	1.01E-03	ND	ND	---
Ethylbenzene	100-41-4	X	2.24E-02	3.07E-04	ND	ND	---
Formaldehyde	50-00-0	X	7.15E-02	1.17E-02	3.18E-04	1.83E-04	---
Hexanal	66-25-1		1.81E-02	3.83E-05	ND	ND	---
Naphthalene	91-20-3	X	5.44E-02	1.52E-03	4.96E-06	2.50E-03	---
Phenol	108-95-2	X	8.26E-03	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	4.11E-02	5.12E-04	ND	ND	---
Toluene	108-88-3	X	1.02E-01	2.88E-03	1.33E-04	1.27E-04	---
Xylenes (mixed isomers)	1330-20-7	X	6.45E-02	9.68E-04	ND	ND	---

Notes for T64-GE-100 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

T700-GE-700

Power Setting			Ground Idle	Flight Idle	Flight Max	Overspeed	---
Fuel Flowrate (lb/hr)			134	469	626	725	---
Percent Thrust/hp			4%	56%	82%	100%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.81E-02	3.03E-04	2.00E-04	ND	---
Acrolein	107-02-8	X	7.23E-03	9.68E-05	1.10E-05	ND	---
Benzaldehyde	100-52-7		ND	9.00E-04	4.15E-04	ND	---
Benzene	71-43-2	X	4.87E-02	2.97E-04	3.12E-04	3.00E-04	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.00E-03	3.26E-04	ND	ND	---
Crotonaldehyde	4170-30-3		9.93E-03	ND	ND	ND	---
Ethylbenzene	100-41-4	X	2.25E-03	2.57E-04	ND	1.99E-04	---
Formaldehyde	50-00-0	X	2.19E-01	4.09E-03	2.09E-03	4.81E-03	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	7.33E-03	1.56E-04	6.73E-05	2.91E-05	---
Phenol	108-95-2	X	6.24E-03	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	5.16E-03	ND	ND	ND	---
Toluene	108-88-3	X	1.28E-02	1.24E-03	AA	2.92E-04	---
Xylenes (mixed isomers)	1330-20-7	X	7.14E-03	5.69E-04	5.07E-04	1.24E-03	---

Notes for T700-GE-700 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"—" Indicates No Data Available

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

TF30-P-109

Power Setting			Idle	Approach	Intermediate	Military	Afterburner
Fuel Flowrate (lb/hr)			761	1727	2921	6263	38460
Percent Thrust/hp			5%	23%	47%	99%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	4.47E-01	2.36E-01	9.00E-03	1.50E-02	6.70E-03
Acrolein	107-02-8	X	3.50E-02	2.30E-02	ND	ND	ND
Benzaldehyde	100-52-7		1.90E-02	7.00E-03	ND	ND	ND
Benzene	71-43-2	X	1.95E-01	5.16E-02	4.39E-03	3.74E-04	6.85E-04
1,3-Butadiene	106-99-0	X	8.34E-02	2.89E-02	ND	ND	ND
2-Butanone (MEK)	78-93-3		2.00E-02	3.60E-02	1.10E-02	4.00E-03	2.50E-03
Crotonaldehyde	4170-30-3		6.20E-02	3.30E-02	ND	ND	ND
Ethylbenzene	100-41-4	X	4.36E-02	4.99E-03	5.67E-04	3.65E-04	6.31E-05
Formaldehyde	50-00-0	X	1.82E+00	7.52E-01	4.70E-02	3.00E-03	2.44E-02
Hexanal	66-25-1		8.00E-02	1.85E-01	2.02E-01	1.17E-01	4.41E-02
Naphthalene	91-20-3	X	1.13E-01	2.24E-02	3.59E-03	8.94E-04	8.44E-04
Phenol	108-95-2	X	7.12E-02	1.70E-02	1.69E-03	2.37E-04	7.38E-04
Propanal	123-38-6	X	5.50E-02	2.50E-02	ND	ND	ND
Styrene	100-42-5	X	2.95E-02	1.28E-02	3.95E-04	ND	3.13E-05
Toluene	108-88-3	X	1.61E-01	2.45E-02	2.12E-03	8.63E-04	2.77E-04
Xylenes (mixed isomers)	1330-20-7	X	1.95E-01	1.77E-02	2.64E-03	1.77E-03	2.68E-04

Notes for TF30-P-109 Engine:

SOURCE: *Engine and Hush House Emissions from a TF30-P109 Jet Engine Tested at Cannon Air Force Base*, NM

"—" Indicates No Data Available

"X" Indicates that compound is a HAP.

ND - Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA - Compound detected was less than the Ambient Air concentration resulting in a negative emission factor when the Ambient Air Concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

TF33-P-7/7A

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			1093	4884	6356	8264	---
Percent Thrust/hp			4%	45%	58%	73%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	ND	8.72E-03	ND	ND	---
Acrolein	107-02-8	X	ND	ND	ND	ND	---
Benzaldehyde	100-52-7		ND	ND	ND	ND	---
Benzene	71-43-2	X	5.23E-01	2.84E-02	6.49E-03	1.47E-03	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		1.89E-02	7.11E-03	ND	ND	---
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	---
Ethylbenzene	100-41-4	X	2.00E-01	2.04E-03	5.11E-04	3.88E-04	---
Formaldehyde	50-00-0	X	2.31E+00	1.26E-01	2.80E-02	5.28E-03	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	3.71E-01	3.13E-03	3.54E-04	AA	---
Phenol	108-95-2	X	1.67E-01	3.54E-03	1.28E-03	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	2.42E-01	3.43E-03	7.46E-04	ND	---
Toluene	108-88-3	X	3.73E-01	1.01E-02	2.54E-03	2.27E-03	---
Xylenes (mixed isomers)	1330-20-7	X	4.62E-01	4.82E-03	1.34E-03	1.64E-03	---

Notes for TF33-P-7/7A Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing Volumes I-III March 1999,* IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"---" Indicates No Data Available

ND – Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA – Compound detected was less than the ambient air concentration resulting in a negative emission factor when the ambient air concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

TF33-P-102

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			1114	4737	5782	7561	---
Percent Thrust/hp			5%	49%	59%	75%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	ND	ND	ND	ND	---
Acrolein	107-02-8	X	ND	ND	ND	ND	---
Benzaldehyde	100-52-7		ND	ND	ND	ND	---
Benzene	71-43-2	X	7.09E-01	1.14E-02	4.05E-03	9.53E-04	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		3.64E-02	1.59E-03	7.45E-04	ND	---
Crotonaldehyde	4170-30-3		ND	ND	ND	ND	---
Ethylbenzene	100-41-4	X	8.63E-02	8.23E-04	4.79E-04	ND	---
Formaldehyde	50-00-0	X	9.43E-01	6.65E-02	2.27E-02	ND	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	2.15E-01	1.10E-03	7.35E-04	1.30E-04	---
Phenol	108-95-2	X	8.41E-02	1.76E-03	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	1.09E-01	1.18E-03	4.38E-04	ND	---
Toluene	108-88-3	X	2.65E-01	2.28E-03	2.65E-03	9.50E-04	---
Xylenes (mixed isomers)	1330-20-7	X	1.98E-01	2.40E-03	1.04E-03	1.08E-03	---

Notes for TF33-P-102 Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March 1999, IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"---" Indicates No Data Available

ND – Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA – Compound detected was less than the ambient air concentration resulting in a negative emission factor when the ambient air concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

TF34-GE-100A

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			498	933	1512	2628	---
Percent Thrust/hp			7%	28%	46%	78%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	1.27E-01	3.08E-02	ND	ND	---
Acrolein	107-02-8	X	6.10E-02	1.36E-02	5.42E-03	2.96E-03	---
Benzaldehyde	100-52-7		5.10E-02	2.03E-02	7.80E-03	5.94E-03	---
Benzene	71-43-2	X	2.81E-01	6.37E-02	9.57E-03	4.27E-03	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		1.50E-02	5.94E-03	ND	ND	---
Crotonaldehyde	4170-30-3		5.10E-02	ND	ND	ND	---
Ethylbenzene	100-41-4	X	2.62E-02	3.50E-03	ND	6.82E-04	---
Formaldehyde	50-00-0	X	1.22E+00	5.31E-01	6.61E-02	2.82E-02	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	4.48E-02	8.51E-03	1.59E-03	3.20E-05	---
Phenol	108-95-2	X	2.73E-02	6.61E-01	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	4.41E-02	6.72E-03	ND	ND	---
Toluene	108-88-3	X	1.12E-01	1.40E-02	3.21E-03	1.34E-04	---
Xylenes (mixed isomers)	1330-20-7	X	8.17E-02	1.16E-02	1.52E-03	3.14E-03	---

Notes for TF34-GE-100A Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing* Volumes I-III March *1999,* IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"---" Indicates No Data Available

ND – Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA – Compound detected was less than the ambient air concentration resulting in a negative emission factor when the ambient air concentration was removed.

Table 2-10. VOC and HAP Emission Factors for Select Engines

TF39-GE-1C

Power Setting			Idle	Approach	Intermediate	Military	---
Fuel Flowrate (lb/hr)			1448	10477	12541	13862	---
Percent Thrust/hp			7%	76%	87%	94%	---
Compound Name	**CAS Number**	**HAP**	**Emission Factors (lb/1000lb fuel burned)**				
Acetaldehyde	75-07-0	X	2.12E-01	3.16E-03	2.61E-04	6.17E-04	---
Acrolein	107-02-8	X	2.06E-01	ND	ND	ND	---
Benzaldehyde	100-52-7		1.42E-01	1.15E-03	1.88E-03	1.70E-03	---
Benzene	71-43-2	X	3.58E-01	1.56E-03	1.41E-03	2.16E-03	---
1,3-Butadiene	106-99-0	X	---	---	---	---	---
2-Butanone (MEK)	78-93-3		2.59E-02	ND	1.16E-03	2.46E-04	---
Crotonaldehyde	4170-30-3		8.77E-02	ND	ND	ND	---
Ethylbenzene	100-41-4	X	2.01E-02	ND	4.99E-04	AA	---
Formaldehyde	50-00-0	X	1.42E+00	8.15E-03	4.90E-03	1.05E-02	---
Hexanal	66-25-1		ND	ND	ND	ND	---
Naphthalene	91-20-3	X	9.74E-02	AA	AA	AA	---
Phenol	108-95-2	X	4.38E-02	ND	ND	ND	---
Propanal	123-38-6	X	---	---	---	---	---
Styrene	100-42-5	X	4.49E-02	ND	ND	6.94E-04	---
Toluene	108-88-3	X	1.28E-01	AA	AA	AA	---
Xylenes (mixed isomers)	1330-20-7	X	5.82E-02	9.26E-04	2.58E-03	AA	---

Notes for TF39-GE-1C Engine:

SOURCE: *Aircraft Engine and APU Emissions Testing Volumes I-III March 1999,* IERA-RS-BR-TR-1999-0006

"X" Indicates that compound is a HAP.

"---" Indicates No Data Available

ND – Compound not detected at the detection limit. Compound may be present at a value less than the detection limit.

AA – Compound detected was less than the ambient air concentration resulting in a negative emission factor when the ambient air concentration was removed.

2511 **Table 2-11. HAP Mass Fractions in Aircraft Engine Exhaust**

Compound Name	CAS	Mass Fraction
Acetaldehyde	75-07-0	0.04272
Acrolein	107-02-8	0.02449
Benzene	71-43-2	0.01681
1,3-Butadiene	106-99-0	0.01687
Ethylbenzene	100-41-4	0.00174
Formaldehyde	50-00-0	0.1231
Isopropylbenzene	98-82-8	0.00003
Methanol	67-56-1	0.01805
1-Methylnaphthalene	90-12-0	0.00247
2-Methylnaphthalene	91-57-6	0.00206
Naphthalene	91-20-3	0.00541
Phenol	108-95-2	0.00726
Propionaldehyde	123-38-6	0.00727
Styrene	100-42-5	0.00309
Toluene	108-88-3	0.00642
Xylenes - Mixed isomers	1330-20-7	0.00448

2512
2513 SOURCE: Recommended Best Practice for Quantifying Speciated Organic
2514 Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and
2515 Turboprop Engines, FAA, 2009
2516

2517 **Table 2-12. Criteria Pollutant and GHG Emission Factors for APUs**

APU Model	Manufacturer	Emission Factors in lb/hr of Operation						
		NO_X	CO	VOC	SO_X [a]	PM_{10}	$PM_{2.5}$	CO_2e [b]
4501687C[c]	Hamilton Sundstrand	1.38	1.07	0.01	0.23	---	---	740.44
GTC 85-72 (200 hp)[d]	Honeywell Inc.	0.81	3.11	0.03	0.23	---	---	674.49
GTCP 30-300	Honeywell Inc.	2.85	---	0.06	0.30	---	---	---
GTCP 36-6[e]	Honeywell Inc.	0.87	1.41	0.06	0.16	---	---	---
GTCP 36-50	Honeywell Inc.	4.25	11.65	0.05	0.15	---	---	---
GTCP 36-300 (80 hp)	Honeywell Inc.	2.85	0.58 [f]	0.06	0.30	---	---	---
GTCP 85 (200 hp)	Honeywell Inc.	1.12	---	0.24	0.25	---	---	---
GTCP 85-98ck (200 hp)	Honeywell Inc.	1.12	4.23 [f]	0.24	0.25	---	---	---
GTCP 85-98d	Honeywell Inc.	1.78	1.64	0.04	0.32	---	---	---
GTCP 85-129 (200 hp)	Honeywell Inc.	1.12	4.23 [g]	0.24	0.25	---	---	---
GTCP 85-129ck (200 hp)	Honeywell Inc.	1.12	4.23 [g]	0.24	0.25	---	---	---
GTCP 85-180[g]	Honeywell Inc.	1.28	2.05	0.01	0.29	0.05	0.01	906.25
GTCP 95-2 (300 hp)[d]	Honeywell Inc.	1.65	0.94	0.11	0.31	---	---	948.89
GTCP 100-54 (400 hp)[d]	Honeywell Inc.	2.46	2.43	0.07	0.44	---	---	1337.86
GTCP 165-1[g]	Honeywell Inc.	1.22	3.76	0.49	0.29	0.13	0.04	910.75
GTCP 331-200/250 (143 hp)	Honeywell Inc.	2.55	---	0.12	0.29	---	---	---
GTCP 331-200ER (143 hp)	Honeywell Inc.	2.55	1.11 [f]	0.12	0.29	---	---	---
GTCP 331-500 (143 hp)	Honeywell Inc.	7.86	0.05 [f]	0.07	0.58	---	---	---
GTCP 660-4 (300 hp)	Honeywell Inc.	4.60	7.46 [f]	0.24	0.93	---	---	---
PW901A	Pratt & Whitney	2.72	14.48 [f]	1.29	0.93	---	---	---
ST-6[h]	United Technologies Corporation	3.92	0.02	0.01	0.47	---	---	---
T-62T-27 (100 hp)[d]	United Technologies Corporation	0.40	4.36	0.79	0.11	---	---	344.76
T-62T-47C1[i]	United Technologies Corporation	1.01	9.46	0.04	0.25	---	---	---
TSCP 700 (142 hp)	Honeywell Inc.	2.77	---	0.08	0.35	---	---	---
TSCP 700-4B (142 hp)	Honeywell Inc.	2.77	0.48 [f]	0.08	0.35	---	---	---
WR27-1[d]	Williams International	0.65	0.79	0.03	0.15	---	---	444.77

2518
2519 Notes for Table 2-12 on following page
2520
2521

Notes for Table 2-12:

SOURCE (unless otherwise stated): Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation memorandum. This document states the original source as Proposed Federal Implementation Plan for California, Docket No. A-94-09 memorandum.

a. SO_X Emission factors assume that JP-8, with an average wt. % of 0.054 Sulfur, is used to power the APU.

b. Greenhouse Gas (GHG) emission factors are presented in equivalent CO_2 (CO_2e). Original source document provided emission factors for CO_2 and CH_4. CH_4 emissions were then multiplied by the global warming potential (GWP) which is stated as 25 per Table A-1 to Subpart A of 40 CFR 98.

c. SOURCE: Emission factors for this unit calculated using collected field data

d. SOURCE: Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines, June 1990.

e. SOURCE: *Air Pollutant Emission Factors for Military and Civil Aircraft*, October 1978.

f. SOURCE: Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation memorandum. This document states the original source as United Air Lines' APU Emissions Database (note: data for LAX 1991)

g. SOURCE: Aircraft Engine and Auxiliary Power Unit Emissions Testing Volume I -III, March 1999

h. SOURCE: Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation memorandum. This document states the original source as AIA Exhaust Emissions Data Sheet letter

"---" Indicates No Data Available

2.9 References

AESO 1990, "Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines," Aircraft Environmental Support Office (AESO), June 1990

AFCCC, "Atmospheric Mixing Heights," Air Force Combat Climatology Center (AFCCC)

AFESC 1985, "Aircraft Engine Emissions Estimator," AFESC, September 1985.

AFESC 1987, "Aircraft Emissions Characterization: TF41-A2, TF30-P-103, and TF30-P109 Engines," AFESC, December 1987.

AFR 2013, "www.afreserve.com," Air Force Reserve, accessed 2013

Airbus 2013, "www.airbus.com," Airbus, accessed 2013

Boeing 2013, "www.boeing.com," Boeing, accessed 2013

DLA 2006, "Petroleum Quality Information System Fuels Data." Defense Logistics Agency, Defense Energy Support Center, April 2006

Doc. A-94-09, "Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation memorandum," Proposed Federal Implementation Plan for California, Docket No. A-94-09 memorandum

Dorr 2002, Dorr, Robert F, "Air Force One," MBI Publishing Company

FAA 1995, "Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation," Federal Aviation Administration, September 1995

FAA 2000, "Consideration of Air Quality Impacts of Airplane Operations at or Above 3000 Feet AGL (FAA-AEE-00-01)," U.S. Department of Transportation, Federal Aviation Administration, September 2000

FAA 2007, "Emissions Dispersion and Modeling System, Version 5.0.2," U.S. Department of Transportation, Federal Aviation Administration, June 2007

FAA 2009, "Recommended Best Practice for Qualifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines," Federal Aviation Administration Office of Environment and Energy and the U.S. Environmental Protection Agency Office of Transportation & Air Quality, May 2009

FBO 2013, "www.fbo.gov," The Federal Business Opportunities, accessed 2013

GEA 2013, "www.geaviation.com," General Electric Aviation, accessed 2013

ICAO 2011, Document 9889, "Airport Air Quality Manual," International Civil Aviation Organization (ICAO)

NMAF 2013, "www.nationalmuseum.af.mil," National Museum of the Air Force, accessed 2013

PW 2013, "www.pw.utc.com," Pratt & Whitney, accessed 2013

SNASM 2013, "www.airandspace.si.edu," Smithsonian National Air and Space Museum, accessed 2013

Tupolev 2013, "www.tupolev.ru/english/", Tupolev, accessed 2013

United 1991, "Technical Data to Support FAA's Advisory Circular on Reducing Emissions from Commercial Aviation memorandum," United Air Lines' APU Emissions Database, data for LAX 1991

USAF 1985, "Aircraft Engine Emissions Estimator," United States Air Force, November 1985

USAF 1996a, "Engine and Hush House Emissions from a TF30-P-109 Jet Engine Tested at Canon AFB, NM," United States Air Force, June 1996

USAF 1996b, "Engine and Hush House Emissions from a F100-PW-100 Jet Engine Tested at Langley Air Force Base, VA," United States Air Force, November 1996

USAF 1997, "Engine and Hush House Emissions from a F100-PW-200 Jet Engine Tested at Kelly Air Force Base, TX," United States Air Force, February 1997

USAF 1998, "Aircraft Emissions Characterization," March 1998

USAF 2002a, "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations, IERA/RSEQ, IERA-RS-BR-SR-2001-0010," January 2002 (Revised December 2003)

USAF 2002b, "Aircraft Engine and Auxiliary Power Unit Emissions Testing Final Report Addendum - F119-PW-100 Engine Emissions Testing Report, IERA-RS-BR-TR-2002-0006," United States Air Force, June 2002

USAF 2002c, "Aircraft Engine and Auxiliary Power Unit Emissions Characterization Study, IERA-RS-BR-TR-1999-0006," United States Air Force

USAF 2002d, Clean Air Act Emission Testing of the T-38C Aircraft Engines, IERA-RS-BR-SR-2003-001, United States Air Force. September 2002

USAF 2002e, "Emissions Measurement Program Summary, IERA-RS-BR-SR-2003-0003," United States Air Force. September 2002

USAF 2002f, "Flightline Emission Factors - Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment, IERA-RS-BR-SR-2005-0001," United States Air Force, October 2002 (updated December 2004)

USAF 2002g, "PT6A-68 Emissions Measurement Program Study, IERA-RS-BR-SR-2003-0003," United States Air Force. September 2002

USAF 2007, "Air Force Alternative Fuels Program, AFRL/WS/06-0078, 22nd Annual UC Symposium on Aviation Noise and Air Quality," United States Air Force, March 2007

USAF 2009, "Air Emissions Factor Guide to Air Force Mobile Sources," United States Air Force, December 2009

USAF 2013, "www.af.mil," US Air Force Fact Sheets, accessed 2013

USDoD 2004 "Model Designation of Military Aerospace Vehicles," U.S. Department of Defense (USDoD), May 2004

USEPA 1971, "Collection and Assessment of Aircraft Emissions," U.S. Environmental Protection Agency, October 1971

USEPA 1978, Air Pollutant Emission Factors for Military and Civil Aircraft, EPA-450/3-78-117, U.S. Environmental Protection Agency, October 1978

USEPA 1980, Compilation of Air Pollutant Emission Factors - Volume II: Mobile Sources (AP-42, Volume II), U.S. Environmental Protection Agency, February 1980.

USEPA 1992, Procedures for Emission Inventory Preparation - Volume IV: Mobile Sources, Chapter 5, EPA420-R-92-009, U.S. Environmental Protection Agency, December 1992

USEPA 1999, "Aircraft Engine and Auxiliary Power Unit Emissions Volumes I-III (IERA-RS-BR-TR-1999-0006)," United States Environmental Protection Agency, March 1999.

USEPA 2012, "National Environmental Policy ACT (NEPA) Facilitation Report," United States Environmental Protection Agency, April 2012

USN 2013, "www.navy.mil," US Navy fact sheets, accessed 2013

This page intentionally left blank.

3.0 FLIGHTLINE GROUND SUPPORT EQUIPMENT (AGE)

3.1 Introduction

Most USAF bases operate a variety of Ground Support Equipment (GSE) or Aerospace Ground Equipment (AGE) to support flightline operations and service aircraft. Emissions from AGE or GSE vary by device type, time of operation, and fuel flow rate. For simplicity, both GSE and AGE are generically referred to as GSE in this section. Common examples of military GSE include generators, air conditioners, start carts, heaters, hydraulic test stands, portable light units, air compressors, cargo and bomb lifts, jacking units, aircraft deicers, tractors tugs, and other service equipment. GSE are designed to be mobile so that they can be used at any number of locations on the flightline and can be easily transported to support readiness and deployment activities around the world. Depending on whether the GSE is designed to be self-propelled, it can be categorized as either vehicular or non-vehicular in nature. Although essentially non-road engines, this section addresses emissions from flightline GSE only. Other non-road engines and equipment are addressed separately in this document in the NONROAD ENGINES AND EQUIPMENT (NRDE) chapter. Emissions of concern from the operation of GSE include the criteria pollutants and several HAPs that are commonly associated with fuel combustion processes (including, but not limited to: benzene, naphthalene, and 1,3-butadiene).

GSE operated on a USAF installation are powered by internal combustion engines fueled by JP-8, diesel fuel, motor gasoline (MOGAS), Compressed Natural Gas (CNG), or Liquefied Petroleum Gas (LPG). The process in which fuel ignition occurs in the engine determines whether GSE is categorized as Compression Ignition (CI) or Spark Ignition (SI) in nature. CI GSE include turbine engines fueled with JP-8, and non-turbine engines fueled with diesel. SI GSE may be fueled with MOGAS, CNG, or LPG.

Individual pollutant emissions from each type of GSE are usually calculated using operating time and/or fuel consumption information applied across an operational parameter such as an LTO cycle or over an inventory period (typically one year). Military aircraft and GSE combinations and their associated EF data are provided in Table 3-2. This information was obtained from a survey developed and distributed by Air Force Institute for Operational Health (AFIOH/RSEQ) to various flight squadrons and AGE shops throughout the USAF (Wade 2004). **These aircraft-GSE combinations are provided as a guideline though do not necessarily reflect all potential combinations.** In instances where military GSE information was unavailable, data was obtained from the FAA Emissions and Dispersion Modeling System (EDMS). Common, non-model specific GSE data from EDMS are provided in Table 3-5.

While most USAF GSE is intended to be mobile by design, there may be instances where the regular use of the equipment results in it not being moved at least once in a 12-month

period. Where the GSE is not physically moved during a 12-month consecutive period, or where it is replaced in the same location, by GSE, then the GSE is deemed a stationary source by regulation and must be reviewed for stationary permit requirements. If an air program manager is uncertain whether a piece of GSE should be considered mobile or stationary for regulatory purposes, he/she should coordinate with their Major Command for assistance and consider consulting with the Air Force Regional Environmental Offices to obtain their insight on state-specific requirements as they may apply to GSE.

3.2 Emission Factors

EFs for flightline GSE have been developed through measurement and testing and are provided in a variety of sources. EFs may be model-specific and provided in units of pounds per hour (lb/hr) as provided in Table 3-3, based on the GSE and fuel type as shown in Table 3-6. For equipment that use either diesel or JP-8, the High Heat Value (HHV) of diesel was used for unit conversions where necessary, since the HHV for diesel is higher than JP-8 and conversion results in conservative estimates. EFs are selected based on the calculation method as described in the next section.

3.3 Emissions Calculation

Information commonly collected and used to calculate emissions from GSE operations include the type and model of equipment, the operating time, type and volume of fuel consumed, and engine operating load and rated power. There are multiple methods used for calculation of emissions, depending on the available information.

3.3.1 Sortie/LTO Method (Preferred Method)

The Sortie/LTO Method is the Air Force's default method and should be used for all GSE that are included in Table 3-2 and Table 3-3. This method involves applying an EF to the operating time of each GSE during a set period (e.g., an aircraft sortie or LTO cycle, annually, or another inventory period). Emissions using this method are calculated as follows:

$$\boldsymbol{E(Pol) = OT \times EF(Pol) \times N}$$

Equation 3-1

Where,

E(Pol) = Emission of each individual pollutant for each piece of GSE (lb/yr)
EF(Pol) = Emission factor of each pollutant (lb/hr)
OT = Operating time of GSE per sortie (hr/sortie)
N = Number of sorties per year (sortie/yr)

The EFs and operating times for calculating emissions for GSE using the sortie/LTO method may be found in the following tables:

- Operating times per LTO for each GSE and associated aircraft are in Table 3-2.
- EFs for each GSE are found in Table 3-3.

3.3.2 Horsepower/Load Factor Method

The horsepower/load factor method is an alternative method for emissions calculations using the engine's rated hp and typical load factor. The load factor is defined as the ratio of the power an engine draws while in operation to its rated power. To calculate emissions using this method, the rated horsepower, load factor, and operating time for each GSE must be known. Emissions from common, non-model specific GSE may be calculated using the data provided in Table 3-5 and Table 3-6. The following general equation is used:

$$E(Pol) = OT \times \frac{LF}{100} \times hp_{rtd} \times \frac{1}{1000} \times EF(Pol) \times N$$

Equation 3-2

Where,

E(Pol) = Emissions of each individual pollutant (lb/yr)
OT = Operating time (hr/unit)
LF = Load factor (%)
100 = Factor for converting percent to a fraction (%)
hp_{rtd} = Engine rated hp (hp)
1000 = Factor converting from hp to 10^3 hp (hp/10^3 hp)
EF(Pol) = Emission factor of each pollutant (lb/10^3 hp-hr)
N = Number of ground support equipment used each year (units/yr)

Assuming a load factor of 100% will result in conservative emissions estimates. However, Table 3-5 does provide average operating loads for the many common GSE types. Alternatively, the load factor may be calculated according to the following equation if the engine horsepower and horsepower under load are known:

$$LF = \frac{hp}{hp_{rtd}}$$

Equation 3-3

Where,

hp = Engine horsepower under load (hp)

The EFs and operating times for common GSE needed to calculate emissions using the horsepower/load factor method may be found in the following tables.

- The typical commercial GSE assignments are given in Table 3-4.
- Table 3-5 provides the average rated hp for each GSE.
- EFs for common GSE are provided in a lb/10^3 hp-hr basis in Table 3-6.
- Table 3-7 provides EFs for several speciated HAPs for uncontrolled diesel reciprocating internal combustion engines.

3.3.3 Fuel Consumption Method

Another method that can be used to calculate GSE emissions involves multiplying the volume of fuel consumed by an EF that is provided in terms of a mass of pollutant emitted per volume of fuel consumed such as lb/hr or gal/hr. As with the horsepower/load factor method, the fuel consumption method also requires that the user know the operating time for each GSE. The following equation can be used as an alternative method of calculating GSE HAP emissions based exclusively on fuel consumption data:

$$\boldsymbol{E(Pol) = FC \times \frac{1}{1000} \times EF(Pol) \times N}$$

Equation 3-4

Where,

FC = Fuel consumption (gal/unit)

In cases where fuel consumption data is unknown, fuel consumption may be estimated using the operating time and fuel flow rate as shown:

$$\boldsymbol{FC = OT \times FFR}$$

Equation 3-5

Where,

FFR = Fuel flow rate. This may be available from the manufacturer (gal/hr)

Alternatively, fuel consumption may also be estimated using engine and operating parameters including hp (if known), hours of operation, brake-specific-fuel consumption (BSFC) factor, and the heating value of the fuel. The following equation is used:

$$\boldsymbol{FC = OT \times \frac{(hp \times BSFC)}{HV}}$$

Equation 3-6

Where,

BSFC = Brake specific fuel consumption (Btu/hp-hr). **Given in Table 3-1.**

HV = Heating value of the fuel (Btu/gal). **Given in Table 3-1.**

To calculate GSE emissions using the fuel consumption method, the following tables are used:

- Table 3-5 provides typical hp for common GSE.
- Table 3-7 provides the EPAs EFs for HAPs from uncontrolled diesel reciprocating internal combustion engines.

3.3.4 Calculating SO_2 Emissions

A more precise method for estimating SO_2 emissions involves applying fuel flow rate data to derive an SO_2 EF based on pounds of pollutant emitted per hour of operation (lb/hr). There is a conservative assumption that all the sulfur in the fuel is converted to SO_2 during the combustion process. Under this assumption, and with the density and sulfur content values known, an SO_2 EF is calculated using the following equation:

$$\boldsymbol{EF(SO_2) = FFR \times \rho \times \frac{S}{100} \times 2}$$

Equation 3-7

Where,

$EF(SO_2)$ = SO_2 emission factor (lb/hr)

ρ = Density of fuel (lb/gal)

S = Weight percent sulfur content of fuel (%)

100 = Factor for converting a percent to a fraction (%)

2 = Conversion factor which is the ratio of the molecular weight of SO_2 to the molecular weight of S

The value for S typically varies from supplier to supplier and the geographic location where the fuel is produced. For enhanced accuracy of the emissions inventory, the sulfur content and density of the fuel should be obtained from the fuel supplier whenever possible. In the absence of such information, the average density and sulfur content is listed in Table 3-1. The sulfur content of JP-8 varies by region, so if the region-specific sulfur content is required, then refer to Table 2-2.

Table 3-1. Fuel Data

Fuel Type	Heating Value (Btu/unit fuel) [a]	BSFC (Btu/hp-hr) [b]	Density (lb/gal) [c]	Sulfur Content (wt. %) [c]
Diesel	138,000 Btu/gal	8,089	7.14	0.025
MOGAS	125,000 Btu/gal	7,000	6.15	0.018
JP-8	124,000 Btu/gal [d]	---	6.71 [e]	0.054 [e]
LPG	92,000 Btu/gal	10,577 [f]	4.41	Negligible
CNG	1,026 Btu/ft^3	7,858	0.046	0.001

a. SOURCE (Unless otherwise noted): Table C-1 to Subpart C of 40 CFR 98.
b. SOURCE (Unless otherwise noted): *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry,* American Petroleum Institute, 2009.
c. SOURCE (Unless otherwise noted): Department of Energy, Energy Information Administration report DOE/EIA-0464/ (2005), *Household Vehicles Energy Use: Latest Data & Trends,* Appendix C, Table C4
d. SOURCE: Defense Logistics Agency, Defense Energy Support Center, *Petroleum Quality Information System Fuels Data (2005),* April 2006.
e. SOURCE: *Petroleum Quality Information System Fuels Data.* Defense Logistics Agency, Defense Energy Support Center, 2001 – 2013. Values were calculated as the average weighted average density for years 2001 – 2013.
f. SOURCE: *Exhaust Emission Factors for Nonroad Engine Modeling: Spark Ignition,* EPA420-R-05-019, 2005.
"---" – Indicates no data available.

3.3.5 Calculating Emissions from Synthetic Aviation Fuel

On-going DoD and USAF initiatives to reduce dependency on foreign petroleum sources are expected to result in the increased use of non-petroleum fuels in a 50-50 blend with JP-8. Testing and certification of such fuels in aircraft engines indicate the blend reduces PM emissions by an average of 35%, sulfur emissions by 50%, and CO_2 emissions by 1.8% (USAF Research Laboratory 2007). Accordingly, when collecting information on GSE operations, verify the blend percentage and whether synthetic fuel was used. If a 50-50 blend was used, apply the appropriate emission reduction factors as given in Table 2-1.

3.4 Information Resources

The base AGE shop is responsible for the operation and repair of most pieces of GSE. Therefore, they should be able to provide most, if not all, of the information needed to calculate the emissions from the GSE used on the installation. In the absence of base-specific data, default EPA information can be used. In some cases, it may be necessary to contact the GSE manufacturer to obtain necessary information.

3.5 Example Calculations

The following section provides examples of how to calculate emissions from GSE operations using the various methodologies identified above and their associated equations.

3.5.1 Problem 1 – Sortie/LTO Method

A USAF base needs to calculate annual NO_X and xylene emissions from GSE operations associated with their B-1B aircraft. The following information was obtained from the base:

B-1B Aircraft	
GSE Types	A/M32A-86D Generator, A/M32A-95 Start Cart, B-1B AC unit, MJ-40 Bomb lift, NF-2 Light Cart
Sorties/year	200

Step 1 – Record the operating times and NO_X emission factors for each GSE. Since the table above does not provide specific operating times for these GSE, the typical operating times for these GSE may be used. Table 3-2 lists the operating times for the generator as **2.20 hr**, the start cart as **0.50 hr**, the AC unit as **2.40 hr**, the bomb lift as **2.50 hr**, and the light cart as **0.50 hr**. Table 3-3 has the NO_X EFs as **6.102 lb/hr** for the generator, **1.470 lb/hr** for the start cart, **7.659 lb/hr** for the AC unit, **0.340 lb/hr** for the bomb lift, and **0.110 lb/hr** for the light cart.

Step 2 – Calculate annual NO_X emissions for each GSE. Using the information in the table above, the data collected in Step 1, and Equation 3-1, the NO_X emissions for each GSE are calculated as follows:

$$E(Pol) = OT \times EF(Pol) \times N$$

$$\boldsymbol{E(NO_x)_{A/M32A-86D}} = 2.20\,\frac{\cancel{hr}}{\cancel{sortie}} \times 6.102\,\frac{lb}{\cancel{hr}} \times 200\,\frac{\cancel{sortie}}{yr} = \mathbf{2,684.88}\,\frac{\boldsymbol{lb}}{\boldsymbol{yr}}$$

$$\boldsymbol{E(NO_x)_{A/M32A-95}} = 0.50\,\frac{\cancel{hr}}{\cancel{sortie}} \times 1.470\,\frac{lb}{\cancel{hr}} \times 200\,\frac{\cancel{sortie}}{yr} = \mathbf{147.00}\,\frac{\boldsymbol{lb}}{\boldsymbol{yr}}$$

$$\boldsymbol{E(NO_x)_{B-1B\ AC\ Unit}} = 2.40\,\frac{\cancel{hr}}{\cancel{sortie}} \times 7.659\,\frac{lb}{\cancel{hr}} \times 200\,\frac{\cancel{sortie}}{yr} = \mathbf{3,676.32}\,\frac{\boldsymbol{lb}}{\boldsymbol{yr}}$$

$$\boldsymbol{E(NO_x)_{MJ-40}} = 2.50\,\frac{\cancel{hr}}{\cancel{sortie}} \times 0.340\,\frac{lb}{\cancel{hr}} \times 200\,\frac{\cancel{sortie}}{yr} = \mathbf{170.00}\,\frac{\boldsymbol{lb}}{\boldsymbol{yr}}$$

$$\boldsymbol{E(NO_x)_{NF-2}} = 0.50\,\frac{\cancel{hr}}{\cancel{sortie}} \times 0.110\,\frac{lb}{\cancel{hr}} \times 200\,\frac{\cancel{sortie}}{yr} = \mathbf{11.00}\,\frac{\boldsymbol{lb}}{\boldsymbol{yr}}$$

Step 3 – Calculate total NOx emissions. Sum the emissions from each GSE to get the total NOX emissions for GSE used for the B-1B.

$$E(NO_X)_{Total} = (2684.88 + 147 + 3676.32 + 170 + 11)\frac{lb}{yr}$$

$$\boxed{\boldsymbol{E(NO_X)_{Total} = 6,689.2\frac{lb}{yr}}}$$

Next, calculate xylene emissions.

Step 4 – Record the fuel flow rate for each GSE. Table 3-3 shows that the fuel flow rate is **6.47 gal/hr** for the generator and **17.14 gal/hr** for the AC unit. Since the fuel flow rate of the start cart, bomb lift, and light cart are not provided in the table, surrogates must be selected. Ideally, the best surrogates will be similar GSE types with similar hp. For this example, the A/M32A-86D was selected as a surrogate for the A/M32A-95, the elevator loader was selected for the MJ-40, and the generator light cart was selected for the NF-2 light cart. The fuel flow rates for the surrogate equipment are listed as **6.47 gal/hr** for the A/M32A-86D, **6.29 gal/hr** for the elevator loader, and **0.62 gal/hr** for the generator light cart.

Step 5 – Calculate the fuel consumption for each GSE. Use the operating times and fuel flow rates recorded in Step 1 and Step 4 above and Equation 3-5.

$$FC = OT \times FFR$$

$$\boldsymbol{FC_{A/M32A-86D}} = 2.20\frac{\cancel{hr}}{unit} \times 6.47\frac{gal}{\cancel{hr}} = \boldsymbol{14.23\frac{gal}{unit}}$$

$$\boldsymbol{FC_{A/M32A-95}} = 0.50\frac{\cancel{hr}}{unit} \times 6.47\frac{gal}{\cancel{hr}} = \boldsymbol{3.24\frac{gal}{unit}}$$

$$\boldsymbol{FC_{B-1B\ AC\ Unit}} = 2.40\frac{\cancel{hr}}{unit} \times 17.14\frac{gal}{\cancel{hr}} = \boldsymbol{41.14\frac{gal}{unit}}$$

$$\boldsymbol{FC_{MJ-40}} = 2.50\frac{\cancel{hr}}{unit} \times 6.29\frac{gal}{\cancel{hr}} = \boldsymbol{15.73\frac{gal}{unit}}$$

$$\boldsymbol{FC_{NF-2}} = 0.50\frac{\cancel{hr}}{unit} \times 0.62\frac{gal}{\cancel{hr}} = \boldsymbol{0.31\frac{gal}{unit}}$$

Step 6 – Calculate the total fuel flow rate for GSE. Sum the values calculated in Step 5 as follows:

$$\boldsymbol{FC_{GSE(Total)}} = (14.23 + 3.24 + 41.14 + 15.73 + 0.31)\frac{gal}{unit} = \boldsymbol{74.65\frac{gal}{unit}}$$

Step 7 – Record the xylene emission factor. Table 3-7 lists the total xylenes EF as **3.93E-02 lb/10^3 gal**.

Step 8 – Calculate xylene emissions. With the estimated fuel consumption calculated in Step 6 and the EF data from Step 7, use Equation 3-4 to calculate xylene emissions:

$$E(Pol) = FC \times \frac{1}{1000} \times EF(Pol) \times N$$

$$E(Xylenes) = 74.65 \frac{\cancel{gal}}{\cancel{unit}} \times \frac{1}{1000}\left(\frac{\cancel{10^3 gal}}{\cancel{gal}}\right) \times 0.0393 \frac{lb}{\cancel{10^3 gal}} \times 200 \frac{\cancel{unit}}{yr}$$

$$\boxed{\boldsymbol{E(Xylenes) = 0.587 \frac{lb}{yr}}}$$

3.5.2 Problem 2 – Horsepower/Load Factor Method

A USAF base periodically operates two diesel-powered baggage tractors used to transport the luggage of visiting dignitaries. Using the following information obtained from the base, calculate CO and 1,3-butadiene emissions.

GSE Type – Baggage tractor	
# of GSE	2
Operating Time	15 hr/unit

Step 1 – Record the average rated power and average operating load. This information is provided in Table 3-5. The average rated power is given as **83 hp** and the operating load is shown as **55%**.

Step 2 – Record the emission factors for this GSE for CO and 1,3-butadiene. Table 3-6 gives the EF for CO for diesel baggage tractors as **11.00 lb/10^3 hp-hr**. Table 3-7 lists the EF for 1,3-butadiene as **3.16E-04 lb/10^3 hp-hr**.

Step 3 – Calculate CO and 1,3-butadiene emissions. Use the data collected in Step 1 and Step 2 with Equation 3-2 to calculate the CO and 1,3-butadiene emissions:

$$E(Pol) = OT \times \frac{LF}{100} \times hp_{rtd} \times \frac{1}{1000} \times EF(Pol) \times N$$

For CO:

$$E(CO)_{Baggage} = 15 \frac{\cancel{hr}}{\cancel{unit}} \times \frac{55\%}{100\%} \times 83 \cancel{hp} \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 11.00 \frac{lb}{\cancel{10^3 hp - hr}} \times 2 \frac{\cancel{unit}}{yr}$$

$$\boxed{E(CO)_{Baggage} = 15.06\,\frac{lb}{yr}}$$

For 1,3-Butadiene:

$$E(1{,}3-Butadiene)_{Baggage} = 15\,\frac{\cancel{hr}}{\cancel{unit}} \times \frac{55\%}{100\%} \times 83\cancel{hp} \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 0.000316\,\frac{lb}{\cancel{10^3 hp-hr}} \times 2\,\frac{\cancel{unit}}{yr}$$

$$\boxed{E(1,3-Butadiene)_{Baggage} = 4.33E-04\,\frac{lb}{yr}}$$

3.5.3 Problem 3 – Fuel Consumption Method

A USAF base wants to estimate total toluene emissions for the previous year resulting from the operation of air start units using JP-8. The following information was obtained from the base:

GSE Type – Air Start Units	
GSE Model	A/M32A-95
# of GSE	35
Fuel Consumption	5,000 gal/unit

Step 1 – Record the toluene emission factor. Table 3-7 provides HAP speciation for diesel-fired engines. This table lists the toluene EF as **5.64E-02 lb/10^3 gal**.

Step 2 – Calculate the toluene emissions. Use the EF in Step 1, the data from the table above, and Equation 3-4.

$$E(Pol) = FC \times \frac{1}{1000} \times EF(Pol) \times N$$

$$E(Toluene) = 5000\,\frac{\cancel{gal}}{\cancel{unit}} \times \frac{1}{1000}\left(\frac{\cancel{10^3 gal}}{\cancel{gal}}\right) \times 0.0564\,\frac{lb}{\cancel{10^3 gal}} \times 35\,\frac{\cancel{unit}}{yr}$$

$$\boxed{E(Toluene) = 9.87\,\frac{lb}{yr}}$$

3.5.4 Problem 4 – Estimating SO_2 Emissions

A USAF base has been asked to estimate SO_2 emissions from the operation of its GSE. The following information was obtained from the base:

Equipment Data – GSE	
# of GSE	40
Fuel	JP-8
Fuel Flow Rate	18 gal/hr
Operating time	2 hours

Calculate SO_2 emissions for the AFB which is in the East Central United States.

Step 1 – Record the density and sulfur content of JP-8. Table 3-1 lists the density of JP-8 as **6.71 lb/gal**. Though Table 3-1 also provides the sulfur content, since it is known that the AFB is in the East Central portion of the United States, a more accurate value given in Table 2-2 of Chapter 2 in this document states the sulfur content of JP-8 in that particular region as **0.067%**.

Step 2 – Calculate the SO_2 emission factor. This is accomplished by using Equation 3-7.

$$EF(SO_2) = FFR \times \rho \times \frac{S}{100} \times 2$$

$$\boldsymbol{EF(SO_2) = 18\frac{\cancel{gal}}{hr} \times 6.71\frac{lb}{\cancel{gal}} \times \frac{0.067\cancel{\%}}{100\%} \times 2 = 0.162\frac{lb}{hr}}$$

Step 3 – Calculate SO_2 emissions. Use the EF calculated in Step 2 and Equation 3-1.

$$E(Pol) = OT \times EF(Pol) \times N$$

$$E(SO_2) = 2\frac{\cancel{hr}}{\cancel{unit}} \times 0.162\frac{lb}{\cancel{hr}} \times 40\frac{\cancel{unit}}{yr}$$

$$\boxed{\boldsymbol{E(SO_2) = 12.96\frac{lb}{yr}}}$$

Table 3-2. Military Aircraft and GSE Assignments

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
A-3A, -3B	**See Generic 2**		
A-4, -4C, -4E, -4F, -4L, -4M	**See Generic 2**		
A-6A, -6B, -6C, -6E, -6F	**See Generic 2**		
A-7A, -7B, -7C, -7D, -7E, -7K	**See Generic 2**		
A-10, -10A, -10C	Generator Set	A/M32A-86D	1.00
	Start Cart	A/M32A-60A	1.00
		A/M32A-95	1.00
	Heater	1H1	2.00
	Hydraulic Test Stand	MJ-2A	2.00
	Light Cart	FL-1D **(S)**	2.00
		NF-2	2.00
	Air Compressor	MC-1A	2.00
		MC-2A **(S)**	1.00
	Bomb Lift	MJ-1B[(a)]	1.00 - 8.00
A-37	**See Generic 2**		
AC-130A, -130H, -130U, -130W	**See C-130A**		
AH-1G, -1J	**See Generic 4**		
AH-64A	**See Generic 4**		
AT-38B	**See T-38**		
AU-24	**See Generic 2**		
B-1A, -1B	Generator Set	A/M32A-86D	2.20
	Start Cart	A/M32A-95	0.50
	Heater/Air Conditioner	B-1B Heater/Air Conditioner	2.40
	Heater	H1	4.00
	Light Cart	FL-1D **(S)**	0.50
		NF-2	0.50
	Bomb Lift	MJ-40	2.50
B-2A	Generator Set	A/M32A-86D	3.00
	Start Cart	A/M32A-60A	2.00
		A/M32A-95	2.00
	Air Conditioner	Ace 401	12.00
		PD501	12.00
	Heater	H1	2.00
	Hydraulic Test Stand	MJ-2/TTU-228	1.00
		MJ-2/TTU-229	1.50
		A/M27T-13	4.00
	Light Cart	NF-2	4.00
		FL-1D **(S)**	4.00
	Air Compressor	MC-1A	1.50
		MC-6 **(S)**	5.00
		MC-7	1.50
	Bomb Lift	MJ-40	2.00
B-52D, -52G, -52H	Generator Set	A/M32A-86D	4.00
	Start Cart	A/M32A-95	1.00
	Air Conditioner	MA-3D	1.00
	Light Cart	NF-2	1.00
	Air Compressor	MC-1A	1.00
	Bomb Lift	MJ-1B	2.00
C-1, -1A	**See Generic 1**		
C-2, -2A	**See Generic 4**		

2973 **Table 3-2. Military Aircraft and GSE Assignments**

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
C-5A, -5B, -5C, -5M	Generator Set	A/M32A-86D	13.00
	Start Cart	A/M32A-95	2.00
	Air Conditioner	MA-3D	3.00 - 12.00
	Heater	H1	9.00
		BT400-46HT	10.00
	Hydraulic Test Stand	MJ-1-1[(a)]	1.00
		M32T1 **(S)**	1.00
		MJ-2A	1.00
	Light Cart	NF-2	16.00
	Air Compressor	MC-2A **(S)**	16.00
		MC-1A	7.00
		MC-7	2.00
	Pumping Unit	AF/M27M-1[(a)]	3.00
C-9, -9A, -9B, -9C	Generator Set	A/M32A-86D	6.00
	Start Cart	A/M32A-95	0.50
	Air Conditioner	MA-3D	6.00
	Heater	H1	6.00
	Light Cart	NF-2	12.00
	Air Compressor	MC-2A **(S)**	2.00
		MC-1A	0.50
		MC-7	2.00
C-11A	**See Generic 1**		
C-12, -12A, -12C, -12D, -12F, -12J, -12L, -12R, -12S, -12T, -12U	Generator Set	A/M32A-86D	0.75
C-17A	Generator Set	A/M32A-86D	2.00
	Start Cart	A/M32A-95	2.00
	Air Conditioner	MA-3D	1.50
	Heater	BT400-46	1.50
		H1	1.50
	Light Cart	NF-2	1.50
	Air Compressor	MC-1A	0.66
		MC-2A **(S)**	0.66
		MC-7	0.66
	Pumping Unit	AF/M27M-1	0.50
	Bomb Lift	MJ-1B	1.50
C-18B	**See Generic 1**		
C-20A, -20B, -20C, -20D, -20E, -20F, -20G, -20H, -20J	Generator Set	A/M32A-86D	5.50
	Air Conditioner	Ace 802-329S[(a)]	1.00
		MA-3D	1.00
	Heater	1H1	3.00
	Light Cart	FL-1D **(S)**	6.00
	Air Compressor	MC-2A **(S)**	0.50
		MC-5	0.50
		MC-7	2.00
		MC-8	3.00
C-21A	**See Generic 1**		
C-22A, -22B	Generator Set	A/M32A-86D	1.50
	Start Cart	A/M32A-60A[(a)]	0.25
	Heater	H1	0.25
	Light Cart	NF-2	0.25
	Air Compressor	MC-1A	0.25
		MC-7	0.25
	Pumping Unit	AF/M27M-1	0.25
C-23A, -23B, -23C	**See Generic 1**		
C-26A, -26B, -26C	**See Generic 1**		

2974

Table 3-2. Military Aircraft and GSE Assignments

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
C-27J	**See Generic 1**		
C-28A	**See Generic 1**		
C-32A	Generator Set	A/M32A-86D	6.00
C-37A	**See Generic 1**		
C-38	**See Generic 1**		
C-40A, -40B, -40C	**See Generic 1**		
C-123K	**See Generic 1**		
C-130A, -130B, -130D, -130E, -130F, -130H, -130J, -130T	Generator Set	A/M32A-86D	4.00 - 11.00
		Trielectron D200T 400	3.00
	Start Cart	MA-1A **(S)**	0.25
		A/M32A-60A	0.25
		A/M32A-95	0.25
	Air Conditioner	Ace 802-993 **(S)**	1.00
		MA-3D	1.00
	Heater	H1	1.00
	Hydraulic Test Stand	MJ-2A[(a)]	3.00
	Light Cart	NF-2	2.00 - 10.00
	Air Compressor	MC-1A	0.50 - 10.00
		MC-2A **(S)**	0.50 - 10.00
C-135A, -135B, -135C, -135E	Generator Set	A/M32A-86D	10.00
	Start Cart	A/M32A-60A	1.00
		A/M32A-95	0.10
	Air Conditioner	Ace 802-993 **(S)**	10.00
		MA-3C **(S)**	2.00
	Heater	H1	4.00
		1H1	5.00
	Light Cart	NF-2	2.00
	Air Compressor	MC-1A	0.33
C-137B, -137C	**See Generic 1**		
C-140A, -140B	**See Generic 1**		
C-141, -141A, -141B, -141C	Generator Set	A/M32A-86D	0.50
	Start Cart	MD-3 **(S)**	0.10
		A/M32A-60A	0.50
	Heater	H1	0.40
	Hydraulic Test Stand	TTU-228E **(S)**	0.10
		M32T1 **(S)**	0.10
	Light Cart	NF-2	0.50
	Air Compressor	MC-1A	0.10
		MC-2A **(S)**	0.10
CH-3B, -3E	**See Generic 4**		
CH-46, -46A, -46E	**See Generic 4**		
CH-53A, -53D	**See Generic 4**		
CT-1B	**See Generic 1**		
CT-39A, -39E, -39G	**See Generic 1**		
CT-43A	**See T-43A**		
CT-49A	**See Generic 1**		
CV-22, -22A	**See Generic 1**		
DC-130A	**See C-130A**		
E-1B	**See Generic 1**		
E-2, -2B, -2C, -2D	**See Generic 1**		
E-3A, -3B, -3C	**See Generic 1**		
E-4A, -4B	**See Generic 1**		
E-6B	**See Generic 1**		
E-8C	**See Generic 1**		
EA-3B	**See Generic 1**		

2977 **Table 3-2. Military Aircraft and GSE Assignments**

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
EA-4F	**See Generic 1**		
EA-6A, -6B	**See Generic 1**		
EA-7L	**See Generic 1**		
EB-57B	**See Generic 1**		
EC-18B, -18D	**See Generic 1**		
EC-24A	**See Generic 1**		
EC-130E, -130H, -130J, -130SJ, -130V	**See C-130A**		
EC-135A, -135B, -135C, -135E, -135G, -135H, -135J, -135K, -135L, -135N, -135P, -135Y	**See C-135A**		
EC-137D	**See Generic 1**		
EF-4J	**See Generic 2**		
EF-111A	**See Generic 2**		
EH-1H, -1X	**See Generic 4**		
EH-60A	**See Generic 4**		
EKA-3B	**See Generic 1**		
EP-3B, -3J	**See Generic 1**		
ERA-3B	**See Generic 2**		
ES-2D	**See Generic 1**		
F-4, -4B, -4C, -4D, -4E, -4G, -4J, -4N, -4S	**See Generic 2**		
F-5A, -5B, -5E, -5F	**See Generic 2**		
F-8, -8J	**See Generic 2**		
F-14A, -14B, -14C, -14D	**See Generic 2**		
F-15A, -15B, -15C, -15D, -15E	Generator Set	A/M32A-86D	0.33
	Start Cart	A/M32A-60A	0.33
		A/M32A-95	0.33
	Heater	H1	0.50
	Hydraulic Test Stand	MJ-1-1	0.50
		MJ-2/TTU-228	0.50
	Light Cart	NF-2	1.00 - 8.00
	Air Compressor	MC-1A	0.33
		MC-2A **(S)**	0.25
		MC-11 **(S)**	2.00
	Bomb Lift	MJ-1B	1.00
F-16, -16A, -16B, -16C, -16D, -16N	Generator Set	A/M32A-86D	0.33
	Start Cart	A/M32A-60A	0.33
		A/M32A-95	0.33
	Heater	H1	0.50
	Hydraulic Test Stand	MJ-1-1	0.50
		MJ-2/TTU-228	0.50
	Light Cart	NF-2	1.00 - 8.00
	Air Compressor	MC-1A	0.33
		MC-2A **(S)**	0.25
		MC-11 **(S)**	2.00
	Bomb Lift	MJ-1B	1.00
F-22A, -22B	**See Generic 2**		
F-35A, -35B, -35C	**See Generic 2**		
F-100	**See Generic 2**		
F-106A, -106B	**See Generic 2**		
F-111, -111A, -111D, -111E, -111F	**See Generic 2**		

2978
2979

2980 **Table 3-2. Military Aircraft and GSE Assignments**

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
F-117A	Generator Set	A/M32A-86D	2.00
	Start Cart	A/M32A-60A	2.00
		A/M32A-95	0.50
	Air Conditioner	Ace 802-329S[a]	2.00
	Heater	H1	1.00
	Hydraulic Test Stand	MJ-1-1	1.00
	Light Cart	NF-2	1.00
	Air Compressor	MC-1A	0.33
		MC-2A **(S)**	0.33
	Bomb Lift	MJ-1B	1.00[b]
F/A-18A, -18B, -18C, -18D, -18E, -18F	**See Generic 2**		
FA-22A	**See Generic 2**		
FB-22A	**See Generic 2**		
FB-111A	**See Generic 2**		
HC-130H, -130J, -130N, -130P	**See C-130A**		
HH-1H, -1K, -1N	Generator Set	A/M32A-86D	1.00 - 16.00
	Start Cart	M24A-9 **(S)**	0.25
	Heater	H1	8.00
	Hydraulic Test Stand	MJ-2/TTU-229	1.00
	Light Cart	NF-2D **(S)**	2.00
		TF-1	2.00
	Air Compressor	MC-1A	1.00
		MC-2A **(S)**	1.00
HH-2D	**See Generic 4**		
HH-3A, -3E, -3F	**See Generic 4**		
HH-43	**See Generic 4**		
HH-46A	**See Generic 4**		
HH-52, -52A	**See Generic 4**		
HH-53	**See Generic 4**		
HH-60G	**See Generic 4**		
HV-22A, -22B	**See Generic 1**		
JA-6A	**See Generic 2**		
KA-3B	**See Generic 2**		
KA-6D	**See Generic 2**		
KC-10, -10A	Generator Set	A/M32A-86D	12.00
		90CU24P5 **(S)**	12.00
	Hydraulic Test Stand	9780-0023D **(S)**	2.00
		05-7056-3600 **(S)**	2.00
	Generator Light Cart	Generator Light Cart	6.00
	Air Compressor	MODP160WJDACJF **(S)**	6.00
KC-46A	**See Generic 1**		
KC-130F, -130R, -130T	**See C-130A**		
KC-135, -135A, -135D, -135E, -135Q, -135R, -135T	**See C-135A**		
KC-767A	**See Generic 1**		
LC-130F, -130H, -130R	**See C-130A**		
MC-12W	**See C-12**		
MC-130E, -130H, -130J, -130P, -130W	**See C-130A**		
MH-53J, -53M	Generator Set	A/M32A-86D	3.00
	Heater	H1	8.00
	Hydraulic Test Stand	MJ-2/TTU-228	2.00
	Light Cart	NF-2D **(S)**	2.00
		FL-1D **(S)**	2.00
	Air Compressor	MC-2A **(S)**	4.00
MH-60A, -60G	**See Generic 4**		

2981

2982 **Table 3-2. Military Aircraft and GSE Assignments**

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
MV-22A, -22B	See Generic 1		
NA-3B	See Generic 2		
NA-4E, -4F, -4M	See Generic 2		
NA-6A, -6E	See Generic 2		
NA-7A, -7C, -7E	See Generic 2		
NB-52B	See B-52D		
NC-12B	See C-12		
NC-21A	See Generic 1		
NC-130A, -130B, -130E, -130H	See C-130A		
NC-135A, -135W	See C-135A		
NC-141A	See C-141		
NCH-46A	See Generic 4		
NF-4D	See Generic 2		
NF-16A, -16D	See F-16		
NF-106B	See Generic 2		
NF/A-18A, -18B, -18C	See Generic 2		
NKC-135A, -135E	See C-135A		
NPC-3C, -3D	See Generic 1		
NRA-3B	See Generic 2		
NRH-53D	See Generic 4		
NSH-3A	See Generic 4		
NT-33A	See Generic 1		
NT-39A	See Generic 1		
NTA-4F, -4J	See Generic 1		
NUH-1E, -1N	See Generic 4		
NUP-3A	See Generic 1		
NVH-3A	See Generic 4		
O-1	See Generic 1		
O-2A, -2B	See Generic 1		
OA-4M	See Generic 2		
OA-10A	See A-10		
OA-37B	See Generic 2		
OC-135B	See C-135A		
OH-6A	See Generic 4		
OH-58A	See Generic 4		
OT-47B	See Generic 1		
OV-10A	See Generic 1		
P-3B, -3C	See Generic 1		
QF-4B, -4E, -4G	See Generic 2		
QF-106A, -106B	See Generic 2		
QRF-4C	See Generic 2		
QT-33A	See Generic 1		
RA-3B	See Generic 2		
RA-5C	See Generic 2		
RC-12D, -12G, -12H	See C-12		
RC-135M, -135S, -135T, -135U, -135V, -135W, -135X	See C-135A		
RF-4B, -4C	See Generic 2		
RF-8G	See Generic 2		
RF/A-18A	See Generic 2		
RH-53D	See Generic 4		

2983
2984

2985

Table 3-2. Military Aircraft and GSE Assignments

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
RP-3D	**See Generic 1**		
RQ-1A, -4, -4A, -4B [(d)]	Generator Set	805 **(S)**	24.00
		806 **(S)**	24.00
	Air Conditioner	MA-3D	2.00
	Heater	H1	4.00
	Light Cart	FL-1D **(S)**	6.00
RU-21J	**See Generic 1**		
S-2, -2D, -2E, -2G	**See Generic 1**		
S-3A	**See Generic 2**		
SH-2D, -2F	**See Generic 4**		
SH-3A, -3G	**See Generic 4**		
SH-60	**See Generic 4**		
SV-22A	**See Generic 1**		
T-1A	Generator Set	Jetex **(S)**	0.33
	Hydraulic Test Stand	Airton **(S)**	0.10
T-2	**See Generic 3**		
T-6A	Generator Set	Jettex-40 **(S)**	0.50
	Start Cart	Jet Series 703D **(S)**	0.50
		MA-1A **(S)**	0.50
	Air Conditioner	MA-3D	0.75
	Hydraulic Test Stand	6X620-RDF **(S)**	1.00
	Light Cart	FL-2D **(S)**	1.00
	Tug	(See "Tug" in Table 3-4 and select appropriate size)	0.33
T-28	**See Generic 3**		
T-33A	**See Generic 3**		
T-34, -34C	**See Generic 3**		
T-37, -37B	Generator Set	A/M32A-86D[(a)]	0.17
	Heater	H1	0.17
	Hydraulic Test Stand	MJ-1-1	0.50
	Light Cart	TL-1D **(S)**	1.00
	Air Compressor	MC-1A	0.50
		MC-2A **(S)**	0.50
	Tug	(See "Tug" in Table 3-4 and select appropriate size)	0.33
T-38, -38A, -38C, -38N	Generator Set	A/M32A-86D	0.25
	Hydraulic Test Stand	MK1 **(S)**	0.75
		MK3A **(S)**	0.75
T-39A, -39B, -39D	**See Generic 3**		
T-41, -41B, -41C, -41D	**See Generic 3**		
T-43A	Generator Set	A/M32A-86D	2.00
		Essex B8098 **(S)**	2.00
	Air Conditioner	MA-3D	12.00
	Hydraulic Test Stand	HPE-45 **(S)**	2.00
	Light Cart	FL-1D **(S)**	2.00
	Air Compressor	MC-1A	1.00
T-44	**See Generic 3**		
T-47A	**See Generic 3**		
TA-3B	**See Generic 2**		
TA-4B, -4F	**See Generic 2**		
TA-7C	**See Generic 2**		
TC-18E, -18F	**See Generic 1**		
TC-130H	**See C-130A**		
TC-135S, -135W	**See C-135A**		
TE-2A, -2C	**See Generic 1**		
TE-8A	**See Generic 1**		
TF-16N	**See F-16**		

2986

2987 **Table 3-2. Military Aircraft and GSE Assignments**

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
TF-18A	**See Generic 2**		
TF/A-18A	**See Generic 2**		
TH-1L	**See Generic 4**		
TH-53A	**See Generic 4**		
TS-2A	**See Generic 2**		
TU-2S	**See Generic 2**		
U-2S	**See Generic 2**		
U-21, -21J	**See Generic 1**		
U-28A	**See Generic 1**		
UA-3B	**See Generic 2**		
UC-12B	**See C-12**		
UC-35A, -35C	**See Generic 1**		
UC-123K	**See Generic 1**		
UH-1E, -1H, -1L, -1N, -1V	**See Generic 4**		
UH-2C	**See Generic 4**		
UH-3A	**See Generic 4**		
UH-46A	**See Generic 4**		
UH-60A, -60C, -60Q	Generator Set	A/M32A-86D	1.00 - 5.00
	Start Cart	A/M32A-95	0.50
	Air Conditioner	MA-3D	2.00
	Heater	H1[(a)]	2.00
	Hydraulic Test Stand	MJ-1-1	2.50
		MJ-2/TTU-228	1.00
	Light Cart	FL-1D **(S)**	0.50 - 4.00
	Air Compressor	MC-1A	1.00
		MC-2A **(S)**	2.50
UP-3B	**See Generic 1**		
US-2A, -2B, -2C, -2D	**See Generic 1**		
UV-18B	**See Generic 1**		
UV-20A	**See Generic 1**		
VC-25A	**See C-5A**		
VC-137B, -137C	**See Generic 1**		
VC-140B	**See Generic 1**		
WC-130E, -130H, -130J	**See C-130A**		
WC-135B, -135C, -135W	**See C-135A**		
X-29A	**See Generic 2**		
X-31A	**See Generic 2**		
X-44A	**See Generic 2**		
YA-7D	**See Generic 2**		
YC-14A	**See Generic 1**		
YE-2C	**See Generic 1**		
YF-4J	**See Generic 2**		
YF-15A, -15B	**See F-15A**		
YF-16A, -16B	**See F-16**		
YOV-10D	**See Generic 2**		
YP-3C	**See Generic 1**		
YS-2G	**See Generic 2**		
YSH-2E	**See Generic 4**		

2988
2989

Table 3-2. Military Aircraft and GSE Assignments

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie or LTO (hr)
Generic 1 Cargo/Bomber (C-130)	Generator Set	A/M32A-86D	4.00 - 11.00
		Trielectron D200T 400	3.00
	Start Cart	MA-1A **(S)**	0.25
		A/M32A-60A	0.25
		A/M32A-95	0.25
	Air Conditioner	Ace 802-993 **(S)**	1.00
		MA-3D	1.00
	Heater	H1	1.00
	Hydraulic Test Stand	MJ-2A [a]	3.00
	Light Cart	NF-2	2.00 - 10.00
	Air Compressor	MC-1A	0.50 - 10.00
		MC-2A **(S)**	0.50 - 10.00
Generic 2 Fighter/Fighter Bomber (F-15)	Generator Set	A/M32A-86D	0.33
	Start Cart	A/M32A-60A	0.33
		A/M32A-95	0.33
	Heater	H1	0.50
	Hydraulic Test Stand	MJ-1-1	0.50
		MJ-2/TTU-228	0.50
	Light Cart	NF-2	1.00 - 8.00
	Air Compressor	MC-1A	0.33
		MC-2A **(S)**	0.25
		MC-11 **(S)**	2.00
	Bomb Lift	MJ-1B	1.00
Generic 3 Small Trainers (T-37, -37B)	Generator Set	A/M32A-86D [a]	0.17
	Heater	H1	0.17
	Hydraulic Test Stand	MJ-1-1	0.50
	Light Cart	TL-1D **(S)**	1.00
	Air Compressor	MC-1A	0.50
		MC-2A **(S)**	0.50
	Tug	(See "Tug" in Table 3-4 and select appropriate size)	0.33
Generic 4 Helicopter (UH-60A)	Generator Set	A/M32A-86D	1.00 - 5.00
	Start Cart	A/M32A-95	0.50
	Air Conditioner	MA-3D	2.00
	Heater	H1	2.00
	Hydraulic Test Stand	MJ-1-1	2.50
		MJ-2/TTU-228	1.00
	Light Cart	FL-1D **(S)**	0.50 - 4.00
	Air Compressor	MC-1A	1.00
		MC-2A **(S)**	2.50
Generic (Not otherwise specified)	Aircraft Tug	(See "Tug" in Table 3-4 and select appropriate size)	0.10
	Package Tug	(See "Tug" in Table 3-4 and select appropriate size)	1.30
	Cargo Loader	Cargo Loader	1.50
	Fuel Truck	Fuel Truck	0.60
	Deicer Truck [c]	Deicer Truck	0.15

Notes for Table 3-2 are provided on the following page.

Notes for Table 3-2:

SOURCE (unless otherwise noted): Data obtained from USAF, IERA-RS-BR-SR-2005-0001, *Flightline Emission Factors – Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment*, December 2004. Data provided by the USAF flight squadrons and associated AGE shops. When calculating GSE emissions, use the data available at the installation. These aircraft/GSE combinations should be used only in the absence of current, more accurate, data.

a. Operating time estimated based on operating time of GSE on similar aircraft.

b. GSE model changed from what was stated in the source document because of suspected error in source.

c. Cold weather months and cold weather bases only.

d. Uses GSE assignments for similar, surrogate engine provided in source document.

"**(S)**" – Indicates that emission factors for this GSE are not found in this document. In the absence of available data, it is recommended that a similar GSE and associated emission factors be used as a surrogate.

3006

Table 3-3. Military Aircraft GSE Emission Factors

GSE Model	GSE Type	Source of Data [a]	Engine Manufacturer	Model Number	Rated Hp	Fuel	Operational Mode	Fuel Flow Rate (gal/hr)	Emission Factors (lb/hr)						
									NO_X	SO_X [b]	CO	VOC [c]	PM_{10}	$PM_{2.5}$ [d]	CO_2e [e]
1H1	Heater	(5)	---	---	6.5	Diesel/JP-8	All Loads	0.39	0.160	0.003	0.180	0.105	0.006	0.006	8.81
A/M27T-13	Hydraulic Test Stand	(5)	---	---	30	Diesel/JP-8	All Loads	---	0.180	0.051	12.250	0.295	0.167 [g]	0.162 [g]	39.70
A/M32A-60A	Start Cart	(5)	Garrett	---	180	Diesel/JP-8	All Loads	---	1.820	0.306	5.480	0.284	0.211	0.205	238.22
A/M32A-86D	Generator Set	(2)	Detroit Diesel	4-71N	148	Diesel/JP-8	All Loads	6.47	6.102	0.047	0.457	0.294	0.091	0.089	146.08
A/M32A-95	Start Cart	(5)	Garrett	---	155	Diesel/JP-8	All Loads	---	1.470	0.264	5.860	0.074	0.110	0.107	205.14
A/M32C-18	Air Compressor	(1)	Detroit Diesel	6V71T	290	Diesel/JP-8	100% Load	16.57	7.973	0.120	1.522	0.205	0.211	0.205	374.13
Ace 401	Air Conditioner	(5)	Detroit Diesel	---	---	Diesel/JP-8	All Loads	---	7.970	0.408	1.520	0.211	0.211	0.205	337.48
Ace 802-329S	Air Conditioner	(3)	Detroit Diesel	6V71N	272	Diesel/JP-8	All Loads	6.8	2.938	0.049	0.150	0.204	0.198	0.192	153.53
AF/M27M-1	Pumping Unit	(1)	Wisconsin	VH4D	30	Gasoline	100% Load	1.78	0.177	0.004	12.262	0.276	0.167 [g]	0.162 [g]	34.57
AF/M32T-1	Cabin Pressure Tester	(7)	Hatz	4M40	---	Diesel/JP-8	All Loads	---	0.118	0.238	0.203	0.095	0.167 [g]	0.162 [g]	185.29
B-1B Heater/Air Conditioner	Heater/Air Conditioner	(1)	Detroit Diesel	6V-92TA	300	Diesel/JP-8	100% Load	17.14	7.659	0.124	1.409	0.258	0.152	0.148	387.00
BAK-13	Arresting Barrier	(1)	Wisconsin	MV-465D	64	Gasoline	100% Load	3.9	0.377	0.010	29.207	0.319	0.167 [g]	0.162 [g]	75.74
BT400-46	Heater	(1)	Lister-Petter	AC1-389548	6.5	Diesel/JP-8	All Loads	0.39	0.158	0.003	0.181	0.100	0.167 [g]	0.162 [g]	8.81
Cargo Loader	Cargo Loader	(6)	---	---	133	Diesel/JP-8	All Loads	7.28	2.554	0.053	1.862	0.420	0.279	0.271	164.37
Deicer Truck	Deicer Truck	(6)	---	---	270	Gasoline	All Loads	14.78	5.940	0.036	73.170	2.519	0.027	0.024	287.04
Elevator Loader	Elevator Loader	(1)	Detroit Diesel	3-53 Series	110	Diesel/JP-8	100% Load	6.29	3.128	0.046	1.048	0.129	0.063	0.061	142.02
EMU-15	Generator Set	(1)	Detroit Diesel	3-71	100	Diesel/JP-8	100% Load	5.71	3.505	0.041	4.905	0.095	0.115	0.111	128.92
EMU-17	Generator Set	(1)	Detroit Diesel	12V-71N	300	Diesel/JP-8	100% Load	17.14	8.863	0.124	11.078	0.337	0.185	0.180	387.00
EMU-19U	Generator Set	(1)	Lister	ST-3	30	Diesel/JP-8	All Loads	1.78	0.743	0.013	0.351	0.266	0.167 [g]	0.162 [g]	40.19
FL-1D	Light Cart	(7)	Kubota	D905	10.5	Diesel/JP-8	All Loads	---	0.030	0.018	0.025	0.008	0.167 [g]	0.162 [g]	13.90
Fuel Truck	Fuel Truck	(6)	---	---	300	Diesel/JP-8	All Loads	16.42	3.300	0.119	0.900	0.316	0.210	0.204	370.74
Generator Light Cart	Generator Light Cart	(4)	Onan	P218G-I/10876C	10.5	Diesel/JP-8	All Loads	0.62	0.181	0.004	0.139	0.022 [f]	0.167 [g]	0.162 [g]	14.00
Generator Set	Generator Set	(1)	Caterpillar	D3333T	214	Diesel/JP-8	100% Load	17.5	3.170	0.127	0.689	0.547	0.071	0.069	395.13
							62% Load	10.46	3.067	0.026	0.618	0.745	0.080	0.078	236.17
Ground Mobile Terminal Generator Set	Ground Mobile Terminal Generator Set	(1)	Detroit Diesel	4-71-T	150	Diesel/JP-8	100% Load	8.57	6.855	0.062	1.114	0.155	0.109	0.106	193.50
H1	Heater	(5)	---	---	6.5	Diesel/JP-8	All Loads	0.39	0.160	0.003	0.180	0.105	0.006	0.006	8.81
MA-3	Air Conditioner	(1)	Onan	L643T*I/1C178-C	65	Diesel/JP-8	All Loads	3.79	0.497	0.027	0.133	0.011	0.167 [g]	0.162 [g]	85.57
MA-3D	Air Conditioner	(1)	John Deere	4045T	120	Diesel/JP-8	All Loads	7.12	4.167	0.052	0.317	0.053	0.167 [g]	0.162 [g]	160.76
MA-3D	Air Conditioner	(3)	John Deere	4039T	110	Diesel/JP-8	All Loads	4.57	0.640	0.033	0.058	0.284	0.063	0.061	103.18

3007

Table 3-3. Military Aircraft GSE Emission Factors

GSE Model	GSE Type	Source of Data [a]	Engine Manufacturer	Model Number	Rated Hp	Fuel	Operational Mode	Fuel Flow Rate (gal/hr)	Emission Factors (lb/hr)						
									NO_X	SO_X [b]	CO	VOC [c]	PM_{10}	$PM_{2.5}$ [d]	CO_2e [e]
MC-1A	Air Compressor	(1)	Hatz	Z790-193	18.4	Diesel/JP-8	All Loads	1.09	0.419	0.008	0.267	0.267	0.071	0.068	24.61
MC-1A	Air Compressor	(1)	Lister Engineering Co.	ST2A/MC1A	20	Diesel/JP-8	All Loads	1.19	0.496	0.009	0.234	0.177	0.167 [g]	0.162 [g]	26.87
MC-5	Air Compressor	(3)	Deutz	F4L912 4CYL	100	Diesel/JP-8	All Loads	2.38	0.547	0.017	0.333	0.110	0.167 [g]	0.162 [g]	53.74
MC-5	Air Compressor	(1)	GMC	Series 4-53	130	Diesel/JP-8	100% Load	7.43	3.396	0.054	0.794	0.195	0.089	0.086	167.76
MC-5	Air Compressor	(1)	John Deere	4039	110	Diesel/JP-8	All Loads	6.52	2.425	0.047	0.485	0.073	0.167 [g]	0.162 [g]	147.21
MC-7	Air Compressor	(1)	John Deere	3164D	52	Diesel/JP-8	100% Load	3.3	1.285	0.024	0.642	0.057	0.167 [g]	0.162 [g]	74.51
MC-7	Air Compressor	(3)	John Deere	3179 SPEC FD16694J	48	Diesel/JP-8	All Loads	1.8	0.414	0.013	0.018	0.053	0.167 [g]	0.162 [g]	40.64
MC-8	Air Compressor	(1)	Deutz	F6L912	110	Diesel/JP-8	All Loads	6.52	2.983	0.047	0.752	0.121	0.167 [g]	0.162 [g]	147.21
MC-20	Air Compressor	(7)	Hatz	1B50	11	Diesel/JP-8	All Loads	---	0.025	0.019	0.045	0.016	0.012	0.012	14.56
Miller Concrete Cutter	Miller Concrete Cutter	(1)	Deutz	BF4D-1011T	75	Diesel/JP-8	All Loads	4.45	1.042	0.032	0.198	0.083	0.167 [g]	0.162 [g]	100.47
MJ-1-1	Hydraulic Test Stand	(1)	Detroit Diesel	3-53 N	97	Diesel/JP-8	All Loads	2.52	0.757	0.018	0.043	0.026	0.167 [g]	0.162 [g]	56.90
MJ-1B	Bomb Lift	(5)	Detroit Diesel	---	---	Diesel/JP-8	All Loads	---	4.780	0.219	3.040	3.201	0.800	0.776	152.20
MJ-1B/C	Bomb Lift	(7)	Deutz	F21011F	26	Diesel/JP-8	All Loads	---	0.009	0.050	0.023	0.006	0.167 [g]	0.162 [g]	34.54
MJ-2/TTU-228	Hydraulic Test Stand	(3)	Detroit Diesel	6V-53N	125	Diesel/JP-8	All Loads	4.92	0.937	0.036	0.083	0.292	0.083	0.080	111.09
MJ-2/TTU-228	Hydraulic Test Stand	(1)	Detroit Diesel	4-53	130	Diesel/JP-8	100% Load	7.43	3.396	0.054	0.794	0.195	0.089	0.086	167.76
MJ-2/TTU-229	Hydraulic Test Stand	(1)	Detroit Diesel	6V-53N	125	Diesel/JP-8	100% Load	10.86	3.858	0.079	2.466	0.193	0.083	0.080	245.20
MJ-2A	Hydraulic Test Stand	(5)	Detroit Diesel	---	---	Diesel/JP-8	All Loads	---	3.850	0.238	2.460	0.200	0.083	0.076	185.29
MJ-40	Bomb Lift	(5)	Detroit Diesel	---	---	Diesel/JP-8	All Loads	---	0.340	0.219	0.210	0.221	0.060	0.055	152.20
NF-2	Light Cart	(5)	---	---	18	Diesel/JP-8	All Loads	---	0.110	0.031	0.080	0.011	0.010	0.010	23.82
Nitrogen Cart	Nitrogen Generating Cart	(7)	Isuzu	4LE1PW14	52	Diesel/JP-8	All Loads	---	0.147	0.089	0.050	0.006	0.016	0.015	69.22
PD501	Air Conditioner	(5)	---	---	---	Diesel/JP-8	All Loads	---	7.650	0.408	1.410	0.274	0.167 [g]	0.162 [g]	337.48
PMU 27/M	Pumping Unit	(1)	Petter Diesel Engine	AC-1	6.5	Diesel/JP-8	All Loads	0.39	0.158	0.003	0.181	0.100	0.167 [g]	0.162 [g]	8.81
R-22	Pumping Unit	(1)	Detroit Diesel	3-53 Series	110	Diesel/JP-8	100% Load	6.29	3.128	0.046	1.048	0.129	0.063	0.061	142.02
TF-1	Light Cart	(5)	---	---	---	Diesel/JP-8	All Loads	---	0.170	0.043	0.130	0.026 [f]	0.160	0.155	33.09
Trilectron D200T 400	Generator Set	(3)	Detroit Diesel	8V-71T	236	Diesel/JP-8	All Loads	10.9	8.621	0.079	0.219	0.271	0.208	0.202	246.11
Tug - Large	Tug	(6)	---	---	617	Diesel/JP-8	All Loads	33.4	10.489	0.242	4.936	0.650	0.864	0.839	754.13
Tug - Medium	Tug	(6)	---	---	475	Diesel/JP-8	All Loads	25.7	8.075	0.186	3.800	0.500	0.665	0.646	580.27
Tug - Small	Tug	(6)	---	---	190	Diesel/JP-8	All Loads	10.3	3.230	0.075	1.520	0.200	0.266	0.258	232.56

Notes for Table 3-3 are provided on the following page:

Notes for Table 3-3:

a. Sources of data include the following:
   (1) Emission factors were obtained from the manufacturer. Fuel usage rates were based on 7,500 Btu/hp-hr.
   (2) Emission factors were obtained from the Southwest Research Institute report titled *Exhaust Emissions from a USAF A/M32-86D Generator.*
   (3) Emission factors were obtained from the Pacific Environmental Services report titled *Aerospace Ground Support Equipment Emissions Characterization for Edwards AFB, California.*
   (4) Emission factors are EPA tier I Non-road engine factors.
   (5) Emission factors were obtained from *Aircraft/Auxiliary Power Units/Ground Support Equipment Emission Factors,* December 2002
   (6) Emission factors calculated using the emission factors in Table 3-6 using the hp stated in the table above. If no hp was given, then the average hp for that equipment type was used (Table 3-5). Fuel usage rates were based on 7,500 Btu/hp-hr.
   (7) Emission factors calculated from on-site emissions testing.

b. SO_X emission factor assumes that all sulfur in the fuel reacts to form SO_2. Emission factors calculated using Equation 3-7. Sulfur content and density of the fuels taken from Table 3-1. Where the fuel flow rate was not provided, the appropriate EF was selected from Table 3-6 and multiplied by the horsepower (hp). If no hp was provided, the appropriate value was selected from Table 3-5. For equipment capable of using "Diesel/JP-8", the density and sulfur content of JP-8 were used.

c. Emission factors from reference (5) were converted from total hydrocarbons (THC) to VOC by multiplying by a factor of 1.053. Emission factors from reference (7) were converted from total organic gas (TOG) to VOC by multiplying by a factor 1.053 and dividing the result by 1.07. These hydrocarbon conversion factors come from "Conversion Factors for Hydrocarbon Emission Components", U.S. Environmental Protection Agency (EPA), Office of Transportation and Air Quality, July 2010.

d. $PM_{2.5}$ conservatively estimated at 97% of PM_{10} for JP-8 or diesel and 92% of PM_{10} for gasoline (per *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition*, EPA420-P-04-009, April 2004).

e. CO_2e emission factor calculated by taking the product of the default CO_2, CH_4, and N_2O emission factors from Tables C-1 and C-2 of 40 Code of Federal Regulations (CFR) part 98, subpart C and their respective global warming potentials (GWP). The GWP for CO_2, CH_4, and N_2O are 1, 25, and 298, respectively. These values were multiplied by the high heat value of the fuel from Table C-1 of 40 CFR part 98 and the fuel flow rate. In cases where the fuel flow rate was not provided, the product of the EF and GWP were multiplied by the engine hp and brake specific fuel consumption (BSFC). A BSFC value of 8089 Btu/hp-hr was used for the diesel/JP-8 equipment.

f. These values were not provided from test data but calculated using the hp (or hp from Table 3-5) and the appropriate emission factor from Table 3-6.

g. The source did not provide an EF for this pollutant. The value provided is the average of EF for this pollutant for all ground support equipment.

"---" Indicates No Data Available.

3040 **Table 3-4. Typical Commercial Aircraft GSE Assignments**

Long Haul Turbine Powered Aircraft	Short Haul/Regional Turbine Powered Aircraft	Turbo-prop Powered Aircraft	Piston Powered Aircraft
Air Conditioner (Diesel/Electric)	Aircraft Tractor (Diesel)	Aircraft Tractor (Diesel)	Fuel Truck (Diesel)
Air Start (Diesel)	Baggage Tractor (Gasoline)	Baggage Tractor (Gasoline)	
Aircraft Tractor/Tug (Diesel)	Belt Loader (Gasoline)	Belt Loader (Gasoline)	
Baggage Tractor (Gasoline)	Catering Truck (Diesel)	Catering Truck (Diesel)	
Belt Loader (Gasoline)	Fuel Truck (Diesel)	Cabin Service Truck (Diesel)	
Cabin Service Truck (Diesel)	Lavatory Truck (Diesel)	Fuel Truck (Diesel)	
Catering Truck (Diesel)	Service Truck (Diesel)	Service Truck (Diesel)	
Hydrant Truck (Diesel)		Cabin Service Truck (Diesel)	
Lavatory Truck (Diesel)			
Service Truck (Diesel)			
Water Service Truck (Diesel)			

3041
3042 SOURCE: FAA Emissions and Dispersion Modeling System, Version 5.02
3043
3044

3045 **Table 3-5. Common GSE Operating Parameters**

GSE Type	Fuel Type	Average Rated Power (hp)	Average Operating Load (% Max Power)	Operating Time Per LTO (hr)
Air Conditioner	Diesel	255	75	0.50
Air Start	Diesel	613	90	0.12
	Gasoline	---	---	0.12
Aircraft Tractor/Tug	Diesel	617	80	0.13
	Diesel	475	80	0.13
	Diesel	190	80	0.13
	Diesel	88	80	0.13
	Gasoline	110	80	0.13
	CNG/LPG	124	80	0.13
Baggage Tractor	Diesel	83	55	1.20
	Gasoline	107	55	1.20
	CNG	83	55	1.20
	LPG	107	55	1.20
Belt Loader	Diesel	71	50	0.80
	Gasoline	107	50	0.80
	CNG	83	50	0.80
	LPG	107	50	0.80
Bobtail	Diesel	225	55	---
	Gasoline	124	55	---
	CNG	110	55	---
	LPG	124	55	---
Cabin Service Truck	Diesel	210	53	0.33
	Diesel	71	53	0.33
	Gasoline	260	53	0.33
	Gasoline	107	53	0.33
	CNG	360	53	0.33
	CNG	83	53	0.33
	LPG	260	53	0.33
	LPG	107	53	0.33
Cargo Loader	Diesel	133	50	1.33
	Diesel	80	50	1.33
	Gasoline	107	50	1.33
	CNG	83	50	1.33
	LPG	107	50	1.33
Cargo Tractor	Diesel	88	54	---
	Gasoline	107	54	---
	CNG	83	54	---
	LPG	88	54	---

3046
3047

3048 **Table 3-5. Common GSE Operating Parameters**

GSE Type	Fuel Type	Average Rated Power (hp)	Average Operating Load (% Max Power)	Operating Time Per LTO (hr)
Cart (Light Cart)	Diesel	25	50	0.17
	Gasoline	25	50	0.17
	CNG/LPG	25	50	0.17
Catering Truck	Diesel	210	53	25.00
	Diesel	71	53	0.25
	Gasoline	260	53	0.25
	Gasoline	107	53	0.25
	CNG	360	53	25.00
	CNG	83	53	0.25
	LPG	260	53	0.25
	LPG	107	53	0.25
Deicer	Diesel	263	95	---
	Diesel	165	95	---
	Gasoline	270	95	---
	Gasoline	107	95	---
	CNG	83	95	---
	CNG	54	95	---
	LPG	270	95	---
	LPG	107	95	---
Forklift	Diesel	55	30	---
	Gasoline	54	30	---
	CNG/LPG	54	30	---
Fuel Truck	Diesel	300	25	0.75
	Diesel	235	25	0.54
	Diesel	175	25	0.33
	Gasoline	420	25	0.75
	Gasoline	260	25	0.54
	CNG	420	25	0.75
	CNG	360	25	0.54
	LPG	420	25	0.75
	LPG	260	25	0.54
Generator Sets	Diesel	158	82	2.00
	Gasoline	107	82	2.00
	CNG/LPG	107	82	2.00
Ground Power Unit	Diesel	194	75	0.67
	Diesel	71	75	0.67
	Gasoline	107	75	0.67
	CNG	83	75	0.67
	LPG	107	75	0.67

3049
3050

3051 **Table 3-5. Common GSE Operating Parameters**

GSE Type	Fuel Type	Average Rated Power (hp)	Average Operating Load (% Max Power)	Operating Time Per LTO (hr)
Hydrant Truck	Diesel	235	70	0.20
	Gasoline	260	70	0.20
	CNG	360	70	0.20
	LPG	260	70	0.20
Lavatory Truck	Diesel	235	25	25.00
	Diesel	56	25	0.25
	Gasoline	260	25	0.25
	Gasoline	97	25	0.25
	CNG	360	25	25.00
	CNG	82	25	0.25
	LPG	260	25	0.25
	LPG	89	25	0.25
Lift	Diesel	115	50	0.17
	Gasoline	105	50	0.17
	CNG/LPG	132	50	0.17
Passenger Stand	Diesel	65	57	---
	Gasoline	107	57	---
	CNG	107	57	---
	LPG	83	57	---
Service Truck	Diesel	235	20	25.00
	Gasoline	260	20	0.25
	CNG	360	20	0.25
	LPG	260	20	0.25
Sweeper	Diesel	53	51	---
	Gasoline	53	51	---
	CNG/LPG	45	51	---
Water Service	Diesel	235	20	0.20
	Gasoline	260	20	0.20
	CNG	360	20	0.20
	LPG	260	20	0.20
Other	Diesel	140	50	---
	Gasoline	126	50	---
	CNG/LPG	173	50	---

3052
3053 SOURCE: FAA Emissions and Dispersion Modeling System, Version 5.02
3054 "---" Indicates No Data Available
3055
3056

3057 **Table 3-6. Common GSE Emission Factors**

GSE Type	Fuel Type	Emission Factors (lb/1000hp-hr)						
		CO	VOC [a]	NO_X	SO_X	PM_{10} [b]	$PM_{2.5}$ [c]	CO_2e [d]
Air Conditioner	Diesel	5.00	1.05	16.40	1.60	1.00	0.97	1330.83
Air Start	Diesel	6.00	1.05	19.30	1.60	1.20	1.16	1330.83
	Gasoline	271.00	9.33	22.00	0.40	0.10	0.09	1093.30
Aircraft Tractor/Tug	Diesel	8.00	1.05	17.00	1.70	1.40	1.36	1330.83
	Gasoline	393.00	12.13	23.20	0.40	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Baggage Tractor	Diesel	11.00	2.11	13.70	1.80	2.10	2.04	1330.83
	Gasoline	395.00	12.13	22.30	0.40	0.20	0.18	1093.30
	CNG/LPG	107.00	6.00	26.90	0.00	0.10	0.10	1458.76
Belt Loader	Diesel	8.00	2.11	14.80	1.80	1.70	1.65	1330.83
	Gasoline	275.00	9.33	22.30	0.40	0.20	0.18	1093.30
	CNG	275.00	10.00	22.30	0.00	0.10	0.10	2229.82
	LPG	74.00	4.00	26.90	0.00	0.00	0.00	1453.67
Bobtail	Diesel	8.00	1.05	16.70	1.70	1.30	1.26	1330.83
	Gasoline	398.00	12.13	22.30	0.40	0.20	0.18	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Cabin Service Truck	Diesel	2.00	1.05	10.30	1.60	0.30	0.29	1330.83
	Gasoline	24.00	3.73	10.70	0.30	0.10	0.09	1093.30
	CNG/LPG	107.00	6.00	26.90	0.00	0.10	0.10	1062.84
Cargo Loader	Diesel	14.00	3.16	19.20	1.90	2.10	2.04	1330.83
	Gasoline	400.00	12.13	22.30	0.40	0.20	0.18	1093.30
	CNG/LPG	106.00	5.00	26.80	0.00	0.10	0.10	1062.84
Cargo Tractor	Diesel	12.00	2.11	17.00	1.80	2.40	2.33	1330.83
	Gasoline	404.00	12.13	22.40	0.40	0.20	0.18	1093.30
	CNG/LPG	107.00	6.00	26.90	0.00	0.10	0.10	1062.84
Cart (Light Cart)	Diesel	---	---	---	---	---	---	1330.83
	Gasoline	392.00	12.13	22.30	0.40	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Catering Truck	Diesel	2.00	1.05	10.30	1.60	0.30	0.29	1330.83
	Gasoline	24.00	3.73	10.70	0.30	0.10	0.09	1093.30
	CNG/LPG	107.00	6.00	27.00	0.00	0.10	0.10	1062.84
Deicer	Diesel	---	---	---	---	---	---	1330.83
	Gasoline	271.00	9.33	22.00	0.40	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Forklift	Diesel	15.00	4.21	22.00	1.90	2.70	2.62	1330.83
	Gasoline	392.00	12.13	22.00	0.40	0.10	0.09	1093.30
	CNG/LPG	108.00	6.00	27.00	0.00	0.10	0.10	1062.84

3058
3059

Table 3-6. Common GSE Emission Factors

GSE Type	Fuel Type	Emission Factors (lb/1000hp-hr)						
		CO	VOC [a]	NO_X	SO_X	PM_{10} [b]	$PM_{2.5}$ [c]	CO_2e [d]
Fuel Truck	Diesel	3.00	1.05	11.00	1.60	0.70	0.68	1330.83
	Gasoline	37.00	4.67	11.00	0.30	0.10	0.09	1093.30
	CNG/LPG	106.00	5.00	27.00	0.00	0.10	0.10	1062.84
Generator	Diesel	6.00	2.11	20.00	1.60	1.40	1.36	1330.83
	Gasoline	271.00	9.33	22.00	0.40	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Ground Power Unit	Diesel	5.00	1.05	17.00	1.60	1.00	0.97	1330.83
	Gasoline	271.00	9.33	22.00	0.40	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	---
Hydrant Truck	Diesel	4.00	1.05	12.00	1.60	1.60	1.55	1330.83
	Gasoline	26.00	3.73	11.00	0.30	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Lavatory Truck	Diesel	4.00	1.05	12.00	1.60	1.30	1.26	1330.83
	Gasoline	18.00	3.73	11.00	0.30	0.10	0.09	1093.30
	CNG/LPG	106.00	5.00	27.00	0.00	0.10	0.10	1062.84
Lift	Diesel	15.00	4.21	22.00	1.90	2.70	2.62	1330.83
	Gasoline	397.00	12.13	22.00	0.40	0.20	0.18	1093.30
	CNG/LPG	106.00	5.00	27.00	0.00	0.10	0.10	1062.84
Passenger Stand	Diesel	4.00	1.05	12.00	1.60	1.60	1.55	1330.83
	Gasoline	46.00	4.67	11.00	0.30	0.10	0.09	1093.30
	CNG/LPG	106.00	5.00	27.00	0.00	0.10	0.10	1062.84
Service Truck	Diesel	3.00	1.05	11.00	1.60	0.90	0.87	1330.83
	Gasoline	46.00	4.67	11.00	0.30	0.10	0.09	1093.30
Sweeper	Diesel	12.00	2.11	17.00	1.80	2.40	2.33	1330.83
	Gasoline	393.00	12.13	22.00	0.40	0.10	0.09	1093.30
	CNG/LPG	108.00	6.00	27.00	0.00	0.10	0.10	1062.84
Water Service	Diesel	---	---	---	---	---	---	1330.83
	Gasoline	46.00	4.67	11.00	0.30	0.10	0.09	1093.30
	CNG/LPG	---	---	---	---	---	---	1458.76
Other	Diesel	8.00	1.05	17.00	1.70	1.30	1.26	1330.83
	Gasoline	396.00	12.13	22.00	0.40	0.20	0.18	1093.30
	CNG/LPG	106.00	5.00	27.00	0.00	0.10	0.10	1062.84

SOURCE: FAA Emission and Dispersion Modeling System, Version 5.02 for model year 2000 GSE and converted from g/hp-hr to lb/10^3 hp-hr.

a. Reported as HC in EDMS. All values assumed to be equal to total hydrocarbons (THC) and converted into VOC. For diesel engines, THC was converted to VOC by multiplying THC value by 1.053. All gasoline engines were assumed to be 4-stroke. For gasoline engines, THC was converted to VOC by multiplying the THC value by 0.933. THC values were assumed to equal VOC emissions for CNG and LPG-fired engines. Hydrocarbon conversion factors come from *Conversion Factors for Hydrocarbon Emission Components*, U.S. Environmental Protection Agency (EPA), July 2010.

b. Reported as PM in EDMS. All PM assumed to be PM_{10}.

c. Using assumptions and factors applied by EPA in its NONROAD model, $PM_{2.5}$ emissions conservatively estimated as 97% of JP-8 or diesel PM_{10} emissions, 92% of gasoline PM_{10} emissions, and 100% of CNG or LPG PM_{10} emissions.

d. CO_2e is the sum of emission factors for CO_2, CH_4, and N_2O. The emission factors are presented in equivalent CO_2 (CO_2e) using global warming potentials of 25 and 298 for CH_4 and N_2O, respectively. The emission factors were provided by the EPA's Emission Factors for Greenhouse Gas Inventories. When "CNG/LPG" is provided as the fuel used, then the greenhouse gas emission factor provided was calculated using the more conservative estimate from LPG. The emission factors for N_2O and CH_4 for CNG and LPG were assumed to be equal to those for gasoline. Calculations were made using the heating values and fuel usage rates provided in Table 3-1.

"---" Indicates No Data Available.

Table 3-7. Speciated HAP Emission Factors for Uncontrolled Diesel Reciprocating Internal Combustion Engines

Compound	Emission Factors	
	lb/10^3 gal	lb/10^3hp-hr
1,3-Butadiene	5.40E-03	3.16E-04
Acenaphthene	1.96E-04	1.15E-05
Acenaphthylene	6.98E-04	4.09E-05
Acetaldehyde	1.06E-01	6.20E-03
Acrolein	1.28E-02	7.48E-04
Anthracene	2.58E-04	1.51E-05
Benz(a)anthracene	2.32E-04	1.36E-05
Benzene	1.29E-01	7.55E-03
Benzo(a)pyrene	2.59E-05	1.52E-06
Benzo(b)fluoranthene	1.37E-05	8.02E-07
Benzo(g,h,i)perylene	6.75E-05	3.96E-06
Benzo(k)fluoranthene	2.14E-05	1.25E-06
Chrysene	4.87E-05	2.86E-06
Dibenz(a,h)anthracene	8.05E-05	4.72E-06
Fluoranthene	1.05E-03	6.16E-05
Fluorene	4.03E-03	2.36E-04
Formaldehyde	1.63E-01	9.55E-03
Indeno(1,2,3-c,d)pyrene	5.18E-05	3.03E-06
Naphthalene	1.17E-03	6.86E-05
Phenanthrene	4.06E-03	2.38E-04
Pyrene	6.60E-04	3.87E-05
Toluene	5.64E-02	3.31E-03
Xylenes	3.93E-02	2.31E-03

SOURCE: *Compilation of Air Pollutant Emission Factors Volume I: Stationary Point and Area Sources fifth edition*, January 1995. Section 3.3. Where necessary, the average brake specific fuel consumption (BSFC) and heating value from Table 3-1 were used for unit conversion.

3.6 References

40 CFR 98, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 98 Subpart C Table C-1-Default CO2 Emission Factors and High Heat Values for Various Types of Fuel," U.S. Environmental Protection Agency

40 CFR 1039, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter U-Air Pollution Controls, Part 1039-CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES," U.S. Environmental Protection Agency

40 CFR 98, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 98 Subpart A Table A-1-Global Warming Potentials," U.S. Environmental Protection Agency

AEE 1997, “Air Quality Procedures for Civilian Airports and Air Force Bases," U.S. Department of Transportation, FAA Office of Environment and Energy (AEE), April 1997

AFCEE 2009, "Air Emissions Factor Guide to Air Force Stationary Sources," Air Force Center for Engineering and the Environment, December 2009

AP-42 2009, “Compilation of Air Pollutant Emission Factors Fifth Edition, January 1995,” United States Environmental Protection Agency, updated 2009

API 2009, “Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry,” American Petroleum Institute, 2009.

CCAR 2007, "California Climate Action Registry General Reporting Protocol Version 2.2," California Climate Action Registry (CCAR), 2007

DLA 2006, “Petroleum Quality Information System Fuels Data (2005),” Defense Logistics Agency (DLA), Defense Energy Support Center, Technology and Standardization Division, 2006

DOE 2005, “Department of Energy, Energy Information Administration report,” DOE/EIA-0464, 2005

EEFNEM 2005, “Spark Ignition, EPA420-R-05-019,” Exhaust Emission Factors for Nonroad Engine Modeling. 2005.

EIA 2005, "Household Vehicles Energy Use: Latest Data & Trends," Energy Information Administration (EIA), Office of Energy Markets and End Use, U.S. Department of Energy, November 2005

EPA 2004, “Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition, EPA420-P-04-009,” United States Environmental Protection Agency, April 2004.

FAA 2007, "Emissions Dispersion and Modeling System, Version 5.0.2," Department of Transportation, Federal Aviation Administration (FAA), June 2007

FAA, “Emissions and Dispersion Modeling System, Version 5.02,” Federal Aviation Administration

O'Brien 2003, O'Brien, Robert J. and Mark D. Wade, "Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations," Air Force Institute for Environment, Safety and Occupational Health Risk Analysis, May 1999

Pacific Environmental Services, Inc. 1997, "Aerospace Ground Support Equipment Emissions Characterization for Edwards AFB, California," 1997

SWRI 1998. "Exhaust Emissions from a USAF A/M32A-86D Generator," Southwest Research Institute (SWRI), 1998

USAF 2002, “Aircraft/Auxiliary Power Units/Ground Support Equipment Emission Factors,” United States Air Force December 2002

USAF 2004, “Flightline Emission Factors – Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment IERA-RS-BR-SR-2005-0001,” United States Air Force, December 2004.

USAF Research Laboratory 2007, "Air Force Alternative Fuels Program," United States Research Laboratory; UC Davis Aviation Noise and Air Quality Symposium-Propulsion Directorate, 2007

USEPA 1996, "Gasoline and Diesel Industrial Engines; Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources (Section 3.3)," United States Environmental Protection Agency, October 1996

USEPA 1998, "Exhaust Emission Factors for Nonroad Engine Modeling - Compression Ignition," United States Environmental Protection Agency, Assessment and Modeling Division, 1998

USEPA 1999, "Tier 2 Vehicle and Gasoline Sulfur Program," United States Environmental Protection Agency, 1999

USEPA 2000, "Factor Information Retrieval System (FIRE) - Version 6.23," United States Environmental Protection Agency, 2000

USEPA 2004, "Clean Air Nonroad Diesel Rule." United States Environmental Protection Agency, Office of Transportation and Air Quality, 2004

USEPA 2004b, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling (EPA 420-P-005, NR-005c), United States Environmental Protection Agency, 4 April 2004

USEPA 2005, "Nonroad 2005 Model," United States Environmental Protection Agency, December 2005

USEPA 2010, "Conversion Factors for Hydrocarbon Emission Components, EPA-420-R-10-015," United States Environmental Protection Agency, July 2010

USEPA, "Emission Factors for Greenhouse Gas Inventories," United States Environmental Protection Agency

Wade 2004, Wade, Mark. "Flightline Emission Factors - Aircraft/Auxiliary Power Units/Aerospace Ground Support Equipment," December 2004

4.0 NONROAD ENGINES AND EQUIPMENT (NRDE)

4.1 Introduction

Air emissions at USAF installations result not only from military operations, but also from day-to-day activities involving nonroad engines and equipment (NRDE). The full federal definition of a nonroad engine can be found in 40 CFR 1068.30. Examples of NRDE that are commonly operated on USAF installations include: industrial equipment (e.g., forklifts, aerial lifts, sweepers, etc.); lawn and garden equipment (e.g., lawn mowers, trimmers, leaf blowers, snow blowers, etc.); agricultural equipment (e.g., sprayers, agricultural tractors, agricultural mowers, etc.); commercial equipment (e.g., pumps, air compressors, etc.); recreational vehicles (e.g., off-road motorcycles, all-terrain vehicles, including utility vehicles, snowmobiles, golf carts, etc.); and logging equipment (e.g., shredders). Portable generators are nonroad engines but as internal combustion (ICOM) units, their emissions are covered in the appropriate sections of either the *Air Emissions Guide for Air Force Stationary Sources* or *Transitory Sources*. Similarly, AGE and GSE are also nonroad engines that are widely used on USAF installations, but are addressed separately in the "Flightline Ground Support Equipment" section of this Guide. Emissions of concern from the operation of NRDE include criteria pollutants and HAPs associated with fuel combustion processes.

NRDE are typically powered by either a reciprocating internal combustion engine or a small gas turbine. For reciprocating engines, a piston moves inside a cylinder to compress an air/fuel mixture. The air/fuel mixture combusts and expands, pushing the piston through the cylinder. The piston returns, pushing out the exhaust gases, and the cycle is repeated. For gas turbines, ambient air is pressurized with a compressor. Fuel is introduced to this compressed air and is ignited. The high temperature, high pressure air flows through a turbine where it expands, producing shaft energy that is used to drive both the compressor and the electric generator.

Reciprocating engines may differ in design by the diameter of the cylinders in the engine, known as the bore, and the length of the linear movement of the piston in each cylinder, known as the stroke. The size of the engine is related to its displacement per cylinder, which is a measure of the volume of the cylinder multiplied by the length of the stroke. A reciprocating engine may be classified as either 4-stroke or 2-stroke. For a 4-stroke engine, the combustion cycle involves two revolutions of the crankshaft, to which the pistons are connected, and the cycle consists of four stages. The induction stroke occurs when the piston moves down within the cylinder, creating a vacuum and drawing in air or an air/fuel mixture. During the compression stroke, the piston moves up to pressurize the air or air/fuel mixture which then ignites. The heated air expands generating a force on the piston such that it is forced downward again in what is called the power stroke. Finally, the piston moves upward again to force the exhaust gas out of the cylinder during the exhaust stroke and returns to the starting position of the induction stroke so

the cycle may be repeated. 2-stroke engines can operate with just one revolution of the crankshaft because induction of the air or air/fuel mixture occurs concurrently with the release of the exhaust gas.

Detonation of the air/fuel mixture during the compression stroke may occur through either compression or spark ignition (CI or SI). In a CI engine, air is first compressed by the piston in the cylinder, which causes the temperature of the air to rise. Fuel is added to the heated air and combusts due to the temperature of the air being above the auto-ignition temperature of the fuel. Reciprocating CI engines are powered either by diesel fuel or JP-8. SI engines, which use gasoline, natural gas, or LPG differ from CI engines in that the fuel/air mixture does not ignite spontaneously, but rather by a spark. Emissions from nonroad engines will vary due to operating conditions such as temperature, humidity, torque, ignition timing, or even air/fuel mixture. Even slight variations in the air/fuel mixture will dramatically affect pollutant emissions.

While most NRDE are powered by either diesel or gasoline fuel, engines fueled with JP-8 are becoming increasingly more common. Presently, there are few EPA-approved NRDE EFs developed specifically for JP-8. However, since the combustion characteristics between JP-8 and diesel fuel are similar, **emissions from JP-8 fueled NRDE are typically calculated using diesel EFs.**

Gas turbines are composed of three major components: a compressor, a combustor, and a power turbine. In a gas turbine, ambient air is drawn in at the front of the engine with a fan, and the pressure is raised up to 30 times the ambient pressure via a compressor. The compressed air is directed into the combustor section where it is sprayed with fuel and ignited with an electric spark. The burning gases expand, and the high-pressure, high-velocity gas stream passes through a turbine area, driving the movement of an output shaft that converts the energy to useful power. Typically, more than half of the shaft energy produced is needed to drive the internal compressor, with the balance available to drive an external load such as an electric generator or water pump. Gas turbines may be more advantageous than reciprocating engines because of their lower operational cost, lower levels of CO and VOC emissions, and potential for use in cogeneration systems. However, the large initial cost of a gas turbine engine means that they are not likely to be a part of NRDE.

4.2 Emission Factors

Emission factors for NRDE are provided at the end of this section. They have been developed for specific equipment and are in units of $lb/10^3$ hp-hr. The appropriate EF should be selected based on the fuel the engine uses and whether the equipment is a 2-stroke or 4-stroke engine, if applicable. The tables also provide typical load factors and calculated BSFC values which may be needed for emissions calculations as described later in this chapter.

4.2.1 Alternative Fuels and Emissions Reduction

Increasingly stringent regulatory requirements mean that some USAF installations may be encouraged to operate non-road engines and equipment on alternative fuels such as ethanol based E85 (a blend of 85% ethanol and 15% gasoline) or B20 (a blend of 20% biodiesel and 80% petroleum diesel). While there are currently no NRDE that use these alternative fuels, there are on-highway flexible fuel vehicles (FFVs) that can operate on E85 and are required to meet EPA's Tier II vehicle emission standards regardless of the fuel type. Some research suggests evidence of potential emission reduction benefits from the use of E85, although testing has been limited and emissions impacts have not been fully characterized. While some reduction in evaporative emissions is expected due to the displacement of gasoline, emissions are believed to be generally similar to gasoline emissions. Note, however, that data indicates that some HAP emissions are reduced while others are increased. Accordingly, EPA does not support the use of emission reduction factors for engines using E85 fuels.

A somewhat similar situation exists regarding information on the emissions impact of B20 fuels. In October 2002, the EPA issued its technical report on biodiesel emissions (USEPA 2002). This report was developed using various statistical analysis tools to compile and assess the results of 39 studies regarding the impact of B20 use on vehicle emissions. Relative to conventional, on-highway diesel fuel (i.e., conventional low-sulfur diesel with sulfur content < 500 ppm), B20 showed a +2% impact on NO_X emissions, a -10% impact on PM emissions, a -21% impact on HC emissions, and a -11% impact on CO emissions. Since the time of the study, however, ultra-low sulfur diesel (ULSD) regulations limiting the sulfur content of on-highway diesel fuel to 15 ppm have been enacted. Since June 2007, the sulfur content of nonroad diesel fuel has been limited to 500 ppm which was then further reduced to 15 ppm effective June 2010. Another study was conducted under the auspices of the DoD Environmental Security Technology Certification Program (ESTCP). This study sought to measure the impact of B20 on CO, NO_X, PM, HC, and HAP emissions from engines used in on-road and portable power generation applications (Environmental Security Technology Certification Program 2006). Using primarily a B20 biodiesel/ULSD blend, the study showed no significant differences in emissions between the B20 blended with ULSD and the ULSD by itself. No consistent trend was observed with regards to HAP emissions.

These examples indicate that efforts to apply emission reduction factors to estimate emissions from alternatively fueled NRDE should be attempted only after careful review of the most current, validated information available. Information can be obtained from either the EPA, the Department of Energy (DoE), the DoD, and Service Engineering and Research Organizations. Application of the B20 EFs developed by the EPA should only be considered if an installation is confident that the nonroad diesel fuel it is replacing has a sulfur concentration of 500 ppm or less. It is important to note that should the sulfur content exceed 500 ppm, potential emissions

benefits of B20 may be underreported because, to date, emission impacts studies have generally not focused on nonroad engines and fuels.

4.3 Emissions Calculation

This section describes several methodologies available for calculating emissions from nonroad engines and equipment using either the EPAs NONROAD emissions estimating software model, or the underlying EFs in the NONROAD model and manual calculation procedures. Regardless of which approach is chosen, the methodology is applied to each individual piece of NRDE for each pollutant for which emissions are being calculated. The methodologies are briefly described in the following paragraphs.

4.3.1 Emissions Estimation Using the EPA NONROAD Model

The EPA recommends use of its NONROAD modeling software for estimating emissions from the operation of nonroad vehicles and equipment. The software was developed to provide consistent means of generating emissions data required by the CAA. The current NONROAD model predicts emissions of six exhaust pollutants (HC, NO_X, CO, CO_2, SO_X, and PM) for more than 80 basic and 260 specific types of NRDE across a variety of model years that use gasoline, diesel, CNG, or LPG. The model allows PM to be reported as PM_{10} or $PM_{2.5}$. **As of June 2014, the NONROAD model was integrated into the Motor Vehicle Emissions Simulator (MOVES 2014) model as an additional module and can now be run within the MOVES software. On August 2023, the MOVES4 model became the official version of MOVES, which continues to include and support the NONROAD model.**

A major benefit of the NONROAD model is that it recognizes that an engine's performance degrades over time due to normal operation and use. Engine deterioration not only increases exhaust emissions, but usually leads to a loss of combustion efficiency, and may increase non-exhaust emissions. EPA believes there is insufficient information to justify the use of adjustment factors for small SI engines. Therefore, the NONROAD model uses EFs based on unadjusted steady-state test results, and applies an adjustment factor only to SI engines with a power rating greater than 25 hp. In terms of CI engines, the NONROAD model addresses the effects of deterioration by multiplying a zero-hour EF for each category of engine by a deterioration factor to reflect degraded performance as the engine ages.

While the core model for NONROAD is written in FORTRAN and can be operated as a standalone application in a DOS environment, the graphical user interface will generate scenarios for only one specified set of conditions. If the user requires multiple scenarios in a single model run, the scenarios must be generated in a DOS environment. The NONROAD reporting utility is written in Microsoft Access and operated similarly to the graphical user

interface. The reporting utility is a standalone application and knowledge of Access is not required to generate reports.

EFs for NRDE manufactured prior to Model Year 1998 have been derived from the NONROAD model and its underlying data sets by the EPA Office of Transportation Air Quality. EFs are provided in Table 4-1 through Table 4-5 and serve as the basis for estimating emissions manually using the methodologies discussed in the following subsections.

4.3.2 Horsepower/Load Factor Method

The most common approach for calculating emissions from NRDE is essentially the same as the method incorporated into the NONROAD model and the horsepower/load factor method used in the "FLIGHTLINE GROUND SUPPORT EQUIPMENT (AGE)" section. Emissions are estimated based on the engine's rated power output, a load factor, and annual operating time. Generally, for calculating emissions from non-road engines, a load factor of 100% is assumed and used in the following equation:

$$E(Pol) = OT \times \frac{LF}{100} \times hp_{rtd} \times \frac{1}{1000} \times EF(Pol) \times N$$

Equation 4-1

Where,

E(Pol) = Annual emissions of each individual pollutant (lb/yr)
OT = Operating time (hr/unit)
LF = Load factor (%). Typically assumed to be 100%, though it may be calculated using Equation 3-3 in this guide.
100 = Factor for converting percent to a fraction (%)
hp_{rtd} = Engine rated horsepower (hp)
1000 = Factor converting from hp to 10^3 hp (hp/10^3 hp)
EF(Pol) = Emission factor of each pollutant (lb/10^3 hp-hr)
N = Number of nonroad engines and equipment used each year (units/yr)

The data required for calculating emissions using the horsepower/load factor method may be found in Table 4-1 through Table 4-5.

4.3.3 Fuel Consumption Method

Estimating emissions based on fuel consumption can be utilized in instances when the fuel consumption is known but the operating time of the NRDE is not. The annual fuel consumption, fuel density, BSFC values for the piece of equipment, and EF must be known to calculate emissions using this method as illustrated in the equation below:

$$E(Pol) = \frac{(FC \times \rho)}{BSFC} \times EF(Pol) \times N$$

Equation 4-2

Where,

E(Pol) = Annual emissions of each individual pollutant (lb/yr)
FC = Annual fuel consumption (gal/unit). If the total fuel consumed is unknown, the fuel consumed may be calculated using Equation 3-5 or Equation 3-6
ρ = Fuel density (lb/gal)
BSFC = Brake-specific fuel consumption for the engine (lb/10^3 hp-hr)
EF(Pol) = Emission factor for each pollutant (lb/10^3 hp-hr)
N = Number of equipment used each year (units/yr)

When performing emissions calculations using the fuel consumption method, enhanced accuracy may be achieved by using the density of the fuel as provided by the fuel supplier, and the BSFC for the engine provided directly from the engine manufacturer. If this data is unavailable, then suggested values for these variables may be found in the following tables:

- Table 3-1 provides the average density for nonroad fuels.
- Table 4-1 through Table 4-6 provides the EFs and BSFC for specific equipment types in lb/10^3 hp-hr.

4.3.4 VOC and HAP Speciation

There is little data available for the speciation of VOCs for nonroad engines. Whenever the quantity of speciated compounds is required to be calculated, the average percentage of each species within the total VOC may be used as a gross estimate of the emissions of that compound. This section should only be used if no acceptable speciated EFs are available for the engine in question. Speciated VOCs are calculated by taking the product of the total VOCs and the weighted percentage of the individual VOC as follows:

$$E(Pol) = E(VOC) \times \frac{P(Pol)}{100}$$

Equation 4-3

Where,

E(Pol) = Emissions of speciated VOC (lb/yr)
E(VOC) = Emissions of total VOC (lb/yr)
P(Pol) = Weight percent of a given pollutant (%). These are provided in Table 4-7
100 = Factor for converting percent to a fraction (%)

The weight percent of individual pollutants were calculated for engines combusting diesel, gasoline, natural gas (which is further subdivided into 2- and 4-stroke lean burn and 4-stroke rich burn), and LPG. The values provided in Table 4-7 were calculated using the equation below. The EF data used in these calculations are from several sources including *Compilation of Air Pollutant Emission Factors* (AP-42), the Mojave Desert Air Quality Management District, and the EPAs *SPECIATE* database. Since the available data regarding mobile NRDE EFs is limited, the factors presented in these sources were assumed to be representative of all non-road engines.

$$P_{(Pol)} = \frac{EF(Pol)}{EF(VOC)_{Total}}$$

Where,

P(Pol) = Weight percent of a given pollutant (%)
EF(Pol) = Individual pollutant emission factor (lb/10^3 hp-hr)
EF(VOC)$_{Total}$ = Total VOC emission factor (lb/10^3 hp-hr)

In addition to the weight percent pollutant speciation values provided in Table 4-7, most equipment manufacturers have data on emissions specific to their product, and many are willing to provide it upon request. HAP emissions may be calculated using the following tables:

- Table 3-7 provides EFs for uncontrolled diesel reciprocating internal combustion engines in a lb/1000 hp-hr format and may be used to calculate HAPs directly using Equation 4-1.
- Table 4-7 gives the weight percent VOC and HAP speciation of emissions for estimating specific VOCs/HAPs using Equation 4-3 above.

4.4 Information Resources

The primary source of information for most NRDE is the Transportation Squadron. The Transportation Vehicle Operations Flight and/or the Transportation Vehicle Maintenance Flight typically maintain records on most USAF-owned NRDE. Records include information such as the identity of the shops/organizations operating the vehicles/equipment, hp rating of the vehicles/equipment, and hours of operation. In some cases, it may be necessary to contact the actual organizations/shops using the vehicle/equipment to obtain information that Transportation may not have. For example, for construction equipment and lawn/garden equipment, it will probably be necessary to contact the Civil Engineering (CE) Operations Flight, the CE Flight and the CE Housing Flight, or a similar organization if base housing has been privatized.

It is important to note that many of the construction and lawn care activities at USAF installations are performed by contractors, and therefore it may be necessary to contact the

contractors directly to obtain the necessary information on their equipment. The contracts section of the CE Engineering Flight should be able to provide information on what equipment was used to perform construction and lawn care activities on base during the year.

In addition, some NRDE (such as leaf blowers, trimmers/edgers, snow blowers, etc.) operated on USAF installations may be owned by personnel who live on base. Since this equipment is privately owned, obtaining this information is usually more difficult than for USAF-owned equipment. One approach to obtaining the necessary information is to work with the CE Housing Flight to identify the types of NRDE used on base housing, estimate the number of each different equipment type, estimate the average hp of each equipment type, and estimate the average operating time (hours per year) for each equipment type. If adequate resources and time are available, a more comprehensive approach would be to survey a representative number of housing units to determine the type and size of equipment used and their associated estimated usage. For NRDE in which emissions are calculated using EFs based on fuel usage (i.e., using "g/gal" EFs), Fuels Supply may be a source of information regarding fuel consumption.

4.5 Example Calculations

The following section provides examples of how the equations and methodologies discussed earlier can be applied to calculate emissions from non-road vehicle and equipment operations. The procedures are applied to each individual NRDE and for each pollutant for which emissions must be calculated. Emissions for all NRDE and pollutants are then summed to obtain the pollutant-specific, base-wide totals. Load factors, BSFCs, and EFs necessary for calculating emissions were obtained from Table 4-1 through Table 4-7.

4.5.1 Problem 1 – Estimating Emissions Using the Horsepower/Load Factor Method

A USAF base has collected information on the NRDE operating on the base for CY 2024. Calculate the CO emissions associated with the operation of diesel-powered forklifts on base. The following information was obtained from the base:

Equipment Type – Diesel powered forklift (SCC-2270003020)	
# of pieces	6
Power Rating	85 hp
Operating Time	200 hr/unit

Step 1 – Record the CO emission factor and load factor. The EF and typical load factor are given in Table 4-1 as **0.269 lb/10^3 hp-hr** and **59%** respectively.

Step 2 – Calculate the annual emissions for the six forklifts. Using the information in the table above and the values recorded in Step 1, the annual CO emissions for the six forklifts can be calculated using Equation 4-1:

$$E(Pol) = OT \times \frac{LF}{100} \times hp \times \frac{1}{1000} \times EF(Pol) \times N$$

$$E(CO) = 200 \frac{\cancel{hr}}{\cancel{unit}} \times \frac{59\%}{100\%} \times 85(\cancel{hp}) \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 0.269 \frac{lb}{\cancel{10^3 hp-hr}} \times 6 \frac{\cancel{unit}}{yr}$$

$$\boxed{\boldsymbol{E(CO) = 16.19 \frac{lb}{yr}}}$$

4.5.2 Problem 2 – Estimating Emissions Using Fuel Consumption

A USAF base operates gasoline fueled commercial lawn mowers to maintain the appearance of public areas on base. Calculate the VOC and formaldehyde emissions associated with operation of the lawnmowers on base for CY 2022. The following information was obtained from the base:

Equipment Type – 4-stroke gasoline lawnmower (SCC 2265004011)	
# of pieces	25
Power rating	5 hp
Fuel Consumption	40 gal each

Step 1 – Record the fuel density, VOC emission factor, and appropriate BSFC. The fuel density is provided in Table 3-1 and the VOC EF and BSFC value for gas powered commercial lawn mowers are provided in Table 4-1. The fuel density is given as **6.15 lb/gal** while the VOC EF and BSFC (for 2022) are given as **13.997 and 880 lb/10^3 hp-hr**, respectively.

Step 2 – Calculate annual VOC emissions. Using the data from Step 1 and Equation 4-2:

$$E(Pol) = \frac{(FC \times D)}{BSFC} \times EF(Pol) \times N$$

$$E(VOC) = \frac{\left(40 \frac{\cancel{gal}}{\cancel{unit}} \times 6.15 \frac{\cancel{lb}}{\cancel{gal}}\right)}{880 \frac{\cancel{lb}}{10^3\ hp-hr}} \times 13.997 \frac{lb}{10^3\ hp-hr} \times 25 \frac{unit}{yr}$$

$$E(VOC) = 0.2795 \frac{\cancel{10^3 hp-hr}}{\cancel{unit}} \times 13.997 \frac{lb}{\cancel{10^3 hp-hr}} \times 25 \frac{\cancel{unit}}{yr}$$

$$\boxed{\boldsymbol{E(VOC) = 97.82 \frac{lb}{yr}}}$$

Next, calculate formaldehyde emissions.

Step 3 – Record formaldehyde weight percent VOC emissions for 4-stroke gasoline engines. Table 4-7 lists this value as **1.32%**.

Step 4 – Calculate annual formaldehyde emissions. Using the formaldehyde weight percent recorded in Step 3 and Equation 4-3:

$$E(Pol) = E(VOC) \times \frac{P(Pol)}{100}$$

$$E(Formaldehyde) = 97.82\,\frac{lb}{yr} \times \frac{1.32\%}{100\%}$$

$$E(Formaldehyde) = 97.82\,\frac{lb}{yr} \times 0.0132$$

$$\boxed{\boldsymbol{E(Formaldehyde) = 1.29\,\frac{lb}{yr}}}$$

4.5.3 Problem 3 – Estimating SO_X Emissions

A USAF base needs to estimate SO_X emissions from the operation of rough terrain forklifts. The following information was obtained from the base:

Equipment Data – Rough terrain forklifts (SCC 2270002057)	
# of pieces	5
Fuel	Diesel
Power rating	80 hp
Model year	1997
Fuel Consumption	200 gal (each); 1,000 gal (total)
Hours of operation	250 hr/unit (each)

Since the model year of the forklifts are pre-1998, then the EFs applicable to these engines are found in Table 4-6. The preferred method of using the horsepower and load factor is used for the calculation of emissions.

Step 1 – Record the load factor and SO_X emission factor. According to Table 4-1, for diesel-powered rough terrain forklifts, the typical load factor is **59%** and Table 4-6 lists the SO_X EF as **0.21 lb/10^3 hp-hr**.

Step 2 – Calculate the total SOx emissions. Using these values and the data in the table above, the SO_X emissions can be calculated using Equation 4-1:

$$E(Pol) = OT \times \frac{LF}{100} \times hp \times \frac{1}{1000} \times EF(Pol) \times N$$

$$E(SO_X) = 250 \frac{\cancel{hr}}{\cancel{unit}} \times \frac{59\%}{100\%} \times 80\cancel{hp} \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 0.21 \frac{lb}{\cancel{10^3 hp-hr}} \times 5 \frac{\cancel{unit}}{yr}$$

$$\boxed{\boldsymbol{E(SO_X) = 12.39 \frac{lb}{yr}}}$$

4.5.4 Problem 4 – Estimating Emissions from the Use of B20

A USAF base has been blending B20 biodiesel into the non-road fuel used to power its off-highway trucks. The normal sulfur content of the non-road diesel is 500 ppm. The following information was obtained from the base.

Equipment Data – Off-Highway Trucks (SCC 2270002051)	
# of pieces	10
Fuel	B20/nonroad diesel (500 ppm blend)
Power rating	250 hp
Model year	2001
Hours of operation	200 hours (each); 2,000 hours (total)

Estimate the NO_X and PM_{10} emissions from the operation of the vehicles.

Step 1 – Record the NOx emission factor and load factor. Table 4-1 gives the EF and load factor (for 2022) as **3.390 lb/10^3 hp-hr** and **59%** respectively.

Step 2 – Calculate annual NOx emissions. Use the EF and load factor recorded in Step 1, the data provided in the table, and Equation 4-1 as follows:

$$E(Pol) = OT \times \frac{LF}{100} \times hp \times \frac{1}{1000} \times EF(Pol) \times N$$

$$\boldsymbol{E(NO_X)} = 200 \frac{\cancel{hr}}{\cancel{unit}} \times \frac{59\%}{100\%} \times 250\cancel{hp} \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 3.390 \frac{lb}{\cancel{10^3 hp-hr}} \times 10 \frac{\cancel{unit}}{yr} =$$

$$\boldsymbol{1{,}000.05 \frac{lb}{yr}}$$

Step 3 – Adjust the estimated emissions to reflect the expected 2% increase in NO_X attributable to the use of B20.

$$E(NO_X) = 1{,}000.05\,\frac{lb}{yr} \times \left(1 + \frac{2\%}{100\%}\right)$$

$$E(NO_X) = 1{,}000.05\,\frac{lb}{yr} \times (1.02)$$

$$\boxed{\boldsymbol{E(NO_X) = 1{,}020.05\,\frac{lb}{yr}}}$$

Step 4 – Record the PM_{10} emission factor. Table 4-1 lists this value as **0.070 lb/10^3 hp-hr**.

Step 5 – Calculate annual PM_{10} emissions. Use Equation 4-1, the EF recorded in Step 4, and the data provided in the table above as follows:

$$E(Pol) = OT \times \frac{LF}{100} \times hp \times \frac{1}{1000} \times EF(Pol) \times N$$

$$E(PM_{10}) = 200\,\frac{\cancel{hr}}{\cancel{unit}} \times \frac{59\%}{100\%} \times 250\cancel{hp} \times \frac{1}{1000}\left(\frac{\cancel{10^3 hp}}{\cancel{hp}}\right) \times 0.070\,\frac{lb}{\cancel{10^3 hp\text{-}hr}} \times 10\,\frac{\cancel{unit}}{yr} = \boldsymbol{20.65\,\frac{lb}{yr}}$$

Step 6 – Adjust the estimated emissions to reflect the expected 10% decrease in PM emissions attributable to the use of B20 fuel:

$$E(PM_{10}) = 20.65\,\frac{lb}{yr} \times \left(1 - \frac{10\%}{100\%}\right)$$

$$E(PM_{10}) = 20.65\,\frac{lb}{yr} \times (0.9)$$

$$\boxed{\boldsymbol{E(PM_{10}) = 18.59\,\frac{lb}{yr}}}$$

3560 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3561 **2023**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260001010	2 Stroke Motorcycles: Off- Road [c]	100	260	78.732	69.691	0.922	0.003	2.551	2.347	573.000
2260001020	2 Stroke Snowmobiles	34	1640	132.426	175.450	5.990	0.012	1.607	1.479	2105.580
2260001030	2 Stroke ATVs [c]	100	210	82.177	15.107	0.942	0.003	0.406	0.373	501.717
2260001060	2 Stroke Specialty Vehicles/Carts	58	1000	575.914	20.587	4.630	0.013	0.296	0.272	2348.316
2260002006	2 Stroke Tampers/Rammers	55	680	560.570	134.770	3.366	0.008	20.412	18.779	1596.022
2260002009	2 Stroke Plate Compactors	55	830	490.658	110.085	5.246	0.013	16.835	15.489	2440.287
2260002021	2 Stroke Paving Equipment	59	830	494.394	109.698	5.246	0.013	16.949	15.593	2437.570
2260002027	2 Stroke Signal Boards/Light Plants	72	830	512.954	128.849	5.246	0.013	17.574	16.168	2422.471
2260002039	2 Stroke Concrete/Industrial Saws	78	630	580.948	136.956	3.517	0.009	21.176	19.482	1645.706
2260002054	2 Stroke Crushing/Proc. Equipment	85	830	512.954	112.858	5.246	0.013	17.574	16.168	2422.470
2260003030	2 Stroke Sweepers/Scrubbers	71	820	512.953	115.390	5.246	0.013	17.574	16.168	2422.469
2260003040	2 Stroke Other General Industrial Equipment	54	830	512.953	113.920	5.246	0.013	17.574	16.168	2422.469
2260004015	2 Stroke Rotary Tillers < 6 HP (Residential)	40	940	455.120	108.327	5.259	0.013	16.271	14.969	2454.502
2260004016	2 Stroke Rotary Tillers < 6 HP (Commercial)	40	900	459.895	94.306	5.259	0.013	16.408	15.095	2451.195
2260004020	2 Stroke Chain Saws < 6 HP (Residential)	70	900	470.395	108.616	5.246	0.013	16.250	14.950	2454.278
2260004021	2 Stroke Chain Saws < 6 HP (Commercial)	70	650	577.069	133.544	3.616	0.009	20.971	19.293	1690.024
2260004025	2 Stroke Trimmers/Edgers/Brush Cutter (Residential)	91	890	434.296	110.004	5.296	0.013	16.888	15.537	2441.523
2260004026	2 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	810	494.612	103.040	4.976	0.012	17.170	15.797	2323.489
2260004030	2 Stroke Leaf blowers/Vacuums (Residential)	94	890	460.603	130.463	5.259	0.013	16.428	15.113	2450.712
2260004031	2 Stroke Leaf blowers/Vacuums (Commercial)	94	760	520.116	113.799	4.354	0.011	18.424	16.950	2042.139
2260004035	2 Stroke Snow blowers (Residential)	35	870	530.459	401.579	1.774	0.006	5.897	5.425	1239.587
2260004036	2 Stroke Snow blowers (Commercial)	35	870	619.164	231.267	2.069	0.007	6.881	6.331	1446.110

3562
3563

3564 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3565 **2023 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260004071	2 Stroke Commercial Turf Equipment	60	840	481.741	98.316	5.246	0.013	16.571	15.246	2446.606
2260005035	2 Stroke Sprayers	65	840	423.969	107.817	5.318	0.013	17.367	15.978	2430.965
2260006005	2 Stroke Generator Sets	68	830	483.463	131.458	5.251	0.013	16.808	15.464	2441.149
2260006010	2 Stroke Pumps	69	830	461.411	136.148	5.276	0.013	18.336	16.869	2396.367
2260006015	2 Stroke Air Compressors	56	830	512.954	134.653	5.246	0.013	17.574	16.168	2422.472
2260006035	2 Stroke Hydro Power Units	56	830	512.954	141.762	5.246	0.013	17.574	16.168	2422.470
2260007005	2 Stroke Chain Saws > 6 HP	70	620	586.887	137.090	3.366	0.008	21.491	19.772	1577.859
2265001010	4 Stroke Motorcycles: Off- Road	100	160	58.517	6.898	1.237	0.003	0.147	0.135	504.310
2265001030	4 Stroke ATVs	100	170	80.824	8.047	0.961	0.003	0.147	0.135	532.985
2265001050	4 Stroke Golf Carts	46	740	587.436	13.470	4.915	0.013	0.301	0.277	2345.372
2265001060	4 Stroke Specialty Vehicles/Carts	58	820	584.215	19.695	7.051	0.013	0.240	0.221	2309.831
2265002003	4 Stroke Pavers	66	700	434.559	9.498	4.296	0.012	0.257	0.236	2156.830
2265002006	4 Stroke Tampers/Rammers	55	760	572.517	12.595	4.534	0.013	0.250	0.230	2345.279
2265002009	4 Stroke Plate Compactors	55	830	488.542	15.027	5.119	0.014	0.516	0.475	2584.954
2265002015	4 Stroke Rollers	62	690	448.720	9.937	4.301	0.012	0.254	0.233	2152.867
2265002021	4 Stroke Paving Equipment	59	780	531.498	14.125	4.784	0.013	0.346	0.318	2416.100
2265002024	4 Stroke Surfacing Equipment	49	750	535.852	13.424	4.829	0.013	0.359	0.330	2389.483
2265002027	4 Stroke Signal Boards/Light Plants	72	780	525.744	13.414	5.090	0.014	0.464	0.427	2495.238
2265002030	4 Stroke Trenchers	66	710	417.021	10.356	4.436	0.012	0.323	0.297	2203.365
2265002033	4 Stroke Bore/Drill Rigs	79	790	367.050	14.581	7.043	0.013	0.490	0.450	2408.597
2265002039	4 Stroke Concrete/Industrial Saws	78	710	519.777	11.418	4.626	0.012	0.279	0.257	2250.915
2265002042	4 Stroke Cement & Mortar Mixers	59	820	535.695	18.152	4.829	0.013	0.351	0.323	2451.316

3566
3567

Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2023 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265002045	4 Stroke Cranes	47	590	104.046	3.715	4.692	0.009	0.161	0.149	1651.204
2265002054	4 Stroke Crushing/Proc. Equipment	85	740	496.672	12.098	4.786	0.013	0.326	0.300	2312.256
2265002057	4 Stroke Rough Terrain Forklifts	63	570	36.079	1.772	3.156	0.009	0.153	0.141	1557.782
2265002060	4 Stroke Rubber Tire Loaders	71	550	24.332	1.389	2.722	0.009	0.153	0.141	1544.026
2265002066	4 Stroke Tractors/Loaders/ Backhoes	48	730	543.027	11.340	4.565	0.013	0.263	0.242	2293.835
2265002072	4 Stroke Skid Steer Loaders	58	640	248.464	6.281	4.566	0.010	0.190	0.174	1865.682
2265002078	4 Stroke Dumpers/Tenders	41	800	550.525	17.661	5.061	0.013	0.281	0.259	2367.958
2265002081	4 Stroke Other Construction Equipment	48	580	58.483	3.078	5.429	0.009	0.149	0.137	1580.964
2265003010	4 Stroke Aerial Lifts	46	630	174.701	5.003	4.561	0.010	0.174	0.160	1756.142
2265003020	4 Stroke Forklifts	30	560	24.006	1.346	2.705	0.009	0.152	0.140	1544.026
2265003030	4 Stroke Sweepers/Scrubbers	71	610	202.600	5.244	3.451	0.010	0.219	0.202	1822.910
2265003040	4 Stroke Other General Industrial Equipment	54	760	441.486	13.779	5.056	0.013	0.533	0.490	2400.478
2265003050	4 Stroke Other Material Handling Equipment	53	640	203.342	5.246	4.005	0.010	0.182	0.168	1802.680
2265003060	4 Stroke AC/Refrigeration	46	740	575.255	12.569	4.604	0.013	0.260	0.239	2345.291
2265003070	4 Stroke Terminal Tractors	78	520	24.452	1.358	2.728	0.009	0.154	0.142	1544.026
2265004010	4 Stroke Lawn mowers (Residential)	33	900	423.059	24.112	5.355	0.015	0.642	0.591	2759.982
2265004011	4 Stroke Lawn mowers (Commercial)	33	880	427.369	14.858	5.557	0.015	0.717	0.659	2759.982
2265004015	4 Stroke Rotary Tillers < 6 HP (Residential)	40	910	422.946	20.986	5.355	0.015	0.643	0.591	2760.134
2265004016	4 Stroke Rotary Tillers < 6 HP (Commercial)	40	890	423.798	13.409	5.395	0.015	0.658	0.605	2760.141
2265004025	4 Stroke Trimmers/Edgers/Brush Cutter HP (Residential)	91	900	423.901	20.269	5.400	0.015	0.660	0.607	2760.146
2265004026	4 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	820	496.859	12.439	5.116	0.014	0.500	0.460	2566.413
2265004030	4 Stroke Leaf blowers/Vacuums (Residential)	94	900	423.918	27.587	5.401	0.015	0.660	0.607	2760.145

3572 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3573 **2023 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265004031	4 Stroke Leaf blowers/Vacuums (Commercial)	94	700	434.998	8.493	4.272	0.012	0.249	0.229	2155.291
2265004035	4 Stroke Snow blowers (Residential)	35	940	605.498	232.016	4.734	0.008	0.126	0.116	1506.663
2265004036	4 Stroke Snow blowers (Commercial)	35	940	710.190	33.889	5.385	0.009	0.147	0.135	1757.282
2265004040	4 Stroke Rear Engine Riding Mowers (Residential)	38	760	571.689	22.433	4.529	0.013	0.247	0.228	2346.431
2265004041	4 Stroke Rear Engine Riding Mowers (Commercial)	38	740	574.505	11.400	4.594	0.013	0.259	0.238	2346.059
2265004046	4 Stroke Front Mowers	65	790	573.599	12.715	4.887	0.013	0.243	0.223	2342.084
2265004051	4 Stroke Shredders < 6 HP	80	890	423.374	13.951	5.375	0.015	0.651	0.599	2760.138
2265004055	4 Stroke Lawn & Garden Tractors (Residential)	44	760	571.456	16.888	4.517	0.013	0.247	0.227	2345.592
2265004056	4 Stroke Lawn & Garden Tractors (Commercial)	44	740	574.674	10.813	4.593	0.013	0.258	0.238	2345.581
2265004066	4 Stroke Chippers/Stump Grinders	78	640	292.398	6.264	3.692	0.011	0.213	0.196	1930.389
2265004071	4 Stroke Commercial Turf Equipment	60	730	487.196	10.457	4.536	0.013	0.315	0.290	2309.798
2265004075	4 Stroke Other Lawn & Garden Equipment	58	850	500.240	24.026	5.206	0.014	0.446	0.410	2557.740
2265004076	4 Stroke Other Lawn & Garden Equipment	58	850	498.182	22.242	5.239	0.014	0.445	0.409	2552.252
2265005010	4 Stroke 2-Wheel Tractors	62	740	577.380	11.894	4.658	0.013	0.267	0.245	2345.308
2265005015	4 Stroke Agricultural Tractors	62	580	105.786	2.876	3.013	0.009	0.170	0.156	1661.918
2265005020	4 Stroke Combines	74	580	139.845	10.993	12.643	0.009	0.153	0.141	1664.631
2265005025	4 Stroke Balers	62	580	139.921	13.446	12.648	0.009	0.153	0.141	1664.610
2265005030	4 Stroke Agricultural Mowers	48	770	571.638	12.478	4.596	0.013	0.250	0.230	2347.902
2265005035	4 Stroke Sprayers	65	740	395.816	15.509	7.838	0.012	0.299	0.275	2196.249
2265005040	4 Stroke Tillers > 6 HP	71	870	749.723	25.236	8.459	0.013	0.253	0.233	2471.814
2265005045	4 Stroke Swathers	52	580	139.921	11.043	12.648	0.009	0.153	0.141	1664.610
2265005055	4 Stroke Other Agricultural Equipment	55	620	226.934	9.422	11.015	0.010	0.175	0.161	1805.880

3574
3575

3576 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3577 **2023 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265005060	4 Stroke Irrigation Sets	60	550	36.225	1.756	2.801	0.009	0.168	0.154	1571.228
2265006005	4 Stroke Generator Sets	68	780	558.465	14.801	4.668	0.013	0.287	0.264	2384.119
2265006010	4 Stroke Pumps	69	760	439.135	12.426	4.950	0.013	0.414	0.381	2360.611
2265006015	4 Stroke Air Compressors	56	700	360.493	9.580	4.294	0.012	0.336	0.309	2144.262
2265006025	4 Stroke Welders	68	710	472.989	9.939	4.388	0.012	0.259	0.238	2199.512
2265006030	4 Stroke Pressure Washers	85	800	520.754	14.104	4.904	0.014	0.415	0.382	2489.869
2265006035	4 Stroke Hydro Power Units	56	750	540.048	12.593	4.753	0.013	0.334	0.307	2370.646
2265007010	4 Stroke Shredders > 6 HP	80	800	579.858	12.652	4.767	0.013	0.246	0.226	2350.199
2265007015	4 Stroke Forest Equipment - Feller/Bunch/Skidder	70	810	492.116	14.559	5.384	0.014	0.598	0.550	2593.343
2265008005	4 Stroke Airport Ground Support Equipment	56	600	129.385	4.222	3.260	0.010	0.232	0.213	1744.054
2265010010	4 Stroke Other Oil Field Equipment	90	740	594.069	12.551	5.085	0.013	0.323	0.297	2345.418
2267001060	LPG Specialty Vehicle Carts	58	490	46.060	1.904	8.867	0.006	0.126	0.126	1297.670
2267002003	LPG Pavers	66	460	12.972	0.318	2.333	0.006	0.127	0.127	1219.228
2267002015	LPG Rollers	62	450	10.633	0.246	2.054	0.006	0.129	0.129	1216.735
2267002021	LPG Paving Equipment	59	480	25.208	0.851	4.504	0.006	0.125	0.125	1244.158
2267002024	LPG Surfacing Equipment	49	460	12.956	0.326	2.367	0.006	0.128	0.128	1219.811
2267002030	LPG Trenchers	66	460	12.959	0.313	2.311	0.006	0.127	0.127	1218.866
2267002033	LPG Bore/Drill Rigs	79	490	54.451	2.206	10.082	0.006	0.125	0.125	1309.824
2267002039	LPG Concrete/Industrial Saws	78	430	10.772	0.251	2.066	0.006	0.130	0.130	1216.744
2267002045	LPG Cranes	47	480	21.781	0.687	3.822	0.006	0.124	0.124	1236.059
2267002054	LPG Crushing/Proc. Equipment	85	480	20.247	0.619	3.546	0.006	0.125	0.125	1232.842
2267002057	LPG Rough Terrain Forklifts	63	470	13.839	0.343	2.430	0.006	0.127	0.127	1220.032

3578
3579

Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2023 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2267002060	LPG Rubber Tire Loaders	71	460	10.548	0.243	2.046	0.006	0.128	0.128	1216.728
2267002066	LPG Tractors/Loaders/ Backhoes	48	450	10.655	0.246	2.056	0.006	0.129	0.129	1216.737
2267002072	LPG Skid Steer Loaders	58	470	20.879	0.658	3.707	0.006	0.125	0.125	1234.970
2267002081	LPG Other Construction Equipment	48	480	25.716	0.852	4.480	0.006	0.124	0.124	1243.422
2267003010	LPG Aerial Lifts	46	480	21.820	0.665	3.716	0.006	0.124	0.124	1234.184
2267003020	LPG Forklifts	30	460	10.406	0.237	2.033	0.006	0.126	0.126	1216.719
2267003030	LPG Sweepers/Scrubbers	71	440	10.557	0.243	2.047	0.006	0.128	0.128	1216.729
2267003040	LPG Other General Industrial Equipment	54	450	10.456	0.239	2.038	0.006	0.127	0.127	1216.722
2267003050	LPG Other Material Handling Equipment	53	480	16.733	0.477	2.983	0.006	0.125	0.125	1226.729
2267003070	LPG Terminal Tractors	78	430	10.599	0.244	2.051	0.006	0.128	0.128	1216.731
2267004066	LPG Chippers/Stump Grinders	78	450	10.508	0.241	2.043	0.006	0.127	0.127	1216.726
2267005055	LPG Other Agricultural Equipment	55	490	64.969	2.438	10.922	0.006	0.128	0.128	1312.994
2267005060	LPG Irrigation Sets	60	450	10.572	0.243	2.048	0.006	0.128	0.128	1216.731
2267006005	LPG Generator Sets	68	480	30.540	1.117	6.968	0.006	0.124	0.124	1274.451
2267006010	LPG Pumps	69	470	18.532	0.507	3.569	0.006	0.126	0.126	1233.345
2267006015	LPG Air Compressors	56	460	11.828	0.263	2.182	0.006	0.127	0.127	1217.849
2267006025	LPG Welders	68	460	12.399	0.287	2.208	0.006	0.127	0.127	1217.678
2267006030	LPG Pressure Washers	85	470	22.284	0.704	3.891	0.006	0.125	0.125	1236.637
2267006035	LPG Hydro Power Units	56	460	11.683	0.268	2.203	0.006	0.127	0.127	1218.242
2267008005	LPG Airport Ground Support Equipment	56	450	10.429	0.238	2.035	0.006	0.127	0.127	1216.722
2268002081	CNG Other Construction Equipment	48	480	25.623	3.065	4.541	0.006	0.124	0.124	1407.887
2268003020	CNG Forklifts	30	460	10.406	0.903	2.129	0.006	0.126	0.126	1159.473

3584 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3585 **2023 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2268003030	CNG Sweepers/Scrubbers	71	460	10.416	0.905	2.130	0.006	0.127	0.127	1159.609
2268003040	CNG Other General Industrial Equipment	54	460	10.418	0.905	2.130	0.006	0.127	0.127	1159.637
2268003060	CNG AC\Refrigeration	46	450	11.040	0.965	2.187	0.006	0.127	0.127	1166.048
2268003070	CNG Terminal Tractors	78	430	10.598	0.930	2.147	0.006	0.128	0.128	1162.144
2268005055	CNG Other Agricultural Equipment	55	510	64.879	8.710	10.963	0.006	0.128	0.128	2057.224
2268005060	CNG Irrigation Sets	60	510	10.577	0.927	2.145	0.006	0.128	0.128	1161.855
2268006005	CNG Generator Sets	68	490	32.632	4.493	7.789	0.006	0.124	0.124	1594.412
2268006010	CNG Pumps	69	480	22.217	2.314	4.386	0.006	0.125	0.125	1328.745
2268006015	CNG Air Compressors	56	470	11.912	0.996	2.285	0.006	0.127	0.127	1170.132
2268006020	CNG Gas Compressors	85	410	11.753	1.087	2.256	0.006	0.139	0.139	1178.200
2268006035	CNG Hydro Power Units	56	470	12.619	1.072	2.410	0.006	0.126	0.126	1179.292
2268010010	CNG Other Oil Field Equipment	90	410	11.075	0.995	2.192	0.006	0.133	0.133	1168.774
2270001060	Diesel Specialty Vehicle Carts	21	450	6.160	1.564	8.053	0.005	0.929	0.901	1439.632
2270002003	Diesel Pavers	59	380	0.526	0.086	1.968	0.003	0.094	0.091	1214.341
2270002006	Diesel Tampers/Rammers	43	1000	5.691	1.829	9.387	0.005	0.583	0.565	1300.175
2270002009	Diesel Plate Compactors	43	410	4.911	1.492	9.039	0.005	0.515	0.500	1300.452
2270002015	Diesel Rollers	59	390	0.783	0.123	2.555	0.003	0.129	0.125	1233.929
2270002018	Diesel Scrapers	59	370	0.587	0.077	1.366	0.003	0.084	0.082	1183.452
2270002021	Diesel Paving Equipment	59	390	1.021	0.198	3.008	0.003	0.167	0.162	1227.270
2270002024	Diesel Surfacing Equipment	59	380	1.787	0.277	4.840	0.004	0.246	0.239	1224.318
2270002027	Diesel Signal Boards/Light Plants	43	410	2.695	0.670	7.553	0.004	0.332	0.322	1293.757
2270002030	Diesel Trenchers	59	400	1.274	0.207	4.522	0.004	0.179	0.173	1273.707

3586
3587

Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2023 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270002033	Diesel Bore/Drill Rigs	43	370	1.688	0.429	6.324	0.004	0.310	0.301	1190.482
2270002036	Diesel Excavators	59	380	0.292	0.053	1.101	0.003	0.057	0.056	1194.764
2270002039	Diesel Concrete/Industrial Saws	59	410	1.442	0.247	4.910	0.004	0.198	0.192	1305.066
2270002042	Diesel Cement & Mortar Mixers	43	390	3.155	0.799	7.680	0.004	0.498	0.483	1244.748
2270002045	Diesel Cranes	43	370	0.446	0.100	1.830	0.003	0.081	0.078	1175.735
2270002048	Diesel Graders	59	370	0.281	0.051	0.832	0.003	0.060	0.058	1185.404
2270002051	Diesel Off-highway Trucks	59	370	0.299	0.079	3.282	0.003	0.061	0.059	1183.448
2270002054	Diesel Crushing/Proc. Equipment	43	380	0.674	0.138	2.996	0.003	0.105	0.102	1203.271
2270002057	Diesel Rough Terrain Forklifts	59	390	1.098	0.133	2.926	0.004	0.185	0.179	1255.859
2270002060	Diesel Rubber Tire Loaders	59	370	0.664	0.109	2.239	0.003	0.112	0.109	1190.478
2270002066	Diesel Tractors/Loaders/ Backhoes	21	460	3.987	0.836	5.401	0.004	0.643	0.624	1466.932
2270002069	Diesel Crawler Tractor/Dozers	59	370	0.502	0.079	1.796	0.003	0.086	0.083	1190.038
2270002072	Diesel Skid Steer Loaders	21	480	7.050	1.478	8.492	0.005	1.100	1.067	1529.379
2270002075	Diesel Off-Highway Tractors	59	370	0.836	0.139	3.637	0.003	0.121	0.118	1183.357
2270002078	Diesel Dumpers/Tenders	21	470	7.227	1.682	8.664	0.005	1.099	1.066	1508.566
2270002081	Diesel Other Construction Equipment	59	370	1.301	0.185	3.251	0.003	0.182	0.177	1185.469
2270003010	Diesel Aerial Lifts	21	480	6.395	1.382	8.515	0.005	0.888	0.862	1531.187
2270003020	Diesel Forklifts	59	400	0.225	0.047	2.341	0.003	0.034	0.033	1265.583
2270003030	Diesel Sweepers/Scrubbers	43	380	0.423	0.081	2.006	0.003	0.075	0.073	1219.326
2270003040	Diesel Other General Industrial Equipment	43	380	0.625	0.123	2.423	0.003	0.119	0.115	1205.541
2270003050	Diesel Other Material Handling Equipment	21	440	3.598	0.929	6.237	0.004	0.608	0.590	1413.916
2270003060	Diesel AC\Refrigeration	43	410	0.818	0.204	5.908	0.004	0.086	0.084	1301.600

3592 **Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3593 **2023 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270003070	Diesel Terminal Tractors	59	380	0.156	0.033	0.784	0.003	0.033	0.032	1199.665
2270004031	Diesel Leaf blowers/Vacuums	43	410	5.481	1.550	10.479	0.004	0.809	0.785	1298.747
2270004036	Diesel Snow blowers	43	370	0.966	0.240	3.670	0.002	0.163	0.158	682.509
2270004046	Diesel Front Mowers	43	410	2.657	0.634	7.720	0.004	0.376	0.365	1300.971
2270004056	Diesel Lawn & Garden Tractors	43	410	3.299	0.778	8.188	0.005	0.392	0.380	1300.982
2270004066	Diesel Chippers/Stump Grinders	43	380	2.232	0.497	6.605	0.004	0.403	0.390	1215.752
2270004071	Diesel Commercial Turf Equipment	43	400	0.927	0.203	4.094	0.004	0.129	0.126	1263.293
2270004076	Diesel Other Lawn & Garden Equipment	43	410	3.542	0.798	8.604	0.004	0.592	0.574	1293.228
2270005010	Diesel 2-Wheel Tractors	59	410	5.454	1.836	9.216	0.005	0.530	0.514	1313.078
2270005015	Diesel Agricultural Tractors	59	380	2.005	0.343	4.931	0.004	0.338	0.328	1211.336
2270005020	Diesel Combines	59	370	2.468	0.583	7.094	0.004	0.520	0.504	1185.396
2270005025	Diesel Balers	59	400	4.756	0.892	8.291	0.004	0.704	0.682	1269.803
2270005030	Diesel Agricultural Mowers	59	410	5.649	0.737	7.455	0.004	0.851	0.826	1312.984
2270005035	Diesel Sprayers	59	380	2.915	0.682	6.937	0.004	0.488	0.474	1195.803
2270005040	Diesel Tillers > 6 HP	59	370	3.188	0.505	6.811	0.004	0.406	0.394	1186.605
2270005045	Diesel Swathers	59	400	5.031	0.794	8.269	0.004	0.771	0.748	1284.403
2270005055	Diesel Other Agricultural Equipment	59	380	2.615	0.504	6.121	0.004	0.467	0.453	1196.360
2270005060	Diesel Irrigation Sets	43	390	1.209	0.230	3.857	0.004	0.223	0.216	1235.212
2270006005	Diesel Generator Sets	43	390	2.488	0.595	6.777	0.004	0.410	0.398	1254.191
2270006010	Diesel Pumps	43	390	2.576	0.606	6.760	0.004	0.435	0.422	1253.246
2270006015	Diesel Air Compressors	43	400	1.144	0.196	4.140	0.004	0.184	0.179	1266.144
2270006020	Diesel Gas Compressors	43	410	0.205	0.044	2.965	0.003	0.032	0.032	1301.569

3594
3595

Table 4-1. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2023 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270006025	Diesel Welders	21	480	6.170	1.279	8.302	0.005	0.891	0.864	1529.655
2270006030	Diesel Pressure Washers	43	380	2.396	0.647	6.714	0.004	0.369	0.357	1224.409
2270006035	Diesel Hydro Power Units	43	400	1.263	0.239	4.567	0.004	0.196	0.191	1272.368
2270007015	Diesel Forest Equipment - Feller/Bunch/Skidder	59	370	0.174	0.034	0.575	0.003	0.037	0.036	1186.536
2270008005	Diesel Airport Ground Support Equipment	59	380	0.776	0.114	1.981	0.003	0.134	0.130	1195.476
2270009010	Diesel Other Underground Mining Equipment	21	450	8.454	2.012	11.074	0.005	1.008	0.977	1428.784
2270010010	Diesel Other Oil Field Equipment	43	370	0.612	0.133	3.287	0.003	0.095	0.093	1174.751
2282005010	2 Stroke Outboard	21	850	215.991	70.721	13.000	0.012	0.491	0.451	2241.035
2282005015	2 Stroke Personal Water Craft	21	820	252.968	20.229	13.996	0.012	0.174	0.160	2152.131
2282010005	4 Stroke Inboard/Sterndrive	21	630	129.663	23.485	12.355	0.010	0.151	0.139	1855.773
2282020005	Diesel Inboard/Sterndrive	35	370	2.264	0.625	9.997	0.011	0.234	0.227	1173.271
2282020010	Diesel Outboards	35	410	4.199	1.295	7.078	0.012	0.656	0.637	1299.940
2285002015	Diesel Railway Maintenance	21	440	4.146	1.018	6.770	0.004	0.732	0.710	1401.642
2285004015	4 Stroke Railway Maintenance	62	750	530.592	13.728	4.606	0.013	0.294	0.270	2343.833
2285006015	LPG Railway Maintenance	62	480	16.512	0.444	2.832	0.006	0.126	0.126	1224.261

Notes for Table 4-1 follow Table 4-5

3601 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3602 **2024**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260001010	2 Stroke Motorcycles: Off- Road [c]	100	260	78.494	68.979	0.925	0.003	2.524	2.322	573.849
2260001020	2 Stroke Snowmobiles	34	1640	129.544	171.949	6.108	0.012	1.554	1.429	2098.727
2260001030	2 Stroke ATVs [c]	100	210	81.901	13.492	0.947	0.003	0.345	0.317	504.174
2260001060	2 Stroke Specialty Vehicles/Carts	58	1000	575.770	20.523	4.626	0.013	0.296	0.273	2348.247
2260002006	2 Stroke Tampers/Rammers	55	680	561.176	134.927	3.366	0.008	20.437	18.802	1595.599
2260002009	2 Stroke Plate Compactors	55	830	490.716	110.105	5.246	0.013	16.837	15.490	2440.244
2260002021	2 Stroke Paving Equipment	59	830	494.465	109.723	5.246	0.013	16.951	15.595	2437.505
2260002027	2 Stroke Signal Boards/Light Plants	72	830	512.953	128.849	5.246	0.013	17.574	16.168	2422.471
2260002039	2 Stroke Concrete/Industrial Saws	78	630	580.949	136.956	3.517	0.009	21.176	19.482	1645.707
2260002054	2 Stroke Crushing/Proc. Equipment	85	830	512.953	112.858	5.246	0.013	17.574	16.168	2422.469
2260003030	2 Stroke Sweepers/Scrubbers	71	820	512.953	115.390	5.246	0.013	17.574	16.168	2422.472
2260003040	2 Stroke Other General Industrial Equipment	54	830	512.954	113.920	5.246	0.013	17.574	16.168	2422.470
2260004015	2 Stroke Rotary Tillers < 6 HP (Residential)	40	940	455.101	108.322	5.259	0.013	16.270	14.968	2454.510
2260004016	2 Stroke Rotary Tillers < 6 HP (Commercial)	40	900	459.767	94.262	5.259	0.013	16.404	15.092	2451.291
2260004020	2 Stroke Chain Saws < 6 HP (Residential)	70	900	470.421	108.624	5.246	0.013	16.251	14.951	2454.258
2260004021	2 Stroke Chain Saws < 6 HP (Commercial)	70	650	577.070	133.544	3.616	0.009	20.971	19.293	1690.025
2260004025	2 Stroke Trimmers/Edgers/Brush Cutter (Residential)	91	890	434.319	110.012	5.296	0.013	16.889	15.538	2441.505
2260004026	2 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	810	494.666	103.059	4.976	0.012	17.172	15.798	2323.450
2260004030	2 Stroke Leaf blowers/Vacuums (Residential)	94	890	460.628	130.471	5.259	0.013	16.428	15.114	2450.695
2260004031	2 Stroke Leaf blowers/Vacuums (Commercial)	94	760	520.168	113.815	4.354	0.011	18.426	16.952	2042.101
2260004035	2 Stroke Snow blowers (Residential)	35	870	530.510	401.593	1.774	0.006	5.897	5.426	1239.563
2260004036	2 Stroke Snow blowers (Commercial)	35	870	618.992	231.221	2.069	0.007	6.880	6.329	1446.196

3603
3604

3605 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3606 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260004071	2 Stroke Commercial Turf Equipment	60	840	481.766	98.325	5.246	0.013	16.572	15.247	2446.586
2260005035	2 Stroke Sprayers	65	840	424.082	107.860	5.318	0.013	17.371	15.981	2430.870
2260006005	2 Stroke Generator Sets	68	830	483.491	131.468	5.251	0.013	16.809	15.464	2441.125
2260006010	2 Stroke Pumps	69	830	461.345	136.117	5.276	0.013	18.336	16.869	2396.339
2260006015	2 Stroke Air Compressors	56	830	512.954	134.652	5.246	0.013	17.574	16.168	2422.471
2260006035	2 Stroke Hydro Power Units	56	830	512.953	141.762	5.246	0.013	17.574	16.168	2422.471
2260007005	2 Stroke Chain Saws > 6 HP	70	620	586.887	137.090	3.366	0.008	21.491	19.772	1577.860
2265001010	4 Stroke Motorcycles: Off- Road	100	160	58.200	6.865	1.235	0.003	0.147	0.135	504.298
2265001030	4 Stroke ATVs	100	170	80.718	8.002	0.956	0.003	0.147	0.135	532.965
2265001050	4 Stroke Golf Carts	46	740	587.436	13.470	4.915	0.013	0.301	0.277	2345.372
2265001060	4 Stroke Specialty Vehicles/Carts	58	820	573.347	18.763	6.730	0.013	0.239	0.220	2301.856
2265002003	4 Stroke Pavers	66	700	434.215	9.484	4.265	0.012	0.257	0.236	2156.460
2265002006	4 Stroke Tampers/Rammers	55	760	572.705	12.614	4.539	0.013	0.251	0.231	2345.278
2265002009	4 Stroke Plate Compactors	55	830	488.662	15.044	5.123	0.014	0.518	0.476	2584.957
2265002015	4 Stroke Rollers	62	690	448.736	9.939	4.302	0.012	0.254	0.233	2152.869
2265002021	4 Stroke Paving Equipment	59	780	531.252	14.099	4.767	0.013	0.345	0.318	2415.973
2265002024	4 Stroke Surfacing Equipment	49	750	535.814	13.423	4.826	0.013	0.359	0.330	2389.446
2265002027	4 Stroke Signal Boards/Light Plants	72	780	525.752	13.415	5.090	0.014	0.464	0.427	2495.238
2265002030	4 Stroke Trenchers	66	710	416.698	10.343	4.407	0.012	0.324	0.298	2203.024
2265002033	4 Stroke Bore/Drill Rigs	79	790	364.722	14.446	6.821	0.013	0.491	0.451	2405.562
2265002039	4 Stroke Concrete/Industrial Saws	78	710	519.778	11.418	4.625	0.012	0.279	0.257	2250.915
2265002042	4 Stroke Cement & Mortar Mixers	59	820	535.493	18.096	4.806	0.013	0.352	0.324	2451.083

3607
3608

3609 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3610 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265002045	4 Stroke Cranes	47	590	100.464	3.539	4.382	0.009	0.162	0.149	1647.238
2265002054	4 Stroke Crushing/Proc. Equipment	85	740	496.271	12.079	4.751	0.013	0.327	0.300	2311.797
2265002057	4 Stroke Rough Terrain Forklifts	63	570	34.231	1.687	3.000	0.009	0.154	0.142	1555.981
2265002060	4 Stroke Rubber Tire Loaders	71	550	24.454	1.394	2.729	0.009	0.154	0.142	1544.026
2265002066	4 Stroke Tractors/Loaders/ Backhoes	48	730	543.041	11.341	4.565	0.013	0.263	0.242	2293.835
2265002072	4 Stroke Skid Steer Loaders	58	640	246.423	6.182	4.388	0.010	0.190	0.175	1863.508
2265002078	4 Stroke Dumpers/Tenders	41	800	548.837	17.486	4.982	0.013	0.282	0.259	2366.790
2265002081	4 Stroke Other Construction Equipment	48	580	53.391	2.827	5.000	0.009	0.149	0.137	1575.872
2265003010	4 Stroke Aerial Lifts	46	630	171.231	4.829	4.279	0.010	0.174	0.160	1753.271
2265003020	4 Stroke Forklifts	30	560	24.025	1.347	2.706	0.009	0.152	0.140	1544.026
2265003030	4 Stroke Sweepers/Scrubbers	71	610	202.622	5.245	3.452	0.010	0.220	0.202	1822.909
2265003040	4 Stroke Other General Industrial Equipment	54	760	441.501	13.780	5.056	0.013	0.533	0.491	2400.478
2265003050	4 Stroke Other Material Handling Equipment	53	640	201.483	5.153	3.843	0.010	0.183	0.168	1800.650
2265003060	4 Stroke AC/Refrigeration	46	740	575.270	12.571	4.605	0.013	0.260	0.239	2345.294
2265003070	4 Stroke Terminal Tractors	78	520	24.467	1.359	2.729	0.009	0.154	0.142	1544.026
2265004010	4 Stroke Lawn mowers (Residential)	33	900	423.025	24.102	5.354	0.015	0.642	0.591	2759.975
2265004011	4 Stroke Lawn mowers (Commercial)	33	880	427.374	14.859	5.557	0.015	0.717	0.659	2759.984
2265004015	4 Stroke Rotary Tillers < 6 HP (Residential)	40	910	422.906	20.974	5.353	0.015	0.643	0.591	2760.133
2265004016	4 Stroke Rotary Tillers < 6 HP (Commercial)	40	890	423.781	13.406	5.394	0.015	0.658	0.605	2760.144
2265004025	4 Stroke Trimmers/Edgers/Brush Cutter HP (Residential)	91	900	423.906	20.270	5.400	0.015	0.660	0.607	2760.147
2265004026	4 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	820	496.870	12.441	5.116	0.014	0.500	0.460	2566.415
2265004030	4 Stroke Leaf blowers/Vacuums (Residential)	94	900	423.923	27.588	5.401	0.015	0.660	0.607	2760.149

3611
3612

3613 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3614 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265004031	4 Stroke Leaf blowers/Vacuums (Commercial)	94	700	434.580	8.478	4.237	0.012	0.249	0.229	2154.918
2265004035	4 Stroke Snow blowers (Residential)	35	940	605.577	232.018	4.734	0.008	0.126	0.116	1506.665
2265004036	4 Stroke Snow blowers (Commercial)	35	940	709.919	33.881	5.385	0.009	0.147	0.135	1757.280
2265004040	4 Stroke Rear Engine Riding Mowers (Residential)	38	760	571.564	22.404	4.522	0.013	0.247	0.228	2346.366
2265004041	4 Stroke Rear Engine Riding Mowers (Commercial)	38	740	574.510	11.400	4.594	0.013	0.259	0.238	2346.060
2265004046	4 Stroke Front Mowers	65	790	571.581	12.526	4.784	0.013	0.243	0.224	2341.085
2265004051	4 Stroke Shredders < 6 HP	80	890	423.362	13.949	5.375	0.015	0.651	0.598	2760.138
2265004055	4 Stroke Lawn & Garden Tractors (Residential)	44	760	571.380	16.870	4.511	0.013	0.247	0.227	2345.570
2265004056	4 Stroke Lawn & Garden Tractors (Commercial)	44	740	574.680	10.813	4.593	0.013	0.258	0.238	2345.579
2265004066	4 Stroke Chippers/Stump Grinders	78	640	292.404	6.264	3.692	0.011	0.213	0.196	1930.390
2265004071	4 Stroke Commercial Turf Equipment	60	730	487.202	10.458	4.536	0.013	0.315	0.290	2309.800
2265004075	4 Stroke Other Lawn & Garden Equipment	58	850	498.870	23.782	5.135	0.014	0.445	0.410	2557.165
2265004076	4 Stroke Other Lawn & Garden Equipment	58	850	496.636	21.992	5.162	0.014	0.444	0.409	2551.576
2265005010	4 Stroke 2-Wheel Tractors	62	740	577.417	11.897	4.659	0.013	0.267	0.245	2345.306
2265005015	4 Stroke Agricultural Tractors	62	580	105.583	2.869	3.000	0.009	0.169	0.156	1661.917
2265005020	4 Stroke Combines	74	580	131.089	10.339	11.820	0.009	0.153	0.141	1653.212
2265005025	4 Stroke Balers	62	580	131.217	12.666	11.829	0.009	0.153	0.141	1653.256
2265005030	4 Stroke Agricultural Mowers	48	770	571.204	12.411	4.564	0.013	0.249	0.229	2347.805
2265005035	4 Stroke Sprayers	65	740	391.427	15.138	7.501	0.012	0.300	0.276	2191.481
2265005040	4 Stroke Tillers > 6 HP	71	870	732.852	24.307	8.187	0.013	0.251	0.231	2458.074
2265005045	4 Stroke Swathers	52	580	131.217	10.390	11.829	0.009	0.153	0.141	1653.255
2265005055	4 Stroke Other Agricultural Equipment	55	620	219.733	8.996	10.348	0.010	0.175	0.161	1796.728

3615
3616

Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2024 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265005060	4 Stroke Irrigation Sets	60	550	36.279	1.758	2.804	0.009	0.168	0.155	1571.227
2265006005	4 Stroke Generator Sets	68	780	558.061	14.726	4.638	0.013	0.287	0.264	2384.020
2265006010	4 Stroke Pumps	69	760	438.748	12.402	4.902	0.013	0.414	0.381	2360.059
2265006015	4 Stroke Air Compressors	56	700	360.285	9.569	4.269	0.012	0.336	0.309	2143.991
2265006025	4 Stroke Welders	68	710	472.790	9.930	4.372	0.012	0.259	0.238	2199.356
2265006030	4 Stroke Pressure Washers	85	800	520.792	14.108	4.904	0.014	0.415	0.382	2489.857
2265006035	4 Stroke Hydro Power Units	56	750	540.044	12.593	4.751	0.013	0.334	0.307	2370.617
2265007010	4 Stroke Shredders > 6 HP	80	800	576.686	12.324	4.648	0.013	0.242	0.223	2349.099
2265007015	4 Stroke Forest Equipment - Feller/Bunch/Skidder	70	810	492.127	14.560	5.384	0.014	0.598	0.551	2593.347
2265008005	4 Stroke Airport Ground Support Equipment	56	600	129.378	4.222	3.259	0.010	0.232	0.213	1744.054
2265010010	4 Stroke Other Oil Field Equipment	90	740	594.070	12.551	5.085	0.013	0.323	0.297	2345.416
2267001060	LPG Specialty Vehicle Carts	58	490	42.798	1.728	8.115	0.006	0.126	0.126	1288.197
2267002003	LPG Pavers	66	460	12.229	0.289	2.221	0.006	0.127	0.127	1218.054
2267002015	LPG Rollers	62	450	10.643	0.246	2.055	0.006	0.129	0.129	1216.735
2267002021	LPG Paving Equipment	59	480	23.358	0.769	4.163	0.006	0.126	0.126	1240.184
2267002024	LPG Surfacing Equipment	49	460	12.351	0.302	2.275	0.006	0.128	0.128	1218.847
2267002030	LPG Trenchers	66	460	12.193	0.286	2.204	0.006	0.127	0.127	1217.788
2267002033	LPG Bore/Drill Rigs	79	490	51.124	2.038	9.353	0.006	0.125	0.125	1300.875
2267002039	LPG Concrete/Industrial Saws	78	430	10.730	0.249	2.063	0.006	0.129	0.129	1216.742
2267002045	LPG Cranes	47	480	19.950	0.610	3.510	0.006	0.125	0.125	1232.518
2267002054	LPG Crushing/Proc. Equipment	85	480	18.586	0.550	3.265	0.006	0.126	0.126	1229.660
2267002057	LPG Rough Terrain Forklifts	63	470	12.831	0.307	2.286	0.006	0.127	0.127	1218.566

3621 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3622 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2267002060	LPG Rubber Tire Loaders	71	460	10.601	0.244	2.051	0.006	0.128	0.128	1216.733
2267002066	LPG Tractors/Loaders/ Backhoes	48	450	10.647	0.246	2.055	0.006	0.129	0.129	1216.735
2267002072	LPG Skid Steer Loaders	58	470	19.208	0.593	3.446	0.006	0.125	0.125	1232.146
2267002081	LPG Other Construction Equipment	48	480	23.155	0.754	4.092	0.006	0.124	0.124	1239.326
2267003010	LPG Aerial Lifts	46	480	19.103	0.576	3.377	0.006	0.124	0.124	1231.109
2267003020	LPG Forklifts	30	460	10.415	0.238	2.034	0.006	0.127	0.127	1216.720
2267003030	LPG Sweepers/Scrubbers	71	440	10.568	0.243	2.048	0.006	0.128	0.128	1216.730
2267003040	LPG Other General Industrial Equipment	54	450	10.475	0.240	2.040	0.006	0.127	0.127	1216.724
2267003050	LPG Other Material Handling Equipment	53	480	15.431	0.424	2.771	0.006	0.125	0.125	1224.374
2267003070	LPG Terminal Tractors	78	430	10.607	0.245	2.051	0.006	0.128	0.128	1216.732
2267004066	LPG Chippers/Stump Grinders	78	450	10.517	0.241	2.043	0.006	0.128	0.128	1216.727
2267005055	LPG Other Agricultural Equipment	55	490	61.876	2.274	10.199	0.006	0.128	0.128	1303.976
2267005060	LPG Irrigation Sets	60	450	10.597	0.244	2.051	0.006	0.128	0.128	1216.733
2267006005	LPG Generator Sets	68	480	28.065	0.992	6.269	0.006	0.124	0.124	1266.047
2267006010	LPG Pumps	69	470	16.943	0.461	3.305	0.006	0.126	0.126	1230.658
2267006015	LPG Air Compressors	56	460	11.374	0.252	2.118	0.006	0.127	0.127	1217.231
2267006025	LPG Welders	68	460	11.685	0.265	2.126	0.006	0.127	0.127	1217.000
2267006030	LPG Pressure Washers	85	470	20.411	0.625	3.572	0.006	0.125	0.125	1233.047
2267006035	LPG Hydro Power Units	56	460	11.345	0.257	2.142	0.006	0.127	0.127	1217.592
2267008005	LPG Airport Ground Support Equipment	56	450	10.422	0.238	2.035	0.006	0.127	0.127	1216.719
2268002081	CNG Other Construction Equipment	48	480	23.066	2.718	4.157	0.006	0.124	0.124	1368.202
2268003020	CNG Forklifts	30	460	10.415	0.905	2.130	0.006	0.127	0.127	1159.598

3623
3624

3625 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3626 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2268003030	CNG Sweepers/Scrubbers	71	460	10.427	0.906	2.131	0.006	0.127	0.127	1159.761
2268003040	CNG Other General Industrial Equipment	54	460	10.439	0.908	2.132	0.006	0.127	0.127	1159.933
2268003060	CNG AC\Refrigeration	46	450	10.812	0.939	2.160	0.006	0.127	0.127	1163.166
2268003070	CNG Terminal Tractors	78	430	10.605	0.931	2.148	0.006	0.128	0.128	1162.247
2268005055	CNG Other Agricultural Equipment	55	510	61.785	8.126	10.243	0.006	0.128	0.128	1988.150
2268005060	CNG Irrigation Sets	60	510	10.601	0.930	2.147	0.006	0.128	0.128	1162.183
2268006005	CNG Generator Sets	68	490	30.211	3.995	7.009	0.006	0.124	0.124	1533.727
2268006010	CNG Pumps	69	480	20.017	2.076	4.006	0.006	0.125	0.125	1300.376
2268006015	CNG Air Compressors	56	470	11.428	0.955	2.217	0.006	0.127	0.127	1165.289
2268006020	CNG Gas Compressors	85	410	11.753	1.087	2.256	0.006	0.139	0.139	1178.200
2268006035	CNG Hydro Power Units	56	470	12.012	1.007	2.305	0.006	0.126	0.126	1171.469
2268010010	CNG Other Oil Field Equipment	90	410	11.071	0.994	2.192	0.006	0.133	0.133	1168.724
2270001060	Diesel Specialty Vehicle Carts	21	450	5.638	1.422	7.614	0.005	0.850	0.824	1440.021
2270002003	Diesel Pavers	59	380	0.433	0.073	1.763	0.003	0.078	0.076	1214.347
2270002006	Diesel Tampers/Rammers	43	1000	5.637	1.831	9.337	0.005	0.571	0.554	1300.218
2270002009	Diesel Plate Compactors	43	410	4.867	1.490	9.002	0.005	0.507	0.492	1300.484
2270002015	Diesel Rollers	59	390	0.667	0.108	2.328	0.003	0.110	0.107	1233.941
2270002018	Diesel Scrapers	59	370	0.483	0.066	1.145	0.003	0.071	0.068	1183.459
2270002021	Diesel Paving Equipment	59	390	0.913	0.180	2.776	0.003	0.148	0.143	1227.291
2270002024	Diesel Surfacing Equipment	59	380	1.593	0.251	4.477	0.004	0.220	0.213	1224.368
2270002027	Diesel Signal Boards/Light Plants	43	410	2.614	0.650	7.425	0.004	0.315	0.306	1293.795
2270002030	Diesel Trenchers	59	400	1.105	0.184	4.312	0.004	0.152	0.147	1273.741

3627
3628

3629 **Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3630 **2024 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270002033	Diesel Bore/Drill Rigs	43	370	1.538	0.392	5.849	0.004	0.282	0.273	1190.573
2270002036	Diesel Excavators	59	380	0.226	0.045	0.957	0.003	0.044	0.043	1194.766
2270002039	Diesel Concrete/Industrial Saws	59	410	1.272	0.226	4.755	0.004	0.171	0.166	1305.098
2270002042	Diesel Cement & Mortar Mixers	43	390	2.971	0.758	7.291	0.004	0.463	0.449	1244.878
2270002045	Diesel Cranes	43	370	0.380	0.085	1.565	0.003	0.070	0.068	1175.750
2270002048	Diesel Graders	59	370	0.218	0.042	0.685	0.003	0.047	0.046	1185.407
2270002051	Diesel Off-highway Trucks	59	370	0.230	0.070	3.183	0.003	0.052	0.050	1183.453
2270002054	Diesel Crushing/Proc. Equipment	43	380	0.573	0.119	2.716	0.003	0.089	0.086	1203.297
2270002057	Diesel Rough Terrain Forklifts	59	390	0.922	0.112	2.661	0.003	0.155	0.151	1255.884
2270002060	Diesel Rubber Tire Loaders	59	370	0.570	0.095	2.006	0.003	0.098	0.095	1190.492
2270002066	Diesel Tractors/Loaders/ Backhoes	21	460	3.369	0.699	4.797	0.004	0.548	0.532	1467.168
2270002069	Diesel Crawler Tractor/Dozers	59	370	0.410	0.068	1.607	0.003	0.071	0.069	1190.045
2270002072	Diesel Skid Steer Loaders	21	480	6.530	1.357	8.149	0.005	1.015	0.985	1529.685
2270002075	Diesel Off-Highway Tractors	59	370	0.711	0.123	3.411	0.003	0.106	0.103	1183.379
2270002078	Diesel Dumpers/Tenders	21	470	6.628	1.541	8.274	0.005	1.002	0.972	1508.952
2270002081	Diesel Other Construction Equipment	59	370	1.093	0.157	2.771	0.003	0.155	0.150	1185.509
2270003010	Diesel Aerial Lifts	21	480	5.828	1.246	8.146	0.005	0.803	0.779	1531.532
2270003020	Diesel Forklifts	59	400	0.198	0.045	2.312	0.003	0.030	0.029	1265.584
2270003030	Diesel Sweepers/Scrubbers	43	380	0.341	0.068	1.819	0.003	0.059	0.058	1219.331
2270003040	Diesel Other General Industrial Equipment	43	380	0.534	0.105	2.134	0.003	0.101	0.098	1205.559
2270003050	Diesel Other Material Handling Equipment	21	440	3.265	0.837	5.740	0.004	0.549	0.533	1414.124
2270003060	Diesel AC\Refrigeration	43	410	0.763	0.195	5.868	0.004	0.078	0.076	1301.605

3631
3632

Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2024 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270003070	Diesel Terminal Tractors	59	380	0.123	0.029	0.710	0.003	0.027	0.026	1199.665
2270004031	Diesel Leaf blowers/Vacuums	43	410	5.197	1.468	10.116	0.004	0.751	0.728	1299.052
2270004036	Diesel Snow blowers	43	370	0.888	0.221	3.372	0.002	0.151	0.146	682.553
2270004046	Diesel Front Mowers	43	410	2.511	0.597	7.540	0.004	0.347	0.337	1301.043
2270004056	Diesel Lawn & Garden Tractors	43	410	3.237	0.764	8.123	0.005	0.381	0.370	1301.006
2270004066	Diesel Chippers/Stump Grinders	43	380	2.042	0.452	6.089	0.004	0.366	0.355	1215.862
2270004071	Diesel Commercial Turf Equipment	43	400	0.856	0.192	3.904	0.004	0.115	0.112	1263.300
2270004076	Diesel Other Lawn & Garden Equipment	43	410	3.329	0.744	8.308	0.004	0.549	0.532	1293.363
2270005010	Diesel 2-Wheel Tractors	59	410	5.453	1.841	9.219	0.005	0.530	0.514	1313.075
2270005015	Diesel Agricultural Tractors	59	380	1.794	0.306	4.542	0.004	0.303	0.294	1211.401
2270005020	Diesel Combines	59	370	2.318	0.546	6.648	0.004	0.480	0.466	1185.485
2270005025	Diesel Balers	59	400	4.484	0.829	7.966	0.004	0.654	0.634	1269.967
2270005030	Diesel Agricultural Mowers	59	410	5.202	0.664	6.952	0.004	0.774	0.751	1313.158
2270005035	Diesel Sprayers	59	380	2.724	0.630	6.531	0.004	0.451	0.437	1195.934
2270005040	Diesel Tillers > 6 HP	59	370	2.968	0.472	6.399	0.004	0.378	0.366	1186.691
2270005045	Diesel Swathers	59	400	4.766	0.744	7.874	0.004	0.718	0.697	1284.528
2270005055	Diesel Other Agricultural Equipment	59	380	2.370	0.450	5.586	0.004	0.420	0.407	1196.467
2270005060	Diesel Irrigation Sets	43	390	1.072	0.201	3.556	0.004	0.198	0.192	1235.255
2270006005	Diesel Generator Sets	43	390	2.308	0.553	6.454	0.004	0.374	0.363	1254.292
2270006010	Diesel Pumps	43	390	2.410	0.566	6.443	0.004	0.403	0.391	1253.342
2270006015	Diesel Air Compressors	43	400	0.962	0.168	3.863	0.004	0.154	0.149	1266.178
2270006020	Diesel Gas Compressors	43	410	0.205	0.044	2.965	0.003	0.032	0.032	1301.567

Table 4-2. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2024 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270006025	Diesel Welders	21	480	5.595	1.154	7.982	0.005	0.798	0.774	1529.937
2270006030	Diesel Pressure Washers	43	380	2.240	0.602	6.381	0.004	0.340	0.330	1224.530
2270006035	Diesel Hydro Power Units	43	400	1.100	0.213	4.324	0.004	0.168	0.163	1272.399
2270007015	Diesel Forest Equipment - Feller/Bunch/Skidder	59	370	0.129	0.028	0.475	0.003	0.029	0.028	1186.536
2270008005	Diesel Airport Ground Support Equipment	59	380	0.644	0.096	1.708	0.003	0.113	0.109	1195.493
2270009010	Diesel Other Underground Mining Equipment	21	450	8.335	1.984	10.976	0.005	0.986	0.957	1428.906
2270010010	Diesel Other Oil Field Equipment	43	370	0.505	0.113	3.003	0.003	0.081	0.078	1174.762
2282005010	2 Stroke Outboard	21	850	214.286	64.918	12.992	0.012	0.424	0.390	2241.265
2282005015	2 Stroke Personal Water Craft	21	820	252.756	19.458	14.032	0.012	0.160	0.147	2152.556
2282010005	4 Stroke Inboard/Sterndrive	21	630	123.548	22.334	11.450	0.010	0.151	0.139	1850.443
2282020005	Diesel Inboard/Sterndrive	35	370	2.257	0.626	9.763	0.011	0.231	0.224	1173.311
2282020010	Diesel Outboards	35	410	4.091	1.255	6.826	0.012	0.630	0.611	1300.093
2285002015	Diesel Railway Maintenance	21	440	3.805	0.931	6.272	0.004	0.671	0.651	1401.841
2285004015	4 Stroke Railway Maintenance	62	750	530.628	13.736	4.598	0.013	0.294	0.271	2343.684
2285006015	LPG Railway Maintenance	62	480	15.238	0.394	2.631	0.006	0.126	0.126	1222.096

Notes for Table 4-2 follow Table 4-5

3642 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3643 **2025**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260001010	2 Stroke Motorcycles: Off- Road [c]	100	260	78.305	68.407	0.928	0.003	2.503	2.303	574.529
2260001020	2 Stroke Snowmobiles	34	1640	127.264	169.102	6.199	0.012	1.512	1.391	2093.481
2260001030	2 Stroke ATVs [c]	100	210	81.674	12.161	0.951	0.003	0.295	0.271	506.200
2260001060	2 Stroke Specialty Vehicles/Carts	58	1000	575.650	20.467	4.625	0.013	0.296	0.273	2348.192
2260002006	2 Stroke Tampers/Rammers	55	680	561.595	135.035	3.366	0.008	20.454	18.818	1595.313
2260002009	2 Stroke Plate Compactors	55	830	490.917	110.178	5.246	0.013	16.844	15.497	2440.078
2260002021	2 Stroke Paving Equipment	59	830	494.578	109.765	5.246	0.013	16.955	15.599	2437.421
2260002027	2 Stroke Signal Boards/Light Plants	72	830	512.954	128.849	5.246	0.013	17.574	16.168	2422.471
2260002039	2 Stroke Concrete/Industrial Saws	78	630	580.949	136.956	3.517	0.009	21.176	19.482	1645.707
2260002054	2 Stroke Crushing/Proc. Equipment	85	830	512.953	112.858	5.246	0.013	17.574	16.168	2422.472
2260003030	2 Stroke Sweepers/Scrubbers	71	820	512.954	115.390	5.246	0.013	17.574	16.168	2422.472
2260003040	2 Stroke Other General Industrial Equipment	54	830	512.953	113.920	5.246	0.013	17.574	16.168	2422.470
2260004015	2 Stroke Rotary Tillers < 6 HP (Residential)	40	940	455.086	108.317	5.259	0.013	16.270	14.968	2454.523
2260004016	2 Stroke Rotary Tillers < 6 HP (Commercial)	40	900	459.752	94.256	5.259	0.013	16.403	15.091	2451.304
2260004020	2 Stroke Chain Saws < 6 HP (Residential)	70	900	470.397	108.617	5.246	0.013	16.250	14.950	2454.272
2260004021	2 Stroke Chain Saws < 6 HP (Commercial)	70	650	577.069	133.544	3.616	0.009	20.971	19.293	1690.024
2260004025	2 Stroke Trimmers/Edgers/Brush Cutter (Residential)	91	890	434.298	110.005	5.296	0.013	16.888	15.537	2441.520
2260004026	2 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	810	494.613	103.041	4.976	0.012	17.170	15.797	2323.487
2260004030	2 Stroke Leaf blowers/Vacuums (Residential)	94	890	460.606	130.464	5.259	0.013	16.428	15.114	2450.710
2260004031	2 Stroke Leaf blowers/Vacuums (Commercial)	94	760	520.118	113.800	4.354	0.011	18.424	16.950	2042.137
2260004035	2 Stroke Snow blowers (Residential)	35	870	530.439	401.574	1.774	0.006	5.897	5.425	1239.598
2260004036	2 Stroke Snow blowers (Commercial)	35	870	618.956	231.209	2.069	0.007	6.879	6.329	1446.217

3644
3645

3646 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3647 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260004071	2 Stroke Commercial Turf Equipment	60	840	481.730	98.312	5.246	0.013	16.571	15.245	2446.614
2260005035	2 Stroke Sprayers	65	840	424.230	107.921	5.318	0.013	17.376	15.986	2430.731
2260006005	2 Stroke Generator Sets	68	830	483.510	131.475	5.251	0.013	16.810	15.465	2441.109
2260006010	2 Stroke Pumps	69	830	461.294	136.093	5.275	0.013	18.336	16.869	2396.321
2260006015	2 Stroke Air Compressors	56	830	512.953	134.652	5.246	0.013	17.574	16.168	2422.472
2260006035	2 Stroke Hydro Power Units	56	830	512.954	141.762	5.246	0.013	17.574	16.168	2422.474
2260007005	2 Stroke Chain Saws > 6 HP	70	620	586.888	137.090	3.366	0.008	21.491	19.772	1577.861
2265001010	4 Stroke Motorcycles: Off- Road	100	160	57.946	6.838	1.233	0.003	0.147	0.135	504.293
2265001030	4 Stroke ATVs	100	170	80.631	7.967	0.951	0.003	0.147	0.135	532.952
2265001050	4 Stroke Golf Carts	46	740	587.435	13.470	4.915	0.013	0.301	0.277	2345.373
2265001060	4 Stroke Specialty Vehicles/Carts	58	820	564.133	17.901	6.431	0.013	0.238	0.219	2295.176
2265002003	4 Stroke Pavers	66	700	434.070	9.482	4.247	0.012	0.257	0.237	2156.232
2265002006	4 Stroke Tampers/Rammers	55	760	572.805	12.623	4.542	0.013	0.251	0.231	2345.279
2265002009	4 Stroke Plate Compactors	55	830	488.766	15.060	5.127	0.014	0.519	0.477	2584.958
2265002015	4 Stroke Rollers	62	690	448.784	9.944	4.303	0.012	0.254	0.234	2152.867
2265002021	4 Stroke Paving Equipment	59	780	531.075	14.084	4.755	0.013	0.345	0.318	2415.866
2265002024	4 Stroke Surfacing Equipment	49	750	535.838	13.427	4.825	0.013	0.359	0.330	2389.411
2265002027	4 Stroke Signal Boards/Light Plants	72	780	525.803	13.420	5.091	0.014	0.464	0.427	2495.239
2265002030	4 Stroke Trenchers	66	710	416.508	10.338	4.387	0.012	0.324	0.298	2202.786
2265002033	4 Stroke Bore/Drill Rigs	79	790	362.358	14.315	6.599	0.013	0.492	0.452	2402.441
2265002039	4 Stroke Concrete/Industrial Saws	78	710	519.799	11.420	4.626	0.012	0.279	0.257	2250.915
2265002042	4 Stroke Cement & Mortar Mixers	59	820	535.121	18.034	4.783	0.013	0.353	0.324	2450.899

3648
3649

3650 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3651 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265002045	4 Stroke Cranes	47	590	97.598	3.397	4.132	0.009	0.163	0.150	1643.999
2265002054	4 Stroke Crushing/Proc. Equipment	85	740	495.998	12.070	4.722	0.013	0.327	0.301	2311.409
2265002057	4 Stroke Rough Terrain Forklifts	63	570	32.940	1.628	2.891	0.009	0.154	0.142	1554.735
2265002060	4 Stroke Rubber Tire Loaders	71	550	24.468	1.394	2.729	0.009	0.154	0.142	1544.025
2265002066	4 Stroke Tractors/Loaders/ Backhoes	48	730	543.112	11.348	4.567	0.013	0.264	0.243	2293.835
2265002072	4 Stroke Skid Steer Loaders	58	640	244.782	6.102	4.244	0.010	0.191	0.175	1861.658
2265002078	4 Stroke Dumpers/Tenders	41	800	547.148	17.313	4.900	0.013	0.281	0.259	2365.760
2265002081	4 Stroke Other Construction Equipment	48	580	49.470	2.631	4.661	0.009	0.150	0.138	1571.559
2265003010	4 Stroke Aerial Lifts	46	630	168.416	4.689	4.049	0.010	0.174	0.160	1750.876
2265003020	4 Stroke Forklifts	30	560	24.055	1.348	2.708	0.009	0.152	0.140	1544.026
2265003030	4 Stroke Sweepers/Scrubbers	71	610	202.641	5.246	3.453	0.010	0.220	0.202	1822.911
2265003040	4 Stroke Other General Industrial Equipment	54	760	441.503	13.780	5.056	0.013	0.533	0.491	2400.477
2265003050	4 Stroke Other Material Handling Equipment	53	640	199.897	5.073	3.708	0.010	0.183	0.168	1798.998
2265003060	4 Stroke AC/Refrigeration	46	740	575.282	12.572	4.605	0.013	0.260	0.239	2345.293
2265003070	4 Stroke Terminal Tractors	78	520	24.498	1.360	2.731	0.009	0.154	0.142	1544.027
2265004010	4 Stroke Lawn mowers (Residential)	33	900	422.998	24.096	5.353	0.015	0.642	0.591	2759.966
2265004011	4 Stroke Lawn mowers (Commercial)	33	880	427.368	14.858	5.557	0.015	0.717	0.659	2759.983
2265004015	4 Stroke Rotary Tillers < 6 HP (Residential)	40	910	422.890	20.969	5.353	0.015	0.643	0.591	2760.131
2265004016	4 Stroke Rotary Tillers < 6 HP (Commercial)	40	890	423.778	13.405	5.394	0.015	0.658	0.605	2760.144
2265004025	4 Stroke Trimmers/Edgers/Brush Cutter HP (Residential)	91	900	423.903	20.269	5.400	0.015	0.660	0.607	2760.145
2265004026	4 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	820	496.861	12.440	5.116	0.014	0.500	0.460	2566.415
2265004030	4 Stroke Leaf blowers/Vacuums (Residential)	94	900	423.919	27.587	5.401	0.015	0.660	0.607	2760.143

3652
3653

3654 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3655 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265004031	4 Stroke Leaf blowers/Vacuums (Commercial)	94	700	434.252	8.465	4.211	0.012	0.249	0.229	2154.673
2265004035	4 Stroke Snow blowers (Residential)	35	940	605.467	232.015	4.734	0.008	0.126	0.116	1506.664
2265004036	4 Stroke Snow blowers (Commercial)	35	940	709.869	33.879	5.385	0.009	0.147	0.135	1757.278
2265004040	4 Stroke Rear Engine Riding Mowers (Residential)	38	760	571.481	22.387	4.518	0.013	0.247	0.228	2346.314
2265004041	4 Stroke Rear Engine Riding Mowers (Commercial)	38	740	574.507	11.400	4.594	0.013	0.259	0.238	2346.061
2265004046	4 Stroke Front Mowers	65	790	570.140	12.402	4.720	0.013	0.243	0.224	2340.323
2265004051	4 Stroke Shredders < 6 HP	80	890	423.361	13.949	5.375	0.015	0.651	0.598	2760.139
2265004055	4 Stroke Lawn & Garden Tractors (Residential)	44	760	571.345	16.862	4.508	0.013	0.247	0.227	2345.561
2265004056	4 Stroke Lawn & Garden Tractors (Commercial)	44	740	574.676	10.813	4.593	0.013	0.258	0.238	2345.580
2265004066	4 Stroke Chippers/Stump Grinders	78	640	292.419	6.265	3.693	0.011	0.213	0.196	1930.390
2265004071	4 Stroke Commercial Turf Equipment	60	730	487.196	10.457	4.536	0.013	0.315	0.290	2309.799
2265004075	4 Stroke Other Lawn & Garden Equipment	58	850	497.922	23.599	5.083	0.014	0.445	0.410	2556.772
2265004076	4 Stroke Other Lawn & Garden Equipment	58	850	495.490	21.794	5.101	0.014	0.444	0.408	2551.093
2265005010	4 Stroke 2-Wheel Tractors	62	740	577.450	11.901	4.660	0.013	0.267	0.246	2345.308
2265005015	4 Stroke Agricultural Tractors	62	580	105.653	2.873	3.003	0.009	0.170	0.156	1661.917
2265005020	4 Stroke Combines	74	580	122.039	9.670	10.981	0.009	0.154	0.141	1641.595
2265005025	4 Stroke Balers	62	580	122.196	11.865	10.993	0.009	0.154	0.141	1641.699
2265005030	4 Stroke Agricultural Mowers	48	770	571.139	12.393	4.550	0.013	0.250	0.230	2347.748
2265005035	4 Stroke Sprayers	65	740	386.869	14.741	7.146	0.012	0.300	0.276	2186.748
2265005040	4 Stroke Tillers > 6 HP	71	870	715.869	23.375	7.903	0.013	0.250	0.230	2444.695
2265005045	4 Stroke Swathers	52	580	122.195	9.720	10.993	0.009	0.154	0.141	1641.698
2265005055	4 Stroke Other Agricultural Equipment	55	620	212.357	8.567	9.671	0.010	0.175	0.161	1787.440

3656
3657

3658 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3659 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265005060	4 Stroke Irrigation Sets	60	550	36.275	1.758	2.804	0.009	0.168	0.155	1571.228
2265006005	4 Stroke Generator Sets	68	780	557.892	14.686	4.621	0.013	0.287	0.264	2383.963
2265006010	4 Stroke Pumps	69	760	438.425	12.382	4.863	0.013	0.414	0.381	2359.622
2265006015	4 Stroke Air Compressors	56	700	360.134	9.561	4.251	0.012	0.336	0.309	2143.818
2265006025	4 Stroke Welders	68	710	472.663	9.925	4.362	0.012	0.259	0.238	2199.297
2265006030	4 Stroke Pressure Washers	85	800	520.820	14.110	4.903	0.014	0.416	0.382	2489.843
2265006035	4 Stroke Hydro Power Units	56	750	540.040	12.593	4.750	0.013	0.334	0.307	2370.599
2265007010	4 Stroke Shredders > 6 HP	80	800	574.873	12.138	4.583	0.013	0.240	0.221	2348.476
2265007015	4 Stroke Forest Equipment - Feller/Bunch/Skidder	70	810	492.131	14.561	5.384	0.014	0.598	0.551	2593.347
2265008005	4 Stroke Airport Ground Support Equipment	56	600	129.439	4.224	3.262	0.010	0.232	0.214	1744.054
2265010010	4 Stroke Other Oil Field Equipment	90	740	594.073	12.552	5.085	0.013	0.323	0.297	2345.417
2267001060	LPG Specialty Vehicle Carts	58	490	39.571	1.556	7.383	0.006	0.126	0.126	1279.002
2267002003	LPG Pavers	66	460	11.694	0.271	2.149	0.006	0.128	0.128	1217.324
2267002015	LPG Rollers	62	450	10.625	0.245	2.053	0.006	0.129	0.129	1216.734
2267002021	LPG Paving Equipment	59	480	21.734	0.695	3.857	0.006	0.126	0.126	1236.558
2267002024	LPG Surfacing Equipment	49	460	11.889	0.284	2.203	0.006	0.128	0.128	1218.063
2267002030	LPG Trenchers	66	460	11.603	0.266	2.127	0.006	0.128	0.128	1217.036
2267002033	LPG Bore/Drill Rigs	79	490	47.879	1.865	8.612	0.006	0.125	0.125	1291.603
2267002039	LPG Concrete/Industrial Saws	78	430	10.724	0.249	2.062	0.006	0.129	0.129	1216.741
2267002045	LPG Cranes	47	480	18.484	0.548	3.258	0.006	0.126	0.126	1229.629
2267002054	LPG Crushing/Proc. Equipment	85	480	17.207	0.491	3.028	0.006	0.126	0.126	1226.942
2267002057	LPG Rough Terrain Forklifts	63	470	12.078	0.281	2.184	0.006	0.128	0.128	1217.553

3660
3661

3662 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3663 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2267002060	LPG Rubber Tire Loaders	71	460	10.606	0.245	2.051	0.006	0.128	0.128	1216.733
2267002066	LPG Tractors/Loaders/ Backhoes	48	450	10.613	0.245	2.052	0.006	0.128	0.128	1216.733
2267002072	LPG Skid Steer Loaders	58	470	17.960	0.540	3.235	0.006	0.126	0.126	1229.750
2267002081	LPG Other Construction Equipment	48	480	21.341	0.678	3.786	0.006	0.125	0.125	1235.872
2267003010	LPG Aerial Lifts	46	480	16.929	0.503	3.099	0.006	0.124	0.124	1228.550
2267003020	LPG Forklifts	30	460	10.428	0.238	2.035	0.006	0.127	0.127	1216.720
2267003030	LPG Sweepers/Scrubbers	71	440	10.581	0.244	2.049	0.006	0.128	0.128	1216.731
2267003040	LPG Other General Industrial Equipment	54	450	10.490	0.240	2.041	0.006	0.127	0.127	1216.724
2267003050	LPG Other Material Handling Equipment	53	480	14.344	0.380	2.595	0.006	0.125	0.125	1222.456
2267003070	LPG Terminal Tractors	78	430	10.620	0.245	2.053	0.006	0.128	0.128	1216.734
2267004066	LPG Chippers/Stump Grinders	78	450	10.527	0.242	2.044	0.006	0.128	0.128	1216.727
2267005055	LPG Other Agricultural Equipment	55	490	58.705	2.106	9.469	0.006	0.128	0.128	1294.883
2267005060	LPG Irrigation Sets	60	450	10.596	0.244	2.050	0.006	0.128	0.128	1216.733
2267006005	LPG Generator Sets	68	480	25.799	0.878	5.636	0.006	0.124	0.124	1258.436
2267006010	LPG Pumps	69	470	15.607	0.424	3.093	0.006	0.126	0.126	1228.544
2267006015	LPG Air Compressors	56	460	11.008	0.244	2.073	0.006	0.127	0.127	1216.834
2267006025	LPG Welders	68	460	11.124	0.251	2.078	0.006	0.127	0.127	1216.746
2267006030	LPG Pressure Washers	85	470	18.838	0.557	3.295	0.006	0.126	0.126	1229.877
2267006035	LPG Hydro Power Units	56	460	11.091	0.250	2.103	0.006	0.127	0.127	1217.201
2267008005	LPG Airport Ground Support Equipment	56	450	10.456	0.239	2.038	0.006	0.127	0.127	1216.722
2268002081	CNG Other Construction Equipment	48	480	21.264	2.452	3.856	0.006	0.125	0.125	1337.469
2268003020	CNG Forklifts	30	460	10.428	0.906	2.131	0.006	0.127	0.127	1159.779

3664
3665

3666 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3667 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2268003030	CNG Sweepers/Scrubbers	71	460	10.439	0.908	2.132	0.006	0.127	0.127	1159.937
2268003040	CNG Other General Industrial Equipment	54	460	10.454	0.910	2.134	0.006	0.127	0.127	1160.143
2268003060	CNG AC\Refrigeration	46	450	10.660	0.925	2.147	0.006	0.127	0.127	1161.720
2268003070	CNG Terminal Tractors	78	430	10.619	0.932	2.149	0.006	0.128	0.128	1162.429
2268005055	CNG Other Agricultural Equipment	55	510	58.612	7.530	9.515	0.006	0.128	0.128	1917.751
2268005060	CNG Irrigation Sets	60	510	10.601	0.930	2.147	0.006	0.128	0.128	1162.182
2268006005	CNG Generator Sets	68	490	27.954	3.534	6.291	0.006	0.124	0.124	1477.602
2268006010	CNG Pumps	69	480	18.124	1.885	3.697	0.006	0.125	0.125	1277.589
2268006015	CNG Air Compressors	56	470	11.036	0.927	2.169	0.006	0.127	0.127	1161.970
2268006020	CNG Gas Compressors	85	410	11.753	1.087	2.256	0.006	0.139	0.139	1178.200
2268006035	CNG Hydro Power Units	56	470	11.537	0.963	2.235	0.006	0.126	0.126	1166.305
2268010010	CNG Other Oil Field Equipment	90	410	11.074	0.994	2.192	0.006	0.133	0.133	1168.757
2270001060	Diesel Specialty Vehicle Carts	21	450	5.171	1.298	7.201	0.005	0.778	0.755	1440.354
2270002003	Diesel Pavers	59	380	0.348	0.062	1.619	0.003	0.063	0.061	1214.353
2270002006	Diesel Tampers/Rammers	43	1000	5.599	1.833	9.303	0.005	0.564	0.547	1300.249
2270002009	Diesel Plate Compactors	43	410	4.833	1.489	8.974	0.005	0.501	0.486	1300.509
2270002015	Diesel Rollers	59	390	0.577	0.097	2.144	0.003	0.095	0.092	1233.947
2270002018	Diesel Scrapers	59	370	0.403	0.058	0.962	0.003	0.061	0.059	1183.461
2270002021	Diesel Paving Equipment	59	390	0.813	0.164	2.573	0.003	0.129	0.125	1227.309
2270002024	Diesel Surfacing Equipment	59	380	1.401	0.225	4.111	0.004	0.193	0.187	1224.413
2270002027	Diesel Signal Boards/Light Plants	43	410	2.553	0.635	7.326	0.004	0.303	0.294	1293.822
2270002030	Diesel Trenchers	59	400	0.973	0.165	4.133	0.004	0.131	0.127	1273.769

3668
3669

3670 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3671 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270002033	Diesel Bore/Drill Rigs	43	370	1.401	0.357	5.396	0.004	0.255	0.247	1190.657
2270002036	Diesel Excavators	59	380	0.185	0.040	0.864	0.003	0.037	0.036	1194.768
2270002039	Diesel Concrete/Industrial Saws	59	410	1.149	0.209	4.623	0.004	0.151	0.146	1305.122
2270002042	Diesel Cement & Mortar Mixers	43	390	2.797	0.721	6.927	0.004	0.430	0.417	1245.000
2270002045	Diesel Cranes	43	370	0.329	0.073	1.357	0.003	0.061	0.059	1175.759
2270002048	Diesel Graders	59	370	0.168	0.035	0.569	0.003	0.037	0.036	1185.409
2270002051	Diesel Off-highway Trucks	59	370	0.176	0.063	3.104	0.003	0.045	0.043	1183.456
2270002054	Diesel Crushing/Proc. Equipment	43	380	0.493	0.103	2.500	0.003	0.076	0.074	1203.316
2270002057	Diesel Rough Terrain Forklifts	59	390	0.776	0.094	2.429	0.003	0.131	0.127	1255.905
2270002060	Diesel Rubber Tire Loaders	59	370	0.491	0.083	1.816	0.003	0.086	0.083	1190.505
2270002066	Diesel Tractors/Loaders/ Backhoes	21	460	2.816	0.578	4.267	0.004	0.466	0.452	1467.363
2270002069	Diesel Crawler Tractor/Dozers	59	370	0.337	0.059	1.453	0.003	0.059	0.058	1190.050
2270002072	Diesel Skid Steer Loaders	21	480	6.057	1.248	7.830	0.005	0.937	0.908	1529.960
2270002075	Diesel Off-Highway Tractors	59	370	0.613	0.111	3.225	0.003	0.094	0.091	1183.397
2270002078	Diesel Dumpers/Tenders	21	470	6.046	1.408	7.902	0.005	0.907	0.880	1509.314
2270002081	Diesel Other Construction Equipment	59	370	0.913	0.133	2.346	0.003	0.131	0.127	1185.545
2270003010	Diesel Aerial Lifts	21	480	5.322	1.127	7.814	0.005	0.726	0.705	1531.825
2270003020	Diesel Forklifts	59	400	0.186	0.044	2.298	0.003	0.028	0.027	1265.584
2270003030	Diesel Sweepers/Scrubbers	43	380	0.283	0.060	1.691	0.003	0.048	0.046	1219.335
2270003040	Diesel Other General Industrial Equipment	43	380	0.444	0.088	1.873	0.003	0.084	0.081	1205.573
2270003050	Diesel Other Material Handling Equipment	21	440	2.961	0.753	5.282	0.004	0.495	0.480	1414.309
2270003060	Diesel AC\Refrigeration	43	410	0.727	0.190	5.842	0.004	0.073	0.071	1301.611

3672
3673

3674 **Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3675 **2025 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270003070	Diesel Terminal Tractors	59	380	0.103	0.026	0.667	0.003	0.023	0.022	1199.665
2270004031	Diesel Leaf blowers/Vacuums	43	410	4.953	1.406	9.805	0.004	0.701	0.680	1299.297
2270004036	Diesel Snow blowers	43	370	0.812	0.203	3.079	0.002	0.138	0.134	682.595
2270004046	Diesel Front Mowers	43	410	2.381	0.565	7.380	0.004	0.321	0.312	1301.100
2270004056	Diesel Lawn & Garden Tractors	43	410	3.185	0.752	8.067	0.005	0.372	0.361	1301.025
2270004066	Diesel Chippers/Stump Grinders	43	380	1.855	0.407	5.579	0.004	0.330	0.320	1215.967
2270004071	Diesel Commercial Turf Equipment	43	400	0.797	0.183	3.741	0.004	0.104	0.101	1263.303
2270004076	Diesel Other Lawn & Garden Equipment	43	410	3.131	0.696	8.024	0.004	0.508	0.493	1293.486
2270005010	Diesel 2-Wheel Tractors	59	410	5.453	1.845	9.222	0.005	0.531	0.515	1313.073
2270005015	Diesel Agricultural Tractors	59	380	1.607	0.274	4.194	0.004	0.270	0.262	1211.457
2270005020	Diesel Combines	59	370	2.179	0.512	6.228	0.004	0.443	0.430	1185.567
2270005025	Diesel Balers	59	400	4.231	0.772	7.662	0.004	0.608	0.590	1270.118
2270005030	Diesel Agricultural Mowers	59	410	4.716	0.587	6.408	0.004	0.691	0.671	1313.335
2270005035	Diesel Sprayers	59	380	2.548	0.583	6.149	0.004	0.416	0.404	1196.053
2270005040	Diesel Tillers > 6 HP	59	370	2.761	0.441	6.004	0.004	0.351	0.341	1186.769
2270005045	Diesel Swathers	59	400	4.518	0.697	7.503	0.004	0.669	0.649	1284.644
2270005055	Diesel Other Agricultural Equipment	59	380	2.111	0.393	5.020	0.004	0.373	0.362	1196.565
2270005060	Diesel Irrigation Sets	43	390	0.904	0.170	3.229	0.004	0.166	0.161	1235.293
2270006005	Diesel Generator Sets	43	390	2.150	0.516	6.163	0.004	0.343	0.333	1254.379
2270006010	Diesel Pumps	43	390	2.252	0.529	6.146	0.004	0.372	0.361	1253.430
2270006015	Diesel Air Compressors	43	400	0.836	0.147	3.634	0.004	0.132	0.128	1266.203
2270006020	Diesel Gas Compressors	43	410	0.205	0.044	2.965	0.003	0.032	0.032	1301.567

3676
3677

Table 4-3. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2025 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270006025	Diesel Welders	21	480	5.055	1.041	7.680	0.005	0.711	0.689	1530.177
2270006030	Diesel Pressure Washers	43	380	2.101	0.563	6.077	0.004	0.316	0.306	1224.634
2270006035	Diesel Hydro Power Units	43	400	0.981	0.192	4.118	0.004	0.147	0.142	1272.425
2270007015	Diesel Forest Equipment - Feller/Bunch/Skidder	59	370	0.106	0.026	0.422	0.003	0.024	0.024	1186.535
2270008005	Diesel Airport Ground Support Equipment	59	380	0.534	0.082	1.473	0.003	0.095	0.092	1195.505
2270009010	Diesel Other Underground Mining Equipment	21	450	8.238	1.961	10.896	0.005	0.969	0.940	1429.004
2270010010	Diesel Other Oil Field Equipment	43	370	0.425	0.099	2.773	0.003	0.070	0.068	1174.768
2282005010	2 Stroke Outboard	21	850	212.876	60.135	12.993	0.012	0.371	0.341	2241.292
2282005015	2 Stroke Personal Water Craft	21	820	252.540	18.894	14.055	0.012	0.149	0.137	2152.915
2282010005	4 Stroke Inboard/Sterndrive	21	630	117.482	21.165	10.502	0.010	0.151	0.139	1845.488
2282020005	Diesel Inboard/Sterndrive	35	370	2.250	0.628	9.540	0.011	0.228	0.221	1173.350
2282020010	Diesel Outboards	35	410	3.994	1.214	6.602	0.012	0.606	0.588	1300.228
2285002015	Diesel Railway Maintenance	21	440	3.453	0.842	5.755	0.004	0.608	0.590	1402.037
2285004015	4 Stroke Railway Maintenance	62	750	530.499	13.727	4.587	0.013	0.294	0.271	2343.575
2285006015	LPG Railway Maintenance	62	480	14.054	0.351	2.465	0.006	0.126	0.126	1220.466

Notes for Table 4-3 follow Table 4-5

3683 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3684 **2026**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260001010	2 Stroke Motorcycles: Off- Road [c]	100	260	78.159	67.958	0.930	0.003	2.486	2.287	575.056
2260001020	2 Stroke Snowmobiles	34	1640	125.658	166.919	6.260	0.012	1.484	1.366	2090.082
2260001030	2 Stroke ATVs [c]	100	210	81.491	11.079	0.954	0.003	0.254	0.234	507.847
2260001060	2 Stroke Specialty Vehicles/Carts	58	1000	575.557	20.418	4.625	0.013	0.296	0.273	2348.143
2260002006	2 Stroke Tampers/Rammers	55	680	561.023	134.887	3.366	0.008	20.431	18.796	1595.706
2260002009	2 Stroke Plate Compactors	55	830	490.703	110.101	5.246	0.013	16.837	15.490	2440.250
2260002021	2 Stroke Paving Equipment	59	830	494.439	109.714	5.246	0.013	16.950	15.594	2437.533
2260002027	2 Stroke Signal Boards/Light Plants	72	830	512.953	128.849	5.246	0.013	17.574	16.168	2422.469
2260002039	2 Stroke Concrete/Industrial Saws	78	630	580.949	136.956	3.517	0.009	21.176	19.482	1645.708
2260002054	2 Stroke Crushing/Proc. Equipment	85	830	512.954	112.858	5.246	0.013	17.574	16.168	2422.473
2260003030	2 Stroke Sweepers/Scrubbers	71	820	512.955	115.391	5.246	0.013	17.574	16.168	2422.474
2260003040	2 Stroke Other General Industrial Equipment	54	830	512.954	113.920	5.246	0.013	17.574	16.168	2422.471
2260004015	2 Stroke Rotary Tillers < 6 HP (Residential)	40	940	455.057	108.307	5.259	0.013	16.269	14.967	2454.545
2260004016	2 Stroke Rotary Tillers < 6 HP (Commercial)	40	900	459.843	94.286	5.259	0.013	16.406	15.094	2451.241
2260004020	2 Stroke Chain Saws < 6 HP (Residential)	70	900	470.343	108.599	5.246	0.013	16.249	14.949	2454.308
2260004021	2 Stroke Chain Saws < 6 HP (Commercial)	70	650	577.069	133.544	3.616	0.009	20.971	19.293	1690.024
2260004025	2 Stroke Trimmers/Edgers/Brush Cutter (Residential)	91	890	434.250	109.988	5.296	0.013	16.887	15.536	2441.560
2260004026	2 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	810	494.627	103.045	4.976	0.012	17.171	15.797	2323.476
2260004030	2 Stroke Leaf blowers/Vacuums (Residential)	94	890	460.554	130.447	5.259	0.013	16.426	15.112	2450.749
2260004031	2 Stroke Leaf blowers/Vacuums (Commercial)	94	760	520.131	113.803	4.354	0.011	18.424	16.950	2042.129
2260004035	2 Stroke Snow blowers (Residential)	35	870	530.461	401.580	1.774	0.006	5.897	5.425	1239.586
2260004036	2 Stroke Snow blowers (Commercial)	35	870	619.109	231.251	2.069	0.007	6.881	6.330	1446.141

3685
3686

3687 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3688 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260004071	2 Stroke Commercial Turf Equipment	60	840	481.749	98.319	5.246	0.013	16.572	15.246	2446.601
2260005035	2 Stroke Sprayers	65	840	424.243	107.926	5.318	0.013	17.377	15.987	2430.717
2260006005	2 Stroke Generator Sets	68	830	483.481	131.465	5.251	0.013	16.809	15.464	2441.134
2260006010	2 Stroke Pumps	69	830	461.249	136.072	5.275	0.013	18.335	16.869	2396.302
2260006015	2 Stroke Air Compressors	56	830	512.954	134.653	5.246	0.013	17.574	16.168	2422.469
2260006035	2 Stroke Hydro Power Units	56	830	512.953	141.762	5.246	0.013	17.574	16.168	2422.469
2260007005	2 Stroke Chain Saws > 6 HP	70	620	586.888	137.090	3.366	0.008	21.491	19.772	1577.862
2265001010	4 Stroke Motorcycles: Off- Road	100	160	57.747	6.817	1.231	0.003	0.147	0.135	504.290
2265001030	4 Stroke ATVs	100	170	80.563	7.938	0.948	0.003	0.147	0.135	532.944
2265001050	4 Stroke Golf Carts	46	740	587.437	13.470	4.915	0.013	0.301	0.277	2345.375
2265001060	4 Stroke Specialty Vehicles/Carts	58	820	555.837	17.093	6.150	0.013	0.237	0.218	2289.246
2265002003	4 Stroke Pavers	66	700	433.852	9.469	4.232	0.012	0.257	0.237	2156.090
2265002006	4 Stroke Tampers/Rammers	55	760	572.771	12.620	4.541	0.013	0.251	0.231	2345.277
2265002009	4 Stroke Plate Compactors	55	830	488.696	15.048	5.124	0.014	0.518	0.476	2584.957
2265002015	4 Stroke Rollers	62	690	448.733	9.939	4.301	0.012	0.254	0.233	2152.868
2265002021	4 Stroke Paving Equipment	59	780	530.969	14.075	4.746	0.013	0.345	0.318	2415.769
2265002024	4 Stroke Surfacing Equipment	49	750	535.789	13.423	4.822	0.013	0.359	0.330	2389.386
2265002027	4 Stroke Signal Boards/Light Plants	72	780	525.775	13.417	5.091	0.014	0.464	0.427	2495.240
2265002030	4 Stroke Trenchers	66	710	416.325	10.327	4.375	0.012	0.324	0.298	2202.699
2265002033	4 Stroke Bore/Drill Rigs	79	790	359.475	14.138	6.343	0.013	0.491	0.452	2398.936
2265002039	4 Stroke Concrete/Industrial Saws	78	710	519.784	11.419	4.625	0.012	0.279	0.257	2250.914
2265002042	4 Stroke Cement & Mortar Mixers	59	820	534.548	17.959	4.759	0.013	0.352	0.324	2450.754

3689
3690

3691 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3692 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265002045	4 Stroke Cranes	47	590	94.948	3.266	3.903	0.009	0.164	0.151	1641.071
2265002054	4 Stroke Crushing/Proc. Equipment	85	740	495.656	12.051	4.695	0.013	0.327	0.301	2311.077
2265002057	4 Stroke Rough Terrain Forklifts	63	570	32.060	1.588	2.817	0.009	0.155	0.143	1553.970
2265002060	4 Stroke Rubber Tire Loaders	71	550	24.388	1.391	2.725	0.009	0.154	0.141	1544.026
2265002066	4 Stroke Tractors/Loaders/ Backhoes	48	730	543.060	11.343	4.565	0.013	0.264	0.242	2293.834
2265002072	4 Stroke Skid Steer Loaders	58	640	243.285	6.026	4.115	0.010	0.191	0.176	1860.007
2265002078	4 Stroke Dumpers/Tenders	41	800	545.705	17.183	4.833	0.013	0.281	0.259	2364.822
2265002081	4 Stroke Other Construction Equipment	48	580	46.077	2.462	4.366	0.009	0.151	0.139	1567.746
2265003010	4 Stroke Aerial Lifts	46	630	166.517	4.593	3.888	0.010	0.174	0.160	1748.892
2265003020	4 Stroke Forklifts	30	560	24.058	1.348	2.708	0.009	0.152	0.140	1544.027
2265003030	4 Stroke Sweepers/Scrubbers	71	610	202.642	5.246	3.453	0.010	0.220	0.202	1822.910
2265003040	4 Stroke Other General Industrial Equipment	54	760	441.500	13.780	5.056	0.013	0.533	0.491	2400.478
2265003050	4 Stroke Other Material Handling Equipment	53	640	198.547	5.003	3.596	0.010	0.183	0.168	1797.650
2265003060	4 Stroke AC/Refrigeration	46	740	575.277	12.572	4.605	0.013	0.260	0.239	2345.293
2265003070	4 Stroke Terminal Tractors	78	520	24.513	1.361	2.732	0.009	0.154	0.142	1544.026
2265004010	4 Stroke Lawn mowers (Residential)	33	900	422.985	24.094	5.353	0.015	0.642	0.591	2759.961
2265004011	4 Stroke Lawn mowers (Commercial)	33	880	427.371	14.859	5.557	0.015	0.717	0.659	2759.983
2265004015	4 Stroke Rotary Tillers < 6 HP (Residential)	40	910	422.886	20.968	5.353	0.015	0.643	0.591	2760.134
2265004016	4 Stroke Rotary Tillers < 6 HP (Commercial)	40	890	423.791	13.408	5.395	0.015	0.658	0.605	2760.143
2265004025	4 Stroke Trimmers/Edgers/Brush Cutter HP (Residential)	91	900	423.894	20.268	5.399	0.015	0.660	0.607	2760.146
2265004026	4 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	820	496.861	12.439	5.116	0.014	0.500	0.460	2566.417
2265004030	4 Stroke Leaf blowers/Vacuums (Residential)	94	900	423.910	27.586	5.400	0.015	0.660	0.607	2760.143

3693
3694

3695 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3696 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265004031	4 Stroke Leaf blowers/Vacuums (Commercial)	94	700	434.060	8.459	4.197	0.012	0.249	0.229	2154.585
2265004035	4 Stroke Snow blowers (Residential)	35	940	605.502	232.016	4.734	0.008	0.126	0.116	1506.663
2265004036	4 Stroke Snow blowers (Commercial)	35	940	710.111	33.886	5.385	0.009	0.147	0.135	1757.281
2265004040	4 Stroke Rear Engine Riding Mowers (Residential)	38	760	571.421	22.379	4.516	0.013	0.247	0.227	2346.273
2265004041	4 Stroke Rear Engine Riding Mowers (Commercial)	38	740	574.506	11.400	4.594	0.013	0.259	0.238	2346.059
2265004046	4 Stroke Front Mowers	65	790	568.892	12.291	4.664	0.013	0.243	0.224	2339.692
2265004051	4 Stroke Shredders < 6 HP	80	890	423.367	13.950	5.375	0.015	0.651	0.599	2760.138
2265004055	4 Stroke Lawn & Garden Tractors (Residential)	44	760	571.327	16.859	4.507	0.013	0.247	0.227	2345.559
2265004056	4 Stroke Lawn & Garden Tractors (Commercial)	44	740	574.675	10.813	4.593	0.013	0.258	0.238	2345.581
2265004066	4 Stroke Chippers/Stump Grinders	78	640	292.427	6.265	3.694	0.011	0.213	0.196	1930.389
2265004071	4 Stroke Commercial Turf Equipment	60	730	487.198	10.458	4.536	0.013	0.315	0.290	2309.800
2265004075	4 Stroke Other Lawn & Garden Equipment	58	850	497.239	23.448	5.040	0.014	0.445	0.410	2556.499
2265004076	4 Stroke Other Lawn & Garden Equipment	58	850	494.610	21.628	5.050	0.014	0.443	0.408	2550.718
2265005010	4 Stroke 2-Wheel Tractors	62	740	577.449	11.901	4.660	0.013	0.267	0.246	2345.307
2265005015	4 Stroke Agricultural Tractors	62	580	105.699	2.874	3.006	0.009	0.170	0.156	1661.918
2265005020	4 Stroke Combines	74	580	112.242	8.952	10.090	0.009	0.153	0.141	1629.334
2265005025	4 Stroke Balers	62	580	112.593	11.022	10.119	0.009	0.153	0.141	1629.650
2265005030	4 Stroke Agricultural Mowers	48	770	571.191	12.390	4.541	0.013	0.250	0.230	2347.707
2265005035	4 Stroke Sprayers	65	740	382.500	14.391	6.803	0.012	0.300	0.276	2182.026
2265005040	4 Stroke Tillers > 6 HP	71	870	700.061	22.460	7.620	0.013	0.248	0.228	2432.569
2265005045	4 Stroke Swathers	52	580	112.593	9.014	10.119	0.009	0.153	0.141	1629.651
2265005055	4 Stroke Other Agricultural Equipment	55	620	204.610	8.124	8.969	0.010	0.175	0.161	1777.836

3697
3698

3699 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3700 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265005060	4 Stroke Irrigation Sets	60	550	36.233	1.756	2.802	0.009	0.168	0.154	1571.227
2265006005	4 Stroke Generator Sets	68	780	557.794	14.660	4.610	0.013	0.287	0.264	2383.925
2265006010	4 Stroke Pumps	69	760	438.125	12.362	4.829	0.013	0.414	0.381	2359.256
2265006015	4 Stroke Air Compressors	56	700	360.047	9.557	4.243	0.012	0.336	0.309	2143.773
2265006025	4 Stroke Welders	68	710	472.588	9.922	4.358	0.012	0.259	0.238	2199.299
2265006030	4 Stroke Pressure Washers	85	800	520.813	14.109	4.902	0.014	0.416	0.382	2489.842
2265006035	4 Stroke Hydro Power Units	56	750	540.025	12.592	4.749	0.013	0.334	0.307	2370.590
2265007010	4 Stroke Shredders > 6 HP	80	800	574.107	12.080	4.563	0.013	0.240	0.221	2348.001
2265007015	4 Stroke Forest Equipment - Feller/Bunch/Skidder	70	810	492.144	14.562	5.385	0.014	0.599	0.551	2593.340
2265008005	4 Stroke Airport Ground Support Equipment	56	600	129.504	4.227	3.266	0.010	0.233	0.214	1744.052
2265010010	4 Stroke Other Oil Field Equipment	90	740	594.074	12.552	5.085	0.013	0.323	0.297	2345.417
2267001060	LPG Specialty Vehicle Carts	58	490	36.401	1.388	6.678	0.006	0.126	0.126	1270.185
2267002003	LPG Pavers	66	460	11.270	0.258	2.098	0.006	0.128	0.128	1216.873
2267002015	LPG Rollers	62	450	10.610	0.245	2.052	0.006	0.128	0.128	1216.732
2267002021	LPG Paving Equipment	59	480	20.139	0.623	3.559	0.006	0.127	0.127	1233.042
2267002024	LPG Surfacing Equipment	49	460	11.504	0.269	2.143	0.006	0.128	0.128	1217.417
2267002030	LPG Trenchers	66	460	11.167	0.255	2.086	0.006	0.128	0.128	1216.754
2267002033	LPG Bore/Drill Rigs	79	490	44.126	1.668	7.778	0.006	0.125	0.125	1281.195
2267002039	LPG Concrete/Industrial Saws	78	430	10.726	0.249	2.062	0.006	0.129	0.129	1216.740
2267002045	LPG Cranes	47	480	17.138	0.492	3.029	0.006	0.126	0.126	1227.018
2267002054	LPG Crushing/Proc. Equipment	85	480	15.986	0.441	2.824	0.006	0.127	0.127	1224.639
2267002057	LPG Rough Terrain Forklifts	63	470	11.503	0.263	2.115	0.006	0.128	0.128	1216.926

3701
3702

3703 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3704 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2267002060	LPG Rubber Tire Loaders	71	460	10.572	0.243	2.048	0.006	0.128	0.128	1216.731
2267002066	LPG Tractors/Loaders/ Backhoes	48	450	10.590	0.244	2.050	0.006	0.128	0.128	1216.731
2267002072	LPG Skid Steer Loaders	58	470	16.869	0.494	3.047	0.006	0.126	0.126	1227.613
2267002081	LPG Other Construction Equipment	48	480	19.804	0.613	3.521	0.006	0.126	0.126	1232.821
2267003010	LPG Aerial Lifts	46	480	15.752	0.455	2.908	0.006	0.124	0.124	1226.450
2267003020	LPG Forklifts	30	460	10.429	0.238	2.035	0.006	0.127	0.127	1216.720
2267003030	LPG Sweepers/Scrubbers	71	440	10.583	0.244	2.049	0.006	0.128	0.128	1216.731
2267003040	LPG Other General Industrial Equipment	54	450	10.478	0.240	2.040	0.006	0.127	0.127	1216.724
2267003050	LPG Other Material Handling Equipment	53	480	13.426	0.343	2.450	0.006	0.125	0.125	1220.889
2267003070	LPG Terminal Tractors	78	430	10.627	0.245	2.053	0.006	0.129	0.129	1216.734
2267004066	LPG Chippers/Stump Grinders	78	450	10.533	0.242	2.045	0.006	0.128	0.128	1216.729
2267005055	LPG Other Agricultural Equipment	55	490	55.227	1.925	8.694	0.006	0.128	0.128	1285.298
2267005060	LPG Irrigation Sets	60	450	10.576	0.244	2.049	0.006	0.128	0.128	1216.731
2267006005	LPG Generator Sets	68	480	23.914	0.789	5.139	0.006	0.124	0.124	1252.545
2267006010	LPG Pumps	69	470	14.291	0.392	2.905	0.006	0.125	0.125	1226.755
2267006015	LPG Air Compressors	56	460	10.732	0.241	2.051	0.006	0.127	0.127	1216.726
2267006025	LPG Welders	68	460	10.744	0.244	2.054	0.006	0.127	0.127	1216.731
2267006030	LPG Pressure Washers	85	470	17.502	0.501	3.069	0.006	0.126	0.126	1227.339
2267006035	LPG Hydro Power Units	56	460	10.887	0.245	2.072	0.006	0.127	0.127	1216.902
2267008005	LPG Airport Ground Support Equipment	56	450	10.492	0.241	2.041	0.006	0.127	0.127	1216.725
2268002081	CNG Other Construction Equipment	48	480	19.743	2.223	3.595	0.006	0.126	0.126	1310.910
2268003020	CNG Forklifts	30	460	10.429	0.907	2.131	0.006	0.127	0.127	1159.795

3705
3706

3707 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3708 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2268003030	CNG Sweepers/Scrubbers	71	460	10.440	0.908	2.132	0.006	0.127	0.127	1159.953
2268003040	CNG Other General Industrial Equipment	54	460	10.441	0.908	2.132	0.006	0.127	0.127	1159.962
2268003060	CNG AC\Refrigeration	46	450	10.572	0.920	2.142	0.006	0.127	0.127	1161.206
2268003070	CNG Terminal Tractors	78	430	10.626	0.933	2.150	0.006	0.129	0.129	1162.526
2268005055	CNG Other Agricultural Equipment	55	510	55.133	6.888	8.744	0.006	0.128	0.128	1842.065
2268005060	CNG Irrigation Sets	60	510	10.581	0.927	2.146	0.006	0.128	0.128	1161.903
2268006005	CNG Generator Sets	68	490	26.166	3.184	5.741	0.006	0.124	0.124	1434.974
2268006010	CNG Pumps	69	480	16.212	1.714	3.422	0.006	0.125	0.125	1257.532
2268006015	CNG Air Compressors	56	470	10.741	0.914	2.147	0.006	0.127	0.127	1160.584
2268006020	CNG Gas Compressors	85	410	11.753	1.087	2.256	0.006	0.139	0.139	1178.200
2268006035	CNG Hydro Power Units	56	470	11.156	0.931	2.183	0.006	0.126	0.126	1162.568
2268010010	CNG Other Oil Field Equipment	90	410	11.075	0.995	2.192	0.006	0.133	0.133	1168.770
2270001060	Diesel Specialty Vehicle Carts	21	450	4.750	1.189	6.816	0.005	0.714	0.692	1440.643
2270002003	Diesel Pavers	59	380	0.281	0.054	1.503	0.003	0.050	0.048	1214.357
2270002006	Diesel Tampers/Rammers	43	1000	5.555	1.836	9.276	0.005	0.555	0.539	1300.271
2270002009	Diesel Plate Compactors	43	410	4.800	1.489	8.951	0.005	0.496	0.481	1300.528
2270002015	Diesel Rollers	59	390	0.478	0.086	2.002	0.003	0.078	0.075	1233.953
2270002018	Diesel Scrapers	59	370	0.334	0.051	0.799	0.003	0.052	0.051	1183.462
2270002021	Diesel Paving Equipment	59	390	0.724	0.151	2.384	0.003	0.114	0.110	1227.323
2270002024	Diesel Surfacing Equipment	59	380	1.228	0.202	3.768	0.004	0.169	0.164	1224.453
2270002027	Diesel Signal Boards/Light Plants	43	410	2.505	0.624	7.246	0.004	0.294	0.285	1293.840
2270002030	Diesel Trenchers	59	400	0.845	0.148	3.970	0.003	0.111	0.108	1273.793

3709
3710

3711 **Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3712 **2026 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270002033	Diesel Bore/Drill Rigs	43	370	1.263	0.322	4.931	0.004	0.227	0.220	1190.736
2270002036	Diesel Excavators	59	380	0.159	0.036	0.801	0.003	0.032	0.031	1194.769
2270002039	Diesel Concrete/Industrial Saws	59	410	1.027	0.194	4.500	0.004	0.131	0.127	1305.142
2270002042	Diesel Cement & Mortar Mixers	43	390	2.614	0.682	6.536	0.004	0.394	0.382	1245.121
2270002045	Diesel Cranes	43	370	0.281	0.063	1.185	0.003	0.053	0.051	1175.769
2270002048	Diesel Graders	59	370	0.133	0.030	0.484	0.003	0.030	0.029	1185.409
2270002051	Diesel Off-highway Trucks	59	370	0.154	0.060	3.072	0.003	0.042	0.041	1183.457
2270002054	Diesel Crushing/Proc. Equipment	43	380	0.433	0.092	2.323	0.003	0.067	0.065	1203.330
2270002057	Diesel Rough Terrain Forklifts	59	390	0.657	0.079	2.227	0.003	0.112	0.109	1255.918
2270002060	Diesel Rubber Tire Loaders	59	370	0.407	0.071	1.642	0.003	0.072	0.070	1190.517
2270002066	Diesel Tractors/Loaders/ Backhoes	21	460	2.400	0.487	3.868	0.004	0.403	0.391	1467.517
2270002069	Diesel Crawler Tractor/Dozers	59	370	0.280	0.052	1.326	0.003	0.051	0.049	1190.053
2270002072	Diesel Skid Steer Loaders	21	480	5.537	1.132	7.477	0.005	0.849	0.824	1530.250
2270002075	Diesel Off-Highway Tractors	59	370	0.530	0.100	3.062	0.003	0.084	0.082	1183.410
2270002078	Diesel Dumpers/Tenders	21	470	5.458	1.275	7.514	0.005	0.810	0.786	1509.650
2270002081	Diesel Other Construction Equipment	59	370	0.771	0.114	2.043	0.003	0.111	0.108	1185.574
2270003010	Diesel Aerial Lifts	21	480	4.852	1.020	7.507	0.005	0.656	0.636	1532.088
2270003020	Diesel Forklifts	59	400	0.183	0.044	2.293	0.003	0.027	0.027	1265.584
2270003030	Diesel Sweepers/Scrubbers	43	380	0.251	0.055	1.612	0.003	0.041	0.040	1219.338
2270003040	Diesel Other General Industrial Equipment	43	380	0.375	0.075	1.655	0.003	0.071	0.069	1205.582
2270003050	Diesel Other Material Handling Equipment	21	440	2.677	0.676	4.856	0.004	0.445	0.432	1414.476
2270003060	Diesel AC\Refrigeration	43	410	0.702	0.186	5.825	0.004	0.069	0.067	1301.614

3713
3714

Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2026 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270003070	Diesel Terminal Tractors	59	380	0.091	0.025	0.642	0.003	0.021	0.020	1199.665
2270004031	Diesel Leaf blowers/Vacuums	43	410	4.725	1.354	9.531	0.004	0.656	0.637	1299.511
2270004036	Diesel Snow blowers	43	370	0.738	0.184	2.785	0.002	0.125	0.122	682.635
2270004046	Diesel Front Mowers	43	410	2.263	0.539	7.227	0.004	0.295	0.287	1301.150
2270004056	Diesel Lawn & Garden Tractors	43	410	3.144	0.743	8.026	0.005	0.365	0.354	1301.038
2270004066	Diesel Chippers/Stump Grinders	43	380	1.695	0.369	5.142	0.004	0.300	0.291	1216.052
2270004071	Diesel Commercial Turf Equipment	43	400	0.733	0.175	3.629	0.004	0.092	0.089	1263.308
2270004076	Diesel Other Lawn & Garden Equipment	43	410	2.937	0.650	7.743	0.004	0.467	0.453	1293.604
2270005010	Diesel 2-Wheel Tractors	59	410	5.447	1.846	9.223	0.005	0.530	0.514	1313.072
2270005015	Diesel Agricultural Tractors	59	380	1.460	0.248	3.908	0.004	0.245	0.238	1211.504
2270005020	Diesel Combines	59	370	2.040	0.477	5.801	0.004	0.407	0.395	1185.648
2270005025	Diesel Balers	59	400	3.978	0.715	7.353	0.004	0.563	0.546	1270.263
2270005030	Diesel Agricultural Mowers	59	410	4.150	0.507	5.823	0.004	0.612	0.594	1313.474
2270005035	Diesel Sprayers	59	380	2.374	0.536	5.759	0.004	0.382	0.371	1196.167
2270005040	Diesel Tillers > 6 HP	59	370	2.566	0.412	5.624	0.004	0.326	0.317	1186.837
2270005045	Diesel Swathers	59	400	4.261	0.649	7.124	0.004	0.620	0.602	1284.760
2270005055	Diesel Other Agricultural Equipment	59	380	1.867	0.341	4.494	0.004	0.330	0.320	1196.650
2270005060	Diesel Irrigation Sets	43	390	0.792	0.148	2.956	0.003	0.145	0.141	1235.321
2270006005	Diesel Generator Sets	43	390	2.009	0.481	5.896	0.004	0.316	0.307	1254.458
2270006010	Diesel Pumps	43	390	2.104	0.493	5.863	0.004	0.344	0.333	1253.511
2270006015	Diesel Air Compressors	43	400	0.710	0.128	3.422	0.003	0.110	0.107	1266.224
2270006020	Diesel Gas Compressors	43	410	0.205	0.044	2.965	0.003	0.032	0.032	1301.567

Table 4-4. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2026 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270006025	Diesel Welders	21	480	4.586	0.942	7.414	0.005	0.635	0.616	1530.392
2270006030	Diesel Pressure Washers	43	380	1.973	0.527	5.789	0.004	0.293	0.284	1224.727
2270006035	Diesel Hydro Power Units	43	400	0.867	0.174	3.928	0.004	0.126	0.123	1272.446
2270007015	Diesel Forest Equipment - Feller/Bunch/Skidder	59	370	0.091	0.024	0.391	0.003	0.022	0.021	1186.535
2270008005	Diesel Airport Ground Support Equipment	59	380	0.443	0.070	1.300	0.003	0.078	0.076	1195.515
2270009010	Diesel Other Underground Mining Equipment	21	450	8.151	1.942	10.825	0.005	0.954	0.925	1429.090
2270010010	Diesel Other Oil Field Equipment	43	370	0.350	0.086	2.553	0.003	0.060	0.059	1174.770
2282005010	2 Stroke Outboard	21	850	211.744	56.251	12.995	0.012	0.328	0.302	2241.271
2282005015	2 Stroke Personal Water Craft	21	820	252.363	18.490	14.070	0.012	0.142	0.131	2153.175
2282010005	4 Stroke Inboard/Sterndrive	21	630	112.441	20.163	9.681	0.010	0.151	0.139	1841.372
2282020005	Diesel Inboard/Sterndrive	35	370	2.245	0.628	9.364	0.011	0.225	0.218	1173.380
2282020010	Diesel Outboards	35	410	3.915	1.179	6.404	0.012	0.586	0.569	1300.336
2285002015	Diesel Railway Maintenance	21	440	3.197	0.778	5.398	0.004	0.565	0.548	1402.171
2285004015	4 Stroke Railway Maintenance	62	750	530.486	13.729	4.582	0.013	0.295	0.271	2343.499
2285006015	LPG Railway Maintenance	62	480	13.261	0.322	2.352	0.006	0.126	0.126	1219.319

Notes for Table 4-4 follow Table 4-5

Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2027

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260001010	2 Stroke Motorcycles: Off- Road [c]	100	260	78.045	67.611	0.932	0.003	2.473	2.276	575.464
2260001020	2 Stroke Snowmobiles	34	1640	124.370	165.150	6.310	0.012	1.462	1.345	2087.269
2260001030	2 Stroke ATVs [c]	100	210	81.345	10.198	0.956	0.003	0.221	0.203	509.188
2260001060	2 Stroke Specialty Vehicles/Carts	58	1000	575.455	20.369	4.625	0.013	0.296	0.273	2348.101
2260002006	2 Stroke Tampers/Rammers	55	680	561.174	134.926	3.366	0.008	20.437	18.802	1595.606
2260002009	2 Stroke Plate Compactors	55	830	490.853	110.155	5.246	0.013	16.842	15.495	2440.129
2260002021	2 Stroke Paving Equipment	59	830	494.543	109.752	5.246	0.013	16.954	15.598	2437.443
2260002027	2 Stroke Signal Boards/Light Plants	72	830	512.953	128.849	5.246	0.013	17.574	16.168	2422.470
2260002039	2 Stroke Concrete/Industrial Saws	78	630	580.948	136.956	3.517	0.009	21.176	19.482	1645.708
2260002054	2 Stroke Crushing/Proc. Equipment	85	830	512.953	112.858	5.246	0.013	17.574	16.168	2422.469
2260003030	2 Stroke Sweepers/Scrubbers	71	820	512.953	115.390	5.246	0.013	17.574	16.168	2422.472
2260003040	2 Stroke Other General Industrial Equipment	54	830	512.954	113.920	5.246	0.013	17.574	16.168	2422.471
2260004015	2 Stroke Rotary Tillers < 6 HP (Residential)	40	940	455.079	108.314	5.259	0.013	16.269	14.968	2454.531
2260004016	2 Stroke Rotary Tillers < 6 HP (Commercial)	40	900	459.829	94.283	5.259	0.013	16.406	15.093	2451.246
2260004020	2 Stroke Chain Saws < 6 HP (Residential)	70	900	470.366	108.605	5.246	0.013	16.249	14.949	2454.295
2260004021	2 Stroke Chain Saws < 6 HP (Commercial)	70	650	577.069	133.544	3.616	0.009	20.971	19.293	1690.026
2260004025	2 Stroke Trimmers/Edgers/Brush Cutter (Residential)	91	890	434.270	109.994	5.296	0.013	16.887	15.536	2441.546
2260004026	2 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	810	494.660	103.057	4.976	0.012	17.172	15.798	2323.450
2260004030	2 Stroke Leaf blowers/Vacuums (Residential)	94	890	460.575	130.453	5.259	0.013	16.427	15.113	2450.738
2260004031	2 Stroke Leaf blowers/Vacuums (Commercial)	94	760	520.163	113.813	4.354	0.011	18.425	16.951	2042.107
2260004035	2 Stroke Snow blowers (Residential)	35	870	530.446	401.576	1.774	0.006	5.897	5.425	1239.595
2260004036	2 Stroke Snow blowers (Commercial)	35	870	619.073	231.242	2.069	0.007	6.880	6.330	1446.158

3729 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3730 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2260004071	2 Stroke Commercial Turf Equipment	60	840	481.757	98.322	5.246	0.013	16.572	15.246	2446.591
2260005035	2 Stroke Sprayers	65	840	424.206	107.912	5.318	0.013	17.376	15.986	2430.751
2260006005	2 Stroke Generator Sets	68	830	483.483	131.465	5.251	0.013	16.809	15.464	2441.131
2260006010	2 Stroke Pumps	69	830	461.214	136.054	5.275	0.013	18.335	16.868	2396.282
2260006015	2 Stroke Air Compressors	56	830	512.953	134.653	5.246	0.013	17.574	16.168	2422.471
2260006035	2 Stroke Hydro Power Units	56	830	512.954	141.762	5.246	0.013	17.574	16.168	2422.474
2260007005	2 Stroke Chain Saws > 6 HP	70	620	586.888	137.090	3.366	0.008	21.491	19.772	1577.859
2265001010	4 Stroke Motorcycles: Off- Road	100	160	57.594	6.801	1.230	0.003	0.147	0.135	504.291
2265001030	4 Stroke ATVs	100	170	80.511	7.915	0.945	0.003	0.147	0.135	532.941
2265001050	4 Stroke Golf Carts	46	740	587.435	13.470	4.915	0.013	0.301	0.277	2345.374
2265001060	4 Stroke Specialty Vehicles/Carts	58	820	548.195	16.333	5.881	0.013	0.236	0.217	2283.892
2265002003	4 Stroke Pavers	66	700	433.776	9.466	4.226	0.012	0.257	0.237	2156.052
2265002006	4 Stroke Tampers/Rammers	55	760	572.718	12.615	4.539	0.013	0.251	0.231	2345.274
2265002009	4 Stroke Plate Compactors	55	830	488.677	15.046	5.123	0.014	0.518	0.476	2584.958
2265002015	4 Stroke Rollers	62	690	448.749	9.941	4.302	0.012	0.254	0.233	2152.867
2265002021	4 Stroke Paving Equipment	59	780	530.888	14.070	4.739	0.013	0.345	0.318	2415.679
2265002024	4 Stroke Surfacing Equipment	49	750	535.791	13.424	4.821	0.013	0.359	0.330	2389.370
2265002027	4 Stroke Signal Boards/Light Plants	72	780	525.787	13.418	5.091	0.014	0.464	0.427	2495.238
2265002030	4 Stroke Trenchers	66	710	416.274	10.326	4.371	0.012	0.324	0.298	2202.697
2265002033	4 Stroke Bore/Drill Rigs	79	790	356.787	13.981	6.103	0.013	0.491	0.452	2395.650
2265002039	4 Stroke Concrete/Industrial Saws	78	710	519.790	11.420	4.626	0.012	0.279	0.257	2250.914
2265002042	4 Stroke Cement & Mortar Mixers	59	820	534.240	17.922	4.747	0.013	0.351	0.323	2450.651

3731
3732

3733 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3734 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265002045	4 Stroke Cranes	47	590	92.661	3.153	3.706	0.009	0.164	0.151	1638.570
2265002054	4 Stroke Crushing/Proc. Equipment	85	740	495.398	12.039	4.672	0.013	0.327	0.301	2310.778
2265002057	4 Stroke Rough Terrain Forklifts	63	570	31.599	1.568	2.782	0.009	0.155	0.143	1553.764
2265002060	4 Stroke Rubber Tire Loaders	71	550	24.345	1.389	2.723	0.009	0.153	0.141	1544.028
2265002066	4 Stroke Tractors/Loaders/ Backhoes	48	730	543.081	11.346	4.566	0.013	0.264	0.243	2293.833
2265002072	4 Stroke Skid Steer Loaders	58	640	241.978	5.960	4.003	0.010	0.191	0.176	1858.567
2265002078	4 Stroke Dumpers/Tenders	41	800	544.577	17.087	4.779	0.013	0.281	0.259	2364.039
2265002081	4 Stroke Other Construction Equipment	48	580	43.023	2.309	4.101	0.009	0.152	0.140	1564.314
2265003010	4 Stroke Aerial Lifts	46	630	164.916	4.511	3.752	0.010	0.174	0.160	1747.175
2265003020	4 Stroke Forklifts	30	560	24.058	1.348	2.708	0.009	0.152	0.140	1544.026
2265003030	4 Stroke Sweepers/Scrubbers	71	610	202.633	5.245	3.452	0.010	0.220	0.202	1822.910
2265003040	4 Stroke Other General Industrial Equipment	54	760	441.493	13.779	5.056	0.013	0.533	0.491	2400.477
2265003050	4 Stroke Other Material Handling Equipment	53	640	197.451	4.948	3.504	0.010	0.183	0.168	1796.548
2265003060	4 Stroke AC/Refrigeration	46	740	575.264	12.570	4.604	0.013	0.260	0.239	2345.291
2265003070	4 Stroke Terminal Tractors	78	520	24.496	1.360	2.731	0.009	0.154	0.142	1544.025
2265004010	4 Stroke Lawn mowers (Residential)	33	900	422.982	24.094	5.353	0.015	0.642	0.591	2759.957
2265004011	4 Stroke Lawn mowers (Commercial)	33	880	427.374	14.859	5.557	0.015	0.717	0.659	2759.984
2265004015	4 Stroke Rotary Tillers < 6 HP (Residential)	40	910	422.889	20.969	5.353	0.015	0.643	0.591	2760.132
2265004016	4 Stroke Rotary Tillers < 6 HP (Commercial)	40	890	423.788	13.407	5.394	0.015	0.658	0.605	2760.143
2265004025	4 Stroke Trimmers/Edgers/Brush Cutter HP (Residential)	91	900	423.898	20.269	5.400	0.015	0.660	0.607	2760.145
2265004026	4 Stroke Trimmers/Edgers/Brush Cutter (Commercial)	91	820	496.870	12.441	5.116	0.014	0.500	0.460	2566.416
2265004030	4 Stroke Leaf blowers/Vacuums (Residential)	94	900	423.915	27.586	5.400	0.015	0.660	0.607	2760.146

3735
3736

3737 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3738 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265004031	4 Stroke Leaf blowers/Vacuums (Commercial)	94	700	433.969	8.458	4.191	0.012	0.249	0.229	2154.584
2265004035	4 Stroke Snow blowers (Residential)	35	940	605.480	232.016	4.734	0.008	0.126	0.116	1506.663
2265004036	4 Stroke Snow blowers (Commercial)	35	940	710.051	33.885	5.385	0.009	0.147	0.135	1757.280
2265004040	4 Stroke Rear Engine Riding Mowers (Residential)	38	760	571.391	22.375	4.515	0.013	0.247	0.228	2346.244
2265004041	4 Stroke Rear Engine Riding Mowers (Commercial)	38	740	574.510	11.400	4.594	0.013	0.259	0.238	2346.060
2265004046	4 Stroke Front Mowers	65	790	567.916	12.200	4.620	0.013	0.243	0.224	2339.209
2265004051	4 Stroke Shredders < 6 HP	80	890	423.374	13.951	5.375	0.015	0.651	0.599	2760.139
2265004055	4 Stroke Lawn & Garden Tractors (Residential)	44	760	571.332	16.859	4.507	0.013	0.247	0.227	2345.557
2265004056	4 Stroke Lawn & Garden Tractors (Commercial)	44	740	574.680	10.813	4.593	0.013	0.258	0.238	2345.580
2265004066	4 Stroke Chippers/Stump Grinders	78	640	292.434	6.266	3.694	0.011	0.213	0.196	1930.390
2265004071	4 Stroke Commercial Turf Equipment	60	730	487.201	10.458	4.536	0.013	0.315	0.290	2309.799
2265004075	4 Stroke Other Lawn & Garden Equipment	58	850	496.792	23.336	5.009	0.014	0.445	0.410	2556.328
2265004076	4 Stroke Other Lawn & Garden Equipment	58	850	494.065	21.511	5.014	0.014	0.443	0.408	2550.472
2265005010	4 Stroke 2-Wheel Tractors	62	740	577.448	11.900	4.660	0.013	0.267	0.246	2345.308
2265005015	4 Stroke Agricultural Tractors	62	580	105.750	2.877	3.008	0.009	0.170	0.157	1661.918
2265005020	4 Stroke Combines	74	580	101.750	8.189	9.153	0.009	0.153	0.141	1616.511
2265005025	4 Stroke Balers	62	580	102.099	10.105	9.182	0.009	0.153	0.141	1616.851
2265005030	4 Stroke Agricultural Mowers	48	770	571.193	12.386	4.535	0.013	0.251	0.231	2347.679
2265005035	4 Stroke Sprayers	65	740	377.861	14.023	6.440	0.012	0.300	0.276	2177.119
2265005040	4 Stroke Tillers > 6 HP	71	870	685.645	21.528	7.332	0.013	0.246	0.226	2421.882
2265005045	4 Stroke Swathers	52	580	102.099	8.247	9.182	0.009	0.153	0.141	1616.851
2265005055	4 Stroke Other Agricultural Equipment	55	620	196.244	7.654	8.221	0.010	0.175	0.161	1767.691

3739
3740

3741 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3742 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2265005060	4 Stroke Irrigation Sets	60	550	36.194	1.755	2.800	0.009	0.168	0.154	1571.227
2265006005	4 Stroke Generator Sets	68	780	557.703	14.642	4.602	0.013	0.287	0.264	2383.902
2265006010	4 Stroke Pumps	69	760	437.915	12.349	4.803	0.013	0.414	0.381	2358.942
2265006015	4 Stroke Air Compressors	56	700	359.999	9.554	4.239	0.012	0.336	0.309	2143.772
2265006025	4 Stroke Welders	68	710	472.538	9.919	4.354	0.012	0.259	0.238	2199.296
2265006030	4 Stroke Pressure Washers	85	800	520.770	14.104	4.901	0.014	0.415	0.382	2489.834
2265006035	4 Stroke Hydro Power Units	56	750	540.015	12.592	4.748	0.013	0.334	0.307	2370.581
2265007010	4 Stroke Shredders > 6 HP	80	800	573.912	12.079	4.558	0.013	0.241	0.222	2347.570
2265007015	4 Stroke Forest Equipment - Feller/Bunch/Skidder	70	810	492.136	14.561	5.384	0.014	0.598	0.551	2593.347
2265008005	4 Stroke Airport Ground Support Equipment	56	600	129.540	4.228	3.268	0.010	0.233	0.214	1744.053
2265010010	4 Stroke Other Oil Field Equipment	90	740	594.072	12.552	5.085	0.013	0.323	0.297	2345.418
2267001060	LPG Specialty Vehicle Carts	58	490	33.352	1.229	6.016	0.006	0.126	0.126	1261.943
2267002003	LPG Pavers	66	460	10.956	0.251	2.073	0.006	0.128	0.128	1216.746
2267002015	LPG Rollers	62	450	10.596	0.244	2.050	0.006	0.128	0.128	1216.732
2267002021	LPG Paving Equipment	59	480	18.692	0.557	3.287	0.006	0.127	0.127	1229.821
2267002024	LPG Surfacing Equipment	49	460	11.204	0.259	2.103	0.006	0.128	0.128	1217.022
2267002030	LPG Trenchers	66	460	10.865	0.250	2.068	0.006	0.128	0.128	1216.743
2267002033	LPG Bore/Drill Rigs	79	490	40.496	1.479	6.988	0.006	0.125	0.125	1271.389
2267002039	LPG Concrete/Industrial Saws	78	430	10.725	0.249	2.062	0.006	0.129	0.129	1216.741
2267002045	LPG Cranes	47	480	15.954	0.442	2.831	0.006	0.127	0.127	1224.784
2267002054	LPG Crushing/Proc. Equipment	85	480	14.911	0.396	2.641	0.006	0.127	0.127	1222.548
2267002057	LPG Rough Terrain Forklifts	63	470	11.084	0.254	2.081	0.006	0.128	0.128	1216.750

3743
3744

3745 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3746 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2267002060	LPG Rubber Tire Loaders	71	460	10.553	0.243	2.047	0.006	0.128	0.128	1216.729
2267002066	LPG Tractors/Loaders/ Backhoes	48	450	10.569	0.243	2.048	0.006	0.128	0.128	1216.730
2267002072	LPG Skid Steer Loaders	58	470	15.924	0.454	2.884	0.006	0.127	0.127	1225.749
2267002081	LPG Other Construction Equipment	48	480	18.443	0.554	3.283	0.006	0.126	0.126	1230.079
2267003010	LPG Aerial Lifts	46	480	14.808	0.415	2.748	0.006	0.125	0.125	1224.638
2267003020	LPG Forklifts	30	460	10.429	0.238	2.035	0.006	0.127	0.127	1216.720
2267003030	LPG Sweepers/Scrubbers	71	440	10.578	0.244	2.049	0.006	0.128	0.128	1216.731
2267003040	LPG Other General Industrial Equipment	54	450	10.469	0.240	2.039	0.006	0.127	0.127	1216.724
2267003050	LPG Other Material Handling Equipment	53	480	12.675	0.313	2.331	0.006	0.125	0.125	1219.608
2267003070	LPG Terminal Tractors	78	430	10.619	0.245	2.053	0.006	0.128	0.128	1216.734
2267004066	LPG Chippers/Stump Grinders	78	450	10.538	0.242	2.045	0.006	0.128	0.128	1216.728
2267005055	LPG Other Agricultural Equipment	55	490	51.441	1.732	7.876	0.006	0.128	0.128	1275.242
2267005060	LPG Irrigation Sets	60	450	10.561	0.243	2.047	0.006	0.128	0.128	1216.730
2267006005	LPG Generator Sets	68	480	22.532	0.719	4.745	0.006	0.124	0.124	1247.780
2267006010	LPG Pumps	69	470	13.627	0.367	2.767	0.006	0.125	0.125	1225.214
2267006015	LPG Air Compressors	56	460	10.553	0.239	2.042	0.006	0.127	0.127	1216.722
2267006025	LPG Welders	68	460	10.485	0.239	2.038	0.006	0.126	0.126	1216.720
2267006030	LPG Pressure Washers	85	470	16.389	0.454	2.881	0.006	0.126	0.126	1225.252
2267006035	LPG Hydro Power Units	56	460	10.709	0.241	2.051	0.006	0.127	0.127	1216.726
2267008005	LPG Airport Ground Support Equipment	56	450	10.513	0.241	2.043	0.006	0.127	0.127	1216.727
2268002081	CNG Other Construction Equipment	48	480	18.384	2.016	3.360	0.006	0.126	0.126	1286.929
2268003020	CNG Forklifts	30	460	10.429	0.907	2.131	0.006	0.127	0.127	1159.797

3747
3748

3749 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3750 **2027Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment**
3751 **– 202 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2268003030	CNG Sweepers/Scrubbers	71	460	10.439	0.908	2.132	0.006	0.127	0.127	1159.931
2268003040	CNG Other General Industrial Equipment	54	460	10.432	0.907	2.131	0.006	0.127	0.127	1159.838
2268003060	CNG AC\Refrigeration	46	450	10.519	0.917	2.139	0.006	0.127	0.127	1160.908
2268003070	CNG Terminal Tractors	78	430	10.618	0.932	2.149	0.006	0.128	0.128	1162.417
2268005055	CNG Other Agricultural Equipment	55	510	51.347	6.200	7.929	0.006	0.128	0.128	1761.163
2268005060	CNG Irrigation Sets	60	510	10.566	0.925	2.144	0.006	0.128	0.128	1161.700
2268006005	CNG Generator Sets	68	490	24.688	2.904	5.299	0.006	0.124	0.124	1400.851
2268006010	CNG Pumps	69	480	15.226	1.585	3.218	0.006	0.125	0.125	1241.954
2268006015	CNG Air Compressors	56	470	10.550	0.908	2.137	0.006	0.127	0.127	1159.978
2268006020	CNG Gas Compressors	85	410	11.753	1.087	2.256	0.006	0.139	0.139	1178.200
2268006035	CNG Hydro Power Units	56	470	10.827	0.911	2.149	0.006	0.126	0.126	1160.218
2268010010	CNG Other Oil Field Equipment	90	410	11.074	0.995	2.192	0.006	0.133	0.133	1168.758
2270001060	Diesel Specialty Vehicle Carts	21	450	4.359	1.088	6.451	0.005	0.653	0.634	1440.903
2270002003	Diesel Pavers	59	380	0.242	0.049	1.427	0.003	0.042	0.041	1214.360
2270002006	Diesel Tampers/Rammers	43	1000	5.524	1.838	9.256	0.005	0.549	0.533	1300.291
2270002009	Diesel Plate Compactors	43	410	4.778	1.489	8.935	0.005	0.491	0.477	1300.540
2270002015	Diesel Rollers	59	390	0.400	0.078	1.885	0.003	0.063	0.061	1233.959
2270002018	Diesel Scrapers	59	370	0.270	0.044	0.666	0.003	0.044	0.043	1183.462
2270002021	Diesel Paving Equipment	59	390	0.650	0.139	2.222	0.003	0.101	0.097	1227.333
2270002024	Diesel Surfacing Equipment	59	380	1.068	0.181	3.458	0.003	0.147	0.143	1224.488
2270002027	Diesel Signal Boards/Light Plants	43	410	2.465	0.615	7.188	0.004	0.285	0.277	1293.852
2270002030	Diesel Trenchers	59	400	0.725	0.133	3.829	0.003	0.094	0.091	1273.812

3752
3753

3754 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3755 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270002033	Diesel Bore/Drill Rigs	43	370	1.120	0.284	4.459	0.004	0.200	0.194	1190.809
2270002036	Diesel Excavators	59	380	0.138	0.034	0.754	0.003	0.028	0.027	1194.769
2270002039	Diesel Concrete/Industrial Saws	59	410	0.919	0.182	4.388	0.004	0.115	0.111	1305.159
2270002042	Diesel Cement & Mortar Mixers	43	390	2.437	0.645	6.153	0.004	0.359	0.348	1245.223
2270002045	Diesel Cranes	43	370	0.234	0.053	1.029	0.003	0.044	0.043	1175.777
2270002048	Diesel Graders	59	370	0.111	0.027	0.427	0.003	0.026	0.025	1185.409
2270002051	Diesel Off-highway Trucks	59	370	0.139	0.058	3.049	0.003	0.040	0.039	1183.458
2270002054	Diesel Crushing/Proc. Equipment	43	380	0.377	0.082	2.174	0.003	0.058	0.057	1203.342
2270002057	Diesel Rough Terrain Forklifts	59	390	0.526	0.066	2.062	0.003	0.091	0.088	1255.930
2270002060	Diesel Rubber Tire Loaders	59	370	0.339	0.062	1.497	0.003	0.061	0.059	1190.523
2270002066	Diesel Tractors/Loaders/ Backhoes	21	460	2.127	0.427	3.605	0.004	0.359	0.348	1467.635
2270002069	Diesel Crawler Tractor/Dozers	59	370	0.231	0.046	1.227	0.003	0.044	0.043	1190.057
2270002072	Diesel Skid Steer Loaders	21	480	5.011	1.016	7.118	0.005	0.760	0.737	1530.534
2270002075	Diesel Off-Highway Tractors	59	370	0.456	0.090	2.913	0.003	0.076	0.073	1183.420
2270002078	Diesel Dumpers/Tenders	21	470	4.917	1.155	7.145	0.005	0.719	0.697	1509.931
2270002081	Diesel Other Construction Equipment	59	370	0.673	0.100	1.823	0.003	0.098	0.095	1185.595
2270003010	Diesel Aerial Lifts	21	480	4.387	0.916	7.205	0.005	0.587	0.569	1532.338
2270003020	Diesel Forklifts	59	400	0.182	0.043	2.291	0.003	0.027	0.026	1265.585
2270003030	Diesel Sweepers/Scrubbers	43	380	0.229	0.052	1.559	0.003	0.037	0.036	1219.340
2270003040	Diesel Other General Industrial Equipment	43	380	0.319	0.064	1.474	0.003	0.060	0.058	1205.589
2270003050	Diesel Other Material Handling Equipment	21	440	2.400	0.600	4.437	0.004	0.396	0.384	1414.637
2270003060	Diesel AC\Refrigeration	43	410	0.683	0.183	5.812	0.004	0.067	0.065	1301.619

3756
3757

3758 **Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment –**
3759 **2027 (cont.)**

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270003070	Diesel Terminal Tractors	59	380	0.084	0.024	0.628	0.003	0.019	0.019	1199.666
2270004031	Diesel Leaf blowers/Vacuums	43	410	4.525	1.310	9.293	0.004	0.617	0.599	1299.694
2270004036	Diesel Snow blowers	43	370	0.672	0.168	2.527	0.002	0.114	0.111	682.669
2270004046	Diesel Front Mowers	43	410	2.161	0.518	7.102	0.004	0.275	0.267	1301.187
2270004056	Diesel Lawn & Garden Tractors	43	410	3.112	0.735	7.991	0.005	0.359	0.349	1301.045
2270004066	Diesel Chippers/Stump Grinders	43	380	1.532	0.330	4.714	0.004	0.269	0.261	1216.131
2270004071	Diesel Commercial Turf Equipment	43	400	0.691	0.170	3.550	0.003	0.084	0.081	1263.312
2270004076	Diesel Other Lawn & Garden Equipment	43	410	2.764	0.610	7.495	0.004	0.431	0.418	1293.705
2270005010	Diesel 2-Wheel Tractors	59	410	5.439	1.847	9.223	0.005	0.529	0.513	1313.071
2270005015	Diesel Agricultural Tractors	59	380	1.293	0.221	3.593	0.004	0.215	0.209	1211.545
2270005020	Diesel Combines	59	370	1.893	0.439	5.340	0.004	0.370	0.359	1185.731
2270005025	Diesel Balers	59	400	3.696	0.656	7.007	0.004	0.514	0.499	1270.413
2270005030	Diesel Agricultural Mowers	59	410	3.605	0.432	5.272	0.004	0.539	0.523	1313.599
2270005035	Diesel Sprayers	59	380	2.193	0.489	5.337	0.004	0.348	0.338	1196.279
2270005040	Diesel Tillers > 6 HP	59	370	2.365	0.383	5.213	0.004	0.301	0.292	1186.903
2270005045	Diesel Swathers	59	400	3.977	0.598	6.715	0.004	0.569	0.552	1284.881
2270005055	Diesel Other Agricultural Equipment	59	380	1.632	0.294	4.009	0.004	0.288	0.279	1196.724
2270005060	Diesel Irrigation Sets	43	390	0.671	0.126	2.677	0.003	0.122	0.118	1235.344
2270006005	Diesel Generator Sets	43	390	1.875	0.448	5.632	0.004	0.291	0.282	1254.532
2270006010	Diesel Pumps	43	390	1.958	0.459	5.576	0.004	0.315	0.306	1253.589
2270006015	Diesel Air Compressors	43	400	0.601	0.110	3.227	0.003	0.092	0.089	1266.243
2270006020	Diesel Gas Compressors	43	410	0.205	0.044	2.965	0.003	0.032	0.032	1301.567

3760
3761

Table 4-5. Criteria Pollutant Emission Factors for Non-Road Engines and Equipment – 2027 (cont.)

SCC	Equipment Description	Load Factor [a] (% Max Power)	BSFC [b] (lb/1000 hp-hr)	Emission Factors (lb/1000 hp-hr)						
				CO	VOC	NO_x	SO_2	PM_{10} [d]	$PM_{2.5}$ [e,f]	CO_2e [g]
2270006025	Diesel Welders	21	480	4.189	0.856	7.181	0.005	0.573	0.556	1530.584
2270006030	Diesel Pressure Washers	43	380	1.848	0.492	5.500	0.004	0.271	0.262	1224.814
2270006035	Diesel Hydro Power Units	43	400	0.767	0.158	3.749	0.004	0.109	0.106	1272.464
2270007015	Diesel Forest Equipment - Feller/Bunch/Skidder	59	370	0.081	0.022	0.369	0.003	0.020	0.019	1186.535
2270008005	Diesel Airport Ground Support Equipment	59	380	0.362	0.059	1.146	0.003	0.064	0.062	1195.522
2270009010	Diesel Other Underground Mining Equipment	21	450	8.080	1.925	10.765	0.005	0.943	0.915	1429.164
2270010010	Diesel Other Oil Field Equipment	43	370	0.287	0.075	2.369	0.003	0.052	0.050	1174.773
2282005010	2 Stroke Outboard	21	850	210.774	52.946	12.992	0.012	0.291	0.268	2241.266
2282005015	2 Stroke Personal Water Craft	21	820	252.215	18.196	14.080	0.012	0.137	0.126	2153.366
2282010005	4 Stroke Inboard/Sterndrive	21	630	107.630	19.175	8.852	0.010	0.151	0.139	1837.679
2282020005	Diesel Inboard/Sterndrive	35	370	2.242	0.627	9.238	0.011	0.223	0.217	1173.399
2282020010	Diesel Outboards	35	410	3.851	1.150	6.229	0.012	0.570	0.553	1300.424
2285002015	Diesel Railway Maintenance	21	440	2.848	0.684	4.889	0.004	0.503	0.488	1402.334
2285004015	4 Stroke Railway Maintenance	62	750	530.287	13.711	4.573	0.013	0.294	0.270	2343.443
2285006015	LPG Railway Maintenance	62	480	12.570	0.299	2.261	0.006	0.126	0.126	1218.454

Notes for Table 4-1 through Table 4-5 provided on the following page.

Notes for Table 4-1 through Table 4-5

a. Load factor and activity data obtained from EPA Office of Transportation Air Quality and were derived from *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling*, EPA 420-R-10-016, NR-005d, July 2010.

b. BSFC and emission factors obtained from EPA Office of Transportation Air Quality and were derived from *Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition*, EPA 420-R-019, NR-010e, December 2005, and *Exhaust Emission Factors for Nonroad Engine Modeling: Compression-Ignition*, EPA 420-P-04-009, NR-009c, April 2004. The emission factors are composite emission factors that represent the national mix of model years and technology types believed to be in existence in 2007. They represent in-use emissions and consider NONROAD model deterioration and transient adjustment factors across all model years.

c. Activities for off-road motorcycles and all-terrain vehicles are in units of miles per year instead of hours per year.

d. PM_{10} is assumed to be equivalent to total PM for gasoline engines.

e. For gasoline engines, $PM_{2.5}$ is assumed to be 92% of the PM_{10} value.

f. For LPG and CNG engines, all PM is assumed to be $PM_{2.5}$.

g. The Carbon Dioxide Equivalent (CO_2e) emission factors are the total of CO_2 and CH_4 converted to equivalent CO_2 (CO_2e) using a global warming potential (GWP) value of 25 for CH_4. The converted CH_4 value was added to the CO_2 emission factor and presented as a CO_2e emission factor in units of lb/1000lb. Calculations were made using the stated BSFC, the fuel density in Table 3-1, and if the fuel was not stated, it was assumed to be gasoline. N_2O is not included in these calculations because there is no N_2O pollutant output for the NONROAD module within MOVES4.

3788 **Table 4-6. Pre-1998 Non-Road CI Engine Criteria Pollutant Emission Factors (Power**
3789 **Rating > 50 hp)**

Equipment Description	Emission Factors (lb/1000 hp-hr)						
	CO	VOC [a]	NO_X	SO_X	PM_{10} [b]	$PM_{2.5}$ [c]	CO_2e [d]
Construction Equipment							
Asphalt Pavers	7.05	1.39	22.71	0.21	1.98	1.92	1323.47
Plate Compactors	6.83	1.86	20.50	0.21	1.98	1.92	1323.47
Concrete Pavers	10.08	2.55	22.09	0.21	1.98	1.92	1323.47
Rollers	6.83	1.86	20.50	0.21	1.72	1.67	1323.47
Scrapers	11.02	1.63	19.18	0.21	2.78	2.69	1323.47
Paving Equipment	10.14	2.34	24.27	0.21	1.98	1.92	1323.47
Signal Boards	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Trenchers	20.15	3.58	22.09	0.21	3.17	3.08	1323.47
Bore/Drill Rigs	20.28	3.27	24.27	0.21	3.17	3.08	1323.47
Excavators	11.46	1.63	23.70	0.21	3.17	3.08	1323.47
Concrete/Industrial Saws	20.28	3.27	24.27	0.21	3.17	3.08	1323.47
Cement and Mortar Mixers	10.14	2.34	24.27	0.21	1.98	1.92	1323.47
Cranes	9.26	2.93	22.71	0.21	3.17	3.08	1323.47
Graders	8.38	3.58	21.16	0.21	2.20	2.14	1323.47
Off-Highway Trucks	6.17	1.95	21.16	0.21	1.76	1.71	1323.47
Crushing/Processing Equipment	20.28	3.27	24.27	0.21	3.17	3.08	1323.47
Rough Terrain Forklifts	22.05	3.90	17.64	0.21	3.53	3.42	1323.47
Rubber Tired Dozers	6.17	1.95	22.71	0.21	1.46	1.41	1323.47
Tractors/Loaders/Backhoes	14.99	3.25	22.27	0.21	2.31	2.25	1323.47
Crawler Tractors	10.58	2.93	22.71	0.21	2.45	2.37	1323.47
Skid Steer Loaders	19.84	4.88	21.16	0.21	3.17	3.08	1323.47
Off-Highway Tractors	32.36	4.78	26.26	0.21	4.48	4.34	1323.47
Dumpers/Tenders	6.17	1.95	21.16	0.21	3.17	3.08	1323.47
Other Construction Equipment	20.28	3.27	24.27	0.21	3.17	3.08	1323.47
Industrial Equipment							
Aerial Lifts	13.36	3.64	30.86	0.21	3.53	3.42	1323.47
Forklifts	13.36	3.64	30.86	0.21	3.53	3.42	1323.47
Sweepers/Scrubbers	13.36	3.64	30.86	0.21	3.53	3.42	1323.47
Other General Equipment	13.36	3.64	30.86	0.21	3.53	3.42	1323.47
Other Material Handling Equipment	13.36	3.64	30.86	0.21	3.53	3.42	1323.47
Lawn and Garden Equipment							
Rear Engine Riding Mowers	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Lawn and Garden Tractors	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Wood Splitters	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Chippers/Stump Grinders	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Other Equipment	11.02	2.79	17.64	0.21	2.20	2.14	1323.47

3790
3791

Table 4-6. Pre-1998 Non-Road CI Engine Criteria Pollutant Emission Factors (Power Rating > 50 hp)

Equipment Description	Emission Factors (lb/1000 hp-hr)						
	CO	VOC [a]	NO_X	SO_X	PM_{10} [b]	$PM_{2.5}$ [c]	CO_2e [d]
Agricultural Equipment							
Tractors	19.71	5.32	24.71	0.21	4.52	4.38	1323.47
Sprayers	8.33	5.18	17.15	0.21	3.33	3.23	1323.47
Tillers	11.02	2.79	17.64	0.21	2.20	2.14	1323.47
Hydro Power Units	8.33	5.18	17.15	0.21	3.33	3.23	1323.47
Other Equipment	9.63	4.23	24.52	0.21	3.33	3.23	1323.47
Logging Equipment							
Skidders	11.46	1.95	24.91	0.21	3.17	3.08	1323.47
Fellers/Bunchers	11.46	1.95	24.91	0.21	3.17	3.08	1323.47
Recreational Equipment							
Specialty Vehicles/Carts	11.02	2.79	17.64	0.21	2.20	2.14	1323.47

SOURCE: *Nonroad Engine and Vehicle Emission Study – Report*, EPA 460/3-91-02, 21A-2001, November 1991.

a. Reported as hydrocarbon (HC) and converted to VOC by multiplying value by a conversion factor (1.053). This value recommended by the document *Conversion Factors for Hydrocarbon Emission Components*, U.S. Environmental Protection Agency (EPA), Office of Transportation and Air Quality, July 2010.

b. Reported as particulate matter (PM) in the source document and assumed to be equal to PM_{10}.

c. Assumed to be 97% of PM_{10} per *Exhaust and Crankshaft Emission Factors for Nonroad Engine Modeling: Compression-Ignition*, EPA 420-P-04-009, April 2004.

d. The Greenhouse Gas (GHG) emission factors calculated by summing the product of the emission factors for CO_2, CH_4, and N_2O and their respective global warming potentials (GWP). The GWP for CO_2, CH_4, and N_2O are 1, 25, and 298, respectively. Emission factors for individual GHG calculated by taking the product of the default emission factor provided in Tables C-1 and C-2 of Title 40 Code of Federal Regulations (CFR) Part 98 and the brake-specific fuel consumption (BSFC) for diesel engines provided in Table 3-1.

Table 4-7. Weight Percent Speciation of VOC Emissions for Non-Road Engines

Compound	HAP	Gasoline [a]	Diesel [b]	Natural Gas [c]			LPG [d]
				2-Stroke LB	4-Stroke LB	4-Stroke RB	
Acenaphthene	X	---	0.02%	0.00%	0.00%	---	---
Acenaphthylene	X	---	0.08%	0.00%	0.01%	---	---
Acetaldehyde	X	0.30%	11.88%	6.49%	7.00%	8.63%	0.88%
Acetylene		15.47%	---	---	---	---	---
Acrolein	X	---	1.43%	6.51%	4.31%	8.14%	---
Anthracene	X	---	0.03%	0.00%	---	---	---
Benz(a)anthracene	X	---	0.03%	0.00%	---	---	---
Benzaldehyde		0.26%	---	---	---	---	---
Benzene	X	5.83%	14.46%	1.62%	0.37%	4.89%	3.23%
Benzo(a)pyrene	X	---	0.00%	0.00%	---	---	---
Benzo(b)fluoranthene	X	---	0.00%	0.00%	0.00%	---	---
Benzo(k)fluoranthene	X	---	0.00%	0.00%	---	---	---
Benzo(g,h,i)perylene	X	---	0.01%	0.00%	0.00%	---	---
Benzo(e)pyrene		---	---	0.00%	0.00%	---	---
Biphenyl	X	---	---	0.00%	0.18%	---	---
1,3-Butadiene	X	0.99%	0.61%	0.69%	0.22%	2.05%	---
Butane		---	---	3.97%	0.45%	---	---
n-Butane		2.19%	---	---	---	---	---
1-Butene		0.40%	---	---	---	---	---
cis-2-Butene		0.22%	---	---	---	---	---
trans-2-Butene		0.28%	---	---	---	---	---
Butyr/Isobutyraldehyde		---	---	0.37%	0.09%	0.15%	0.59%
Carbon Tetrachloride	X	---	---	0.05%	0.03%	0.05%	---
Chlorobenzene		---	---	0.04%	0.03%	0.04%	---
Chloroethane	X	---	---	---	0.00%	---	---
Chloroform	X	---	---	0.04%	0.02%	0.04%	---
Chrysene	X	---	0.00%	0.00%	0.00%	---	---
Cyclohexane		---	---	0.26%	---	---	---
Cyclopentane		---	---	0.08%	0.19%	---	---
1,3-Cyclopentadiene		0.26%	---	---	---	---	---
Dibenz(a,h)anthracene	X	---	0.01%	---	---	---	---
1,1-Dichloroethane	X	---	---	0.03%	0.02%	0.03%	---
1,2-Dichloroethane	X	---	---	0.04%	0.02%	0.03%	---
1,2-Dichloropropane	X	---	---	0.04%	0.02%	0.04%	---
1,3-Dichloropropene	X	---	---	0.04%	0.02%	0.04%	---
Dicyclopentadiene		0.27%	---	---	---	---	---
1,2-Diethylbenzene		0.56%	---	---	---	---	---
1,3-Diethylbenzene		0.45%	---	---	---	---	---
2,2-Dimethylbutane		0.30%	---	---	---	---	---
2,3-Dimethylbutane		0.62%	---	---	---	---	---
trans-1,3-Dimethylcyclopentane		0.28%	---	---	---	---	---
2,3-Dimethylhexane		0.32%	---	---	---	---	---
2,4-Dimethylhexane		0.45%	---	---	---	---	---
2,5-Dimethylhexane		0.24%	---	---	---	---	---
2,3-Dimethylpentane		1.16%	---	---	---	---	---
2,4-Dimethylpentane		0.71%	---	---	---	---	---
1,2-Dimethyl-4-Ethylbenzene		0.17%	---	---	---	---	---
1,3-Dimethyl-2-Ethylbenzene		0.34%	---	---	---	---	---
1,3-Dimethyl-4-Ethylbenzene		0.20%	---	---	---	---	---
Ethylbenzene	X	2.00%	---	0.09%	0.03%	0.08%	0.29%
Ethylene		11.39%	---	---	---	---	18.53%
Ethylene Dibromide	X	---	---	0.06%	0.04%	0.07%	---
Fluoranthene	X	---	0.12%	0.00%	0.00%	---	---
Fluorene	X	---	0.45%	0.00%	0.01%	---	---
Formaldehyde	X	1.32%	18.28%	46.17%	44.24%	63.43%	23.82%
n-Heptane		0.78%	---	---	---	---	---
1-Hexene		0.20%	---	---	---	---	---
n-Hexane	X	0.45%	---	0.37%	0.93%	---	0.59%
trans-2-Hexene		0.16%	---	---	---	---	---
Indan		---	---	---	---	---	---
Indeno(1,2,3-c,d)pyrene	X	0.24%	0.01%	0.00%	---	---	---

Compound	HAP	Gasoline [a]	Diesel [b]	Natural Gas [c]			LPG [d]
				2-Stroke LB	4-Stroke LB	4-Stroke RB	
Isobutane		---	---	3.14%	---	---	---
Isobutene		2.02%	---	---	---	---	---
Isopentane		5.50%	---	---	---	---	---
Isoprene		0.32%	---	---	---	---	---
Methanol	X	0.15%	---	2.07%	2.10%	9.47%	---
2-Methyl-1-Butene		0.35%	---	---	---	---	---
2-Methyl-2-Butene		0.37%	---	---	---	---	---
Methylcyclohexane		0.24%	---	0.28%	1.03%	---	---
Methylcyclopentane		0.40%	---	---	---	---	---
1-Methylcyclopentene		0.16%	---	---	---	---	---
1-Methyl-2-Ethylbenzene		0.50%	---	---	---	---	---
1-Methyl-3-Ethylbenzene		1.52%	---	---	---	---	---
1-Methyl-4-Ethylbenzene		0.71%	---	---	---	---	---
2-Methylheptane		0.37%	---	---	---	---	---
3-Methylheptane		0.40%	---	---	---	---	---
4-Methylheptane		0.17%	---	---	---	---	---
2-Methylhexane		1.02%	---	---	---	---	---
3-Methylhexane		1.18%	---	---	---	---	---
3-Methyl-cis-3-Hexene		0.18%	---	---	---	---	---
2-Methylnaphthalene		---	---	0.02%	0.03%	---	---
3-Methyloctane		0.20%	---	---	---	---	---
2-Methyl-2-Pentene		0.18%	---	---	---	---	---
2-Methylpentane		1.73%	---	---	---	---	---
3-Methylpentane		0.99%	---	---	---	---	---
1-Methyl-3-Propylbenzene		0.26%	---	---	---	---	---
Methyl t-butyl ether	X	0.30%	---	---	---	---	---
Naphthalene	X	0.35%	1.31%	0.08%	0.06%	0.30%	---
n-Nonane		---	---	0.03%	0.09%	---	---
1-Nonene		0.61%	---	---	---	---	---
n-Octane		0.30%	---	0.06%	0.29%	---	---
1-Octene		0.22%	---	---	---	---	---
n-Pentane		0.71%	---	1.28%	2.18%	---	---
1-Pentene		0.27%	---	---	---	---	---
cis-2-Pentene		0.21%	---	---	---	---	---
trans-2-Pentene		0.34%	---	---	---	---	---
Perylene		---	---	0.00%	---	---	---
Phenanthrene	X	---	0.46%	0.00%	0.01%	---	---
Phenol	X	---	---	0.03%	0.02%	---	---
1,2-Propadiene		0.29%	---	---	---	---	---
Propane		---	---	24.01%	35.11%	---	---
n-Propylbenzene		0.38%	---	---	---	---	---
Propylene		4.72%	39.98%	---	---	---	49.71%
1-Propyne		0.48%	---	---	---	---	---
Pyrene	X	---	0.07%	0.00%	0.00%	---	---
Styrene	X	---	---	0.05%	0.02%	0.04%	---
Tetrachloroethane		---	---	---	0.00%	---	---
1,1,2,2,-Tetrachloroethane	X	---	---	0.06%	0.03%	0.08%	---
1,2,3,5-Tetramethylbenzene		0.22%	---	---	---	---	---
Tolualdehyde		0.16%	---	---	---	---	---
Toluene	X	8.21%	6.34%	0.81%	0.34%	1.73%	1.18%
1,1,2-Trichloroethane	X	---	---	0.04%	0.03%	0.05%	---
1,2,3-Trimethylbenzene		0.40%	---	0.03%	0.02%	---	---
1,2,4-Trimethylbenzene		2.18%	---	0.09%	0.01%	---	---
1,3,5-Trimethylbenzene		0.77%	---	0.01%	0.03%	---	---
2,2,5-Trimethylhexane		0.30%	---	---	---	---	---
2,2,4-Trimethylpentane	X	2.37%	---	0.71%	0.21%	---	---
2,3,4-Trimethylpentane		0.52%	---	---	---	---	---
Vinyl Chloride	X	---	---	0.02%	0.01%	0.02%	---
Vinylacetylene		0.23%	---	---	---	---	---
o-Vinyltoluene		0.26%	---	---	---	---	---
Xylenes	X	7.47%	4.42%	0.22%	0.15%	0.60%	1.18%

a. SOURCE: Emission factors used to calculate weight percent taken from EPA's SPECIATE profile #4738.
b. SOURCE: Emission factors used to calculate weight percent taken from Section 3.3 of AP-42.
c. SOURCE: Emission factors used to calculate weight percent taken from Section 3.2 of AP-42.
d. SOURCE: Emission factors used to calculate weight percent taken from Mojave Desert AQMD.
"X" Indicates the compound is a HAP.
"---" Indicates No Data Available.

4.6 References

40 CFR 98, "Title 40-Protection of the Environment, Chapter I-Environmental Protection Agency, Subchapter C-Air Programs, Part 98 Subpart C Table C-1-Default CO2 Emission Factors and High Heat Values for Various Types of Fuel," U.S. Environmental Protection Agency

CCAR 2007, "California Climate Action Registry General Reporting Protocol Version 2.2," California Climate Action Registry (CCAR), 2007

DLA 2006, "Petroleum Quality Information System Fuels Data (2005)," Defense Logistics Agency (DLA), Defense Energy Support Center, Technology and Standardization Division, 2006

Eastern Research Group, Inc. 2000, "Documentation for the 1996 Base Year National Toxics Inventory for Nonroad Vehicle and Equipment Mobile Sources," June 2000

Environmental Security Technology Certification Program 2006, "Effect of Biodiesel on Diesel Engine Nitrogen Oxide and Other Regulated Emissions, Project Number WP-0308," May 2006

MDAQMD "Mojave Desert Air Quality Management District"

USAF 2002, "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (IERA/RSEQ, IERA-RS-BR-SR-2001-0010)," United States Air Force, January 2002 (Revised December 2003)

USEPA 2004a, "Clean Air Nonroad Diesel Rule," United States Environmental Agency, June 2004

USEPA "SPECIATE profile #4738." United States Environmental Protection Agency

USEPA 1991, "Nonroad Engine and Vehicle Emission Study-Report," United States Environmental Protection Agency, November 1991

USEPA 1996, "Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources (AP-42), Section 3.2: Natural Gas-fired Reciprocating Engines," U.S. Environmental Protection Agency, August 2000

USEPA 1996, "Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources (AP-42), Section 3.3 Gasoline and Industrial Engines," U.S. Environmental Protection Agency, October 1996

USEPA 1999, "Tier 2 Vehicle and Gasoline Sulfur Program," United States Environmental Protection Agency, December 1999

USEPA 2001, "Clean Air Highway Diesel Rule," U.S. Environmental Protection Agency, January 2001

USEPA 2002, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions (EPA 420-P-02-001), United States Environmental Protection Agency, October 2002

USEPA 2004b, "Exhaust Emission Factors for Nonroad Engine Modeling: Compression-Ignition (EPA 420-P-04-009, NR-009c), United States Environmental Protection Agency, April 2004

USEPA 2004c, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling (EPA 420-P-005, NR-005c), United States Environmental Protection Agency, 4 April 2004

USEPA 2005, "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition (EPA 420-R-019, NR-010e)," U.S. Environmental Protection Agency, December 2005

USEPA 2010, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling: Compression-Ignition (EPA 420-R-10-018, NR-009d)," United States Environmental Protection Agency, July 2010

World LP Gas Association 2002, "Emissions, Test Methods, Standards and Technology," 2002

5.0 ON-ROAD VEHICLES (VEHE)

***Air Force policy considers the dispensing of fuel into on-road vehicles as a mobile source of emissions. However, if the regulator insists this category be included as a stationary source, subtract those emissions from the Mobile AEI and add them to the Stationary AEI to avoid duplicate reporting. This is accomplished by manually calculating emissions generated from on-road vehicle refueling using the procedures given in the "Fuel Dispensing" section of this document, then subtracting those values from the emissions generated by on-road vehicles described in this section. ***

5.1 Introduction

On-road vehicles encompass the full range of passenger cars, light duty trucks, heavy duty trucks, buses, and motorcycles that are specifically designed to operate on highways and other road systems. On-road vehicles in use on USAF installations are classified either as Government Owned Vehicles (GOVs) or Privately Owned Vehicles (POVs). GOVs include all on-road vehicles that are owned or leased and operated by government organizations on the base (e.g., Air Force, Guard, Reserve, etc.). Such vehicles are typically referred to as "fleet vehicles" and range from small passenger cars to large vehicles such as refueling or fire trucks. This classification also includes Tactical Vehicles. Tactical vehicles are defined as any motor vehicle designed to military specifications to meet direct transportation support of combat, tactical or relief operations, or for training of personnel for such purposes. POVs are those on-road vehicles that travel on a USAF installation, but are owned or leased and operated by base employees and visitors. Both GOVs and POVs typically operate on conventional gasoline and diesel motor fuels, but may also operate on alternative, non-petroleum-based fuels.

The emissions of concern from the operation of on-road vehicles include the criteria pollutants: NO_X, VOC, CO, SO_2, $PM_{2.5}$, PM_{10}, and GHGs as well as HAPs. HAPs include: 1,3-butadiene., benzene, acetaldehyde, formaldehyde, acrolein, and methyl tert-butyl ether (MTBE). Some of these direct pollutant emissions also participate in atmospheric reactions that contribute to the formation of ground level ozone and fine PM pollution. Factors which impact the volume of pollutants emitted include the vehicle make and model, the vehicle miles traveled (VMT), the average operating speed, vehicle age, climate, altitude, fuel type and quality, and maintenance procedures. To control vehicle emissions, the EPA has adopted an integrated approach to controlling on-road vehicle emissions. This approach has resulted in the establishment of regulatory standards that consider changes in vehicle and engine design, advanced emission controls, and the mandated use of reformulated and cleaner burning fuels.

Emissions from the operation of on-road vehicles are designated as exhaust, evaporative, or fugitive in nature. Exhaust emissions result from the combustion (sometimes incomplete) of the

motor fuel while evaporative emissions result from the volatilization of the fuel in engine components during the different stages of a vehicle's operating cycle. Additionally, fugitive particulate emissions, in the form of road dust, brake wear dust, and tire wear dust, can be attributed to the operation of on-road vehicles.

The EPA is currently proposing to regulate greenhouse gases (GHGs) for both mobile and stationary sources. As a matter of USAF policy, GHG emissions are to be reported as part of the mobile AEI. Specifically, CO_2, N_2O and CH_4 emissions should be estimated for all mobile sources when EFs are available. Since CO_2, N_2O and CH_4 EFs are attainable for on-road vehicles, emissions should be estimated as part of a mobile source AEI. Additionally, although not currently regulated under the CAA, many regulatory agencies may request installations to include GHG emissions from motor vehicles in mobile source AEIs. Specific requests to calculate and provide CO_2 and/or N_2O and CH_4 emissions data to regulatory agencies as part of this process should be reported through the appropriate Air Force Civil Engineer Center (AFCEC) channels and coordinated through the chain-of-command. Such coordination should be accomplished prior to responding to the request to ensure a consistent USAF response.

Since 1978, the EPA has used computer models to estimate emissions from cars, trucks, and other mobile sources. The EPA's initial on-road vehicle emissions modeling software, known as the MOBILE model, was expanded many times over the years to incorporate new data. The updates included new data on vehicle emissions and new vehicle emission standards, and better addressed new policy questions, while keeping the basic structure of the model. MOBILE uses average gram per mile emission rates and a series of correction factors to estimate emissions over a wide range of driving conditions. MOBILE6.2, finalized in 2004, was the EPA's official model for highway vehicle emissions. Several analysts have critiqued the MOBILE series of models and suggested that the EPA develop a modeling "toolkit" that would better serve the range of users for highway vehicle modeling, including consistent modeling at the aggregate scale, mesoscale, and microscale analyses.

In response to these and other concerns, the EPA developed the Motor Vehicle Emissions Simulator (MOVES) model. MOVES incorporates extensive new data and advanced algorithms to estimate highway vehicle emissions of GHGs, criteria pollutants, and selected air toxics at the national, regional, and project levels. In September of 2023, the EPA published an announcement in the Federal Register approving the newest model, MOVES4, for official use (outside of California). MOVES4 includes updated vehicle population data, fuel supply, travel activity, and emission rates and incorporates the impacts of the EPA Heavy-Duty low NOx rule for model years 2027 and later and the light-duty greenhouse gas rule for model years 2023 and later. MOVES4 is used for EPA internal policy analysis and is required for use (outside of California) in the evaluation of State Implementation Plans (SIPs) and transportation conformity determinations. On the official EPA website, use of other models, such as the MOBILE model

and previous versions of MOVES, is being discouraged as they contain outdated or otherwise inaccurate data. The emission factors derived in this guide were generated using the MOVES4 model.

Vehicle emissions within the state of California are not calculated using MOVES software but instead use a similar, California-developed calculation model known as the EMission FACtor (EMFAC) model. On January 15, 2021, California released the latest EMFAC Model, EMFAC2021 and an update was released in April 2022. The EMFAC2021 model was used to derive county emission factors in this guide.

The EPA has historically classified on-road vehicles into eight broad categories based on the motor fuel type and Gross Vehicle Weight (GVW). MOVES was designed to reflect the general fleet distribution or fleet characterization (i.e., fractional vehicle category distribution by year) for a specific location. MOVES can also estimate emission rates (e.g., grams/mile, grams/vehicle) or accept input VMT and vehicle populations to generate total emissions for any year from 1990 and 1999-2050. **The MOVES model incorporates emissions from on-road vehicle refueling. Therefore, these emissions are not addressed in the "Fuel Dispensing" section of this document since they are already accounted for in the EFs presented in this section.**

5.1.1 Vehicle Categories

The 28 vehicle *categories* from MOVES have been grouped into seven major aggregate categories based on vehicle type and Gross Vehicle Weight Rating (GVWR). Table 5-1 provides the seven major aggregate categories based upon available MOBILE6 EF outputs and readily identifiable general vehicle groupings. The seven aggregate vehicle categories are:

- ***Light-Duty Gasoline Vehicles (LDGV)*** – All gasoline-powered passenger cars
- ***Light-Duty Diesel Vehicles (LDDV)*** – All diesel-powered passenger cars
- ***Light-Duty Gasoline Trucks (LDGT)*** – All smaller gasoline-powered trucks (0 to 8,500 lbs. GVWR)
- ***Light-Duty Diesel Trucks (LDDT)*** – All smaller diesel-powered trucks (0 to 8,500 lbs. GVWR)
- ***Heavy-Duty Gasoline Vehicles (HDGV)*** – All larger gasoline-powered vehicles (8,501 lbs. to >60,000 lbs. GVWR)
- ***Heavy-Duty Diesel Vehicles (HDDV)*** – All larger diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)
- ***Motorcycles (MC)*** – All motorcycles (assumed to be gasoline-powered)

5.1.2 Vehicle Fleet Characterization

Based upon a review of recent USAF mobile source emission inventories, the vehicle categories that are most representative of the types of GOVs and POVs expected to be encountered on a typical USAF installation have been identified. The seven Air Force vehicle categories provide the most readily identifiable and discernible vehicle classes for vehicle mix identification and characterization. It is recognized that some vehicles encountered may not fit within the specific weight parameters of the categories chosen. In such instances, personnel conducting the AEI should use professional judgment to assign the vehicles to the listed category which most closely approximates the vehicle(s) in question. This approximation should be based on the fuel type and vehicle weight. Table 5-2 provides a breakdown of the fleet characterization for the typical POV and GOV vehicle mix at a USAF installation. **The vehicle mix provided in this table is to be used for estimating vehicle emissions unless specific vehicle mix data is available from a recent traffic study.**

5.1.3 Tactical Vehicles

Tactical vehicles are defined as any motor vehicle designed to military specifications to meet direct transportation support of combat, tactical or relief operations, or for training of personnel for such purposes. This also includes commercially designed motor vehicles modified to military specifications. Tactical vehicles are a subset of GOVs, and Table 5-3 provides vehicle mix percentages for Tactical Vehicles as well as well as Non-Tactical Vehicles out of the total GOV vehicle mix. This supplemental information is provided if the need to calculate emissions specific to tactical or non-tactical vehicles arises.

4003 **Table 5-1. Air Force On-Road Vehicle Categories**

CATEGORY		VEHICLE CLASS DECRIPTION
Air Force	MOVES	
Gas/Diesel		
LDGV	LDGV	Light-Duty Gasoline Vehicles (Passenger Cars)
LDDV	LDDV	Light-Duty Diesel Vehicles (Passenger Cars)
LDGT	LDGT1	Light-Duty Gasoline Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)
	LDGT2	Light-Duty Gasoline Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)
	LDGT3	Light-Duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)
	LDGT4	Light-Duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR, greater than 5,751 lbs. ALVW)
LDDT	LDDT1/2	Light-Duty Diesel Trucks 1 and 2 (0-6,000 lbs. GVWR)
	LDDT3/4	Light-Duty Diesel Trucks 3 and 4 (6,001-8,500 lbs. GVWR)
HDGV	HDGV2b	Class 2b Heavy-Duty Gasoline Vehicles (8,501-10,000 lbs. GVWR)
	HDGV3	Class 3 Heavy-Duty Gasoline Vehicles (10,001-14,000 lbs. GVWR)
	HDGV4	Class 4 Heavy-Duty Gasoline Vehicles (14,001-16,000 lbs. GVWR)
	HDGV5	Class 5 Heavy-Duty Gasoline Vehicles (16,001-19,500 lbs. GVWR)
	HDGV6	Class 6 Heavy-Duty Gasoline Vehicles (19,501-26,000 lbs. GVWR)
	HDGV7	Class 7 Heavy-Duty Gasoline Vehicles (26,001-33,000 lbs. GVWR)
	HDGV8a	Class 8a Heavy-Duty Gasoline Vehicles (33,001-60,000 lbs. GVWR)
	HDGV8b	Class 8b Heavy-Duty Gasoline Vehicles (>60,000 lbs. GVWR)
	HDGB	Gasoline Buses (School, Transit and Urban)
HDDV	HDDV2b	Class 2b Heavy-Duty Diesel Vehicles (8,501-10,000 lbs. GVWR)
	HDDV3	Class 3 Heavy-Duty Diesel Vehicles (10,001-14,000 lbs. GVWR)
	HDDV4	Class 4 Heavy-Duty Diesel Vehicles (14,001-16,000 lbs. GVWR)
	HDDV5	Class 5 Heavy-Duty Diesel Vehicles (16,001-19,500 lbs. GVWR)
	HDDV6	Class 6 Heavy-Duty Diesel Vehicles (19,501-26,000 lbs. GVWR)
	HDDV7	Class 7 Heavy-Duty Diesel Vehicles (26,001-33,000 lbs. GVWR)
	HDDV8a	Class 8a Heavy-Duty Diesel Vehicles (33,001-60,000 lbs. GVWR)
	HDDV8b	Class 8b Heavy-Duty Diesel Vehicles (>60,000 lbs. GVWR)
	HDDBT	Diesel Transit and Urban Buses
	HDDBS	Diesel School Buses
MC	MC	Motorcycles (Gasoline)
HYBRID		
LDGV (H)	---	---
LDGT (H)	---	---
ELECTRIC		
LDV (EV)	---	---
LDT (EV)	---	---

4004
4005

4006 **Table 5-2. Typical Air Force POV & GOV Mix**

CATEGORY		2012 to 2020 Avg. National Vehicle Mix (%)		POV Vehicle Mix (%)[a]	GOV Vehicle Mix (%)[b]
Air Force	MOVES				
Gas/Diesel					
LDGV	LDGV	34.86	34.86	41.00	9.48
LDDV	LDDV	0.03	0.03	0.52	0.59
LDGT	LDGT1	9.57	56.00	46.40	46.57
	LDGT2	31.86			
	LDGT3	9.98			
	LDGT4	4.59			
LDDT	LDDT1/2	0.00	0.19	0.66	16.43
	LDDT3/4	0.19			
HDGV	HDGV2a	2.88	3.46	3.39	4.60
	HDGV2b				
	HDGV3	0.10			
	HDGV4	0.03			
	HDGV5	0.11			
	HDGV6	0.24			
	HDGV7	0.10			
	HDGV8a	0.00			
	HDGV8b	0.00			
	HDGB	0.00			
HDDV	HDDV2b	0.72	3.70	2.51	21.22
	HDDV3	0.22			
	HDDV4	0.21			
	HDDV5	0.10			
	HDDV6	0.41			
	HDDV7	0.59			
	HDDV8a	0.35			
	HDDV8b	0.82			
	HDDBT	0.03			
	HDDBS	0.25			
MC	MC	1.76	1.76	1.88	0.00
HYBRID					
LDGV (H)	---	---	---	0.09	0.85
LDGT (H)	---	---	---	0.09	0.11
ELECTRIC					
LDV (EV)	---	---	---	2.14	0.08
LDT (EV)		---	---	1.32	0.08

4007
4008 a. SOURCE: POV vehicle mix based on available Employee-Certification and Reporting
4009 System (ECARS) data collected on 2/2024.
4010 b. SOURCE: GOV vehicle mix based on information provided by the Air Force Vehicle and
4011 Equipment Management Office (VEMSO).
4012 "---" Indicates No Data Available

4013 **Table 5-3. GOV Tactical and Non-Tactical Vehicle Mix**

CATEGORY		GOV Tactical Vehicle Mix (%)	GOV Non-Tactical Vehicle Mix (%)
Air Force	MOVES		
Gas/Diesel			
LDGV	LDGV	0.00	9.48
LDDV	LDDV	0.00	0.59
LDGT	LDGT1	1.34	46.57
	LDGT2		
	LDGT3		
	LDGT4		
LDDT	LDDT1/2	5.24	16.43
	LDDT3/4		
HDGV	HDGV2a	3.03	4.60
	HDGV2b		
	HDGV3		
	HDGV4		
	HDGV5		
	HDGV6		
	HDGV7		
	HDGV8a		
	HDGV8b		
	HDGB		
HDDV	HDDV2b	90.39	21.22
	HDDV3		
	HDDV4		
	HDDV5		
	HDDV6		
	HDDV7		
	HDDV8a		
	HDDV8b		
	HDDBT		
	HDDBS		
MC	MC	0.00	0.00
HYBRID			
LDGV (H)	---	0.00	0.85
LDGT (H)	---	0.00	0.11
ELECTRIC			
LDV (EV)	---	0.00	0.08
LDT (EV)	---	0.00	0.08

4014
4015 SOURCE: GOV vehicle mix based on information provided by the Air Force Vehicle and Equipment
4016 Management Office (VEMSO).

5.2 Emission Factors

Emissions from on-road vehicles include exhaust emissions, which occur both when the vehicle is in motion and while idling, as well as fugitive particulate emissions from road dust. The methodology for estimating emissions from each of these contributing sources is described in the following sections.

5.2.1 Vehicle Exhaust Emissions

The operation of on-road vehicles results in the generation of vehicle exhaust, which emits criteria pollutants, HAPs, and GHGs. Estimating emissions from vehicle exhaust is made more challenging because the number of pollutants emitted is different for a vehicle in normal operation versus when a vehicle is idling. The emissions total from vehicle exhaust is quantified by taking the sum of both the idling and normal operating exhaust emissions. **MOVES accounts for idling in proportion to normal driving, therefore calculation of idling emissions is not required for an AEI.** Particulate emissions estimation is made further complicated by the fact that particulate is emitted from vehicle exhaust from both idle and normal vehicle use, as well as from the suspension of road dust. The EFs for each contributing source are described in more detail below.

5.2.1.1 Vehicle Exhaust Emissions– Normal Vehicle Operation

EFs for the Air Force vehicle categories were obtained directly from MOVES4. The MOVES4 model was used to generate estimations of on-road vehicle emissions for each state (except California), the District of Columbia, and relevant US territories. This model requires various inputs such as population of personnel and VMT by vehicle type, age distribution and average speed distribution, ambient meteorological conditions, and elevation among other inputs. The "default" input database for MOVES4 was used for all calculations and derivations. The MOVES4 model was run for each state for calendar years 2024 through 2028 using the national estimates contained within the default database for all vehicle types listed in Table 5-1. The vehicle types selected for the run were all gasoline and diesel vehicles available in the MOVES database. The vehicle model years used for each run include the 30-year span from the calendar year of the run to 30 years prior. The output emission rates were averaged using an activity-(mileage) weighted average over all vehicle model years for each calendar year to estimate a representative emission factor for each pollutant for each vehicle type. The resultant EFs are provided in a gram/mile format and are presented in Table 5-19 through Table 5-23 for all states except California. The State of California uses the EMFAC2021 Model to calculate vehicle emissions. This model calculates emissions in a manner similar to MOVES in that it calculates emissions for all motor vehicles (across model years) in the state using data stored in a default database structured similarly to the MOVES database. EMFAC vehicle emissions data provided in this guide is on a county-basis for each county in California and is presented in Table 5-39

through Table 5-43. Vehicle-specific emission factors for California vehicle types are also included.

Additionally, there are composite EF tables included in this section. These values account for emissions reductions resulting in the use of alternative fuels and are calculated using Air Force-specific vehicle mix data (refer to Section 5.2.1.3 for more information on alternative fuels). The composite EFs are provided in Table 5-9 through Table 5-18 and are presented chronologically by calendar year. Furthermore, since the calculation of composite EFs account for Air Force vehicle mix data, the tables are further subdivided in to POV and GOV categories. The composite EFs for California were derived from EMFAC and are provided in Table 5-29 through Table 5-38. The model inputs and default values used to calculate EFs in MOVES and EMFAC are provided in Table 5-4 and Table 5-5, respectively.

Table 5-4. MOVES4 Model Inputs and Default Values

Model Input	Input Value
Scale	National
Calculation Type	Inventory
Model Years	30-year range from calendar year back
Years	2024-2028
Months	All
Days	Weekend and Weekdays
Hours	All
Geographic Bounds	State/Territory Specific
Fuels	Diesel Fuel and Gasoline
Source Use Types	All
Road Types	All
Pollutants and Processes	NO_x, SO_x, CO, VOC, PM_{10}, $PM_{2.5}$, CO_2, NH_3, and all required additional processes
Activity	Distance Traveled, Populations, Starts

Table 5-5. EMFAC2021 Model Inputs and Default Values

Model Input	Input Value
Run Mode	Emissions
Run Type	Default Activity
Area	County Specific
Years	2024-2028
Season	Annual
Aggregation Level	Day
Vehicle Class	ALL
Model Year	30-year range from calendar year back
Fuel	By Fuel
Speed	Aggregated
Pollutants and Processes	NO_x, SO_x, CO, ROG, PM_{10}, $PM_{2.5}$, CO_2, CH_4
Activities	VMT, Population

There is no universally accepted set of EFs for installations located outside of the continental United States (OCONUS). Additionally, determining the vehicle mix or classifying vehicles may be more difficult in a foreign country. Calculating emissions for on-road vehicles at OCONUS facilities can be approximated by calculating the average of all state-specific composite EFs. The EFs for vehicle emissions at OCONUS installations are provided in Table 5-49 and Table 5-50 and are to be used with the same methodology as calculating on-road vehicle emissions within the United States.

5.2.1.2 Vehicle Exhaust Emissions – Idling

An idling vehicle wastes fuel, increases the cost of maintenance, and creates air pollution. Several states have adopted anti-idling restrictions with some including these restrictions in their SIPs. EFs for emissions from idling vehicles were developed and are provided in a gram/hour format. An idling vehicle is not in motion; therefore, emissions may not be calculated on miles driven, but rather on the time spent in idle. For this reason, the total amount of time that a vehicle spends in idle must be known or closely approximated. **Note that MOVES EFs already account for vehicle idling in proportion to normal driving. For this reason, the EFs provided in this chapter are presented for calculating theoretical emissions for NEPA, or for intersection modeling.** Idling EFs for each vehicle category are provided in Table 5-6.

Table 5-6. Idling Emission Factors for On-Road Vehicles

Vehicle Category	Emission Factors (g/hr)				
	CO	NO_X	VOC	PM_{10} [a]	$PM_{2.5}$ [b]
LDGV (Passenger Cars)	71.225	3.515	2.683	---	---
LDGT (0-8,500 lb GVWR)	72.725	4.065	4.043	---	---
HDGV (>8,500 lb GVWR)	151.900	5.330	6.495	---	---
LDDV (Passenger Cars)	7.018	2.690	1.373	---	---
LDDT (Light-Duty Trucks)	5.853	3.705	2.720	---	---
HDDV (>8,500 lb GVWR)	25.628	33.763	3.455	1.196	1.100
MC (Motorcycles)	301.075	1.625	19.153	---	---

SOURCE: *Idling Vehicle Emissions for Passenger Cars, Light-Duty Trucks, and Heavy-Duty Trucks*, United States Environmental Protection Agency, Office of Transportation and Air Quality, EPA420-F-08-025, October 2008.

a. PM_{10} is an average of HDDV particulate emissions.

b. $PM_{2.5}$ value is assumed to be 92% of the PM_{10} value per *Air Emissions Factor Guide to Air Force Mobile Sources*, December 2009.

"---" Indicates No Data Available

5.2.1.3 Alternative Fuel Emission Reduction Factors

Progressively stringent requirements resulting from the EPA, Presidential Executive Orders, DoD, and Air Force pollution prevention and energy conservation initiatives will result in an increasing number of GOVs and POVs powered by alternative fuels such as E85, CNG, or B20, and advanced hybrid electric vehicles (HEVs). Regardless of fuel type, all vehicles operating on alternative fuels are currently required to meet existing EPA emission standards established for gasoline and/or diesel-powered vehicles. However, some fuels offer potential emission reductions beyond those standards.

Relative to conventional gasoline, the higher-octane value and oxygen content of E85 fuel should lead to reduced vehicle emissions. The EPA's Office of Transportation Air Quality (OTAQ) notes that while potential reductions will vary with engine design, E85 fuel should lead to reductions in VOCs, CO, PM, and NO_X relative to conventional gasoline (USEPA 2006a). The case with HAP emissions is not as clear since some data indicates a reduction in benzene and fewer total toxics, but an increase in ethanol and acetaldehyde emissions (USEPA 2006a). Adding to the complexity, some studies have shown that with the use of a catalytic converter, there is virtually no difference in exhaust emissions from on-road vehicles powered by gasoline. Due to these inconsistencies and the lack of clear data trends, **the application of E85 emission reduction factors is not recommended.**

CNG is recognized as one of the cleanest burning alternative fuels available and offers several advantages over gasoline (USDOE 2002). There is limited data for emissions reductions that CNG offers over conventional gasoline, especially since emissions will vary with engine design and performance. However, the EPA suggests that, relative to conventional gasoline-powered

vehicle applications, emissions from CNG-powered vehicles are estimated to be substantially lower for CO, PM, NO_X, and non-methane hydrocarbons.

There have been a few studies on the impacts of B20 fuel on vehicle emissions. In October 2002, the EPA issued a draft technical report on biodiesel emissions (USEPA 2002b). The EPA used the results from 39 studies to compare the difference in emissions between vehicles using B20 versus diesel fuel. Relative to low sulfur diesel (sulfur content of 500 ppm), B20 use resulted in notable reductions of NO_X, PM, HC, and CO emissions. Since the publication of the study, Ultra-Low Sulfur Diesel (ULSD) regulations that limit the sulfur content of on-highway diesel fuel to 15 ppm have been enacted and are in place across the country. Another study conducted under the auspices of the DoD Environmental Security Technology Certification Program (ESTCP) sought to measure the impact of B20 on emissions from engines used in on-road and portable power generation applications (DoD 2006). Whereas the EPA study used a B20/low sulfur diesel blend, the ESTCP study used a B20 biodiesel/ULSD blend to reflect the fact that conventional low sulfur diesel is no longer available for use in on-road vehicles. **The ESTCP study concluded that there were no statistically significant differences in criteria pollutant emissions between the B20 biodiesel blended with ULSD and ULSD by itself.** Likewise, no consistent trend was observed regarding HAP emissions.

Hybrid Electric Vehicles (HEVs) produce fewer criteria pollutant, HAP, and CO_2 emissions than comparable dedicated gasoline-powered vehicles. This is because HEVs utilize an electric motor in conjunction with a traditional, and often smaller, internal combustion engine. The electric motor decreases the frequency in which the combustion engine is used, which reduces fuel consumption and, therefore, emissions. Overall emissions will vary depending on several factors, including the vehicle's electrical storage capacity and how long it can operate in "electric-only" mode. Additional factors include how advanced the engine controls are, which emission standards the vehicles have been produced to meet, vehicle size, and model year. For these reasons, the emission profile of HEVs must be judged individually based on the miles traveled under each power mode, complicating attempts to estimate vehicle emission reductions. To estimate the potential emission reduction benefits from the use of HEVs, two sources were utilized: Vehicle family application and emission certification data contained in the EPA OTAQ Certification and Fuel Economy Information System, and the California Air Resources Board (CARB) On-Road Vehicle and Engine Certification website. The assessment of representative certification data indicated NO_X, CO, HC (assumed to be equal to VOCs), and CO_2 were substantially reduced on average (U.S. Environmental Protection Agency, Office of Transportation Air Quality, Certification and Fuel Economy Information System).

Based upon this data, reduction factors for alternative fuels were calculated for on-road vehicles and are provided in Table 5-7. To estimate potential emission reductions from the use of these alternative fuels and advanced vehicle technologies, calculate vehicle emissions using the

MOVES4 gasoline or diesel fuel emission factors provided, and apply an appropriate percent impact based upon the values listed in the table.

Table 5-7. Alternative Fuel Emission Reduction Factors (FERFs)

Alternative Fuel (Original fuel type)	Vehicle Category	Fuel Reduction Emission Factor (%)					
		CO	NO_X	VOC [a]	PM_{10}	$PM_{2.5}$	CO_2
CNG (Gasoline) [b]	LDGV, LDGT, HDGV	90	35	50	90 [c]	90 [c]	25
B20 (Diesel) [d]	LDDV, LDDT, HDDV	0	0	0	0	0	0
HEVs (Gasoline) [e]	LDGV, LDGT	50	75	35	---	---	30

a. Source provided emission factors (EFs) for hydrocarbons (HC) or non-methane HCs which are assumed to be equivalent to VOC emissions reduction.
b. SOURCE*: Clean Alternative Fuels: Compressed Natural Gas* (EPA 420-F-00-033), U.S. Environmental Protection Agency, March 2002.
c. SOURCE: Arkansas Gas Association, Natural Gas Vehicles
d. Based on EFs using a default of 15 parts per million (ppm) sulfur for diesel, and results of the Department of Defense Environmental Security Technology Certification Program study, Effect of Biodiesel on Diesel Engine Nitrogen Oxide and Other Regulated Emissions, Project number WP-0308, May 2006, indicating no statistically significant difference in B20/Ultra Low Sulfur Diesel (ULSD) vs. ULSD emissions.
e. EFs represent the difference in CO_2 emissions associated with the combustion of one gallon of gasoline equivalent of Compressed Natural Gas (CNG). Source: California Climate Action Registry, General Reporting Protocol Version 2.2, Table C-3, March 2007.

"---" Indicates No Data Available.

5.2.2 Fugitive Particulate Matter (PM) Emissions

Though roads are themselves stationary, the generation of airborne road dust is the result of the turbulent wake created by on-road vehicles, which are mobile sources. Therefore, road dust emissions are provided in this section. **Note that this section does not describe emissions from asphalt paving since those operations are considered transitory and are addressed in the *Air Emissions Guide for Air Force Transitory Sources*.** Since fugitive PM emissions are the result of road dust suspended as the vehicle moves across a road surface, the extent of the emitted PM is dependent on whether the road surface is paved or unpaved. These surfaces are subjected to strong air currents from the turbulent wake that follows behind a vehicle as it passes. The currents disturb the loose material pulverized under the weight of the vehicle and PM is cast into the air. PM emissions will fluctuate for several reasons, including construction activities in the area, road degradation due to vehicular traffic, and the application of granular material for snow and ice control. Typically, the most important factors regarding road PM emissions are the number and weight of the vehicles that travel the road, and the VMT. Paved and unpaved road EFs are already derived and may be found in Table 5-8.

Table 5-8. Fugitive PM Emission Factors

	POV		GOV	
	PM_{10} (g/mi)	**$PM_{2.5}$ (g/mi)**	**PM_{10} (g/mi)**	**$PM_{2.5}$ (g/mi)**
Paved Road	0.058	0.014	0.069	0.017
Unpaved Road	466.206	46.621	505.981	50.598

The EFs for suspension of loose material on paved and unpaved road surfaces due to vehicle travel were derived from the following empirical equations from AP-42 Chapter 13.2.1 (Jan 2011) and AP-42 Chapter 13.2.2 (Nov 2006):

$$EF(Pol)_P = k(Pol) \times (sL)^{0.91} \times W^{1.02}$$ AP-42 Chapter 13.2.1.3

Where,

$EF(Pol)_P$ = Particulate emission factor for **paved** roads (g/mi)

k(Pol) = Particle size multiplier (g/mi). **$PM_{2.5}$ = 0.25 and PM_{10} = 1.00**

sL = Road surface silt loading (g/m^2). **AP-42 Chapter 13.2.1 recommends a default value of 0.015 for limited access roadways (such as Air Force roads)**

W = Average weight of the vehicles traveling the road (tons). **POVs = 2.581 and GOVs = 3.096**

$$EF(Pol)_U = k(Pol) \times \left(\frac{s}{12}\right)^a \times \left(\frac{W}{3}\right)^b \times 453.6$$ AP-42 Chapter 13.2.2.2

Where,

$EF(Pol)_U$ = Particulate emission factor for **unpaved** roads (g/mi)

k(Pol) = Particle size multiplier (lb/mi). **$PM_{2.5}$ = 0.15 and PM_{10} = 1.5**

s = Surface material silt content (%). **AP-42 Chapter 13.2.2 value for construction site road value of 8.5**

a, b = Empirical constants for industrial roads from AP-42 Table 13.2.2-2. **a=0.9 and b=0.45**

453.6 = Factor converting lbs to grams (g/lb)

***Note:** The equation above calls for the average weight of all vehicles traveling the road and is **not** intended to be used to calculate a separate EF for each vehicle weight class. Rather, one EF should be calculated to represent the "fleet" average weight of all vehicles.

5.2.2.1 Corrected Emission Factors Accounting for Precipitation

Average fugitive PM emissions are inversely proportional to the frequency of measurable precipitation (>0.01 inch). The total fugitive PM emissions are calculated using the appropriate EF listed above, the total vehicle miles traveled, and a precipitation correction factor. When accounting for precipitation, the fugitive PM EFs must be corrected. The corrected EFs for both paved ($EF(Pol)_{CP}$) and unpaved ($EF(Pol)_{CU}$) roads are calculated as follows:

$$EF(Pol)_{CP} = EF(Pol)_{P} \times \left(1 - \frac{P}{4N}\right)$$

Equation 5-1

$$EF(Pol)_{CU} = EF(Pol)_{U} \times \left(1 - \frac{P}{N}\right)$$

Equation 5-2

Where,

$EF(Pol)_{CP/CU}$ = Corrected emission factor for paved or unpaved roads (g/mi)

P = Number of days in the inventory period in which at least 0.01 inches of precipitation was measured (days). See Figure 5-1 to determine this value based on the installation's geographic location.

N = Number of days in the inventory period (days). 1 year = 365 days

***Note** – The paved road precipitation factor differs from the unpaved precipitation factor since it incorporates a factor of 4 in the denominator to account for the fact that paved roads dry more quickly than unpaved roads.

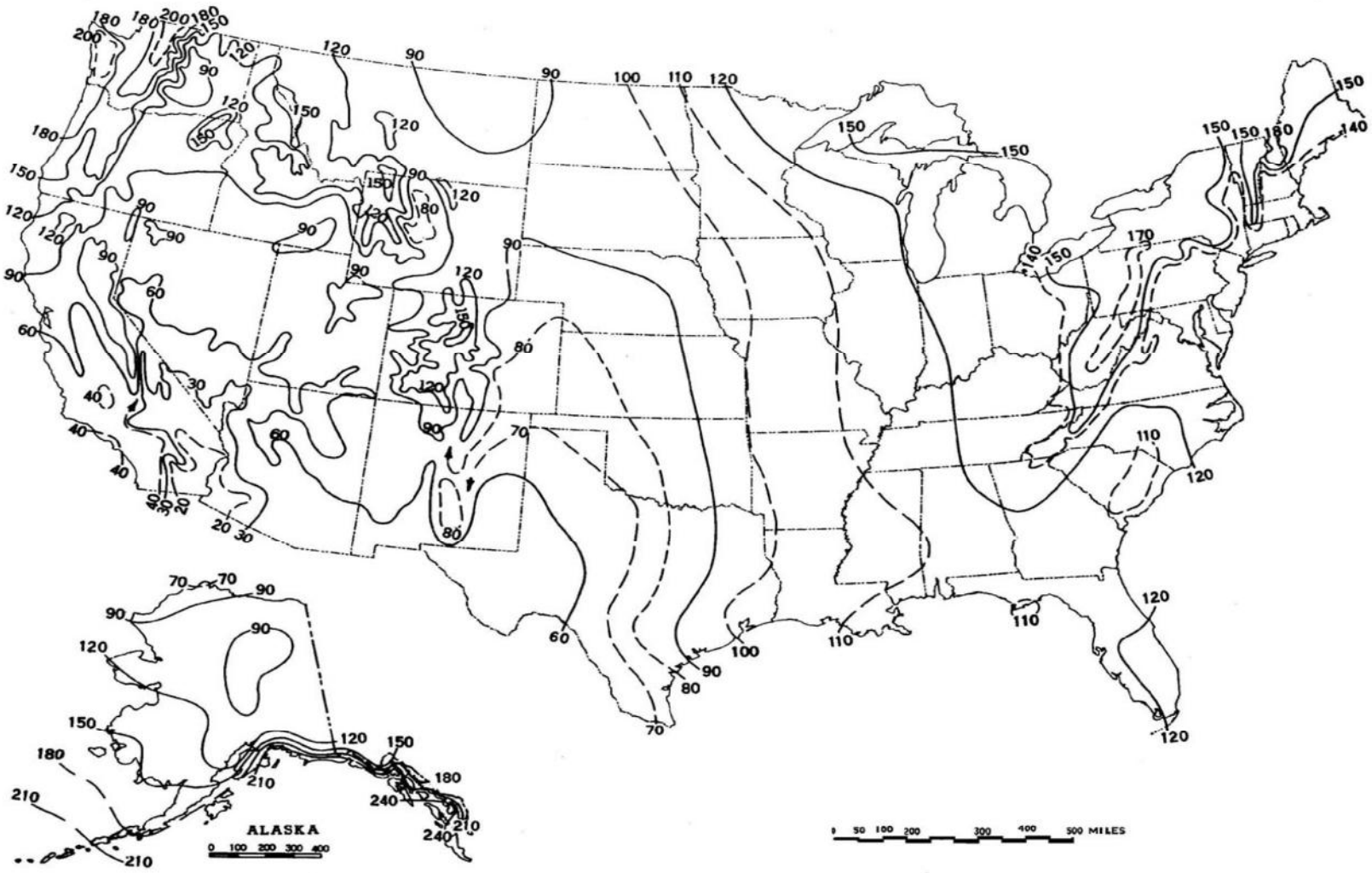


Figure 5-1. Mean Number of Days in the Year with Precipitation of 0.01 Inches or More

5.3 Emission Calculations

The total emissions from the operation of on-road vehicles are the sum of the emissions from the vehicle exhaust and fugitive PM from road dust. There are three accepted methods for estimating vehicle emissions. The first, which is the simplest and preferred method, uses Air Force/State/Territory composite EFs. The second method uses POV and GOV fleet mix from recent traffic studies. The third and final method uses the typical USAF POV and GOV fleet mix from Table 5-2. **No matter which method is used for estimation, POV and GOV emissions are calculated independently.**

5.3.1 Vehicle Exhaust Emissions – Typical Vehicle Operation

Calculating emissions from vehicle exhaust is dependent on the VMT and appropriate EF. Vehicle exhaust emissions are directly dependent on the vehicle mix at the installation. There are two circumstances that determine the method for calculating vehicle exhaust emissions – when the specific vehicle mix is known, or when it is unknown. If the vehicle mix is known, that data may be used for emissions calculations. If the vehicle mix is unknown, the mix from Table 5-2 may be assumed. Calculating these emissions is discussed below.

5.3.1.1 Method 1: Using Air Force/State/Territory Composite Emission Factors (Preferred Method)

This is the preferred method for emissions estimates because it is the simplest method to use. The EFs used for this method are selected based on the emission inventory year and the state/territory in which the installation is located. The Air Force/State/Territory composite EFs ($EF(Pol)_{Comp}$) were derived using the assumed vehicle mix as provided in Table 5-2 and Table 5-19 through Table 5-23 for most states. For the State of California, the composite values are provided in Table 5-29 though Table 5-38. Use Table 5-49 and Table 5-50 for OCONUS installations. Note that the tables are separated into POV and GOV since the EFs account for the vehicle mix which differs between these two classifications. **Also note that these EFs have already been adjusted to reflect the reduction in emissions due to vehicles that operate on alternative fuels.** Therefore, no additional calculation is needed to account for the reduction in emissions from the use of alternative fuels. Emissions calculation using the adjusted EFs is estimated as follows:

$$E(Pol)_{Total} = VMT_{Total} \times EF(Pol)_{Comp} \times 0.002205$$

Equation 5-3

Where,

$E(Pol)_{Total}$ = Total annual emissions of specific pollutant from vehicle exhaust (lb/yr)

VMT_{Total} = Total annual vehicle miles traveled for all POV or GOV (mi/yr). This should be available for GOVs through records or estimated for GOVs and POVs using Equation 5-4 and Equation 5-5 respectively. **Note that this includes both paved and unpaved roads, as applicable.**

$EF(Pol)_{Comp}$ = Air Force/State/Territory composite EF for specific pollutant (g/mi) from Table 5-9 through Table 5-18 and for California, Table 5-29 through Table 5-38.

0.002205 = Factor for converting grams to pound (lb/g)

Emissions from GOVs and POVs are calculated using the general formula provided in Equation 5-3. **These steps must be completed independently for each pollutant of concern. Note GOVs and POVs should not be combined, and their emissions must be calculated independently.** Due to the complexity of calculating on-road vehicle emissions, the following steps are recommended for use as a guideline for data collection and emissions calculations:

Step 1 – Gather fleet data. The first step is to determine the number of POVs or GOVs (N) operating on base. Also, the total vehicle miles traveled (VMT_{Total}) or average vehicle miles traveled (AVM) for GOVs should be recorded. This data can often be provided or estimated by the Security Forces Squadron (from the Pass & Registration section) and/or the Military Personnel Flight (MPF). For POVs, VMT_{Total} is calculated using Equation 5-5 while Equation 5-4 may be used to calculate VMT_{Total} for GOVs only if necessary.

Vehicle Miles Traveled for GOVs:

The total vehicle miles traveled (VMT_{Total}) for GOVs is the sum of all the miles driven using GOVs during the inventory period. These values should be available through records kept by the base transportation organization or directly from the organizations that operate and/or maintain the vehicles. Alternatively, VMT_{Total} may be estimated if it is assumed that each vehicle category traveled the same distance per year, as shown:

$$\boldsymbol{VMT_{Total} = AVM \times N}$$

Equation 5-4

Where,

VMT_{Total} = The total vehicle miles traveled for all GOV vehicles (mi/yr)

AVM = The annual average miles traveled per vehicle (mi/yr)

N = The number of vehicles – GOV in this case – at the installation

Vehicle Miles Traveled for POVs:

For POVs, the suggested method for estimating VMT_{Total} is to assume that each POV in operation on an installation travels twice the distance from the main gate to the population centroid of the installation. Not every person will operate their vehicle every day of the year so it is assumed that the majority of POVs will be driven during the workweek. Additionally, a statistical analysis of available Employee-Certification and Reporting System (ECARS) data revealed that typically only 70% of the installation population operates their vehicles on the installation during the week. Using this information, the VMT_{Total} for POVs is estimated as follows:

$$\boldsymbol{VMT_{Total} = D \times 520 \times 0.7 \times P}$$

Equation 5-5

Where,

D = One-way distance from the main gate to the population centroid of the installation (miles/trip)

520 = Factor converting the number of miles per trip to miles per year (trips/year)

0.7 = Fraction of the installation population that operates their vehicle during the week

P = Installation population

In Equation 5-5, the 520-multiplying factor was derived as follows:

$$2\,\frac{\boldsymbol{trips}}{\boldsymbol{\cancel{days}}} \times 5\,\frac{\boldsymbol{\cancel{days}}}{\boldsymbol{\cancel{weeks}}} \times 52\,\frac{\boldsymbol{\cancel{weeks}}}{\boldsymbol{yr}} = 520\,\frac{\boldsymbol{trips}}{\boldsymbol{yr}}$$

Step 2 – Select emission factors. These are provided in **Table *5-19*** through **Table *5-28*** for all states other than California, **Table *5-39*** through **Table *5-48*** for California, or **Table *5-49*** and **Table *5-50*** for OCONUS installations.

Step 3 – Calculate emissions. Emissions of each pollutant (and vehicle classification) are calculated *independently* using Equation 5-3.

5.3.1.2 Method 2: Using Specific Vehicle Mix Data

This method is more intensive than the preferred method given above. However, it may be desirable if a recent traffic study conflicts with the typical vehicle mix provided, or if emissions from each vehicle category are required. The EFs used for this method are selected based on the emission inventory year, the state in which the installation is located, and the vehicle category (LDGV, LDDV, etc.). Additionally, they can be found in Table 5-19 through Table 5-28 (for states other than California) and Table 5-39 through Table 5-48 for California. To account for the reduction in emissions due to the use of alternative fuels, the appropriate emissions reduction

factor, as given in Table 5-7, is employed. Emissions are estimated using the VMT for each vehicle category and summed as follows:

$$E(Pol)_{Total} = \sum_{i=1}^{n} \left\{ VMT_i \times EF(Pol)_i \times \left[1 - \frac{FERF(Pol)}{100} \right] \times 0.002205 \right\}$$

Equation 5-6

Where,

$E(Pol)_{Total}$ = Total annual emissions of specific pollutant from vehicle exhaust (lb/yr)
VMT_i = Total annual vehicle miles traveled for each vehicle class (mi/yr). This should be available for GOVs through records and estimated for POVs using Equation 5-5. Note that this includes both paved and unpaved roads, if applicable.
$EF(Pol)_i$ = Air Force/State/Territory emission factor for specific pollutant (g/mi)
FERF(Pol) = Pollutant-specific fuel emission reduction factor, as applicable (%). This is provided in Table 5-7.
100 = Factor converting percent to fraction
0.002205 = Factor converting grams to pounds (lb/g)

To accurately account for the reduction of emissions using alternative fuels, the VMT_i for each hybrid and CNG vehicle should be known and treated as a separate vehicle category. If the annual VMT for each vehicle category is not known, the following equation may be used to approximate VMT for each specific vehicle category (VMT_i):

$$VMT_i = AVM_i \times n_i = AVM_i \times N \times \frac{MIX_i}{100}$$

Equation 5-7

Where,

AVM_i = Average annual vehicle miles traveled by each vehicle category (mi/yr)
n_i = Number of vehicles in a specific vehicle category
N = Total number of vehicles (POV or GOV)
MIX_i = Vehicle mix for a specific vehicle category (%)

To quantify the emissions from on-road vehicles using this method, the following process is recommended:

Step 1 – Gather fleet data. Data required to calculate vehicle emissions typically includes vehicle category, model year, and vehicle miles traveled. (VMTi) during the year in question.

a. **GOV Fleet Mix Data:** If a GOV is driven both on and off base during the inventory year, an estimate must be made to apportion the number of miles driven between off and on installation miles. The best way to collect GOV information is to provide blank forms for each vehicle category to the installation organization(s) responsible for managing GOVs.

b. **POV Fleet Mix Data:** Prior to conducting an AEI that includes POVs, it is recommended that the individual responsible for preparing the mobile source emission inventory contacts the Base Development and/or Community Planning section of the Civil Engineering Squadron. This is to determine if a traffic survey has been conducted recently at the installation, which may contain information that will be useful in calculating POV emissions.

   If a recent traffic survey is not available, and resources do not allow for a new traffic survey to be conducted, data provided by the Security Forces Squadron (from the Pass & Registration section) and/or the Military Personnel Flight (MPF) can be used to estimate POV fleet data. Types of data that can usually be obtained from the Security Forces Squadron and/or MPF include:

   1) The estimated average number of registered POVs at the installation during the applicable inventory year.
   2) The estimated percentage of registered vehicles that fall under the seven vehicle categories.
   3) The estimated distance (in miles) of the average POV trip on the installation during a typical weekday and weekend day.
   4) The estimated distance (in miles) of non-registered vehicles that travel on the installation during a typical weekday and weekend day.

   An alternative approach to obtaining vehicle registration information may be available at some installations as some installations may be able to provide a listing of the vehicles contained in their databases.

Step 2 – Group vehicle categories. Upon gathering fleet data, group together all vehicles based on the USAF vehicle categories identified in Table 5-1. Record the number of vehicles (n_i) and total annual miles traveled (VMT_i) for each vehicle category.

a. If $\mathbf{VMT_i}$ is unknown, it can be estimated using Equation 5-7.

b. If there is insufficient fleet data to provide the number of vehicles (n_i) for each vehicle category despite the total number of vehicles and associated relative vehicle mix (MIX_i) for each specific category being known, the equation below can be used to estimate n_i:

$$n_i = N \times \frac{MIX_i}{100}$$

Step 3 – Select emission factors. The appropriate EFs are selected based on the vehicle category, the calendar year for which emissions calculations are being performed, and the installation's geographic location. Vehicle exhaust EFs are selected from Table 5-19 through Table 5-28 for states other than California, Table 5-39 through Table 5-48 for California emissions calculations, and for OCONUS, Table 5-49 and Table 5-50.

Step 4 – Calculate emissions. For vehicle exhaust emissions, calculate the emissions for each individual vehicle category and sum these values for the total vehicle emissions for that pollutant. Pollutant emissions for each vehicle category are calculated using Equation 5-6.

5.3.1.3 Method 3: Using USAF Typical Vehicle Mix Data

Another method for calculating on-road vehicle emissions is to calculate the emissions from each vehicle category using the typical USAF vehicle mix. This method is like that of calculating emissions using specific vehicle mix data. The EFs used for this method are selected based on three metrics: 1) the emission inventory year, 2) the state in which the installation is located, and 3) the vehicle category. Emissions are estimated via this method using a modified version of Equation 5-3 by substituting the correct EF as shown:

$$E(Pol)_{Total} = VMT_{Total} \times EF(Pol)_{Total} \times 0.002205$$

Equation 5-8

Where,

$EF(Pol)_{Total}$ = Total adjusted on-road vehicle exhaust emissions (lb/yr).

The total adjusted on-road vehicle EF considers any reduction in emissions due to alternative fuel use. This is calculated as follows:

$$EF(Pol)_{Total} = \sum_{i=1}^{n} \left\{ \left(\frac{MIX_i}{100} \right) \times EF(Pol)_i \times \left[1 - \frac{FERF(Pol)}{100} \right] \right\}$$

Equation 5-9

The total vehicle miles traveled (VMT_{Total}) is the sum of the average miles traveled for all vehicle categories as shown:

$$VMT_{Total} = \sum_{i=1}^{n} \left(AVM_i \times N \times \frac{MIX_i}{100} \right)$$

Equation 5-10

Emissions from vehicles are calculated by applying the equations in Method 2 using the typical POV or GOV vehicle mix data from Table 5-2. **These steps must be completed separately for each pollutant of concern. GOVs and POVs should not be combined, and their emissions should be calculated independently of each other.** Due to the complexity of calculating on-road vehicle emissions, the following steps are recommended for use as a guideline for data collection and emissions calculations:

Step 1 – Gather fleet data. In this case, fleet data or a traffic survey for the base is not available. Therefore, obtain the total number (N) of vehicles (POV or GOV) driving on base and the overall average annual vehicle miles traveled (AVM) for all vehicle categories. The data can often be provided or estimated by the Security Forces Squadron (from the Pass & Registration section) and/or the Military Personnel Flight (MPF) can be used to estimate POV fleet data. Types of data that can usually be obtained from the Security Forces Squadron and/or MPF include: 1) the estimated average number of registered POVs and/or GOVs at the installation during the applicable inventory year; 2) the estimated distance (in miles) of the average POV travels on the installation during a typical weekday and weekend day; and 3) the estimated number of non-registered vehicles that travel on the installation during a typical weekday and weekend day.

An alternative approach to obtaining vehicle registration information may be available at some installations. Data such as listings of vehicles held in databases (preferably in hardcopy format) as well as the number of registered vehicles are examples of alternative data options that may be available at specific installations.

Step 2 – Group vehicle categories. Upon gathering fleet data on the total number (N) of vehicles (POV or GOV) driving on base and overall average AVM, obtain and record the typical vehicle mix values (MIX_i) from Table 5-2 for each vehicle category. Then, assuming all vehicle categories traveled the same distance per year, calculate the total annual vehicle miles traveled (VMT_{Total}) for all vehicle categories combined using Equation 5-4.

Step 3 – Select emission factors. Selection of the appropriate EF is based on the vehicle category, the calendar year being calculated for, the installation's location (state), and the installation's altitude. The EFs are then selected from Table 5-19 through Table 5-28 for all states except California, Table 5-39 through Table 5-48 for California, or Table 5-49 and Table 5-50 for OCONUS installations.

Once the appropriate pollutant specific EFs for each vehicle have been obtained, calculate the total composite EF using Equation 5-9.

Step 4 – Calculate emissions. The total pollutant emissions, on a per vehicle category-basis, for on-road emissions are calculated using Equation 5-8.

5.3.2 Vehicle Exhaust Emissions – Idling

Calculating idling emissions uses slightly modified versions of equations used for calculating on-road emissions caused by normal vehicle operation as discussed in the previous sections. The primary difference is that the EFs for idling vehicles are presented as grams/hr, meaning the time spent in idle mode must be known (or estimated). Idling emissions from typical on-road vehicle operation have also been addressed in the previous section. Estimating the emissions from vehicle idling is performed under two circumstances: 1) where the vehicle mix is known (e.g., from a recent traffic study) and 2) where the typical USAF vehicle mix is used. **This section describes the calculation of *theoretical* emissions from idling vehicles for NEPA and intersection modeling, not for a mobile AEI.**

5.3.2.1 Method 1: Using Specific Vehicle Mix Data

If necessary, emissions may be calculated using a specific vehicle mix different from the one provided in Table 5-2. This method may be desirable if a recent traffic study conflicts with the typical vehicle mix provided. The EFs used for this method are selected based on the vehicle category. These EFs are provided in Table 5-6. Idling emissions are estimated as follows:

$$E(Pol)_{Total} = \sum_{i=1}^{n} \left\{ VIT_i \times EF(Pol)_i \times \left[1 - \frac{FERF(Pol)}{100} \right] \times 0.002205 \right\}$$

Equation 5-11

Where,

$E(Pol)_{Total}$ = Total theoretical emissions of specific pollutant from idling (lb/yr)
VIT_i = Annual vehicle idling time (hr/yr)
$EF(Pol)_i$ = Idling emission factor for specific pollutant (g/hr) from Table 5-6.

The vehicle idling time is the most difficult parameter to determine. Depending on the proposed action, idling times of varying lengths may be recommended for each vehicle *category* and/or *classification*. The idling time for each vehicle category may be estimated using an average idling time as shown:

$$VIT_i = AVIT_i \times n_i = AVIT_i \times N \times \frac{MIX_i}{100}$$

Equation 5-12

Where,

AVIT$_i$ = Average annual vehicle idling time (hr/yr)

5.3.2.2 Method 2: Using Air Force Typical Vehicle Mix Data

If the specific vehicle mix data is not available from a recent traffic study, the typical vehicle mix from Table 5-2 can be assumed. The EFs used for this method are selected based on the Air Force vehicle category. These EFs can be found in Table 5-6. Theoretical emissions from vehicle idling using this method are calculated as follows:

$$E(Pol)_{Total} = VIT_{Total} \times EF(Pol)_{Total} \times 0.002205$$

Equation 5-13

Where,

VIT$_{Total}$ = Total annual vehicle idling time for all POVs or GOVs (hr/yr)

EF(Pol)$_{Total}$ = Total adjusted idling emission factor (g/hr). Calculated using Equation 5-14 below.

The total adjusted idling EF considers any reduction in emissions due to alternative fuel use and is calculated as follows:

$$EF(Pol)_{Total} = \sum_{i=1}^{n} \left\{ EF(Pol)_i \times \frac{MIX_i}{100} \times \left[1 - \frac{FERF(Pol)}{100} \right] \right\}$$

Equation 5-14

The total vehicle idling time (VIT_{Total}) is the sum of the average idling time for all vehicles categories as shown below:

$$VIT_{Total} = \sum_{i=1}^{n} \left(AVIT_i \times N \times \frac{MIX_i}{100} \right)$$

Equation 5-15

Equation 5-15 may be simplified if it is assumed that each vehicle category will idle for the same amount of time per year. This simplification reduces Equation 5-15 to the equation that follows:

$$VIT_{Total} = AVIT \times N$$

Equation 5-16

In the absence of average vehicle idling time (AVIT) data, contact Base CE for assistance in estimating this value.

5.3.3 Fugitive PM Emissions

Particulate emissions are generated from vehicle exhaust and are described in the previous sections. Fugitive particulate emissions, however, are generated from the operation of on-road vehicles across paved or unpaved road surfaces. The amount of particulate generated is a function of the road surface (paved or unpaved) and the total vehicle miles traveled (VMT_{Total}). The EFs are selected from Table 5-8 based on the road surface type (paved or unpaved) and vehicle classification (POV or GOV). The selected EFs must be corrected based on the number of days in the year with precipitation greater than or equal to 0.01 inches using the appropriate equation (either Equation 5-1 or Equation 5-2) and the type of road surface. Using the corrected EF for paved or unpaved roads ($EF(Pol)_{CP}$ or $EF(Pol)_{CU}$ respectively), fugitive PM emissions are calculated as follows:

$$E(Pol)_{Total} = VMT_{Total} \times \left\{\left[\frac{\%VMT_P}{100} \times EF(Pol)_{CP}\right] + \left[\frac{\%VMT_U}{100} \times EF(Pol)_{CU}\right]\right\} \times 0.002205$$

Equation 5-17

Where,

$E(Pol)_{Total}$ = Total annual emission of fugitive PM from on-road vehicles (lb/yr)
$\%VMT_P$ = Percent of total miles driven on paved roads (%)
$\%VMT_U$ = Percent of total miles driven on unpaved roads (%)

5.3.4 VOC Speciation

On-road vehicles have the potential to produce a significant amount of air pollutants released into the atmosphere. The amount of pollution is a function of the number of on-road vehicles, the average number of miles driven, the time of year, the content of the fuel used, and even the average idling time. The large number of variables impacting air emissions from on-road vehicles increases the complexity of quantifying their emissions. However, measurements are continually being taken to develop more accurate air emissions estimates. Individual VOCs may be estimated using the weight fractions of each chemical to the total emitted VOC.

The weight fractions provided in this document were determined using test data from a variety of sources, including the EPA's *SPECIATE* database. The emission profiles used to determine the VOC weight percent are assumed to be representative of the vehicle category's emissions.

However, this information should only be used when no alternative emission profiles are available. The average weight percent of individual pollutants were calculated using the following equations:

$$P_{Pol} = \frac{A_{Pol}}{AVOC_{Total}}$$

Equation 5-18

Where,

P_{Pol} = Weight percent of a given pollutant (%)
A_{Pol} = Individual pollutant emission factor (mg/mi)
$AVOC_{Total}$ = Total VOC emission factor (mg/mi)

Speciated VOCs are calculated by taking the product of the total VOCs and the weighted percentage of the individual VOC as follows:

$$E_{Pol} = E_{VOC} \times \frac{P_{Pol}}{100}$$

Equation 5-19

Where,

E_{Pol} = Emission of speciated VOC (lb/yr)
100 = Factor for converting percent to a fraction (%)
E_{VOC} = Emissions of total VOC (lb/yr)

The percentages of each VOC to total VOC are provided in Table 5-51. Note that the light-duty gas vehicles, light-duty gas trucks, and heavy-duty gas vehicles (LDGV, LDGT, and HDGV) are not further subdivided into hybrid and CNG-fueled vehicles. To calculate emissions specific to these vehicles, apply the vehicle mix (using the default values if no onsite data is available).

5.4 Information Resources

Information required for calculating emissions from GOVs can usually be obtained from the installation transportation organization as it typically maintains records on most, if not all, GOVs assigned to the installation. At some installations, it may also be necessary to obtain information directly from the organizations that use and/or maintain the vehicles. For example, the Fire Department may need to be contacted to obtain information specific to fire trucks and rescue vehicles.

In some cases, it may be necessary to obtain and review data contained in the installation's vehicle maintenance index file (VMIF), on-line vehicle interactive management system

(OLVIMS) report, or equivalent vehicle information management system to verify vehicle class/type as some installations do not use the same classification system used by the EPA. Some facilities may have a cross-reference tool with management codes that will assist in interpreting how vehicle usage is being tracked (e.g., miles, hours, and kilometers).

Most information required to calculate POV emissions may be obtained from the Security Forces Squadron. The Pass & Registration section of the base Security Forces Squadron usually maintains computer records on all POVs registered at the installation. Some installations perform vehicle registration at MPF. The office that handles vehicle registrations (Pass & Registration or MPF) is also in a good position to survey personnel on their vehicle usage. Since the Security Forces Squadron is responsible for staffing the installation gates, they are usually the best source of information on non-registered vehicles.

If the POV information needed to calculate vehicle emissions cannot be obtained from the Security Forces Squadron, it might be necessary to survey a representative number of installation personnel to obtain the required information. It is also highly recommended that personnel conducting the AEI check with the Base Development and/or Community Planning sections of the Civil Engineering Squadron to determine whether any recent traffic surveys have been conducted.

For purposes of estimating the length of typical on-installation POV trips, consider the trip length in terms of the mileage from the main gate to a common on-installation destination and back. For instance, if most POVs are believed to be traveling to the Base Exchange, the Commissary, or the Medical Clinic, estimate the distance from the main gate to those locations. In such instances, it may be assumed that a median round-trip distance of 3-4 miles is appropriate for use. However, it may also be necessary to estimate vehicle travel distances for individuals who travel on and off the installation more than once per day, such as personnel who leave during lunchtime. **In the absence of installation-specific survey data, it can be conservatively assumed that 5% of installation personnel will travel off-installation during lunchtime.** Since this is a second trip through the gate, you should assume the daily on-installation mileage is doubled for those individuals. If installation organizations are unable to provide required data, it may be possible to obtain trip length and driver behavior data that can be extrapolated to on-installation conditions from the local metropolitan planning office (MPO).

5.5 Example Problems

5.5.1 Problem 1 – Calculating POV and GOV Emissions Using Method 1

A USAF base in performing an air emissions inventory for calendar year (CY) 2024 CO emissions for their POVs and GOVs operated by the facility during the year. Data indicates that

there is a total of 422 POVs and 38 GOVs and all vehicles traveled an average of 4,563 miles each. Calculate CO emissions for CY2024 if the base is in Alabama.

Step 1 – Gather fleet data. The data required to calculate emissions is provided in the problem statement. This information includes the number of POVs (**N_{POV} = 422**), the number of GOVs (**N_{GOV} = 38**), and the average miles traveled for each vehicle (**AVM = 4,563 mi/yr**).

Next, calculate total vehicle miles traveled (VMT_{Total}). Using the number of POVs and GOVs, the average vehicle miles traveled (AVM), and Equation 5-4, the VMT_{Total} is calculated as follows:

$$VMT_{Total} = AVM \times N$$

For POVs

$$\boldsymbol{VMT_{Total-POV}} = 4{,}563\,\frac{mi}{yr} \times 422 = \boldsymbol{1{,}925{,}586\,\frac{mi}{yr}}$$

For GOVs:

$$\boldsymbol{VMT_{Total-GOV}} = 4{,}563\,\frac{mi}{yr} \times 38 = \boldsymbol{173{,}394\,\frac{mi}{yr}}$$

Step 2 – Select emission factors. According to Table 5-9, for CY2024 in Alabama, the CO EF ($EF(CO)_{Alabama}$) for POVs is **4.506 g/mi**. Similarly, the CO EF ($EF(CO)_{Alabama}$) for GOVs is **4.153 g/mi**.

Step 3 – Calculate emissions. Emissions are calculated using the adjusted EFs from Step 2, the VMT_{Total} calculated from Step 1, and Equation 5-3 as shown below:

$$E(Pol)_{Total} = VMT_{Total} \times EF(Pol)_{Total} \times 0.002205$$

For POVs:

$$E(CO)_{Total} = 1{,}925{,}586\,\frac{\cancel{mi}}{yr} \times 4.506\,\frac{\cancel{g}}{\cancel{mi}} \times 0.002205\,\frac{lb}{\cancel{g}}$$

$$\boxed{\boldsymbol{E(CO)_{Total} = 19{,}132.10\,\frac{lb}{yr}}}$$

For GOVs:

$$E(CO)_{Total} = 173{,}394\,\frac{\cancel{mi}}{yr} \times 4.153\,\frac{\cancel{g}}{\cancel{mi}} \times 0.002205\,\frac{lb}{\cancel{g}}$$

$$\boxed{E(CO)_{Total} = 1,587.83 \frac{lb}{yr}}$$

5.5.2 Problem 2 – Calculating GOV Emissions Using Method 2

A USAF base is performing an inventory for CY2024 CO emissions for their 15 GOVs operated by the facility during the year. The Air Force Base is in Alabama.

Step 1 – Gather fleet data and Step 2 – Group vehicle categories. Since the data was available from the Environmental manager, steps 1 and 2 are combined.

Installation Name: Anytown AFB			**Inventory Year:** 2024	
Responsible Organization (Name and Office Symbol):				
POC (Name, Phone #, and email):				
Vehicle Category:				
Vehicle Identification Number (VIN)	**Vehicle Description**	**Bldg. Number**	**Model Year**	**Miles Driven (mi/yr)**
LDGV				
Vehicle #1	Sedan	Bldg. 45-2	1999	4,900
Vehicle #10	Sedan	Bldg. 45-2	1999	5,670
Vehicle #11	Sedan	Bldg. 15-1	2004	4,368
Vehicle #15	Sedan	Bldg. 23-6	2002	6,670
Vehicle #8	Sedan	Bldg. 15	1998	2,700
Vehicle #3	Sedan	Bldg. 1	2004	7,400
Vehicle #5	Sedan	Bldg. 10	1997	1,730
Vehicle #9	Sedan	Bldg. 10	1997	1,450
		Average	**2000**	**4,361**
		Total		**34,888**
LDGT				
Vehicle #6	Pickup	Bldg. 15	2000	4,600
Vehicle #7	Pickup	Bldg. 15	2000	5,200
Vehicle #13	Van	Bldg. 15	1999	6,500
Vehicle #14	SUV	Bldg. 15	2003	3,200
		Average	**2000**	**4,875**
		Total		**19,500**
HDGV				
Vehicle #2	Flatbed	Bldg. 15	1998	4,450
		Average	**1998**	**4,450**
		Total		**4,450**
LDDT				
Vehicle #4	Pickup	Bldg. 1	2004	4,300
		Average	**2004**	**4,300**
		Total		**4,300**
HDDV				
Vehicle #12	Fire Truck	Bldg. 45-2	2002	5,300
		Average	**2002**	**5,300**
		Total		**5,300**

Step 3 – Select emission factors. For vehicles in CY2024 in Alabama, the CO EFs for each vehicle category are given in Table 5-19. The EFs are provided in the table below.

Vehicle Category	CO Emission Factor (g/mi)
LDGV	4.527
LDGT	4.089
HDGV	11.927
LDDV	5.385
LDDT	5.362
HDDV	1.592
MC	12.896

Step 4 – Calculate emissions. No information was provided regarding whether any of the vehicles operated on alternative fuel. Using the vehicle miles traveled for each vehicle category (VMT_i) from the fleet data, the EFs recorded in Step 3, and Equation 5-6, the emissions are first calculated for each vehicle category as follows:

$$E(Pol)_{Total} = \sum_{i=1}^{7}\left\{VMT_i \times EF(Pol)_i \times \left[1 - \frac{FERF(Pol)}{100}\right] \times 0.002205\right\}$$

$$\boldsymbol{E(CO)_{LDGV}} = 34{,}888\frac{\cancel{mi}}{yr} \times 4.527\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{323.77\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDGT}} = 19{,}500\frac{\cancel{mi}}{yr} \times 4.089\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{175.82\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{HDGV}} = 4{,}450\frac{\cancel{mi}}{yr} \times 11.927\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{108.80\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDDV}} = 0\frac{\cancel{mi}}{yr} \times 5.38\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{0.0\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDDT}} = 4{,}300\frac{\cancel{mi}}{yr} \times 5.362\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{50.84\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{HDDV}} = 5{,}300\frac{\cancel{mi}}{yr} \times 1.592\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{18.60\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{MC}} = 0\frac{\cancel{mi}}{yr} \times 12.896\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\frac{lb}{\cancel{g}} = \boldsymbol{0.0\frac{lb}{yr}}$$

Finally, the total CO emission are calculated by summing the contributing CO emission from each vehicle category.

$$E(Pol)_{Total} = \sum_{i=1}^{7} E(Pol)_i$$

$$E(CO)_{TOTAL} = (323.77 + 175.82 + 108.80 + 0 + 50.84 + 18.60 + 0)\frac{lb}{yr}$$

$$\boxed{\boldsymbol{E(CO)_{TOTAL} = 677.83\frac{lb}{yr}}}$$

5.5.3 Problem 3 – Calculate POV Emissions Using Method 2

A USAF Base (located in Alabama) is conducting an emissions inventory to quantify CY2024 emissions attributable to the operation of POVs. Using the information provided by the Security Forces Squadron, the following data was used to calculate the CY2024 emissions of CO from the operation of POVs.

Step 1 – Gather fleet data. Fleet data information is provided in the figure following Step 2.

Step 2 – Group vehicle categories. The first step in grouping the vehicle categories is to calculate the estimated total number of vehicles (N) driving on base. Using the data provided in the form referenced in Step 1, the total number of POVs is estimated as follows:

$$N = Registered + Unregistered$$

$$\boldsymbol{N = 1{,}675 + 125 = 1{,}800\ vehicles}$$

Installation Name: Anytown AFB	**Inventory Year:** 2024
Responsible Organization (Name and Office Symbol): 58 CES/CD	
POC (Name, Phone #, and email): SSgt John Jones, DSN 234-5678	

Question	**Response**
Can you provide the listing of all registered vehicles on base? (Y/N)? If so, be sure to include all specific information (make/model year, etc.) about the vehicles.	N
What is the estimated average number of registered POVs at the installation during the inventory period?	1,675
What is the estimated percentage of registered vehicles which travel on the installation during a typical weekday (Monday-Friday)?	75
What is the estimated percentage of registered vehicles which travel on the installation during a typical weekend day (Saturday and Sunday)?	50
What is the estimated distance the average POV travels on base during a typical weekday?	6 mi/day
What is the estimated distance the average POV travels on base during a typical weekend day?	4 mi/day
What is the estimated number of non-registered POVs which travel on base during a typical weekday?	125
What is the estimated average model year of all POVs driven on base during the inventory year? (NOTE: This is not required if the average model years are listed below for each vehicle category)	

Using registration information, provide an estimate of the percentage of registered POVs which fall under each of the 7 vehicle categories listed below.

Vehicle Category	**Category Description**	**Estimated % of Registered Vehicles**
LDGV	Light-Duty Gasoline Vehicles – All gasoline-powered passenger cars	36
LDDV	Light-Duty Diesel Vehicles – All diesel-powered passenger cars	1
LDGT	Light-Duty Gasoline Trucks – All smaller gasoline-powered trucks (0 to 8,500 lbs. GVWR)	54
LDDT	Light-Duty Diesel Trucks (LDDT) – All smaller diesel-powered trucks (0 to 8,500 lbs. GVWR)	1
HDGV	Heavy-Duty Gasoline Vehicles (HDGV) – All larger gasoline-powered vehicles (8,501to >60,000 lbs. GVWR)	4
HDDV	Heavy-Duty Diesel Vehicles – All larger diesel-powered vehicles (10,001to >60,000 lbs. GVWR)	3
MC	Motorcycles (MC) – All motorcycles (assumed to be gasoline powered)	1

Next, the number of vehicles which fall under each vehicle category are calculated under the assumption that the fleet mix for the unregistered vehicles is the same as for the registered

vehicles. By slightly modifying Equation 5-7, the number of vehicles for each category (n_i) may be derived from the total number of vehicles (N) and vehicle category mix (MIX_i).

$$n_i = N \times \frac{MIX_i}{100}$$

$$\boldsymbol{n_{LDGV}} = 1{,}800 \times \frac{36\%}{100\%} = \boldsymbol{648\ Vehicles}$$

$$\boldsymbol{n_{LDDV}} = 1{,}800 \times \frac{1\%}{100\%} = \boldsymbol{18\ Vehicles}$$

$$\boldsymbol{n_{LDGT}} = 1{,}800 \times \frac{54\%}{100\%} = \boldsymbol{972\ Vehicles}$$

$$\boldsymbol{n_{LDDT}} = 1{,}800 \times \frac{1\%}{100\%} = \boldsymbol{18\ Vehicles}$$

$$\boldsymbol{n_{HDGV}} = 1{,}800 \times \frac{4\%}{100\%} = \boldsymbol{72\ Vehicles}$$

$$\boldsymbol{n_{HDDV}} = 1{,}800 \times \frac{3\%}{100\%} = \boldsymbol{54\ Vehicles}$$

$$\boldsymbol{n_{MC}} = 1{,}800 \times \frac{1\%}{100\%} = \boldsymbol{18\ Vehicles}$$

Next, the average annual vehicle miles traveled (AVM_i) is calculated. Using the data provided in the form above, the AVM traveled is calculated as follows:

$$AVM_i = \frac{52\ weeks}{yr} \times \left[\left(\frac{75\%}{100\%} \times 6\frac{mi}{day} \times 5\frac{day}{week}\right) + \left(\frac{50\%}{100\%} \times 4\frac{mi}{day} \times 2\frac{day}{week}\right)\right]$$

$$AVM_i = \frac{52\ weeks}{yr} \times \left[\left(0.75 \times 6\frac{mi}{\cancel{day}} \times 5\frac{\cancel{day}}{week}\right) + \left(0.5 \times 4\frac{mi}{\cancel{day}} \times 2\frac{\cancel{day}}{week}\right)\right]$$

$$AVM_i = \frac{52\ weeks}{yr} \times \left[\left(22.5\frac{mi}{week}\right) + \left(4\frac{mi}{week}\right)\right]$$

$$\boldsymbol{AVM_i} = \frac{52\ \cancel{weeks}}{yr} \times \left[\left(26.5\frac{mi}{\cancel{week}}\right)\right] = \boldsymbol{1{,}378\frac{mi}{yr}}$$

Finally, the total annual VMT for each category (VMT_i) is calculated using Equation 5-7.

$$VMT_i = AVM_i \times n_i$$

$$\boldsymbol{VMT_{LDGV}} = 1378\frac{mi}{yr} \times 648\ vehicles = \boldsymbol{892{,}944\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{LDDV}} = 1378\frac{mi}{yr} \times 18\ vehicles = \boldsymbol{24{,}804\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{LDGT}} = 1378\frac{mi}{yr} \times 972\ vehicles = \boldsymbol{1,339,416\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{LDDT}} = 1378\frac{mi}{yr} \times 18\ vehicles = \boldsymbol{24,804\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{HDGV}} = 1378\frac{mi}{yr} \times 72\ vehicles = \boldsymbol{99,216\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{HDDV}} = 1378\frac{mi}{yr} \times 54\ vehicles = \boldsymbol{74,412\frac{mi}{yr}}$$

$$\boldsymbol{VMT_{MC}} = 1378\frac{mi}{yr} \times 18\ vehicles = \boldsymbol{24,804\frac{mi}{yr}}$$

Step 3 – Select emission factors. EFs for vehicles in CY2024 are provided in Table 5-19. The CO EFs for a base in Alabama for 2024 are provided in the sub-table below.

Vehicle Category	CO Emission Factor (g/mi)
LDGV	4.527
LDGT	4.089
HDGV	11.927
LDDV	5.385
LDDT	5.362
HDDV	1.592
MC	12.896

Step 4 – Calculate emissions. Emissions are calculated using the vehicle miles traveled as calculated in Step 2, the EFs recorded in Step 3, and Equation 5-6. First, the CO emissions from each vehicle category are individually calculated and then summed for total CO emissions. Also, since no information was provided regarding the use of alternative fuels, a FERF value of "0" is used.

$$E(Pol)_{Total} = \sum_{i=1}^{n}\left[VMT_i \times EF(Pol)_i \times \frac{FERF(Pol)}{100} \times 0.002205\right]$$

$$\boldsymbol{E(CO)_{LDGV}} = 892{,}944\frac{\cancel{mi}}{yr} \times 4.527\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\ \frac{lb}{\cancel{g}} = \boldsymbol{8,913.40\ \frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDDV}} = 24{,}804\frac{\cancel{mi}}{yr} \times 4.089\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\ \frac{lb}{\cancel{g}} = \boldsymbol{223.64\ \frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDGT}} = 1{,}339{,}416\frac{\cancel{mi}}{yr} \times 11.927\frac{\cancel{g}}{\cancel{mi}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\ \frac{lb}{\cancel{g}} = \boldsymbol{35,225.35\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{LDDT}} = 24{,}804\,\frac{\boldsymbol{\cancel{mi}}}{yr} \times 5.385\,\frac{\boldsymbol{\cancel{g}}}{\boldsymbol{\cancel{mi}}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\,\frac{lb}{\boldsymbol{\cancel{g}}} = \boldsymbol{294.52\,\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{HDGV}} = 99{,}216\,\frac{\boldsymbol{\cancel{mi}}}{yr} \times 5.362\,\frac{\boldsymbol{\cancel{g}}}{\boldsymbol{\cancel{mi}}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\,\frac{lb}{\boldsymbol{\cancel{g}}} = \boldsymbol{1{,}173.05\,\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{HDDV}} = 74{,}412\,\frac{\boldsymbol{\cancel{mi}}}{yr} \times 1.592\,\frac{\boldsymbol{\cancel{g}}}{\boldsymbol{\cancel{mi}}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\,\frac{lb}{\boldsymbol{\cancel{g}}} = \boldsymbol{261.21\,\frac{lb}{yr}}$$

$$\boldsymbol{E(CO)_{MC}} = 24{,}804\,\frac{\boldsymbol{\cancel{mi}}}{yr} \times 12.896\,\frac{\boldsymbol{\cancel{g}}}{\boldsymbol{\cancel{mi}}} \times \left[1 - \frac{0\%}{100\%}\right] \times 0.002205\,\frac{lb}{\boldsymbol{\cancel{g}}} = \boldsymbol{705.32\,\frac{lb}{yr}}$$

The total CO emissions are calculated by summing the CO emissions from each contributing vehicle category as shown:

$$E(Pol)_{Total} = \sum_{i=1}^{n} E(Pol)_i$$

$$E(CO)_{Total} = (8{,}913.40 + 223.64 + 35{,}225.35 + 294.52 + 1{,}173.05 + 261.21 + 705.32)\,\frac{lb}{yr}$$

$$\boxed{\boldsymbol{E(CO)_{TOTAL} = 46{,}796.49\,\frac{lb}{yr}}}$$

5.5.4 Problem 4 – Calculating POV Emissions Using Method 3

A USAF base is interested in determining the NO_X generated by the operation of POVs driven on base. There are approximately 600 POVs that average 3,700 miles per year, but no vehicle studies have been conducted to describe the vehicle mix. Using the typical USAF vehicle mix, determine the NO_X generated by the operation of these vehicles on base for CY 2024. The base is in Colorado.

Step 1 – Gather fleet data. The problem statement provided information regard the number of POVs (**N=600**) and the average vehicle miles driven by each vehicle (**AVM = 3,700 miles per year)**.

Step 2 – Group vehicle categories. The first step is to determine the total annual vehicle miles traveled (VMT_{Total}) for all vehicles. The problem statement provided information regarding the average vehicle miles traveled for all POVs (AVM), but not the average miles traveled for each vehicle category (AVM_i). Therefore, the appropriate method for calculating the total annual vehicle miles traveled for all vehicles utilizes Equation 5-4 as shown:

$$VMT_{Total} = AVM \times N$$

$$\boldsymbol{VMT_{Total}} = 3{,}700\,\frac{mi}{yr} \times 600 = \boldsymbol{2{,}220{,}000\,\frac{mi}{yr}}$$

Since the typical vehicle mix is assumed for this example, the vehicle mix (MIX_i) for each category for POVs has been extracted from Table 5-2 and presented in the following table.

Vehicle Category	POV Vehicle Mix (%)
LDGV	41.00
LDDV	0.52
LDGT	46.4
LDDT	0.66
HDGV	3.39
HDDV	2.51
MC	1.88
LDGV (H)	0.09
LDGT (H)	0.09
LDGV (V)	2.14
LDGT (V)	1.32

Step 3 – Select emission factors. The EFs for CY 2024 POVs are presented in Table 5-19. The EFs for NO_X in Colorado have been extracted from the table and presented in the table below.

Vehicle Category	NO_X Emission Factor (g/mi)
LDGV	0.168
LDDV	0.224
LDGT	0.754
LDDT	0.148
HDGV	0.492
HDDV	2.745
MC	0.758

Step 4 – Calculate emissions. First, a total composite EF is calculated by taking the product of the EF for each vehicle category ($EF(Pol)_i$) – from the table in Step 3 above), the vehicle mix value for the corresponding vehicle category (MIX_i – from the table in Step 2), and the appropriate FERF from Table 5-7. FERF for electric vehicles are assumed to be 100%. These values are calculated as follows:

$$EF(Pol)_{Total} = \sum_{i=1}^{n} \left\{ EF(Pol)_i \times \frac{MIX_i}{100} \times \left[1 - \frac{FERF(Pol)}{100} \right] \right\}$$

$$\boldsymbol{EF(NO_X)_{LDGV}} = 0.168 \frac{g}{mi} \times \left(\frac{41.00\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.0689} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDDV}} = 0.224 \frac{g}{mi} \times \left(\frac{0.52\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.0012} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDGT}} = 0.754 \frac{g}{mi} \times \left(\frac{46.4\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.350} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDDT}} = 0.148 \frac{g}{mi} \times \left(\frac{0.66\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.001} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{HDGV}} = 0.492 \frac{g}{mi} \times \left(\frac{3.39\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.017} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{HDDV}} = 2.51 \frac{g}{mi} \times \left(\frac{2.745\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.069} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{MC}} = 0.758 \frac{g}{mi} \times \left(\frac{1.88\%}{100\%} \right) \times \left[1 - \frac{0\%}{100\%} \right] = \mathbf{0.014} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDGV(H)}} = 0.168 \frac{g}{mi} \times \left(\frac{0.09\%}{100\%} \right) \times \left[1 - \frac{75\%}{100\%} \right] = \mathbf{0.00004} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDGT(H)}} = 0.754 \frac{g}{mi} \times \left(\frac{0.09\%}{100\%} \right) \times \left[1 - \frac{75\%}{100\%} \right] = \mathbf{0.0002} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDGV\,(V)}} = 0.168 \frac{g}{mi} \times \left(\frac{2.14\%}{100\%} \right) \times \left[1 - \frac{100\%}{100\%} \right] = \mathbf{0.00} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

$$\boldsymbol{EF(NO_X)_{LDGT\,(V)}} = 0.754 \frac{g}{mi} \times \left(\frac{1.32\%}{100\%} \right) \times \left[1 - \frac{100\%}{100\%} \right] = \mathbf{0.00} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

Next, sum these values for a total composite emission factor ($EF(Pol)_{Total}$) as shown:

$$EF(Pol)_{Total} = \sum_{i=1}^{n} EF(Pol)_i$$

$$\boldsymbol{EF(NO_X)_{Total}} = (0.0689 + 0.0012 + 0.350 + 0.001 + 0.017 + 0.069 + 0.014 + 0.00004 + 0.002 + 0.00 + 0.00) \frac{g}{mi} = \mathbf{0.523} \frac{\boldsymbol{g}}{\boldsymbol{mi}}$$

Finally, using the total vehicle miles traveled (VMT_{Total}) from Step 2, and the total composite EF, the total NO_X emissions are calculated using Equation 5-8 as shown:

$$E(Pol)_{Total} = VMT_{Total} \times EF(Pol)_{Total} \times 0.002205$$

$$E(NO_X)_{Total} = 2{,}220{,}000 \frac{\cancel{mi}}{yr} \times 0.523 \frac{\cancel{g}}{\cancel{mi}} \times 0.002205 \frac{lb}{\cancel{g}}$$

$$\boxed{\boldsymbol{E(NO_X)_{Total} = 2{,}560.14 \frac{lb}{yr}}}$$

5.5.5 Problem 5 – Calculating Fugitive PM Emissions

Determine the fugitive PM_{10} generated from the POVs and GOVs provided in Problem 1 given that the base is in central Alabama. It can be assumed that 100% of all miles traveled by POVs are on paved roads, whereas GOVs traveled 90% on paved roads and 10% on unpaved roads.

Step 1 – Gather fleet data. Calculation of fugitive PM_{10} emissions from on-road vehicle operation requires that the total vehicle miles driven (VMT_{Total}) for POVs and GOVs is known. These values have been calculated in Step 1 of Problem 1: **$VMT_{Total\text{-}POV}$ = 1,925,586** and **$VMT_{Total\text{-}GOV}$ = 173,394 miles/year**.

Step 2 – Select emission factors. Fugitive PM_{10} EFs are provided in Table 5-8. For POVs, the EFs for paved and unpaved roads are **0.058** and **466.206 g/mi**, respectively. Similarly, for GOVs, the EFs for paved and unpaved roads are **0.069** and **505.981 g/mi**, respectively.

Once selected, the EFs must be corrected to account for precipitation at the base. It is given that the base is in central Alabama. Based on this information, a review of Figure 5-1 reveals that the base is estimated to have 110 days in the year with precipitation of 0.01 inches or more. The EFs are corrected using this value and Equation 5-1 or Equation 5-2.

For POVs:

$$EF(Pol)_{CP} = EF(Pol)_P \times \left(1 - \frac{P}{4N}\right)$$

$$EF(PM_{10})_{CP} = 0.058\frac{g}{mi} \times \left(1 - \frac{110}{4\times365}\right)$$

$$\boldsymbol{EF(PM_{10})_{CP} = 0.058\frac{g}{mi} \times \left(1 - \frac{110}{1460}\right) = 0.054\frac{g}{mi}}$$

For GOVs:

$$EF(PM_{10})_{CP} = 0.069\frac{g}{mi} \times \left(1 - \frac{110}{4\times365}\right)$$

$$\boldsymbol{EF(PM_{10})_{CP} = 0.069\frac{g}{mi} \times \left(1 - \frac{110}{1460}\right) = 0.064\frac{g}{mi}}$$

$$EF(Pol)_{CU} = EF(Pol)_U \times \left(1 - \frac{P}{N}\right)$$

$$\boldsymbol{EF(PM_{10})_{CU} = 505.981\frac{g}{mi} \times \left(1 - \frac{110}{365}\right) = 353.494\frac{g}{mi}}$$

Step 3 – Calculate emissions. Using the VMT_{Total} for POVs and GOVs as recorded in Step 1, the estimated percentage of driving on paved and unpaved roads (as given in the problem statement), and Equation 5-17, emissions are calculated as follows:

$$E(Pol)_{Total} = VMT_{Total} \times \left[\left(\frac{\%VMT_P}{100} \times EF(Pol)_{CP}\right) + \left(\frac{\%VMT_U}{100} \times EF(Pol)_{CU}\right)\right] \times 0.002205$$

For POVs:

$$E(PM_{10})_{Total} = 1{,}925{,}586\frac{mi}{yr} \times \left[\left(\frac{100\%}{100\%} \times 0.054\frac{g}{mi}\right) + (0)\right] \times 0.002205\frac{lb}{g}$$

$$E(PM_{10})_{Total} = 1{,}925{,}586\frac{\cancel{mi}}{yr} \times \left[\left(1 \times 0.054\frac{\cancel{g}}{\cancel{mi}}\right)\right] \times 0.002205\frac{lb}{\cancel{g}}$$

$$\boxed{\boldsymbol{E(PM_{10})_{Total} = 229.28\frac{lb}{yr}}}$$

For GOVs:

$$E(PM_{10})_{Total} = 173{,}394\frac{mi}{yr} \times \left[\left(\frac{90\%}{100\%} \times 0.064\frac{g}{mi}\right) + \left(\frac{10\%}{100\%} \times 353.494\frac{g}{mi}\right)\right] \times 0.002205\frac{lb}{g}$$

$$E(PM_{10})_{Total} = 173{,}394\frac{mi}{yr} \times \left[\left(0.9 \times 0.064\frac{g}{mi}\right) + \left(0.1 \times 353.494\frac{g}{mi}\right)\right] \times 0.002205\frac{lb}{g}$$

$$E(PM_{10})_{Total} = 173{,}394\frac{mi}{yr} \times \left[\left(0.0576\frac{g}{mi}\right) + \left(35.3494\frac{g}{mi}\right)\right] \times 0.002205\frac{lb}{g}$$

$$E(PM_{10})_{Total} = 173{,}394\frac{\cancel{mi}}{yr} \times \left[35.407\frac{\cancel{g}}{\cancel{mi}}\right] \times 0.002205\frac{lb}{\cancel{g}}$$

$$\boxed{\boldsymbol{E(PM_{10})_{Total} = 13{,}537.29\frac{lb}{yr}}}$$

4945 **Table 5-9. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2024 POV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	4.506	0.334	0.274	0.002	0.007	0.006	0.049
ALASKA	All Vehicles	5.661	0.331	0.291	0.001	0.008	0.007	0.048
ARIZONA	All Vehicles	4.294	0.351	0.282	0.001	0.007	0.006	0.049
ARKANSAS	All Vehicles	4.454	0.328	0.278	0.002	0.007	0.006	0.048
CALIFORNIA	All Vehicles	3.595	0.261	0.253	0.001	0.006	0.006	0.048
COLORADO	All Vehicles	3.886	0.317	0.286	0.002	0.008	0.007	0.048
CONNECTICUT	All Vehicles	3.619	0.293	0.260	0.002	0.008	0.007	0.049
DELAWARE	All Vehicles	3.779	0.282	0.271	0.002	0.007	0.006	0.050
DISTRICT OF COLUMBIA	All Vehicles	3.812	0.280	0.265	0.002	0.007	0.007	0.051
FLORIDA	All Vehicles	4.883	0.356	0.261	0.002	0.006	0.006	0.050
GEORGIA	All Vehicles	4.235	0.324	0.271	0.002	0.007	0.006	0.049
HAWAII	All Vehicles	4.790	0.362	0.261	0.002	0.007	0.006	0.050
IDAHO	All Vehicles	4.074	0.318	0.297	0.002	0.008	0.007	0.048
ILLINOIS	All Vehicles	4.081	0.312	0.277	0.002	0.008	0.007	0.049
INDIANA	All Vehicles	4.326	0.321	0.286	0.002	0.008	0.007	0.049
IOWA	All Vehicles	4.358	0.325	0.291	0.002	0.009	0.008	0.048
KANSAS	All Vehicles	4.408	0.325	0.287	0.002	0.008	0.007	0.048
KENTUCKY	All Vehicles	4.358	0.317	0.282	0.002	0.007	0.006	0.048
LOUISIANA	All Vehicles	4.555	0.330	0.263	0.002	0.006	0.006	0.049
MAINE	All Vehicles	4.071	0.305	0.288	0.002	0.008	0.007	0.047
MARYLAND	All Vehicles	3.800	0.301	0.269	0.002	0.007	0.006	0.049
MASSACHUSETTS	All Vehicles	3.736	0.304	0.274	0.002	0.008	0.007	0.050
MICHIGAN	All Vehicles	4.352	0.321	0.293	0.002	0.009	0.008	0.049
MINNESOTA	All Vehicles	4.492	0.322	0.296	0.002	0.009	0.008	0.048
MISSISSIPPI	All Vehicles	4.472	0.329	0.269	0.002	0.007	0.006	0.048
MISSOURI	All Vehicles	4.174	0.313	0.276	0.002	0.007	0.007	0.048
MONTANA	All Vehicles	4.247	0.321	0.304	0.002	0.008	0.007	0.047
NEBRASKA	All Vehicles	4.391	0.327	0.293	0.002	0.008	0.008	0.048
NEVADA	All Vehicles	4.120	0.333	0.296	0.002	0.008	0.007	0.049
NEW HAMPSHIRE	All Vehicles	3.719	0.297	0.273	0.002	0.008	0.007	0.048
NEW JERSEY	All Vehicles	3.655	0.263	0.263	0.002	0.007	0.006	0.047
NEW MEXICO	All Vehicles	4.177	0.336	0.298	0.002	0.007	0.007	0.048
NEW YORK	All Vehicles	3.624	0.291	0.260	0.002	0.008	0.007	0.049
NORTH CAROLINA	All Vehicles	4.099	0.318	0.274	0.002	0.007	0.006	0.049
NORTH DAKOTA	All Vehicles	4.587	0.329	0.301	0.002	0.009	0.008	0.047
OHIO	All Vehicles	4.214	0.316	0.283	0.002	0.008	0.007	0.049
OKLAHOMA	All Vehicles	4.456	0.331	0.282	0.002	0.007	0.006	0.048
OREGON	All Vehicles	3.817	0.290	0.282	0.002	0.007	0.006	0.049
PACIFIC ISLANDS	All Vehicles	4.055	0.305	0.272	0.002	0.007	0.006	0.049
PENNSYLVANIA	All Vehicles	3.912	0.301	0.274	0.002	0.008	0.007	0.049
PUERTO RICO	All Vehicles	5.121	0.364	0.247	0.002	0.006	0.006	0.050
RHODE ISLAND	All Vehicles	3.670	0.298	0.262	0.002	0.008	0.007	0.050
SOUTH CAROLINA	All Vehicles	4.467	0.329	0.275	0.002	0.007	0.006	0.049
SOUTH DAKOTA	All Vehicles	4.506	0.319	0.298	0.002	0.008	0.007	0.047
TENNESSEE	All Vehicles	4.449	0.329	0.282	0.002	0.007	0.006	0.049
TEXAS	All Vehicles	4.142	0.318	0.257	0.002	0.006	0.006	0.049
UTAH	All Vehicles	3.956	0.319	0.291	0.002	0.008	0.007	0.049
VERMONT	All Vehicles	3.773	0.299	0.276	0.002	0.009	0.008	0.047
VIRGIN ISLANDS	All Vehicles	5.116	0.349	0.237	0.002	0.006	0.005	0.047
VIRGINIA	All Vehicles	4.156	0.311	0.276	0.002	0.007	0.006	0.049
WASHINGTON	All Vehicles	4.074	0.290	0.294	0.002	0.007	0.006	0.049
WEST VIRGINIA	All Vehicles	4.256	0.315	0.284	0.002	0.008	0.007	0.048
WISCONSIN	All Vehicles	4.267	0.310	0.288	0.002	0.008	0.007	0.048
WYOMING	All Vehicles	4.286	0.327	0.306	0.002	0.008	0.007	0.047

4946
4947

4948 **Table 5-10. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2025 POV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	4.314	0.324	0.248	0.002	0.006	0.006	0.047
ALASKA	All Vehicles	5.402	0.320	0.265	0.001	0.008	0.007	0.047
ARIZONA	All Vehicles	4.108	0.340	0.255	0.001	0.006	0.006	0.047
ARKANSAS	All Vehicles	4.268	0.318	0.252	0.002	0.007	0.006	0.047
CALIFORNIA	All Vehicles	3.436	0.254	0.229	0.001	0.006	0.005	0.047
COLORADO	All Vehicles	3.725	0.308	0.260	0.002	0.007	0.007	0.047
CONNECTICUT	All Vehicles	3.461	0.285	0.236	0.002	0.007	0.006	0.048
DELAWARE	All Vehicles	3.611	0.274	0.245	0.002	0.007	0.006	0.048
DISTRICT OF COLUMBIA	All Vehicles	3.642	0.272	0.241	0.002	0.007	0.006	0.050
FLORIDA	All Vehicles	4.673	0.345	0.237	0.002	0.006	0.005	0.049
GEORGIA	All Vehicles	4.055	0.314	0.246	0.002	0.006	0.006	0.048
HAWAII	All Vehicles	4.590	0.351	0.237	0.002	0.007	0.006	0.048
IDAHO	All Vehicles	3.904	0.309	0.269	0.002	0.007	0.007	0.046
ILLINOIS	All Vehicles	3.901	0.302	0.251	0.002	0.007	0.007	0.048
INDIANA	All Vehicles	4.143	0.311	0.259	0.002	0.008	0.007	0.048
IOWA	All Vehicles	4.179	0.316	0.264	0.002	0.008	0.007	0.046
KANSAS	All Vehicles	4.226	0.315	0.261	0.002	0.007	0.007	0.046
KENTUCKY	All Vehicles	4.174	0.307	0.255	0.002	0.007	0.006	0.046
LOUISIANA	All Vehicles	4.361	0.320	0.238	0.002	0.006	0.005	0.047
MAINE	All Vehicles	3.898	0.296	0.261	0.002	0.008	0.007	0.046
MARYLAND	All Vehicles	3.632	0.292	0.243	0.002	0.007	0.006	0.047
MASSACHUSETTS	All Vehicles	3.565	0.294	0.249	0.002	0.007	0.007	0.048
MICHIGAN	All Vehicles	4.169	0.311	0.266	0.002	0.008	0.007	0.047
MINNESOTA	All Vehicles	4.305	0.313	0.269	0.002	0.008	0.007	0.047
MISSISSIPPI	All Vehicles	4.282	0.319	0.244	0.002	0.006	0.006	0.046
MISSOURI	All Vehicles	3.996	0.303	0.250	0.002	0.007	0.006	0.046
MONTANA	All Vehicles	4.072	0.312	0.276	0.002	0.008	0.007	0.046
NEBRASKA	All Vehicles	4.210	0.317	0.266	0.002	0.008	0.007	0.046
NEVADA	All Vehicles	3.947	0.323	0.268	0.002	0.008	0.007	0.048
NEW HAMPSHIRE	All Vehicles	3.554	0.288	0.247	0.002	0.008	0.007	0.047
NEW JERSEY	All Vehicles	3.496	0.256	0.238	0.002	0.007	0.006	0.045
NEW MEXICO	All Vehicles	4.003	0.326	0.269	0.002	0.007	0.006	0.046
NEW YORK	All Vehicles	3.471	0.283	0.237	0.002	0.007	0.007	0.048
NORTH CAROLINA	All Vehicles	3.924	0.308	0.248	0.002	0.007	0.006	0.047
NORTH DAKOTA	All Vehicles	4.398	0.320	0.273	0.002	0.009	0.008	0.046
OHIO	All Vehicles	4.036	0.306	0.257	0.002	0.008	0.007	0.047
OKLAHOMA	All Vehicles	4.270	0.321	0.255	0.002	0.007	0.006	0.046
OREGON	All Vehicles	3.656	0.282	0.256	0.002	0.007	0.006	0.047
PACIFIC ISLANDS	All Vehicles	3.881	0.296	0.247	0.002	0.007	0.006	0.047
PENNSYLVANIA	All Vehicles	3.744	0.292	0.249	0.002	0.007	0.007	0.047
PUERTO RICO	All Vehicles	4.901	0.352	0.224	0.002	0.006	0.005	0.048
RHODE ISLAND	All Vehicles	3.512	0.289	0.239	0.002	0.007	0.006	0.048
SOUTH CAROLINA	All Vehicles	4.278	0.319	0.249	0.002	0.006	0.006	0.047
SOUTH DAKOTA	All Vehicles	4.319	0.310	0.270	0.002	0.008	0.007	0.046
TENNESSEE	All Vehicles	4.260	0.319	0.255	0.002	0.007	0.006	0.048
TEXAS	All Vehicles	3.964	0.308	0.232	0.002	0.006	0.005	0.047
UTAH	All Vehicles	3.790	0.310	0.264	0.002	0.007	0.006	0.047
VERMONT	All Vehicles	3.610	0.291	0.251	0.002	0.008	0.007	0.046
VIRGIN ISLANDS	All Vehicles	4.895	0.337	0.215	0.002	0.006	0.005	0.046
VIRGINIA	All Vehicles	3.978	0.301	0.250	0.002	0.007	0.006	0.047
WASHINGTON	All Vehicles	3.904	0.282	0.267	0.002	0.007	0.006	0.047
WEST VIRGINIA	All Vehicles	4.077	0.305	0.258	0.002	0.007	0.006	0.046
WISCONSIN	All Vehicles	4.086	0.301	0.262	0.002	0.008	0.007	0.046
WYOMING	All Vehicles	4.111	0.317	0.278	0.002	0.008	0.007	0.046

4949
4950

4951 **Table 5-11. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2026 POV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	4.069	0.294	0.217	0.002	0.006	0.005	0.046
ALASKA	All Vehicles	5.078	0.297	0.235	0.001	0.007	0.007	0.045
ARIZONA	All Vehicles	3.862	0.310	0.220	0.001	0.006	0.006	0.046
ARKANSAS	All Vehicles	4.032	0.289	0.221	0.002	0.006	0.006	0.045
CALIFORNIA	All Vehicles	3.222	0.230	0.198	0.001	0.006	0.005	0.046
COLORADO	All Vehicles	3.528	0.285	0.229	0.002	0.007	0.006	0.045
CONNECTICUT	All Vehicles	3.255	0.262	0.207	0.002	0.007	0.006	0.046
DELAWARE	All Vehicles	3.379	0.249	0.210	0.002	0.006	0.006	0.046
DISTRICT OF COLUMBIA	All Vehicles	3.431	0.248	0.210	0.002	0.007	0.006	0.048
FLORIDA	All Vehicles	4.406	0.311	0.207	0.002	0.006	0.005	0.047
GEORGIA	All Vehicles	3.819	0.284	0.215	0.002	0.006	0.006	0.046
HAWAII	All Vehicles	4.337	0.317	0.207	0.002	0.007	0.006	0.047
IDAHO	All Vehicles	3.682	0.283	0.235	0.002	0.007	0.006	0.045
ILLINOIS	All Vehicles	3.642	0.275	0.217	0.002	0.007	0.006	0.046
INDIANA	All Vehicles	3.910	0.284	0.228	0.002	0.007	0.006	0.046
IOWA	All Vehicles	3.951	0.290	0.232	0.002	0.008	0.007	0.045
KANSAS	All Vehicles	3.995	0.289	0.229	0.002	0.007	0.006	0.045
KENTUCKY	All Vehicles	3.939	0.280	0.224	0.002	0.007	0.006	0.045
LOUISIANA	All Vehicles	4.110	0.289	0.207	0.002	0.006	0.005	0.046
MAINE	All Vehicles	3.668	0.272	0.228	0.002	0.008	0.007	0.045
MARYLAND	All Vehicles	3.397	0.266	0.208	0.002	0.006	0.006	0.046
MASSACHUSETTS	All Vehicles	3.341	0.268	0.218	0.002	0.007	0.006	0.047
MICHIGAN	All Vehicles	3.936	0.285	0.234	0.002	0.008	0.007	0.046
MINNESOTA	All Vehicles	4.069	0.288	0.237	0.002	0.008	0.007	0.045
MISSISSIPPI	All Vehicles	4.041	0.289	0.214	0.002	0.006	0.005	0.045
MISSOURI	All Vehicles	3.752	0.277	0.218	0.002	0.007	0.006	0.045
MONTANA	All Vehicles	3.852	0.288	0.243	0.002	0.007	0.007	0.044
NEBRASKA	All Vehicles	3.982	0.291	0.234	0.002	0.008	0.007	0.045
NEVADA	All Vehicles	3.708	0.293	0.228	0.002	0.007	0.007	0.046
NEW HAMPSHIRE	All Vehicles	3.289	0.261	0.210	0.002	0.007	0.007	0.045
NEW JERSEY	All Vehicles	3.273	0.234	0.205	0.002	0.006	0.006	0.044
NEW MEXICO	All Vehicles	3.776	0.298	0.234	0.002	0.007	0.006	0.045
NEW YORK	All Vehicles	3.285	0.261	0.209	0.002	0.007	0.006	0.046
NORTH CAROLINA	All Vehicles	3.696	0.279	0.217	0.002	0.006	0.006	0.046
NORTH DAKOTA	All Vehicles	4.162	0.295	0.241	0.002	0.009	0.008	0.045
OHIO	All Vehicles	3.810	0.280	0.226	0.002	0.007	0.007	0.046
OKLAHOMA	All Vehicles	4.035	0.292	0.224	0.002	0.007	0.006	0.045
OREGON	All Vehicles	3.438	0.257	0.223	0.002	0.006	0.006	0.046
PACIFIC ISLANDS	All Vehicles	3.653	0.270	0.215	0.002	0.006	0.006	0.046
PENNSYLVANIA	All Vehicles	3.512	0.266	0.215	0.002	0.007	0.006	0.046
PUERTO RICO	All Vehicles	4.623	0.317	0.196	0.002	0.005	0.005	0.046
RHODE ISLAND	All Vehicles	3.319	0.266	0.210	0.002	0.007	0.006	0.047
SOUTH CAROLINA	All Vehicles	4.037	0.289	0.218	0.002	0.006	0.005	0.046
SOUTH DAKOTA	All Vehicles	4.084	0.286	0.239	0.002	0.008	0.007	0.044
TENNESSEE	All Vehicles	4.019	0.290	0.224	0.002	0.007	0.006	0.046
TEXAS	All Vehicles	3.728	0.280	0.203	0.002	0.006	0.005	0.046
UTAH	All Vehicles	3.570	0.285	0.230	0.002	0.007	0.006	0.046
VERMONT	All Vehicles	3.356	0.265	0.214	0.002	0.008	0.007	0.045
VIRGIN ISLANDS	All Vehicles	4.619	0.304	0.188	0.002	0.005	0.005	0.044
VIRGINIA	All Vehicles	3.750	0.275	0.219	0.002	0.006	0.006	0.046
WASHINGTON	All Vehicles	3.686	0.257	0.234	0.002	0.007	0.006	0.046
WEST VIRGINIA	All Vehicles	3.849	0.279	0.227	0.002	0.007	0.006	0.045
WISCONSIN	All Vehicles	3.846	0.276	0.229	0.002	0.008	0.007	0.045
WYOMING	All Vehicles	3.890	0.293	0.245	0.002	0.008	0.007	0.044

4952
4953

4954 **Table 5-12. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2027 POV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_X	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	3.914	0.285	0.198	0.002	0.006	0.005	0.045
ALASKA	All Vehicles	4.875	0.288	0.216	0.001	0.007	0.006	0.044
ARIZONA	All Vehicles	3.714	0.300	0.201	0.001	0.006	0.005	0.045
ARKANSAS	All Vehicles	3.882	0.280	0.202	0.002	0.006	0.006	0.044
CALIFORNIA	All Vehicles	3.096	0.223	0.182	0.001	0.005	0.005	0.044
COLORADO	All Vehicles	3.396	0.277	0.211	0.002	0.007	0.006	0.044
CONNECTICUT	All Vehicles	3.129	0.255	0.190	0.002	0.007	0.006	0.045
DELAWARE	All Vehicles	3.247	0.242	0.192	0.002	0.006	0.006	0.045
DISTRICT OF COLUMBIA	All Vehicles	3.293	0.242	0.193	0.002	0.006	0.006	0.047
FLORIDA	All Vehicles	4.234	0.301	0.189	0.002	0.005	0.005	0.046
GEORGIA	All Vehicles	3.673	0.275	0.197	0.002	0.006	0.005	0.045
HAWAII	All Vehicles	4.172	0.307	0.189	0.002	0.006	0.006	0.045
IDAHO	All Vehicles	3.545	0.275	0.215	0.002	0.007	0.006	0.044
ILLINOIS	All Vehicles	3.502	0.267	0.199	0.002	0.007	0.006	0.045
INDIANA	All Vehicles	3.761	0.276	0.209	0.002	0.007	0.006	0.045
IOWA	All Vehicles	3.806	0.281	0.213	0.002	0.008	0.007	0.044
KANSAS	All Vehicles	3.848	0.280	0.210	0.002	0.007	0.006	0.044
KENTUCKY	All Vehicles	3.791	0.272	0.205	0.002	0.006	0.006	0.044
LOUISIANA	All Vehicles	3.954	0.280	0.190	0.002	0.006	0.005	0.044
MAINE	All Vehicles	3.532	0.265	0.209	0.002	0.007	0.007	0.043
MARYLAND	All Vehicles	3.266	0.258	0.190	0.002	0.006	0.005	0.045
MASSACHUSETTS	All Vehicles	3.156	0.259	0.193	0.002	0.007	0.006	0.046
MICHIGAN	All Vehicles	3.787	0.277	0.215	0.002	0.008	0.007	0.045
MINNESOTA	All Vehicles	3.917	0.279	0.218	0.002	0.008	0.007	0.044
MISSISSIPPI	All Vehicles	3.889	0.280	0.195	0.002	0.006	0.005	0.044
MISSOURI	All Vehicles	3.611	0.268	0.200	0.002	0.007	0.006	0.044
MONTANA	All Vehicles	3.711	0.280	0.223	0.002	0.007	0.006	0.043
NEBRASKA	All Vehicles	3.835	0.283	0.214	0.002	0.008	0.007	0.043
NEVADA	All Vehicles	3.570	0.284	0.209	0.002	0.007	0.006	0.045
NEW HAMPSHIRE	All Vehicles	3.166	0.254	0.193	0.002	0.007	0.006	0.044
NEW JERSEY	All Vehicles	3.151	0.227	0.188	0.002	0.006	0.005	0.043
NEW MEXICO	All Vehicles	3.637	0.289	0.214	0.002	0.007	0.006	0.044
NEW YORK	All Vehicles	3.161	0.254	0.192	0.002	0.007	0.006	0.045
NORTH CAROLINA	All Vehicles	3.556	0.271	0.199	0.002	0.006	0.005	0.045
NORTH DAKOTA	All Vehicles	4.009	0.287	0.221	0.002	0.008	0.007	0.043
OHIO	All Vehicles	3.665	0.272	0.207	0.002	0.007	0.006	0.044
OKLAHOMA	All Vehicles	3.885	0.283	0.205	0.002	0.006	0.006	0.044
OREGON	All Vehicles	3.309	0.250	0.204	0.002	0.006	0.006	0.044
PACIFIC ISLANDS	All Vehicles	3.513	0.262	0.197	0.002	0.006	0.005	0.044
PENNSYLVANIA	All Vehicles	3.380	0.258	0.197	0.002	0.007	0.006	0.044
PUERTO RICO	All Vehicles	4.443	0.307	0.179	0.002	0.005	0.005	0.045
RHODE ISLAND	All Vehicles	3.190	0.259	0.193	0.002	0.007	0.006	0.045
SOUTH CAROLINA	All Vehicles	3.884	0.281	0.199	0.002	0.006	0.005	0.044
SOUTH DAKOTA	All Vehicles	3.934	0.277	0.219	0.002	0.007	0.007	0.043
TENNESSEE	All Vehicles	3.866	0.281	0.205	0.002	0.006	0.006	0.045
TEXAS	All Vehicles	3.586	0.271	0.185	0.002	0.005	0.005	0.044
UTAH	All Vehicles	3.436	0.277	0.210	0.002	0.007	0.006	0.044
VERMONT	All Vehicles	3.233	0.258	0.197	0.002	0.008	0.007	0.043
VIRGIN ISLANDS	All Vehicles	4.443	0.293	0.172	0.002	0.005	0.004	0.043
VIRGINIA	All Vehicles	3.607	0.267	0.200	0.002	0.006	0.005	0.044
WASHINGTON	All Vehicles	3.548	0.250	0.215	0.002	0.006	0.006	0.044
WEST VIRGINIA	All Vehicles	3.705	0.271	0.208	0.002	0.007	0.006	0.044
WISCONSIN	All Vehicles	3.702	0.269	0.210	0.002	0.007	0.007	0.043
WYOMING	All Vehicles	3.748	0.285	0.225	0.002	0.007	0.006	0.043

4955
4956

4957 **Table 5-13. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2028 POV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	3.725	0.270	0.177	0.002	0.006	0.005	0.043
ALASKA	All Vehicles	4.641	0.278	0.194	0.001	0.007	0.006	0.043
ARIZONA	All Vehicles	3.534	0.282	0.179	0.001	0.006	0.005	0.043
ARKANSAS	All Vehicles	3.699	0.266	0.180	0.002	0.006	0.005	0.042
CALIFORNIA	All Vehicles	2.945	0.213	0.162	0.001	0.005	0.005	0.043
COLORADO	All Vehicles	3.238	0.265	0.189	0.002	0.007	0.006	0.043
CONNECTICUT	All Vehicles	2.980	0.244	0.170	0.002	0.006	0.006	0.043
DELAWARE	All Vehicles	3.088	0.231	0.171	0.002	0.006	0.005	0.044
DISTRICT OF COLUMBIA	All Vehicles	3.129	0.231	0.172	0.002	0.006	0.005	0.045
FLORIDA	All Vehicles	4.027	0.284	0.168	0.002	0.005	0.005	0.044
GEORGIA	All Vehicles	3.496	0.261	0.176	0.002	0.006	0.005	0.044
HAWAII	All Vehicles	3.973	0.289	0.169	0.002	0.006	0.005	0.044
IDAHO	All Vehicles	3.380	0.264	0.192	0.002	0.007	0.006	0.042
ILLINOIS	All Vehicles	3.334	0.255	0.178	0.002	0.007	0.006	0.043
INDIANA	All Vehicles	3.582	0.264	0.186	0.002	0.007	0.006	0.043
IOWA	All Vehicles	3.631	0.269	0.191	0.002	0.008	0.007	0.042
KANSAS	All Vehicles	3.669	0.267	0.187	0.002	0.007	0.006	0.042
KENTUCKY	All Vehicles	3.611	0.259	0.183	0.002	0.006	0.005	0.042
LOUISIANA	All Vehicles	3.763	0.265	0.169	0.002	0.005	0.005	0.043
MAINE	All Vehicles	3.368	0.254	0.187	0.002	0.007	0.006	0.042
MARYLAND	All Vehicles	3.108	0.246	0.170	0.002	0.006	0.005	0.043
MASSACHUSETTS	All Vehicles	3.004	0.248	0.173	0.002	0.007	0.006	0.044
MICHIGAN	All Vehicles	3.610	0.265	0.192	0.002	0.007	0.007	0.043
MINNESOTA	All Vehicles	3.737	0.268	0.195	0.002	0.007	0.007	0.042
MISSISSIPPI	All Vehicles	3.702	0.266	0.174	0.002	0.005	0.005	0.042
MISSOURI	All Vehicles	3.441	0.256	0.178	0.002	0.006	0.006	0.042
MONTANA	All Vehicles	3.541	0.269	0.199	0.002	0.007	0.006	0.042
NEBRASKA	All Vehicles	3.659	0.271	0.192	0.002	0.007	0.007	0.042
NEVADA	All Vehicles	3.402	0.270	0.186	0.002	0.007	0.006	0.044
NEW HAMPSHIRE	All Vehicles	3.018	0.244	0.173	0.002	0.007	0.006	0.043
NEW JERSEY	All Vehicles	3.001	0.217	0.168	0.002	0.006	0.005	0.041
NEW MEXICO	All Vehicles	3.466	0.276	0.191	0.002	0.006	0.006	0.042
NEW YORK	All Vehicles	3.011	0.243	0.171	0.002	0.007	0.006	0.043
NORTH CAROLINA	All Vehicles	3.385	0.257	0.177	0.002	0.006	0.005	0.043
NORTH DAKOTA	All Vehicles	3.827	0.276	0.198	0.002	0.008	0.007	0.042
OHIO	All Vehicles	3.492	0.260	0.185	0.002	0.007	0.006	0.043
OKLAHOMA	All Vehicles	3.702	0.269	0.182	0.002	0.006	0.005	0.042
OREGON	All Vehicles	3.154	0.239	0.183	0.002	0.006	0.005	0.043
PACIFIC ISLANDS	All Vehicles	3.344	0.249	0.176	0.002	0.006	0.005	0.043
PENNSYLVANIA	All Vehicles	3.220	0.246	0.176	0.002	0.007	0.006	0.043
PUERTO RICO	All Vehicles	4.226	0.288	0.159	0.002	0.005	0.004	0.044
RHODE ISLAND	All Vehicles	3.037	0.248	0.172	0.002	0.006	0.006	0.044
SOUTH CAROLINA	All Vehicles	3.698	0.266	0.177	0.002	0.006	0.005	0.043
SOUTH DAKOTA	All Vehicles	3.754	0.266	0.196	0.002	0.007	0.006	0.041
TENNESSEE	All Vehicles	3.681	0.267	0.182	0.002	0.006	0.005	0.043
TEXAS	All Vehicles	3.413	0.255	0.165	0.002	0.005	0.005	0.043
UTAH	All Vehicles	3.276	0.265	0.188	0.002	0.006	0.006	0.043
VERMONT	All Vehicles	3.085	0.247	0.177	0.002	0.008	0.007	0.042
VIRGIN ISLANDS	All Vehicles	4.224	0.273	0.152	0.002	0.005	0.004	0.042
VIRGINIA	All Vehicles	3.434	0.254	0.179	0.002	0.006	0.005	0.043
WASHINGTON	All Vehicles	3.382	0.240	0.192	0.002	0.006	0.005	0.043
WEST VIRGINIA	All Vehicles	3.531	0.259	0.185	0.002	0.006	0.006	0.042
WISCONSIN	All Vehicles	3.530	0.257	0.188	0.002	0.007	0.006	0.042
WYOMING	All Vehicles	3.578	0.274	0.201	0.002	0.007	0.006	0.042

4958
4959

4960 **Table 5-14. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2024 GOV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	4.153	0.253	0.779	0.003	0.017	0.016	0.048
ALASKA	All Vehicles	4.802	0.275	0.825	0.002	0.018	0.016	0.047
ARIZONA	All Vehicles	4.094	0.259	0.834	0.002	0.017	0.016	0.048
ARKANSAS	All Vehicles	4.090	0.249	0.772	0.003	0.017	0.016	0.047
CALIFORNIA	All Vehicles	3.513	0.204	0.776	0.002	0.017	0.015	0.047
COLORADO	All Vehicles	3.665	0.249	0.820	0.003	0.018	0.016	0.047
CONNECTICUT	All Vehicles	3.515	0.241	0.795	0.003	0.018	0.017	0.048
DELAWARE	All Vehicles	3.645	0.227	0.800	0.003	0.018	0.016	0.048
DISTRICT OF COLUMBIA	All Vehicles	3.735	0.234	0.854	0.003	0.020	0.018	0.049
FLORIDA	All Vehicles	4.530	0.269	0.778	0.003	0.018	0.016	0.049
GEORGIA	All Vehicles	3.987	0.251	0.791	0.003	0.018	0.016	0.048
HAWAII	All Vehicles	4.406	0.274	0.773	0.003	0.019	0.017	0.048
IDAHO	All Vehicles	3.757	0.248	0.818	0.002	0.018	0.016	0.047
ILLINOIS	All Vehicles	3.830	0.252	0.807	0.003	0.018	0.017	0.048
INDIANA	All Vehicles	3.969	0.255	0.810	0.003	0.018	0.017	0.048
IOWA	All Vehicles	3.943	0.253	0.792	0.002	0.018	0.016	0.047
KANSAS	All Vehicles	4.033	0.250	0.789	0.003	0.017	0.016	0.047
KENTUCKY	All Vehicles	4.002	0.244	0.780	0.003	0.017	0.015	0.047
LOUISIANA	All Vehicles	4.237	0.246	0.757	0.003	0.017	0.015	0.048
MAINE	All Vehicles	3.704	0.242	0.786	0.003	0.018	0.016	0.047
MARYLAND	All Vehicles	3.656	0.242	0.792	0.003	0.018	0.016	0.048
MASSACHUSETTS	All Vehicles	3.608	0.253	0.830	0.003	0.019	0.018	0.048
MICHIGAN	All Vehicles	3.967	0.259	0.817	0.003	0.019	0.017	0.048
MINNESOTA	All Vehicles	4.029	0.259	0.807	0.002	0.018	0.017	0.047
MISSISSIPPI	All Vehicles	4.112	0.245	0.752	0.003	0.017	0.015	0.047
MISSOURI	All Vehicles	3.887	0.243	0.777	0.003	0.017	0.016	0.047
MONTANA	All Vehicles	3.840	0.249	0.814	0.002	0.017	0.016	0.047
NEBRASKA	All Vehicles	3.987	0.253	0.798	0.003	0.018	0.016	0.047
NEVADA	All Vehicles	3.915	0.250	0.859	0.003	0.019	0.017	0.048
NEW HAMPSHIRE	All Vehicles	3.531	0.240	0.789	0.003	0.018	0.016	0.047
NEW JERSEY	All Vehicles	3.495	0.202	0.756	0.003	0.016	0.015	0.047
NEW MEXICO	All Vehicles	3.857	0.249	0.814	0.003	0.017	0.016	0.047
NEW YORK	All Vehicles	3.490	0.239	0.795	0.003	0.018	0.017	0.048
NORTH CAROLINA	All Vehicles	3.860	0.246	0.786	0.003	0.018	0.016	0.048
NORTH DAKOTA	All Vehicles	4.054	0.259	0.806	0.002	0.018	0.017	0.047
OHIO	All Vehicles	3.886	0.252	0.801	0.003	0.018	0.017	0.048
OKLAHOMA	All Vehicles	4.089	0.249	0.777	0.003	0.017	0.016	0.047
OREGON	All Vehicles	3.596	0.231	0.802	0.003	0.017	0.016	0.047
PACIFIC ISLANDS	All Vehicles	3.815	0.238	0.787	0.002	0.017	0.016	0.048
PENNSYLVANIA	All Vehicles	3.690	0.241	0.794	0.003	0.018	0.016	0.048
PUERTO RICO	All Vehicles	4.756	0.271	0.739	0.003	0.017	0.016	0.048
RHODE ISLAND	All Vehicles	3.555	0.245	0.806	0.003	0.019	0.017	0.048
SOUTH CAROLINA	All Vehicles	4.117	0.248	0.774	0.003	0.017	0.015	0.048
SOUTH DAKOTA	All Vehicles	4.037	0.247	0.797	0.002	0.017	0.016	0.047
TENNESSEE	All Vehicles	4.099	0.255	0.797	0.003	0.018	0.016	0.048
TEXAS	All Vehicles	3.961	0.242	0.760	0.003	0.017	0.015	0.047
UTAH	All Vehicles	3.734	0.251	0.833	0.003	0.018	0.016	0.048
VERMONT	All Vehicles	3.514	0.237	0.777	0.002	0.018	0.016	0.047
VIRGIN ISLANDS	All Vehicles	4.684	0.252	0.677	0.003	0.016	0.015	0.046
VIRGINIA	All Vehicles	3.879	0.243	0.785	0.003	0.017	0.016	0.048
WASHINGTON	All Vehicles	3.775	0.234	0.815	0.003	0.017	0.016	0.048
WEST VIRGINIA	All Vehicles	3.889	0.244	0.780	0.002	0.017	0.016	0.047
WISCONSIN	All Vehicles	3.870	0.247	0.791	0.002	0.018	0.016	0.047
WYOMING	All Vehicles	3.874	0.250	0.817	0.002	0.017	0.016	0.047

4961
4962

4963 **Table 5-15. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2025 GOV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	4.010	0.243	0.731	0.003	0.015	0.014	0.047
ALASKA	All Vehicles	4.611	0.265	0.774	0.002	0.016	0.015	0.046
ARIZONA	All Vehicles	3.958	0.249	0.782	0.002	0.015	0.014	0.047
ARKANSAS	All Vehicles	3.952	0.239	0.723	0.002	0.015	0.014	0.046
CALIFORNIA	All Vehicles	3.395	0.196	0.728	0.002	0.015	0.014	0.046
COLORADO	All Vehicles	3.545	0.240	0.769	0.002	0.016	0.014	0.046
CONNECTICUT	All Vehicles	3.398	0.233	0.747	0.003	0.016	0.015	0.047
DELAWARE	All Vehicles	3.520	0.219	0.751	0.003	0.016	0.015	0.047
DISTRICT OF COLUMBIA	All Vehicles	3.608	0.226	0.806	0.003	0.018	0.016	0.048
FLORIDA	All Vehicles	4.373	0.258	0.731	0.003	0.016	0.015	0.047
GEORGIA	All Vehicles	3.853	0.241	0.742	0.003	0.016	0.014	0.047
HAWAII	All Vehicles	4.256	0.263	0.727	0.002	0.017	0.015	0.047
IDAHO	All Vehicles	3.631	0.239	0.766	0.002	0.016	0.014	0.046
ILLINOIS	All Vehicles	3.696	0.242	0.757	0.003	0.016	0.015	0.047
INDIANA	All Vehicles	3.832	0.246	0.760	0.002	0.016	0.015	0.047
IOWA	All Vehicles	3.809	0.244	0.742	0.002	0.016	0.015	0.046
KANSAS	All Vehicles	3.897	0.240	0.738	0.002	0.016	0.014	0.046
KENTUCKY	All Vehicles	3.865	0.234	0.730	0.002	0.015	0.014	0.046
LOUISIANA	All Vehicles	4.093	0.237	0.709	0.003	0.015	0.014	0.047
MAINE	All Vehicles	3.576	0.233	0.736	0.002	0.016	0.014	0.046
MARYLAND	All Vehicles	3.531	0.233	0.743	0.003	0.016	0.014	0.047
MASSACHUSETTS	All Vehicles	3.480	0.244	0.781	0.003	0.017	0.016	0.047
MICHIGAN	All Vehicles	3.830	0.249	0.766	0.002	0.017	0.015	0.047
MINNESOTA	All Vehicles	3.888	0.250	0.757	0.002	0.017	0.015	0.046
MISSISSIPPI	All Vehicles	3.971	0.235	0.704	0.002	0.015	0.013	0.046
MISSOURI	All Vehicles	3.756	0.234	0.728	0.002	0.015	0.014	0.046
MONTANA	All Vehicles	3.711	0.240	0.761	0.002	0.016	0.014	0.046
NEBRASKA	All Vehicles	3.853	0.243	0.747	0.002	0.016	0.014	0.046
NEVADA	All Vehicles	3.787	0.240	0.806	0.002	0.017	0.015	0.047
NEW HAMPSHIRE	All Vehicles	3.409	0.231	0.739	0.003	0.016	0.015	0.046
NEW JERSEY	All Vehicles	3.379	0.195	0.707	0.003	0.014	0.013	0.046
NEW MEXICO	All Vehicles	3.728	0.239	0.761	0.002	0.015	0.014	0.046
NEW YORK	All Vehicles	3.376	0.231	0.747	0.003	0.016	0.015	0.047
NORTH CAROLINA	All Vehicles	3.730	0.236	0.737	0.002	0.016	0.014	0.047
NORTH DAKOTA	All Vehicles	3.914	0.250	0.754	0.002	0.017	0.015	0.046
OHIO	All Vehicles	3.753	0.243	0.752	0.002	0.016	0.015	0.047
OKLAHOMA	All Vehicles	3.950	0.240	0.727	0.002	0.015	0.014	0.046
OREGON	All Vehicles	3.475	0.223	0.752	0.002	0.015	0.014	0.046
PACIFIC ISLANDS	All Vehicles	3.685	0.229	0.738	0.002	0.015	0.014	0.047
PENNSYLVANIA	All Vehicles	3.565	0.232	0.744	0.002	0.016	0.014	0.047
PUERTO RICO	All Vehicles	4.593	0.259	0.694	0.003	0.015	0.014	0.047
RHODE ISLAND	All Vehicles	3.436	0.236	0.757	0.003	0.016	0.015	0.047
SOUTH CAROLINA	All Vehicles	3.976	0.238	0.725	0.002	0.015	0.014	0.047
SOUTH DAKOTA	All Vehicles	3.899	0.238	0.745	0.002	0.015	0.014	0.046
TENNESSEE	All Vehicles	3.957	0.245	0.748	0.003	0.016	0.014	0.047
TEXAS	All Vehicles	3.830	0.232	0.713	0.003	0.015	0.014	0.046
UTAH	All Vehicles	3.611	0.242	0.781	0.002	0.016	0.014	0.047
VERMONT	All Vehicles	3.395	0.229	0.727	0.002	0.016	0.014	0.046
VIRGIN ISLANDS	All Vehicles	4.522	0.241	0.635	0.002	0.014	0.013	0.045
VIRGINIA	All Vehicles	3.746	0.234	0.736	0.003	0.015	0.014	0.047
WASHINGTON	All Vehicles	3.646	0.225	0.763	0.002	0.016	0.014	0.047
WEST VIRGINIA	All Vehicles	3.756	0.235	0.730	0.002	0.015	0.014	0.046
WISCONSIN	All Vehicles	3.736	0.238	0.741	0.002	0.016	0.014	0.046
WYOMING	All Vehicles	3.744	0.241	0.763	0.002	0.015	0.014	0.046

4964
4965

4966 **Table 5-16. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2026 GOV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	3.733	0.212	0.669	0.002	0.014	0.013	0.046
ALASKA	All Vehicles	4.281	0.239	0.710	0.002	0.014	0.013	0.046
ARIZONA	All Vehicles	3.680	0.217	0.714	0.002	0.014	0.013	0.046
ARKANSAS	All Vehicles	3.685	0.210	0.662	0.002	0.014	0.012	0.045
CALIFORNIA	All Vehicles	3.148	0.169	0.667	0.002	0.013	0.012	0.046
COLORADO	All Vehicles	3.314	0.214	0.705	0.002	0.014	0.013	0.046
CONNECTICUT	All Vehicles	3.157	0.207	0.686	0.003	0.015	0.013	0.046
DELAWARE	All Vehicles	3.258	0.191	0.686	0.003	0.014	0.013	0.046
DISTRICT OF COLUMBIA	All Vehicles	3.359	0.197	0.743	0.003	0.016	0.015	0.047
FLORIDA	All Vehicles	4.070	0.223	0.671	0.003	0.014	0.013	0.047
GEORGIA	All Vehicles	3.583	0.210	0.681	0.002	0.014	0.013	0.046
HAWAII	All Vehicles	3.968	0.228	0.667	0.002	0.015	0.014	0.046
IDAHO	All Vehicles	3.381	0.212	0.700	0.002	0.014	0.013	0.045
ILLINOIS	All Vehicles	3.416	0.213	0.692	0.002	0.015	0.013	0.046
INDIANA	All Vehicles	3.568	0.217	0.697	0.002	0.015	0.013	0.046
IOWA	All Vehicles	3.555	0.217	0.679	0.002	0.015	0.013	0.045
KANSAS	All Vehicles	3.636	0.212	0.676	0.002	0.014	0.013	0.045
KENTUCKY	All Vehicles	3.600	0.207	0.668	0.002	0.014	0.012	0.046
LOUISIANA	All Vehicles	3.810	0.206	0.648	0.002	0.013	0.012	0.046
MAINE	All Vehicles	3.324	0.208	0.672	0.002	0.014	0.013	0.045
MARYLAND	All Vehicles	3.268	0.204	0.678	0.003	0.014	0.013	0.046
MASSACHUSETTS	All Vehicles	3.223	0.215	0.717	0.003	0.015	0.014	0.046
MICHIGAN	All Vehicles	3.567	0.221	0.702	0.002	0.015	0.014	0.046
MINNESOTA	All Vehicles	3.627	0.223	0.693	0.002	0.015	0.014	0.045
MISSISSIPPI	All Vehicles	3.701	0.206	0.644	0.002	0.013	0.012	0.045
MISSOURI	All Vehicles	3.486	0.206	0.665	0.002	0.014	0.013	0.045
MONTANA	All Vehicles	3.464	0.215	0.696	0.002	0.014	0.013	0.045
NEBRASKA	All Vehicles	3.596	0.216	0.683	0.002	0.014	0.013	0.045
NEVADA	All Vehicles	3.517	0.209	0.734	0.002	0.015	0.014	0.046
NEW HAMPSHIRE	All Vehicles	3.133	0.204	0.673	0.002	0.014	0.013	0.045
NEW JERSEY	All Vehicles	3.132	0.171	0.644	0.002	0.013	0.012	0.045
NEW MEXICO	All Vehicles	3.473	0.211	0.694	0.002	0.014	0.012	0.045
NEW YORK	All Vehicles	3.156	0.206	0.687	0.002	0.015	0.013	0.046
NORTH CAROLINA	All Vehicles	3.469	0.207	0.675	0.002	0.014	0.013	0.046
NORTH DAKOTA	All Vehicles	3.655	0.224	0.691	0.002	0.015	0.014	0.045
OHIO	All Vehicles	3.496	0.215	0.689	0.002	0.015	0.013	0.046
OKLAHOMA	All Vehicles	3.684	0.211	0.665	0.002	0.014	0.012	0.045
OREGON	All Vehicles	3.228	0.195	0.688	0.002	0.014	0.013	0.046
PACIFIC ISLANDS	All Vehicles	3.426	0.201	0.676	0.002	0.014	0.013	0.046
PENNSYLVANIA	All Vehicles	3.306	0.204	0.680	0.002	0.014	0.013	0.046
PUERTO RICO	All Vehicles	4.279	0.224	0.636	0.003	0.014	0.013	0.046
RHODE ISLAND	All Vehicles	3.207	0.210	0.697	0.003	0.015	0.014	0.046
SOUTH CAROLINA	All Vehicles	3.703	0.208	0.663	0.002	0.013	0.012	0.046
SOUTH DAKOTA	All Vehicles	3.639	0.212	0.682	0.002	0.014	0.013	0.045
TENNESSEE	All Vehicles	3.684	0.214	0.685	0.002	0.014	0.013	0.046
TEXAS	All Vehicles	3.561	0.202	0.652	0.002	0.013	0.012	0.046
UTAH	All Vehicles	3.361	0.215	0.714	0.002	0.014	0.013	0.046
VERMONT	All Vehicles	3.130	0.202	0.661	0.002	0.014	0.013	0.045
VIRGIN ISLANDS	All Vehicles	4.220	0.209	0.580	0.002	0.013	0.012	0.044
VIRGINIA	All Vehicles	3.486	0.206	0.674	0.002	0.014	0.012	0.046
WASHINGTON	All Vehicles	3.396	0.198	0.700	0.002	0.014	0.013	0.046
WEST VIRGINIA	All Vehicles	3.499	0.207	0.668	0.002	0.014	0.013	0.045
WISCONSIN	All Vehicles	3.474	0.211	0.677	0.002	0.014	0.013	0.045
WYOMING	All Vehicles	3.496	0.216	0.698	0.002	0.014	0.013	0.045

4967
4968

4969 **Table 5-17. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2027 GOV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	3.593	0.199	0.613	0.002	0.012	0.011	0.045
ALASKA	All Vehicles	4.110	0.225	0.652	0.002	0.013	0.012	0.045
ARIZONA	All Vehicles	3.541	0.203	0.654	0.002	0.012	0.011	0.045
ARKANSAS	All Vehicles	3.551	0.196	0.606	0.002	0.012	0.011	0.044
CALIFORNIA	All Vehicles	3.031	0.159	0.611	0.002	0.012	0.011	0.045
COLORADO	All Vehicles	3.192	0.202	0.647	0.002	0.013	0.012	0.045
CONNECTICUT	All Vehicles	3.040	0.194	0.629	0.002	0.013	0.012	0.045
DELAWARE	All Vehicles	3.136	0.179	0.628	0.002	0.013	0.012	0.045
DISTRICT OF COLUMBIA	All Vehicles	3.224	0.185	0.682	0.003	0.014	0.013	0.046
FLORIDA	All Vehicles	3.910	0.208	0.614	0.002	0.013	0.012	0.046
GEORGIA	All Vehicles	3.448	0.196	0.624	0.002	0.013	0.012	0.045
HAWAII	All Vehicles	3.814	0.213	0.611	0.002	0.013	0.012	0.045
IDAHO	All Vehicles	3.259	0.200	0.641	0.002	0.013	0.012	0.044
ILLINOIS	All Vehicles	3.287	0.200	0.634	0.002	0.013	0.012	0.045
INDIANA	All Vehicles	3.434	0.204	0.639	0.002	0.013	0.012	0.045
IOWA	All Vehicles	3.427	0.204	0.622	0.002	0.013	0.012	0.044
KANSAS	All Vehicles	3.504	0.200	0.619	0.002	0.013	0.012	0.044
KENTUCKY	All Vehicles	3.469	0.194	0.612	0.002	0.012	0.011	0.045
LOUISIANA	All Vehicles	3.669	0.192	0.594	0.002	0.012	0.011	0.045
MAINE	All Vehicles	3.207	0.196	0.616	0.002	0.013	0.012	0.044
MARYLAND	All Vehicles	3.147	0.192	0.622	0.002	0.013	0.012	0.045
MASSACHUSETTS	All Vehicles	3.064	0.200	0.654	0.003	0.014	0.013	0.045
MICHIGAN	All Vehicles	3.434	0.208	0.644	0.002	0.014	0.012	0.045
MINNESOTA	All Vehicles	3.494	0.210	0.636	0.002	0.014	0.012	0.044
MISSISSIPPI	All Vehicles	3.566	0.192	0.590	0.002	0.012	0.011	0.044
MISSOURI	All Vehicles	3.361	0.193	0.609	0.002	0.012	0.011	0.044
MONTANA	All Vehicles	3.341	0.203	0.638	0.002	0.013	0.012	0.044
NEBRASKA	All Vehicles	3.466	0.203	0.626	0.002	0.013	0.012	0.044
NEVADA	All Vehicles	3.386	0.196	0.673	0.002	0.014	0.012	0.045
NEW HAMPSHIRE	All Vehicles	3.022	0.192	0.617	0.002	0.013	0.012	0.044
NEW JERSEY	All Vehicles	3.026	0.161	0.590	0.002	0.012	0.011	0.044
NEW MEXICO	All Vehicles	3.350	0.198	0.636	0.002	0.012	0.011	0.044
NEW YORK	All Vehicles	3.040	0.193	0.630	0.002	0.013	0.012	0.045
NORTH CAROLINA	All Vehicles	3.341	0.193	0.618	0.002	0.013	0.011	0.045
NORTH DAKOTA	All Vehicles	3.524	0.212	0.633	0.002	0.014	0.012	0.044
OHIO	All Vehicles	3.365	0.202	0.632	0.002	0.013	0.012	0.045
OKLAHOMA	All Vehicles	3.551	0.198	0.609	0.002	0.012	0.011	0.044
OREGON	All Vehicles	3.110	0.184	0.630	0.002	0.012	0.011	0.045
PACIFIC ISLANDS	All Vehicles	3.298	0.188	0.619	0.002	0.012	0.011	0.045
PENNSYLVANIA	All Vehicles	3.186	0.192	0.623	0.002	0.013	0.012	0.045
PUERTO RICO	All Vehicles	4.113	0.209	0.583	0.002	0.012	0.011	0.045
RHODE ISLAND	All Vehicles	3.086	0.198	0.639	0.002	0.013	0.012	0.045
SOUTH CAROLINA	All Vehicles	3.567	0.195	0.607	0.002	0.012	0.011	0.045
SOUTH DAKOTA	All Vehicles	3.510	0.200	0.624	0.002	0.013	0.011	0.044
TENNESSEE	All Vehicles	3.545	0.201	0.627	0.002	0.013	0.012	0.045
TEXAS	All Vehicles	3.430	0.189	0.598	0.002	0.012	0.011	0.045
UTAH	All Vehicles	3.237	0.202	0.654	0.002	0.013	0.012	0.045
VERMONT	All Vehicles	3.023	0.191	0.606	0.002	0.013	0.012	0.044
VIRGIN ISLANDS	All Vehicles	4.067	0.195	0.531	0.002	0.011	0.010	0.044
VIRGINIA	All Vehicles	3.358	0.193	0.617	0.002	0.012	0.011	0.045
WASHINGTON	All Vehicles	3.270	0.186	0.641	0.002	0.013	0.011	0.045
WEST VIRGINIA	All Vehicles	3.373	0.195	0.612	0.002	0.012	0.011	0.044
WISCONSIN	All Vehicles	3.349	0.199	0.621	0.002	0.013	0.012	0.044
WYOMING	All Vehicles	3.374	0.204	0.639	0.002	0.013	0.011	0.044

4970
4971

4972 **Table 5-18. Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors – 2028 GOV**

State	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
ALABAMA	All Vehicles	3.187	0.176	0.513	0.002	0.010	0.009	0.044
ALASKA	All Vehicles	3.710	0.205	0.548	0.002	0.011	0.010	0.044
ARIZONA	All Vehicles	3.128	0.179	0.545	0.002	0.010	0.009	0.045
ARKANSAS	All Vehicles	3.155	0.175	0.506	0.002	0.010	0.009	0.044
CALIFORNIA	All Vehicles	2.673	0.139	0.510	0.002	0.010	0.009	0.044
COLORADO	All Vehicles	2.838	0.181	0.543	0.002	0.011	0.010	0.044
CONNECTICUT	All Vehicles	2.689	0.174	0.528	0.002	0.011	0.010	0.044
DELAWARE	All Vehicles	2.769	0.159	0.528	0.002	0.011	0.010	0.045
DISTRICT OF COLUMBIA	All Vehicles	2.846	0.163	0.579	0.003	0.012	0.011	0.046
FLORIDA	All Vehicles	3.465	0.183	0.515	0.002	0.010	0.009	0.045
GEORGIA	All Vehicles	3.053	0.173	0.523	0.002	0.010	0.009	0.045
HAWAII	All Vehicles	3.388	0.188	0.514	0.002	0.011	0.010	0.045
IDAHO	All Vehicles	2.901	0.179	0.537	0.002	0.011	0.010	0.044
ILLINOIS	All Vehicles	2.917	0.179	0.533	0.002	0.011	0.010	0.045
INDIANA	All Vehicles	3.056	0.182	0.537	0.002	0.011	0.010	0.045
IOWA	All Vehicles	3.057	0.184	0.520	0.002	0.011	0.010	0.044
KANSAS	All Vehicles	3.121	0.178	0.517	0.002	0.011	0.010	0.044
KENTUCKY	All Vehicles	3.086	0.173	0.510	0.002	0.010	0.009	0.044
LOUISIANA	All Vehicles	3.250	0.170	0.495	0.002	0.010	0.009	0.044
MAINE	All Vehicles	2.856	0.176	0.515	0.002	0.011	0.010	0.044
MARYLAND	All Vehicles	2.781	0.171	0.521	0.002	0.011	0.010	0.044
MASSACHUSETTS	All Vehicles	2.711	0.179	0.552	0.002	0.012	0.010	0.045
MICHIGAN	All Vehicles	3.062	0.187	0.541	0.002	0.012	0.010	0.044
MINNESOTA	All Vehicles	3.125	0.189	0.533	0.002	0.011	0.010	0.044
MISSISSIPPI	All Vehicles	3.162	0.170	0.491	0.002	0.010	0.009	0.044
MISSOURI	All Vehicles	2.984	0.172	0.508	0.002	0.010	0.009	0.044
MONTANA	All Vehicles	2.984	0.182	0.533	0.002	0.011	0.010	0.044
NEBRASKA	All Vehicles	3.093	0.183	0.523	0.002	0.011	0.010	0.044
NEVADA	All Vehicles	2.999	0.174	0.564	0.002	0.011	0.010	0.045
NEW HAMPSHIRE	All Vehicles	2.678	0.172	0.516	0.002	0.011	0.010	0.044
NEW JERSEY	All Vehicles	2.673	0.143	0.489	0.002	0.010	0.009	0.044
NEW MEXICO	All Vehicles	2.975	0.177	0.530	0.002	0.010	0.009	0.044
NEW YORK	All Vehicles	2.690	0.173	0.529	0.002	0.011	0.010	0.044
NORTH CAROLINA	All Vehicles	2.959	0.171	0.518	0.002	0.010	0.009	0.044
NORTH DAKOTA	All Vehicles	3.158	0.191	0.530	0.002	0.012	0.011	0.044
OHIO	All Vehicles	2.994	0.181	0.530	0.002	0.011	0.010	0.044
OKLAHOMA	All Vehicles	3.156	0.176	0.508	0.002	0.010	0.009	0.044
OREGON	All Vehicles	2.761	0.164	0.528	0.002	0.010	0.009	0.044
PACIFIC ISLANDS	All Vehicles	2.923	0.167	0.518	0.002	0.010	0.009	0.044
PENNSYLVANIA	All Vehicles	2.825	0.171	0.522	0.002	0.011	0.010	0.044
PUERTO RICO	All Vehicles	3.642	0.183	0.486	0.002	0.010	0.009	0.045
RHODE ISLAND	All Vehicles	2.732	0.177	0.538	0.002	0.011	0.010	0.045
SOUTH CAROLINA	All Vehicles	3.166	0.173	0.506	0.002	0.010	0.009	0.044
SOUTH DAKOTA	All Vehicles	3.140	0.180	0.521	0.002	0.011	0.010	0.044
TENNESSEE	All Vehicles	3.151	0.179	0.526	0.002	0.011	0.010	0.045
TEXAS	All Vehicles	3.027	0.166	0.498	0.002	0.010	0.009	0.044
UTAH	All Vehicles	2.876	0.181	0.549	0.002	0.011	0.010	0.044
VERMONT	All Vehicles	2.683	0.171	0.506	0.002	0.011	0.010	0.044
VIRGIN ISLANDS	All Vehicles	3.586	0.170	0.438	0.002	0.009	0.008	0.043
VIRGINIA	All Vehicles	2.979	0.172	0.516	0.002	0.010	0.009	0.044
WASHINGTON	All Vehicles	2.914	0.167	0.538	0.002	0.010	0.009	0.044
WEST VIRGINIA	All Vehicles	3.001	0.174	0.511	0.002	0.010	0.009	0.044
WISCONSIN	All Vehicles	2.987	0.179	0.519	0.002	0.011	0.010	0.044
WYOMING	All Vehicles	3.014	0.184	0.533	0.002	0.011	0.010	0.044

4973
4974

4975 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.527	0.305	0.164	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.089	0.255	0.217	0.002	0.005	0.004	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.927	0.904	0.736	0.005	0.021	0.019	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.385	0.097	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.362	0.201	0.474	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.592	0.135	2.591	0.004	0.060	0.055	0.065
	Gasoline	MC	Motorcycles	12.869	2.905	0.628	0.002	0.023	0.020	0.053
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.791	0.317	0.177	0.001	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	5.231	0.278	0.230	0.002	0.007	0.006	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	15.126	0.827	0.721	0.003	0.023	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.450	0.147	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.528	0.241	0.487	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.529	0.166	2.765	0.004	0.058	0.053	0.065
	Gasoline	MC	Motorcycles	13.313	1.971	0.734	0.001	0.017	0.015	0.053
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.239	0.310	0.163	0.001	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.912	0.267	0.218	0.001	0.005	0.004	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.454	0.915	0.732	0.003	0.021	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.731	0.090	0.156	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.763	0.199	0.521	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.618	0.132	2.808	0.004	0.060	0.055	0.065
	Gasoline	MC	Motorcycles	12.805	3.375	0.742	0.001	0.023	0.020	0.053
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.448	0.304	0.169	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.058	0.252	0.224	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.708	0.863	0.737	0.005	0.022	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.212	0.101	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.250	0.199	0.478	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.538	0.131	2.538	0.004	0.057	0.053	0.065
	Gasoline	MC	Motorcycles	13.090	2.759	0.659	0.002	0.023	0.021	0.054
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.789	0.288	0.168	0.002	0.005	0.005	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.514	0.249	0.224	0.002	0.006	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.833	0.793	0.754	0.005	0.023	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.747	0.115	0.148	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.844	0.217	0.492	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.555	0.148	2.745	0.004	0.059	0.054	0.065
	Gasoline	MC	Motorcycles	12.581	2.678	0.758	0.002	0.022	0.019	0.053
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.459	0.256	0.145	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.281	0.234	0.198	0.002	0.006	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.301	0.784	0.680	0.005	0.022	0.020	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.740	0.109	0.143	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.880	0.220	0.480	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.600	0.158	2.723	0.004	0.061	0.056	0.064
	Gasoline	MC	Motorcycles	12.210	2.479	0.683	0.002	0.022	0.019	0.053
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.668	0.257	0.158	0.002	0.005	0.004	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.404	0.220	0.210	0.002	0.005	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.770	0.676	0.714	0.005	0.022	0.019	0.096
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.008	0.107	0.144	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.039	0.214	0.476	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.613	0.152	2.710	0.004	0.062	0.057	0.064
	Gasoline	MC	Motorcycles	12.145	2.410	0.657	0.002	0.022	0.019	0.052
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.704	0.247	0.146	0.002	0.005	0.004	0.056
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.430	0.219	0.194	0.002	0.005	0.005	0.048
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.775	0.664	0.713	0.005	0.023	0.021	0.101
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.243	0.105	0.142	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.235	0.228	0.476	0.002	0.006	0.005	0.019
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.805	0.183	3.005	0.004	0.071	0.066	0.063
	Gasoline	MC	Motorcycles	12.040	2.539	0.616	0.002	0.022	0.019	0.049

4976
4977

4978 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.941	0.313	0.152	0.002	0.004	0.003	0.055
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.459	0.276	0.203	0.002	0.004	0.004	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.675	1.004	0.722	0.005	0.021	0.018	0.097
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.030	0.085	0.143	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.969	0.201	0.472	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.709	0.139	2.625	0.004	0.064	0.059	0.064
	Gasoline	MC	Motorcycles	12.807	3.230	0.549	0.002	0.023	0.020	0.051
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.176	0.285	0.159	0.002	0.004	0.004	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.840	0.250	0.213	0.002	0.005	0.004	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.585	0.895	0.727	0.005	0.022	0.019	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.306	0.097	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.325	0.206	0.476	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.624	0.143	2.655	0.004	0.062	0.057	0.064
	Gasoline	MC	Motorcycles	12.865	2.923	0.631	0.002	0.023	0.020	0.052
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.830	0.319	0.151	0.002	0.004	0.004	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.345	0.283	0.203	0.002	0.005	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.610	1.055	0.730	0.005	0.023	0.020	0.097
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.704	0.080	0.141	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.655	0.194	0.464	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.696	0.137	2.606	0.004	0.065	0.060	0.063
	Gasoline	MC	Motorcycles	13.428	3.131	0.589	0.002	0.024	0.021	0.051
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.055	0.301	0.182	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.667	0.247	0.237	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.074	0.789	0.766	0.005	0.023	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.747	0.122	0.150	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.785	0.214	0.490	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.522	0.143	2.703	0.004	0.057	0.052	0.065
	Gasoline	MC	Motorcycles	12.584	2.501	0.778	0.002	0.021	0.019	0.054
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.016	0.282	0.163	0.002	0.005	0.005	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.708	0.249	0.217	0.002	0.006	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.254	0.829	0.725	0.005	0.023	0.020	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.917	0.113	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.986	0.220	0.480	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.596	0.153	2.720	0.004	0.060	0.056	0.065
	Gasoline	MC	Motorcycles	12.305	2.481	0.676	0.002	0.022	0.019	0.052
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.317	0.294	0.171	0.002	0.005	0.005	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.914	0.253	0.226	0.002	0.006	0.006	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.675	0.859	0.760	0.005	0.024	0.021	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.932	0.114	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.953	0.217	0.477	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.591	0.151	2.706	0.004	0.060	0.056	0.065
	Gasoline	MC	Motorcycles	12.906	2.530	0.683	0.002	0.023	0.020	0.052
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.373	0.313	0.180	0.002	0.006	0.006	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.946	0.256	0.235	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.490	0.816	0.756	0.005	0.025	0.022	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.791	0.122	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.830	0.212	0.479	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.509	0.140	2.598	0.004	0.056	0.052	0.065
	Gasoline	MC	Motorcycles	13.118	2.393	0.718	0.002	0.023	0.021	0.054
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.392	0.304	0.175	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.022	0.253	0.233	0.002	0.006	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.626	0.832	0.751	0.004	0.023	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.016	0.110	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.086	0.205	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.522	0.133	2.586	0.004	0.056	0.052	0.066
	Gasoline	MC	Motorcycles	13.090	2.629	0.699	0.002	0.024	0.021	0.054

4979
4980

4981 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.330	0.295	0.171	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.977	0.245	0.227	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.664	0.830	0.731	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.984	0.108	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.064	0.203	0.481	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.518	0.130	2.566	0.004	0.056	0.051	0.066
	Gasoline	MC	Motorcycles	12.853	2.574	0.687	0.002	0.023	0.020	0.055
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.551	0.301	0.156	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.164	0.251	0.209	0.002	0.005	0.004	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.926	0.861	0.701	0.005	0.020	0.018	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.635	0.092	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.654	0.195	0.477	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.578	0.127	2.512	0.004	0.058	0.053	0.065
	Gasoline	MC	Motorcycles	12.900	2.969	0.601	0.002	0.023	0.020	0.053
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.075	0.298	0.178	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.659	0.240	0.230	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.010	0.759	0.733	0.005	0.024	0.021	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.494	0.129	0.148	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.559	0.212	0.478	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.474	0.140	2.586	0.004	0.055	0.051	0.065
	Gasoline	MC	Motorcycles	12.519	2.140	0.754	0.002	0.022	0.020	0.055
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.678	0.265	0.156	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.438	0.238	0.209	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.715	0.814	0.696	0.005	0.021	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.941	0.104	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.047	0.212	0.481	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.591	0.149	2.676	0.004	0.060	0.055	0.064
	Gasoline	MC	Motorcycles	12.293	2.566	0.670	0.002	0.022	0.019	0.053
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.596	0.264	0.157	0.002	0.005	0.004	0.055
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.384	0.245	0.210	0.002	0.006	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.669	0.822	0.713	0.005	0.024	0.021	0.097
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.784	0.113	0.142	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.883	0.229	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.668	0.173	2.850	0.004	0.065	0.060	0.063
	Gasoline	MC	Motorcycles	12.154	2.499	0.673	0.002	0.022	0.019	0.051
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.328	0.295	0.177	0.002	0.006	0.005	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.960	0.258	0.235	0.002	0.007	0.006	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.686	0.843	0.777	0.005	0.025	0.022	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.761	0.119	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.830	0.222	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.574	0.155	2.710	0.004	0.060	0.055	0.065
	Gasoline	MC	Motorcycles	13.012	2.415	0.710	0.002	0.023	0.021	0.053
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.506	0.304	0.182	0.002	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.095	0.260	0.238	0.002	0.007	0.006	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.892	0.813	0.778	0.005	0.025	0.022	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.646	0.125	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.716	0.221	0.480	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.529	0.154	2.655	0.004	0.058	0.053	0.064
	Gasoline	MC	Motorcycles	13.022	2.298	0.742	0.002	0.023	0.020	0.054
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.483	0.308	0.163	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.070	0.247	0.216	0.002	0.005	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.717	0.870	0.711	0.005	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.334	0.097	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.340	0.192	0.474	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.525	0.125	2.472	0.004	0.057	0.052	0.065
	Gasoline	MC	Motorcycles	12.924	2.824	0.639	0.002	0.023	0.020	0.054

4982
4983

4984 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.109	0.289	0.166	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.806	0.245	0.221	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.304	0.811	0.717	0.005	0.022	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.980	0.108	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.076	0.205	0.481	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.523	0.133	2.569	0.004	0.056	0.052	0.066
	Gasoline	MC	Motorcycles	12.722	2.539	0.684	0.002	0.023	0.020	0.055
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.272	0.315	0.189	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.833	0.251	0.246	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.326	0.769	0.775	0.004	0.023	0.020	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.619	0.130	0.151	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.675	0.214	0.490	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.483	0.138	2.658	0.004	0.055	0.050	0.066
	Gasoline	MC	Motorcycles	12.631	2.343	0.795	0.002	0.022	0.019	0.055
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.387	0.310	0.181	0.002	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.995	0.256	0.237	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.573	0.817	0.759	0.004	0.024	0.022	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.860	0.119	0.148	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.925	0.211	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.510	0.136	2.613	0.004	0.056	0.051	0.066
	Gasoline	MC	Motorcycles	13.129	2.519	0.724	0.002	0.023	0.021	0.055
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.038	0.303	0.174	0.002	0.005	0.005	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.709	0.257	0.230	0.002	0.006	0.006	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.327	0.750	0.787	0.005	0.025	0.022	0.096
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.370	0.098	0.153	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.400	0.209	0.514	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.634	0.143	2.892	0.004	0.061	0.056	0.065
	Gasoline	MC	Motorcycles	13.382	3.107	0.762	0.002	0.024	0.021	0.052
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.596	0.273	0.161	0.002	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.355	0.236	0.213	0.002	0.007	0.006	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.542	0.764	0.696	0.005	0.023	0.021	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.614	0.120	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.719	0.217	0.482	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.523	0.147	2.648	0.004	0.057	0.053	0.065
	Gasoline	MC	Motorcycles	12.455	2.308	0.729	0.002	0.022	0.020	0.054
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.556	0.261	0.160	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.282	0.198	0.204	0.002	0.005	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.240	0.550	0.649	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.791	0.115	0.151	0.001	0.003	0.003	0.015
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.895	0.196	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.458	0.121	2.521	0.004	0.053	0.049	0.067
	Gasoline	MC	Motorcycles	12.280	2.156	0.726	0.002	0.022	0.019	0.057
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.141	0.316	0.182	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.778	0.254	0.239	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.203	0.830	0.771	0.004	0.022	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.952	0.108	0.153	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.003	0.200	0.499	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.508	0.129	2.668	0.004	0.056	0.051	0.066
	Gasoline	MC	Motorcycles	13.111	2.910	0.780	0.002	0.023	0.021	0.055
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.511	0.260	0.148	0.002	0.005	0.005	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.244	0.230	0.196	0.002	0.006	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.163	0.775	0.680	0.005	0.023	0.021	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.752	0.113	0.143	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.847	0.220	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.593	0.157	2.726	0.004	0.061	0.056	0.064
	Gasoline	MC	Motorcycles	12.513	2.422	0.694	0.002	0.022	0.020	0.053

4985
4986

4987 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.022	0.285	0.162	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.710	0.245	0.217	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.294	0.861	0.726	0.005	0.022	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.121	0.101	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.155	0.204	0.476	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.581	0.139	2.622	0.004	0.060	0.055	0.065
	Gasoline	MC	Motorcycles	12.894	2.782	0.657	0.002	0.023	0.020	0.053
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.672	0.324	0.188	0.002	0.007	0.006	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.156	0.263	0.243	0.002	0.008	0.007	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.873	0.791	0.772	0.004	0.026	0.023	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.614	0.136	0.149	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.654	0.220	0.483	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.489	0.146	2.634	0.004	0.056	0.051	0.065
	Gasoline	MC	Motorcycles	13.048	2.213	0.773	0.002	0.023	0.020	0.054
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.161	0.286	0.168	0.002	0.005	0.005	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.827	0.250	0.224	0.002	0.006	0.006	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.403	0.841	0.748	0.005	0.024	0.021	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.819	0.113	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.894	0.216	0.477	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.572	0.151	2.672	0.004	0.060	0.055	0.064
	Gasoline	MC	Motorcycles	13.065	2.534	0.695	0.002	0.023	0.021	0.053
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.449	0.307	0.171	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.065	0.254	0.227	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.686	0.858	0.744	0.005	0.022	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.192	0.102	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.239	0.199	0.482	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.529	0.130	2.544	0.004	0.057	0.052	0.065
	Gasoline	MC	Motorcycles	13.102	2.793	0.676	0.002	0.023	0.021	0.054
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.731	0.270	0.169	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.422	0.226	0.221	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.804	0.715	0.735	0.005	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.665	0.113	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.739	0.212	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.546	0.143	2.683	0.004	0.058	0.054	0.065
	Gasoline	MC	Motorcycles	12.560	2.378	0.743	0.002	0.022	0.019	0.053
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.982	0.276	0.160	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.671	0.236	0.214	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.176	0.795	0.715	0.004	0.021	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.005	0.103	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.070	0.206	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.569	0.139	2.637	0.004	0.059	0.054	0.065
	Gasoline	MC	Motorcycles	12.681	2.643	0.680	0.002	0.023	0.020	0.053
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.815	0.272	0.162	0.002	0.005	0.005	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.529	0.237	0.215	0.002	0.006	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.923	0.804	0.714	0.005	0.023	0.020	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.818	0.113	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.905	0.215	0.480	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.557	0.145	2.665	0.004	0.058	0.054	0.065
	Gasoline	MC	Motorcycles	12.803	2.490	0.700	0.002	0.023	0.020	0.053
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.175	0.315	0.142	0.002	0.004	0.003	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.736	0.284	0.193	0.002	0.004	0.004	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.927	1.020	0.680	0.005	0.020	0.017	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.369	0.078	0.142	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.367	0.194	0.472	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.688	0.130	2.475	0.004	0.062	0.057	0.064
	Gasoline	MC	Motorcycles	12.863	3.350	0.524	0.002	0.023	0.020	0.052

4988
4989

4990 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.518	0.262	0.147	0.002	0.005	0.004	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.322	0.237	0.199	0.002	0.006	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.529	0.801	0.698	0.005	0.023	0.020	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.763	0.111	0.142	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.877	0.223	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.622	0.161	2.768	0.004	0.062	0.057	0.064
	Gasoline	MC	Motorcycles	12.181	2.484	0.678	0.002	0.022	0.019	0.052
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.467	0.303	0.166	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.067	0.250	0.220	0.002	0.005	0.004	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.824	0.877	0.729	0.005	0.021	0.018	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.301	0.098	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.320	0.197	0.478	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.553	0.129	2.556	0.004	0.058	0.053	0.066
	Gasoline	MC	Motorcycles	12.906	2.835	0.646	0.002	0.023	0.020	0.054
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.529	0.310	0.186	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.105	0.250	0.242	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.845	0.775	0.754	0.004	0.023	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.709	0.127	0.151	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.806	0.211	0.489	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.472	0.132	2.594	0.004	0.054	0.049	0.067
	Gasoline	MC	Motorcycles	13.073	2.343	0.769	0.002	0.023	0.020	0.056
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.431	0.296	0.168	0.002	0.005	0.004	0.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.053	0.256	0.224	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.902	0.887	0.754	0.005	0.022	0.020	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.160	0.103	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.205	0.208	0.478	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.593	0.141	2.651	0.004	0.060	0.055	0.065
	Gasoline	MC	Motorcycles	12.970	2.806	0.655	0.002	0.023	0.020	0.053
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.085	0.283	0.149	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.769	0.243	0.200	0.002	0.005	0.004	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.162	0.861	0.684	0.005	0.020	0.017	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.551	0.091	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.588	0.196	0.482	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.582	0.130	2.550	0.004	0.059	0.054	0.065
	Gasoline	MC	Motorcycles	12.323	2.931	0.618	0.002	0.022	0.019	0.053
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.865	0.288	0.172	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.588	0.252	0.229	0.002	0.006	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.905	0.807	0.759	0.005	0.023	0.020	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.877	0.114	0.149	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.963	0.218	0.498	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.572	0.149	2.788	0.004	0.059	0.054	0.065
	Gasoline	MC	Motorcycles	12.566	2.704	0.768	0.002	0.022	0.019	0.053
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.700	0.291	0.168	0.002	0.007	0.006	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.373	0.234	0.217	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.461	0.741	0.693	0.004	0.025	0.022	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.534	0.129	0.148	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.600	0.212	0.480	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.472	0.139	2.583	0.004	0.055	0.051	0.065
	Gasoline	MC	Motorcycles	12.935	2.165	0.762	0.002	0.023	0.021	0.055
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.250	0.337	0.144	0.002	0.004	0.003	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.700	0.259	0.188	0.002	0.004	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.441	0.963	0.638	0.005	0.019	0.017	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.455	0.081	0.148	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.312	0.175	0.466	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.537	0.114	2.211	0.004	0.057	0.052	0.063
	Gasoline	MC	Motorcycles	12.900	2.838	0.539	0.002	0.023	0.020	0.054

4991
4992

4993 **Table 5-19. On-Road Vehicle Criteria Pollutant Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.097	0.282	0.164	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.778	0.242	0.219	0.002	0.005	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.381	0.828	0.727	0.005	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.970	0.105	0.145	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.053	0.206	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.553	0.137	2.612	0.004	0.058	0.053	0.065
	Gasoline	MC	Motorcycles	12.557	2.597	0.673	0.002	0.022	0.020	0.054
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.000	0.268	0.176	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.698	0.230	0.236	0.002	0.006	0.005	0.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.354	0.698	0.774	0.005	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.601	0.113	0.144	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.719	0.216	0.479	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.556	0.147	2.698	0.004	0.059	0.054	0.065
	Gasoline	MC	Motorcycles	12.583	2.338	0.738	0.002	0.021	0.019	0.053
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.225	0.295	0.174	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.863	0.244	0.229	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.446	0.817	0.741	0.004	0.022	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.769	0.112	0.146	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.846	0.205	0.476	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.505	0.135	2.560	0.004	0.056	0.052	0.065
	Gasoline	MC	Motorcycles	13.058	2.508	0.709	0.002	0.023	0.021	0.055
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.263	0.297	0.177	0.002	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.868	0.246	0.231	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.465	0.779	0.741	0.004	0.024	0.021	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.628	0.125	0.147	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.703	0.215	0.480	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.498	0.143	2.606	0.004	0.056	0.052	0.065
	Gasoline	MC	Motorcycles	12.765	2.243	0.743	0.002	0.022	0.020	0.055
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.309	0.321	0.191	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.881	0.254	0.249	0.002	0.007	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.370	0.765	0.772	0.004	0.023	0.020	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.640	0.130	0.153	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.719	0.213	0.496	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.473	0.134	2.659	0.004	0.054	0.050	0.067
	Gasoline	MC	Motorcycles	12.653	2.411	0.807	0.002	0.022	0.019	0.056

4994
4995

4996 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.372	0.297	0.144	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.860	0.242	0.192	0.002	0.005	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.333	0.887	0.676	0.005	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.738	0.101	0.152	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.454	0.205	0.480	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.540	0.121	2.434	0.004	0.051	0.047	0.066
	Gasoline	MC	Motorcycles	12.704	2.900	0.626	0.002	0.023	0.020	0.053
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.566	0.308	0.158	0.001	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.936	0.265	0.205	0.002	0.006	0.006	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	14.366	0.809	0.664	0.003	0.022	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.741	0.150	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.602	0.246	0.492	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.480	0.152	2.594	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	13.103	1.973	0.732	0.001	0.017	0.015	0.054
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.088	0.301	0.143	0.001	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.690	0.253	0.192	0.001	0.005	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.908	0.900	0.673	0.003	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.107	0.094	0.163	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.864	0.203	0.528	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.565	0.117	2.637	0.004	0.051	0.047	0.066
	Gasoline	MC	Motorcycles	12.643	3.366	0.740	0.001	0.023	0.020	0.053
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.299	0.296	0.148	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.834	0.239	0.198	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.161	0.848	0.677	0.005	0.022	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.553	0.105	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.339	0.203	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.488	0.117	2.380	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	12.925	2.755	0.657	0.002	0.023	0.021	0.054
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.658	0.281	0.149	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.323	0.238	0.199	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.350	0.779	0.694	0.005	0.023	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.057	0.119	0.154	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.925	0.222	0.498	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.505	0.134	2.577	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.420	2.677	0.755	0.002	0.022	0.019	0.054
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.330	0.250	0.128	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.094	0.224	0.175	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.838	0.772	0.627	0.005	0.022	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.051	0.113	0.149	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.961	0.224	0.486	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.549	0.143	2.560	0.004	0.052	0.048	0.064
	Gasoline	MC	Motorcycles	12.050	2.476	0.681	0.002	0.022	0.019	0.053
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.530	0.251	0.138	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.205	0.210	0.185	0.002	0.005	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.260	0.665	0.657	0.005	0.022	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.337	0.111	0.151	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.124	0.219	0.482	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.561	0.136	2.549	0.004	0.053	0.049	0.065
	Gasoline	MC	Motorcycles	11.986	2.406	0.655	0.002	0.022	0.019	0.052
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.564	0.241	0.128	0.002	0.004	0.004	0.055
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.234	0.209	0.171	0.002	0.005	0.005	0.046
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.209	0.654	0.658	0.005	0.024	0.021	0.099
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.589	0.109	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.324	0.234	0.483	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.746	0.164	2.842	0.004	0.061	0.056	0.064
	Gasoline	MC	Motorcycles	11.882	2.534	0.614	0.002	0.022	0.019	0.049

4997
4998

4999 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.772	0.304	0.133	0.002	0.004	0.003	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.209	0.261	0.180	0.002	0.004	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.999	0.985	0.664	0.005	0.021	0.019	0.096
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.427	0.089	0.150	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.075	0.206	0.479	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.652	0.123	2.472	0.004	0.055	0.051	0.065
	Gasoline	MC	Motorcycles	12.644	3.222	0.547	0.002	0.023	0.020	0.051
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.030	0.278	0.140	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.624	0.237	0.189	0.002	0.005	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.043	0.880	0.672	0.005	0.022	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.654	0.101	0.150	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.416	0.211	0.482	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.571	0.127	2.497	0.004	0.053	0.048	0.065
	Gasoline	MC	Motorcycles	12.701	2.919	0.629	0.002	0.023	0.020	0.053
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.672	0.311	0.133	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.108	0.268	0.179	0.002	0.005	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.942	1.036	0.672	0.005	0.023	0.020	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.080	0.084	0.147	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.754	0.199	0.471	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.640	0.121	2.456	0.004	0.055	0.051	0.064
	Gasoline	MC	Motorcycles	13.263	3.122	0.587	0.002	0.024	0.021	0.051
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.916	0.294	0.160	0.002	0.005	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.465	0.236	0.210	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.579	0.775	0.704	0.005	0.023	0.020	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.056	0.125	0.156	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.864	0.219	0.496	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.473	0.129	2.535	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	12.422	2.500	0.776	0.002	0.021	0.019	0.054
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.868	0.274	0.144	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.493	0.237	0.192	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.727	0.815	0.668	0.005	0.023	0.021	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.239	0.116	0.151	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.070	0.224	0.486	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.545	0.138	2.556	0.004	0.052	0.047	0.066
	Gasoline	MC	Motorcycles	12.144	2.478	0.674	0.002	0.022	0.019	0.053
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.168	0.287	0.151	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.697	0.241	0.200	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.111	0.843	0.699	0.005	0.024	0.021	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.255	0.118	0.151	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.036	0.222	0.482	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.539	0.136	2.543	0.004	0.052	0.047	0.066
	Gasoline	MC	Motorcycles	12.741	2.528	0.681	0.002	0.023	0.020	0.053
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.226	0.305	0.159	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.731	0.244	0.208	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.975	0.800	0.695	0.005	0.025	0.022	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.103	0.125	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.910	0.216	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.461	0.126	2.435	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.952	2.391	0.716	0.002	0.023	0.021	0.055
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.245	0.296	0.155	0.002	0.005	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.802	0.241	0.206	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.105	0.816	0.690	0.005	0.023	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.343	0.113	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.171	0.209	0.489	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.473	0.120	2.424	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.925	2.627	0.697	0.002	0.024	0.021	0.055

5000
5001

5002 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.181	0.288	0.151	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.754	0.233	0.201	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.141	0.814	0.672	0.005	0.022	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.309	0.112	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.149	0.207	0.486	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.469	0.117	2.404	0.004	0.048	0.044	0.067
	Gasoline	MC	Motorcycles	12.688	2.571	0.685	0.002	0.023	0.020	0.055
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.395	0.293	0.137	0.002	0.004	0.003	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.930	0.238	0.185	0.002	0.004	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.355	0.845	0.644	0.005	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.005	0.096	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.751	0.200	0.483	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.526	0.113	2.357	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.735	2.963	0.599	0.002	0.023	0.020	0.054
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.932	0.291	0.157	0.002	0.006	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.455	0.229	0.204	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.528	0.745	0.673	0.005	0.024	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.786	0.132	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.633	0.216	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.426	0.127	2.423	0.004	0.047	0.043	0.066
	Gasoline	MC	Motorcycles	12.356	2.139	0.751	0.002	0.022	0.020	0.055
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.541	0.258	0.137	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.238	0.226	0.185	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.224	0.801	0.642	0.005	0.021	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.265	0.108	0.150	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.133	0.217	0.487	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.540	0.134	2.515	0.004	0.051	0.047	0.065
	Gasoline	MC	Motorcycles	12.133	2.563	0.668	0.002	0.022	0.019	0.053
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.455	0.257	0.138	0.002	0.005	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.180	0.233	0.186	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.164	0.808	0.658	0.005	0.024	0.021	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.099	0.116	0.149	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.963	0.234	0.483	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.614	0.156	2.686	0.004	0.055	0.051	0.064
	Gasoline	MC	Motorcycles	11.995	2.496	0.671	0.002	0.022	0.019	0.052
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.180	0.287	0.157	0.002	0.006	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.742	0.246	0.208	0.002	0.007	0.006	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.131	0.827	0.715	0.005	0.025	0.023	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.073	0.122	0.151	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.910	0.226	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.523	0.140	2.547	0.004	0.051	0.047	0.065
	Gasoline	MC	Motorcycles	12.846	2.414	0.708	0.002	0.023	0.021	0.053
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.351	0.296	0.161	0.002	0.006	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.873	0.248	0.212	0.002	0.007	0.006	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.334	0.797	0.715	0.005	0.025	0.022	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.949	0.129	0.152	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.794	0.226	0.486	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.480	0.140	2.492	0.004	0.050	0.046	0.065
	Gasoline	MC	Motorcycles	12.853	2.297	0.740	0.002	0.023	0.020	0.054
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.330	0.300	0.144	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.842	0.235	0.191	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.159	0.854	0.653	0.005	0.020	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.682	0.101	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.430	0.196	0.480	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.475	0.111	2.318	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.759	2.820	0.637	0.002	0.023	0.020	0.055

5003
5004

5005 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.964	0.282	0.146	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.591	0.233	0.196	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.807	0.797	0.659	0.005	0.022	0.019	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.305	0.112	0.153	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.161	0.209	0.487	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.474	0.120	2.408	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.559	2.536	0.682	0.002	0.023	0.020	0.055
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.128	0.307	0.168	0.002	0.006	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.625	0.239	0.218	0.002	0.006	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.832	0.754	0.711	0.004	0.023	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.919	0.133	0.158	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.751	0.218	0.496	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.435	0.125	2.489	0.004	0.047	0.043	0.067
	Gasoline	MC	Motorcycles	12.468	2.343	0.792	0.002	0.022	0.019	0.055
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.240	0.303	0.160	0.002	0.006	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.778	0.244	0.211	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.065	0.801	0.697	0.004	0.025	0.022	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.177	0.122	0.155	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.007	0.215	0.490	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.462	0.123	2.449	0.004	0.047	0.044	0.067
	Gasoline	MC	Motorcycles	12.963	2.517	0.722	0.002	0.023	0.021	0.055
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.899	0.295	0.152	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.501	0.244	0.203	0.002	0.006	0.006	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.808	0.739	0.725	0.005	0.025	0.022	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.723	0.102	0.161	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.493	0.213	0.520	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.581	0.128	2.719	0.004	0.052	0.048	0.066
	Gasoline	MC	Motorcycles	13.216	3.100	0.760	0.002	0.024	0.021	0.052
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.458	0.266	0.142	0.002	0.005	0.005	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.159	0.225	0.188	0.002	0.006	0.006	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.099	0.751	0.641	0.005	0.023	0.021	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.915	0.124	0.152	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.797	0.221	0.487	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.474	0.133	2.484	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	12.292	2.307	0.727	0.002	0.022	0.020	0.055
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.423	0.255	0.140	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.089	0.189	0.180	0.002	0.005	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.854	0.542	0.596	0.005	0.020	0.018	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.102	0.118	0.157	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.976	0.200	0.490	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.412	0.109	2.357	0.004	0.045	0.041	0.068
	Gasoline	MC	Motorcycles	12.119	2.154	0.723	0.002	0.022	0.019	0.057
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.000	0.308	0.160	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.567	0.241	0.211	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.715	0.815	0.708	0.004	0.022	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.275	0.111	0.160	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.086	0.204	0.505	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.460	0.115	2.500	0.004	0.048	0.044	0.067
	Gasoline	MC	Motorcycles	12.946	2.908	0.778	0.002	0.023	0.021	0.055
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.384	0.253	0.130	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.064	0.219	0.174	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.710	0.763	0.627	0.005	0.023	0.021	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.064	0.117	0.150	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.928	0.225	0.485	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.541	0.142	2.563	0.004	0.052	0.048	0.065
	Gasoline	MC	Motorcycles	12.351	2.420	0.692	0.002	0.022	0.020	0.053

5006
5007

5008 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.878	0.278	0.142	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.500	0.232	0.192	0.002	0.005	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.804	0.847	0.671	0.005	0.022	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.457	0.105	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.242	0.209	0.482	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.530	0.125	2.464	0.004	0.051	0.047	0.065
	Gasoline	MC	Motorcycles	12.730	2.778	0.655	0.002	0.023	0.020	0.053
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.513	0.316	0.167	0.002	0.007	0.006	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.934	0.251	0.216	0.002	0.008	0.007	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.341	0.776	0.710	0.004	0.026	0.023	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.914	0.139	0.156	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.730	0.224	0.489	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.441	0.133	2.468	0.004	0.047	0.044	0.066
	Gasoline	MC	Motorcycles	12.879	2.213	0.771	0.002	0.023	0.020	0.055
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.017	0.279	0.149	0.002	0.005	0.005	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.614	0.238	0.199	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.868	0.826	0.689	0.005	0.024	0.021	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.135	0.116	0.151	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.975	0.221	0.483	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.521	0.136	2.511	0.004	0.051	0.047	0.065
	Gasoline	MC	Motorcycles	12.899	2.532	0.693	0.002	0.023	0.021	0.053
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.300	0.299	0.151	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.841	0.241	0.201	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.144	0.842	0.684	0.005	0.022	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.531	0.106	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.327	0.203	0.488	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.479	0.116	2.385	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.937	2.789	0.674	0.002	0.023	0.021	0.055
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.600	0.263	0.149	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.230	0.215	0.196	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.323	0.703	0.677	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.970	0.116	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.817	0.216	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.496	0.129	2.518	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.399	2.376	0.741	0.002	0.022	0.019	0.054
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.841	0.270	0.141	0.002	0.004	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.463	0.225	0.189	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.658	0.782	0.658	0.004	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.333	0.106	0.151	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.156	0.210	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.518	0.125	2.476	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.518	2.640	0.678	0.002	0.023	0.020	0.054
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.678	0.264	0.142	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.328	0.225	0.190	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.443	0.790	0.658	0.005	0.023	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.134	0.117	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.987	0.219	0.486	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.506	0.131	2.502	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.638	2.488	0.698	0.002	0.023	0.020	0.054
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.998	0.306	0.125	0.002	0.004	0.003	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.471	0.268	0.171	0.002	0.004	0.004	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.248	1.001	0.626	0.005	0.020	0.018	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.788	0.082	0.149	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.481	0.199	0.479	0.002	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.631	0.115	2.328	0.004	0.053	0.049	0.065
	Gasoline	MC	Motorcycles	12.700	3.341	0.523	0.002	0.023	0.020	0.053

5009
5010

5011 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.388	0.256	0.129	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.136	0.226	0.176	0.002	0.006	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.042	0.788	0.643	0.005	0.023	0.020	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.075	0.115	0.149	0.001	0.003	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.958	0.228	0.485	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.569	0.146	2.605	0.004	0.053	0.049	0.065
	Gasoline	MC	Motorcycles	12.022	2.482	0.676	0.002	0.022	0.019	0.053
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.314	0.295	0.146	0.002	0.004	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.839	0.238	0.194	0.002	0.005	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.264	0.861	0.669	0.005	0.021	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.648	0.102	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.411	0.202	0.484	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.503	0.115	2.397	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	12.741	2.831	0.644	0.002	0.023	0.020	0.054
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.374	0.303	0.165	0.002	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.882	0.238	0.215	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.346	0.760	0.692	0.004	0.023	0.021	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.015	0.130	0.157	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.885	0.215	0.494	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.425	0.119	2.427	0.004	0.046	0.042	0.067
	Gasoline	MC	Motorcycles	12.904	2.343	0.767	0.002	0.023	0.020	0.056
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.280	0.288	0.148	0.002	0.005	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.826	0.243	0.199	0.002	0.005	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.326	0.870	0.693	0.005	0.022	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.498	0.106	0.151	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.293	0.213	0.484	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.541	0.126	2.490	0.004	0.051	0.047	0.066
	Gasoline	MC	Motorcycles	12.805	2.802	0.653	0.002	0.023	0.020	0.053
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.941	0.275	0.130	0.002	0.004	0.003	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.554	0.230	0.176	0.002	0.004	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.635	0.846	0.629	0.005	0.020	0.017	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.915	0.095	0.153	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.683	0.200	0.488	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.530	0.115	2.394	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.165	2.924	0.616	0.002	0.022	0.019	0.054
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.730	0.281	0.151	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.390	0.240	0.203	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.418	0.793	0.699	0.005	0.023	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.196	0.117	0.156	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.046	0.222	0.504	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.521	0.134	2.618	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.405	2.703	0.765	0.002	0.022	0.019	0.054
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.562	0.283	0.148	0.002	0.006	0.006	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.178	0.223	0.192	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.046	0.728	0.638	0.004	0.025	0.022	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.828	0.133	0.155	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.674	0.216	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.424	0.126	2.419	0.004	0.047	0.043	0.066
	Gasoline	MC	Motorcycles	12.770	2.164	0.760	0.002	0.023	0.021	0.056
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.071	0.328	0.127	0.002	0.004	0.003	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.436	0.244	0.166	0.002	0.004	0.003	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.784	0.945	0.585	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.877	0.085	0.155	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.421	0.180	0.473	0.001	0.005	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.484	0.100	2.073	0.004	0.048	0.045	0.064
	Gasoline	MC	Motorcycles	12.735	2.828	0.538	0.002	0.023	0.020	0.055

5012
5013

5014 **Table 5-20. On-Road Vehicle Criteria Pollutant Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.953	0.275	0.144	0.002	0.004	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.564	0.230	0.194	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.853	0.813	0.668	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.296	0.109	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.138	0.211	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.503	0.123	2.451	0.004	0.049	0.045	0.066
	Gasoline	MC	Motorcycles	12.394	2.594	0.671	0.002	0.022	0.020	0.054
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.864	0.262	0.156	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.494	0.220	0.209	0.002	0.005	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.829	0.686	0.712	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.902	0.116	0.150	0.001	0.003	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.797	0.220	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.506	0.133	2.534	0.004	0.050	0.046	0.066
	Gasoline	MC	Motorcycles	12.421	2.337	0.736	0.002	0.021	0.019	0.054
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.081	0.288	0.153	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.648	0.232	0.203	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.930	0.802	0.680	0.004	0.022	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.080	0.116	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.926	0.209	0.482	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.456	0.121	2.399	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.891	2.506	0.707	0.002	0.023	0.021	0.055
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.113	0.289	0.156	0.002	0.006	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.653	0.235	0.205	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.954	0.764	0.681	0.004	0.024	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.930	0.128	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.780	0.219	0.485	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.450	0.129	2.443	0.004	0.048	0.044	0.066
	Gasoline	MC	Motorcycles	12.599	2.242	0.741	0.002	0.022	0.020	0.055
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.164	0.313	0.170	0.002	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.671	0.243	0.221	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.891	0.750	0.709	0.004	0.023	0.020	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.942	0.134	0.160	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.796	0.216	0.501	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.426	0.121	2.489	0.004	0.046	0.042	0.067
	Gasoline	MC	Motorcycles	12.490	2.411	0.804	0.002	0.022	0.019	0.056

5015
5016

5017 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.203	0.264	0.126	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.555	0.214	0.155	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.511	0.798	0.600	0.005	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.860	0.099	0.150	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.024	0.155	0.415	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.492	0.108	2.300	0.004	0.044	0.041	0.066
	Gasoline	MC	Motorcycles	12.554	2.892	0.624	0.002	0.023	0.020	0.053
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.325	0.284	0.140	0.001	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.544	0.241	0.169	0.001	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	13.292	0.746	0.591	0.003	0.021	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.840	0.147	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.208	0.199	0.427	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.436	0.140	2.449	0.004	0.042	0.039	0.067
	Gasoline	MC	Motorcycles	12.911	1.975	0.730	0.001	0.017	0.015	0.054
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.909	0.269	0.120	0.001	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.389	0.226	0.152	0.001	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.123	0.811	0.593	0.003	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.238	0.092	0.161	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.410	0.153	0.457	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.516	0.104	2.490	0.004	0.044	0.040	0.067
	Gasoline	MC	Motorcycles	12.494	3.354	0.738	0.001	0.023	0.020	0.054
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.137	0.265	0.130	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.539	0.213	0.161	0.002	0.005	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.407	0.765	0.602	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.670	0.103	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.917	0.156	0.421	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.442	0.105	2.245	0.004	0.042	0.039	0.067
	Gasoline	MC	Motorcycles	12.774	2.747	0.656	0.002	0.023	0.021	0.055
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.518	0.255	0.131	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.081	0.217	0.163	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.720	0.712	0.618	0.005	0.021	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.164	0.116	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.516	0.174	0.432	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.459	0.122	2.434	0.004	0.043	0.040	0.066
	Gasoline	MC	Motorcycles	12.273	2.676	0.753	0.002	0.022	0.019	0.054
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.183	0.226	0.111	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.842	0.203	0.141	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.166	0.703	0.555	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.158	0.111	0.147	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.547	0.175	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.501	0.130	2.422	0.004	0.045	0.041	0.065
	Gasoline	MC	Motorcycles	11.903	2.468	0.679	0.002	0.022	0.019	0.054
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.360	0.225	0.115	0.002	0.004	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.926	0.187	0.144	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.480	0.587	0.575	0.005	0.021	0.018	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.450	0.108	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.704	0.168	0.416	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.513	0.123	2.412	0.004	0.045	0.042	0.066
	Gasoline	MC	Motorcycles	11.840	2.396	0.653	0.002	0.022	0.019	0.053
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.410	0.215	0.108	0.002	0.004	0.004	0.053
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.983	0.189	0.137	0.002	0.005	0.005	0.044
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.470	0.581	0.582	0.005	0.022	0.020	0.098
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.709	0.106	0.147	0.001	0.004	0.003	0.018
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.883	0.175	0.411	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.693	0.149	2.702	0.004	0.053	0.049	0.064
	Gasoline	MC	Motorcycles	11.738	2.523	0.613	0.002	0.022	0.019	0.050

5018
5019

5020 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.592	0.269	0.115	0.002	0.004	0.003	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.876	0.230	0.145	0.002	0.004	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.063	0.884	0.590	0.005	0.020	0.017	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.566	0.087	0.147	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.608	0.151	0.411	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.600	0.109	2.340	0.004	0.047	0.044	0.066
	Gasoline	MC	Motorcycles	12.495	3.208	0.546	0.002	0.023	0.020	0.052
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.870	0.246	0.121	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.329	0.209	0.152	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.260	0.793	0.598	0.005	0.020	0.018	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.775	0.099	0.148	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.983	0.159	0.416	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.523	0.115	2.362	0.004	0.045	0.042	0.066
	Gasoline	MC	Motorcycles	12.551	2.910	0.627	0.002	0.023	0.020	0.053
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.502	0.275	0.115	0.002	0.004	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.794	0.237	0.144	0.002	0.005	0.004	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.037	0.934	0.599	0.005	0.022	0.019	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.210	0.082	0.145	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.308	0.144	0.404	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.588	0.107	2.328	0.004	0.048	0.044	0.065
	Gasoline	MC	Motorcycles	13.112	3.102	0.586	0.002	0.024	0.021	0.052
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.755	0.266	0.139	0.002	0.005	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.194	0.212	0.169	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.874	0.703	0.621	0.005	0.021	0.019	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.162	0.123	0.155	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.463	0.173	0.431	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.428	0.117	2.392	0.004	0.042	0.038	0.067
	Gasoline	MC	Motorcycles	12.274	2.499	0.774	0.002	0.021	0.019	0.055
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.673	0.245	0.122	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.183	0.211	0.152	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.887	0.734	0.587	0.005	0.022	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.350	0.114	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.650	0.174	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.497	0.125	2.416	0.004	0.044	0.041	0.066
	Gasoline	MC	Motorcycles	11.997	2.471	0.672	0.002	0.022	0.019	0.053
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.005	0.258	0.132	0.002	0.005	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.409	0.216	0.163	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.332	0.765	0.621	0.005	0.023	0.020	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.366	0.115	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.620	0.172	0.417	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.492	0.124	2.405	0.004	0.044	0.041	0.066
	Gasoline	MC	Motorcycles	12.590	2.521	0.679	0.002	0.023	0.020	0.053
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.065	0.277	0.141	0.002	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.450	0.220	0.170	0.002	0.007	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.263	0.728	0.617	0.005	0.024	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.210	0.123	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.509	0.171	0.421	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.416	0.115	2.296	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.801	2.386	0.714	0.002	0.023	0.021	0.055
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.085	0.267	0.136	0.002	0.005	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.512	0.216	0.168	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.385	0.741	0.613	0.005	0.022	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.456	0.111	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.755	0.164	0.426	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.428	0.108	2.285	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.774	2.620	0.695	0.002	0.024	0.021	0.055

5021
5022

5023 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.019	0.258	0.133	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.458	0.209	0.164	0.002	0.005	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.412	0.737	0.597	0.005	0.020	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.421	0.109	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.731	0.162	0.424	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.423	0.106	2.266	0.004	0.041	0.038	0.068
	Gasoline	MC	Motorcycles	12.537	2.564	0.683	0.002	0.023	0.020	0.055
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.222	0.259	0.119	0.002	0.004	0.003	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.616	0.211	0.148	0.002	0.004	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.547	0.755	0.570	0.005	0.019	0.017	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.133	0.094	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.306	0.151	0.419	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.479	0.101	2.223	0.004	0.043	0.039	0.067
	Gasoline	MC	Motorcycles	12.585	2.952	0.598	0.002	0.023	0.020	0.054
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.758	0.265	0.138	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.176	0.207	0.165	0.002	0.007	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.818	0.678	0.595	0.005	0.022	0.020	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.885	0.130	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.248	0.173	0.422	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.382	0.116	2.284	0.004	0.040	0.037	0.067
	Gasoline	MC	Motorcycles	12.207	2.134	0.749	0.002	0.022	0.020	0.056
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.369	0.232	0.114	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.954	0.202	0.143	0.002	0.005	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.455	0.720	0.560	0.005	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.377	0.106	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.713	0.168	0.421	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.492	0.121	2.377	0.004	0.044	0.041	0.066
	Gasoline	MC	Motorcycles	11.986	2.554	0.666	0.002	0.022	0.019	0.054
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.302	0.230	0.119	0.002	0.005	0.004	0.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.902	0.209	0.148	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.426	0.733	0.585	0.005	0.023	0.020	0.094
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.207	0.114	0.147	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.546	0.181	0.417	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.565	0.143	2.546	0.004	0.048	0.044	0.065
	Gasoline	MC	Motorcycles	11.849	2.489	0.669	0.002	0.022	0.019	0.052
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.018	0.260	0.138	0.002	0.006	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.453	0.221	0.170	0.002	0.007	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.361	0.752	0.636	0.005	0.024	0.021	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.180	0.120	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.501	0.178	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.476	0.128	2.407	0.004	0.044	0.040	0.066
	Gasoline	MC	Motorcycles	12.695	2.408	0.706	0.002	0.023	0.021	0.054
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.182	0.269	0.142	0.002	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.583	0.225	0.173	0.002	0.007	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.564	0.727	0.636	0.005	0.024	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.053	0.126	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.398	0.179	0.422	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.434	0.128	2.353	0.004	0.043	0.039	0.066
	Gasoline	MC	Motorcycles	12.699	2.293	0.738	0.002	0.023	0.020	0.055
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.163	0.267	0.126	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.541	0.208	0.155	0.002	0.004	0.004	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.388	0.769	0.579	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.802	0.099	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.009	0.150	0.418	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.429	0.099	2.186	0.004	0.041	0.038	0.066
	Gasoline	MC	Motorcycles	12.609	2.811	0.636	0.002	0.023	0.020	0.055

5024
5025

5026 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.786	0.252	0.126	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.292	0.208	0.157	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.057	0.719	0.582	0.005	0.021	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.417	0.109	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.744	0.164	0.425	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.428	0.108	2.270	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.410	2.528	0.680	0.002	0.023	0.020	0.055
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.969	0.280	0.149	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.354	0.217	0.179	0.002	0.006	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.154	0.688	0.631	0.004	0.022	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.021	0.131	0.156	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.357	0.175	0.433	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.391	0.114	2.345	0.004	0.040	0.037	0.067
	Gasoline	MC	Motorcycles	12.319	2.342	0.790	0.002	0.022	0.019	0.056
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.080	0.274	0.141	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.492	0.220	0.172	0.002	0.007	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.361	0.729	0.619	0.005	0.023	0.021	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.285	0.120	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.599	0.170	0.427	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.417	0.112	2.308	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.811	2.513	0.720	0.002	0.023	0.021	0.055
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.727	0.262	0.125	0.002	0.005	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.212	0.216	0.156	0.002	0.006	0.006	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.021	0.650	0.632	0.005	0.024	0.021	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.845	0.100	0.159	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.053	0.162	0.449	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.532	0.115	2.571	0.004	0.045	0.042	0.066
	Gasoline	MC	Motorcycles	13.065	3.092	0.758	0.002	0.024	0.021	0.053
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.241	0.237	0.117	0.002	0.005	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.853	0.200	0.145	0.002	0.006	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.289	0.676	0.558	0.005	0.022	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.018	0.121	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.397	0.175	0.424	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.428	0.122	2.344	0.004	0.042	0.039	0.066
	Gasoline	MC	Motorcycles	12.144	2.302	0.725	0.002	0.022	0.020	0.055
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.252	0.230	0.117	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.818	0.169	0.143	0.002	0.005	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.235	0.476	0.523	0.005	0.019	0.016	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.208	0.116	0.156	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.571	0.159	0.431	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.368	0.098	2.216	0.004	0.039	0.035	0.068
	Gasoline	MC	Motorcycles	11.971	2.146	0.721	0.002	0.022	0.019	0.057
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.839	0.277	0.139	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.286	0.216	0.170	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.018	0.737	0.624	0.005	0.021	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.386	0.109	0.158	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.676	0.159	0.440	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.414	0.104	2.356	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.794	2.908	0.775	0.002	0.023	0.021	0.055
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.248	0.230	0.114	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.841	0.200	0.142	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.136	0.698	0.557	0.005	0.022	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.171	0.114	0.148	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.517	0.175	0.419	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.494	0.129	2.424	0.004	0.045	0.041	0.066
	Gasoline	MC	Motorcycles	12.203	2.412	0.690	0.002	0.022	0.020	0.053

5027
5028

5029 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.722	0.247	0.124	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.214	0.206	0.155	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.074	0.764	0.598	0.005	0.020	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.572	0.102	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.821	0.160	0.417	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.482	0.112	2.328	0.004	0.044	0.040	0.066
	Gasoline	MC	Motorcycles	12.579	2.771	0.653	0.002	0.023	0.020	0.054
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.338	0.289	0.149	0.002	0.007	0.006	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.645	0.228	0.177	0.002	0.008	0.007	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.604	0.710	0.631	0.004	0.025	0.022	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.016	0.136	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.340	0.180	0.426	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.397	0.121	2.327	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.724	2.210	0.769	0.002	0.023	0.020	0.055
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.860	0.251	0.130	0.002	0.005	0.005	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.334	0.214	0.162	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.127	0.750	0.612	0.005	0.023	0.020	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.244	0.114	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.565	0.172	0.418	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.474	0.124	2.373	0.004	0.044	0.040	0.066
	Gasoline	MC	Motorcycles	12.746	2.526	0.691	0.002	0.023	0.021	0.054
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.138	0.268	0.133	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.546	0.215	0.164	0.002	0.005	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.398	0.761	0.607	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.648	0.104	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.908	0.157	0.425	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.433	0.105	2.249	0.004	0.042	0.038	0.067
	Gasoline	MC	Motorcycles	12.786	2.781	0.672	0.002	0.023	0.021	0.055
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.443	0.236	0.128	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.965	0.192	0.157	0.002	0.005	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.617	0.628	0.598	0.005	0.020	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.074	0.114	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.413	0.169	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.450	0.117	2.378	0.004	0.043	0.039	0.067
	Gasoline	MC	Motorcycles	12.252	2.371	0.739	0.002	0.022	0.019	0.054
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.680	0.241	0.122	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.181	0.200	0.152	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.917	0.702	0.583	0.004	0.020	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.446	0.104	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.737	0.162	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.472	0.112	2.339	0.004	0.043	0.040	0.066
	Gasoline	MC	Motorcycles	12.369	2.632	0.676	0.002	0.023	0.020	0.054
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.507	0.236	0.121	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.047	0.201	0.151	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.705	0.714	0.579	0.005	0.022	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.242	0.114	0.150	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.574	0.171	0.422	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.460	0.119	2.362	0.004	0.043	0.040	0.067
	Gasoline	MC	Motorcycles	12.488	2.482	0.696	0.002	0.023	0.020	0.054
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.813	0.270	0.108	0.002	0.003	0.003	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.120	0.236	0.138	0.002	0.004	0.003	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.306	0.897	0.557	0.005	0.019	0.016	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.934	0.080	0.147	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	6.000	0.145	0.414	0.002	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.579	0.101	2.201	0.004	0.046	0.042	0.066
	Gasoline	MC	Motorcycles	12.550	3.322	0.521	0.002	0.023	0.020	0.053

5030
5031

5032 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.251	0.230	0.113	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.902	0.206	0.143	0.002	0.006	0.005	0.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.409	0.720	0.571	0.005	0.022	0.019	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.184	0.113	0.147	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.542	0.177	0.418	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.521	0.133	2.465	0.004	0.046	0.042	0.065
	Gasoline	MC	Motorcycles	11.875	2.474	0.674	0.002	0.022	0.019	0.053
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.148	0.263	0.127	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.537	0.211	0.158	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.487	0.776	0.594	0.005	0.019	0.017	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.767	0.100	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.982	0.154	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.456	0.103	2.261	0.004	0.042	0.039	0.067
	Gasoline	MC	Motorcycles	12.590	2.822	0.642	0.002	0.023	0.020	0.054
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.205	0.276	0.147	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.589	0.216	0.177	0.002	0.006	0.006	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.653	0.694	0.615	0.004	0.022	0.019	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.119	0.128	0.156	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.483	0.173	0.433	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.381	0.109	2.284	0.004	0.039	0.036	0.068
	Gasoline	MC	Motorcycles	12.750	2.340	0.765	0.002	0.023	0.020	0.057
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.115	0.258	0.129	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.525	0.216	0.161	0.002	0.005	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.526	0.785	0.616	0.005	0.021	0.018	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.615	0.104	0.149	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.865	0.163	0.419	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.494	0.114	2.353	0.004	0.044	0.040	0.066
	Gasoline	MC	Motorcycles	12.654	2.795	0.651	0.002	0.023	0.020	0.054
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.774	0.244	0.113	0.002	0.004	0.003	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.264	0.204	0.142	0.002	0.004	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.875	0.760	0.557	0.005	0.018	0.016	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.041	0.093	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.245	0.152	0.424	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.482	0.103	2.260	0.004	0.043	0.040	0.066
	Gasoline	MC	Motorcycles	12.020	2.911	0.614	0.002	0.022	0.019	0.054
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.570	0.254	0.130	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.123	0.216	0.162	0.002	0.006	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.717	0.720	0.616	0.005	0.021	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.307	0.115	0.154	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.630	0.174	0.437	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.474	0.122	2.473	0.004	0.043	0.040	0.067
	Gasoline	MC	Motorcycles	12.257	2.700	0.763	0.002	0.021	0.019	0.054
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.351	0.255	0.124	0.002	0.006	0.006	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.883	0.200	0.149	0.002	0.007	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.305	0.657	0.556	0.004	0.023	0.021	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.928	0.130	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.287	0.173	0.424	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.381	0.115	2.279	0.004	0.040	0.037	0.067
	Gasoline	MC	Motorcycles	12.619	2.160	0.757	0.002	0.023	0.021	0.056
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.874	0.290	0.111	0.002	0.003	0.003	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.094	0.215	0.134	0.002	0.004	0.003	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.878	0.847	0.519	0.005	0.018	0.016	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.021	0.083	0.153	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.979	0.133	0.411	0.001	0.005	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.436	0.088	1.955	0.004	0.042	0.038	0.065
	Gasoline	MC	Motorcycles	12.584	2.804	0.536	0.002	0.023	0.020	0.055

5033
5034

5035 **Table 5-21. On-Road Vehicle Criteria Pollutant Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.795	0.247	0.126	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.281	0.206	0.157	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.116	0.736	0.593	0.005	0.020	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.408	0.107	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.719	0.163	0.421	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.456	0.111	2.313	0.004	0.043	0.039	0.067
	Gasoline	MC	Motorcycles	12.246	2.586	0.669	0.002	0.022	0.020	0.055
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.715	0.235	0.137	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.222	0.197	0.171	0.002	0.005	0.005	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.110	0.612	0.633	0.005	0.020	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.005	0.114	0.149	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.392	0.173	0.421	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.460	0.121	2.393	0.004	0.043	0.040	0.067
	Gasoline	MC	Motorcycles	12.273	2.333	0.734	0.002	0.021	0.019	0.054
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.921	0.259	0.135	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.363	0.208	0.166	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.214	0.727	0.604	0.005	0.021	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.187	0.114	0.151	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.524	0.164	0.420	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.411	0.110	2.262	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.739	2.501	0.704	0.002	0.023	0.021	0.055
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.934	0.262	0.137	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.361	0.212	0.166	0.002	0.006	0.006	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.210	0.695	0.603	0.005	0.022	0.020	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.032	0.126	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.385	0.174	0.423	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.405	0.118	2.303	0.004	0.041	0.038	0.067
	Gasoline	MC	Motorcycles	12.447	2.238	0.739	0.002	0.022	0.020	0.055
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.005	0.286	0.151	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.397	0.221	0.181	0.002	0.006	0.006	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.232	0.685	0.629	0.004	0.022	0.019	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.044	0.131	0.158	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.399	0.174	0.439	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.382	0.110	2.343	0.004	0.039	0.036	0.068
	Gasoline	MC	Motorcycles	12.341	2.412	0.802	0.002	0.022	0.019	0.056

5036
5037

5038 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.070	0.259	0.116	0.002	0.004	0.003	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.398	0.204	0.138	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.800	0.754	0.541	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.987	0.096	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.949	0.131	0.396	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.446	0.097	2.103	0.004	0.038	0.035	0.067
	Gasoline	MC	Motorcycles	12.421	2.873	0.623	0.002	0.023	0.020	0.054
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	5.140	0.278	0.131	0.001	0.005	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.344	0.231	0.153	0.001	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	12.408	0.705	0.535	0.003	0.020	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.944	0.144	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.146	0.176	0.409	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.392	0.129	2.240	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.742	1.970	0.729	0.001	0.017	0.015	0.055
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.784	0.263	0.111	0.001	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.235	0.215	0.135	0.001	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.470	0.768	0.534	0.003	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.375	0.089	0.155	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.320	0.128	0.436	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.468	0.093	2.276	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.362	3.326	0.736	0.001	0.023	0.020	0.054
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.007	0.259	0.121	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.386	0.203	0.144	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.743	0.724	0.542	0.005	0.020	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.793	0.100	0.145	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.854	0.133	0.403	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.397	0.094	2.051	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.640	2.730	0.654	0.002	0.023	0.021	0.055
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.405	0.250	0.122	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.947	0.208	0.147	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.138	0.677	0.558	0.005	0.021	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.276	0.113	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.445	0.150	0.413	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.414	0.110	2.226	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.142	2.664	0.751	0.002	0.022	0.019	0.055
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.077	0.223	0.103	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.713	0.195	0.126	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.609	0.670	0.503	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.271	0.108	0.142	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.475	0.150	0.402	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.455	0.118	2.217	0.004	0.039	0.035	0.066
	Gasoline	MC	Motorcycles	11.774	2.456	0.678	0.002	0.022	0.019	0.054
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.249	0.222	0.107	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.792	0.179	0.128	0.002	0.005	0.004	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.874	0.562	0.519	0.005	0.020	0.017	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.569	0.105	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.630	0.143	0.397	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.466	0.112	2.208	0.004	0.039	0.036	0.066
	Gasoline	MC	Motorcycles	11.711	2.382	0.651	0.002	0.022	0.019	0.053
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.298	0.212	0.100	0.002	0.004	0.004	0.052
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.841	0.181	0.122	0.002	0.005	0.004	0.042
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.812	0.557	0.527	0.005	0.021	0.019	0.096
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.836	0.103	0.141	0.001	0.004	0.003	0.018
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.781	0.148	0.388	0.001	0.006	0.005	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.641	0.135	2.481	0.004	0.045	0.042	0.065
	Gasoline	MC	Motorcycles	11.610	2.507	0.611	0.002	0.022	0.019	0.050

5039
5040

5041 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.447	0.263	0.106	0.002	0.003	0.003	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.701	0.218	0.128	0.002	0.004	0.004	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.264	0.834	0.532	0.005	0.019	0.016	0.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.710	0.084	0.142	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.503	0.124	0.390	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.550	0.097	2.143	0.004	0.041	0.037	0.066
	Gasoline	MC	Motorcycles	12.363	3.183	0.544	0.002	0.023	0.020	0.052
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.746	0.241	0.113	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.181	0.199	0.136	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.583	0.750	0.540	0.005	0.019	0.017	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.901	0.096	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.901	0.134	0.396	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.475	0.103	2.161	0.004	0.039	0.036	0.066
	Gasoline	MC	Motorcycles	12.418	2.892	0.625	0.002	0.023	0.020	0.053
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.363	0.270	0.106	0.002	0.004	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.626	0.225	0.129	0.002	0.005	0.004	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.256	0.886	0.541	0.005	0.021	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.347	0.080	0.140	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.208	0.119	0.384	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.539	0.094	2.132	0.004	0.041	0.038	0.065
	Gasoline	MC	Motorcycles	12.978	3.078	0.584	0.002	0.024	0.021	0.052
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.635	0.261	0.129	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.056	0.204	0.151	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.278	0.667	0.560	0.005	0.020	0.018	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.274	0.120	0.149	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.402	0.150	0.413	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.384	0.107	2.186	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.143	2.488	0.772	0.002	0.021	0.019	0.055
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.553	0.241	0.113	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.041	0.202	0.136	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.258	0.697	0.530	0.005	0.021	0.019	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.467	0.111	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.575	0.150	0.401	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.451	0.114	2.211	0.004	0.038	0.035	0.067
	Gasoline	MC	Motorcycles	11.867	2.458	0.670	0.002	0.022	0.019	0.054
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.876	0.253	0.123	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.259	0.206	0.146	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.654	0.725	0.560	0.005	0.022	0.019	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.483	0.112	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.548	0.148	0.397	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.446	0.112	2.200	0.004	0.038	0.035	0.067
	Gasoline	MC	Motorcycles	12.456	2.509	0.677	0.002	0.023	0.020	0.053
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.936	0.271	0.131	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.304	0.211	0.153	0.002	0.007	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.634	0.690	0.556	0.005	0.023	0.020	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.322	0.119	0.146	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.455	0.148	0.404	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.372	0.104	2.098	0.004	0.035	0.032	0.067
	Gasoline	MC	Motorcycles	12.666	2.374	0.712	0.002	0.023	0.021	0.055
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.957	0.262	0.127	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.361	0.207	0.151	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.748	0.702	0.553	0.005	0.021	0.019	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.574	0.108	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.690	0.141	0.409	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.383	0.098	2.087	0.004	0.035	0.032	0.068
	Gasoline	MC	Motorcycles	12.640	2.605	0.693	0.002	0.024	0.021	0.056

5042
5043

5044 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.890	0.254	0.123	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.308	0.199	0.147	0.002	0.005	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.770	0.698	0.538	0.005	0.019	0.017	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.538	0.106	0.146	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.672	0.138	0.407	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.379	0.095	2.069	0.004	0.035	0.032	0.068
	Gasoline	MC	Motorcycles	12.404	2.549	0.681	0.002	0.023	0.020	0.056
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.088	0.254	0.110	0.002	0.004	0.003	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.456	0.201	0.132	0.002	0.004	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.857	0.714	0.514	0.005	0.018	0.016	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.266	0.091	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.230	0.127	0.401	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.432	0.090	2.031	0.004	0.036	0.034	0.067
	Gasoline	MC	Motorcycles	12.452	2.931	0.596	0.002	0.023	0.020	0.055
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.637	0.260	0.128	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.041	0.198	0.148	0.002	0.006	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.231	0.644	0.536	0.005	0.022	0.019	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	4.989	0.126	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.207	0.150	0.406	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.340	0.105	2.086	0.004	0.035	0.032	0.067
	Gasoline	MC	Motorcycles	12.075	2.123	0.747	0.002	0.022	0.020	0.056
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.258	0.228	0.105	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.820	0.193	0.128	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.868	0.685	0.506	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.495	0.103	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.641	0.143	0.403	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.446	0.110	2.175	0.004	0.038	0.035	0.066
	Gasoline	MC	Motorcycles	11.856	2.539	0.664	0.002	0.022	0.019	0.054
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.123	0.224	0.104	0.002	0.005	0.004	0.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.726	0.198	0.126	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.646	0.689	0.517	0.005	0.022	0.019	0.092
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.322	0.111	0.141	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.464	0.155	0.397	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.517	0.130	2.334	0.004	0.041	0.038	0.065
	Gasoline	MC	Motorcycles	11.720	2.477	0.667	0.002	0.022	0.019	0.052
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.889	0.255	0.128	0.002	0.006	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.303	0.212	0.152	0.002	0.007	0.006	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.692	0.713	0.573	0.005	0.023	0.021	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.293	0.117	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.432	0.153	0.401	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.431	0.117	2.202	0.004	0.038	0.035	0.067
	Gasoline	MC	Motorcycles	12.561	2.397	0.704	0.002	0.023	0.021	0.054
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.049	0.264	0.133	0.002	0.006	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.431	0.215	0.156	0.002	0.007	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.897	0.689	0.574	0.005	0.023	0.020	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.162	0.123	0.145	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.339	0.156	0.404	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.390	0.117	2.152	0.004	0.036	0.034	0.066
	Gasoline	MC	Motorcycles	12.563	2.284	0.736	0.002	0.023	0.020	0.055
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.031	0.262	0.117	0.002	0.004	0.003	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.386	0.199	0.138	0.002	0.004	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.714	0.726	0.522	0.005	0.018	0.016	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.927	0.096	0.146	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.950	0.127	0.401	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.384	0.089	1.996	0.004	0.035	0.033	0.067
	Gasoline	MC	Motorcycles	12.475	2.792	0.634	0.002	0.023	0.020	0.055

5045
5046

5047 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.664	0.248	0.118	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.148	0.199	0.141	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.450	0.682	0.525	0.005	0.020	0.018	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.534	0.106	0.145	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.683	0.140	0.408	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.384	0.098	2.073	0.004	0.035	0.032	0.068
	Gasoline	MC	Motorcycles	12.278	2.514	0.678	0.002	0.023	0.020	0.056
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.843	0.275	0.139	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.212	0.208	0.160	0.002	0.006	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.553	0.653	0.568	0.004	0.021	0.019	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.129	0.128	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.306	0.153	0.416	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.348	0.104	2.141	0.004	0.034	0.032	0.068
	Gasoline	MC	Motorcycles	12.187	2.333	0.788	0.002	0.022	0.019	0.056
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.951	0.269	0.131	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.343	0.211	0.155	0.002	0.007	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.736	0.691	0.558	0.005	0.022	0.020	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.399	0.117	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.538	0.147	0.410	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.373	0.101	2.108	0.004	0.035	0.032	0.068
	Gasoline	MC	Motorcycles	12.677	2.500	0.718	0.002	0.023	0.021	0.056
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.610	0.257	0.116	0.002	0.005	0.005	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.069	0.207	0.140	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.399	0.623	0.571	0.005	0.023	0.020	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.974	0.097	0.152	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.964	0.137	0.427	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.485	0.103	2.352	0.004	0.039	0.036	0.067
	Gasoline	MC	Motorcycles	12.931	3.070	0.756	0.002	0.024	0.021	0.053
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.135	0.233	0.109	0.002	0.005	0.005	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.728	0.192	0.130	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.752	0.643	0.504	0.005	0.021	0.019	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.127	0.118	0.145	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.342	0.152	0.407	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.384	0.111	2.143	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.012	2.292	0.723	0.002	0.022	0.020	0.055
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.144	0.226	0.109	0.002	0.005	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.694	0.162	0.128	0.002	0.005	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.746	0.457	0.472	0.005	0.018	0.016	0.085
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.319	0.113	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.532	0.137	0.415	0.001	0.006	0.006	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.325	0.088	2.021	0.004	0.033	0.030	0.069
	Gasoline	MC	Motorcycles	11.841	2.133	0.719	0.002	0.022	0.019	0.058
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.717	0.272	0.129	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.145	0.206	0.152	0.002	0.005	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.417	0.698	0.562	0.005	0.020	0.018	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.502	0.106	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.622	0.136	0.422	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.370	0.093	2.151	0.004	0.035	0.032	0.068
	Gasoline	MC	Motorcycles	12.660	2.892	0.773	0.002	0.023	0.021	0.056
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.142	0.226	0.106	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.714	0.192	0.127	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.585	0.665	0.505	0.005	0.021	0.019	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.284	0.111	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.447	0.151	0.400	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.448	0.118	2.218	0.004	0.038	0.035	0.066
	Gasoline	MC	Motorcycles	12.072	2.401	0.688	0.002	0.022	0.020	0.054

5048
5049

5050 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.604	0.242	0.115	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.071	0.196	0.138	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.445	0.723	0.541	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.694	0.100	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.749	0.135	0.399	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.436	0.101	2.129	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.446	2.754	0.651	0.002	0.023	0.020	0.054
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.200	0.284	0.139	0.002	0.007	0.006	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.493	0.219	0.159	0.002	0.007	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.960	0.673	0.569	0.005	0.024	0.021	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.124	0.133	0.148	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.288	0.158	0.409	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.354	0.111	2.126	0.004	0.035	0.032	0.067
	Gasoline	MC	Motorcycles	12.587	2.202	0.767	0.002	0.023	0.020	0.056
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.737	0.247	0.121	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.187	0.205	0.145	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.480	0.711	0.553	0.005	0.022	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.358	0.111	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.496	0.148	0.400	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.429	0.112	2.171	0.004	0.037	0.034	0.066
	Gasoline	MC	Motorcycles	12.612	2.514	0.689	0.002	0.023	0.021	0.054
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.008	0.263	0.123	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.393	0.205	0.146	0.002	0.005	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.740	0.720	0.547	0.005	0.020	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.770	0.101	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.847	0.133	0.407	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.388	0.094	2.054	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.652	2.764	0.671	0.002	0.023	0.021	0.055
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.333	0.232	0.119	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.834	0.184	0.141	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.038	0.599	0.540	0.005	0.019	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.184	0.111	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.349	0.145	0.402	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.406	0.106	2.174	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.122	2.360	0.737	0.002	0.022	0.019	0.055
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.560	0.236	0.113	0.001	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.038	0.191	0.136	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.288	0.667	0.526	0.004	0.019	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.564	0.101	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.666	0.138	0.402	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.426	0.101	2.138	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.237	2.617	0.675	0.002	0.023	0.020	0.054
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.394	0.232	0.113	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.913	0.192	0.135	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.119	0.678	0.523	0.005	0.021	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.356	0.111	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.510	0.147	0.404	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.415	0.108	2.159	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.355	2.470	0.694	0.002	0.023	0.020	0.055
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.661	0.264	0.100	0.002	0.003	0.003	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.934	0.224	0.123	0.002	0.004	0.003	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.497	0.846	0.503	0.005	0.018	0.016	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.087	0.078	0.141	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.892	0.119	0.394	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.529	0.089	2.013	0.004	0.039	0.036	0.066
	Gasoline	MC	Motorcycles	12.418	3.293	0.520	0.002	0.023	0.020	0.053

5051
5052

5053 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.143	0.227	0.105	0.002	0.005	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.770	0.198	0.128	0.002	0.006	0.005	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.824	0.686	0.517	0.005	0.021	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.297	0.110	0.142	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.466	0.152	0.399	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.475	0.121	2.257	0.004	0.039	0.036	0.066
	Gasoline	MC	Motorcycles	11.746	2.462	0.672	0.002	0.022	0.019	0.053
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.016	0.258	0.118	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.382	0.201	0.141	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.808	0.733	0.535	0.005	0.019	0.016	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.892	0.097	0.145	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.915	0.130	0.402	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.411	0.092	2.066	0.004	0.036	0.033	0.068
	Gasoline	MC	Motorcycles	12.457	2.804	0.640	0.002	0.023	0.020	0.055
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.071	0.271	0.137	0.002	0.006	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.438	0.207	0.159	0.002	0.006	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.036	0.657	0.555	0.004	0.021	0.019	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.229	0.125	0.150	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.433	0.151	0.417	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.339	0.099	2.084	0.004	0.033	0.031	0.069
	Gasoline	MC	Motorcycles	12.613	2.330	0.763	0.002	0.023	0.020	0.057
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.984	0.253	0.120	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.369	0.206	0.144	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.832	0.743	0.555	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.738	0.101	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.789	0.138	0.400	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.447	0.103	2.151	0.004	0.038	0.035	0.067
	Gasoline	MC	Motorcycles	12.520	2.779	0.649	0.002	0.023	0.020	0.054
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.654	0.239	0.104	0.002	0.004	0.003	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.118	0.194	0.126	0.002	0.004	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.242	0.720	0.503	0.005	0.018	0.016	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.173	0.091	0.145	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.168	0.127	0.405	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.436	0.092	2.065	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	11.893	2.889	0.613	0.002	0.022	0.019	0.055
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.455	0.249	0.121	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.986	0.207	0.145	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.131	0.684	0.557	0.005	0.020	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.422	0.112	0.148	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.554	0.150	0.418	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.429	0.111	2.261	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.127	2.687	0.761	0.002	0.021	0.019	0.054
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.243	0.250	0.116	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.760	0.192	0.134	0.002	0.007	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.790	0.625	0.503	0.004	0.023	0.020	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.033	0.127	0.148	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.246	0.151	0.407	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.338	0.105	2.081	0.004	0.034	0.032	0.067
	Gasoline	MC	Motorcycles	12.485	2.151	0.755	0.002	0.023	0.021	0.056
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.720	0.283	0.103	0.002	0.003	0.003	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.915	0.204	0.119	0.002	0.004	0.003	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	10.098	0.797	0.467	0.005	0.017	0.015	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.173	0.080	0.147	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	5.920	0.110	0.394	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.390	0.077	1.785	0.004	0.036	0.033	0.065
	Gasoline	MC	Motorcycles	12.451	2.777	0.535	0.002	0.023	0.020	0.055

5054
5055

5056 **Table 5-22. On-Road Vehicle Criteria Pollutant Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.672	0.242	0.117	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.136	0.197	0.141	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.478	0.698	0.534	0.005	0.019	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.525	0.104	0.144	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.654	0.139	0.403	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.411	0.100	2.114	0.004	0.036	0.033	0.067
	Gasoline	MC	Motorcycles	12.114	2.572	0.667	0.002	0.022	0.020	0.055
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.597	0.231	0.127	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.082	0.189	0.153	0.002	0.005	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.482	0.584	0.571	0.005	0.019	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.114	0.111	0.143	0.001	0.004	0.003	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.325	0.149	0.403	0.001	0.006	0.006	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.415	0.110	2.188	0.004	0.037	0.034	0.067
	Gasoline	MC	Motorcycles	12.142	2.322	0.732	0.002	0.021	0.019	0.055
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.796	0.255	0.126	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.218	0.199	0.149	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.583	0.688	0.544	0.005	0.020	0.018	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.298	0.110	0.145	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.472	0.141	0.403	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.368	0.099	2.066	0.004	0.035	0.032	0.067
	Gasoline	MC	Motorcycles	12.604	2.489	0.703	0.002	0.023	0.021	0.056
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.806	0.258	0.128	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.217	0.203	0.149	0.002	0.006	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.592	0.659	0.544	0.005	0.022	0.019	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.141	0.123	0.146	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.334	0.152	0.406	0.001	0.006	0.005	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.362	0.108	2.104	0.004	0.035	0.032	0.067
	Gasoline	MC	Motorcycles	12.312	2.228	0.737	0.002	0.022	0.020	0.056
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.878	0.281	0.140	0.002	0.006	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.254	0.212	0.163	0.002	0.006	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.643	0.650	0.566	0.004	0.021	0.018	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.152	0.128	0.152	0.001	0.004	0.003	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.350	0.152	0.422	0.001	0.006	0.005	0.016
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.339	0.100	2.138	0.004	0.034	0.031	0.069
	Gasoline	MC	Motorcycles	12.208	2.402	0.800	0.002	0.022	0.019	0.057

5057
5058

5059 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.921	0.245	0.101	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.231	0.195	0.124	0.002	0.004	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.665	0.683	0.485	0.005	0.018	0.016	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.279	0.099	0.152	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.407	0.062	0.097	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.402	0.086	1.914	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	12.300	2.809	0.621	0.002	0.023	0.020	0.054
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.945	0.269	0.116	0.001	0.005	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	4.139	0.225	0.138	0.001	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	11.000	0.650	0.480	0.003	0.019	0.017	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.184	0.145	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.845	0.105	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.351	0.119	2.042	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.587	1.953	0.727	0.001	0.017	0.015	0.055
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.645	0.245	0.096	0.001	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.076	0.204	0.121	0.001	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.415	0.693	0.480	0.003	0.019	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.687	0.091	0.163	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.683	0.059	0.106	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.423	0.082	2.070	0.004	0.029	0.027	0.068
	Gasoline	MC	Motorcycles	12.242	3.235	0.734	0.001	0.023	0.020	0.054
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.862	0.245	0.105	0.002	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.222	0.194	0.129	0.002	0.005	0.004	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.684	0.657	0.487	0.005	0.019	0.017	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.075	0.102	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.336	0.065	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.355	0.084	1.865	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.518	2.668	0.652	0.002	0.023	0.021	0.056
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.282	0.239	0.107	0.002	0.005	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.808	0.200	0.132	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.205	0.622	0.501	0.005	0.020	0.018	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.533	0.115	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.059	0.081	0.100	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.372	0.100	2.027	0.004	0.029	0.026	0.067
	Gasoline	MC	Motorcycles	12.023	2.619	0.750	0.002	0.022	0.019	0.055
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	2.963	0.213	0.090	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.582	0.187	0.113	0.002	0.005	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.699	0.617	0.452	0.005	0.020	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.529	0.110	0.149	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.078	0.080	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.411	0.107	2.021	0.004	0.030	0.028	0.066
	Gasoline	MC	Motorcycles	11.655	2.408	0.676	0.002	0.022	0.019	0.054
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.127	0.211	0.093	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.655	0.172	0.115	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.884	0.513	0.465	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.841	0.108	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.184	0.073	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.422	0.101	2.012	0.004	0.030	0.028	0.067
	Gasoline	MC	Motorcycles	11.594	2.330	0.649	0.002	0.022	0.019	0.054
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.174	0.202	0.087	0.002	0.004	0.004	0.049
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.702	0.173	0.109	0.002	0.005	0.004	0.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.744	0.508	0.472	0.005	0.021	0.018	0.095
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.123	0.106	0.149	0.001	0.004	0.004	0.018
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.304	0.075	0.098	0.001	0.004	0.004	0.019
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.591	0.122	2.267	0.004	0.035	0.032	0.066
	Gasoline	MC	Motorcycles	11.494	2.452	0.610	0.002	0.022	0.019	0.050

5060
5061

5062 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.284	0.246	0.092	0.002	0.004	0.003	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.518	0.207	0.115	0.002	0.004	0.003	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.996	0.751	0.480	0.005	0.018	0.016	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.040	0.087	0.149	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.814	0.054	0.097	0.001	0.004	0.003	0.019
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.502	0.085	1.951	0.004	0.031	0.029	0.067
	Gasoline	MC	Motorcycles	12.242	3.099	0.543	0.002	0.023	0.020	0.052
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.609	0.227	0.097	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.026	0.190	0.122	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.486	0.680	0.487	0.005	0.019	0.017	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.190	0.098	0.150	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.379	0.065	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.430	0.092	1.968	0.004	0.030	0.028	0.067
	Gasoline	MC	Motorcycles	12.297	2.828	0.624	0.002	0.023	0.020	0.054
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.207	0.252	0.092	0.002	0.004	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.451	0.214	0.115	0.002	0.005	0.004	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.039	0.804	0.488	0.005	0.021	0.018	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.658	0.082	0.147	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.601	0.050	0.096	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.491	0.082	1.942	0.004	0.032	0.029	0.066
	Gasoline	MC	Motorcycles	12.856	2.995	0.583	0.002	0.024	0.021	0.052
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.503	0.250	0.113	0.002	0.005	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.911	0.196	0.136	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.317	0.611	0.501	0.005	0.020	0.018	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.529	0.122	0.157	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.021	0.081	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.343	0.097	1.990	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.023	2.445	0.770	0.002	0.021	0.019	0.055
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.421	0.230	0.099	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.894	0.194	0.122	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.243	0.638	0.475	0.005	0.021	0.018	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.734	0.113	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.151	0.079	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.408	0.103	2.015	0.004	0.030	0.027	0.067
	Gasoline	MC	Motorcycles	11.748	2.410	0.669	0.002	0.022	0.019	0.054
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.735	0.242	0.107	0.002	0.005	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.102	0.198	0.131	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.569	0.662	0.502	0.005	0.022	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.750	0.114	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.127	0.078	0.097	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.403	0.102	2.005	0.004	0.030	0.027	0.067
	Gasoline	MC	Motorcycles	12.334	2.461	0.676	0.002	0.023	0.020	0.054
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.796	0.259	0.115	0.002	0.006	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.148	0.203	0.137	0.002	0.007	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.626	0.631	0.499	0.005	0.023	0.020	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.579	0.121	0.154	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.052	0.080	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.331	0.095	1.910	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.544	2.331	0.711	0.002	0.023	0.021	0.056
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.815	0.249	0.111	0.002	0.005	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.201	0.198	0.135	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.728	0.640	0.496	0.005	0.021	0.018	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.845	0.110	0.154	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.228	0.073	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.342	0.088	1.899	0.004	0.028	0.025	0.068
	Gasoline	MC	Motorcycles	12.518	2.551	0.691	0.002	0.024	0.021	0.056

5063
5064

5065 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.748	0.241	0.107	0.002	0.005	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.146	0.191	0.132	0.002	0.005	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.733	0.635	0.482	0.005	0.019	0.017	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.807	0.108	0.154	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.213	0.071	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.338	0.086	1.881	0.004	0.027	0.025	0.069
	Gasoline	MC	Motorcycles	12.282	2.496	0.680	0.002	0.023	0.020	0.056
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.939	0.239	0.095	0.002	0.004	0.003	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.285	0.191	0.118	0.002	0.004	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.746	0.644	0.462	0.005	0.018	0.016	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.572	0.093	0.152	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.609	0.058	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.388	0.080	1.847	0.004	0.029	0.026	0.068
	Gasoline	MC	Motorcycles	12.330	2.856	0.595	0.002	0.023	0.020	0.055
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.505	0.249	0.112	0.002	0.006	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.897	0.191	0.133	0.002	0.006	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.279	0.591	0.479	0.005	0.021	0.019	0.085
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.229	0.128	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.869	0.083	0.097	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.300	0.096	1.898	0.004	0.027	0.025	0.068
	Gasoline	MC	Motorcycles	11.955	2.089	0.745	0.002	0.022	0.020	0.056
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.137	0.216	0.092	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.682	0.185	0.115	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.911	0.628	0.455	0.005	0.019	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.764	0.105	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.193	0.074	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.402	0.099	1.981	0.004	0.030	0.027	0.067
	Gasoline	MC	Motorcycles	11.737	2.485	0.662	0.002	0.022	0.019	0.054
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.008	0.214	0.090	0.002	0.005	0.004	0.048
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.595	0.191	0.114	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.690	0.635	0.464	0.005	0.021	0.019	0.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.583	0.113	0.149	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.074	0.083	0.098	0.001	0.004	0.003	0.019
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.472	0.118	2.130	0.004	0.032	0.029	0.066
	Gasoline	MC	Motorcycles	11.602	2.432	0.666	0.002	0.022	0.019	0.053
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.749	0.244	0.112	0.002	0.006	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.146	0.204	0.137	0.002	0.007	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.631	0.654	0.515	0.005	0.023	0.020	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.551	0.119	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.045	0.083	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.389	0.106	2.007	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	12.438	2.354	0.703	0.002	0.023	0.021	0.054
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.903	0.253	0.116	0.002	0.006	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.272	0.208	0.141	0.002	0.007	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.846	0.631	0.516	0.005	0.023	0.020	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.413	0.125	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.971	0.087	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.349	0.107	1.961	0.004	0.029	0.026	0.067
	Gasoline	MC	Motorcycles	12.438	2.244	0.734	0.002	0.023	0.020	0.055
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.884	0.247	0.102	0.002	0.004	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.219	0.189	0.124	0.002	0.004	0.004	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.631	0.657	0.468	0.005	0.018	0.016	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.215	0.098	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.398	0.060	0.097	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.342	0.079	1.815	0.004	0.028	0.026	0.067
	Gasoline	MC	Motorcycles	12.353	2.727	0.633	0.002	0.023	0.020	0.056

5066
5067

5068 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.531	0.235	0.102	0.002	0.005	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.996	0.191	0.126	0.002	0.005	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.468	0.623	0.472	0.005	0.020	0.017	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.803	0.108	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.220	0.072	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.342	0.088	1.886	0.004	0.028	0.025	0.068
	Gasoline	MC	Motorcycles	12.158	2.460	0.677	0.002	0.023	0.020	0.056
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.705	0.264	0.122	0.002	0.006	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.062	0.201	0.144	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.591	0.598	0.508	0.004	0.021	0.018	0.085
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.376	0.129	0.158	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.950	0.085	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.309	0.095	1.949	0.004	0.027	0.025	0.068
	Gasoline	MC	Motorcycles	12.066	2.296	0.786	0.002	0.022	0.019	0.056
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.810	0.257	0.115	0.002	0.006	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.186	0.203	0.139	0.002	0.007	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.733	0.632	0.500	0.005	0.022	0.020	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.661	0.119	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.120	0.079	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.333	0.092	1.918	0.004	0.027	0.025	0.068
	Gasoline	MC	Motorcycles	12.554	2.454	0.717	0.002	0.023	0.021	0.056
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.481	0.243	0.100	0.002	0.005	0.005	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.923	0.198	0.125	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.390	0.566	0.513	0.005	0.023	0.020	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.266	0.099	0.161	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.432	0.067	0.104	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.440	0.092	2.141	0.004	0.030	0.028	0.067
	Gasoline	MC	Motorcycles	12.809	2.998	0.754	0.002	0.024	0.021	0.053
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.021	0.223	0.095	0.002	0.005	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.599	0.185	0.117	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.861	0.592	0.452	0.005	0.021	0.019	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.376	0.120	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.974	0.083	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.343	0.101	1.951	0.004	0.028	0.026	0.067
	Gasoline	MC	Motorcycles	11.892	2.251	0.721	0.002	0.022	0.020	0.056
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.027	0.216	0.095	0.002	0.005	0.004	0.044
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.561	0.156	0.114	0.002	0.005	0.004	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.901	0.418	0.421	0.005	0.018	0.016	0.084
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.575	0.115	0.158	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.104	0.072	0.099	0.001	0.004	0.003	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.286	0.080	1.836	0.004	0.026	0.024	0.069
	Gasoline	MC	Motorcycles	11.722	2.085	0.718	0.002	0.022	0.019	0.058
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.583	0.258	0.112	0.002	0.005	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.993	0.198	0.136	0.002	0.005	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.439	0.634	0.503	0.005	0.020	0.018	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.768	0.108	0.160	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.171	0.069	0.101	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.330	0.084	1.956	0.004	0.028	0.025	0.068
	Gasoline	MC	Motorcycles	12.538	2.836	0.772	0.002	0.023	0.021	0.056
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.027	0.216	0.092	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.584	0.185	0.114	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.675	0.612	0.453	0.005	0.021	0.019	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.542	0.113	0.150	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.055	0.081	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.405	0.107	2.022	0.004	0.030	0.028	0.067
	Gasoline	MC	Motorcycles	11.953	2.355	0.687	0.002	0.022	0.020	0.054

5069
5070

5071 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.473	0.229	0.099	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.920	0.187	0.124	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.391	0.656	0.487	0.005	0.019	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.971	0.102	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.267	0.067	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.393	0.090	1.938	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	12.325	2.696	0.650	0.002	0.023	0.020	0.054
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.050	0.273	0.122	0.002	0.007	0.006	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.333	0.211	0.144	0.002	0.007	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.933	0.617	0.509	0.005	0.024	0.021	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.371	0.135	0.156	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.935	0.089	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.314	0.102	1.936	0.004	0.027	0.025	0.068
	Gasoline	MC	Motorcycles	12.462	2.166	0.765	0.002	0.023	0.020	0.056
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.600	0.235	0.106	0.002	0.005	0.005	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.034	0.197	0.131	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.444	0.650	0.497	0.005	0.022	0.019	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.619	0.113	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.089	0.079	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.386	0.102	1.978	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	12.488	2.466	0.688	0.002	0.023	0.021	0.054
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.863	0.248	0.107	0.002	0.005	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.229	0.196	0.131	0.002	0.005	0.004	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.691	0.653	0.491	0.005	0.019	0.017	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.051	0.103	0.154	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.330	0.066	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.347	0.084	1.868	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.530	2.702	0.669	0.002	0.023	0.021	0.056
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.211	0.222	0.104	0.002	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.699	0.178	0.127	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.103	0.549	0.484	0.005	0.019	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.436	0.113	0.152	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.986	0.077	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.364	0.096	1.980	0.004	0.029	0.026	0.068
	Gasoline	MC	Motorcycles	12.003	2.317	0.735	0.002	0.022	0.019	0.055
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.429	0.224	0.098	0.001	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.890	0.183	0.122	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.276	0.607	0.472	0.004	0.019	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.836	0.103	0.152	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.211	0.069	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.383	0.091	1.947	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	12.117	2.561	0.673	0.002	0.023	0.020	0.055
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.270	0.221	0.098	0.002	0.005	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.773	0.184	0.121	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.157	0.621	0.469	0.005	0.021	0.018	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.617	0.113	0.152	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.098	0.078	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.373	0.098	1.966	0.004	0.029	0.026	0.068
	Gasoline	MC	Motorcycles	12.233	2.423	0.692	0.002	0.023	0.020	0.055
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.490	0.245	0.086	0.002	0.003	0.003	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.740	0.212	0.110	0.002	0.004	0.003	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.223	0.759	0.456	0.005	0.017	0.015	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.436	0.080	0.149	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.091	0.049	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.480	0.078	1.831	0.004	0.030	0.028	0.067
	Gasoline	MC	Motorcycles	12.297	3.195	0.519	0.002	0.023	0.020	0.054

5072
5073

5074 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.025	0.217	0.091	0.002	0.005	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.637	0.190	0.115	0.002	0.006	0.005	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.871	0.631	0.464	0.005	0.020	0.018	0.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.556	0.112	0.149	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.073	0.081	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.431	0.110	2.058	0.004	0.031	0.028	0.067
	Gasoline	MC	Motorcycles	11.628	2.416	0.670	0.002	0.022	0.019	0.054
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.870	0.243	0.102	0.002	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.216	0.192	0.126	0.002	0.004	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.716	0.664	0.480	0.005	0.018	0.016	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.179	0.099	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.383	0.063	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.368	0.082	1.879	0.004	0.028	0.026	0.068
	Gasoline	MC	Motorcycles	12.336	2.740	0.639	0.002	0.023	0.020	0.055
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.924	0.259	0.120	0.002	0.006	0.005	0.044
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.276	0.199	0.143	0.002	0.006	0.006	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	9.039	0.601	0.497	0.004	0.021	0.018	0.084
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.481	0.127	0.158	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.043	0.083	0.100	0.001	0.004	0.003	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.299	0.090	1.895	0.004	0.026	0.024	0.069
	Gasoline	MC	Motorcycles	12.488	2.289	0.761	0.002	0.023	0.020	0.057
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.839	0.239	0.104	0.002	0.004	0.004	0.047
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.205	0.197	0.129	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.724	0.675	0.498	0.005	0.020	0.017	0.089
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.018	0.103	0.151	0.001	0.004	0.004	0.017
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.300	0.069	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.404	0.092	1.959	0.004	0.029	0.027	0.068
	Gasoline	MC	Motorcycles	12.398	2.720	0.648	0.002	0.023	0.020	0.054
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.520	0.223	0.090	0.002	0.004	0.003	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.964	0.184	0.113	0.002	0.004	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.220	0.652	0.452	0.005	0.017	0.015	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	6.475	0.093	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.565	0.059	0.099	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.392	0.082	1.878	0.004	0.029	0.027	0.067
	Gasoline	MC	Motorcycles	11.776	2.814	0.611	0.002	0.022	0.019	0.055
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.330	0.238	0.105	0.002	0.005	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.845	0.199	0.131	0.002	0.006	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.186	0.627	0.499	0.005	0.020	0.018	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.687	0.114	0.156	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.139	0.080	0.101	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.387	0.101	2.060	0.004	0.029	0.027	0.068
	Gasoline	MC	Motorcycles	12.008	2.638	0.760	0.002	0.021	0.019	0.055
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.126	0.240	0.102	0.002	0.006	0.006	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.631	0.185	0.121	0.002	0.007	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	7.925	0.575	0.450	0.004	0.022	0.020	0.085
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.276	0.129	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.897	0.084	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.299	0.095	1.894	0.004	0.027	0.025	0.068
	Gasoline	MC	Motorcycles	12.363	2.115	0.754	0.002	0.023	0.021	0.057
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	4.547	0.261	0.089	0.002	0.003	0.003	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.717	0.192	0.106	0.002	0.004	0.003	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.858	0.712	0.422	0.005	0.016	0.014	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	7.521	0.083	0.155	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	4.053	0.044	0.095	0.001	0.004	0.003	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.346	0.067	1.620	0.004	0.028	0.026	0.066
	Gasoline	MC	Motorcycles	12.330	2.685	0.534	0.002	0.023	0.020	0.056

5075
5076

5077 **Table 5-23. On-Road Vehicle Criteria Pollutant Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	NH_3
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.537	0.230	0.102	0.002	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.982	0.189	0.126	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.450	0.636	0.479	0.005	0.019	0.017	0.087
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.794	0.106	0.152	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.200	0.071	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.369	0.090	1.924	0.004	0.029	0.026	0.068
	Gasoline	MC	Motorcycles	11.994	2.517	0.665	0.002	0.022	0.020	0.055
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.466	0.222	0.111	0.002	0.004	0.004	0.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	2.936	0.182	0.138	0.002	0.005	0.004	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.489	0.535	0.513	0.005	0.019	0.017	0.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.363	0.113	0.151	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.973	0.080	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.373	0.100	1.993	0.004	0.029	0.027	0.068
	Gasoline	MC	Motorcycles	12.022	2.279	0.730	0.002	0.021	0.019	0.055
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.658	0.242	0.110	0.002	0.005	0.004	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.062	0.191	0.133	0.002	0.005	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.567	0.627	0.488	0.005	0.020	0.018	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.555	0.112	0.153	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	3.063	0.074	0.097	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.327	0.089	1.880	0.004	0.028	0.025	0.068
	Gasoline	MC	Motorcycles	12.481	2.441	0.701	0.002	0.023	0.021	0.056
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.668	0.247	0.112	0.002	0.006	0.005	0.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.065	0.196	0.134	0.002	0.006	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.598	0.604	0.488	0.005	0.021	0.019	0.086
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.389	0.125	0.154	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.966	0.084	0.098	0.001	0.004	0.003	0.018
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.322	0.098	1.916	0.004	0.028	0.025	0.068
	Gasoline	MC	Motorcycles	12.189	2.189	0.735	0.002	0.022	0.020	0.056
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	3.739	0.269	0.123	0.002	0.006	0.005	0.044
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	3.103	0.204	0.146	0.002	0.006	0.005	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	8.695	0.596	0.506	0.004	0.020	0.018	0.085
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	5.400	0.130	0.160	0.001	0.004	0.004	0.016
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	2.983	0.085	0.101	0.001	0.004	0.003	0.017
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.300	0.091	1.945	0.004	0.027	0.024	0.069
	Gasoline	MC	Motorcycles	12.088	2.364	0.798	0.002	0.022	0.019	0.057

5078

5079

5080 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0167	0.0055	338.521	340.570
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0168	0.0076	418.114	420.787
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0573	0.0273	916.714	926.276
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0484	0.0007	381.136	382.553
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0366	0.0010	435.184	436.397
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0237	0.1596	1288.646	1336.812
	Gasoline	MC	Motorcycles	0.1101	0.0030	391.905	395.560
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0243	0.0054	324.496	326.709
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0232	0.0074	401.513	404.299
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0635	0.0265	885.989	895.469
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0754	0.0007	364.733	366.814
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0608	0.0009	417.936	419.738
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0437	0.1615	1300.363	1349.576
	Gasoline	MC	Motorcycles	0.0882	0.0029	390.562	393.638
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0053	340.329	342.287
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0077	423.330	426.015
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0565	0.0277	919.196	928.844
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0442	0.0007	384.042	385.349
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0345	0.0010	441.187	442.347
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0214	0.1606	1300.510	1348.902
	Gasoline	MC	Motorcycles	0.1211	0.0031	393.912	397.863
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0177	0.0054	330.734	332.786
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0176	0.0074	410.581	413.219
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0573	0.0263	896.667	905.930
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0506	0.0007	372.109	373.568
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0382	0.0009	427.036	428.274
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0243	0.1606	1293.018	1341.469
	Gasoline	MC	Motorcycles	0.1099	0.0028	393.932	397.521
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0186	0.0053	327.560	329.595
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0186	0.0075	407.736	410.443
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0584	0.0270	896.483	905.975
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	367.060	368.711
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0010	422.427	423.895
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0327	0.1600	1290.847	1339.321
	Gasoline	MC	Motorcycles	0.1136	0.0030	394.853	398.582
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0162	0.0052	332.047	334.004
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0169	0.0078	415.243	417.998
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0557	0.0282	906.044	915.820
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0551	0.0007	372.328	373.907
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0468	0.0010	430.261	431.736
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0348	0.1572	1273.199	1320.890
	Gasoline	MC	Motorcycles	0.1240	0.0031	394.983	399.015
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0054	337.882	339.903
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0169	0.0078	418.391	421.120
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0584	0.0281	919.580	929.387
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0536	0.0007	379.335	380.886
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0428	0.0010	434.315	435.695
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0309	0.1584	1280.970	1328.936
	Gasoline	MC	Motorcycles	0.1245	0.0031	392.197	396.244

5081

5082 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0159	0.0055	352.616	354.648
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0166	0.0083	436.892	439.782
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0617	0.0309	967.140	977.880
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0521	0.0008	395.916	397.453
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0439	0.0012	453.370	454.819
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0361	0.1555	1270.517	1317.749
	Gasoline	MC	Motorcycles	0.1349	0.0036	389.150	393.604
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0160	0.0054	352.501	354.517
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0167	0.0080	436.101	438.884
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0615	0.0290	949.674	959.843
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0415	0.0007	397.808	399.063
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0318	0.0011	454.676	455.795
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0205	0.1585	1288.823	1336.556
	Gasoline	MC	Motorcycles	0.1158	0.0033	390.940	394.826
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0158	0.0054	339.657	341.656
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0164	0.0078	421.068	423.785
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0577	0.0281	922.131	931.917
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0483	0.0007	382.257	383.675
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0381	0.0010	437.961	439.221
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0261	0.1588	1285.071	1333.023
	Gasoline	MC	Motorcycles	0.1124	0.0031	392.382	396.132
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0191	0.0054	345.519	347.599
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0197	0.0079	427.633	430.466
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0762	0.0289	938.567	949.059
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0389	0.0007	390.198	391.386
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0294	0.0011	446.255	447.307
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0180	0.1558	1265.772	1312.655
	Gasoline	MC	Motorcycles	0.1399	0.0033	390.394	394.872
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0198	0.0054	326.203	328.316
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0190	0.0073	403.629	406.276
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0569	0.0261	892.109	901.299
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0618	0.0007	365.197	366.935
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0009	418.168	419.628
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1614	1298.121	1347.013
	Gasoline	MC	Motorcycles	0.1067	0.0028	393.863	397.377
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0184	0.0054	335.178	337.236
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0187	0.0077	416.155	418.925
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0595	0.0278	913.421	923.188
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0569	0.0007	375.742	377.371
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0464	0.0010	431.280	432.742
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0328	0.1600	1293.681	1342.183
	Gasoline	MC	Motorcycles	0.1167	0.0031	393.683	397.530
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0193	0.0055	336.013	338.123
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0192	0.0076	415.183	417.938
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0615	0.0276	915.487	925.243
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0574	0.0007	376.674	378.317
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0454	0.0010	430.461	431.899
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1600	1291.946	1340.434
	Gasoline	MC	Motorcycles	0.1146	0.0031	392.419	396.205

5083

5084 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0218	0.0055	326.822	328.997
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0206	0.0073	404.530	407.206
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0603	0.0258	889.868	899.064
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0617	0.0007	365.758	367.493
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0466	0.0009	419.047	420.487
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0308	0.1614	1297.286	1346.160
	Gasoline	MC	Motorcycles	0.1093	0.0028	393.982	397.539
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0195	0.0054	325.954	328.032
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0191	0.0073	405.399	408.056
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0590	0.0260	888.530	897.730
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0554	0.0006	366.009	367.582
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0426	0.0009	420.854	422.192
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0273	0.1620	1303.863	1352.814
	Gasoline	MC	Motorcycles	0.1115	0.0028	395.260	398.881
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0181	0.0054	326.610	328.670
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0178	0.0074	406.304	408.939
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0556	0.0259	888.496	897.600
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0543	0.0006	366.849	368.398
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0415	0.0009	421.881	423.193
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0261	0.1629	1311.232	1360.442
	Gasoline	MC	Motorcycles	0.1081	0.0028	395.734	399.264
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0054	337.843	339.838
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0158	0.0075	419.299	421.941
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0542	0.0269	910.591	919.957
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0454	0.0007	380.949	382.284
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0343	0.0010	436.802	437.950
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0210	0.1612	1301.913	1350.488
	Gasoline	MC	Motorcycles	0.1084	0.0030	393.911	397.501
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0215	0.0055	320.999	323.169
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0199	0.0071	398.120	400.734
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0573	0.0252	877.132	886.069
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0656	0.0006	358.568	360.397
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0009	411.973	413.457
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1609	1290.360	1339.115
	Gasoline	MC	Motorcycles	0.1114	0.0026	394.384	397.950
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0160	0.0053	333.173	335.142
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0167	0.0078	415.608	418.334
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0562	0.0278	906.476	916.162
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0524	0.0007	374.174	375.686
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0431	0.0010	431.353	432.732
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0302	0.1581	1279.238	1327.107
	Gasoline	MC	Motorcycles	0.1211	0.0031	394.505	398.445
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0175	0.0053	338.987	341.007
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0185	0.0080	422.504	425.359
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0616	0.0293	928.037	938.287
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0567	0.0007	379.795	381.429
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0011	437.464	439.005
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0386	0.1566	1272.123	1319.731
	Gasoline	MC	Motorcycles	0.1289	0.0033	392.857	397.075

5085

5086 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0211	0.0054	332.482	334.606
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0210	0.0076	412.420	415.213
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0647	0.0274	906.858	916.635
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0600	0.0007	372.170	373.874
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0010	426.959	428.473
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0353	0.1595	1287.611	1336.011
	Gasoline	MC	Motorcycles	0.1172	0.0030	393.641	397.477
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0219	0.0054	327.844	329.985
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0212	0.0074	406.663	409.396
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0607	0.0266	893.340	902.757
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0637	0.0007	366.280	368.069
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0506	0.0010	420.503	422.052
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0365	0.1588	1278.775	1327.003
	Gasoline	MC	Motorcycles	0.1046	0.0029	393.919	397.388
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0165	0.0055	329.986	332.020
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0073	409.154	411.715
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0534	0.0259	894.067	903.088
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0484	0.0006	371.740	373.144
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0353	0.0009	426.107	427.264
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0221	0.1604	1290.046	1338.389
	Gasoline	MC	Motorcycles	0.1048	0.0027	393.207	396.645
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0182	0.0053	326.777	328.816
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0181	0.0074	407.160	409.812
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0567	0.0261	888.379	897.567
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0544	0.0006	366.955	368.505
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0423	0.0009	422.654	423.989
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0275	0.1618	1302.802	1351.688
	Gasoline	MC	Motorcycles	0.1114	0.0028	395.832	399.451
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0223	0.0055	321.014	323.196
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0207	0.0071	397.890	400.515
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0579	0.0251	878.874	887.789
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0663	0.0006	358.667	360.510
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0494	0.0009	411.680	413.178
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0322	0.1628	1306.530	1355.840
	Gasoline	MC	Motorcycles	0.1036	0.0027	395.095	398.477
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0212	0.0054	324.855	326.987
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0204	0.0073	403.360	406.028
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0598	0.0257	886.497	895.639
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0601	0.0006	363.933	365.624
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0460	0.0009	418.005	419.425
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0300	0.1626	1307.848	1357.049
	Gasoline	MC	Motorcycles	0.1092	0.0028	395.296	398.852
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0181	0.0054	340.012	342.059
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0187	0.0078	422.027	424.817
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0677	0.0282	924.502	934.576
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0489	0.0007	382.778	384.208
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0390	0.0010	438.974	440.257
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0267	0.1600	1296.392	1344.734
	Gasoline	MC	Motorcycles	0.1350	0.0032	392.866	397.194

5087

5088 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0183	0.0053	326.326	328.369
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0182	0.0075	406.069	408.738
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0557	0.0265	889.088	898.364
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0610	0.0007	365.090	366.809
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0010	420.278	421.778
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0338	0.1598	1286.851	1335.306
	Gasoline	MC	Motorcycles	0.1153	0.0028	395.143	398.872
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0164	0.0055	316.986	319.025
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0070	396.245	398.719
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0471	0.0243	866.539	874.936
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0581	0.0006	355.637	357.268
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0419	0.0008	411.204	412.504
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0253	0.1649	1322.246	1372.014
	Gasoline	MC	Motorcycles	0.1098	0.0025	397.440	400.917
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0180	0.0055	325.903	327.977
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0175	0.0073	404.581	407.178
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0548	0.0257	887.358	896.376
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0542	0.0006	366.106	367.653
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0404	0.0009	420.302	421.585
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0251	0.1622	1303.298	1352.247
	Gasoline	MC	Motorcycles	0.1081	0.0027	394.590	398.107
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0164	0.0053	333.475	335.472
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0164	0.0078	414.901	417.621
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0280	909.575	919.239
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0571	0.0007	373.675	375.309
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0472	0.0010	429.821	431.305
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0343	0.1583	1280.319	1328.356
	Gasoline	MC	Motorcycles	0.1200	0.0031	393.856	397.779
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0158	0.0054	334.467	336.468
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0076	414.708	417.374
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0553	0.0273	909.171	918.689
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0503	0.0007	376.144	377.606
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0392	0.0010	431.138	432.416
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0261	0.1593	1285.761	1333.873
	Gasoline	MC	Motorcycles	0.1100	0.0030	392.985	396.632
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0241	0.0055	323.366	325.595
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0221	0.0071	399.869	402.537
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0593	0.0254	883.123	892.152
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0694	0.0006	360.517	362.440
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0521	0.0009	413.081	414.649
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0350	0.1614	1295.521	1344.492
	Gasoline	MC	Motorcycles	0.1019	0.0027	394.153	397.503
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0187	0.0053	331.547	333.604
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0188	0.0076	411.866	414.604
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0593	0.0274	904.277	913.910
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0569	0.0007	371.678	373.301
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0459	0.0010	426.930	428.374
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0325	0.1590	1283.873	1332.071
	Gasoline	MC	Motorcycles	0.1125	0.0030	393.782	397.495

5089

5090 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0179	0.0054	329.415	331.468
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0177	0.0073	409.337	411.967
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0569	0.0261	893.117	902.313
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0512	0.0006	370.537	372.010
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0388	0.0009	425.650	426.897
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0245	0.1606	1292.995	1341.470
	Gasoline	MC	Motorcycles	0.1091	0.0028	394.263	397.820
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0174	0.0054	327.201	329.240
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0174	0.0075	406.020	408.688
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0567	0.0268	896.533	905.941
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0568	0.0007	367.029	368.647
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0447	0.0010	421.183	422.589
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0303	0.1607	1294.672	1343.315
	Gasoline	MC	Motorcycles	0.1121	0.0030	394.115	397.796
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0054	331.698	333.700
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0165	0.0076	412.155	414.829
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0556	0.0272	903.564	913.045
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0514	0.0007	372.881	374.367
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0405	0.0010	428.267	429.572
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0269	0.1600	1291.762	1340.128
	Gasoline	MC	Motorcycles	0.1131	0.0030	393.949	397.668
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0172	0.0054	331.283	333.315
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0076	411.678	414.373
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0555	0.0271	901.415	910.867
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0570	0.0007	371.366	372.993
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0456	0.0010	426.702	428.136
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0310	0.1608	1296.841	1345.524
	Gasoline	MC	Motorcycles	0.1126	0.0030	394.646	398.346
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0152	0.0053	351.285	353.237
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0161	0.0079	437.573	440.333
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0587	0.0285	938.963	948.930
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0378	0.0007	397.011	398.164
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0290	0.0010	456.661	457.697
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0169	0.1580	1286.332	1333.851
	Gasoline	MC	Motorcycles	0.1132	0.0032	393.370	397.160
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0165	0.0053	335.208	337.198
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0170	0.0079	418.012	420.792
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0577	0.0285	915.669	925.605
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0561	0.0007	375.726	377.338
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0474	0.0010	433.020	434.519
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0351	0.1579	1279.748	1327.679
	Gasoline	MC	Motorcycles	0.1259	0.0032	394.001	398.104
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0166	0.0055	333.488	335.527
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0166	0.0075	413.220	415.853
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0551	0.0265	903.476	912.755
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0489	0.0007	375.452	376.875
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0368	0.0010	429.985	431.190
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0229	0.1617	1302.779	1351.530
	Gasoline	MC	Motorcycles	0.1075	0.0029	393.704	397.254

5091

5092 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0212	0.0054	318.861	321.003
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0198	0.0071	397.198	399.796
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0544	0.0247	871.808	880.518
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0649	0.0006	356.466	358.266
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0485	0.0009	410.979	412.447
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0299	0.1644	1319.528	1369.265
	Gasoline	MC	Motorcycles	0.0989	0.0026	397.171	400.412
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0175	0.0054	336.370	338.415
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0178	0.0077	417.299	420.033
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0593	0.0276	913.625	923.314
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0513	0.0007	378.123	379.610
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0405	0.0010	433.571	434.884
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0270	0.1604	1296.254	1344.731
	Gasoline	MC	Motorcycles	0.1122	0.0031	393.466	397.186
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0151	0.0053	336.568	338.533
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0155	0.0076	418.525	421.168
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0543	0.0271	908.498	917.921
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0452	0.0007	379.488	380.818
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0348	0.0010	435.978	437.138
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0217	0.1597	1290.221	1338.348
	Gasoline	MC	Motorcycles	0.1170	0.0030	393.932	397.738
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0181	0.0053	330.356	332.387
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0184	0.0076	410.949	413.673
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0576	0.0273	902.821	912.374
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0575	0.0007	370.397	372.032
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0468	0.0010	425.907	427.367
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0323	0.1605	1296.215	1344.847
	Gasoline	MC	Motorcycles	0.1130	0.0030	394.627	398.356
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0199	0.0055	321.123	323.254
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0184	0.0071	398.393	400.966
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0531	0.0251	876.631	885.428
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0660	0.0006	358.617	360.455
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0489	0.0009	412.158	413.645
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1615	1294.652	1343.562
	Gasoline	MC	Motorcycles	0.1065	0.0026	394.686	398.123
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0153	0.0056	339.915	341.955
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0148	0.0070	420.070	422.514
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0508	0.0252	906.270	915.044
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0393	0.0006	384.744	385.919
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0259	0.0009	439.291	440.209
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0142	0.1563	1256.092	1303.033
	Gasoline	MC	Motorcycles	0.1024	0.0026	389.766	393.105
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0173	0.0054	330.956	332.986
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0174	0.0076	411.609	414.294
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0567	0.0269	899.361	908.785
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0527	0.0007	371.785	373.302
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0415	0.0010	427.419	428.747
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0272	0.1608	1297.081	1345.687
	Gasoline	MC	Motorcycles	0.1141	0.0029	394.747	398.473

5093

5094 **Table 5-24. On-Road Vehicle Speciated GHG Emission Factors – 2024 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0185	0.0053	326.766	328.805
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0188	0.0076	407.120	409.857
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0594	0.0272	895.921	905.499
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0570	0.0007	366.410	368.033
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0465	0.0010	422.007	423.460
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1605	1294.870	1343.490
	Gasoline	MC	Motorcycles	0.1094	0.0030	395.231	398.861
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0186	0.0054	324.767	326.843
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0181	0.0073	403.703	406.329
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0556	0.0259	884.879	893.968
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0567	0.0006	364.270	365.879
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0431	0.0009	418.860	420.214
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0279	0.1611	1294.742	1343.438
	Gasoline	MC	Motorcycles	0.1061	0.0027	394.832	398.300
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0206	0.0054	323.861	325.985
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0196	0.0073	402.017	404.664
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0563	0.0257	883.433	892.503
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0636	0.0006	362.039	363.819
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0488	0.0009	416.014	417.506
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0326	0.1609	1292.939	1341.704
	Gasoline	MC	Motorcycles	0.1041	0.0027	394.796	398.210
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0224	0.0055	319.211	321.394
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0206	0.0071	396.719	399.335
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0566	0.0248	873.719	882.501
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0665	0.0006	356.627	358.471
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0494	0.0009	410.375	411.866
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0305	0.1642	1317.255	1366.940
	Gasoline	MC	Motorcycles	0.1022	0.0026	396.464	399.793

5095

5096 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0158	0.0052	332.325	334.262
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0071	409.946	412.451
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0552	0.0262	918.819	927.997
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0496	0.0007	378.943	380.391
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0362	0.0010	428.435	429.639
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0233	0.1615	1266.929	1315.634
	Gasoline	MC	Motorcycles	0.1084	0.0030	392.032	395.644
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0230	0.0051	318.578	320.675
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0217	0.0070	393.658	396.273
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0612	0.0255	888.198	897.301
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0767	0.0007	362.657	364.770
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0604	0.0009	411.509	413.302
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0438	0.1633	1278.616	1328.381
	Gasoline	MC	Motorcycles	0.0866	0.0029	390.692	393.726
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0141	0.0050	334.097	335.949
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0144	0.0073	415.070	417.589
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0548	0.0265	921.283	930.555
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0454	0.0007	381.817	383.154
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0341	0.0010	434.389	435.539
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0210	0.1624	1278.567	1327.501
	Gasoline	MC	Motorcycles	0.1193	0.0031	394.041	397.946
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0168	0.0051	324.687	326.631
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0164	0.0069	402.562	405.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0553	0.0252	898.661	907.556
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0518	0.0007	369.966	371.455
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0379	0.0009	420.485	421.713
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0240	0.1624	1271.381	1320.369
	Gasoline	MC	Motorcycles	0.1082	0.0028	394.062	397.609
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0177	0.0050	321.576	323.505
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0175	0.0071	399.770	402.312
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0565	0.0259	898.725	907.848
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0594	0.0007	364.958	366.640
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0469	0.0010	415.924	417.382
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0325	0.1618	1269.179	1318.198
	Gasoline	MC	Motorcycles	0.1119	0.0030	394.983	398.669
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0153	0.0049	325.976	327.828
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0158	0.0074	407.134	409.720
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0540	0.0271	908.388	917.787
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0563	0.0007	370.207	371.816
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0464	0.0010	423.621	425.087
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0346	0.1590	1251.679	1299.913
	Gasoline	MC	Motorcycles	0.1222	0.0031	395.113	399.098
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0051	331.699	333.611
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0158	0.0073	410.214	412.772
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0565	0.0269	921.863	931.284
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0548	0.0007	377.171	378.753
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0424	0.0010	427.562	428.933
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0306	0.1602	1259.296	1307.806
	Gasoline	MC	Motorcycles	0.1226	0.0031	392.324	396.325

5097

5098 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0052	346.153	348.071
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0155	0.0078	428.352	431.061
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0596	0.0296	969.862	980.179
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0534	0.0008	393.666	395.234
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0435	0.0012	446.187	447.626
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0358	0.1574	1248.474	1296.265
	Gasoline	MC	Motorcycles	0.1329	0.0036	389.272	393.676
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0151	0.0051	346.038	347.941
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0155	0.0075	427.589	430.196
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0592	0.0279	951.904	961.666
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0427	0.0007	395.506	396.792
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0314	0.0011	447.567	448.676
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0199	0.1604	1266.817	1315.093
	Gasoline	MC	Motorcycles	0.1139	0.0033	391.065	394.906
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0051	333.439	335.328
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0153	0.0073	412.844	415.390
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0558	0.0269	924.361	933.763
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0495	0.0007	380.063	381.511
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0377	0.0010	431.159	432.409
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0257	0.1606	1263.319	1311.812
	Gasoline	MC	Motorcycles	0.1107	0.0031	392.510	396.215
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0181	0.0051	339.185	341.151
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0184	0.0074	419.285	421.940
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0737	0.0277	940.894	950.979
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0402	0.0007	387.944	389.163
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0290	0.0011	439.246	440.288
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0174	0.1577	1244.137	1291.556
	Gasoline	MC	Motorcycles	0.1379	0.0033	390.519	394.946
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0188	0.0052	320.246	322.250
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0178	0.0069	395.737	398.222
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0550	0.0250	894.226	903.052
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0630	0.0007	363.105	364.874
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0469	0.0009	411.736	413.186
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0315	0.1632	1276.430	1325.864
	Gasoline	MC	Motorcycles	0.1051	0.0028	393.993	397.466
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0174	0.0051	329.049	330.996
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0175	0.0073	408.023	410.620
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0575	0.0267	915.693	925.074
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0581	0.0007	373.598	375.257
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0460	0.0010	424.611	426.064
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0326	0.1619	1271.860	1320.910
	Gasoline	MC	Motorcycles	0.1150	0.0031	393.812	397.614
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0183	0.0052	329.868	331.865
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0179	0.0072	407.065	409.650
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0593	0.0265	917.737	927.104
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0586	0.0007	374.524	376.198
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0451	0.0010	423.780	425.209
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1619	1270.162	1319.196
	Gasoline	MC	Motorcycles	0.1128	0.0031	392.547	396.288

5099

5100 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0207	0.0052	320.854	322.918
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0194	0.0068	396.620	399.133
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0582	0.0248	891.897	900.728
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0629	0.0007	363.664	365.431
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0462	0.0009	412.624	414.055
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0306	0.1633	1275.646	1325.061
	Gasoline	MC	Motorcycles	0.1077	0.0028	394.113	397.627
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0185	0.0051	319.999	321.970
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0179	0.0069	397.480	399.974
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0570	0.0249	890.557	899.396
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0566	0.0006	363.900	365.503
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0423	0.0009	414.426	415.755
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0270	0.1638	1282.100	1331.591
	Gasoline	MC	Motorcycles	0.1098	0.0028	395.391	398.970
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0171	0.0051	320.643	322.595
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0167	0.0069	398.366	400.839
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0249	890.466	899.207
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0555	0.0006	364.742	366.322
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0411	0.0009	415.465	416.768
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0258	0.1648	1289.368	1339.120
	Gasoline	MC	Motorcycles	0.1064	0.0028	395.866	399.354
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0146	0.0051	331.660	333.548
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0147	0.0071	411.114	413.591
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0523	0.0258	912.563	921.556
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0466	0.0007	378.745	380.111
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0339	0.0010	430.096	431.235
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0206	0.1631	1280.050	1329.164
	Gasoline	MC	Motorcycles	0.1067	0.0029	394.041	397.588
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0205	0.0052	315.143	317.203
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0187	0.0067	390.333	392.788
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0554	0.0242	879.130	887.712
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0668	0.0006	356.522	358.382
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0483	0.0009	405.679	407.155
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0320	0.1627	1268.914	1318.208
	Gasoline	MC	Motorcycles	0.1097	0.0026	394.517	398.040
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0151	0.0050	327.079	328.943
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0073	407.492	410.049
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0544	0.0267	908.722	918.031
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0536	0.0007	372.036	373.578
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0427	0.0010	424.702	426.072
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0300	0.1599	1257.658	1306.068
	Gasoline	MC	Motorcycles	0.1193	0.0031	394.634	398.529
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0165	0.0050	332.785	334.693
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0076	414.247	416.924
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0597	0.0281	930.557	940.408
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0580	0.0007	377.640	379.304
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0483	0.0011	430.641	432.173
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0385	0.1584	1250.425	1298.584
	Gasoline	MC	Motorcycles	0.1270	0.0033	392.984	397.153

5101

5102 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0200	0.0051	326.405	328.416
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0197	0.0072	404.358	406.979
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0625	0.0263	909.120	918.510
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0613	0.0007	370.048	371.783
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0483	0.0010	420.358	421.862
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0352	0.1613	1265.939	1314.885
	Gasoline	MC	Motorcycles	0.1154	0.0030	393.770	397.561
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0208	0.0051	321.858	323.888
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0199	0.0070	398.713	401.279
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0586	0.0255	895.517	904.561
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0650	0.0007	364.189	366.010
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0502	0.0010	414.023	415.563
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0364	0.1606	1257.364	1306.132
	Gasoline	MC	Motorcycles	0.1030	0.0029	394.050	397.477
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0052	323.952	325.878
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0151	0.0068	401.163	403.564
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0514	0.0248	895.985	904.644
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0496	0.0006	369.592	371.027
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0349	0.0009	419.566	420.714
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0217	0.1622	1268.495	1317.371
	Gasoline	MC	Motorcycles	0.1031	0.0027	393.338	396.735
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0172	0.0051	320.807	322.740
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0170	0.0069	399.208	401.697
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0549	0.0251	890.388	899.215
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0556	0.0006	364.847	366.427
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0420	0.0009	416.217	417.542
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0272	0.1636	1281.054	1330.480
	Gasoline	MC	Motorcycles	0.1097	0.0028	395.964	399.540
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0212	0.0052	315.159	317.231
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0194	0.0067	390.108	392.575
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0560	0.0241	880.878	889.441
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0676	0.0006	356.611	358.486
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0491	0.0009	405.404	406.893
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1646	1284.818	1334.671
	Gasoline	MC	Motorcycles	0.1020	0.0027	395.227	398.569
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0201	0.0051	318.924	320.947
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0191	0.0068	395.476	397.982
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0578	0.0247	888.523	897.304
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0613	0.0006	361.842	363.563
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0456	0.0009	411.627	413.038
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0298	0.1645	1286.051	1335.795
	Gasoline	MC	Motorcycles	0.1075	0.0028	395.428	398.941
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0171	0.0051	333.787	335.724
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0175	0.0073	413.786	416.402
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0658	0.0271	926.753	936.439
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0501	0.0007	380.577	382.037
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0386	0.0010	432.164	433.438
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0263	0.1619	1274.443	1323.331
	Gasoline	MC	Motorcycles	0.1330	0.0032	392.993	397.272

5103

5104 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0173	0.0051	320.367	322.302
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0170	0.0070	398.133	400.638
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0540	0.0254	891.220	900.134
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0622	0.0007	363.009	364.759
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0483	0.0010	413.840	415.331
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0337	0.1616	1265.333	1314.329
	Gasoline	MC	Motorcycles	0.1136	0.0028	395.275	398.960
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0052	311.204	313.141
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0146	0.0066	388.501	390.824
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0458	0.0233	868.317	876.383
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0594	0.0006	353.593	355.255
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0415	0.0008	405.047	406.337
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0250	0.1668	1300.375	1350.682
	Gasoline	MC	Motorcycles	0.1082	0.0025	397.575	401.012
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0170	0.0052	319.949	321.916
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0163	0.0068	396.674	399.111
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0530	0.0246	889.316	897.975
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0555	0.0006	364.004	365.583
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0400	0.0009	413.888	415.162
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0248	0.1640	1281.575	1331.063
	Gasoline	MC	Motorcycles	0.1065	0.0027	394.721	398.196
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0050	327.378	329.268
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0073	406.794	409.347
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0521	0.0268	911.884	921.171
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0583	0.0007	371.549	373.213
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0468	0.0010	423.173	424.648
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0342	0.1602	1258.705	1307.287
	Gasoline	MC	Motorcycles	0.1181	0.0031	393.985	397.863
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0051	328.348	330.240
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0150	0.0071	406.607	409.106
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0535	0.0262	911.332	920.477
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0516	0.0007	373.987	375.480
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0389	0.0010	424.471	425.739
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0258	0.1611	1264.110	1312.761
	Gasoline	MC	Motorcycles	0.1082	0.0030	393.114	396.718
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0230	0.0052	317.469	319.586
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0208	0.0067	392.048	394.555
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0573	0.0243	885.179	893.849
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0706	0.0006	358.453	360.407
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0517	0.0009	406.748	408.308
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0350	0.1632	1273.962	1323.475
	Gasoline	MC	Motorcycles	0.1003	0.0027	394.284	397.594
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0177	0.0051	325.486	327.434
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0176	0.0072	403.817	406.386
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0572	0.0263	906.518	915.771
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0581	0.0007	369.555	371.209
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0456	0.0010	420.334	421.769
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0323	0.1609	1262.266	1311.008
	Gasoline	MC	Motorcycles	0.1108	0.0030	393.911	397.580

5105

5106 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0170	0.0051	323.393	325.338
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0166	0.0069	401.343	403.810
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0550	0.0251	895.089	903.921
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0524	0.0006	368.401	369.905
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0384	0.0009	419.133	420.370
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0242	0.1624	1271.385	1320.397
	Gasoline	MC	Motorcycles	0.1074	0.0028	394.393	397.909
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0165	0.0051	321.220	323.152
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0163	0.0070	398.082	400.587
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0548	0.0258	898.734	907.772
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0580	0.0007	364.935	366.583
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0443	0.0010	414.695	416.092
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0301	0.1625	1272.960	1322.146
	Gasoline	MC	Motorcycles	0.1104	0.0029	394.245	397.883
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0154	0.0051	325.631	327.526
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0071	404.104	406.611
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0261	905.726	914.833
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0526	0.0007	370.744	372.260
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0401	0.0010	421.668	422.964
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0266	0.1619	1270.049	1318.955
	Gasoline	MC	Motorcycles	0.1114	0.0030	394.078	397.754
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0051	325.228	327.152
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0071	403.632	406.161
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0260	903.569	912.648
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	369.248	370.905
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0452	0.0010	420.150	421.575
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0308	0.1626	1275.080	1324.307
	Gasoline	MC	Motorcycles	0.1109	0.0030	394.776	398.432
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0143	0.0050	344.847	346.690
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0150	0.0074	429.046	431.632
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0566	0.0274	941.037	950.609
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0390	0.0007	394.695	395.878
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0286	0.0010	449.592	450.618
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0164	0.1599	1264.457	1312.514
	Gasoline	MC	Motorcycles	0.1115	0.0032	393.497	397.242
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0050	329.077	330.961
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0160	0.0074	409.845	412.455
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0559	0.0274	918.059	927.608
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0573	0.0007	373.590	375.232
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0471	0.0010	426.312	427.801
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0350	0.1597	1258.063	1306.543
	Gasoline	MC	Motorcycles	0.1241	0.0032	394.129	398.186
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0052	327.388	329.318
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0070	405.148	407.617
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0531	0.0255	905.471	914.377
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0502	0.0007	373.290	374.744
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0364	0.0010	423.384	424.580
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0226	0.1635	1280.952	1330.243
	Gasoline	MC	Motorcycles	0.1058	0.0029	393.834	397.342

5107

5108 **Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0202	0.0051	313.048	315.082
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0186	0.0066	389.434	391.875
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0525	0.0237	873.717	882.082
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0661	0.0006	354.417	356.248
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0482	0.0009	404.784	406.243
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0298	0.1662	1297.660	1347.941
	Gasoline	MC	Motorcycles	0.0974	0.0026	397.306	400.507
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0166	0.0051	330.215	332.150
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0166	0.0072	409.148	411.710
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0572	0.0265	915.797	925.100
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0525	0.0007	375.956	377.474
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0401	0.0010	426.877	428.181
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0268	0.1623	1274.412	1323.434
	Gasoline	MC	Motorcycles	0.1105	0.0031	393.594	397.270
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0051	330.408	332.268
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0144	0.0071	410.358	412.836
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0526	0.0260	910.526	919.578
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0464	0.0007	377.294	378.654
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0344	0.0010	429.273	430.424
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0213	0.1615	1268.525	1317.189
	Gasoline	MC	Motorcycles	0.1152	0.0030	394.061	397.824
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0172	0.0050	324.318	326.242
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0172	0.0071	402.920	405.477
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0558	0.0262	905.065	914.246
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0587	0.0007	368.275	369.940
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0464	0.0010	419.344	420.795
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1623	1274.426	1323.604
	Gasoline	MC	Motorcycles	0.1112	0.0030	394.756	398.442
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0188	0.0052	315.266	317.288
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0067	390.601	393.016
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0514	0.0241	878.601	887.051
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0673	0.0006	356.569	358.439
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0485	0.0009	405.875	407.353
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0318	0.1633	1273.150	1322.599
	Gasoline	MC	Motorcycles	0.1048	0.0026	394.818	398.214
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0144	0.0053	333.691	335.624
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0137	0.0065	411.874	414.164
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0489	0.0242	907.928	916.347
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0405	0.0006	382.476	383.682
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0256	0.0009	432.473	433.381
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0137	0.1581	1235.107	1282.566
	Gasoline	MC	Motorcycles	0.1008	0.0026	389.896	393.195
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0051	324.905	326.827
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0071	403.569	406.087
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0547	0.0258	901.455	910.506
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0540	0.0007	369.657	371.205
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0411	0.0010	420.868	422.186
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0269	0.1627	1275.333	1324.480
	Gasoline	MC	Motorcycles	0.1124	0.0029	394.877	398.560

5109

Table 5-25. On-Road Vehicle Speciated GHG Emission Factors – 2025 (cont.)

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0175	0.0050	320.794	322.726
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0176	0.0072	399.164	401.733
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0573	0.0261	898.174	907.376
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	364.322	365.975
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0461	0.0010	415.521	416.965
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1623	1273.130	1322.295
	Gasoline	MC	Motorcycles	0.1077	0.0030	395.361	398.948
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0176	0.0051	318.836	320.803
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0169	0.0069	395.813	398.277
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0248	886.888	895.614
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0579	0.0006	362.186	363.825
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0428	0.0009	412.463	413.808
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0277	0.1629	1273.154	1322.388
	Gasoline	MC	Motorcycles	0.1045	0.0027	394.964	398.390
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0196	0.0051	317.951	319.966
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0184	0.0068	394.157	396.643
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0544	0.0247	885.486	894.197
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0648	0.0006	359.970	361.780
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0484	0.0009	409.651	411.135
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0325	0.1627	1271.394	1320.700
	Gasoline	MC	Motorcycles	0.1024	0.0027	394.928	398.301
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0213	0.0052	313.391	315.466
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0194	0.0066	388.962	391.421
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0547	0.0237	875.656	884.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0678	0.0006	354.581	356.456
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0490	0.0009	404.168	405.649
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0304	0.1660	1295.413	1345.642
	Gasoline	MC	Motorcycles	0.1006	0.0026	396.598	399.887

5112 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0143	0.0050	327.444	329.286
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0133	0.0068	402.501	404.859
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0514	0.0264	922.160	931.299
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0498	0.0007	376.600	378.051
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0354	0.0010	422.825	424.010
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0230	0.1629	1248.348	1297.479
	Gasoline	MC	Motorcycles	0.1069	0.0030	392.143	395.711
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0212	0.0049	313.858	315.854
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0192	0.0067	386.441	388.906
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0569	0.0256	891.645	900.697
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0767	0.0007	360.422	362.535
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0593	0.0010	406.184	407.950
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0439	0.1648	1259.960	1310.159
	Gasoline	MC	Motorcycles	0.0851	0.0029	390.800	393.792
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0127	0.0049	329.198	330.958
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0124	0.0069	407.550	409.927
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0514	0.0268	924.616	933.867
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0455	0.0007	379.443	380.783
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0333	0.0010	428.743	429.874
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0206	0.1639	1259.797	1309.161
	Gasoline	MC	Motorcycles	0.1176	0.0031	394.152	398.011
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0153	0.0049	319.914	321.765
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0142	0.0066	395.251	397.584
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0516	0.0254	901.892	910.750
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0519	0.0007	367.673	369.165
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0370	0.0009	415.062	416.271
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0237	0.1638	1252.803	1302.212
	Gasoline	MC	Motorcycles	0.1066	0.0028	394.175	397.679
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0164	0.0048	316.837	318.678
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0157	0.0068	392.483	394.893
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0538	0.0261	902.240	911.355
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0595	0.0007	362.708	364.391
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0459	0.0010	410.548	411.984
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0324	0.1633	1250.653	1300.102
	Gasoline	MC	Motorcycles	0.1103	0.0030	395.093	398.735
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0140	0.0048	321.179	322.943
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0071	399.717	402.165
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0511	0.0273	912.002	921.396
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0563	0.0007	367.939	369.550
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0455	0.0010	418.087	419.530
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0345	0.1605	1233.393	1282.063
	Gasoline	MC	Motorcycles	0.1205	0.0031	395.223	399.161
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0140	0.0049	326.820	328.638
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0135	0.0070	402.745	405.154
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0523	0.0271	925.397	934.778
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0549	0.0007	374.857	376.441
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0415	0.0010	421.926	423.275
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0304	0.1617	1240.831	1289.774
	Gasoline	MC	Motorcycles	0.1210	0.0031	392.433	396.388

5113

5114 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0050	341.066	342.890
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0138	0.0075	420.543	423.109
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0570	0.0299	973.873	984.199
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0535	0.0008	391.264	392.835
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0425	0.0012	440.125	441.542
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0356	0.1589	1229.944	1278.194
	Gasoline	MC	Motorcycles	0.1311	0.0036	389.377	393.730
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0135	0.0049	340.968	342.775
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0130	0.0071	419.839	422.291
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0550	0.0281	955.366	965.091
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0428	0.0007	393.052	394.341
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0307	0.0011	441.622	442.714
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0195	0.1619	1248.102	1296.815
	Gasoline	MC	Motorcycles	0.1123	0.0033	391.174	394.969
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0134	0.0049	328.542	330.338
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0130	0.0070	405.343	407.740
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0520	0.0271	927.842	937.212
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0497	0.0007	377.720	379.170
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0369	0.0010	425.491	426.722
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0254	0.1621	1244.776	1293.702
	Gasoline	MC	Motorcycles	0.1091	0.0031	392.620	396.280
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0164	0.0049	334.215	336.084
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0158	0.0071	411.686	414.183
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0693	0.0279	944.478	954.521
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0403	0.0007	385.542	386.764
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0283	0.0011	433.418	434.443
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0170	0.1592	1225.799	1273.651
	Gasoline	MC	Motorcycles	0.1360	0.0033	390.628	395.004
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0173	0.0050	315.521	317.431
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0066	388.519	390.865
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0513	0.0252	897.601	906.388
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0631	0.0006	360.862	362.632
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0460	0.0009	406.428	407.856
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0314	0.1647	1257.797	1307.656
	Gasoline	MC	Motorcycles	0.1036	0.0028	394.104	397.535
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0049	324.204	326.051
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0150	0.0070	400.586	403.030
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0530	0.0269	919.224	928.555
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	371.302	372.963
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0450	0.0010	419.054	420.484
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0325	0.1633	1253.231	1302.716
	Gasoline	MC	Motorcycles	0.1133	0.0031	393.921	397.678
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0167	0.0050	325.010	326.910
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0157	0.0069	399.644	402.081
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0554	0.0267	921.240	930.568
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0587	0.0007	372.223	373.899
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0441	0.0010	418.216	419.623
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1633	1251.548	1301.015
	Gasoline	MC	Motorcycles	0.1112	0.0031	392.656	396.352

5115

5116 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0192	0.0050	316.120	318.088
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0171	0.0065	389.389	391.760
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0545	0.0250	895.166	903.955
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0630	0.0006	361.417	363.185
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0453	0.0009	407.310	408.718
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0305	0.1647	1257.032	1306.869
	Gasoline	MC	Motorcycles	0.1061	0.0027	394.225	397.697
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0170	0.0049	315.287	317.166
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0157	0.0066	390.250	392.604
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0533	0.0251	893.843	902.644
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0567	0.0006	361.642	363.246
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0414	0.0009	409.129	410.436
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0268	0.1652	1263.383	1313.298
	Gasoline	MC	Motorcycles	0.1082	0.0028	395.504	399.039
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0049	315.923	317.783
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0145	0.0066	391.123	393.455
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0501	0.0250	893.688	902.392
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0556	0.0006	362.486	364.067
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0403	0.0009	410.153	411.435
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0256	0.1662	1270.532	1320.707
	Gasoline	MC	Motorcycles	0.1049	0.0028	395.979	399.425
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0132	0.0049	326.794	328.589
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0125	0.0068	403.662	405.995
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0486	0.0260	915.765	924.721
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0467	0.0007	376.391	377.759
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0331	0.0010	424.527	425.647
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0202	0.1645	1261.285	1310.824
	Gasoline	MC	Motorcycles	0.1052	0.0029	394.153	397.657
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0188	0.0050	310.487	312.450
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0165	0.0064	383.209	385.526
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0516	0.0243	882.368	890.905
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0669	0.0006	354.323	356.184
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0474	0.0009	400.480	401.932
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1641	1250.448	1300.160
	Gasoline	MC	Motorcycles	0.1082	0.0026	394.629	398.110
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0048	322.270	324.040
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0133	0.0070	400.079	402.488
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0503	0.0269	912.227	921.499
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0537	0.0007	369.749	371.293
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0418	0.0010	419.165	420.513
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0298	0.1614	1239.271	1288.114
	Gasoline	MC	Motorcycles	0.1176	0.0031	394.744	398.594
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0048	327.887	329.700
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0149	0.0072	406.689	409.211
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0559	0.0284	934.355	944.184
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0580	0.0007	375.335	377.001
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0011	424.921	426.430
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0383	0.1599	1232.068	1280.674
	Gasoline	MC	Motorcycles	0.1253	0.0033	393.091	397.212

5117

5118 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0184	0.0049	321.594	323.508
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0069	396.980	399.452
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0584	0.0265	912.638	921.987
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0613	0.0007	367.775	369.512
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0010	414.868	416.349
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0350	0.1628	1247.429	1296.808
	Gasoline	MC	Motorcycles	0.1137	0.0030	393.880	397.624
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0192	0.0049	317.106	319.040
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0177	0.0067	391.433	393.855
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0548	0.0257	898.939	907.945
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0650	0.0007	361.945	363.767
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0492	0.0010	408.657	410.174
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0363	0.1621	1239.041	1288.236
	Gasoline	MC	Motorcycles	0.1014	0.0029	394.160	397.545
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0141	0.0050	319.192	321.027
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0129	0.0065	393.885	396.148
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0479	0.0250	899.131	907.753
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0497	0.0006	367.295	368.731
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0341	0.0009	414.164	415.294
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0213	0.1637	1249.965	1299.258
	Gasoline	MC	Motorcycles	0.1016	0.0027	393.452	396.807
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0049	316.085	317.923
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0147	0.0067	391.949	394.295
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0510	0.0253	893.648	902.432
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0557	0.0006	362.589	364.171
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0411	0.0009	410.890	412.195
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0270	0.1650	1262.355	1312.205
	Gasoline	MC	Motorcycles	0.1082	0.0028	396.077	399.610
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0197	0.0050	310.501	312.479
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0064	382.988	385.319
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0525	0.0243	884.138	892.662
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0676	0.0006	354.401	356.277
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0481	0.0009	400.237	401.703
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1661	1266.090	1316.363
	Gasoline	MC	Motorcycles	0.1005	0.0026	395.340	398.641
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0186	0.0049	314.220	316.150
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0169	0.0065	388.271	390.636
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0541	0.0249	891.805	900.547
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0614	0.0006	359.598	361.321
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0447	0.0009	406.368	407.756
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0296	0.1659	1267.280	1317.448
	Gasoline	MC	Motorcycles	0.1060	0.0028	395.541	399.011
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0049	328.886	330.726
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0150	0.0070	406.269	408.731
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0614	0.0273	930.265	939.905
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0502	0.0007	378.227	379.690
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0378	0.0010	426.494	427.747
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0259	0.1634	1255.720	1305.044
	Gasoline	MC	Motorcycles	0.1312	0.0032	393.103	397.332

5119

5120 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0154	0.0049	315.642	317.475
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0145	0.0067	390.871	393.228
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0494	0.0256	894.601	903.456
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0623	0.0007	360.777	362.528
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0010	408.499	409.967
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0335	0.1631	1246.893	1296.315
	Gasoline	MC	Motorcycles	0.1120	0.0028	395.386	399.027
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0141	0.0050	306.616	308.463
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0063	381.437	383.629
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0425	0.0234	871.347	879.376
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0594	0.0006	351.399	353.062
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0407	0.0008	399.963	401.233
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0247	0.1682	1281.412	1332.135
	Gasoline	MC	Motorcycles	0.1067	0.0024	397.691	401.087
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0050	315.239	317.113
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0142	0.0065	389.462	391.760
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0494	0.0248	892.518	901.139
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0555	0.0006	361.753	363.333
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0392	0.0009	408.582	409.836
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0246	0.1654	1262.864	1312.771
	Gasoline	MC	Motorcycles	0.1050	0.0027	394.834	398.268
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0143	0.0049	322.557	324.360
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0138	0.0070	399.377	401.801
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0499	0.0270	915.455	924.750
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0584	0.0007	369.274	370.939
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0459	0.0010	417.627	419.080
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0341	0.1616	1240.296	1289.313
	Gasoline	MC	Motorcycles	0.1165	0.0031	394.094	397.926
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0134	0.0049	323.522	325.322
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0128	0.0068	399.215	401.570
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0499	0.0264	914.743	923.856
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0517	0.0007	371.681	373.176
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0380	0.0010	418.931	420.179
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0255	0.1626	1245.604	1294.683
	Gasoline	MC	Motorcycles	0.1067	0.0030	393.224	396.785
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0214	0.0050	312.771	314.792
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0186	0.0064	384.882	387.251
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0536	0.0245	888.478	897.106
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0707	0.0006	356.230	358.185
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0507	0.0009	401.535	403.070
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0349	0.1646	1255.404	1305.338
	Gasoline	MC	Motorcycles	0.0988	0.0027	394.396	397.665
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0162	0.0049	320.693	322.547
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0069	396.459	398.883
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0536	0.0265	910.018	919.240
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	367.283	368.938
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0446	0.0010	414.856	416.269
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1623	1243.819	1292.991
	Gasoline	MC	Motorcycles	0.1091	0.0030	394.022	397.646

5121

5122 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0049	318.639	320.491
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0144	0.0066	394.054	396.381
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0514	0.0252	898.298	907.093
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0525	0.0006	366.117	367.622
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0375	0.0009	413.743	414.960
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0240	0.1639	1252.819	1302.251
	Gasoline	MC	Motorcycles	0.1059	0.0028	394.507	397.980
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0151	0.0049	316.489	318.328
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0141	0.0067	390.830	393.192
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0511	0.0260	902.206	911.207
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0581	0.0007	362.693	364.343
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0434	0.0010	409.320	410.694
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0299	0.1640	1254.364	1303.979
	Gasoline	MC	Motorcycles	0.1088	0.0029	394.355	397.950
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0139	0.0049	320.844	322.646
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0133	0.0068	396.756	399.122
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0501	0.0263	909.145	918.222
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0527	0.0007	368.460	369.978
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0393	0.0010	416.192	417.467
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0263	0.1633	1251.472	1300.807
	Gasoline	MC	Motorcycles	0.1098	0.0030	394.189	397.821
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0148	0.0049	320.438	322.267
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0068	396.279	398.663
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0498	0.0262	906.975	916.016
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0583	0.0007	366.980	368.639
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0443	0.0010	414.694	416.097
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0307	0.1641	1256.440	1306.097
	Gasoline	MC	Motorcycles	0.1093	0.0030	394.887	398.499
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0048	339.799	341.550
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0071	421.290	423.723
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0526	0.0276	944.329	953.868
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0392	0.0007	392.225	393.411
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0279	0.0010	443.701	444.710
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0159	0.1614	1245.826	1294.315
	Gasoline	MC	Motorcycles	0.1098	0.0032	393.608	397.308
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0144	0.0048	324.233	326.030
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0144	0.0071	402.373	404.849
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0535	0.0276	921.721	931.276
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0574	0.0007	371.306	372.949
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0461	0.0011	420.705	422.170
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0349	0.1612	1239.640	1288.559
	Gasoline	MC	Motorcycles	0.1224	0.0032	394.238	398.247
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0050	322.578	324.415
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0132	0.0067	397.793	400.119
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0494	0.0256	908.703	917.572
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0503	0.0007	370.980	372.436
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0356	0.0010	417.907	419.083
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0223	0.1650	1262.197	1311.912
	Gasoline	MC	Motorcycles	0.1043	0.0029	393.946	397.411

5123

5124 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0187	0.0050	308.423	310.364
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0165	0.0064	382.333	384.640
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0491	0.0239	876.886	885.214
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0661	0.0006	352.214	354.046
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0472	0.0009	399.687	401.122
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0296	0.1677	1278.742	1329.443
	Gasoline	MC	Motorcycles	0.0959	0.0026	397.420	400.581
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0049	325.361	327.201
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0143	0.0069	401.708	404.122
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0532	0.0267	919.219	928.485
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0526	0.0007	373.639	375.159
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0393	0.0010	421.302	422.585
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0265	0.1637	1255.733	1305.186
	Gasoline	MC	Motorcycles	0.1089	0.0031	393.704	397.336
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0049	325.560	327.329
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0123	0.0068	402.920	405.257
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0491	0.0262	913.789	922.812
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0465	0.0007	374.951	376.313
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0336	0.0010	423.711	424.843
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0209	0.1630	1249.950	1299.038
	Gasoline	MC	Motorcycles	0.1136	0.0029	394.173	397.892
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0048	319.541	321.373
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0151	0.0068	395.579	397.994
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0522	0.0264	908.580	917.733
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0588	0.0007	366.003	367.669
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0455	0.0010	413.910	415.339
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1638	1255.794	1305.405
	Gasoline	MC	Motorcycles	0.1097	0.0030	394.867	398.508
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0170	0.0050	310.607	312.525
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0149	0.0064	383.472	385.745
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0471	0.0242	881.809	890.199
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0673	0.0006	354.368	356.238
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0475	0.0009	400.683	402.138
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1647	1254.617	1304.483
	Gasoline	MC	Motorcycles	0.1033	0.0026	394.931	398.286
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0129	0.0051	328.802	330.642
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0116	0.0063	404.433	406.588
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0454	0.0243	910.735	919.114
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0407	0.0006	380.051	381.260
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0249	0.0009	426.878	427.772
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0132	0.1595	1217.058	1264.920
	Gasoline	MC	Motorcycles	0.0993	0.0026	390.010	393.268
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0049	320.127	321.957
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0141	0.0068	396.229	398.607
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0513	0.0260	904.800	913.821
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0540	0.0007	367.380	368.930
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0402	0.0010	415.421	416.718
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0267	0.1641	1256.690	1306.263
	Gasoline	MC	Motorcycles	0.1108	0.0029	394.989	398.628

5125

5126 **Table 5-26. On-Road Vehicle Speciated GHG Emission Factors – 2026 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0161	0.0048	316.070	317.910
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0069	391.891	394.314
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0263	901.708	910.877
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0583	0.0007	362.087	363.742
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0452	0.0010	410.141	411.562
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0318	0.1638	1254.538	1304.136
	Gasoline	MC	Motorcycles	0.1062	0.0030	395.471	399.015
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0161	0.0049	314.139	316.013
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0148	0.0066	388.609	390.933
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0501	0.0250	890.142	898.831
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0579	0.0006	359.952	361.593
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0419	0.0009	407.167	408.491
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0275	0.1643	1254.591	1304.245
	Gasoline	MC	Motorcycles	0.1029	0.0027	395.077	398.461
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0179	0.0049	313.257	315.175
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0065	386.965	389.311
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0506	0.0249	888.785	897.453
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0648	0.0006	357.748	359.559
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0475	0.0009	404.394	405.854
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0324	0.1642	1252.873	1302.600
	Gasoline	MC	Motorcycles	0.1009	0.0027	395.040	398.372
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0198	0.0050	308.758	310.740
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0173	0.0064	381.865	384.190
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0513	0.0239	878.851	887.247
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0678	0.0006	352.380	354.256
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0480	0.0009	399.059	400.517
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0302	0.1674	1276.527	1327.176
	Gasoline	MC	Motorcycles	0.0992	0.0026	396.711	399.960

5127

5128 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0049	321.992	323.787
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0123	0.0066	395.553	397.817
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0484	0.0254	924.191	932.958
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0498	0.0007	374.108	375.559
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0347	0.0010	419.607	420.773
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0227	0.1641	1227.249	1276.716
	Gasoline	MC	Motorcycles	0.1055	0.0030	392.237	395.769
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0203	0.0048	308.561	310.503
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0180	0.0064	379.672	382.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0247	893.754	902.439
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0766	0.0007	358.029	360.140
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0585	0.0009	402.929	404.675
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0440	0.1659	1238.623	1289.160
	Gasoline	MC	Motorcycles	0.0838	0.0029	390.887	393.845
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0121	0.0047	323.732	325.448
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0114	0.0067	400.534	402.818
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0489	0.0258	926.652	935.542
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0456	0.0007	376.922	378.263
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0325	0.0010	425.483	426.595
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0203	0.1651	1238.443	1288.143
	Gasoline	MC	Motorcycles	0.1162	0.0031	394.247	398.069
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0147	0.0048	314.581	316.384
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0132	0.0064	388.422	390.662
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0488	0.0245	903.810	912.312
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0519	0.0007	365.233	366.725
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0363	0.0009	411.814	413.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0234	0.1649	1231.592	1281.328
	Gasoline	MC	Motorcycles	0.1053	0.0028	394.270	397.739
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0047	311.534	313.328
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0147	0.0066	385.665	387.982
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0512	0.0252	904.419	913.179
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0595	0.0007	360.309	361.991
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0452	0.0010	407.319	408.735
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0322	0.1644	1229.518	1279.303
	Gasoline	MC	Motorcycles	0.1089	0.0030	395.185	398.791
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0135	0.0047	315.813	317.533
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0131	0.0068	392.783	395.138
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0487	0.0263	914.313	923.346
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0563	0.0007	365.524	367.135
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0447	0.0010	414.884	416.307
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0343	0.1616	1212.663	1261.679
	Gasoline	MC	Motorcycles	0.1190	0.0031	395.314	399.214
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0134	0.0048	321.366	323.138
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0067	395.770	398.086
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0498	0.0261	927.619	936.630
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0549	0.0007	372.393	373.977
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0408	0.0010	418.736	420.066
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0302	0.1629	1219.923	1269.210
	Gasoline	MC	Motorcycles	0.1195	0.0031	392.525	396.441

5129

5130 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0131	0.0049	335.382	337.162
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0128	0.0072	413.263	415.728
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0541	0.0288	976.561	986.480
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0536	0.0008	388.711	390.282
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0417	0.0012	436.992	438.388
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0355	0.1602	1209.333	1257.959
	Gasoline	MC	Motorcycles	0.1295	0.0036	389.464	393.776
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0129	0.0048	335.312	337.074
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0120	0.0069	412.619	414.972
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0517	0.0270	957.546	966.873
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0429	0.0007	390.448	391.739
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0299	0.0011	438.399	439.471
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0190	0.1631	1227.029	1276.090
	Gasoline	MC	Motorcycles	0.1108	0.0033	391.266	395.023
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0048	323.073	324.822
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0119	0.0067	398.343	400.645
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0491	0.0261	930.017	939.010
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0497	0.0007	375.228	376.680
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0361	0.0010	422.284	423.496
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0250	0.1633	1223.773	1273.040
	Gasoline	MC	Motorcycles	0.1077	0.0031	392.712	396.336
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0157	0.0048	328.673	330.493
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0146	0.0068	404.607	407.003
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0659	0.0269	946.767	956.412
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0404	0.0007	382.994	384.218
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0275	0.0011	430.239	431.244
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0166	0.1604	1205.224	1253.424
	Gasoline	MC	Motorcycles	0.1344	0.0033	390.721	395.054
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0166	0.0049	310.230	312.091
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0146	0.0063	381.766	384.021
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0487	0.0243	899.625	908.063
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0630	0.0006	358.467	360.235
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0453	0.0009	403.191	404.600
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0312	0.1658	1236.484	1286.672
	Gasoline	MC	Motorcycles	0.1022	0.0028	394.197	397.593
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0048	318.784	320.584
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0067	393.635	395.983
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0502	0.0259	921.432	930.393
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	368.856	370.517
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0443	0.0010	415.836	417.247
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0323	0.1645	1232.046	1281.873
	Gasoline	MC	Motorcycles	0.1119	0.0031	394.013	397.732
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0160	0.0049	319.575	321.426
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0146	0.0066	392.709	395.050
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0524	0.0257	923.412	932.363
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0587	0.0007	369.770	371.446
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0434	0.0010	415.011	416.399
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0315	0.1645	1230.395	1280.204
	Gasoline	MC	Motorcycles	0.1097	0.0031	392.748	396.406

5131

5132 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0184	0.0049	310.818	312.734
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0160	0.0063	382.622	384.900
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0516	0.0240	897.098	905.533
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0629	0.0006	359.017	360.784
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0445	0.0009	404.062	405.452
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0303	0.1658	1235.729	1285.893
	Gasoline	MC	Motorcycles	0.1047	0.0027	394.319	397.755
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0048	310.017	311.847
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0146	0.0064	383.488	385.749
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0505	0.0242	895.790	904.242
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0566	0.0006	359.235	360.839
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0406	0.0009	405.860	407.148
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0266	0.1664	1241.935	1292.176
	Gasoline	MC	Motorcycles	0.1068	0.0028	395.599	399.099
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0048	310.645	312.456
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0135	0.0064	384.349	386.589
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0473	0.0241	895.575	903.929
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0556	0.0006	360.082	361.663
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0395	0.0009	406.880	408.143
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0253	0.1673	1248.917	1299.416
	Gasoline	MC	Motorcycles	0.1035	0.0028	396.075	399.485
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0126	0.0048	321.361	323.110
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0115	0.0066	396.707	398.948
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0458	0.0250	917.668	926.263
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0468	0.0007	373.889	375.259
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0324	0.0010	421.260	422.361
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0199	0.1657	1239.884	1289.753
	Gasoline	MC	Motorcycles	0.1038	0.0029	394.249	397.717
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0181	0.0049	305.267	307.179
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0155	0.0062	376.538	378.765
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0490	0.0234	884.264	892.460
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0668	0.0006	351.972	353.831
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0466	0.0009	397.239	398.673
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0318	0.1652	1229.289	1279.323
	Gasoline	MC	Motorcycles	0.1068	0.0026	394.723	398.169
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0130	0.0047	316.893	318.619
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0124	0.0067	393.153	395.469
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0479	0.0259	914.430	923.342
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0537	0.0007	367.316	368.860
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0410	0.0010	415.951	417.280
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0296	0.1626	1218.396	1267.580
	Gasoline	MC	Motorcycles	0.1161	0.0030	394.837	398.649
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0140	0.0047	322.407	324.164
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0136	0.0070	399.628	402.043
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0517	0.0273	936.841	946.250
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0580	0.0007	372.881	374.547
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0465	0.0011	421.749	423.237
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0382	0.1611	1211.389	1260.353
	Gasoline	MC	Motorcycles	0.1237	0.0033	393.180	397.261

5133

5134 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0176	0.0048	316.208	318.072
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0066	390.080	392.454
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0552	0.0255	914.829	923.803
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0613	0.0007	365.351	367.087
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0465	0.0010	411.654	413.116
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0349	0.1639	1226.373	1276.092
	Gasoline	MC	Motorcycles	0.1122	0.0030	393.971	397.678
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0184	0.0048	311.783	313.666
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0165	0.0064	384.617	386.944
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0518	0.0247	901.036	909.681
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0650	0.0007	359.549	361.369
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0485	0.0010	405.431	406.928
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0362	0.1632	1218.165	1267.695
	Gasoline	MC	Motorcycles	0.1001	0.0028	394.252	397.603
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0135	0.0049	313.875	315.662
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0120	0.0063	387.089	389.262
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0451	0.0240	900.965	909.237
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0498	0.0006	364.850	366.287
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0334	0.0009	410.914	412.025
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0210	0.1648	1228.808	1278.424
	Gasoline	MC	Motorcycles	0.1003	0.0027	393.548	396.869
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0048	310.804	312.595
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0137	0.0064	385.160	387.415
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0483	0.0243	895.583	904.020
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0557	0.0006	360.184	361.766
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0403	0.0009	407.622	408.908
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0267	0.1662	1240.930	1291.107
	Gasoline	MC	Motorcycles	0.1068	0.0028	396.172	399.670
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0189	0.0049	305.280	307.206
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0162	0.0062	376.319	378.559
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0497	0.0233	886.035	894.219
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0676	0.0006	352.039	353.912
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0474	0.0009	396.969	398.416
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1672	1244.575	1295.172
	Gasoline	MC	Motorcycles	0.0992	0.0026	395.433	398.701
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0178	0.0048	308.954	310.833
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0158	0.0063	381.527	383.799
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0512	0.0239	893.739	902.132
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0614	0.0006	357.204	358.926
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0440	0.0009	403.096	404.465
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0294	0.1670	1245.744	1296.237
	Gasoline	MC	Motorcycles	0.1046	0.0027	395.635	399.070
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0048	323.412	325.206
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0068	399.253	401.620
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0587	0.0262	932.462	941.731
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0502	0.0007	375.729	377.193
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0370	0.0010	423.274	424.508
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0256	0.1645	1234.474	1284.141
	Gasoline	MC	Motorcycles	0.1296	0.0032	393.196	397.384

5135

5136 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0148	0.0048	310.351	312.137
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0136	0.0065	384.075	386.342
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0471	0.0247	896.660	905.171
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0622	0.0007	358.395	360.145
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0466	0.0010	405.266	406.714
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0334	0.1642	1225.834	1275.587
	Gasoline	MC	Motorcycles	0.1106	0.0028	395.479	399.084
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0049	301.480	303.279
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0118	0.0061	374.824	376.933
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0406	0.0225	873.021	880.738
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0594	0.0006	349.056	350.718
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0400	0.0008	396.649	397.901
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0245	0.1692	1259.524	1310.561
	Gasoline	MC	Motorcycles	0.1054	0.0024	397.789	401.151
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0049	309.972	311.797
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0132	0.0063	382.719	384.927
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0468	0.0239	894.387	902.663
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0555	0.0006	359.353	360.932
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0384	0.0009	405.327	406.562
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0243	0.1665	1241.418	1291.649
	Gasoline	MC	Motorcycles	0.1036	0.0027	394.930	398.329
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0137	0.0048	317.163	318.921
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0130	0.0067	392.444	394.775
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0475	0.0260	917.711	926.645
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0584	0.0007	366.849	368.514
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0451	0.0010	414.427	415.860
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0340	0.1628	1219.406	1268.766
	Gasoline	MC	Motorcycles	0.1150	0.0031	394.185	397.980
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0048	318.129	319.883
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0118	0.0066	392.314	394.574
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0471	0.0254	916.840	925.587
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0517	0.0007	369.228	370.723
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0372	0.0010	415.719	416.948
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0252	0.1637	1224.573	1273.987
	Gasoline	MC	Motorcycles	0.1053	0.0030	393.318	396.843
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0205	0.0049	307.503	309.469
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0174	0.0062	378.167	380.444
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0508	0.0236	890.423	898.705
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0706	0.0006	353.852	355.804
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0500	0.0009	398.275	399.792
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0348	0.1657	1234.142	1284.402
	Gasoline	MC	Motorcycles	0.0975	0.0027	394.489	397.724
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0048	315.330	317.136
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0143	0.0066	389.579	391.908
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0507	0.0255	912.197	921.051
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0582	0.0007	364.861	366.517
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0439	0.0010	411.644	413.037
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0320	0.1635	1222.839	1272.351
	Gasoline	MC	Motorcycles	0.1077	0.0030	394.113	397.701

5137

5138 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0048	313.325	315.129
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0133	0.0064	387.244	389.478
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0486	0.0243	900.195	908.637
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0525	0.0006	363.684	365.190
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0368	0.0009	410.488	411.686
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0237	0.1650	1231.606	1281.364
	Gasoline	MC	Motorcycles	0.1045	0.0028	394.602	398.040
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0145	0.0048	311.196	312.988
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0132	0.0065	384.049	386.319
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0485	0.0250	904.335	912.982
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0581	0.0007	360.304	361.954
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0427	0.0010	406.110	407.466
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0298	0.1651	1233.136	1283.084
	Gasoline	MC	Motorcycles	0.1074	0.0029	394.448	398.007
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0134	0.0048	315.492	317.249
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0123	0.0066	389.892	392.164
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0475	0.0253	911.245	919.960
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0527	0.0007	366.029	367.547
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0385	0.0010	412.970	414.227
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0261	0.1645	1230.308	1279.976
	Gasoline	MC	Motorcycles	0.1084	0.0030	394.283	397.878
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0048	315.079	316.861
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0131	0.0066	389.403	391.694
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0473	0.0252	909.059	917.743
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0583	0.0007	364.562	366.220
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0436	0.0010	411.463	412.847
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0305	0.1652	1235.168	1285.160
	Gasoline	MC	Motorcycles	0.1079	0.0029	394.980	398.555
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0122	0.0047	334.173	335.879
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0116	0.0069	414.062	416.397
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0495	0.0266	946.369	955.525
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0393	0.0007	389.606	390.795
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0271	0.0010	440.423	441.412
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0155	0.1626	1224.794	1273.624
	Gasoline	MC	Motorcycles	0.1084	0.0032	393.703	397.366
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0138	0.0047	318.815	320.566
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0135	0.0069	395.390	397.770
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0509	0.0266	924.070	933.254
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0574	0.0007	368.873	370.517
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0453	0.0011	417.511	418.957
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0348	0.1624	1218.775	1268.043
	Gasoline	MC	Motorcycles	0.1209	0.0032	394.328	398.298
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0049	317.204	318.994
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0122	0.0065	390.924	393.157
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0466	0.0247	910.617	919.126
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0503	0.0007	368.521	369.977
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0348	0.0010	414.657	415.815
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0220	0.1661	1240.774	1290.817
	Gasoline	MC	Motorcycles	0.1029	0.0029	394.041	397.471

5139

5140 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0179	0.0049	303.239	305.129
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0062	375.679	377.896
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0465	0.0230	878.690	886.686
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0661	0.0006	349.859	351.689
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0465	0.0009	396.374	397.790
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0294	0.1687	1256.932	1307.952
	Gasoline	MC	Motorcycles	0.0947	0.0026	397.515	400.644
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0144	0.0048	319.937	321.729
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0133	0.0067	394.760	397.078
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0502	0.0256	921.326	930.217
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0526	0.0007	371.174	372.694
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0385	0.0010	418.077	419.341
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0263	0.1649	1234.478	1284.268
	Gasoline	MC	Motorcycles	0.1074	0.0031	393.798	397.393
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0123	0.0048	320.149	321.873
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0114	0.0066	395.978	398.223
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0465	0.0252	915.759	924.427
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0466	0.0007	372.460	373.824
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0328	0.0010	420.458	421.571
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0206	0.1641	1228.810	1278.229
	Gasoline	MC	Motorcycles	0.1122	0.0029	394.269	397.951
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0151	0.0047	314.196	315.982
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0142	0.0066	388.712	391.034
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0497	0.0254	910.759	919.557
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0588	0.0007	363.581	365.247
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0447	0.0010	410.675	412.084
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0318	0.1649	1234.545	1284.494
	Gasoline	MC	Motorcycles	0.1082	0.0030	394.959	398.564
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0163	0.0049	305.383	307.252
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0062	376.796	378.982
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0449	0.0233	883.674	891.734
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0672	0.0006	352.012	353.880
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0468	0.0009	397.430	398.867
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0316	0.1658	1233.361	1283.550
	Gasoline	MC	Motorcycles	0.1020	0.0026	395.025	398.345
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0123	0.0050	323.352	325.144
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0107	0.0060	397.498	399.566
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0426	0.0234	912.292	920.328
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0407	0.0006	377.476	378.686
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0242	0.0009	423.594	424.470
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0128	0.1606	1196.630	1244.809
	Gasoline	MC	Motorcycles	0.0980	0.0026	390.108	393.333
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0143	0.0048	314.783	316.566
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0131	0.0066	389.371	391.655
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0485	0.0250	906.827	915.488
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0541	0.0007	364.956	366.506
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0395	0.0010	412.183	413.462
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0265	0.1653	1235.403	1285.309
	Gasoline	MC	Motorcycles	0.1094	0.0029	395.083	398.686

5141

5142 **Table 5-27. On-Road Vehicle Speciated GHG Emission Factors – 2027 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0154	0.0047	310.783	312.576
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0143	0.0066	385.087	387.416
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0508	0.0253	903.903	912.709
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0583	0.0007	359.705	361.360
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0444	0.0010	406.926	408.328
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0316	0.1649	1233.314	1283.248
	Gasoline	MC	Motorcycles	0.1048	0.0030	395.563	399.072
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0048	308.883	310.708
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0137	0.0063	381.871	384.103
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0473	0.0240	892.068	900.406
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0579	0.0006	357.570	359.210
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0411	0.0009	403.924	405.229
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0273	0.1654	1233.339	1283.319
	Gasoline	MC	Motorcycles	0.1016	0.0027	395.171	398.521
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0172	0.0048	307.997	309.865
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0151	0.0063	380.232	382.486
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0479	0.0239	890.746	899.069
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0648	0.0006	355.373	357.183
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0467	0.0009	401.145	402.587
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0323	0.1653	1231.667	1281.722
	Gasoline	MC	Motorcycles	0.0996	0.0027	395.133	398.431
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0190	0.0049	303.565	305.495
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0163	0.0061	375.215	377.449
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0487	0.0230	880.678	888.740
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0677	0.0006	350.026	351.900
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0473	0.0009	395.761	397.200
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0301	0.1685	1254.769	1305.738
	Gasoline	MC	Motorcycles	0.0979	0.0026	396.806	400.021

5143

5144 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alabama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0129	0.0048	317.378	319.117
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0118	0.0063	390.208	392.376
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0431	0.0246	924.188	932.603
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0492	0.0007	372.733	374.168
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0376	0.0010	391.843	393.081
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0225	0.1652	1208.626	1258.424
	Gasoline	MC	Motorcycles	0.1042	0.0030	392.322	395.822
Alaska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0193	0.0047	304.039	305.920
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0172	0.0062	374.429	376.697
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0484	0.0240	893.933	902.273
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0754	0.0007	356.705	358.785
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0640	0.0009	375.840	377.721
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0441	0.1670	1219.742	1270.610
	Gasoline	MC	Motorcycles	0.0825	0.0029	390.966	393.892
Arizona	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0115	0.0046	319.114	320.778
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0109	0.0064	395.143	397.330
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0443	0.0250	926.628	935.183
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0450	0.0007	375.530	376.857
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0352	0.0010	397.395	398.573
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0200	0.1662	1219.573	1269.606
	Gasoline	MC	Motorcycles	0.1148	0.0031	394.334	398.121
Arkansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0139	0.0047	310.064	311.810
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0061	383.164	385.310
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0437	0.0238	903.761	911.926
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0512	0.0007	363.885	365.359
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0394	0.0009	384.315	385.581
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0232	0.1660	1212.802	1262.860
	Gasoline	MC	Motorcycles	0.1040	0.0028	394.357	397.793
Colorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0150	0.0046	307.031	308.770
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0141	0.0063	380.405	382.626
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0466	0.0244	904.596	913.030
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0587	0.0007	358.991	360.652
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0492	0.0010	380.053	381.569
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0321	0.1655	1210.862	1260.979
	Gasoline	MC	Motorcycles	0.1076	0.0030	395.269	398.842
Connecticut	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0045	311.262	312.931
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0065	387.436	389.692
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0444	0.0255	914.544	923.251
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0556	0.0007	364.201	365.792
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0010	387.368	388.889
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0342	0.1628	1194.465	1243.828
	Gasoline	MC	Motorcycles	0.1177	0.0031	395.396	399.262
Delaware	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0127	0.0047	316.743	318.461
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0121	0.0064	390.398	392.616
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0451	0.0254	927.766	936.438
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0542	0.0007	371.039	372.604
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0443	0.0010	391.085	392.503
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0300	0.1641	1201.540	1251.170
	Gasoline	MC	Motorcycles	0.1181	0.0031	392.608	396.489

5145

5146 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
District of Columbia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0124	0.0048	330.570	332.296
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0123	0.0069	407.662	410.021
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0490	0.0280	976.977	986.524
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0529	0.0008	387.309	388.864
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0454	0.0012	408.723	410.210
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0354	0.1615	1191.452	1240.463
	Gasoline	MC	Motorcycles	0.1280	0.0036	389.544	393.817
Florida	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0121	0.0047	330.538	332.244
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0114	0.0066	407.077	409.328
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0459	0.0262	957.560	966.512
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0425	0.0007	389.006	390.285
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0323	0.0011	409.857	410.987
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0187	0.1643	1208.519	1257.930
	Gasoline	MC	Motorcycles	0.1095	0.0033	391.350	395.073
Georgia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0121	0.0047	318.444	320.139
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0114	0.0064	392.958	395.161
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0438	0.0254	930.109	938.748
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0491	0.0007	373.857	375.292
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0392	0.0010	394.440	395.727
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0248	0.1644	1205.289	1254.897
	Gasoline	MC	Motorcycles	0.1063	0.0031	392.796	396.387
Hawaii	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0149	0.0047	323.994	325.756
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0065	399.173	401.467
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0598	0.0261	946.889	956.153
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0400	0.0007	381.592	382.804
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0297	0.0011	402.066	403.125
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0162	0.1616	1187.226	1235.778
	Gasoline	MC	Motorcycles	0.1329	0.0033	390.804	395.100
Idaho	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0158	0.0047	305.733	307.536
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0141	0.0061	376.552	378.713
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0440	0.0236	899.709	907.822
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0621	0.0006	357.145	358.891
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0493	0.0009	376.092	377.600
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0312	0.1669	1217.601	1268.113
	Gasoline	MC	Motorcycles	0.1010	0.0028	394.281	397.645
Illinois	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0047	314.185	315.929
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0134	0.0064	388.274	390.524
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0453	0.0251	921.594	930.212
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0574	0.0007	367.511	369.151
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0482	0.0010	388.269	389.777
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0322	0.1656	1213.370	1263.537
	Gasoline	MC	Motorcycles	0.1105	0.0031	394.095	397.781
Indiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0152	0.0047	314.962	316.755
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0064	387.363	389.604
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0470	0.0249	923.550	932.146
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0579	0.0007	368.421	370.076
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0472	0.0010	387.495	388.977
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0315	0.1656	1211.745	1261.891
	Gasoline	MC	Motorcycles	0.1084	0.0031	392.830	396.455

5147

5148 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Iowa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0175	0.0048	306.311	308.167
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0154	0.0060	377.397	379.581
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0466	0.0233	897.107	905.208
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0620	0.0006	357.690	359.434
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0485	0.0009	376.919	378.406
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0302	0.1669	1216.835	1267.319
	Gasoline	MC	Motorcycles	0.1035	0.0027	394.404	397.808
Kansas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0155	0.0047	305.546	307.318
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0140	0.0061	378.275	380.442
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0456	0.0235	895.802	903.923
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0559	0.0006	357.907	359.491
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0442	0.0009	378.581	379.957
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0265	0.1674	1222.901	1273.460
	Gasoline	MC	Motorcycles	0.1056	0.0028	395.685	399.152
Kentucky	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0047	306.168	307.923
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0129	0.0061	379.129	381.275
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0424	0.0234	895.542	903.566
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0549	0.0006	358.756	360.317
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0429	0.0009	379.592	380.940
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0252	0.1684	1229.702	1280.516
	Gasoline	MC	Motorcycles	0.1023	0.0028	396.161	399.539
Louisiana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0119	0.0047	316.768	318.463
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0110	0.0063	391.361	393.505
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0408	0.0243	917.566	925.821
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0462	0.0007	372.505	373.860
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0351	0.0010	393.341	394.508
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0196	0.1668	1220.924	1271.116
	Gasoline	MC	Motorcycles	0.1025	0.0029	394.335	397.772
Maine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0173	0.0048	300.824	302.676
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0149	0.0059	371.383	373.518
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0444	0.0227	884.273	892.150
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0658	0.0006	350.671	352.504
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0508	0.0009	370.402	371.939
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1663	1210.511	1260.861
	Gasoline	MC	Motorcycles	0.1056	0.0026	394.808	398.222
Maryland	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0124	0.0046	312.338	314.011
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0119	0.0065	387.817	390.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0434	0.0252	914.574	923.156
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0530	0.0007	365.980	367.506
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0446	0.0010	388.364	389.781
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0295	0.1637	1200.026	1249.550
	Gasoline	MC	Motorcycles	0.1148	0.0030	394.921	398.698
Massachusetts	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0133	0.0046	317.758	319.463
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0130	0.0067	394.183	396.497
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0470	0.0265	937.176	946.240
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0573	0.0007	371.537	373.183
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0507	0.0011	394.025	395.617
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0382	0.1623	1193.319	1242.645
	Gasoline	MC	Motorcycles	0.1223	0.0033	393.260	397.305

5149

5150 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Michigan	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0167	0.0047	311.633	313.439
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0155	0.0063	384.755	387.029
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0498	0.0248	914.996	923.617
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0605	0.0007	364.017	365.732
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0507	0.0010	384.258	385.823
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0348	0.1651	1207.812	1257.869
	Gasoline	MC	Motorcycles	0.1109	0.0030	394.053	397.726
Minnesota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0175	0.0047	307.254	309.079
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0159	0.0062	379.351	381.581
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0467	0.0240	901.155	909.464
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0640	0.0007	358.225	360.021
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0529	0.0010	378.247	379.853
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0362	0.1643	1199.741	1249.602
	Gasoline	MC	Motorcycles	0.0988	0.0028	394.335	397.654
Mississippi	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0128	0.0048	309.375	311.106
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0114	0.0060	381.859	383.940
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0401	0.0233	900.852	908.793
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0491	0.0006	363.497	364.917
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0362	0.0009	383.428	384.608
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0207	0.1658	1210.050	1259.983
	Gasoline	MC	Motorcycles	0.0991	0.0027	393.635	396.925
Missouri	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0046	306.326	308.061
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0131	0.0062	379.927	382.087
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0436	0.0236	895.577	903.690
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0549	0.0006	358.858	360.420
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0438	0.0009	380.292	381.664
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0265	0.1672	1221.919	1272.415
	Gasoline	MC	Motorcycles	0.1055	0.0028	396.258	399.724
Montana	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0180	0.0048	300.835	302.701
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0059	371.164	373.312
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0450	0.0227	886.060	893.924
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0666	0.0006	350.730	352.579
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0516	0.0009	370.095	371.647
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0316	0.1682	1225.444	1276.354
	Gasoline	MC	Motorcycles	0.0980	0.0026	395.518	398.754
Nebraska	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0170	0.0047	304.480	306.300
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0151	0.0061	376.322	378.500
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0462	0.0232	893.761	901.825
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0605	0.0006	355.882	357.582
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0479	0.0009	375.947	377.413
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0292	0.1681	1226.612	1277.423
	Gasoline	MC	Motorcycles	0.1034	0.0027	395.720	399.123
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0047	318.780	320.520
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0135	0.0065	393.858	396.125
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0537	0.0255	932.573	941.496
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0496	0.0007	374.355	375.802
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0402	0.0010	395.375	396.686
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0254	0.1657	1215.755	1265.763
	Gasoline	MC	Motorcycles	0.1281	0.0032	393.280	397.430

5151

5152 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
New Hampshire	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0141	0.0046	305.854	307.587
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0131	0.0062	378.827	381.000
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0429	0.0240	896.754	904.950
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0613	0.0007	357.083	358.810
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0507	0.0010	378.102	379.653
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0333	0.1653	1207.213	1257.294
	Gasoline	MC	Motorcycles	0.1093	0.0028	395.562	399.134
New Jersey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0129	0.0048	297.117	298.862
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0113	0.0058	369.722	371.744
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0369	0.0219	872.885	880.314
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0585	0.0006	347.759	349.399
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0434	0.0008	369.755	371.092
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0242	0.1703	1239.962	1291.299
	Gasoline	MC	Motorcycles	0.1042	0.0024	397.877	401.209
New Mexico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0142	0.0048	305.504	307.272
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0060	377.522	379.638
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0421	0.0232	894.341	902.293
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0548	0.0006	358.028	359.589
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0417	0.0009	378.121	379.438
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0241	0.1676	1222.367	1272.912
	Gasoline	MC	Motorcycles	0.1024	0.0027	395.017	398.383
New York	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0131	0.0046	312.586	314.291
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0124	0.0065	387.097	389.330
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0432	0.0253	917.909	926.514
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0576	0.0007	365.517	367.162
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0491	0.0010	386.946	388.478
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0339	0.1639	1201.035	1250.739
	Gasoline	MC	Motorcycles	0.1137	0.0031	394.268	398.027
North Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0121	0.0047	313.562	315.261
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0113	0.0063	387.001	389.165
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0419	0.0247	916.906	925.307
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0510	0.0007	367.877	369.356
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0404	0.0010	388.132	389.440
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0251	0.1648	1206.023	1255.770
	Gasoline	MC	Motorcycles	0.1040	0.0030	393.403	396.895
North Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0196	0.0048	303.012	304.917
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0168	0.0059	372.973	375.156
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0459	0.0229	890.473	898.430
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0696	0.0006	352.531	354.457
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0545	0.0009	371.338	372.967
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0348	0.1668	1215.278	1265.856
	Gasoline	MC	Motorcycles	0.0962	0.0027	394.573	397.776
Ohio	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0147	0.0046	310.778	312.529
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0137	0.0063	384.273	386.504
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0456	0.0248	912.348	920.858
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0574	0.0007	363.530	365.165
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0477	0.0010	384.238	385.727
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0319	0.1646	1204.351	1254.199
	Gasoline	MC	Motorcycles	0.1064	0.0030	394.197	397.751

5153

5154 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Oklahoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0141	0.0047	308.823	310.570
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0128	0.0061	381.999	384.139
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0436	0.0236	900.136	908.244
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0518	0.0006	362.340	363.828
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0399	0.0009	383.029	384.305
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0235	0.1661	1212.804	1262.881
	Gasoline	MC	Motorcycles	0.1032	0.0028	394.689	398.095
Oregon	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0137	0.0047	306.704	308.441
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0062	378.820	380.995
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0440	0.0243	904.481	912.800
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0573	0.0007	358.994	360.623
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0464	0.0010	378.956	380.405
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0297	0.1662	1214.372	1264.650
	Gasoline	MC	Motorcycles	0.1061	0.0029	394.531	398.058
Pacific Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0126	0.0047	310.958	312.661
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0118	0.0063	384.606	386.783
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0427	0.0246	911.330	919.711
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0521	0.0007	364.692	366.193
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0418	0.0010	385.493	386.832
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0259	0.1656	1211.617	1261.616
	Gasoline	MC	Motorcycles	0.1071	0.0030	394.368	397.930
Pennsylvania	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0134	0.0047	310.531	312.259
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0125	0.0063	384.100	386.295
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0427	0.0245	909.148	917.501
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0575	0.0007	363.232	364.870
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0474	0.0010	384.065	385.544
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0304	0.1663	1216.359	1266.681
	Gasoline	MC	Motorcycles	0.1066	0.0029	395.064	398.606
Puerto Rico	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0115	0.0046	329.429	331.080
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0110	0.0066	408.517	410.752
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0439	0.0258	946.260	955.052
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0389	0.0007	388.150	389.328
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0292	0.0010	411.655	412.696
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0151	0.1637	1206.279	1255.451
	Gasoline	MC	Motorcycles	0.1071	0.0032	393.788	397.418
Rhode Island	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0132	0.0046	314.219	315.917
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0130	0.0066	390.005	392.286
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0464	0.0258	924.324	933.170
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0566	0.0007	367.540	369.163
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0493	0.0010	389.923	391.469
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0347	0.1636	1200.464	1250.082
	Gasoline	MC	Motorcycles	0.1195	0.0032	394.410	398.345
South Carolina	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0129	0.0047	312.655	314.388
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0117	0.0062	385.638	387.776
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0415	0.0240	910.558	918.728
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0497	0.0007	367.163	368.603
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0378	0.0010	387.061	388.292
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0217	0.1672	1221.780	1272.144
	Gasoline	MC	Motorcycles	0.1017	0.0029	394.128	397.526

5155

5156 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi)			
				Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
South Dakota	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0171	0.0047	298.826	300.657
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0148	0.0059	370.536	372.661
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0420	0.0223	878.656	886.339
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0651	0.0006	348.553	350.358
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0506	0.0009	369.467	370.986
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0293	0.1698	1237.477	1288.804
	Gasoline	MC	Motorcycles	0.0935	0.0026	397.601	400.700
Tennessee	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0136	0.0047	315.342	317.078
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0127	0.0064	389.411	391.630
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0449	0.0249	921.397	929.935
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0519	0.0007	369.817	371.320
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0418	0.0010	390.396	391.742
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0261	0.1660	1215.711	1265.835
	Gasoline	MC	Motorcycles	0.1061	0.0030	393.882	397.444
Texas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0116	0.0046	315.574	317.245
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0109	0.0063	390.640	392.791
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0418	0.0245	915.703	924.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0460	0.0007	371.085	372.433
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0356	0.0010	392.577	393.757
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0203	0.1652	1210.124	1259.871
	Gasoline	MC	Motorcycles	0.1109	0.0029	394.356	398.005
Utah	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0144	0.0046	309.660	311.391
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0136	0.0063	383.415	385.641
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0452	0.0247	910.925	919.394
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0580	0.0007	362.250	363.896
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0487	0.0010	383.269	384.776
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0317	0.1661	1215.783	1266.066
	Gasoline	MC	Motorcycles	0.1070	0.0030	395.042	398.614
Vermont	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0156	0.0048	300.936	302.749
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0135	0.0059	371.636	373.732
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0408	0.0226	883.663	891.417
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0662	0.0006	350.707	352.550
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0510	0.0009	370.569	372.110
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0315	0.1668	1214.480	1264.982
	Gasoline	MC	Motorcycles	0.1008	0.0026	395.111	398.399
Virgin Islands	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0116	0.0049	318.753	320.488
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0102	0.0058	392.173	394.152
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0375	0.0227	911.879	919.582
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0403	0.0006	376.029	377.227
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0261	0.0009	395.352	396.273
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0125	0.1617	1178.549	1227.042
	Gasoline	MC	Motorcycles	0.0968	0.0026	390.197	393.392
Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0135	0.0047	310.255	311.982
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0126	0.0063	384.087	386.274
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0437	0.0243	906.866	915.191
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0533	0.0007	363.623	365.154
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0429	0.0010	384.730	386.093
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0263	0.1664	1216.566	1266.798
	Gasoline	MC	Motorcycles	0.1081	0.0029	395.168	398.738

5157

5158 **Table 5-28. On-Road Vehicle Speciated GHG Emission Factors – 2028 (cont.)**

State	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Washington	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0147	0.0046	306.296	308.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0138	0.0063	379.840	382.072
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0459	0.0246	904.096	912.563
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0575	0.0007	358.402	360.035
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0484	0.0010	379.736	381.236
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0315	0.1660	1214.572	1264.839
	Gasoline	MC	Motorcycles	0.1035	0.0030	395.646	399.123
West Virginia	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0147	0.0047	304.421	306.190
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0132	0.0061	376.674	378.812
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0424	0.0233	892.067	900.076
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0571	0.0006	356.257	357.875
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0447	0.0009	376.797	378.191
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0272	0.1665	1214.490	1264.788
	Gasoline	MC	Motorcycles	0.1004	0.0027	395.257	398.575
Wisconsin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0164	0.0047	303.522	305.333
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0145	0.0060	375.030	377.190
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0433	0.0232	890.790	898.790
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0639	0.0006	354.061	355.847
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0509	0.0009	374.120	375.665
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0323	0.1663	1212.868	1263.242
	Gasoline	MC	Motorcycles	0.0984	0.0027	395.218	398.485
Wyoming	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.0182	0.0048	299.143	301.012
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.0156	0.0059	370.074	372.216
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.0441	0.0223	880.662	888.411
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.0667	0.0006	348.721	350.569
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.0515	0.0009	368.907	370.451
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.0300	0.1696	1235.372	1286.649
	Gasoline	MC	Motorcycles	0.0967	0.0026	396.891	400.076

5159
5160

5161 **Table 5-29. EMFAC County-Specific On-Road Vehicle Composite EFs – 2024 POV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.162	0.003	1.477	0.228	0.020	0.008	0.038
ALPINE	All Vehicles	0.201	0.003	1.845	0.254	0.022	0.008	0.037
AMADOR	All Vehicles	0.277	0.003	2.336	0.353	0.021	0.008	0.036
BUTTE	All Vehicles	0.207	0.003	1.926	0.303	0.021	0.008	0.037
CALAVERAS	All Vehicles	0.280	0.003	2.482	0.362	0.023	0.010	0.037
COLUSA	All Vehicles	0.179	0.003	1.630	0.248	0.019	0.008	0.037
CONTRA COSTA	All Vehicles	0.162	0.003	1.498	0.229	0.020	0.008	0.037
DEL NORTE	All Vehicles	0.275	0.003	2.200	0.337	0.021	0.009	0.035
EL DORADO	All Vehicles	0.194	0.003	1.817	0.287	0.021	0.008	0.036
FRESNO	All Vehicles	0.173	0.003	1.601	0.252	0.019	0.007	0.038
GLENN	All Vehicles	0.182	0.003	1.735	0.266	0.021	0.008	0.037
HUMBOLDT	All Vehicles	0.250	0.003	2.109	0.328	0.021	0.008	0.036
IMPERIAL	All Vehicles	0.189	0.004	1.822	0.265	0.019	0.007	0.038
INYO	All Vehicles	0.197	0.004	1.823	0.276	0.020	0.008	0.037
KERN	All Vehicles	0.172	0.003	1.587	0.242	0.019	0.007	0.038
KINGS	All Vehicles	0.178	0.004	1.566	0.243	0.017	0.007	0.038
LAKE	All Vehicles	0.281	0.003	2.440	0.377	0.022	0.009	0.036
LASSEN	All Vehicles	0.231	0.003	2.086	0.306	0.022	0.009	0.036
LOS ANGELES	All Vehicles	0.162	0.003	1.559	0.211	0.022	0.008	0.038
MADERA	All Vehicles	0.187	0.003	1.643	0.267	0.018	0.007	0.037
MARIN	All Vehicles	0.165	0.003	1.519	0.244	0.019	0.007	0.037
MARIPOSA	All Vehicles	0.304	0.004	2.629	0.395	0.023	0.010	0.035
MENDOCINO	All Vehicles	0.233	0.003	2.023	0.312	0.021	0.008	0.037
MERCED	All Vehicles	0.200	0.003	1.821	0.268	0.021	0.008	0.037
MODOC	All Vehicles	0.252	0.004	2.239	0.306	0.024	0.010	0.036
MONO	All Vehicles	0.215	0.003	1.921	0.275	0.020	0.008	0.037
MONTEREY	All Vehicles	0.203	0.003	1.751	0.270	0.020	0.008	0.037
NAPA	All Vehicles	0.180	0.003	1.623	0.246	0.021	0.008	0.037
NEVADA	All Vehicles	0.225	0.003	2.018	0.324	0.021	0.008	0.036
ORANGE	All Vehicles	0.139	0.003	1.405	0.201	0.021	0.008	0.038
PLACER	All Vehicles	0.164	0.003	1.602	0.241	0.021	0.008	0.037
PLUMAS	All Vehicles	0.274	0.004	2.472	0.349	0.025	0.010	0.036
RIVERSIDE	All Vehicles	0.159	0.003	1.511	0.219	0.019	0.007	0.038
SACRAMENTO	All Vehicles	0.188	0.003	1.676	0.261	0.021	0.008	0.037
SAN BENITO	All Vehicles	0.180	0.003	1.702	0.265	0.022	0.008	0.038
SAN BERNARDINO	All Vehicles	0.168	0.003	1.556	0.231	0.019	0.007	0.038
SAN DIEGO	All Vehicles	0.166	0.004	1.539	0.227	0.021	0.008	0.037
SAN FRANCISCO	All Vehicles	0.156	0.003	1.570	0.233	0.023	0.009	0.038
SAN JOAQUIN	All Vehicles	0.172	0.003	1.662	0.250	0.022	0.008	0.037
SAN LUIS OBISPO	All Vehicles	0.187	0.003	1.662	0.274	0.019	0.008	0.036
SAN MATEO	All Vehicles	0.135	0.003	1.342	0.210	0.019	0.007	0.039
SANTA BARBARA	All Vehicles	0.199	0.003	1.722	0.278	0.020	0.008	0.037
SANTA CLARA	All Vehicles	0.161	0.003	1.497	0.222	0.020	0.008	0.038
SANTA CRUZ	All Vehicles	0.222	0.003	1.995	0.306	0.023	0.009	0.036
SHASTA	All Vehicles	0.194	0.003	1.781	0.283	0.020	0.008	0.037
SIERRA	All Vehicles	0.244	0.004	2.160	0.301	0.024	0.010	0.036
SISKIYOU	All Vehicles	0.233	0.004	2.170	0.316	0.022	0.009	0.037
SOLANO	All Vehicles	0.172	0.003	1.508	0.237	0.019	0.007	0.037
SONOMA	All Vehicles	0.193	0.003	1.793	0.274	0.022	0.008	0.037
STANISLAUS	All Vehicles	0.180	0.003	1.740	0.264	0.022	0.008	0.037
SUTTER	All Vehicles	0.181	0.003	1.751	0.265	0.021	0.008	0.038
TEHAMA	All Vehicles	0.199	0.003	1.832	0.278	0.021	0.008	0.037
TRINITY	All Vehicles	0.245	0.004	2.301	0.318	0.024	0.010	0.037
TULARE	All Vehicles	0.192	0.003	1.749	0.262	0.021	0.008	0.037
TUOLUMNE	All Vehicles	0.270	0.003	2.402	0.370	0.023	0.009	0.036
VENTURA	All Vehicles	0.167	0.003	1.526	0.233	0.020	0.007	0.037
YOLO	All Vehicles	0.164	0.003	1.614	0.244	0.021	0.008	0.037
YUBA	All Vehicles	0.206	0.003	1.823	0.283	0.021	0.008	0.036

5162
5163

5164 **Table 5-30. EMFAC County-Specific On-Road Vehicle Composite EFs – 2025 POV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.152	0.003	1.399	0.220	0.020	0.007	0.038
ALPINE	All Vehicles	0.187	0.003	1.746	0.247	0.022	0.008	0.038
AMADOR	All Vehicles	0.258	0.003	2.188	0.341	0.021	0.008	0.037
BUTTE	All Vehicles	0.192	0.003	1.804	0.292	0.021	0.008	0.038
CALAVERAS	All Vehicles	0.262	0.003	2.333	0.352	0.023	0.009	0.037
COLUSA	All Vehicles	0.167	0.003	1.533	0.239	0.019	0.007	0.038
CONTRA COSTA	All Vehicles	0.152	0.003	1.418	0.221	0.020	0.008	0.038
DEL NORTE	All Vehicles	0.255	0.003	2.061	0.325	0.021	0.009	0.036
EL DORADO	All Vehicles	0.182	0.003	1.724	0.281	0.021	0.008	0.037
FRESNO	All Vehicles	0.161	0.003	1.507	0.243	0.019	0.007	0.038
GLENN	All Vehicles	0.169	0.003	1.629	0.257	0.021	0.008	0.038
HUMBOLDT	All Vehicles	0.233	0.003	1.987	0.319	0.021	0.008	0.036
IMPERIAL	All Vehicles	0.175	0.003	1.704	0.255	0.019	0.007	0.039
INYO	All Vehicles	0.184	0.003	1.719	0.268	0.020	0.008	0.038
KERN	All Vehicles	0.160	0.003	1.493	0.233	0.019	0.007	0.039
KINGS	All Vehicles	0.166	0.003	1.471	0.234	0.017	0.007	0.039
LAKE	All Vehicles	0.259	0.003	2.274	0.364	0.022	0.009	0.036
LASSEN	All Vehicles	0.215	0.003	1.964	0.298	0.022	0.009	0.037
LOS ANGELES	All Vehicles	0.151	0.003	1.473	0.203	0.022	0.008	0.039
MADERA	All Vehicles	0.174	0.003	1.540	0.257	0.017	0.007	0.038
MARIN	All Vehicles	0.154	0.003	1.440	0.237	0.019	0.007	0.038
MARIPOSA	All Vehicles	0.284	0.003	2.466	0.381	0.023	0.010	0.036
MENDOCINO	All Vehicles	0.217	0.003	1.902	0.303	0.021	0.008	0.038
MERCED	All Vehicles	0.185	0.003	1.696	0.255	0.020	0.008	0.038
MODOC	All Vehicles	0.233	0.004	2.101	0.294	0.024	0.010	0.037
MONO	All Vehicles	0.200	0.003	1.811	0.266	0.020	0.008	0.038
MONTEREY	All Vehicles	0.188	0.003	1.647	0.261	0.020	0.008	0.037
NAPA	All Vehicles	0.168	0.003	1.534	0.238	0.021	0.008	0.037
NEVADA	All Vehicles	0.210	0.003	1.911	0.317	0.021	0.008	0.037
ORANGE	All Vehicles	0.130	0.003	1.334	0.195	0.020	0.008	0.039
PLACER	All Vehicles	0.154	0.003	1.520	0.234	0.021	0.008	0.038
PLUMAS	All Vehicles	0.254	0.004	2.317	0.338	0.024	0.010	0.037
RIVERSIDE	All Vehicles	0.149	0.003	1.429	0.212	0.019	0.007	0.039
SACRAMENTO	All Vehicles	0.175	0.003	1.588	0.254	0.021	0.008	0.037
SAN BENITO	All Vehicles	0.168	0.003	1.605	0.258	0.022	0.008	0.039
SAN BERNARDINO	All Vehicles	0.157	0.003	1.466	0.223	0.019	0.007	0.039
SAN DIEGO	All Vehicles	0.155	0.003	1.461	0.220	0.021	0.008	0.038
SAN FRANCISCO	All Vehicles	0.146	0.003	1.502	0.228	0.023	0.009	0.039
SAN JOAQUIN	All Vehicles	0.160	0.003	1.565	0.241	0.022	0.008	0.038
SAN LUIS OBISPO	All Vehicles	0.175	0.003	1.573	0.268	0.019	0.007	0.037
SAN MATEO	All Vehicles	0.126	0.003	1.285	0.207	0.019	0.007	0.040
SANTA BARBARA	All Vehicles	0.185	0.003	1.621	0.270	0.020	0.007	0.037
SANTA CLARA	All Vehicles	0.150	0.003	1.420	0.216	0.020	0.008	0.038
SANTA CRUZ	All Vehicles	0.206	0.003	1.885	0.298	0.023	0.009	0.037
SHASTA	All Vehicles	0.181	0.003	1.678	0.274	0.020	0.008	0.038
SIERRA	All Vehicles	0.225	0.004	2.029	0.291	0.024	0.010	0.037
SISKIYOU	All Vehicles	0.217	0.004	2.041	0.306	0.022	0.009	0.038
SOLANO	All Vehicles	0.161	0.003	1.425	0.229	0.018	0.007	0.038
SONOMA	All Vehicles	0.180	0.003	1.693	0.265	0.022	0.008	0.037
STANISLAUS	All Vehicles	0.167	0.003	1.636	0.255	0.022	0.008	0.038
SUTTER	All Vehicles	0.168	0.003	1.642	0.255	0.021	0.008	0.038
TEHAMA	All Vehicles	0.185	0.003	1.719	0.268	0.021	0.008	0.038
TRINITY	All Vehicles	0.227	0.004	2.160	0.307	0.024	0.010	0.038
TULARE	All Vehicles	0.178	0.003	1.636	0.252	0.020	0.008	0.038
TUOLUMNE	All Vehicles	0.251	0.003	2.252	0.359	0.023	0.009	0.036
VENTURA	All Vehicles	0.156	0.003	1.443	0.226	0.020	0.007	0.038
YOLO	All Vehicles	0.153	0.003	1.528	0.237	0.021	0.008	0.038
YUBA	All Vehicles	0.190	0.003	1.703	0.272	0.020	0.008	0.037

5165
5166

5167 **Table 5-31. EMFAC County-Specific On-Road Vehicle Composite EFs – 2026 POV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.143	0.003	1.332	0.213	0.020	0.007	0.039
ALPINE	All Vehicles	0.176	0.003	1.661	0.241	0.022	0.008	0.039
AMADOR	All Vehicles	0.242	0.003	2.056	0.329	0.020	0.008	0.038
BUTTE	All Vehicles	0.179	0.003	1.699	0.282	0.021	0.008	0.039
CALAVERAS	All Vehicles	0.245	0.003	2.201	0.342	0.023	0.009	0.038
COLUSA	All Vehicles	0.156	0.003	1.449	0.231	0.019	0.007	0.039
CONTRA COSTA	All Vehicles	0.142	0.003	1.350	0.215	0.020	0.007	0.039
DEL NORTE	All Vehicles	0.238	0.003	1.939	0.315	0.021	0.009	0.037
EL DORADO	All Vehicles	0.171	0.003	1.643	0.276	0.021	0.008	0.038
FRESNO	All Vehicles	0.151	0.003	1.426	0.235	0.019	0.007	0.039
GLENN	All Vehicles	0.158	0.003	1.539	0.248	0.021	0.008	0.039
HUMBOLDT	All Vehicles	0.218	0.003	1.878	0.311	0.021	0.008	0.037
IMPERIAL	All Vehicles	0.163	0.003	1.601	0.244	0.018	0.007	0.039
INYO	All Vehicles	0.172	0.003	1.630	0.261	0.020	0.008	0.039
KERN	All Vehicles	0.151	0.003	1.413	0.226	0.019	0.007	0.039
KINGS	All Vehicles	0.156	0.003	1.389	0.225	0.017	0.007	0.039
LAKE	All Vehicles	0.241	0.003	2.130	0.351	0.021	0.009	0.037
LASSEN	All Vehicles	0.200	0.003	1.859	0.289	0.022	0.009	0.037
LOS ANGELES	All Vehicles	0.141	0.003	1.401	0.197	0.022	0.008	0.039
MADERA	All Vehicles	0.163	0.003	1.451	0.248	0.017	0.007	0.039
MARIN	All Vehicles	0.144	0.003	1.373	0.230	0.019	0.007	0.038
MARIPOSA	All Vehicles	0.265	0.003	2.315	0.368	0.023	0.009	0.037
MENDOCINO	All Vehicles	0.203	0.003	1.795	0.294	0.021	0.008	0.038
MERCED	All Vehicles	0.172	0.003	1.589	0.244	0.020	0.008	0.038
MODOC	All Vehicles	0.217	0.004	1.981	0.284	0.024	0.010	0.038
MONO	All Vehicles	0.188	0.003	1.716	0.258	0.020	0.008	0.039
MONTEREY	All Vehicles	0.175	0.003	1.556	0.253	0.020	0.007	0.038
NAPA	All Vehicles	0.158	0.003	1.457	0.231	0.021	0.008	0.038
NEVADA	All Vehicles	0.197	0.003	1.817	0.312	0.021	0.008	0.038
ORANGE	All Vehicles	0.122	0.003	1.275	0.189	0.020	0.008	0.039
PLACER	All Vehicles	0.145	0.003	1.449	0.227	0.021	0.008	0.039
PLUMAS	All Vehicles	0.237	0.003	2.179	0.327	0.024	0.010	0.037
RIVERSIDE	All Vehicles	0.140	0.003	1.360	0.206	0.019	0.007	0.039
SACRAMENTO	All Vehicles	0.164	0.003	1.512	0.248	0.021	0.008	0.038
SAN BENITO	All Vehicles	0.158	0.003	1.523	0.252	0.022	0.008	0.039
SAN BERNARDINO	All Vehicles	0.147	0.003	1.389	0.216	0.019	0.007	0.039
SAN DIEGO	All Vehicles	0.146	0.003	1.388	0.213	0.020	0.008	0.039
SAN FRANCISCO	All Vehicles	0.137	0.003	1.442	0.223	0.023	0.009	0.039
SAN JOAQUIN	All Vehicles	0.150	0.003	1.482	0.233	0.022	0.008	0.039
SAN LUIS OBISPO	All Vehicles	0.164	0.003	1.495	0.261	0.019	0.007	0.038
SAN MATEO	All Vehicles	0.119	0.003	1.240	0.204	0.019	0.007	0.040
SANTA BARBARA	All Vehicles	0.172	0.003	1.514	0.261	0.019	0.007	0.038
SANTA CLARA	All Vehicles	0.141	0.003	1.355	0.210	0.020	0.008	0.039
SANTA CRUZ	All Vehicles	0.192	0.003	1.789	0.292	0.023	0.009	0.038
SHASTA	All Vehicles	0.170	0.003	1.588	0.267	0.020	0.008	0.039
SIERRA	All Vehicles	0.209	0.003	1.920	0.282	0.024	0.010	0.038
SISKIYOU	All Vehicles	0.203	0.004	1.928	0.296	0.022	0.009	0.039
SOLANO	All Vehicles	0.151	0.003	1.352	0.222	0.018	0.007	0.038
SONOMA	All Vehicles	0.168	0.003	1.605	0.257	0.022	0.008	0.038
STANISLAUS	All Vehicles	0.156	0.003	1.548	0.246	0.022	0.008	0.038
SUTTER	All Vehicles	0.157	0.003	1.550	0.246	0.021	0.008	0.039
TEHAMA	All Vehicles	0.173	0.003	1.622	0.258	0.020	0.008	0.039
TRINITY	All Vehicles	0.212	0.004	2.035	0.296	0.024	0.010	0.039
TULARE	All Vehicles	0.166	0.003	1.540	0.242	0.020	0.008	0.039
TUOLUMNE	All Vehicles	0.234	0.003	2.119	0.348	0.023	0.009	0.037
VENTURA	All Vehicles	0.146	0.003	1.370	0.219	0.019	0.007	0.039
YOLO	All Vehicles	0.144	0.003	1.454	0.230	0.021	0.008	0.039
YUBA	All Vehicles	0.175	0.003	1.600	0.263	0.020	0.008	0.037

5168
5169

5170 **Table 5-32. EMFAC County-Specific On-Road Vehicle Composite EFs – 2027 POV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.136	0.003	1.273	0.207	0.020	0.007	0.040
ALPINE	All Vehicles	0.167	0.003	1.587	0.236	0.022	0.008	0.040
AMADOR	All Vehicles	0.226	0.003	1.939	0.319	0.020	0.008	0.038
BUTTE	All Vehicles	0.167	0.003	1.608	0.274	0.021	0.008	0.039
CALAVERAS	All Vehicles	0.230	0.003	2.080	0.333	0.023	0.009	0.038
COLUSA	All Vehicles	0.147	0.003	1.377	0.224	0.019	0.007	0.040
CONTRA COSTA	All Vehicles	0.134	0.003	1.289	0.209	0.020	0.007	0.039
DEL NORTE	All Vehicles	0.222	0.003	1.833	0.307	0.021	0.008	0.037
EL DORADO	All Vehicles	0.161	0.003	1.573	0.271	0.021	0.008	0.039
FRESNO	All Vehicles	0.143	0.003	1.356	0.229	0.019	0.007	0.040
GLENN	All Vehicles	0.149	0.003	1.463	0.241	0.021	0.008	0.039
HUMBOLDT	All Vehicles	0.205	0.003	1.781	0.304	0.021	0.008	0.038
IMPERIAL	All Vehicles	0.153	0.003	1.497	0.236	0.018	0.007	0.040
INYO	All Vehicles	0.162	0.003	1.551	0.255	0.020	0.008	0.039
KERN	All Vehicles	0.143	0.003	1.345	0.219	0.019	0.007	0.040
KINGS	All Vehicles	0.147	0.003	1.319	0.218	0.017	0.006	0.040
LAKE	All Vehicles	0.224	0.003	2.000	0.339	0.021	0.008	0.038
LASSEN	All Vehicles	0.188	0.003	1.768	0.283	0.022	0.009	0.038
LOS ANGELES	All Vehicles	0.132	0.003	1.338	0.192	0.021	0.008	0.040
MADERA	All Vehicles	0.153	0.003	1.373	0.240	0.017	0.007	0.039
MARIN	All Vehicles	0.136	0.003	1.313	0.225	0.019	0.007	0.039
MARIPOSA	All Vehicles	0.248	0.003	2.182	0.357	0.023	0.009	0.037
MENDOCINO	All Vehicles	0.190	0.003	1.702	0.287	0.021	0.008	0.039
MERCED	All Vehicles	0.160	0.003	1.499	0.233	0.020	0.008	0.039
MODOC	All Vehicles	0.203	0.004	1.875	0.273	0.024	0.010	0.038
MONO	All Vehicles	0.177	0.003	1.632	0.251	0.020	0.008	0.039
MONTEREY	All Vehicles	0.164	0.003	1.477	0.247	0.020	0.007	0.039
NAPA	All Vehicles	0.149	0.003	1.389	0.224	0.021	0.008	0.039
NEVADA	All Vehicles	0.186	0.003	1.732	0.308	0.021	0.008	0.038
ORANGE	All Vehicles	0.115	0.003	1.224	0.184	0.020	0.007	0.040
PLACER	All Vehicles	0.138	0.003	1.390	0.221	0.021	0.008	0.040
PLUMAS	All Vehicles	0.221	0.003	2.061	0.319	0.024	0.010	0.038
RIVERSIDE	All Vehicles	0.133	0.003	1.297	0.201	0.019	0.007	0.040
SACRAMENTO	All Vehicles	0.154	0.003	1.449	0.242	0.021	0.008	0.039
SAN BENITO	All Vehicles	0.149	0.003	1.451	0.246	0.022	0.008	0.040
SAN BERNARDINO	All Vehicles	0.139	0.003	1.323	0.210	0.019	0.007	0.040
SAN DIEGO	All Vehicles	0.137	0.003	1.335	0.208	0.020	0.008	0.039
SAN FRANCISCO	All Vehicles	0.130	0.003	1.390	0.220	0.022	0.008	0.040
SAN JOAQUIN	All Vehicles	0.142	0.003	1.419	0.227	0.022	0.008	0.040
SAN LUIS OBISPO	All Vehicles	0.154	0.003	1.425	0.255	0.019	0.007	0.038
SAN MATEO	All Vehicles	0.113	0.003	1.204	0.202	0.019	0.007	0.041
SANTA BARBARA	All Vehicles	0.160	0.003	1.436	0.253	0.019	0.007	0.039
SANTA CLARA	All Vehicles	0.133	0.003	1.298	0.205	0.020	0.007	0.040
SANTA CRUZ	All Vehicles	0.179	0.003	1.704	0.286	0.023	0.009	0.038
SHASTA	All Vehicles	0.160	0.003	1.509	0.260	0.020	0.007	0.039
SIERRA	All Vehicles	0.195	0.003	1.824	0.276	0.023	0.009	0.038
SISKIYOU	All Vehicles	0.191	0.003	1.828	0.288	0.022	0.009	0.039
SOLANO	All Vehicles	0.143	0.003	1.287	0.216	0.018	0.007	0.039
SONOMA	All Vehicles	0.158	0.003	1.528	0.250	0.022	0.008	0.039
STANISLAUS	All Vehicles	0.147	0.003	1.448	0.238	0.021	0.008	0.039
SUTTER	All Vehicles	0.148	0.003	1.476	0.238	0.021	0.008	0.040
TEHAMA	All Vehicles	0.163	0.003	1.538	0.250	0.020	0.008	0.040
TRINITY	All Vehicles	0.198	0.004	1.927	0.288	0.023	0.009	0.039
TULARE	All Vehicles	0.155	0.003	1.453	0.234	0.020	0.008	0.039
TUOLUMNE	All Vehicles	0.219	0.003	2.003	0.339	0.023	0.009	0.038
VENTURA	All Vehicles	0.137	0.003	1.305	0.212	0.019	0.007	0.039
YOLO	All Vehicles	0.137	0.003	1.393	0.224	0.021	0.008	0.039
YUBA	All Vehicles	0.163	0.003	1.510	0.254	0.020	0.008	0.038

5171
5172

5173 **Table 5-33. EMFAC County-Specific On-Road Vehicle Composite EFs – 2028 POV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.129	0.003	1.223	0.201	0.019	0.007	0.040
ALPINE	All Vehicles	0.158	0.003	1.524	0.231	0.022	0.008	0.040
AMADOR	All Vehicles	0.212	0.003	1.834	0.309	0.020	0.008	0.039
BUTTE	All Vehicles	0.157	0.003	1.530	0.265	0.021	0.008	0.040
CALAVERAS	All Vehicles	0.216	0.003	1.973	0.325	0.023	0.009	0.039
COLUSA	All Vehicles	0.140	0.003	1.316	0.217	0.019	0.007	0.040
CONTRA COSTA	All Vehicles	0.127	0.003	1.237	0.203	0.020	0.007	0.040
DEL NORTE	All Vehicles	0.208	0.003	1.739	0.298	0.021	0.008	0.038
EL DORADO	All Vehicles	0.152	0.003	1.511	0.265	0.021	0.008	0.039
FRESNO	All Vehicles	0.135	0.003	1.297	0.222	0.019	0.007	0.040
GLENN	All Vehicles	0.141	0.003	1.398	0.234	0.021	0.008	0.040
HUMBOLDT	All Vehicles	0.193	0.003	1.695	0.296	0.020	0.008	0.038
IMPERIAL	All Vehicles	0.144	0.003	1.426	0.228	0.018	0.007	0.041
INYO	All Vehicles	0.153	0.003	1.483	0.249	0.020	0.007	0.040
KERN	All Vehicles	0.136	0.003	1.287	0.212	0.019	0.007	0.041
KINGS	All Vehicles	0.140	0.003	1.259	0.211	0.017	0.006	0.041
LAKE	All Vehicles	0.209	0.003	1.888	0.329	0.021	0.008	0.038
LASSEN	All Vehicles	0.177	0.003	1.688	0.276	0.022	0.009	0.039
LOS ANGELES	All Vehicles	0.125	0.003	1.287	0.187	0.021	0.008	0.041
MADERA	All Vehicles	0.145	0.003	1.306	0.232	0.017	0.006	0.040
MARIN	All Vehicles	0.129	0.003	1.262	0.220	0.019	0.007	0.040
MARIPOSA	All Vehicles	0.233	0.003	2.061	0.345	0.023	0.009	0.038
MENDOCINO	All Vehicles	0.179	0.003	1.621	0.280	0.021	0.008	0.039
MERCED	All Vehicles	0.151	0.003	1.418	0.223	0.020	0.008	0.040
MODOC	All Vehicles	0.190	0.003	1.783	0.264	0.023	0.009	0.039
MONO	All Vehicles	0.167	0.003	1.560	0.244	0.020	0.008	0.040
MONTEREY	All Vehicles	0.154	0.003	1.409	0.240	0.019	0.007	0.039
NAPA	All Vehicles	0.141	0.003	1.330	0.218	0.021	0.008	0.039
NEVADA	All Vehicles	0.176	0.003	1.658	0.303	0.021	0.008	0.039
ORANGE	All Vehicles	0.110	0.003	1.180	0.180	0.020	0.007	0.040
PLACER	All Vehicles	0.131	0.003	1.337	0.215	0.021	0.008	0.040
PLUMAS	All Vehicles	0.207	0.003	1.959	0.310	0.024	0.009	0.039
RIVERSIDE	All Vehicles	0.126	0.003	1.245	0.196	0.019	0.007	0.041
SACRAMENTO	All Vehicles	0.145	0.003	1.395	0.236	0.021	0.008	0.040
SAN BENITO	All Vehicles	0.142	0.003	1.393	0.241	0.022	0.008	0.040
SAN BERNARDINO	All Vehicles	0.131	0.003	1.266	0.203	0.019	0.007	0.040
SAN DIEGO	All Vehicles	0.130	0.003	1.283	0.203	0.020	0.008	0.040
SAN FRANCISCO	All Vehicles	0.124	0.003	1.344	0.216	0.022	0.008	0.041
SAN JOAQUIN	All Vehicles	0.134	0.003	1.359	0.220	0.022	0.008	0.040
SAN LUIS OBISPO	All Vehicles	0.145	0.003	1.364	0.249	0.019	0.007	0.039
SAN MATEO	All Vehicles	0.108	0.003	1.175	0.201	0.019	0.007	0.041
SANTA BARBARA	All Vehicles	0.150	0.003	1.370	0.246	0.019	0.007	0.039
SANTA CLARA	All Vehicles	0.127	0.003	1.250	0.200	0.020	0.007	0.040
SANTA CRUZ	All Vehicles	0.168	0.003	1.629	0.279	0.022	0.008	0.039
SHASTA	All Vehicles	0.151	0.003	1.442	0.252	0.020	0.007	0.040
SIERRA	All Vehicles	0.183	0.003	1.742	0.269	0.023	0.009	0.039
SISKIYOU	All Vehicles	0.180	0.003	1.743	0.280	0.022	0.008	0.040
SOLANO	All Vehicles	0.135	0.003	1.232	0.209	0.018	0.007	0.040
SONOMA	All Vehicles	0.149	0.003	1.461	0.243	0.021	0.008	0.039
STANISLAUS	All Vehicles	0.139	0.003	1.383	0.230	0.021	0.008	0.040
SUTTER	All Vehicles	0.140	0.003	1.412	0.230	0.021	0.008	0.040
TEHAMA	All Vehicles	0.154	0.003	1.466	0.242	0.020	0.008	0.040
TRINITY	All Vehicles	0.186	0.004	1.834	0.279	0.023	0.009	0.040
TULARE	All Vehicles	0.146	0.003	1.382	0.225	0.020	0.007	0.040
TUOLUMNE	All Vehicles	0.206	0.003	1.900	0.330	0.022	0.009	0.038
VENTURA	All Vehicles	0.129	0.003	1.250	0.206	0.019	0.007	0.040
YOLO	All Vehicles	0.130	0.003	1.340	0.219	0.021	0.008	0.040
YUBA	All Vehicles	0.151	0.003	1.441	0.246	0.020	0.008	0.039

5174

5175

5176 **Table 5-34. EMFAC County-Specific On-Road Vehicle Composite EFs – 2024 GOV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.551	0.005	0.969	0.113	0.042	0.018	0.066
ALPINE	All Vehicles	0.657	0.005	1.266	0.141	0.047	0.021	0.063
AMADOR	All Vehicles	0.848	0.005	1.664	0.220	0.046	0.024	0.053
BUTTE	All Vehicles	0.663	0.005	1.335	0.170	0.046	0.022	0.061
CALAVERAS	All Vehicles	0.854	0.005	1.807	0.227	0.050	0.026	0.053
COLUSA	All Vehicles	0.603	0.005	1.132	0.136	0.043	0.020	0.064
CONTRA COSTA	All Vehicles	0.554	0.005	0.973	0.116	0.042	0.019	0.062
DEL NORTE	All Vehicles	0.889	0.005	1.580	0.219	0.049	0.026	0.050
EL DORADO	All Vehicles	0.654	0.005	1.199	0.160	0.043	0.021	0.055
FRESNO	All Vehicles	0.594	0.006	1.094	0.129	0.042	0.019	0.065
GLENN	All Vehicles	0.623	0.005	1.200	0.148	0.045	0.021	0.062
HUMBOLDT	All Vehicles	0.763	0.005	1.464	0.195	0.046	0.023	0.056
IMPERIAL	All Vehicles	0.591	0.006	1.300	0.140	0.042	0.019	0.066
INYO	All Vehicles	0.649	0.005	1.269	0.158	0.045	0.021	0.060
KERN	All Vehicles	0.590	0.006	1.085	0.123	0.043	0.019	0.067
KINGS	All Vehicles	0.610	0.006	1.099	0.128	0.042	0.019	0.067
LAKE	All Vehicles	0.835	0.005	1.690	0.231	0.048	0.025	0.053
LASSEN	All Vehicles	0.771	0.005	1.467	0.193	0.048	0.025	0.052
LOS ANGELES	All Vehicles	0.526	0.005	1.059	0.109	0.042	0.018	0.065
MADERA	All Vehicles	0.623	0.006	1.124	0.143	0.042	0.019	0.064
MARIN	All Vehicles	0.537	0.005	0.966	0.127	0.040	0.018	0.059
MARIPOSA	All Vehicles	0.940	0.005	1.888	0.258	0.051	0.027	0.049
MENDOCINO	All Vehicles	0.729	0.005	1.427	0.182	0.047	0.023	0.060
MERCED	All Vehicles	0.647	0.006	1.302	0.146	0.045	0.020	0.066
MODOC	All Vehicles	0.855	0.005	1.595	0.195	0.051	0.026	0.053
MONO	All Vehicles	0.681	0.005	1.313	0.156	0.045	0.021	0.062
MONTEREY	All Vehicles	0.611	0.005	1.182	0.150	0.041	0.019	0.061
NAPA	All Vehicles	0.614	0.005	1.079	0.133	0.043	0.020	0.060
NEVADA	All Vehicles	0.710	0.005	1.378	0.176	0.046	0.022	0.059
ORANGE	All Vehicles	0.446	0.005	0.911	0.098	0.038	0.016	0.064
PLACER	All Vehicles	0.580	0.005	1.038	0.119	0.044	0.020	0.062
PLUMAS	All Vehicles	0.886	0.005	1.772	0.220	0.050	0.026	0.051
RIVERSIDE	All Vehicles	0.546	0.005	1.031	0.107	0.042	0.019	0.066
SACRAMENTO	All Vehicles	0.719	0.005	1.087	0.134	0.042	0.019	0.060
SAN BENITO	All Vehicles	0.599	0.006	1.158	0.137	0.046	0.020	0.066
SAN BERNARDINO	All Vehicles	0.562	0.005	1.059	0.117	0.042	0.018	0.066
SAN DIEGO	All Vehicles	0.574	0.005	1.059	0.125	0.042	0.019	0.061
SAN FRANCISCO	All Vehicles	0.530	0.005	0.975	0.111	0.043	0.018	0.064
SAN JOAQUIN	All Vehicles	0.584	0.005	1.122	0.128	0.044	0.020	0.065
SAN LUIS OBISPO	All Vehicles	0.614	0.005	1.080	0.149	0.042	0.020	0.057
SAN MATEO	All Vehicles	0.426	0.005	0.839	0.102	0.037	0.016	0.065
SANTA BARBARA	All Vehicles	0.608	0.005	1.149	0.152	0.041	0.019	0.060
SANTA CLARA	All Vehicles	0.537	0.005	0.995	0.116	0.041	0.018	0.064
SANTA CRUZ	All Vehicles	0.681	0.005	1.314	0.166	0.044	0.021	0.058
SHASTA	All Vehicles	0.657	0.005	1.207	0.151	0.044	0.021	0.062
SIERRA	All Vehicles	0.815	0.005	1.539	0.190	0.049	0.025	0.053
SISKIYOU	All Vehicles	0.716	0.006	1.528	0.180	0.049	0.023	0.063
SOLANO	All Vehicles	0.589	0.005	0.991	0.122	0.042	0.019	0.064
SONOMA	All Vehicles	0.610	0.005	1.193	0.152	0.043	0.020	0.060
STANISLAUS	All Vehicles	0.601	0.005	1.189	0.142	0.045	0.020	0.063
SUTTER	All Vehicles	0.583	0.005	1.197	0.141	0.044	0.020	0.064
TEHAMA	All Vehicles	0.650	0.005	1.270	0.152	0.046	0.022	0.064
TRINITY	All Vehicles	0.755	0.006	1.648	0.187	0.050	0.025	0.060
TULARE	All Vehicles	0.629	0.005	1.225	0.146	0.044	0.020	0.063
TUOLUMNE	All Vehicles	0.841	0.005	1.689	0.230	0.049	0.025	0.051
VENTURA	All Vehicles	0.538	0.005	0.991	0.119	0.039	0.017	0.061
YOLO	All Vehicles	0.559	0.005	1.064	0.124	0.042	0.019	0.062
YUBA	All Vehicles	0.718	0.005	1.252	0.167	0.044	0.022	0.054

5177
5178

5179 **Table 5-35. EMFAC County-Specific On-Road Vehicle Composite EFs – 2025 GOV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.527	0.005	0.917	0.107	0.041	0.018	0.067
ALPINE	All Vehicles	0.620	0.005	1.195	0.134	0.046	0.021	0.064
AMADOR	All Vehicles	0.807	0.005	1.552	0.209	0.046	0.023	0.054
BUTTE	All Vehicles	0.630	0.005	1.245	0.161	0.045	0.021	0.062
CALAVERAS	All Vehicles	0.813	0.005	1.689	0.216	0.049	0.025	0.054
COLUSA	All Vehicles	0.577	0.005	1.062	0.129	0.043	0.020	0.064
CONTRA COSTA	All Vehicles	0.526	0.005	0.920	0.111	0.041	0.018	0.063
DEL NORTE	All Vehicles	0.844	0.005	1.472	0.208	0.048	0.025	0.051
EL DORADO	All Vehicles	0.621	0.005	1.134	0.154	0.043	0.021	0.056
FRESNO	All Vehicles	0.570	0.005	1.025	0.122	0.042	0.019	0.066
GLENN	All Vehicles	0.595	0.005	1.122	0.140	0.044	0.020	0.063
HUMBOLDT	All Vehicles	0.727	0.005	1.373	0.186	0.046	0.023	0.057
IMPERIAL	All Vehicles	0.561	0.005	1.209	0.132	0.042	0.019	0.067
INYO	All Vehicles	0.616	0.005	1.192	0.150	0.044	0.021	0.061
KERN	All Vehicles	0.567	0.006	1.018	0.116	0.043	0.019	0.067
KINGS	All Vehicles	0.588	0.006	1.029	0.120	0.042	0.019	0.067
LAKE	All Vehicles	0.791	0.005	1.563	0.218	0.047	0.024	0.054
LASSEN	All Vehicles	0.728	0.005	1.372	0.184	0.047	0.024	0.054
LOS ANGELES	All Vehicles	0.496	0.005	0.995	0.103	0.042	0.018	0.066
MADERA	All Vehicles	0.598	0.005	1.050	0.135	0.041	0.019	0.065
MARIN	All Vehicles	0.505	0.005	0.915	0.122	0.039	0.018	0.060
MARIPOSA	All Vehicles	0.897	0.005	1.767	0.247	0.050	0.026	0.050
MENDOCINO	All Vehicles	0.693	0.005	1.335	0.173	0.046	0.022	0.061
MERCED	All Vehicles	0.620	0.006	1.205	0.137	0.045	0.020	0.067
MODOC	All Vehicles	0.805	0.005	1.490	0.185	0.050	0.025	0.054
MONO	All Vehicles	0.649	0.005	1.236	0.149	0.045	0.021	0.063
MONTEREY	All Vehicles	0.579	0.005	1.107	0.142	0.041	0.019	0.062
NAPA	All Vehicles	0.587	0.005	1.017	0.127	0.042	0.019	0.061
NEVADA	All Vehicles	0.678	0.005	1.303	0.170	0.046	0.022	0.060
ORANGE	All Vehicles	0.422	0.005	0.862	0.094	0.038	0.016	0.065
PLACER	All Vehicles	0.554	0.005	0.982	0.113	0.044	0.020	0.063
PLUMAS	All Vehicles	0.839	0.005	1.655	0.210	0.050	0.025	0.052
RIVERSIDE	All Vehicles	0.523	0.005	0.970	0.102	0.041	0.018	0.067
SACRAMENTO	All Vehicles	0.676	0.005	1.024	0.128	0.042	0.019	0.061
SAN BENITO	All Vehicles	0.577	0.005	1.084	0.129	0.046	0.020	0.067
SAN BERNARDINO	All Vehicles	0.536	0.005	0.991	0.111	0.041	0.018	0.067
SAN DIEGO	All Vehicles	0.541	0.005	1.001	0.119	0.042	0.019	0.062
SAN FRANCISCO	All Vehicles	0.497	0.005	0.929	0.107	0.042	0.018	0.065
SAN JOAQUIN	All Vehicles	0.560	0.005	1.051	0.120	0.044	0.019	0.066
SAN LUIS OBISPO	All Vehicles	0.584	0.005	1.018	0.142	0.042	0.020	0.058
SAN MATEO	All Vehicles	0.395	0.005	0.800	0.098	0.036	0.015	0.066
SANTA BARBARA	All Vehicles	0.576	0.005	1.075	0.144	0.040	0.018	0.061
SANTA CLARA	All Vehicles	0.510	0.005	0.942	0.110	0.041	0.018	0.065
SANTA CRUZ	All Vehicles	0.642	0.005	1.233	0.159	0.044	0.021	0.059
SHASTA	All Vehicles	0.628	0.005	1.132	0.143	0.044	0.020	0.063
SIERRA	All Vehicles	0.760	0.005	1.433	0.180	0.049	0.024	0.054
SISKIYOU	All Vehicles	0.682	0.006	1.432	0.171	0.048	0.023	0.064
SOLANO	All Vehicles	0.565	0.005	0.933	0.116	0.041	0.019	0.065
SONOMA	All Vehicles	0.580	0.005	1.120	0.144	0.043	0.020	0.061
STANISLAUS	All Vehicles	0.575	0.005	1.111	0.133	0.044	0.020	0.064
SUTTER	All Vehicles	0.560	0.005	1.118	0.132	0.044	0.020	0.065
TEHAMA	All Vehicles	0.623	0.005	1.188	0.143	0.045	0.021	0.064
TRINITY	All Vehicles	0.715	0.006	1.541	0.176	0.050	0.024	0.062
TULARE	All Vehicles	0.600	0.005	1.138	0.136	0.043	0.020	0.064
TUOLUMNE	All Vehicles	0.800	0.005	1.578	0.220	0.048	0.025	0.052
VENTURA	All Vehicles	0.507	0.005	0.932	0.112	0.039	0.017	0.062
YOLO	All Vehicles	0.537	0.005	1.003	0.118	0.041	0.018	0.063
YUBA	All Vehicles	0.678	0.005	1.158	0.157	0.044	0.021	0.056

5180
5181

5182 **Table 5-36. EMFAC County-Specific On-Road Vehicle Composite EFs – 2026 GOV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.505	0.005	0.873	0.103	0.041	0.018	0.067
ALPINE	All Vehicles	0.595	0.005	1.134	0.129	0.046	0.021	0.065
AMADOR	All Vehicles	0.764	0.004	1.449	0.198	0.044	0.022	0.055
BUTTE	All Vehicles	0.599	0.005	1.166	0.151	0.045	0.021	0.064
CALAVERAS	All Vehicles	0.776	0.005	1.586	0.206	0.048	0.024	0.055
COLUSA	All Vehicles	0.554	0.005	1.001	0.122	0.043	0.019	0.065
CONTRA COSTA	All Vehicles	0.501	0.005	0.874	0.106	0.041	0.018	0.064
DEL NORTE	All Vehicles	0.800	0.005	1.376	0.198	0.047	0.025	0.052
EL DORADO	All Vehicles	0.588	0.005	1.076	0.149	0.042	0.020	0.058
FRESNO	All Vehicles	0.548	0.005	0.967	0.116	0.042	0.018	0.067
GLENN	All Vehicles	0.570	0.005	1.056	0.132	0.044	0.020	0.064
HUMBOLDT	All Vehicles	0.693	0.005	1.292	0.178	0.045	0.022	0.058
IMPERIAL	All Vehicles	0.535	0.005	1.130	0.123	0.042	0.018	0.068
INYO	All Vehicles	0.586	0.005	1.127	0.143	0.044	0.020	0.063
KERN	All Vehicles	0.548	0.005	0.961	0.110	0.042	0.019	0.068
KINGS	All Vehicles	0.568	0.006	0.970	0.114	0.042	0.019	0.068
LAKE	All Vehicles	0.751	0.005	1.454	0.206	0.046	0.023	0.055
LASSEN	All Vehicles	0.688	0.005	1.292	0.176	0.046	0.023	0.055
LOS ANGELES	All Vehicles	0.469	0.005	0.941	0.097	0.042	0.017	0.067
MADERA	All Vehicles	0.576	0.005	0.987	0.127	0.041	0.018	0.066
MARIN	All Vehicles	0.476	0.005	0.872	0.117	0.039	0.017	0.061
MARIPOSA	All Vehicles	0.854	0.005	1.652	0.235	0.049	0.025	0.051
MENDOCINO	All Vehicles	0.661	0.005	1.255	0.165	0.046	0.022	0.062
MERCED	All Vehicles	0.597	0.005	1.123	0.128	0.045	0.020	0.067
MODOC	All Vehicles	0.759	0.005	1.397	0.175	0.049	0.025	0.055
MONO	All Vehicles	0.620	0.005	1.170	0.142	0.044	0.020	0.064
MONTEREY	All Vehicles	0.551	0.005	1.043	0.135	0.041	0.018	0.063
NAPA	All Vehicles	0.561	0.005	0.965	0.121	0.042	0.019	0.062
NEVADA	All Vehicles	0.647	0.005	1.236	0.164	0.045	0.021	0.062
ORANGE	All Vehicles	0.401	0.005	0.822	0.090	0.038	0.016	0.066
PLACER	All Vehicles	0.530	0.005	0.935	0.108	0.043	0.019	0.064
PLUMAS	All Vehicles	0.795	0.005	1.548	0.200	0.049	0.024	0.054
RIVERSIDE	All Vehicles	0.502	0.005	0.919	0.097	0.041	0.018	0.068
SACRAMENTO	All Vehicles	0.637	0.005	0.971	0.122	0.041	0.018	0.062
SAN BENITO	All Vehicles	0.558	0.005	1.022	0.122	0.045	0.020	0.067
SAN BERNARDINO	All Vehicles	0.513	0.005	0.936	0.105	0.041	0.018	0.067
SAN DIEGO	All Vehicles	0.512	0.005	0.948	0.114	0.042	0.019	0.063
SAN FRANCISCO	All Vehicles	0.469	0.005	0.891	0.103	0.042	0.018	0.066
SAN JOAQUIN	All Vehicles	0.539	0.005	0.992	0.114	0.043	0.019	0.066
SAN LUIS OBISPO	All Vehicles	0.556	0.005	0.964	0.136	0.041	0.020	0.059
SAN MATEO	All Vehicles	0.369	0.005	0.770	0.095	0.036	0.015	0.066
SANTA BARBARA	All Vehicles	0.547	0.005	0.998	0.137	0.039	0.018	0.062
SANTA CLARA	All Vehicles	0.485	0.005	0.897	0.106	0.040	0.017	0.066
SANTA CRUZ	All Vehicles	0.605	0.005	1.163	0.152	0.043	0.020	0.060
SHASTA	All Vehicles	0.602	0.005	1.067	0.136	0.044	0.020	0.064
SIERRA	All Vehicles	0.710	0.005	1.348	0.171	0.048	0.024	0.056
SISKIYOU	All Vehicles	0.650	0.006	1.349	0.162	0.048	0.022	0.065
SOLANO	All Vehicles	0.543	0.005	0.885	0.110	0.041	0.018	0.065
SONOMA	All Vehicles	0.553	0.005	1.058	0.137	0.042	0.019	0.062
STANISLAUS	All Vehicles	0.552	0.005	1.046	0.126	0.044	0.020	0.065
SUTTER	All Vehicles	0.539	0.005	1.052	0.125	0.044	0.019	0.066
TEHAMA	All Vehicles	0.598	0.005	1.118	0.135	0.045	0.021	0.065
TRINITY	All Vehicles	0.679	0.006	1.446	0.167	0.049	0.023	0.063
TULARE	All Vehicles	0.573	0.005	1.064	0.128	0.043	0.019	0.065
TUOLUMNE	All Vehicles	0.760	0.005	1.479	0.210	0.047	0.024	0.053
VENTURA	All Vehicles	0.480	0.005	0.881	0.107	0.038	0.016	0.063
YOLO	All Vehicles	0.516	0.005	0.951	0.113	0.041	0.018	0.064
YUBA	All Vehicles	0.640	0.005	1.076	0.147	0.043	0.021	0.057

5183
5184

5185 **Table 5-37. EMFAC County-Specific On-Road Vehicle Composite EFs – 2027 GOV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.485	0.005	0.834	0.098	0.041	0.017	0.068
ALPINE	All Vehicles	0.571	0.005	1.082	0.124	0.046	0.020	0.066
AMADOR	All Vehicles	0.728	0.004	1.358	0.188	0.044	0.022	0.056
BUTTE	All Vehicles	0.570	0.005	1.097	0.143	0.044	0.020	0.065
CALAVERAS	All Vehicles	0.740	0.005	1.490	0.196	0.047	0.023	0.056
COLUSA	All Vehicles	0.533	0.005	0.949	0.115	0.042	0.019	0.066
CONTRA COSTA	All Vehicles	0.477	0.005	0.834	0.101	0.041	0.018	0.065
DEL NORTE	All Vehicles	0.756	0.004	1.290	0.188	0.046	0.024	0.053
EL DORADO	All Vehicles	0.558	0.005	1.027	0.144	0.042	0.020	0.059
FRESNO	All Vehicles	0.528	0.005	0.917	0.110	0.041	0.018	0.068
GLENN	All Vehicles	0.547	0.005	1.000	0.125	0.044	0.020	0.065
HUMBOLDT	All Vehicles	0.656	0.005	1.216	0.170	0.044	0.021	0.059
IMPERIAL	All Vehicles	0.512	0.005	1.051	0.116	0.041	0.018	0.068
INYO	All Vehicles	0.558	0.005	1.068	0.137	0.044	0.020	0.064
KERN	All Vehicles	0.529	0.005	0.914	0.104	0.042	0.018	0.069
KINGS	All Vehicles	0.549	0.005	0.919	0.107	0.041	0.018	0.069
LAKE	All Vehicles	0.712	0.005	1.354	0.194	0.045	0.022	0.056
LASSEN	All Vehicles	0.651	0.004	1.221	0.168	0.045	0.022	0.056
LOS ANGELES	All Vehicles	0.446	0.005	0.894	0.093	0.041	0.017	0.068
MADERA	All Vehicles	0.556	0.005	0.931	0.120	0.041	0.018	0.067
MARIN	All Vehicles	0.450	0.005	0.834	0.113	0.039	0.017	0.062
MARIPOSA	All Vehicles	0.812	0.005	1.547	0.223	0.048	0.024	0.052
MENDOCINO	All Vehicles	0.628	0.005	1.183	0.157	0.045	0.021	0.063
MERCED	All Vehicles	0.574	0.005	1.054	0.119	0.044	0.019	0.068
MODOC	All Vehicles	0.716	0.005	1.316	0.165	0.048	0.024	0.057
MONO	All Vehicles	0.595	0.005	1.111	0.136	0.044	0.020	0.065
MONTEREY	All Vehicles	0.524	0.005	0.985	0.129	0.040	0.018	0.064
NAPA	All Vehicles	0.536	0.005	0.918	0.116	0.042	0.019	0.063
NEVADA	All Vehicles	0.618	0.005	1.176	0.159	0.045	0.021	0.063
ORANGE	All Vehicles	0.382	0.005	0.787	0.086	0.038	0.015	0.067
PLACER	All Vehicles	0.508	0.005	0.896	0.103	0.043	0.019	0.065
PLUMAS	All Vehicles	0.751	0.005	1.457	0.190	0.048	0.024	0.055
RIVERSIDE	All Vehicles	0.482	0.005	0.875	0.092	0.041	0.018	0.068
SACRAMENTO	All Vehicles	0.602	0.005	0.928	0.117	0.041	0.018	0.063
SAN BENITO	All Vehicles	0.540	0.005	0.968	0.116	0.045	0.020	0.068
SAN BERNARDINO	All Vehicles	0.493	0.005	0.888	0.099	0.041	0.018	0.068
SAN DIEGO	All Vehicles	0.485	0.005	0.909	0.109	0.041	0.018	0.064
SAN FRANCISCO	All Vehicles	0.441	0.005	0.857	0.100	0.042	0.017	0.066
SAN JOAQUIN	All Vehicles	0.519	0.005	0.947	0.108	0.043	0.019	0.067
SAN LUIS OBISPO	All Vehicles	0.529	0.005	0.915	0.131	0.041	0.019	0.060
SAN MATEO	All Vehicles	0.347	0.004	0.745	0.092	0.036	0.015	0.067
SANTA BARBARA	All Vehicles	0.518	0.005	0.942	0.130	0.039	0.017	0.063
SANTA CLARA	All Vehicles	0.461	0.005	0.857	0.102	0.040	0.017	0.067
SANTA CRUZ	All Vehicles	0.569	0.005	1.099	0.145	0.042	0.019	0.061
SHASTA	All Vehicles	0.577	0.005	1.011	0.129	0.043	0.020	0.065
SIERRA	All Vehicles	0.669	0.005	1.274	0.163	0.047	0.023	0.057
SISKIYOU	All Vehicles	0.621	0.005	1.275	0.154	0.047	0.021	0.066
SOLANO	All Vehicles	0.523	0.005	0.842	0.105	0.041	0.018	0.066
SONOMA	All Vehicles	0.524	0.005	1.002	0.130	0.042	0.019	0.063
STANISLAUS	All Vehicles	0.529	0.005	0.972	0.119	0.043	0.019	0.066
SUTTER	All Vehicles	0.519	0.005	0.997	0.118	0.043	0.019	0.067
TEHAMA	All Vehicles	0.576	0.005	1.057	0.128	0.045	0.020	0.066
TRINITY	All Vehicles	0.646	0.005	1.363	0.158	0.048	0.023	0.064
TULARE	All Vehicles	0.547	0.005	0.998	0.120	0.042	0.019	0.065
TUOLUMNE	All Vehicles	0.724	0.004	1.391	0.201	0.047	0.023	0.055
VENTURA	All Vehicles	0.454	0.005	0.835	0.102	0.038	0.016	0.064
YOLO	All Vehicles	0.496	0.005	0.909	0.107	0.041	0.018	0.065
YUBA	All Vehicles	0.603	0.005	1.005	0.138	0.043	0.020	0.058

5186

5187

5188 **Table 5-38. EMFAC County-Specific On-Road Vehicle Composite EFs – 2028 GOV**

County	Vehicle Type	Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
		NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
ALAMEDA	All Vehicles	0.468	0.005	0.801	0.094	0.040	0.017	0.069
ALPINE	All Vehicles	0.550	0.005	1.038	0.119	0.046	0.020	0.067
AMADOR	All Vehicles	0.691	0.004	1.277	0.179	0.043	0.021	0.057
BUTTE	All Vehicles	0.546	0.005	1.040	0.135	0.044	0.019	0.065
CALAVERAS	All Vehicles	0.708	0.005	1.405	0.187	0.047	0.023	0.057
COLUSA	All Vehicles	0.515	0.005	0.906	0.110	0.042	0.019	0.067
CONTRA COSTA	All Vehicles	0.457	0.005	0.800	0.097	0.040	0.017	0.066
DEL NORTE	All Vehicles	0.718	0.004	1.216	0.179	0.046	0.023	0.054
EL DORADO	All Vehicles	0.530	0.005	0.984	0.139	0.042	0.019	0.060
FRESNO	All Vehicles	0.510	0.005	0.876	0.105	0.041	0.018	0.068
GLENN	All Vehicles	0.527	0.005	0.954	0.119	0.043	0.019	0.066
HUMBOLDT	All Vehicles	0.627	0.005	1.153	0.162	0.044	0.020	0.060
IMPERIAL	All Vehicles	0.493	0.005	0.998	0.110	0.041	0.018	0.069
INYO	All Vehicles	0.533	0.005	1.019	0.131	0.043	0.020	0.065
KERN	All Vehicles	0.514	0.005	0.874	0.099	0.042	0.018	0.069
KINGS	All Vehicles	0.532	0.005	0.876	0.102	0.041	0.018	0.069
LAKE	All Vehicles	0.676	0.005	1.268	0.184	0.044	0.022	0.057
LASSEN	All Vehicles	0.617	0.004	1.160	0.161	0.045	0.022	0.057
LOS ANGELES	All Vehicles	0.425	0.005	0.857	0.088	0.041	0.017	0.068
MADERA	All Vehicles	0.538	0.005	0.885	0.114	0.041	0.018	0.067
MARIN	All Vehicles	0.426	0.005	0.801	0.109	0.038	0.017	0.063
MARIPOSA	All Vehicles	0.777	0.005	1.454	0.213	0.047	0.023	0.053
MENDOCINO	All Vehicles	0.600	0.005	1.121	0.150	0.044	0.020	0.064
MERCED	All Vehicles	0.555	0.005	0.995	0.112	0.044	0.019	0.068
MODOC	All Vehicles	0.678	0.005	1.245	0.157	0.047	0.022	0.058
MONO	All Vehicles	0.573	0.005	1.062	0.130	0.044	0.020	0.065
MONTEREY	All Vehicles	0.500	0.005	0.937	0.123	0.040	0.017	0.065
NAPA	All Vehicles	0.514	0.005	0.877	0.111	0.041	0.018	0.064
NEVADA	All Vehicles	0.593	0.005	1.123	0.154	0.045	0.020	0.063
ORANGE	All Vehicles	0.364	0.005	0.757	0.083	0.038	0.015	0.067
PLACER	All Vehicles	0.489	0.005	0.863	0.099	0.043	0.019	0.066
PLUMAS	All Vehicles	0.711	0.005	1.378	0.182	0.048	0.023	0.056
RIVERSIDE	All Vehicles	0.466	0.005	0.839	0.088	0.041	0.018	0.069
SACRAMENTO	All Vehicles	0.570	0.005	0.891	0.112	0.041	0.018	0.064
SAN BENITO	All Vehicles	0.525	0.005	0.926	0.110	0.045	0.019	0.069
SAN BERNARDINO	All Vehicles	0.476	0.005	0.848	0.094	0.041	0.017	0.068
SAN DIEGO	All Vehicles	0.462	0.005	0.871	0.104	0.041	0.018	0.065
SAN FRANCISCO	All Vehicles	0.420	0.005	0.829	0.097	0.041	0.017	0.067
SAN JOAQUIN	All Vehicles	0.502	0.005	0.906	0.103	0.043	0.018	0.068
SAN LUIS OBISPO	All Vehicles	0.505	0.005	0.873	0.125	0.040	0.018	0.061
SAN MATEO	All Vehicles	0.328	0.004	0.727	0.090	0.036	0.015	0.067
SANTA BARBARA	All Vehicles	0.494	0.005	0.895	0.124	0.039	0.017	0.064
SANTA CLARA	All Vehicles	0.441	0.005	0.824	0.098	0.040	0.017	0.067
SANTA CRUZ	All Vehicles	0.537	0.005	1.044	0.138	0.042	0.018	0.062
SHASTA	All Vehicles	0.556	0.005	0.963	0.122	0.043	0.019	0.066
SIERRA	All Vehicles	0.633	0.005	1.210	0.156	0.047	0.022	0.058
SISKIYOU	All Vehicles	0.597	0.005	1.212	0.147	0.046	0.021	0.067
SOLANO	All Vehicles	0.505	0.005	0.806	0.100	0.041	0.018	0.067
SONOMA	All Vehicles	0.501	0.005	0.954	0.125	0.041	0.018	0.064
STANISLAUS	All Vehicles	0.510	0.005	0.925	0.113	0.043	0.019	0.066
SUTTER	All Vehicles	0.502	0.005	0.952	0.111	0.043	0.019	0.068
TEHAMA	All Vehicles	0.556	0.005	1.006	0.121	0.044	0.020	0.067
TRINITY	All Vehicles	0.616	0.005	1.292	0.149	0.047	0.022	0.065
TULARE	All Vehicles	0.525	0.005	0.945	0.113	0.042	0.018	0.066
TUOLUMNE	All Vehicles	0.689	0.004	1.312	0.193	0.046	0.023	0.056
VENTURA	All Vehicles	0.432	0.004	0.797	0.097	0.038	0.016	0.065
YOLO	All Vehicles	0.478	0.005	0.873	0.103	0.041	0.017	0.066
YUBA	All Vehicles	0.569	0.004	0.951	0.130	0.042	0.020	0.059

5189
5190

5191 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.144	0.138	0.016	0.006	286.234	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.117	0.003	1.357	0.152	0.018	0.006	350.082	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.201	0.005	1.623	0.201	0.029	0.010	525.363	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.246	0.002	0.358	0.031	0.036	0.024	238.071	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.066	0.003	0.149	0.016	0.024	0.012	313.462	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.199	0.013	0.573	0.073	0.123	0.056	1385.858	0.204
	Gasoline	MC	Motorcycles	0.651	0.002	16.260	4.863	0.019	0.008	207.629	0.009
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.304	0.133	0.018	0.007	278.409	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.161	0.003	1.820	0.190	0.020	0.007	345.922	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.293	0.005	2.188	0.273	0.031	0.011	536.271	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.227	0.002	0.389	0.032	0.035	0.023	224.464	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.060	0.003	0.186	0.020	0.025	0.012	298.047	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.583	0.013	0.730	0.106	0.140	0.069	1366.832	0.191
	Gasoline	MC	Motorcycles	0.756	0.002	19.623	5.257	0.019	0.008	211.724	0.009
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.111	0.003	1.545	0.181	0.017	0.006	282.590	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.260	0.004	2.583	0.296	0.019	0.007	358.806	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.361	0.006	2.690	0.409	0.031	0.011	558.525	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.455	0.002	0.382	0.030	0.035	0.023	217.885	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.176	0.003	0.197	0.024	0.032	0.020	292.570	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.143	0.009	0.700	0.194	0.137	0.077	941.332	0.141
	Gasoline	MC	Motorcycles	0.852	0.002	20.778	6.494	0.019	0.008	209.705	0.008
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.324	0.157	0.017	0.006	294.192	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.178	0.004	1.982	0.237	0.019	0.007	365.661	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.275	0.005	2.161	0.306	0.029	0.011	539.540	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.286	0.002	0.393	0.032	0.036	0.024	239.393	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.139	0.003	0.215	0.026	0.033	0.020	317.787	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.518	0.012	0.673	0.122	0.133	0.067	1229.803	0.182
	Gasoline	MC	Motorcycles	0.762	0.002	19.620	6.126	0.019	0.008	215.559	0.008
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.107	0.003	1.589	0.187	0.019	0.007	295.689	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.270	0.004	2.808	0.303	0.022	0.008	377.174	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.367	0.006	2.792	0.410	0.033	0.012	564.922	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.417	0.002	0.507	0.043	0.042	0.029	239.639	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.156	0.003	0.283	0.034	0.035	0.021	318.739	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.172	0.009	0.767	0.199	0.142	0.080	961.504	0.142
	Gasoline	MC	Motorcycles	0.846	0.002	21.694	6.680	0.019	0.008	221.139	0.008
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.155	0.129	0.016	0.006	293.806	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.143	0.004	1.623	0.186	0.017	0.006	361.584	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.231	0.005	1.868	0.244	0.027	0.010	532.813	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.281	0.002	0.387	0.031	0.033	0.022	234.909	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.070	0.003	0.171	0.019	0.024	0.013	307.317	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.380	0.012	0.683	0.103	0.133	0.065	1302.495	0.192
	Gasoline	MC	Motorcycles	0.683	0.002	16.944	5.200	0.019	0.008	209.791	0.009
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.137	0.134	0.017	0.006	285.835	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	1.373	0.149	0.018	0.007	350.840	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.209	0.005	1.669	0.204	0.028	0.010	512.857	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.202	0.002	0.314	0.024	0.030	0.019	235.300	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.143	0.015	0.023	0.012	316.999	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.223	0.012	0.558	0.100	0.123	0.059	1223.636	0.187
	Gasoline	MC	Motorcycles	0.676	0.002	17.043	5.049	0.019	0.008	208.399	0.009
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.105	0.003	1.406	0.165	0.017	0.006	306.167	0.033
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.253	0.004	2.391	0.290	0.019	0.007	385.384	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.320	0.006	2.281	0.315	0.029	0.011	563.716	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.374	0.002	0.550	0.046	0.041	0.029	254.370	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.177	0.003	0.340	0.040	0.036	0.024	336.485	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.365	0.008	0.764	0.217	0.145	0.083	860.857	0.128
	Gasoline	MC	Motorcycles	0.839	0.002	21.909	6.272	0.020	0.008	229.115	0.008

5192
5193

5194 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.081	0.003	1.251	0.135	0.018	0.006	290.413	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.150	0.004	1.759	0.205	0.020	0.007	362.291	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.264	0.005	2.110	0.290	0.030	0.011	538.577	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.295	0.002	0.393	0.032	0.035	0.023	238.068	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.057	0.003	0.170	0.018	0.025	0.012	317.125	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.603	0.009	0.601	0.163	0.126	0.068	963.036	0.154
	Gasoline	MC	Motorcycles	0.815	0.002	21.117	6.505	0.019	0.008	221.332	0.008
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.118	0.126	0.015	0.005	290.966	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.004	1.578	0.183	0.017	0.006	359.439	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.219	0.005	1.809	0.241	0.025	0.009	518.509	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.240	0.002	0.318	0.027	0.032	0.021	228.598	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.086	0.003	0.148	0.017	0.024	0.013	297.980	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.350	0.013	0.650	0.082	0.130	0.061	1414.617	0.202
	Gasoline	MC	Motorcycles	0.704	0.002	17.546	5.546	0.019	0.008	209.011	0.009
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.237	0.136	0.017	0.006	299.328	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.142	0.004	1.715	0.199	0.019	0.007	366.602	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.247	0.005	2.063	0.276	0.028	0.010	537.385	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.209	0.002	0.412	0.032	0.033	0.021	237.789	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.079	0.003	0.214	0.025	0.027	0.015	313.198	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.470	0.012	0.683	0.116	0.133	0.066	1243.863	0.186
	Gasoline	MC	Motorcycles	0.708	0.002	18.095	5.617	0.019	0.008	215.138	0.009
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.106	0.003	1.417	0.169	0.017	0.006	293.553	0.033
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.227	0.004	2.193	0.268	0.019	0.007	368.004	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.312	0.005	2.253	0.307	0.030	0.011	547.729	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.566	0.002	0.564	0.051	0.048	0.036	247.113	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.213	0.003	0.269	0.032	0.034	0.022	319.625	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.800	0.010	0.709	0.158	0.135	0.071	1092.401	0.158
	Gasoline	MC	Motorcycles	0.860	0.002	21.862	6.367	0.019	0.008	221.958	0.008
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.074	0.003	1.253	0.140	0.015	0.005	308.189	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.172	0.004	1.983	0.211	0.017	0.006	378.645	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.232	0.005	2.042	0.244	0.025	0.009	510.059	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.305	0.002	0.402	0.037	0.039	0.028	247.632	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.081	0.003	0.140	0.016	0.024	0.013	315.658	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.248	0.013	0.621	0.064	0.130	0.061	1389.140	0.203
	Gasoline	MC	Motorcycles	0.623	0.002	15.893	5.294	0.019	0.008	206.952	0.009
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.274	0.140	0.016	0.006	304.938	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.160	0.004	1.832	0.211	0.018	0.007	377.330	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.279	0.006	2.234	0.291	0.029	0.011	561.338	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.369	0.002	0.504	0.043	0.040	0.029	248.010	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.073	0.003	0.209	0.023	0.025	0.013	321.854	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.540	0.011	0.701	0.132	0.138	0.070	1190.787	0.177
	Gasoline	MC	Motorcycles	0.728	0.002	18.730	5.713	0.019	0.008	219.118	0.009
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.140	0.126	0.016	0.005	291.860	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.004	1.542	0.172	0.017	0.006	356.888	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.220	0.005	1.804	0.230	0.026	0.009	529.176	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.225	0.002	0.312	0.026	0.031	0.020	230.423	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.072	0.003	0.134	0.015	0.023	0.012	301.381	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.345	0.014	0.691	0.078	0.134	0.062	1472.190	0.207
	Gasoline	MC	Motorcycles	0.689	0.002	17.142	5.335	0.019	0.008	207.825	0.009
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.052	0.118	0.014	0.005	300.230	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.145	0.004	1.577	0.182	0.015	0.005	370.235	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.210	0.005	1.720	0.234	0.023	0.008	528.905	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.246	0.002	0.357	0.029	0.031	0.022	239.986	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.083	0.003	0.174	0.020	0.024	0.014	313.347	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.408	0.014	0.708	0.081	0.136	0.064	1474.308	0.206
	Gasoline	MC	Motorcycles	0.690	0.002	17.186	5.297	0.019	0.008	213.468	0.009

5195
5196

5197 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.132	0.003	1.782	0.206	0.018	0.006	305.689	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.250	0.004	2.522	0.310	0.020	0.007	381.096	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.378	0.006	2.789	0.397	0.031	0.011	564.838	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.604	0.002	0.613	0.059	0.055	0.042	252.409	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.224	0.003	0.300	0.034	0.036	0.023	326.145	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.051	0.009	0.738	0.195	0.139	0.077	940.854	0.143
	Gasoline	MC	Motorcycles	0.862	0.002	22.352	6.881	0.020	0.009	224.944	0.008
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.091	0.003	1.391	0.151	0.018	0.007	305.564	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.193	0.004	2.155	0.244	0.021	0.008	382.132	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.341	0.006	2.698	0.350	0.032	0.012	570.483	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.288	0.002	0.524	0.039	0.035	0.023	251.758	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	0.283	0.033	0.031	0.018	336.349	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.003	0.008	0.710	0.202	0.139	0.078	871.871	0.139
	Gasoline	MC	Motorcycles	0.798	0.002	21.348	6.060	0.020	0.009	228.897	0.009
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.176	0.123	0.019	0.007	296.494	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.131	0.004	1.552	0.151	0.020	0.007	361.262	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.218	0.005	1.806	0.201	0.031	0.011	505.550	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.240	0.002	0.455	0.043	0.045	0.032	252.042	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.065	0.003	0.192	0.022	0.027	0.014	323.671	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.051	0.012	0.482	0.060	0.117	0.052	1224.471	0.199
	Gasoline	MC	Motorcycles	0.583	0.002	14.855	4.338	0.019	0.008	208.711	0.009
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.076	0.125	0.014	0.005	294.973	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.155	0.004	1.633	0.206	0.015	0.005	365.879	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.253	0.005	1.883	0.263	0.024	0.009	539.773	0.035
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.237	0.002	0.306	0.024	0.028	0.019	235.114	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.065	0.003	0.119	0.013	0.020	0.011	307.073	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.450	0.013	0.700	0.095	0.134	0.064	1386.193	0.197
	Gasoline	MC	Motorcycles	0.758	0.002	19.137	5.770	0.019	0.008	214.429	0.009
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.085	0.003	1.194	0.153	0.016	0.006	285.470	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.119	0.003	1.377	0.164	0.017	0.006	351.234	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.207	0.005	1.644	0.208	0.029	0.010	531.864	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.220	0.002	0.338	0.028	0.033	0.022	238.992	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.141	0.014	0.022	0.010	325.883	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.140	0.010	0.498	0.110	0.117	0.058	1060.180	0.171
	Gasoline	MC	Motorcycles	0.679	0.002	16.966	5.059	0.019	0.008	209.326	0.009
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.122	0.003	1.712	0.194	0.019	0.007	304.779	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.277	0.004	2.868	0.348	0.022	0.008	389.293	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.472	0.006	3.432	0.463	0.034	0.013	593.958	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.507	0.002	0.604	0.052	0.047	0.033	252.736	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.114	0.003	0.309	0.038	0.037	0.023	332.426	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.558	0.008	0.797	0.230	0.145	0.083	872.704	0.122
	Gasoline	MC	Motorcycles	0.914	0.002	24.102	6.994	0.020	0.009	231.687	0.008
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.098	0.003	1.366	0.159	0.017	0.006	289.389	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.207	0.004	2.112	0.254	0.019	0.007	362.941	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.315	0.005	2.323	0.317	0.030	0.011	545.819	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.563	0.002	0.566	0.054	0.052	0.039	245.881	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.260	0.003	0.288	0.032	0.035	0.022	322.877	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.648	0.011	0.702	0.132	0.135	0.069	1211.498	0.175
	Gasoline	MC	Motorcycles	0.798	0.002	20.220	6.082	0.019	0.008	217.268	0.008
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.074	0.003	1.190	0.125	0.017	0.006	287.893	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.177	0.004	1.940	0.216	0.019	0.007	360.891	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.271	0.005	2.118	0.267	0.026	0.009	520.689	0.035
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.247	0.002	0.312	0.024	0.031	0.019	223.440	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	0.164	0.021	0.028	0.016	293.740	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.485	0.014	0.723	0.081	0.136	0.064	1495.432	0.206
	Gasoline	MC	Motorcycles	0.729	0.002	18.051	5.580	0.019	0.008	207.202	0.009

5198
5199

5200 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.098	0.003	1.510	0.154	0.020	0.007	327.109	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.210	0.004	2.318	0.243	0.023	0.009	408.063	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.382	0.006	2.969	0.370	0.034	0.013	606.664	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.366	0.003	0.749	0.059	0.045	0.032	282.276	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.004	0.406	0.046	0.038	0.024	372.673	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.340	0.009	0.741	0.197	0.142	0.079	945.856	0.140
	Gasoline	MC	Motorcycles	0.795	0.002	22.235	5.972	0.020	0.009	243.633	0.009
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.092	0.003	1.305	0.139	0.016	0.006	293.167	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.179	0.004	1.894	0.213	0.018	0.007	367.770	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.320	0.005	2.361	0.305	0.029	0.011	554.751	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.347	0.002	0.480	0.037	0.035	0.024	245.352	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	0.229	0.022	0.024	0.012	329.280	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.618	0.012	0.714	0.118	0.138	0.069	1293.454	0.184
	Gasoline	MC	Motorcycles	0.797	0.002	21.514	5.615	0.019	0.008	225.514	0.009
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.091	0.003	1.250	0.152	0.016	0.006	289.515	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.178	0.004	1.759	0.208	0.018	0.007	361.880	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.286	0.005	1.974	0.260	0.028	0.010	537.680	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.276	0.002	0.382	0.034	0.038	0.027	243.724	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.077	0.003	0.156	0.017	0.025	0.013	324.277	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.316	0.011	0.565	0.105	0.121	0.060	1193.209	0.183
	Gasoline	MC	Motorcycles	0.713	0.002	17.935	5.256	0.019	0.008	211.775	0.009
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.157	0.129	0.017	0.006	281.324	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.003	1.551	0.172	0.019	0.007	351.180	0.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.253	0.005	1.908	0.250	0.030	0.011	542.476	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.285	0.002	0.392	0.038	0.042	0.030	236.405	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.068	0.003	0.156	0.016	0.025	0.012	316.152	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.443	0.011	0.590	0.118	0.124	0.062	1182.159	0.178
	Gasoline	MC	Motorcycles	0.727	0.002	18.363	5.411	0.019	0.008	209.531	0.009
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.094	0.003	1.348	0.166	0.017	0.006	287.206	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.192	0.004	2.015	0.242	0.019	0.007	366.538	0.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.326	0.005	2.336	0.326	0.031	0.011	549.863	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.335	0.002	0.413	0.032	0.034	0.023	232.667	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.164	0.003	0.241	0.025	0.029	0.017	319.821	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.674	0.012	0.733	0.131	0.137	0.070	1240.179	0.176
	Gasoline	MC	Motorcycles	0.880	0.002	22.762	6.837	0.019	0.008	222.558	0.008
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.070	0.115	0.018	0.006	286.550	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	1.342	0.138	0.019	0.007	350.770	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.181	0.005	1.559	0.175	0.030	0.011	499.757	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.156	0.002	0.334	0.026	0.032	0.019	237.399	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.154	0.016	0.024	0.011	316.540	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.757	0.010	0.380	0.055	0.104	0.046	1079.797	0.194
	Gasoline	MC	Motorcycles	0.586	0.002	14.758	4.391	0.019	0.008	203.934	0.009
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.221	0.131	0.018	0.006	292.240	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.110	0.004	1.436	0.150	0.019	0.007	356.583	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.209	0.005	1.802	0.217	0.029	0.010	530.132	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.280	0.002	0.400	0.034	0.037	0.025	238.938	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.065	0.003	0.167	0.017	0.024	0.012	314.568	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.353	0.012	0.635	0.108	0.130	0.064	1258.958	0.186
	Gasoline	MC	Motorcycles	0.736	0.002	18.832	5.675	0.019	0.008	215.644	0.009
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.108	0.003	1.623	0.174	0.020	0.008	312.320	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.243	0.004	2.647	0.287	0.023	0.009	398.298	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.409	0.006	3.222	0.408	0.034	0.013	585.650	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.366	0.003	0.661	0.056	0.048	0.034	266.854	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.178	0.003	0.385	0.039	0.032	0.018	356.561	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.355	0.009	0.761	0.204	0.143	0.080	928.029	0.135
	Gasoline	MC	Motorcycles	0.850	0.002	23.575	6.647	0.020	0.009	239.247	0.008

5201
5202

5203 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.080	0.113	0.016	0.006	292.817	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.125	0.004	1.496	0.152	0.017	0.006	358.118	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.199	0.005	1.676	0.199	0.026	0.009	491.197	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.182	0.002	0.310	0.025	0.030	0.019	238.383	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.068	0.003	0.145	0.016	0.024	0.012	311.926	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.165	0.013	0.582	0.062	0.125	0.059	1370.135	0.204
	Gasoline	MC	Motorcycles	0.628	0.002	15.938	4.959	0.019	0.008	205.818	0.009
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.079	0.003	1.275	0.148	0.018	0.006	298.073	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.125	0.004	1.562	0.176	0.019	0.007	365.511	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.231	0.005	1.917	0.244	0.030	0.011	553.258	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.244	0.002	0.373	0.028	0.032	0.020	236.920	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.166	0.018	0.024	0.012	314.105	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.971	0.012	0.542	0.106	0.122	0.060	1238.366	0.177
	Gasoline	MC	Motorcycles	0.720	0.002	18.401	5.705	0.019	0.008	215.473	0.009
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.079	0.003	1.208	0.129	0.019	0.007	282.061	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.141	0.003	1.649	0.195	0.020	0.007	348.729	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.236	0.005	1.888	0.253	0.029	0.010	512.189	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.210	0.002	0.358	0.028	0.033	0.020	230.561	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.061	0.003	0.166	0.017	0.025	0.012	307.484	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.372	0.014	0.721	0.085	0.135	0.064	1455.906	0.204
	Gasoline	MC	Motorcycles	0.740	0.002	18.935	5.878	0.019	0.008	213.171	0.009
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.083	0.115	0.016	0.006	291.296	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.136	0.004	1.548	0.172	0.017	0.006	357.186	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.223	0.005	1.780	0.219	0.026	0.009	493.757	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.216	0.002	0.330	0.027	0.032	0.021	240.962	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.066	0.003	0.132	0.015	0.023	0.012	312.201	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.210	0.013	0.585	0.062	0.125	0.059	1360.661	0.202
	Gasoline	MC	Motorcycles	0.662	0.002	16.786	5.046	0.019	0.008	207.521	0.009
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.098	0.120	0.017	0.006	305.385	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.130	0.004	1.509	0.164	0.019	0.007	378.857	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.199	0.005	1.651	0.200	0.029	0.010	548.672	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.179	0.002	0.526	0.037	0.032	0.020	254.753	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.067	0.003	0.282	0.030	0.025	0.013	340.614	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.287	0.011	0.571	0.106	0.123	0.060	1187.299	0.183
	Gasoline	MC	Motorcycles	0.645	0.002	16.630	4.872	0.019	0.008	220.555	0.009
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.227	0.138	0.019	0.007	301.271	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.108	0.004	1.421	0.148	0.022	0.008	370.666	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.179	0.006	1.605	0.164	0.035	0.012	571.648	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.190	0.002	0.470	0.037	0.038	0.025	257.854	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.245	0.025	0.028	0.014	348.756	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.133	0.012	0.349	0.076	0.115	0.051	1271.403	0.193
	Gasoline	MC	Motorcycles	0.681	0.002	18.060	5.297	0.020	0.009	223.995	0.009
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.202	0.127	0.019	0.007	294.197	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.004	1.604	0.174	0.020	0.007	360.035	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.228	0.005	1.914	0.247	0.028	0.010	519.308	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.223	0.002	0.398	0.029	0.032	0.020	236.238	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.057	0.003	0.185	0.021	0.025	0.012	308.408	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.330	0.013	0.635	0.088	0.128	0.061	1367.523	0.198
	Gasoline	MC	Motorcycles	0.704	0.002	18.118	5.637	0.019	0.008	213.717	0.009
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.150	0.141	0.016	0.006	290.125	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.146	0.004	1.556	0.193	0.017	0.006	361.679	0.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.251	0.005	1.833	0.250	0.028	0.010	539.721	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.217	0.002	0.330	0.027	0.031	0.021	240.496	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.087	0.003	0.172	0.019	0.026	0.015	325.476	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.404	0.010	0.595	0.142	0.126	0.066	1028.160	0.164
	Gasoline	MC	Motorcycles	0.810	0.002	20.604	6.113	0.019	0.008	220.232	0.008

5204
5205

5206 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.075	0.003	1.120	0.142	0.016	0.006	281.370	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	1.218	0.132	0.017	0.006	337.488	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.147	0.005	1.389	0.152	0.028	0.010	498.256	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.189	0.002	0.304	0.023	0.028	0.017	232.227	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.126	0.014	0.022	0.010	303.861	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.687	0.010	0.349	0.079	0.104	0.047	1076.417	0.191
	Gasoline	MC	Motorcycles	0.562	0.002	13.727	4.451	0.019	0.008	202.873	0.009
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.090	0.003	1.236	0.158	0.017	0.006	281.170	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.171	0.003	1.706	0.209	0.018	0.007	349.584	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.278	0.005	1.968	0.266	0.029	0.010	536.500	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.239	0.002	0.323	0.026	0.031	0.020	225.102	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.081	0.003	0.158	0.017	0.025	0.013	303.142	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.316	0.011	0.530	0.110	0.118	0.058	1143.126	0.178
	Gasoline	MC	Motorcycles	0.744	0.002	18.098	5.536	0.019	0.008	208.548	0.009
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.075	0.003	1.142	0.128	0.017	0.006	284.716	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.436	0.157	0.019	0.007	349.855	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.201	0.005	1.668	0.203	0.028	0.010	512.391	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.213	0.002	0.331	0.028	0.033	0.021	232.398	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.143	0.016	0.024	0.012	308.133	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.135	0.012	0.521	0.083	0.119	0.055	1273.077	0.195
	Gasoline	MC	Motorcycles	0.617	0.002	15.386	4.662	0.019	0.008	204.161	0.009
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.103	0.003	1.454	0.167	0.019	0.007	293.522	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.186	0.004	1.972	0.227	0.022	0.008	365.245	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.298	0.005	2.162	0.281	0.032	0.012	544.135	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.372	0.002	0.492	0.048	0.049	0.035	252.279	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.003	0.209	0.024	0.031	0.017	332.597	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.604	0.010	0.539	0.125	0.119	0.062	1098.165	0.168
	Gasoline	MC	Motorcycles	0.803	0.002	20.893	6.323	0.020	0.009	222.159	0.008
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.213	0.140	0.016	0.006	292.442	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.153	0.004	1.738	0.205	0.018	0.006	361.324	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.264	0.005	2.072	0.285	0.028	0.010	541.047	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.269	0.002	0.359	0.029	0.033	0.022	235.569	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.101	0.003	0.171	0.019	0.025	0.013	306.865	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.580	0.012	0.713	0.117	0.136	0.068	1301.907	0.186
	Gasoline	MC	Motorcycles	0.804	0.002	20.507	6.226	0.019	0.008	217.545	0.008
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.094	0.003	1.436	0.147	0.020	0.007	316.814	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.205	0.004	2.230	0.235	0.022	0.009	397.285	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.361	0.006	2.922	0.351	0.033	0.012	583.064	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.350	0.003	0.705	0.056	0.045	0.032	273.328	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.067	0.003	0.343	0.036	0.028	0.014	354.147	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.205	0.009	0.762	0.206	0.144	0.082	899.050	0.140
	Gasoline	MC	Motorcycles	0.800	0.002	21.884	6.058	0.020	0.009	239.164	0.009
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.097	0.003	1.442	0.158	0.018	0.007	313.499	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.206	0.004	2.217	0.251	0.020	0.008	391.648	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.352	0.006	2.752	0.353	0.031	0.012	575.867	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.468	0.003	0.668	0.055	0.046	0.033	269.470	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.153	0.003	0.342	0.039	0.033	0.020	350.140	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.670	0.013	0.775	0.113	0.141	0.070	1383.818	0.191
	Gasoline	MC	Motorcycles	0.835	0.002	22.926	6.344	0.020	0.009	237.879	0.008
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.088	0.127	0.015	0.005	291.238	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.126	0.004	1.384	0.164	0.016	0.006	357.892	0.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.217	0.005	1.656	0.226	0.026	0.009	532.493	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.261	0.002	0.353	0.030	0.033	0.023	241.137	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.119	0.012	0.020	0.010	316.597	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.368	0.013	0.659	0.096	0.131	0.063	1350.014	0.196
	Gasoline	MC	Motorcycles	0.725	0.002	18.293	5.256	0.019	0.008	212.521	0.009

5207
5208

5209 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.283	0.146	0.019	0.007	285.971	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.157	0.004	1.765	0.203	0.020	0.007	354.207	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.264	0.005	2.019	0.264	0.033	0.012	554.032	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.317	0.002	0.405	0.035	0.039	0.026	241.297	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	0.188	0.022	0.030	0.017	322.838	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.348	0.010	0.548	0.124	0.120	0.061	1093.243	0.176
	Gasoline	MC	Motorcycles	0.749	0.002	19.228	5.701	0.019	0.008	213.055	0.009
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.219	0.131	0.019	0.007	281.906	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.145	0.003	1.749	0.196	0.020	0.007	349.104	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.234	0.005	1.964	0.258	0.030	0.010	515.758	0.035
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.211	0.002	0.315	0.025	0.032	0.019	221.115	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.070	0.003	0.154	0.018	0.028	0.015	291.481	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.372	0.012	0.637	0.103	0.129	0.063	1287.503	0.191
	Gasoline	MC	Motorcycles	0.728	0.002	18.212	5.715	0.019	0.008	205.295	0.009
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.262	0.141	0.018	0.006	298.032	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.148	0.004	1.739	0.195	0.019	0.007	365.023	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.237	0.005	1.973	0.263	0.028	0.010	530.178	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.226	0.002	0.373	0.029	0.033	0.021	237.249	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.063	0.003	0.173	0.020	0.026	0.014	310.433	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.281	0.013	0.658	0.095	0.130	0.062	1321.397	0.196
	Gasoline	MC	Motorcycles	0.711	0.002	18.040	5.624	0.019	0.008	214.530	0.009
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.081	0.003	1.229	0.135	0.017	0.006	298.028	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.166	0.004	1.834	0.208	0.019	0.007	368.697	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.265	0.005	2.077	0.283	0.028	0.010	540.951	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.268	0.002	0.444	0.034	0.034	0.023	243.353	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.124	0.003	0.243	0.028	0.030	0.018	319.995	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.498	0.013	0.732	0.109	0.137	0.067	1350.620	0.192
	Gasoline	MC	Motorcycles	0.788	0.002	20.397	6.003	0.020	0.009	222.074	0.008
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.098	0.003	1.525	0.154	0.019	0.007	333.171	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.224	0.004	2.441	0.256	0.022	0.009	416.646	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.334	0.006	2.647	0.330	0.033	0.012	601.214	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.449	0.003	0.818	0.074	0.058	0.045	291.959	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.004	0.443	0.050	0.039	0.024	380.560	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.827	0.012	0.753	0.132	0.141	0.071	1272.320	0.177
	Gasoline	MC	Motorcycles	0.805	0.002	22.676	6.401	0.020	0.009	247.722	0.009
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.133	0.122	0.017	0.006	285.639	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.169	0.003	1.841	0.206	0.018	0.007	353.977	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.248	0.005	1.979	0.256	0.026	0.009	507.544	0.035
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.250	0.002	0.317	0.026	0.033	0.021	231.699	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.085	0.003	0.153	0.019	0.028	0.016	302.744	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.435	0.012	0.645	0.105	0.130	0.064	1294.790	0.189
	Gasoline	MC	Motorcycles	0.722	0.002	18.291	5.592	0.019	0.008	206.002	0.009
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.112	0.003	1.605	0.194	0.019	0.007	303.686	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.239	0.004	2.517	0.300	0.021	0.008	381.957	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.423	0.006	3.165	0.419	0.033	0.012	578.555	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.415	0.002	0.561	0.047	0.044	0.031	249.684	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.214	0.003	0.312	0.033	0.033	0.020	329.435	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.115	0.008	0.738	0.213	0.141	0.080	869.780	0.135
	Gasoline	MC	Motorcycles	0.891	0.002	23.585	6.953	0.020	0.009	230.637	0.008
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.086	0.128	0.017	0.006	284.564	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.003	1.472	0.166	0.018	0.007	351.281	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.225	0.005	1.704	0.226	0.028	0.010	489.856	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.205	0.002	0.331	0.026	0.032	0.020	239.117	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.068	0.003	0.154	0.017	0.024	0.013	320.646	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.097	0.010	0.433	0.070	0.111	0.051	1030.104	0.181
	Gasoline	MC	Motorcycles	0.684	0.002	17.306	4.995	0.019	0.008	209.273	0.009

5210
5211

5212 **Table 5-39. EMFAC County-Specific On-Road Vehicle EFs – 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.137	0.116	0.017	0.006	294.257	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.123	0.004	1.546	0.169	0.019	0.007	362.834	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.202	0.005	1.751	0.211	0.029	0.010	531.071	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.254	0.002	0.374	0.029	0.033	0.021	237.999	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.061	0.003	0.168	0.018	0.025	0.012	315.167	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.235	0.012	0.568	0.099	0.119	0.058	1227.625	0.188
	Gasoline	MC	Motorcycles	0.733	0.002	18.806	5.760	0.019	0.008	215.953	0.009
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.210	0.128	0.017	0.006	292.785	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.166	0.004	1.855	0.218	0.019	0.007	362.005	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.282	0.005	2.185	0.293	0.027	0.010	522.979	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.270	0.002	0.363	0.030	0.034	0.022	230.968	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.003	0.173	0.019	0.026	0.014	298.139	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.815	0.009	0.644	0.167	0.134	0.072	1001.307	0.149
	Gasoline	MC	Motorcycles	0.788	0.002	19.809	6.097	0.019	0.008	215.306	0.008

5213
5214

5215 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.079	0.132	0.016	0.006	280.297	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	1.274	0.145	0.018	0.006	342.034	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.180	0.005	1.510	0.187	0.029	0.010	511.279	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.220	0.002	0.346	0.029	0.034	0.023	235.802	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.059	0.003	0.144	0.015	0.023	0.012	306.707	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.121	0.013	0.568	0.071	0.122	0.055	1367.860	0.205
	Gasoline	MC	Motorcycles	0.633	0.002	15.793	4.804	0.019	0.008	206.637	0.009
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.080	0.003	1.229	0.128	0.018	0.006	272.503	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.147	0.003	1.703	0.182	0.020	0.007	338.065	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.267	0.005	2.049	0.260	0.031	0.011	523.302	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.205	0.002	0.383	0.030	0.034	0.021	222.315	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.054	0.003	0.185	0.019	0.025	0.012	292.300	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.457	0.013	0.721	0.101	0.139	0.067	1354.616	0.194
	Gasoline	MC	Motorcycles	0.739	0.002	19.194	5.260	0.019	0.008	211.004	0.009
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.100	0.003	1.424	0.169	0.017	0.006	276.179	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.239	0.003	2.396	0.280	0.018	0.007	352.063	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.334	0.005	2.517	0.394	0.031	0.011	548.207	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.428	0.002	0.374	0.030	0.035	0.023	216.764	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.159	0.003	0.187	0.022	0.031	0.019	287.229	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.023	0.009	0.684	0.187	0.135	0.075	949.950	0.145
	Gasoline	MC	Motorcycles	0.838	0.002	20.496	6.539	0.019	0.008	209.278	0.008
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.228	0.146	0.017	0.006	287.487	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.160	0.004	1.830	0.223	0.019	0.007	357.180	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.252	0.005	2.031	0.294	0.029	0.010	527.352	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.259	0.002	0.384	0.031	0.035	0.023	237.643	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.119	0.003	0.202	0.024	0.031	0.018	310.322	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.426	0.012	0.666	0.116	0.132	0.066	1232.517	0.185
	Gasoline	MC	Motorcycles	0.747	0.002	19.244	6.159	0.019	0.008	214.969	0.009
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.097	0.003	1.476	0.177	0.019	0.007	289.030	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.248	0.004	2.606	0.287	0.021	0.008	370.115	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.340	0.005	2.621	0.398	0.032	0.012	554.464	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.391	0.002	0.504	0.041	0.041	0.028	238.100	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.003	0.271	0.030	0.032	0.018	312.665	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.056	0.009	0.753	0.192	0.140	0.078	969.974	0.146
	Gasoline	MC	Motorcycles	0.836	0.002	21.524	6.782	0.019	0.008	221.085	0.008
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.088	0.123	0.016	0.006	287.596	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.129	0.003	1.501	0.174	0.017	0.006	352.741	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.211	0.005	1.753	0.235	0.027	0.010	522.226	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.253	0.002	0.377	0.029	0.032	0.021	232.986	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.164	0.018	0.023	0.012	300.784	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.306	0.012	0.680	0.100	0.132	0.064	1295.129	0.194
	Gasoline	MC	Motorcycles	0.665	0.002	16.482	5.164	0.019	0.008	208.867	0.009
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.072	0.128	0.017	0.006	279.823	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.106	0.003	1.287	0.141	0.018	0.007	342.899	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.189	0.005	1.565	0.194	0.028	0.010	501.840	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.182	0.002	0.306	0.023	0.029	0.018	233.491	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.141	0.014	0.023	0.011	311.237	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.127	0.011	0.549	0.096	0.122	0.058	1213.151	0.190
	Gasoline	MC	Motorcycles	0.658	0.002	16.569	4.998	0.019	0.008	207.418	0.009
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.095	0.003	1.304	0.156	0.017	0.006	299.644	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.230	0.004	2.207	0.274	0.019	0.007	377.594	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.295	0.005	2.151	0.306	0.029	0.011	553.198	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.331	0.002	0.536	0.043	0.038	0.027	252.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.157	0.003	0.324	0.038	0.034	0.022	329.964	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.230	0.008	0.746	0.210	0.143	0.081	866.696	0.132
	Gasoline	MC	Motorcycles	0.823	0.002	21.514	6.279	0.019	0.008	228.469	0.008

5216
5217

5218 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.074	0.003	1.170	0.128	0.018	0.006	283.567	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.138	0.004	1.655	0.199	0.020	0.007	355.145	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.244	0.005	2.001	0.281	0.030	0.011	527.739	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.268	0.002	0.385	0.030	0.034	0.021	236.100	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.169	0.017	0.024	0.012	311.684	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.487	0.009	0.584	0.156	0.124	0.066	970.630	0.158
	Gasoline	MC	Motorcycles	0.799	0.002	20.738	6.556	0.019	0.008	220.801	0.008
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.058	0.121	0.015	0.005	284.996	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.121	0.003	1.459	0.172	0.017	0.006	350.758	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.198	0.005	1.692	0.231	0.025	0.009	507.941	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.212	0.002	0.303	0.025	0.031	0.020	225.903	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.073	0.003	0.138	0.015	0.023	0.012	291.106	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.283	0.013	0.648	0.079	0.129	0.060	1401.717	0.203
	Gasoline	MC	Motorcycles	0.683	0.002	17.010	5.515	0.019	0.008	207.965	0.009
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.160	0.129	0.017	0.006	292.956	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.004	1.583	0.186	0.019	0.007	357.614	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.225	0.005	1.926	0.264	0.028	0.010	526.039	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.183	0.002	0.405	0.030	0.031	0.020	235.598	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.070	0.003	0.207	0.023	0.026	0.014	306.380	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.386	0.012	0.679	0.112	0.132	0.065	1241.479	0.189
	Gasoline	MC	Motorcycles	0.691	0.002	17.694	5.597	0.019	0.008	214.387	0.009
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.096	0.003	1.318	0.160	0.017	0.006	287.512	0.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.208	0.004	2.041	0.255	0.019	0.007	361.067	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.286	0.005	2.113	0.296	0.030	0.011	537.112	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.517	0.002	0.547	0.049	0.046	0.034	245.179	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.190	0.003	0.255	0.030	0.033	0.020	313.723	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.702	0.010	0.700	0.152	0.133	0.070	1099.460	0.162
	Gasoline	MC	Motorcycles	0.844	0.002	21.499	6.412	0.019	0.008	221.447	0.008
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.183	0.134	0.015	0.005	301.852	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.155	0.004	1.822	0.197	0.016	0.006	369.166	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.209	0.005	1.889	0.231	0.025	0.009	498.878	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.279	0.002	0.389	0.035	0.038	0.027	245.361	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.070	0.003	0.132	0.015	0.023	0.012	308.295	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.163	0.013	0.617	0.063	0.130	0.061	1375.066	0.205
	Gasoline	MC	Motorcycles	0.607	0.002	15.393	5.254	0.019	0.008	205.984	0.009
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.200	0.134	0.016	0.006	298.555	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.145	0.004	1.704	0.200	0.018	0.006	368.831	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.255	0.005	2.082	0.277	0.029	0.010	548.779	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.337	0.002	0.493	0.040	0.039	0.027	245.657	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.065	0.003	0.205	0.022	0.024	0.013	315.230	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.435	0.011	0.691	0.126	0.137	0.069	1188.137	0.180
	Gasoline	MC	Motorcycles	0.711	0.002	18.267	5.714	0.019	0.008	218.342	0.009
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.076	0.121	0.016	0.005	285.672	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	1.426	0.161	0.017	0.006	348.236	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.200	0.005	1.692	0.220	0.026	0.009	518.168	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.204	0.002	0.304	0.025	0.030	0.019	228.527	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.059	0.003	0.124	0.014	0.022	0.011	294.438	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.286	0.014	0.689	0.076	0.133	0.062	1456.341	0.208
	Gasoline	MC	Motorcycles	0.670	0.002	16.632	5.295	0.019	0.008	206.805	0.009
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	0.995	0.113	0.014	0.005	294.061	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.130	0.004	1.454	0.169	0.015	0.005	361.165	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.190	0.005	1.606	0.224	0.023	0.008	518.418	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.218	0.002	0.341	0.027	0.030	0.020	237.297	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.073	0.003	0.164	0.019	0.023	0.013	306.494	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.351	0.014	0.706	0.079	0.135	0.063	1459.204	0.207
	Gasoline	MC	Motorcycles	0.671	0.002	16.634	5.270	0.019	0.008	212.415	0.009

5219
5220

5221 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.120	0.003	1.646	0.194	0.017	0.006	299.531	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.225	0.004	2.310	0.291	0.019	0.007	373.099	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.347	0.005	2.601	0.382	0.031	0.011	553.496	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.560	0.002	0.597	0.056	0.052	0.040	250.191	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.191	0.003	0.280	0.031	0.033	0.020	319.409	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.938	0.009	0.724	0.188	0.137	0.076	948.219	0.147
	Gasoline	MC	Motorcycles	0.849	0.002	22.059	6.961	0.020	0.009	224.649	0.008
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.303	0.144	0.018	0.007	298.959	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.175	0.004	1.999	0.231	0.020	0.008	373.989	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.315	0.006	2.534	0.338	0.031	0.012	558.822	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.258	0.002	0.518	0.036	0.034	0.021	249.606	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.091	0.003	0.275	0.030	0.029	0.016	329.619	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.863	0.008	0.691	0.195	0.137	0.076	878.528	0.144
	Gasoline	MC	Motorcycles	0.782	0.002	20.940	6.087	0.020	0.009	228.293	0.009
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.115	0.119	0.018	0.007	290.479	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.119	0.003	1.445	0.142	0.020	0.007	352.298	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.195	0.005	1.671	0.187	0.030	0.011	492.357	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.216	0.002	0.444	0.040	0.042	0.029	249.083	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.187	0.021	0.026	0.013	316.254	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.949	0.011	0.474	0.058	0.116	0.051	1204.706	0.201
	Gasoline	MC	Motorcycles	0.569	0.002	14.521	4.292	0.019	0.008	207.987	0.009
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.011	0.119	0.014	0.005	288.900	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.138	0.004	1.502	0.192	0.015	0.005	357.030	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.230	0.005	1.760	0.252	0.024	0.009	529.360	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.206	0.002	0.289	0.022	0.027	0.017	232.670	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.054	0.003	0.112	0.012	0.019	0.010	300.217	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.387	0.013	0.700	0.092	0.133	0.063	1376.292	0.199
	Gasoline	MC	Motorcycles	0.736	0.002	18.532	5.747	0.019	0.008	213.313	0.009
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.079	0.003	1.123	0.146	0.016	0.006	279.247	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.110	0.003	1.299	0.157	0.017	0.006	343.815	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.186	0.005	1.538	0.195	0.029	0.010	518.692	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.202	0.002	0.332	0.027	0.032	0.021	237.547	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.140	0.013	0.022	0.010	321.874	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.019	0.010	0.485	0.105	0.115	0.056	1052.650	0.175
	Gasoline	MC	Motorcycles	0.660	0.002	16.468	5.020	0.019	0.008	208.352	0.009
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.109	0.003	1.575	0.181	0.019	0.007	297.746	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.254	0.004	2.664	0.331	0.021	0.008	382.068	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.444	0.006	3.267	0.452	0.034	0.013	583.835	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.465	0.002	0.596	0.050	0.044	0.031	250.581	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.102	0.003	0.301	0.036	0.035	0.021	326.699	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.429	0.008	0.781	0.224	0.143	0.081	879.894	0.126
	Gasoline	MC	Motorcycles	0.901	0.002	23.779	7.029	0.020	0.009	231.191	0.008
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.089	0.003	1.273	0.151	0.017	0.006	283.272	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.189	0.004	1.959	0.241	0.019	0.007	355.541	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.288	0.005	2.176	0.305	0.030	0.011	534.229	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.523	0.002	0.552	0.052	0.050	0.038	244.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.227	0.003	0.271	0.028	0.032	0.020	316.497	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.555	0.012	0.695	0.126	0.134	0.067	1214.672	0.178
	Gasoline	MC	Motorcycles	0.783	0.002	19.873	6.129	0.019	0.008	216.812	0.009
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.117	0.119	0.017	0.006	282.235	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.157	0.003	1.768	0.199	0.018	0.007	351.920	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.244	0.005	1.959	0.252	0.026	0.009	510.999	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.216	0.002	0.300	0.022	0.029	0.018	221.247	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.080	0.003	0.152	0.018	0.026	0.014	286.859	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.426	0.014	0.723	0.079	0.136	0.063	1479.424	0.207
	Gasoline	MC	Motorcycles	0.707	0.002	17.542	5.492	0.019	0.008	206.032	0.009

5222
5223

5224 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.090	0.003	1.414	0.146	0.020	0.007	320.126	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.190	0.004	2.139	0.228	0.022	0.009	398.956	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.353	0.006	2.801	0.356	0.034	0.013	594.400	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.337	0.003	0.749	0.057	0.044	0.030	279.990	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.101	0.003	0.401	0.044	0.036	0.022	365.071	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.169	0.009	0.722	0.188	0.140	0.077	951.628	0.145
	Gasoline	MC	Motorcycles	0.780	0.002	21.702	5.926	0.020	0.009	242.616	0.009
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.084	0.003	1.221	0.132	0.016	0.006	286.599	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.163	0.004	1.766	0.203	0.018	0.007	359.676	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.293	0.005	2.210	0.291	0.029	0.010	542.277	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.318	0.002	0.471	0.035	0.034	0.023	243.278	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.088	0.003	0.227	0.022	0.023	0.012	323.651	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.519	0.012	0.707	0.114	0.137	0.068	1286.701	0.187
	Gasoline	MC	Motorcycles	0.778	0.002	20.931	5.590	0.019	0.008	224.435	0.009
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.171	0.145	0.016	0.006	283.654	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.161	0.003	1.632	0.197	0.018	0.007	353.975	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.263	0.005	1.861	0.250	0.028	0.010	527.199	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.254	0.002	0.374	0.033	0.037	0.026	242.216	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.067	0.003	0.150	0.016	0.024	0.012	318.579	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.221	0.011	0.556	0.100	0.120	0.058	1190.309	0.186
	Gasoline	MC	Motorcycles	0.696	0.002	17.494	5.255	0.019	0.008	210.981	0.009
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.086	0.122	0.017	0.006	275.273	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.123	0.003	1.450	0.164	0.019	0.007	343.805	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.231	0.005	1.791	0.239	0.030	0.011	530.816	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.263	0.002	0.383	0.036	0.041	0.029	234.645	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.063	0.003	0.155	0.015	0.025	0.012	311.968	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.354	0.011	0.582	0.113	0.123	0.061	1180.039	0.181
	Gasoline	MC	Motorcycles	0.709	0.002	17.902	5.368	0.019	0.008	208.609	0.009
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.084	0.003	1.248	0.156	0.017	0.006	280.348	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.177	0.004	1.894	0.235	0.019	0.007	360.277	0.035
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.301	0.005	2.206	0.315	0.030	0.011	538.545	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.299	0.002	0.399	0.030	0.033	0.021	230.597	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.149	0.003	0.234	0.023	0.028	0.016	315.877	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.576	0.012	0.725	0.125	0.136	0.069	1242.420	0.180
	Gasoline	MC	Motorcycles	0.867	0.002	22.490	6.940	0.019	0.008	222.366	0.008
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	1.013	0.110	0.018	0.006	280.315	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	1.262	0.131	0.019	0.007	342.361	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.164	0.005	1.466	0.166	0.030	0.010	487.356	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.140	0.002	0.327	0.025	0.030	0.018	235.159	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.153	0.016	0.023	0.011	310.340	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.671	0.010	0.373	0.053	0.103	0.045	1066.682	0.196
	Gasoline	MC	Motorcycles	0.571	0.002	14.411	4.343	0.019	0.008	203.176	0.009
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.152	0.125	0.018	0.006	285.766	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.100	0.003	1.346	0.143	0.019	0.007	348.520	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.191	0.005	1.698	0.207	0.029	0.010	518.106	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.258	0.002	0.395	0.033	0.036	0.024	236.971	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.059	0.003	0.166	0.017	0.024	0.011	308.539	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.263	0.012	0.627	0.103	0.129	0.062	1254.190	0.189
	Gasoline	MC	Motorcycles	0.718	0.002	18.400	5.651	0.019	0.008	214.798	0.009
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.098	0.003	1.504	0.164	0.020	0.007	305.113	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.221	0.004	2.450	0.273	0.023	0.009	390.361	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.378	0.006	3.027	0.393	0.034	0.013	573.991	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.337	0.003	0.659	0.053	0.045	0.031	264.407	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.160	0.003	0.380	0.038	0.031	0.017	350.301	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.209	0.009	0.743	0.196	0.141	0.078	935.828	0.139
	Gasoline	MC	Motorcycles	0.834	0.002	23.155	6.667	0.020	0.009	238.606	0.008

5225
5226

5227 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	1.028	0.110	0.016	0.006	286.877	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.390	0.143	0.017	0.006	349.274	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.180	0.005	1.572	0.189	0.026	0.009	479.739	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.165	0.002	0.303	0.023	0.029	0.018	236.470	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.060	0.003	0.139	0.015	0.023	0.012	305.129	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.097	0.013	0.581	0.060	0.125	0.058	1357.706	0.205
	Gasoline	MC	Motorcycles	0.612	0.002	15.524	4.942	0.019	0.008	205.030	0.009
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.206	0.143	0.018	0.006	291.987	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.114	0.004	1.461	0.168	0.019	0.007	357.233	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.209	0.005	1.781	0.232	0.030	0.011	539.069	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.216	0.002	0.362	0.026	0.030	0.018	234.526	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.055	0.003	0.163	0.017	0.024	0.011	307.298	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.809	0.012	0.533	0.101	0.121	0.059	1230.179	0.181
	Gasoline	MC	Motorcycles	0.703	0.002	17.976	5.689	0.019	0.008	214.664	0.009
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.140	0.124	0.018	0.007	276.147	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.124	0.003	1.516	0.182	0.020	0.007	340.092	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.214	0.005	1.781	0.244	0.028	0.010	502.102	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.194	0.002	0.357	0.027	0.032	0.020	229.254	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.165	0.017	0.025	0.012	301.577	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.317	0.014	0.721	0.082	0.135	0.063	1443.754	0.205
	Gasoline	MC	Motorcycles	0.728	0.002	18.726	5.951	0.019	0.008	213.005	0.009
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.027	0.111	0.016	0.006	285.388	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.431	0.160	0.017	0.006	348.183	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.201	0.005	1.655	0.207	0.026	0.009	481.682	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.194	0.002	0.318	0.025	0.031	0.020	238.691	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.126	0.014	0.022	0.011	304.968	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.133	0.013	0.582	0.061	0.125	0.058	1346.740	0.203
	Gasoline	MC	Motorcycles	0.645	0.002	16.310	5.020	0.019	0.008	206.601	0.009
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.040	0.115	0.017	0.006	298.955	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.119	0.004	1.415	0.156	0.019	0.007	370.110	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.179	0.005	1.538	0.187	0.029	0.010	535.863	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.163	0.002	0.527	0.035	0.031	0.019	252.993	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.061	0.003	0.281	0.029	0.025	0.013	334.136	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.169	0.011	0.559	0.101	0.122	0.059	1174.704	0.186
	Gasoline	MC	Motorcycles	0.633	0.002	16.309	4.849	0.020	0.008	219.914	0.009
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.162	0.132	0.019	0.007	294.584	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.101	0.004	1.349	0.143	0.022	0.008	362.788	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.160	0.005	1.499	0.152	0.034	0.012	552.667	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.177	0.002	0.471	0.036	0.037	0.024	256.030	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.055	0.003	0.246	0.025	0.027	0.014	343.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.007	0.012	0.344	0.074	0.113	0.050	1250.965	0.195
	Gasoline	MC	Motorcycles	0.670	0.002	17.823	5.312	0.020	0.009	223.607	0.009
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.135	0.122	0.018	0.007	288.314	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	1.480	0.162	0.020	0.007	351.009	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.205	0.005	1.789	0.234	0.028	0.010	508.242	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.196	0.002	0.389	0.027	0.031	0.018	233.871	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.181	0.019	0.024	0.011	301.068	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.261	0.013	0.632	0.085	0.127	0.060	1357.649	0.200
	Gasoline	MC	Motorcycles	0.686	0.002	17.679	5.610	0.019	0.008	212.840	0.009
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.075	0.003	1.079	0.134	0.016	0.005	283.872	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.133	0.004	1.455	0.184	0.017	0.006	354.128	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.230	0.005	1.728	0.240	0.027	0.010	527.831	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.202	0.002	0.327	0.026	0.031	0.020	239.455	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.079	0.003	0.167	0.018	0.025	0.014	320.934	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.308	0.010	0.584	0.136	0.125	0.064	1033.054	0.167
	Gasoline	MC	Motorcycles	0.792	0.002	20.126	6.132	0.019	0.008	219.449	0.008

5228
5229

5230 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.073	0.140	0.016	0.006	275.569	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.089	0.003	1.156	0.127	0.017	0.006	329.500	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.134	0.005	1.326	0.144	0.028	0.010	486.035	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.166	0.002	0.292	0.021	0.027	0.016	229.732	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.123	0.013	0.021	0.010	296.371	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.567	0.010	0.337	0.075	0.102	0.046	1058.603	0.194
	Gasoline	MC	Motorcycles	0.547	0.002	13.401	4.465	0.019	0.008	202.304	0.009
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.154	0.150	0.016	0.006	275.343	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.154	0.003	1.586	0.199	0.018	0.006	342.026	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.252	0.005	1.833	0.253	0.028	0.010	523.587	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.214	0.002	0.315	0.025	0.030	0.019	223.579	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.071	0.003	0.153	0.016	0.024	0.012	298.825	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.219	0.011	0.521	0.105	0.117	0.057	1140.572	0.180
	Gasoline	MC	Motorcycles	0.727	0.002	17.745	5.555	0.019	0.008	207.945	0.009
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.078	0.123	0.017	0.006	278.775	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.003	1.350	0.150	0.019	0.007	341.873	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.180	0.005	1.557	0.190	0.028	0.010	500.238	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.188	0.002	0.320	0.026	0.032	0.020	229.948	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.141	0.015	0.024	0.012	301.891	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.040	0.012	0.514	0.080	0.117	0.054	1257.346	0.197
	Gasoline	MC	Motorcycles	0.602	0.002	15.039	4.638	0.019	0.008	203.463	0.009
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.094	0.003	1.359	0.159	0.019	0.007	287.567	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.169	0.004	1.840	0.217	0.022	0.008	357.850	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.272	0.005	2.028	0.268	0.032	0.011	531.102	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.341	0.002	0.483	0.046	0.047	0.033	250.367	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.086	0.003	0.207	0.023	0.031	0.017	327.361	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.473	0.010	0.523	0.118	0.117	0.060	1098.682	0.172
	Gasoline	MC	Motorcycles	0.790	0.002	20.627	6.386	0.020	0.009	221.872	0.008
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.135	0.133	0.016	0.006	286.033	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.138	0.003	1.611	0.194	0.018	0.006	352.909	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.241	0.005	1.938	0.273	0.028	0.010	528.820	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.243	0.002	0.349	0.028	0.032	0.021	233.752	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.088	0.003	0.163	0.017	0.024	0.013	300.340	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.496	0.012	0.708	0.112	0.135	0.067	1299.513	0.189
	Gasoline	MC	Motorcycles	0.786	0.002	20.074	6.262	0.019	0.008	216.882	0.008
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.354	0.141	0.020	0.007	310.096	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.185	0.004	2.062	0.221	0.022	0.008	388.485	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.323	0.006	2.617	0.326	0.033	0.012	568.792	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.322	0.003	0.705	0.055	0.044	0.030	271.076	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.345	0.035	0.027	0.013	347.700	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.005	0.009	0.736	0.195	0.142	0.079	902.499	0.146
	Gasoline	MC	Motorcycles	0.784	0.002	21.415	6.058	0.020	0.009	238.367	0.009
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.088	0.003	1.350	0.150	0.018	0.007	306.698	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.187	0.004	2.057	0.238	0.020	0.008	383.212	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.322	0.006	2.561	0.337	0.031	0.011	563.176	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.428	0.003	0.660	0.053	0.044	0.031	267.109	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.134	0.003	0.333	0.037	0.032	0.019	342.459	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.575	0.013	0.768	0.108	0.141	0.069	1375.965	0.194
	Gasoline	MC	Motorcycles	0.817	0.002	22.376	6.349	0.020	0.009	236.975	0.009
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.027	0.121	0.015	0.005	285.428	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.288	0.154	0.016	0.006	349.525	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.197	0.005	1.553	0.215	0.026	0.009	520.879	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.234	0.002	0.339	0.028	0.032	0.021	238.957	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.046	0.003	0.116	0.012	0.020	0.010	310.364	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.293	0.013	0.655	0.093	0.131	0.062	1337.793	0.198
	Gasoline	MC	Motorcycles	0.707	0.002	17.775	5.218	0.019	0.008	211.497	0.009

5231
5232

5233 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.079	0.003	1.202	0.139	0.018	0.007	280.029	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.144	0.003	1.648	0.193	0.020	0.007	346.555	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.241	0.005	1.895	0.252	0.033	0.012	541.586	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.286	0.002	0.393	0.033	0.038	0.025	239.356	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.085	0.003	0.181	0.020	0.029	0.016	316.971	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.256	0.010	0.537	0.118	0.118	0.059	1096.105	0.179
	Gasoline	MC	Motorcycles	0.732	0.002	18.809	5.696	0.019	0.008	212.306	0.009
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.149	0.125	0.019	0.007	276.140	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.129	0.003	1.614	0.184	0.020	0.007	340.614	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.213	0.005	1.843	0.248	0.030	0.010	505.544	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.186	0.002	0.306	0.023	0.031	0.018	218.898	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.060	0.003	0.148	0.017	0.026	0.013	285.300	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.298	0.012	0.633	0.099	0.128	0.062	1283.258	0.193
	Gasoline	MC	Motorcycles	0.709	0.002	17.816	5.690	0.019	0.008	204.486	0.009
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.183	0.133	0.017	0.006	291.589	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.004	1.601	0.181	0.019	0.007	355.788	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.216	0.005	1.856	0.254	0.028	0.010	519.424	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.197	0.002	0.361	0.027	0.031	0.019	234.666	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.170	0.019	0.025	0.013	303.941	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.217	0.012	0.655	0.091	0.129	0.062	1315.682	0.198
	Gasoline	MC	Motorcycles	0.694	0.002	17.626	5.600	0.019	0.008	213.721	0.009
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.074	0.003	1.151	0.128	0.017	0.006	291.593	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.149	0.004	1.690	0.195	0.018	0.007	359.864	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.242	0.005	1.955	0.272	0.028	0.010	529.402	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.243	0.002	0.438	0.033	0.033	0.022	241.579	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.003	0.235	0.027	0.028	0.016	313.608	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.430	0.013	0.730	0.105	0.137	0.066	1345.754	0.194
	Gasoline	MC	Motorcycles	0.769	0.002	19.885	5.990	0.020	0.008	221.146	0.009
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.090	0.003	1.428	0.147	0.019	0.007	326.095	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.203	0.004	2.256	0.240	0.022	0.009	407.355	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.304	0.006	2.461	0.314	0.032	0.012	587.917	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.421	0.003	0.821	0.073	0.058	0.044	290.050	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.004	0.436	0.048	0.037	0.023	372.463	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.707	0.012	0.743	0.126	0.139	0.070	1271.960	0.181
	Gasoline	MC	Motorcycles	0.790	0.002	22.179	6.402	0.020	0.009	246.904	0.009
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.070	0.117	0.017	0.006	279.968	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.151	0.003	1.686	0.191	0.018	0.007	345.173	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.226	0.005	1.854	0.246	0.026	0.009	498.576	0.035
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.217	0.002	0.298	0.023	0.031	0.019	228.890	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.072	0.003	0.142	0.017	0.026	0.014	295.510	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.353	0.012	0.640	0.100	0.129	0.062	1288.411	0.191
	Gasoline	MC	Motorcycles	0.701	0.002	17.727	5.539	0.019	0.008	204.843	0.009
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.100	0.003	1.476	0.181	0.019	0.007	296.605	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.219	0.004	2.335	0.287	0.021	0.008	374.573	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.394	0.006	2.986	0.406	0.033	0.012	567.942	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.378	0.002	0.553	0.045	0.042	0.029	247.619	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.184	0.003	0.297	0.031	0.031	0.017	321.762	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.004	0.008	0.722	0.206	0.139	0.079	876.691	0.139
	Gasoline	MC	Motorcycles	0.877	0.002	23.259	7.029	0.020	0.009	230.281	0.008
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.024	0.122	0.017	0.006	278.545	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.123	0.003	1.374	0.157	0.018	0.006	342.935	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.205	0.005	1.596	0.215	0.028	0.010	478.715	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.186	0.002	0.323	0.025	0.031	0.019	237.414	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.060	0.003	0.150	0.016	0.024	0.012	315.163	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.994	0.010	0.425	0.067	0.110	0.050	1025.131	0.184
	Gasoline	MC	Motorcycles	0.667	0.002	16.857	4.964	0.019	0.008	208.385	0.009

5234
5235

5236 **Table 5-40. EMFAC County-Specific On-Road Vehicle EFs – 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.072	0.110	0.017	0.006	287.891	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.004	1.441	0.160	0.019	0.007	354.603	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.185	0.005	1.648	0.203	0.029	0.010	519.849	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.225	0.002	0.366	0.027	0.031	0.019	235.777	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.167	0.017	0.024	0.012	309.513	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.165	0.012	0.564	0.095	0.118	0.056	1223.945	0.190
	Gasoline	MC	Motorcycles	0.718	0.002	18.432	5.750	0.019	0.008	215.268	0.009
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.128	0.120	0.017	0.006	286.621	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.147	0.003	1.693	0.202	0.018	0.007	352.865	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.259	0.005	2.056	0.282	0.027	0.010	512.387	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.235	0.002	0.349	0.028	0.032	0.020	228.619	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	0.164	0.018	0.024	0.013	291.453	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.696	0.010	0.629	0.161	0.133	0.070	1006.233	0.154
	Gasoline	MC	Motorcycles	0.774	0.002	19.493	6.129	0.019	0.008	214.795	0.008

5237
5238

5239 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.022	0.126	0.016	0.006	274.428	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.099	0.003	1.204	0.139	0.018	0.006	334.434	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.163	0.005	1.424	0.176	0.028	0.010	498.430	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.194	0.002	0.334	0.027	0.032	0.021	233.273	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.141	0.015	0.023	0.011	300.246	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.049	0.013	0.564	0.069	0.121	0.054	1350.215	0.207
	Gasoline	MC	Motorcycles	0.616	0.002	15.361	4.748	0.019	0.008	205.675	0.009
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.075	0.003	1.167	0.123	0.018	0.006	266.765	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.003	1.597	0.174	0.020	0.007	330.637	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.246	0.005	1.952	0.252	0.031	0.011	511.392	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.180	0.002	0.374	0.028	0.032	0.020	219.685	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.050	0.003	0.183	0.019	0.024	0.011	286.733	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.375	0.013	0.715	0.097	0.139	0.067	1342.928	0.196
	Gasoline	MC	Motorcycles	0.721	0.002	18.779	5.263	0.019	0.008	210.276	0.009
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.091	0.003	1.322	0.158	0.017	0.006	269.934	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.220	0.003	2.227	0.265	0.018	0.007	345.408	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.310	0.005	2.383	0.380	0.031	0.011	538.051	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.406	0.002	0.369	0.029	0.034	0.023	215.655	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	0.161	0.017	0.026	0.014	279.605	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.906	0.009	0.667	0.180	0.133	0.073	958.911	0.149
	Gasoline	MC	Motorcycles	0.822	0.002	20.177	6.567	0.019	0.008	208.726	0.008
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.148	0.137	0.017	0.006	281.014	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.145	0.003	1.699	0.209	0.019	0.007	349.045	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.232	0.005	1.920	0.283	0.029	0.010	515.511	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.227	0.002	0.370	0.028	0.032	0.020	235.200	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.095	0.003	0.185	0.021	0.028	0.015	302.611	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.339	0.012	0.659	0.110	0.132	0.065	1234.012	0.189
	Gasoline	MC	Motorcycles	0.731	0.002	18.857	6.190	0.019	0.008	214.321	0.009
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.089	0.003	1.379	0.167	0.019	0.007	282.576	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.228	0.004	2.426	0.272	0.021	0.008	363.230	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.317	0.005	2.504	0.388	0.032	0.012	544.439	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.360	0.002	0.497	0.038	0.039	0.026	236.057	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	0.267	0.029	0.031	0.017	307.890	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.941	0.009	0.738	0.185	0.139	0.077	978.427	0.150
	Gasoline	MC	Motorcycles	0.826	0.002	21.323	6.884	0.019	0.008	220.950	0.008
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.031	0.118	0.016	0.006	281.503	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	1.396	0.163	0.017	0.006	344.457	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.194	0.005	1.660	0.227	0.027	0.009	511.952	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.222	0.002	0.364	0.027	0.030	0.019	230.491	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.055	0.003	0.159	0.017	0.022	0.011	294.626	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.233	0.012	0.676	0.096	0.132	0.063	1286.652	0.196
	Gasoline	MC	Motorcycles	0.648	0.002	16.063	5.148	0.019	0.008	208.020	0.009
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.016	0.123	0.017	0.006	273.857	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	1.214	0.135	0.018	0.006	335.356	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.172	0.005	1.481	0.184	0.027	0.010	491.346	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.161	0.002	0.296	0.021	0.028	0.016	231.314	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.137	0.014	0.023	0.011	305.374	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.035	0.011	0.540	0.092	0.121	0.057	1202.632	0.192
	Gasoline	MC	Motorcycles	0.641	0.002	16.118	4.948	0.019	0.008	206.440	0.009
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.220	0.148	0.017	0.006	293.186	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.210	0.004	2.045	0.259	0.019	0.007	370.015	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.273	0.005	2.045	0.298	0.029	0.010	542.920	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.284	0.002	0.518	0.039	0.035	0.023	248.934	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.003	0.310	0.035	0.032	0.020	323.693	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.090	0.008	0.727	0.202	0.141	0.080	872.776	0.136
	Gasoline	MC	Motorcycles	0.809	0.002	21.125	6.331	0.019	0.008	227.854	0.008

5240
5241

5242 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.102	0.120	0.018	0.006	276.957	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.003	1.565	0.193	0.020	0.007	348.179	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.226	0.005	1.909	0.274	0.030	0.011	517.210	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.240	0.002	0.375	0.028	0.032	0.020	233.766	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.168	0.016	0.024	0.011	306.276	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.367	0.009	0.567	0.148	0.122	0.064	977.898	0.162
	Gasoline	MC	Motorcycles	0.781	0.002	20.343	6.595	0.019	0.008	220.154	0.009
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	1.005	0.116	0.015	0.005	279.079	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.003	1.358	0.162	0.017	0.006	342.579	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.179	0.005	1.598	0.221	0.025	0.009	497.672	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.176	0.002	0.282	0.022	0.028	0.017	222.164	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.063	0.003	0.131	0.014	0.022	0.011	284.872	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.221	0.013	0.647	0.077	0.129	0.059	1388.960	0.205
	Gasoline	MC	Motorcycles	0.663	0.002	16.519	5.492	0.019	0.008	206.976	0.009
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.095	0.123	0.017	0.006	286.710	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.114	0.003	1.471	0.175	0.019	0.007	349.179	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.206	0.005	1.818	0.254	0.028	0.010	515.103	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.161	0.002	0.398	0.028	0.030	0.018	233.392	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.202	0.022	0.025	0.013	299.976	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.307	0.012	0.674	0.107	0.131	0.064	1238.321	0.191
	Gasoline	MC	Motorcycles	0.675	0.002	17.297	5.586	0.019	0.008	213.606	0.009
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.088	0.003	1.234	0.151	0.017	0.006	281.518	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.191	0.004	1.905	0.245	0.019	0.007	354.270	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.264	0.005	2.008	0.289	0.029	0.011	526.911	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.458	0.002	0.522	0.044	0.042	0.030	241.956	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.167	0.003	0.243	0.028	0.031	0.019	307.867	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.604	0.010	0.690	0.145	0.132	0.069	1105.897	0.165
	Gasoline	MC	Motorcycles	0.829	0.002	21.132	6.478	0.019	0.008	220.908	0.008
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.122	0.128	0.015	0.005	296.029	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.004	1.682	0.182	0.016	0.006	360.771	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.190	0.005	1.775	0.219	0.025	0.009	488.656	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.238	0.002	0.365	0.031	0.034	0.023	241.794	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.124	0.014	0.021	0.011	301.730	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.090	0.013	0.613	0.061	0.130	0.061	1360.604	0.206
	Gasoline	MC	Motorcycles	0.592	0.002	14.937	5.225	0.019	0.008	205.294	0.009
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.136	0.128	0.016	0.006	292.304	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.133	0.004	1.595	0.190	0.018	0.006	360.789	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.234	0.005	1.973	0.267	0.029	0.010	536.962	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.304	0.002	0.478	0.037	0.036	0.025	242.801	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.199	0.021	0.023	0.012	308.747	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.333	0.011	0.680	0.121	0.136	0.068	1184.419	0.184
	Gasoline	MC	Motorcycles	0.694	0.002	17.827	5.723	0.019	0.008	217.582	0.009
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.021	0.116	0.015	0.005	279.577	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	1.328	0.151	0.017	0.006	340.157	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.182	0.005	1.598	0.211	0.026	0.009	507.426	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.180	0.002	0.292	0.022	0.029	0.018	226.053	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.120	0.013	0.021	0.010	288.412	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.232	0.014	0.688	0.074	0.133	0.061	1440.441	0.209
	Gasoline	MC	Motorcycles	0.651	0.002	16.167	5.263	0.019	0.008	205.857	0.009
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.945	0.108	0.014	0.005	287.955	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	1.349	0.158	0.015	0.005	352.698	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.173	0.005	1.519	0.215	0.023	0.008	508.253	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.188	0.002	0.323	0.024	0.027	0.018	234.064	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.066	0.003	0.157	0.018	0.022	0.012	300.175	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.298	0.014	0.705	0.077	0.135	0.063	1444.091	0.208
	Gasoline	MC	Motorcycles	0.653	0.002	16.119	5.244	0.019	0.008	211.398	0.009

5243
5244

5245 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.110	0.003	1.533	0.183	0.017	0.006	293.472	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.203	0.004	2.126	0.274	0.019	0.007	365.319	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.320	0.005	2.453	0.368	0.030	0.011	542.419	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.510	0.002	0.576	0.051	0.048	0.036	246.994	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.166	0.003	0.265	0.028	0.031	0.018	313.262	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.829	0.009	0.710	0.180	0.135	0.074	955.519	0.151
	Gasoline	MC	Motorcycles	0.834	0.002	21.700	7.011	0.020	0.009	224.100	0.008
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.231	0.137	0.018	0.007	292.537	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.160	0.004	1.863	0.220	0.020	0.008	366.217	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.294	0.005	2.420	0.329	0.031	0.011	547.694	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.231	0.002	0.513	0.035	0.032	0.020	247.492	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.078	0.003	0.270	0.028	0.027	0.014	323.577	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.723	0.008	0.672	0.186	0.136	0.075	885.127	0.148
	Gasoline	MC	Motorcycles	0.767	0.002	20.517	6.119	0.020	0.009	227.595	0.009
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.061	0.115	0.018	0.007	284.575	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.003	1.356	0.134	0.020	0.007	344.089	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.175	0.005	1.565	0.175	0.030	0.011	480.300	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.188	0.002	0.428	0.036	0.039	0.026	245.422	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.184	0.020	0.025	0.012	309.548	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.858	0.011	0.467	0.056	0.115	0.050	1186.829	0.202
	Gasoline	MC	Motorcycles	0.558	0.002	14.246	4.262	0.019	0.008	207.358	0.009
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.957	0.113	0.014	0.005	282.887	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.124	0.003	1.390	0.180	0.015	0.005	348.645	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.208	0.005	1.657	0.242	0.024	0.009	519.142	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.178	0.002	0.273	0.020	0.025	0.016	230.081	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.108	0.011	0.019	0.009	294.061	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.328	0.013	0.700	0.090	0.133	0.063	1366.582	0.201
	Gasoline	MC	Motorcycles	0.716	0.002	17.956	5.722	0.019	0.008	212.222	0.009
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.062	0.139	0.016	0.006	273.172	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.102	0.003	1.232	0.152	0.017	0.006	336.724	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.169	0.005	1.456	0.186	0.028	0.010	506.241	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.185	0.002	0.327	0.026	0.031	0.020	236.046	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.140	0.013	0.022	0.010	317.686	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.909	0.010	0.473	0.100	0.114	0.055	1045.051	0.179
	Gasoline	MC	Motorcycles	0.643	0.002	16.013	4.989	0.019	0.008	207.432	0.009
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.099	0.003	1.460	0.168	0.019	0.007	290.953	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.232	0.004	2.468	0.313	0.021	0.008	374.844	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.416	0.006	3.110	0.437	0.034	0.013	573.406	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.425	0.002	0.587	0.047	0.042	0.029	248.262	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.093	0.003	0.295	0.034	0.033	0.020	321.100	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.291	0.008	0.760	0.216	0.141	0.080	887.237	0.130
	Gasoline	MC	Motorcycles	0.886	0.002	23.431	7.060	0.020	0.009	230.607	0.008
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.194	0.143	0.017	0.006	277.290	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.173	0.003	1.825	0.229	0.019	0.007	348.411	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.265	0.005	2.058	0.295	0.030	0.011	523.107	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.469	0.002	0.529	0.047	0.046	0.034	240.646	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.203	0.003	0.259	0.027	0.031	0.018	310.877	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.466	0.012	0.687	0.121	0.133	0.066	1216.704	0.181
	Gasoline	MC	Motorcycles	0.767	0.002	19.504	6.176	0.019	0.008	216.229	0.009
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.055	0.113	0.017	0.006	276.556	0.035
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.003	1.621	0.184	0.018	0.007	343.336	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.220	0.005	1.832	0.239	0.026	0.009	501.448	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.187	0.002	0.287	0.020	0.028	0.016	218.826	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.069	0.003	0.144	0.017	0.025	0.013	280.784	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.372	0.014	0.723	0.078	0.136	0.063	1463.534	0.208
	Gasoline	MC	Motorcycles	0.687	0.002	17.061	5.420	0.019	0.008	204.912	0.009

5246
5247

5248 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.334	0.138	0.020	0.007	313.279	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.173	0.004	1.985	0.214	0.022	0.008	390.302	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.325	0.006	2.635	0.340	0.034	0.013	582.220	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.308	0.003	0.748	0.055	0.042	0.029	277.407	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.092	0.003	0.398	0.043	0.034	0.020	357.826	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.007	0.009	0.701	0.180	0.138	0.075	957.619	0.150
	Gasoline	MC	Motorcycles	0.764	0.002	21.194	5.892	0.020	0.009	241.628	0.009
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.150	0.124	0.016	0.006	280.282	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.149	0.003	1.655	0.193	0.018	0.007	351.967	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.270	0.005	2.092	0.280	0.029	0.010	530.411	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.289	0.002	0.461	0.033	0.033	0.022	240.907	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.080	0.003	0.224	0.021	0.023	0.011	318.070	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.429	0.012	0.700	0.109	0.137	0.067	1279.294	0.190
	Gasoline	MC	Motorcycles	0.759	0.002	20.379	5.577	0.019	0.008	223.408	0.009
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.103	0.138	0.016	0.006	277.842	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.146	0.003	1.522	0.188	0.018	0.006	346.387	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.242	0.005	1.763	0.241	0.028	0.010	516.865	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.223	0.002	0.358	0.029	0.034	0.023	239.750	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.060	0.003	0.146	0.015	0.023	0.012	313.107	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.133	0.011	0.548	0.096	0.119	0.057	1187.026	0.188
	Gasoline	MC	Motorcycles	0.679	0.002	17.046	5.242	0.019	0.008	210.103	0.009
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.025	0.116	0.017	0.006	269.339	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.364	0.157	0.019	0.007	336.683	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.212	0.005	1.700	0.230	0.030	0.011	519.629	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.232	0.002	0.369	0.033	0.038	0.026	231.967	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.153	0.015	0.024	0.012	307.374	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.266	0.011	0.573	0.109	0.122	0.060	1177.196	0.184
	Gasoline	MC	Motorcycles	0.691	0.002	17.466	5.337	0.019	0.008	207.724	0.009
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.163	0.146	0.017	0.006	273.761	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.163	0.004	1.786	0.228	0.019	0.007	354.078	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.279	0.005	2.103	0.308	0.030	0.011	527.637	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.264	0.002	0.384	0.027	0.030	0.019	228.245	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.137	0.003	0.230	0.022	0.027	0.015	311.880	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.481	0.012	0.715	0.118	0.135	0.068	1243.366	0.183
	Gasoline	MC	Motorcycles	0.854	0.002	22.202	7.058	0.019	0.008	222.137	0.008
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.963	0.106	0.018	0.006	274.419	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.091	0.003	1.195	0.125	0.019	0.007	334.831	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.149	0.005	1.390	0.158	0.029	0.010	476.095	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.124	0.002	0.321	0.023	0.029	0.017	232.915	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.154	0.016	0.023	0.011	304.919	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.594	0.010	0.368	0.051	0.103	0.045	1055.381	0.198
	Gasoline	MC	Motorcycles	0.559	0.002	14.128	4.310	0.019	0.008	202.669	0.009
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.091	0.119	0.017	0.006	279.443	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.092	0.003	1.271	0.136	0.019	0.007	340.818	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.175	0.005	1.612	0.198	0.029	0.010	506.572	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.233	0.002	0.385	0.031	0.034	0.022	234.380	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.164	0.016	0.023	0.011	302.576	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.177	0.012	0.620	0.098	0.128	0.062	1248.617	0.192
	Gasoline	MC	Motorcycles	0.701	0.002	17.978	5.626	0.019	0.008	213.922	0.009
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.089	0.003	1.405	0.153	0.020	0.007	298.220	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.201	0.004	2.268	0.258	0.023	0.009	382.631	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.353	0.006	2.880	0.381	0.033	0.012	562.906	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.312	0.002	0.659	0.051	0.043	0.030	262.296	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.145	0.003	0.376	0.037	0.031	0.016	344.094	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.064	0.009	0.723	0.188	0.139	0.076	943.716	0.144
	Gasoline	MC	Motorcycles	0.820	0.002	22.767	6.726	0.020	0.009	238.070	0.009

5249
5250

5251 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.983	0.106	0.016	0.006	280.763	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.103	0.003	1.303	0.135	0.017	0.006	340.789	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.163	0.005	1.485	0.180	0.026	0.009	468.426	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.144	0.002	0.292	0.021	0.028	0.017	233.711	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.133	0.014	0.022	0.011	298.419	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.034	0.013	0.579	0.059	0.125	0.058	1344.510	0.206
	Gasoline	MC	Motorcycles	0.598	0.002	15.126	4.929	0.019	0.008	204.102	0.009
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.145	0.137	0.017	0.006	285.918	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	1.375	0.161	0.019	0.007	349.292	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.190	0.005	1.680	0.222	0.030	0.011	525.545	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.191	0.002	0.351	0.024	0.029	0.017	232.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.161	0.016	0.023	0.011	300.950	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.657	0.012	0.523	0.096	0.119	0.057	1222.143	0.184
	Gasoline	MC	Motorcycles	0.686	0.002	17.577	5.685	0.019	0.008	213.878	0.009
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.083	0.119	0.018	0.007	270.363	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.111	0.003	1.405	0.170	0.020	0.007	332.022	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.196	0.005	1.684	0.235	0.028	0.010	492.223	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.182	0.002	0.358	0.027	0.032	0.020	228.099	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.164	0.017	0.024	0.011	295.796	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.265	0.014	0.720	0.080	0.135	0.063	1430.544	0.207
	Gasoline	MC	Motorcycles	0.716	0.002	18.500	6.039	0.019	0.008	212.803	0.009
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.978	0.106	0.016	0.006	279.664	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.111	0.003	1.335	0.151	0.017	0.006	339.994	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.182	0.005	1.556	0.196	0.026	0.009	470.459	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.170	0.002	0.304	0.023	0.029	0.018	236.003	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.049	0.003	0.121	0.013	0.021	0.010	298.589	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.064	0.013	0.580	0.059	0.125	0.058	1332.832	0.205
	Gasoline	MC	Motorcycles	0.629	0.002	15.861	4.997	0.019	0.008	205.786	0.009
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	0.986	0.110	0.017	0.006	292.206	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.004	1.329	0.148	0.019	0.007	361.373	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.161	0.005	1.444	0.177	0.028	0.010	523.434	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.146	0.002	0.520	0.033	0.029	0.018	250.172	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.056	0.003	0.277	0.028	0.024	0.012	326.983	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.061	0.011	0.547	0.097	0.121	0.057	1162.711	0.189
	Gasoline	MC	Motorcycles	0.620	0.002	15.960	4.822	0.020	0.008	218.946	0.009
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.103	0.126	0.019	0.007	288.013	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.004	1.289	0.139	0.022	0.008	355.321	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.145	0.005	1.420	0.143	0.033	0.012	536.058	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.163	0.002	0.470	0.035	0.036	0.023	253.735	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.246	0.024	0.027	0.013	337.121	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.893	0.012	0.339	0.071	0.112	0.049	1231.657	0.197
	Gasoline	MC	Motorcycles	0.660	0.002	17.580	5.338	0.020	0.009	223.177	0.009
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.077	0.117	0.018	0.007	282.448	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.106	0.003	1.378	0.152	0.020	0.007	342.568	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.185	0.005	1.684	0.223	0.028	0.010	497.508	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.171	0.002	0.380	0.025	0.029	0.017	231.235	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.044	0.003	0.179	0.019	0.024	0.011	294.683	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.196	0.013	0.630	0.082	0.127	0.059	1347.984	0.202
	Gasoline	MC	Motorcycles	0.668	0.002	17.260	5.584	0.019	0.008	211.960	0.009
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.019	0.127	0.016	0.005	277.723	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.368	0.177	0.017	0.006	346.835	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.212	0.005	1.641	0.231	0.027	0.010	516.367	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.185	0.002	0.322	0.025	0.030	0.019	238.050	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.071	0.003	0.162	0.017	0.024	0.013	316.232	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.215	0.010	0.573	0.129	0.124	0.063	1037.769	0.171
	Gasoline	MC	Motorcycles	0.774	0.002	19.635	6.150	0.019	0.008	218.581	0.009

5252
5253

5254 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.032	0.137	0.016	0.006	270.164	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.084	0.003	1.109	0.122	0.017	0.006	322.462	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.124	0.005	1.283	0.138	0.027	0.010	475.395	0.041
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.145	0.002	0.280	0.019	0.025	0.014	227.071	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.121	0.013	0.021	0.010	289.767	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.463	0.010	0.327	0.072	0.101	0.045	1043.111	0.196
	Gasoline	MC	Motorcycles	0.535	0.002	13.168	4.496	0.019	0.008	201.901	0.009
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.075	0.003	1.068	0.142	0.016	0.006	269.040	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.003	1.460	0.188	0.017	0.006	334.102	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.228	0.005	1.706	0.241	0.028	0.010	510.520	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.186	0.002	0.289	0.021	0.028	0.017	220.638	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.065	0.003	0.141	0.015	0.023	0.012	293.496	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.129	0.011	0.511	0.100	0.115	0.056	1137.523	0.183
	Gasoline	MC	Motorcycles	0.710	0.002	17.293	5.544	0.019	0.008	206.707	0.009
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.023	0.118	0.017	0.006	272.916	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	1.278	0.144	0.019	0.007	334.372	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.163	0.005	1.472	0.179	0.028	0.010	489.051	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.163	0.002	0.307	0.023	0.030	0.018	227.110	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.139	0.015	0.023	0.011	295.792	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.949	0.012	0.506	0.077	0.117	0.053	1241.106	0.199
	Gasoline	MC	Motorcycles	0.588	0.002	14.727	4.618	0.019	0.008	202.806	0.009
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.087	0.003	1.278	0.151	0.019	0.007	281.687	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.154	0.003	1.725	0.208	0.022	0.008	350.657	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.248	0.005	1.916	0.256	0.031	0.011	518.628	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.305	0.002	0.470	0.042	0.043	0.030	247.711	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.077	0.003	0.202	0.022	0.029	0.015	321.807	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.351	0.010	0.507	0.112	0.116	0.058	1098.698	0.175
	Gasoline	MC	Motorcycles	0.777	0.002	20.340	6.451	0.020	0.009	221.500	0.009
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.068	0.125	0.016	0.006	279.801	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.125	0.003	1.503	0.183	0.018	0.006	344.927	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.221	0.005	1.833	0.262	0.028	0.010	517.075	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.207	0.002	0.331	0.024	0.029	0.018	230.822	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.077	0.003	0.157	0.017	0.023	0.012	294.161	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.416	0.012	0.702	0.107	0.135	0.066	1296.108	0.191
	Gasoline	MC	Motorcycles	0.769	0.002	19.635	6.301	0.019	0.008	216.170	0.009
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.081	0.003	1.282	0.134	0.019	0.007	303.528	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.169	0.004	1.921	0.210	0.022	0.008	380.149	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.298	0.006	2.484	0.313	0.032	0.012	556.384	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.296	0.003	0.704	0.053	0.042	0.029	268.535	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.346	0.034	0.027	0.013	341.486	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.818	0.009	0.710	0.186	0.139	0.077	906.025	0.151
	Gasoline	MC	Motorcycles	0.768	0.002	20.955	6.073	0.020	0.009	237.549	0.009
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.270	0.142	0.018	0.007	300.047	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.171	0.004	1.917	0.225	0.020	0.008	375.150	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.297	0.005	2.420	0.324	0.031	0.011	551.147	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.387	0.003	0.650	0.050	0.041	0.029	264.385	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	0.322	0.034	0.029	0.017	334.848	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.486	0.013	0.762	0.103	0.140	0.068	1366.813	0.196
	Gasoline	MC	Motorcycles	0.799	0.002	21.825	6.355	0.020	0.009	235.998	0.009
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	0.973	0.116	0.015	0.005	279.590	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.103	0.003	1.206	0.146	0.016	0.006	341.573	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.179	0.005	1.465	0.204	0.026	0.009	509.707	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.206	0.002	0.323	0.025	0.030	0.019	236.330	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.114	0.012	0.020	0.009	304.309	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.224	0.013	0.651	0.090	0.130	0.062	1325.636	0.199
	Gasoline	MC	Motorcycles	0.689	0.002	17.265	5.183	0.019	0.008	210.455	0.009

5255
5256

5257 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.132	0.131	0.018	0.007	274.207	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.003	1.546	0.183	0.020	0.007	339.213	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.221	0.005	1.799	0.242	0.032	0.011	529.703	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.258	0.002	0.382	0.031	0.036	0.023	237.379	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.077	0.003	0.177	0.019	0.028	0.015	311.330	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.165	0.010	0.526	0.113	0.117	0.058	1098.073	0.182
	Gasoline	MC	Motorcycles	0.715	0.002	18.395	5.695	0.019	0.008	211.526	0.009
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.089	0.119	0.019	0.007	270.401	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.117	0.003	1.499	0.172	0.020	0.007	332.568	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.194	0.005	1.741	0.238	0.029	0.010	495.466	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.160	0.002	0.295	0.021	0.029	0.017	216.215	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.145	0.016	0.026	0.012	279.601	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.229	0.012	0.629	0.095	0.127	0.061	1279.393	0.195
	Gasoline	MC	Motorcycles	0.691	0.002	17.435	5.674	0.019	0.008	203.684	0.009
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.117	0.126	0.017	0.006	285.269	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.119	0.003	1.485	0.169	0.019	0.007	347.144	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.198	0.005	1.759	0.245	0.028	0.010	508.935	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.176	0.002	0.354	0.026	0.030	0.018	232.500	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.168	0.019	0.025	0.013	297.900	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.158	0.012	0.652	0.087	0.129	0.061	1309.067	0.200
	Gasoline	MC	Motorcycles	0.678	0.002	17.235	5.584	0.019	0.008	212.935	0.009
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.085	0.121	0.017	0.006	285.292	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.003	1.569	0.182	0.018	0.007	351.514	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.222	0.005	1.850	0.261	0.028	0.010	518.176	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.210	0.002	0.425	0.030	0.030	0.019	238.788	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.091	0.003	0.224	0.024	0.026	0.014	307.111	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.367	0.013	0.728	0.101	0.137	0.066	1339.975	0.196
	Gasoline	MC	Motorcycles	0.750	0.002	19.389	5.977	0.019	0.008	220.228	0.009
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.346	0.139	0.019	0.007	319.185	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.185	0.004	2.091	0.226	0.022	0.008	398.497	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.278	0.006	2.323	0.301	0.032	0.012	575.297	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.380	0.003	0.813	0.068	0.053	0.039	286.145	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.115	0.003	0.430	0.046	0.035	0.021	364.755	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.595	0.012	0.733	0.120	0.138	0.069	1270.340	0.184
	Gasoline	MC	Motorcycles	0.775	0.002	21.685	6.399	0.020	0.009	246.025	0.009
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	1.016	0.112	0.017	0.006	274.339	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.136	0.003	1.554	0.177	0.018	0.006	336.878	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.206	0.005	1.749	0.236	0.026	0.009	489.669	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.182	0.002	0.277	0.020	0.029	0.017	225.552	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.133	0.015	0.025	0.013	288.914	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.276	0.012	0.636	0.097	0.128	0.062	1282.512	0.193
	Gasoline	MC	Motorcycles	0.682	0.002	17.213	5.509	0.019	0.008	203.782	0.009
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.091	0.003	1.369	0.169	0.019	0.007	289.759	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.200	0.004	2.173	0.275	0.021	0.008	367.325	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.369	0.006	2.848	0.396	0.033	0.012	557.510	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.343	0.002	0.546	0.044	0.041	0.028	245.513	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.158	0.003	0.284	0.028	0.029	0.015	314.454	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.888	0.008	0.705	0.199	0.138	0.077	883.649	0.142
	Gasoline	MC	Motorcycles	0.862	0.002	22.874	7.064	0.020	0.009	229.680	0.008
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	0.970	0.117	0.016	0.006	272.580	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.290	0.149	0.018	0.006	335.081	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.186	0.005	1.506	0.205	0.028	0.010	467.990	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.165	0.002	0.313	0.023	0.029	0.018	235.222	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.146	0.015	0.023	0.011	309.773	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.897	0.010	0.417	0.064	0.109	0.049	1020.236	0.187
	Gasoline	MC	Motorcycles	0.651	0.002	16.431	4.935	0.019	0.008	207.499	0.009

5258
5259

5260 **Table 5-41. EMFAC County-Specific On-Road Vehicle EFs – 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)							
				Criteria Pollutants and Ozone Precursors							
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	CO_2	NH_3
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	1.015	0.105	0.017	0.006	281.597	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.102	0.003	1.352	0.152	0.019	0.007	346.715	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.170	0.005	1.567	0.196	0.029	0.010	508.941	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.204	0.002	0.360	0.026	0.031	0.019	234.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.167	0.017	0.024	0.012	303.998	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.096	0.012	0.559	0.091	0.118	0.056	1219.711	0.192
	Gasoline	MC	Motorcycles	0.702	0.002	18.066	5.740	0.019	0.008	214.558	0.009
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.059	0.114	0.017	0.006	280.495	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.131	0.003	1.554	0.188	0.018	0.007	344.127	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.237	0.005	1.937	0.270	0.027	0.010	501.868	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.202	0.002	0.336	0.025	0.030	0.018	226.148	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.090	0.003	0.157	0.017	0.024	0.012	285.204	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.570	0.010	0.614	0.154	0.131	0.069	1011.654	0.158
	Gasoline	MC	Motorcycles	0.759	0.002	19.160	6.178	0.019	0.008	214.234	0.009

5261
5262

5263 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	0.972	0.121	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.092	0.003	1.143	0.133	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.147	0.005	1.348	0.166	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.166	0.002	0.319	0.024	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.132	0.013	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.985	0.013	0.560	0.067	0.121	0.054	0.208
	Gasoline	MC	Motorcycles	0.601	0.002	14.981	4.702	0.019	0.008	0.009
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.114	0.119	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.124	0.003	1.508	0.167	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.227	0.005	1.870	0.245	0.030	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.155	0.002	0.364	0.025	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.180	0.018	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.300	0.013	0.709	0.093	0.139	0.066	0.199
	Gasoline	MC	Motorcycles	0.704	0.002	18.371	5.256	0.019	0.008	0.009
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.084	0.003	1.235	0.149	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.203	0.003	2.073	0.252	0.018	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.289	0.005	2.275	0.370	0.031	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.381	0.002	0.360	0.028	0.033	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	0.149	0.014	0.024	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.797	0.009	0.650	0.172	0.131	0.072	0.153
	Gasoline	MC	Motorcycles	0.807	0.002	19.870	6.611	0.019	0.008	0.008
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.081	0.129	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.132	0.003	1.584	0.198	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.213	0.005	1.823	0.272	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.194	0.002	0.355	0.024	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.068	0.003	0.166	0.017	0.024	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.260	0.012	0.652	0.105	0.131	0.064	0.192
	Gasoline	MC	Motorcycles	0.715	0.002	18.484	6.215	0.019	0.008	0.009
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.291	0.157	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.211	0.004	2.263	0.259	0.021	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.295	0.005	2.376	0.378	0.032	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.332	0.002	0.489	0.035	0.036	0.023	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.003	0.251	0.025	0.027	0.014	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.838	0.009	0.723	0.177	0.137	0.075	0.154
	Gasoline	MC	Motorcycles	0.813	0.002	21.089	6.957	0.019	0.008	0.008
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.981	0.113	0.016	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.106	0.003	1.307	0.153	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.178	0.005	1.582	0.220	0.027	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.192	0.002	0.350	0.024	0.028	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.151	0.015	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.173	0.012	0.673	0.093	0.131	0.063	0.198
	Gasoline	MC	Motorcycles	0.633	0.002	15.674	5.117	0.019	0.008	0.009
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.965	0.118	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.090	0.003	1.151	0.129	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.157	0.005	1.406	0.176	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.141	0.002	0.286	0.019	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.133	0.013	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.952	0.011	0.533	0.088	0.120	0.056	0.194
	Gasoline	MC	Motorcycles	0.625	0.002	15.708	4.899	0.019	0.008	0.009
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.080	0.003	1.148	0.141	0.017	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.192	0.004	1.903	0.245	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.253	0.005	1.946	0.291	0.029	0.010	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.249	0.002	0.507	0.036	0.032	0.021	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.003	0.285	0.030	0.028	0.016	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.958	0.008	0.707	0.194	0.139	0.078	0.140
	Gasoline	MC	Motorcycles	0.794	0.002	20.756	6.377	0.019	0.008	0.009

5264

5265

5266 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.045	0.114	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	1.487	0.188	0.020	0.007	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.210	0.005	1.831	0.266	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.211	0.002	0.364	0.025	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.166	0.016	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.257	0.009	0.550	0.140	0.121	0.063	0.166
	Gasoline	MC	Motorcycles	0.764	0.002	19.968	6.613	0.019	0.008	0.009
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.959	0.112	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.100	0.003	1.273	0.153	0.016	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.164	0.005	1.517	0.214	0.025	0.009	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.149	0.002	0.266	0.019	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.050	0.003	0.121	0.013	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.163	0.013	0.645	0.074	0.129	0.059	0.206
	Gasoline	MC	Motorcycles	0.644	0.002	16.041	5.468	0.019	0.008	0.009
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	1.040	0.118	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	1.377	0.165	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.188	0.005	1.720	0.244	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.142	0.002	0.392	0.026	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.050	0.003	0.193	0.020	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.238	0.012	0.670	0.103	0.131	0.063	0.194
	Gasoline	MC	Motorcycles	0.660	0.002	16.938	5.578	0.019	0.008	0.009
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.082	0.003	1.161	0.144	0.017	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.176	0.003	1.784	0.234	0.019	0.007	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.245	0.005	1.912	0.282	0.029	0.010	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.404	0.002	0.501	0.040	0.039	0.027	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	0.208	0.020	0.024	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.513	0.011	0.680	0.139	0.132	0.067	0.169
	Gasoline	MC	Motorcycles	0.813	0.002	20.754	6.528	0.019	0.008	0.009
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	1.055	0.123	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.003	1.545	0.170	0.016	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.173	0.005	1.664	0.209	0.025	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.201	0.002	0.342	0.026	0.030	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.110	0.011	0.019	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.031	0.013	0.609	0.060	0.130	0.061	0.208
	Gasoline	MC	Motorcycles	0.580	0.002	14.506	5.194	0.019	0.008	0.009
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.080	0.124	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.499	0.182	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.216	0.005	1.879	0.258	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.270	0.002	0.463	0.034	0.033	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.192	0.019	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.241	0.011	0.669	0.115	0.136	0.067	0.187
	Gasoline	MC	Motorcycles	0.679	0.002	17.414	5.729	0.019	0.008	0.009
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.974	0.111	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	1.248	0.142	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.166	0.005	1.519	0.204	0.026	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.155	0.002	0.279	0.020	0.026	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.114	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.181	0.013	0.685	0.072	0.133	0.061	0.210
	Gasoline	MC	Motorcycles	0.634	0.002	15.716	5.227	0.019	0.008	0.009
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.902	0.104	0.014	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.107	0.003	1.262	0.148	0.015	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.158	0.005	1.443	0.208	0.023	0.008	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.156	0.002	0.302	0.021	0.025	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.142	0.015	0.020	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.249	0.014	0.703	0.075	0.135	0.062	0.209
	Gasoline	MC	Motorcycles	0.635	0.002	15.623	5.212	0.019	0.008	0.009

5267

5268

5269 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.101	0.003	1.432	0.173	0.017	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.184	0.004	1.962	0.257	0.019	0.007	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.296	0.005	2.322	0.356	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.458	0.002	0.555	0.046	0.044	0.032	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.130	0.003	0.243	0.023	0.027	0.014	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.725	0.009	0.695	0.173	0.133	0.072	0.154
	Gasoline	MC	Motorcycles	0.818	0.002	21.326	7.038	0.019	0.008	0.008
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.167	0.132	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.147	0.004	1.747	0.210	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.275	0.005	2.321	0.322	0.031	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.206	0.002	0.508	0.033	0.031	0.019	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.063	0.003	0.262	0.026	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.596	0.008	0.653	0.178	0.134	0.073	0.152
	Gasoline	MC	Motorcycles	0.753	0.002	20.139	6.161	0.020	0.009	0.009
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	1.013	0.112	0.018	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.100	0.003	1.279	0.126	0.020	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.158	0.005	1.476	0.165	0.030	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.157	0.002	0.409	0.032	0.035	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.177	0.018	0.024	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.780	0.011	0.461	0.054	0.115	0.050	0.204
	Gasoline	MC	Motorcycles	0.548	0.002	14.016	4.241	0.019	0.008	0.009
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.909	0.108	0.014	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.003	1.294	0.169	0.015	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.190	0.005	1.565	0.233	0.024	0.008	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.151	0.002	0.256	0.017	0.024	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.099	0.010	0.018	0.008	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.273	0.013	0.697	0.087	0.133	0.062	0.202
	Gasoline	MC	Motorcycles	0.696	0.002	17.397	5.698	0.019	0.008	0.009
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.007	0.134	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.095	0.003	1.175	0.147	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.155	0.005	1.387	0.177	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.165	0.002	0.319	0.023	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.138	0.012	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.811	0.010	0.462	0.096	0.113	0.054	0.182
	Gasoline	MC	Motorcycles	0.627	0.002	15.600	4.956	0.019	0.008	0.009
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.090	0.003	1.358	0.157	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.213	0.004	2.296	0.298	0.021	0.008	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.392	0.006	2.969	0.425	0.034	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.387	0.002	0.579	0.044	0.040	0.027	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.058	0.003	0.272	0.027	0.028	0.014	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.173	0.008	0.742	0.209	0.139	0.078	0.134
	Gasoline	MC	Motorcycles	0.873	0.002	23.117	7.141	0.020	0.009	0.008
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.127	0.137	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.159	0.003	1.706	0.218	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.244	0.005	1.957	0.287	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.416	0.002	0.506	0.042	0.042	0.030	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.163	0.003	0.235	0.022	0.026	0.014	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.383	0.012	0.680	0.115	0.133	0.065	0.184
	Gasoline	MC	Motorcycles	0.751	0.002	19.162	6.239	0.019	0.008	0.009
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	1.004	0.108	0.017	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.124	0.003	1.501	0.170	0.018	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.200	0.005	1.724	0.229	0.026	0.009	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.163	0.002	0.276	0.019	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.128	0.013	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.320	0.014	0.721	0.076	0.136	0.063	0.209
	Gasoline	MC	Motorcycles	0.666	0.002	16.545	5.332	0.019	0.008	0.009

5270

5271

5272 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.263	0.132	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.157	0.004	1.850	0.201	0.022	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.303	0.006	2.520	0.330	0.033	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.278	0.003	0.744	0.052	0.040	0.027	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.073	0.003	0.386	0.039	0.030	0.016	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.863	0.009	0.682	0.172	0.136	0.073	0.154
	Gasoline	MC	Motorcycles	0.748	0.002	20.657	5.818	0.020	0.009	0.009
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.090	0.119	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.137	0.003	1.556	0.185	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.249	0.005	1.992	0.270	0.029	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.261	0.002	0.450	0.031	0.031	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.071	0.003	0.220	0.020	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.352	0.012	0.694	0.105	0.137	0.066	0.192
	Gasoline	MC	Motorcycles	0.742	0.002	19.860	5.565	0.019	0.008	0.009
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.045	0.133	0.016	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.133	0.003	1.427	0.179	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.223	0.005	1.676	0.235	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.196	0.002	0.345	0.026	0.032	0.021	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.137	0.013	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.052	0.011	0.541	0.091	0.118	0.056	0.191
	Gasoline	MC	Motorcycles	0.664	0.002	16.652	5.240	0.019	0.008	0.009
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	0.972	0.111	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	1.288	0.150	0.019	0.007	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.195	0.005	1.620	0.222	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.197	0.002	0.352	0.028	0.034	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.148	0.014	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.184	0.011	0.566	0.104	0.121	0.059	0.187
	Gasoline	MC	Motorcycles	0.673	0.002	17.028	5.274	0.019	0.008	0.009
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.091	0.137	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.151	0.003	1.688	0.223	0.019	0.007	0.036
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.260	0.005	2.014	0.300	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.235	0.002	0.371	0.025	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.115	0.003	0.217	0.020	0.025	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.395	0.012	0.707	0.112	0.135	0.067	0.187
	Gasoline	MC	Motorcycles	0.840	0.002	21.895	7.163	0.019	0.008	0.008
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.919	0.102	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.084	0.003	1.139	0.120	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.137	0.005	1.327	0.151	0.029	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.106	0.002	0.313	0.021	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.036	0.003	0.153	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.527	0.010	0.362	0.049	0.102	0.045	0.200
	Gasoline	MC	Motorcycles	0.549	0.002	13.893	4.284	0.019	0.008	0.009
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.040	0.114	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.085	0.003	1.209	0.130	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.161	0.005	1.540	0.190	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.206	0.002	0.375	0.028	0.032	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.161	0.015	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.102	0.012	0.613	0.094	0.128	0.061	0.194
	Gasoline	MC	Motorcycles	0.685	0.002	17.609	5.600	0.019	0.008	0.009
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.321	0.145	0.020	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.184	0.004	2.112	0.245	0.023	0.009	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.331	0.005	2.769	0.374	0.033	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.273	0.002	0.650	0.045	0.038	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.130	0.003	0.371	0.036	0.030	0.015	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.915	0.009	0.703	0.180	0.137	0.074	0.148
	Gasoline	MC	Motorcycles	0.806	0.002	22.388	6.780	0.020	0.009	0.009

5273

5274

5275 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.055	0.003	0.940	0.103	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.003	1.227	0.127	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.149	0.005	1.410	0.173	0.025	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.125	0.002	0.283	0.019	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.126	0.013	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.969	0.013	0.577	0.058	0.125	0.058	0.208
	Gasoline	MC	Motorcycles	0.584	0.002	14.755	4.915	0.019	0.008	0.009
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	1.096	0.133	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	1.305	0.154	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.174	0.005	1.598	0.213	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.167	0.002	0.340	0.022	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.157	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.522	0.011	0.516	0.091	0.118	0.056	0.187
	Gasoline	MC	Motorcycles	0.670	0.002	17.235	5.673	0.019	0.008	0.009
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.034	0.115	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.100	0.003	1.312	0.160	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.178	0.005	1.594	0.228	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.153	0.002	0.346	0.023	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.159	0.015	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.219	0.013	0.720	0.078	0.135	0.063	0.208
	Gasoline	MC	Motorcycles	0.704	0.002	18.264	6.107	0.019	0.008	0.009
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.935	0.103	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.101	0.003	1.254	0.142	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.165	0.005	1.472	0.186	0.026	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.143	0.002	0.289	0.020	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.115	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.005	0.012	0.577	0.058	0.125	0.058	0.206
	Gasoline	MC	Motorcycles	0.614	0.002	15.460	4.974	0.019	0.008	0.009
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.945	0.106	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.101	0.004	1.264	0.141	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.147	0.005	1.372	0.168	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.130	0.002	0.525	0.032	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.277	0.027	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.966	0.011	0.537	0.093	0.120	0.057	0.191
	Gasoline	MC	Motorcycles	0.610	0.002	15.721	4.813	0.020	0.009	0.009
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.051	0.122	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.088	0.003	1.237	0.134	0.021	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.133	0.005	1.356	0.136	0.033	0.012	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.145	0.002	0.463	0.033	0.034	0.021	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.242	0.023	0.026	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.787	0.011	0.334	0.069	0.111	0.048	0.199
	Gasoline	MC	Motorcycles	0.650	0.002	17.352	5.368	0.020	0.009	0.009
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	1.033	0.113	0.018	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	1.299	0.143	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.168	0.005	1.598	0.214	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.145	0.002	0.381	0.023	0.028	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.040	0.003	0.185	0.019	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.135	0.013	0.626	0.079	0.127	0.059	0.203
	Gasoline	MC	Motorcycles	0.653	0.002	16.951	5.571	0.019	0.008	0.009
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	0.965	0.122	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.003	1.291	0.170	0.017	0.006	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.195	0.005	1.562	0.223	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.160	0.002	0.311	0.022	0.028	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.054	0.003	0.149	0.014	0.022	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.127	0.010	0.562	0.123	0.122	0.062	0.174
	Gasoline	MC	Motorcycles	0.755	0.002	19.154	6.147	0.019	0.008	0.009

5276

5277

5278 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	0.996	0.135	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.080	0.003	1.073	0.119	0.017	0.006	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.116	0.005	1.251	0.133	0.027	0.010	0.041
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.125	0.002	0.268	0.017	0.024	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.033	0.003	0.117	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.375	0.010	0.320	0.069	0.101	0.044	0.198
	Gasoline	MC	Motorcycles	0.526	0.002	13.006	4.533	0.019	0.008	0.009
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.070	0.003	1.007	0.136	0.016	0.005	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.128	0.003	1.369	0.179	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.208	0.005	1.611	0.230	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.162	0.002	0.279	0.019	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.050	0.003	0.132	0.012	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.041	0.011	0.502	0.095	0.114	0.055	0.186
	Gasoline	MC	Motorcycles	0.694	0.002	16.925	5.539	0.019	0.008	0.009
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.975	0.113	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	1.215	0.138	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.148	0.005	1.399	0.170	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.141	0.002	0.296	0.021	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.132	0.013	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.868	0.012	0.500	0.074	0.116	0.052	0.201
	Gasoline	MC	Motorcycles	0.576	0.002	14.449	4.598	0.019	0.008	0.009
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.081	0.003	1.207	0.145	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.142	0.003	1.624	0.200	0.022	0.008	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.228	0.005	1.819	0.246	0.031	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.272	0.002	0.458	0.038	0.041	0.027	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.055	0.003	0.189	0.018	0.026	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.232	0.010	0.493	0.106	0.114	0.056	0.179
	Gasoline	MC	Motorcycles	0.764	0.002	20.067	6.512	0.020	0.009	0.009
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.012	0.120	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.114	0.003	1.409	0.173	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.203	0.005	1.740	0.252	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.178	0.002	0.317	0.021	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.062	0.003	0.147	0.015	0.022	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.343	0.012	0.697	0.103	0.135	0.065	0.194
	Gasoline	MC	Motorcycles	0.752	0.002	19.208	6.325	0.019	0.008	0.009
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.220	0.130	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.154	0.004	1.797	0.200	0.022	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.275	0.005	2.358	0.301	0.032	0.012	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.269	0.003	0.701	0.051	0.040	0.027	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.052	0.003	0.345	0.033	0.026	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.670	0.009	0.688	0.177	0.137	0.074	0.155
	Gasoline	MC	Motorcycles	0.753	0.002	20.528	6.098	0.020	0.009	0.009
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.203	0.136	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.156	0.004	1.792	0.214	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.275	0.005	2.307	0.313	0.031	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.339	0.002	0.634	0.045	0.037	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.090	0.003	0.306	0.030	0.026	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.409	0.013	0.756	0.099	0.140	0.067	0.199
	Gasoline	MC	Motorcycles	0.782	0.002	21.299	6.342	0.020	0.009	0.009
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.924	0.112	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.095	0.003	1.136	0.138	0.016	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.163	0.005	1.389	0.195	0.026	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.181	0.002	0.309	0.023	0.028	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.035	0.003	0.108	0.011	0.019	0.008	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.159	0.012	0.647	0.087	0.130	0.061	0.201
	Gasoline	MC	Motorcycles	0.672	0.002	16.780	5.142	0.019	0.008	0.009

5279

5280

5281 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.073	0.126	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.456	0.175	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.203	0.005	1.711	0.233	0.032	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.224	0.002	0.366	0.027	0.033	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.160	0.015	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.080	0.010	0.515	0.107	0.115	0.057	0.185
	Gasoline	MC	Motorcycles	0.698	0.002	18.003	5.681	0.019	0.008	0.009
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	1.017	0.114	0.018	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.105	0.003	1.376	0.162	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.177	0.005	1.629	0.230	0.029	0.010	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.136	0.002	0.267	0.018	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.128	0.013	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.162	0.012	0.622	0.091	0.127	0.060	0.198
	Gasoline	MC	Motorcycles	0.674	0.002	16.953	5.620	0.019	0.008	0.009
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.063	0.121	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.108	0.003	1.391	0.158	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.183	0.005	1.679	0.237	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.155	0.002	0.347	0.024	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.161	0.017	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.104	0.012	0.650	0.084	0.129	0.061	0.202
	Gasoline	MC	Motorcycles	0.662	0.002	16.898	5.563	0.019	0.008	0.009
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	1.028	0.116	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.465	0.172	0.018	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.204	0.005	1.755	0.251	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.186	0.002	0.416	0.027	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.072	0.003	0.211	0.022	0.024	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.309	0.013	0.726	0.098	0.137	0.065	0.199
	Gasoline	MC	Motorcycles	0.732	0.002	18.909	5.957	0.019	0.008	0.009
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.078	0.003	1.275	0.133	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.169	0.004	1.950	0.214	0.022	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.255	0.006	2.209	0.290	0.032	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.329	0.003	0.796	0.059	0.045	0.031	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.003	0.416	0.042	0.031	0.017	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.500	0.012	0.724	0.114	0.138	0.068	0.187
	Gasoline	MC	Motorcycles	0.760	0.002	21.226	6.404	0.020	0.009	0.009
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.967	0.108	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.122	0.003	1.441	0.165	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.188	0.005	1.654	0.229	0.026	0.009	0.036
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.151	0.002	0.256	0.017	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.118	0.012	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.203	0.012	0.630	0.092	0.127	0.061	0.196
	Gasoline	MC	Motorcycles	0.662	0.002	16.685	5.459	0.019	0.008	0.009
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.279	0.159	0.018	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.184	0.004	2.027	0.262	0.021	0.008	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.346	0.005	2.718	0.386	0.033	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.301	0.002	0.532	0.040	0.038	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.003	0.276	0.027	0.028	0.015	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.776	0.008	0.688	0.192	0.136	0.075	0.146
	Gasoline	MC	Motorcycles	0.846	0.002	22.511	7.118	0.020	0.009	0.008
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.920	0.113	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	1.216	0.141	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.170	0.005	1.425	0.195	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.144	0.002	0.302	0.021	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.045	0.003	0.140	0.014	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.809	0.010	0.410	0.061	0.108	0.049	0.190
	Gasoline	MC	Motorcycles	0.637	0.002	16.063	4.903	0.019	0.008	0.009

5282

5283

5284 **Table 5-42. EMFAC County-Specific On-Road Vehicle EFs – 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.055	0.003	0.969	0.101	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.093	0.003	1.280	0.144	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.157	0.005	1.502	0.190	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.175	0.002	0.350	0.023	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.162	0.016	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.036	0.012	0.556	0.088	0.117	0.055	0.194
	Gasoline	MC	Motorcycles	0.687	0.002	17.736	5.714	0.019	0.008	0.009
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	1.001	0.108	0.017	0.006	0.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	1.435	0.174	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.217	0.005	1.830	0.260	0.027	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.168	0.002	0.319	0.022	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.069	0.003	0.146	0.014	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.451	0.010	0.599	0.147	0.130	0.067	0.162
	Gasoline	MC	Motorcycles	0.744	0.002	18.820	6.193	0.019	0.008	0.009

5285

5286

5287 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	0.928	0.117	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.085	0.003	1.092	0.127	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.135	0.005	1.285	0.157	0.028	0.010	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.137	0.002	0.301	0.021	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.129	0.013	0.021	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.926	0.012	0.558	0.066	0.121	0.054	0.209
	Gasoline	MC	Motorcycles	0.587	0.002	14.644	4.651	0.019	0.008	0.009
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.067	0.003	1.065	0.115	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	1.435	0.160	0.020	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.211	0.005	1.798	0.236	0.030	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.132	0.002	0.353	0.023	0.028	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.178	0.017	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.227	0.012	0.705	0.090	0.139	0.066	0.201
	Gasoline	MC	Motorcycles	0.689	0.002	18.024	5.241	0.019	0.008	0.009
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.156	0.139	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.186	0.003	1.938	0.239	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.270	0.005	2.177	0.360	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.345	0.002	0.342	0.025	0.030	0.019	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.078	0.003	0.136	0.013	0.022	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.681	0.009	0.632	0.164	0.129	0.070	0.157
	Gasoline	MC	Motorcycles	0.790	0.002	19.537	6.621	0.019	0.008	0.008
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.026	0.122	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.120	0.003	1.487	0.187	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.197	0.005	1.738	0.261	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.170	0.002	0.344	0.023	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.155	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.188	0.012	0.647	0.100	0.131	0.063	0.194
	Gasoline	MC	Motorcycles	0.699	0.002	18.110	6.211	0.019	0.008	0.009
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.218	0.149	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.193	0.003	2.115	0.246	0.021	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.276	0.005	2.276	0.368	0.032	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.305	0.002	0.481	0.033	0.033	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.089	0.003	0.250	0.024	0.027	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.738	0.009	0.709	0.170	0.136	0.073	0.157
	Gasoline	MC	Motorcycles	0.801	0.002	20.858	7.029	0.019	0.008	0.008
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.938	0.109	0.016	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	1.233	0.144	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.165	0.005	1.514	0.212	0.026	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.165	0.002	0.336	0.023	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.147	0.015	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.118	0.012	0.670	0.089	0.131	0.062	0.200
	Gasoline	MC	Motorcycles	0.619	0.002	15.324	5.082	0.019	0.008	0.009
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.922	0.113	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.084	0.003	1.098	0.124	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.145	0.005	1.344	0.167	0.027	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.123	0.002	0.275	0.018	0.025	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.130	0.012	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.876	0.011	0.527	0.085	0.120	0.055	0.196
	Gasoline	MC	Motorcycles	0.610	0.002	15.339	4.845	0.019	0.008	0.009
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.074	0.003	1.086	0.134	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.176	0.004	1.776	0.232	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.236	0.005	1.861	0.284	0.029	0.010	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.226	0.002	0.502	0.035	0.031	0.020	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	0.277	0.029	0.027	0.015	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.830	0.008	0.687	0.186	0.138	0.076	0.144
	Gasoline	MC	Motorcycles	0.781	0.002	20.403	6.422	0.019	0.008	0.009

5288
5289

5290 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	0.997	0.108	0.018	0.006	0.039
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.110	0.003	1.418	0.182	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.196	0.005	1.765	0.258	0.030	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.190	0.002	0.355	0.024	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.040	0.003	0.164	0.015	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.149	0.009	0.534	0.133	0.119	0.061	0.170
	Gasoline	MC	Motorcycles	0.747	0.002	19.564	6.615	0.019	0.008	0.009
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.920	0.107	0.015	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.091	0.003	1.204	0.144	0.016	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.150	0.005	1.445	0.205	0.025	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.123	0.002	0.248	0.017	0.023	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.040	0.003	0.113	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.109	0.013	0.644	0.072	0.129	0.059	0.207
	Gasoline	MC	Motorcycles	0.627	0.002	15.619	5.429	0.019	0.008	0.009
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.994	0.113	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.095	0.003	1.299	0.155	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.173	0.005	1.635	0.235	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.122	0.002	0.384	0.025	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.187	0.019	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.173	0.012	0.666	0.099	0.131	0.063	0.196
	Gasoline	MC	Motorcycles	0.646	0.002	16.606	5.564	0.019	0.008	0.009
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.098	0.137	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.162	0.003	1.677	0.224	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.228	0.005	1.834	0.275	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.361	0.002	0.483	0.037	0.036	0.024	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.102	0.003	0.203	0.019	0.024	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.424	0.011	0.671	0.133	0.131	0.066	0.172
	Gasoline	MC	Motorcycles	0.797	0.002	20.399	6.563	0.019	0.008	0.009
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	1.011	0.119	0.014	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.116	0.003	1.451	0.160	0.016	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.159	0.005	1.582	0.199	0.024	0.009	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.174	0.002	0.324	0.024	0.028	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.035	0.003	0.105	0.010	0.018	0.008	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.972	0.013	0.607	0.058	0.131	0.061	0.209
	Gasoline	MC	Motorcycles	0.567	0.002	14.127	5.157	0.019	0.008	0.009
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.062	0.003	1.031	0.119	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.418	0.174	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.200	0.005	1.790	0.247	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.236	0.002	0.443	0.031	0.030	0.019	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.040	0.003	0.188	0.018	0.021	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.154	0.011	0.660	0.110	0.135	0.066	0.190
	Gasoline	MC	Motorcycles	0.664	0.002	17.040	5.733	0.019	0.008	0.009
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.932	0.107	0.015	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.089	0.003	1.180	0.134	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.153	0.005	1.449	0.196	0.025	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.133	0.002	0.266	0.018	0.025	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.036	0.003	0.111	0.011	0.019	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.134	0.013	0.684	0.070	0.133	0.061	0.211
	Gasoline	MC	Motorcycles	0.618	0.002	15.314	5.179	0.019	0.008	0.009
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.053	0.003	0.864	0.100	0.013	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	1.191	0.139	0.015	0.005	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.146	0.005	1.380	0.200	0.023	0.008	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.126	0.002	0.279	0.018	0.022	0.012	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.132	0.014	0.018	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.202	0.013	0.702	0.073	0.136	0.062	0.210
	Gasoline	MC	Motorcycles	0.619	0.002	15.173	5.165	0.019	0.008	0.009

5291
5292

5293 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.093	0.003	1.347	0.164	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.166	0.003	1.818	0.241	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.275	0.005	2.214	0.344	0.030	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.407	0.002	0.529	0.041	0.038	0.026	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.109	0.003	0.230	0.022	0.025	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.621	0.009	0.680	0.166	0.132	0.071	0.158
	Gasoline	MC	Motorcycles	0.804	0.002	20.991	7.077	0.019	0.008	0.008
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	1.114	0.126	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.135	0.003	1.646	0.201	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.257	0.005	2.220	0.314	0.031	0.011	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.183	0.002	0.502	0.031	0.029	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.055	0.003	0.259	0.025	0.024	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.473	0.009	0.635	0.170	0.132	0.071	0.156
	Gasoline	MC	Motorcycles	0.739	0.002	19.775	6.175	0.020	0.009	0.009
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.057	0.003	0.972	0.109	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.093	0.003	1.218	0.120	0.020	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.144	0.005	1.405	0.155	0.030	0.010	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.128	0.002	0.389	0.028	0.031	0.019	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.175	0.018	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.709	0.011	0.457	0.053	0.115	0.049	0.205
	Gasoline	MC	Motorcycles	0.340	0.002	13.832	4.221	0.019	0.008	0.009
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.869	0.104	0.014	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.102	0.003	1.214	0.159	0.015	0.005	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.174	0.005	1.485	0.223	0.024	0.008	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.124	0.002	0.238	0.015	0.021	0.012	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.032	0.003	0.096	0.009	0.017	0.008	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.221	0.013	0.696	0.084	0.133	0.062	0.204
	Gasoline	MC	Motorcycles	0.676	0.002	16.851	5.641	0.019	0.008	0.009
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	0.960	0.128	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.089	0.003	1.126	0.143	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.142	0.005	1.328	0.169	0.028	0.010	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.141	0.002	0.306	0.021	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.137	0.012	0.021	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.718	0.010	0.453	0.092	0.113	0.053	0.185
	Gasoline	MC	Motorcycles	0.613	0.002	15.240	4.925	0.019	0.008	0.009
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.083	0.003	1.272	0.146	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.195	0.004	2.138	0.284	0.021	0.008	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.369	0.005	2.839	0.412	0.034	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.355	0.002	0.572	0.042	0.038	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.264	0.026	0.026	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	3.068	0.009	0.724	0.201	0.138	0.076	0.137
	Gasoline	MC	Motorcycles	0.858	0.002	22.750	7.137	0.020	0.009	0.008
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.071	0.003	1.070	0.130	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.146	0.003	1.602	0.208	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.226	0.005	1.865	0.277	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.366	0.002	0.482	0.038	0.037	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.142	0.003	0.223	0.020	0.025	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.305	0.012	0.673	0.110	0.132	0.064	0.187
	Gasoline	MC	Motorcycles	0.736	0.002	18.831	6.271	0.019	0.008	0.009
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.957	0.103	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.003	1.394	0.158	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.182	0.005	1.631	0.217	0.026	0.009	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.136	0.002	0.262	0.017	0.025	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.041	0.003	0.125	0.013	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.270	0.013	0.720	0.074	0.136	0.062	0.210
	Gasoline	MC	Motorcycles	0.647	0.002	16.110	5.239	0.019	0.008	0.009

5294
5295

5296 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.203	0.126	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.144	0.004	1.738	0.191	0.022	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.280	0.006	2.389	0.317	0.033	0.012	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.250	0.003	0.738	0.050	0.038	0.024	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.051	0.003	0.370	0.036	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.739	0.009	0.664	0.164	0.134	0.071	0.158
	Gasoline	MC	Motorcycles	0.733	0.002	20.168	5.754	0.020	0.009	0.009
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.069	0.003	1.038	0.113	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.127	0.003	1.473	0.177	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.231	0.005	1.904	0.259	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.226	0.002	0.430	0.028	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.064	0.003	0.217	0.020	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.283	0.012	0.689	0.101	0.136	0.066	0.194
	Gasoline	MC	Motorcycles	0.726	0.002	19.382	5.548	0.019	0.008	0.009
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.068	0.003	0.995	0.128	0.016	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.121	0.003	1.345	0.170	0.018	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.206	0.005	1.599	0.226	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.162	0.002	0.324	0.024	0.028	0.017	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.134	0.012	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.977	0.011	0.536	0.087	0.118	0.056	0.193
	Gasoline	MC	Motorcycles	0.649	0.002	16.285	5.223	0.019	0.008	0.009
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.927	0.106	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	1.222	0.143	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.180	0.005	1.544	0.213	0.030	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.164	0.002	0.332	0.025	0.030	0.019	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.042	0.003	0.145	0.013	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.106	0.011	0.559	0.100	0.120	0.058	0.189
	Gasoline	MC	Motorcycles	0.658	0.002	16.645	5.230	0.019	0.008	0.009
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.066	0.003	1.032	0.130	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.140	0.003	1.600	0.217	0.019	0.007	0.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.243	0.005	1.935	0.292	0.030	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.209	0.002	0.358	0.023	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.104	0.003	0.212	0.019	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.316	0.012	0.700	0.107	0.134	0.066	0.190
	Gasoline	MC	Motorcycles	0.825	0.002	21.570	7.230	0.019	0.008	0.009
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.051	0.003	0.881	0.098	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.079	0.003	1.091	0.115	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.126	0.005	1.273	0.144	0.029	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.090	0.002	0.302	0.019	0.025	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.034	0.003	0.151	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.462	0.010	0.358	0.048	0.102	0.044	0.201
	Gasoline	MC	Motorcycles	0.540	0.002	13.675	4.253	0.019	0.008	0.009
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	0.995	0.109	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.079	0.003	1.157	0.124	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.148	0.005	1.476	0.182	0.029	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.184	0.002	0.363	0.026	0.030	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.159	0.015	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.032	0.012	0.607	0.090	0.128	0.060	0.197
	Gasoline	MC	Motorcycles	0.669	0.002	17.220	5.552	0.019	0.008	0.009
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.251	0.137	0.020	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.168	0.004	1.979	0.235	0.023	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.312	0.005	2.660	0.365	0.033	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.248	0.002	0.644	0.042	0.035	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.118	0.003	0.368	0.035	0.029	0.015	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.777	0.009	0.683	0.171	0.135	0.072	0.153
	Gasoline	MC	Motorcycles	0.792	0.002	22.010	6.791	0.020	0.009	0.009

5297
5298

5299 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.052	0.003	0.905	0.100	0.016	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.087	0.003	1.165	0.120	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.136	0.004	1.346	0.164	0.025	0.009	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.107	0.002	0.271	0.018	0.024	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.122	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.918	0.012	0.576	0.056	0.125	0.058	0.209
	Gasoline	MC	Motorcycles	0.572	0.002	14.426	4.892	0.019	0.008	0.009
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	1.053	0.129	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.088	0.003	1.245	0.147	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.159	0.005	1.526	0.204	0.029	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.146	0.002	0.327	0.020	0.026	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.156	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.394	0.011	0.509	0.087	0.117	0.055	0.190
	Gasoline	MC	Motorcycles	0.655	0.002	16.874	5.638	0.019	0.008	0.009
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.991	0.112	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.091	0.003	1.237	0.151	0.020	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.165	0.005	1.528	0.220	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.138	0.002	0.342	0.023	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.039	0.003	0.159	0.015	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.176	0.013	0.720	0.076	0.136	0.063	0.209
	Gasoline	MC	Motorcycles	0.691	0.002	18.029	6.154	0.019	0.008	0.009
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.053	0.003	0.897	0.100	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.093	0.003	1.185	0.134	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.151	0.004	1.399	0.176	0.026	0.009	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.122	0.002	0.274	0.018	0.025	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.035	0.003	0.113	0.011	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.949	0.012	0.576	0.057	0.125	0.057	0.208
	Gasoline	MC	Motorcycles	0.600	0.002	15.072	4.935	0.019	0.008	0.009
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.905	0.102	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.094	0.003	1.204	0.135	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.134	0.005	1.308	0.159	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.114	0.002	0.518	0.030	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.044	0.003	0.275	0.027	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.877	0.011	0.528	0.089	0.119	0.056	0.194
	Gasoline	MC	Motorcycles	0.600	0.002	15.458	4.791	0.020	0.009	0.009
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	1.004	0.117	0.019	0.007	0.039
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.084	0.003	1.193	0.131	0.021	0.008	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.123	0.005	1.306	0.130	0.032	0.011	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.123	0.002	0.451	0.030	0.031	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.043	0.003	0.241	0.023	0.026	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.704	0.011	0.333	0.067	0.109	0.047	0.200
	Gasoline	MC	Motorcycles	0.639	0.002	17.122	5.370	0.020	0.009	0.009
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.990	0.109	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.088	0.003	1.229	0.135	0.020	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.154	0.005	1.519	0.204	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.123	0.002	0.370	0.022	0.026	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.037	0.003	0.184	0.019	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.079	0.013	0.625	0.076	0.127	0.058	0.205
	Gasoline	MC	Motorcycles	0.637	0.002	16.585	5.533	0.019	0.008	0.009
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.061	0.003	0.919	0.116	0.015	0.005	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.103	0.003	1.224	0.164	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.180	0.005	1.495	0.215	0.027	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.141	0.002	0.302	0.021	0.026	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.143	0.014	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.044	0.010	0.552	0.118	0.121	0.060	0.177
	Gasoline	MC	Motorcycles	0.738	0.002	18.699	6.139	0.019	0.008	0.009

5300
5301

5302 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi)						
				Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.063	0.003	0.965	0.133	0.016	0.006	0.039
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.076	0.003	1.045	0.116	0.017	0.006	0.040
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.110	0.005	1.224	0.129	0.027	0.009	0.041
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.109	0.002	0.256	0.016	0.023	0.012	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.031	0.003	0.117	0.012	0.020	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.299	0.010	0.315	0.067	0.100	0.043	0.199
	Gasoline	MC	Motorcycles	0.518	0.002	12.900	4.578	0.019	0.008	0.009
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.065	0.003	0.956	0.130	0.016	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.117	0.003	1.291	0.171	0.017	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.191	0.005	1.531	0.220	0.027	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.139	0.002	0.268	0.018	0.024	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.044	0.003	0.129	0.012	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.960	0.011	0.494	0.091	0.114	0.054	0.188
	Gasoline	MC	Motorcycles	0.678	0.002	16.574	5.527	0.019	0.008	0.009
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.934	0.109	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.090	0.003	1.162	0.133	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.136	0.005	1.340	0.162	0.028	0.010	0.040
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.118	0.002	0.281	0.019	0.026	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.033	0.003	0.129	0.013	0.022	0.009	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.793	0.011	0.495	0.072	0.116	0.052	0.202
	Gasoline	MC	Motorcycles	0.565	0.002	14.210	4.579	0.019	0.008	0.009
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.076	0.003	1.146	0.138	0.019	0.007	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.131	0.003	1.535	0.191	0.021	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.210	0.005	1.733	0.235	0.031	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.240	0.002	0.445	0.036	0.037	0.024	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.048	0.003	0.185	0.017	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.118	0.010	0.480	0.101	0.113	0.055	0.182
	Gasoline	MC	Motorcycles	0.751	0.002	19.778	6.549	0.020	0.009	0.009
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.964	0.114	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.105	0.003	1.329	0.164	0.017	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.187	0.005	1.660	0.242	0.027	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.157	0.002	0.308	0.020	0.025	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.053	0.003	0.141	0.014	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.276	0.012	0.693	0.098	0.135	0.064	0.196
	Gasoline	MC	Motorcycles	0.735	0.002	18.784	6.327	0.019	0.008	0.009
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.166	0.125	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.141	0.004	1.692	0.191	0.022	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.255	0.005	2.259	0.291	0.032	0.012	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.249	0.002	0.697	0.049	0.038	0.025	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.049	0.003	0.345	0.033	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.539	0.009	0.666	0.168	0.135	0.072	0.160
	Gasoline	MC	Motorcycles	0.739	0.002	20.139	6.085	0.020	0.009	0.009
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.072	0.003	1.147	0.131	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.143	0.004	1.685	0.204	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.255	0.005	2.196	0.301	0.030	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.305	0.002	0.624	0.043	0.035	0.023	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.079	0.003	0.299	0.029	0.025	0.012	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.338	0.013	0.750	0.095	0.140	0.067	0.201
	Gasoline	MC	Motorcycles	0.765	0.002	20.819	6.320	0.020	0.009	0.009
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.058	0.003	0.883	0.107	0.015	0.005	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.087	0.003	1.076	0.131	0.016	0.006	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.150	0.005	1.322	0.186	0.026	0.009	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.158	0.002	0.295	0.021	0.026	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.032	0.003	0.107	0.010	0.019	0.008	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.097	0.012	0.643	0.084	0.130	0.061	0.203
	Gasoline	MC	Motorcycles	0.656	0.002	16.327	5.091	0.019	0.008	0.009

5303
5304

5305 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.064	0.003	1.022	0.120	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.113	0.003	1.379	0.167	0.020	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.188	0.005	1.635	0.223	0.032	0.011	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.199	0.002	0.354	0.025	0.031	0.018	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.047	0.003	0.156	0.015	0.024	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.000	0.010	0.506	0.102	0.114	0.055	0.187
	Gasoline	MC	Motorcycles	0.683	0.002	17.626	5.649	0.019	0.008	0.009
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.055	0.003	0.973	0.110	0.018	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.096	0.003	1.296	0.152	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.163	0.005	1.554	0.222	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.116	0.002	0.257	0.016	0.026	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.034	0.003	0.124	0.012	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.100	0.012	0.618	0.087	0.126	0.059	0.200
	Gasoline	MC	Motorcycles	0.657	0.002	16.580	5.575	0.019	0.008	0.009
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.059	0.003	1.018	0.115	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.098	0.003	1.312	0.148	0.019	0.007	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.168	0.005	1.608	0.229	0.028	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.135	0.002	0.337	0.023	0.028	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.158	0.016	0.023	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.054	0.012	0.648	0.081	0.129	0.060	0.204
	Gasoline	MC	Motorcycles	0.647	0.002	16.555	5.523	0.019	0.008	0.009
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.060	0.003	0.979	0.110	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.112	0.003	1.377	0.162	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.188	0.005	1.676	0.240	0.027	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.162	0.002	0.406	0.026	0.027	0.016	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.061	0.003	0.204	0.020	0.023	0.011	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.254	0.013	0.724	0.094	0.137	0.065	0.201
	Gasoline	MC	Motorcycles	0.715	0.002	18.452	5.921	0.019	0.008	0.009
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.073	0.003	1.214	0.128	0.019	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.155	0.004	1.829	0.202	0.022	0.008	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.236	0.005	2.107	0.278	0.032	0.012	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.294	0.003	0.787	0.056	0.041	0.028	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.074	0.003	0.400	0.039	0.027	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.413	0.012	0.717	0.108	0.137	0.067	0.190
	Gasoline	MC	Motorcycles	0.746	0.002	20.786	6.381	0.020	0.009	0.009
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.054	0.003	0.927	0.103	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.111	0.003	1.348	0.154	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.173	0.005	1.575	0.220	0.026	0.009	0.037
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.125	0.002	0.238	0.015	0.024	0.013	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.035	0.003	0.110	0.011	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.138	0.012	0.625	0.089	0.127	0.060	0.198
	Gasoline	MC	Motorcycles	0.644	0.002	16.214	5.398	0.019	0.008	0.009
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.077	0.003	1.203	0.149	0.018	0.007	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.169	0.003	1.898	0.251	0.021	0.008	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.324	0.005	2.593	0.374	0.032	0.012	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.264	0.002	0.519	0.037	0.034	0.022	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.121	0.003	0.266	0.026	0.026	0.013	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.668	0.008	0.669	0.185	0.134	0.074	0.150
	Gasoline	MC	Motorcycles	0.831	0.002	22.150	7.161	0.020	0.009	0.008
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.879	0.108	0.016	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.097	0.003	1.154	0.135	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.156	0.004	1.356	0.185	0.028	0.010	0.039
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.124	0.002	0.289	0.019	0.025	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.135	0.013	0.021	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.728	0.010	0.405	0.059	0.108	0.048	0.192
	Gasoline	MC	Motorcycles	0.623	0.002	15.704	4.868	0.019	0.008	0.009

5306
5307

5308 **Table 5-43. EMFAC County-Specific On-Road Vehicle EFs – 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Criteria Pollutants and Ozone Precursors						
				NO_x	SO_x	CO	ROG	PM_{10}	$PM_{2.5}$	NH_3
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.052	0.003	0.930	0.096	0.017	0.006	0.038
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.086	0.003	1.219	0.137	0.019	0.007	0.038
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.146	0.005	1.443	0.184	0.029	0.010	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.150	0.002	0.338	0.022	0.027	0.015	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.038	0.003	0.160	0.015	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	1.975	0.011	0.553	0.084	0.117	0.054	0.196
	Gasoline	MC	Motorcycles	0.673	0.002	17.385	5.682	0.019	0.008	0.009
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.056	0.003	0.958	0.103	0.017	0.006	0.037
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.105	0.003	1.343	0.162	0.018	0.006	0.039
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.200	0.005	1.739	0.247	0.027	0.009	0.038
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.144	0.002	0.318	0.021	0.026	0.014	0.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.059	0.003	0.147	0.014	0.022	0.010	0.003
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	2.331	0.010	0.585	0.140	0.128	0.065	0.166
	Gasoline	MC	Motorcycles	0.728	0.002	18.491	6.200	0.019	0.008	0.009

5309
5310 Notes for **Error! Reference source not found.** through **Error! Reference source not found.**
5311 The values in the NH_3 column reflect statewide values as calculated by MOVES4 for the state of California due to EMFAC
5312 lacking NH_3 as a pollutant output.
5313

5314 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	286.234	289.228
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	350.082	353.717
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	525.363	530.458
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.071	249.285
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.462	328.198
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.218	1385.858	1451.009
	Gasoline	MC	Motorcycles	0.238	0.044	207.629	226.607
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	278.409	281.622
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.013	345.922	350.379
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	536.271	542.926
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	224.464	235.039
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.047	312.063
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.215	1366.832	1431.128
	Gasoline	MC	Motorcycles	0.293	0.048	211.724	233.495
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.011	282.590	286.163
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.023	0.018	358.806	364.886
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.030	0.023	558.525	566.218
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	217.885	228.150
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.570	306.334
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.148	941.332	985.753
	Gasoline	MC	Motorcycles	0.296	0.053	209.705	232.830
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	294.192	297.353
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	365.661	370.361
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	539.540	545.859
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	239.393	250.670
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	317.787	332.738
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.194	1229.803	1287.683
	Gasoline	MC	Motorcycles	0.287	0.049	215.559	237.291
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.015	0.011	295.689	299.217
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.025	0.019	377.174	383.430
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.023	564.922	572.696
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	239.639	250.940
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.050	318.739	333.742
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.151	961.504	1006.878
	Gasoline	MC	Motorcycles	0.333	0.053	221.139	245.192
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	293.806	296.652
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	361.584	365.633
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	532.813	538.448
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.909	245.974
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.317	321.767
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.205	1302.495	1363.767
	Gasoline	MC	Motorcycles	0.248	0.045	209.791	229.447
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	285.835	288.764
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	350.840	354.447
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	512.857	518.112
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.300	246.375
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.999	331.900
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.193	1223.636	1281.202
	Gasoline	MC	Motorcycles	0.247	0.045	208.399	227.967
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.011	306.167	309.714
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.025	0.018	385.384	391.373
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.022	563.716	570.799
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	254.370	266.366
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.053	336.485	352.330
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.136	860.857	901.526
	Gasoline	MC	Motorcycles	0.333	0.052	229.115	253.033

5315

5316 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	290.413	293.431
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	362.291	366.530
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	538.577	544.733
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.068	249.282
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	317.125	332.034
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.152	963.036	1008.440
	Gasoline	MC	Motorcycles	0.317	0.051	221.332	244.502
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	290.966	293.751
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	359.439	363.365
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	518.509	523.942
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.598	239.363
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.980	311.990
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.223	1414.617	1481.128
	Gasoline	MC	Motorcycles	0.250	0.046	209.011	228.989
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	299.328	302.242
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	366.602	370.620
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	537.385	543.233
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.789	248.990
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.198	327.931
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.196	1243.863	1302.397
	Gasoline	MC	Motorcycles	0.272	0.046	215.138	235.773
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.011	293.553	297.140
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.017	368.004	373.588
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.021	547.729	554.667
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	247.113	258.775
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	319.625	334.669
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.172	1092.401	1143.873
	Gasoline	MC	Motorcycles	0.325	0.053	221.958	245.910
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.009	308.189	311.030
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.014	378.645	383.142
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.017	510.059	515.614
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	247.632	259.301
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.658	330.497
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.219	1389.140	1454.435
	Gasoline	MC	Motorcycles	0.224	0.042	206.952	225.195
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	304.938	307.974
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	377.330	381.692
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	561.338	567.695
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	248.010	259.704
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	321.854	336.992
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.188	1190.787	1246.848
	Gasoline	MC	Motorcycles	0.279	0.047	219.118	240.193
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.860	294.687
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	356.888	360.731
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	529.176	534.610
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.423	241.271
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	301.381	315.549
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.232	1472.190	1541.400
	Gasoline	MC	Motorcycles	0.244	0.045	207.825	227.465
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	300.230	302.961
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	370.235	374.304
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	528.905	534.155
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	239.986	251.288
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.347	328.082
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.232	1474.308	1543.620
	Gasoline	MC	Motorcycles	0.247	0.045	213.468	233.170

5317

5318 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.017	0.012	305.689	309.754
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.024	0.018	381.096	387.032
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.024	564.838	572.813
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.040	252.409	264.329
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.051	326.145	341.497
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.148	940.854	985.253
	Gasoline	MC	Motorcycles	0.336	0.053	224.944	249.217
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	305.564	308.834
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.015	382.132	387.089
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.030	0.022	570.483	577.843
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	251.758	263.623
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.053	336.349	352.178
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.137	871.871	913.041
	Gasoline	MC	Motorcycles	0.331	0.051	228.897	252.233
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	296.494	299.322
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.012	361.262	365.064
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	505.550	510.914
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	252.042	263.926
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	323.671	338.893
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.193	1224.471	1282.029
	Gasoline	MC	Motorcycles	0.226	0.041	208.711	226.523
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.009	294.973	297.775
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	365.879	370.130
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	539.773	545.752
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.114	246.181
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.073	321.506
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.218	1386.193	1451.385
	Gasoline	MC	Motorcycles	0.267	0.048	214.429	235.509
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	285.470	288.624
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	351.234	354.943
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	531.864	537.090
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.992	250.245
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	325.883	341.199
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.167	1060.180	1110.084
	Gasoline	MC	Motorcycles	0.247	0.045	209.326	228.896
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.016	0.011	304.779	308.592
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.027	0.019	389.293	395.677
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.038	0.029	593.958	603.431
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	252.736	264.662
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.052	332.426	348.077
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.011	0.137	872.704	913.945
	Gasoline	MC	Motorcycles	0.376	0.056	231.687	257.701
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	289.389	292.781
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.016	362.941	368.165
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.021	545.819	552.794
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.039	245.881	257.488
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	322.877	338.073
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.191	1211.498	1268.532
	Gasoline	MC	Motorcycles	0.302	0.050	217.268	239.823
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.009	287.893	290.731
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	360.891	365.567
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	520.689	526.953
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.440	233.959
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.740	307.556
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.236	1495.432	1565.737
	Gasoline	MC	Motorcycles	0.259	0.047	207.202	227.764

5319

5320 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.015	0.010	327.109	330.548
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.023	0.016	408.063	413.308
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.033	0.024	606.664	614.667
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.044	282.276	295.597
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.059	372.673	390.224
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.149	945.856	990.492
	Gasoline	MC	Motorcycles	0.365	0.051	243.633	267.848
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	293.167	296.471
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.014	367.770	372.534
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.021	554.751	561.813
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.352	256.914
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	329.280	344.765
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.204	1293.454	1354.319
	Gasoline	MC	Motorcycles	0.321	0.050	225.514	248.506
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	289.515	292.769
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	361.880	366.608
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.020	537.680	544.182
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	243.724	255.206
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	324.277	339.522
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.188	1193.209	1249.352
	Gasoline	MC	Motorcycles	0.260	0.047	211.775	232.146
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	281.324	284.248
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	351.180	355.145
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	542.476	548.470
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	236.405	247.549
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.152	331.014
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.186	1182.159	1237.798
	Gasoline	MC	Motorcycles	0.267	0.047	209.531	230.261
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	287.206	290.514
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	366.538	371.560
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.022	549.863	557.054
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	232.667	243.628
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	319.821	334.865
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.195	1240.179	1298.557
	Gasoline	MC	Motorcycles	0.337	0.054	222.558	247.073
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	286.550	289.224
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	350.770	354.164
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.015	499.757	504.536
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.399	248.576
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.540	331.421
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.170	1079.797	1130.557
	Gasoline	MC	Motorcycles	0.219	0.041	203.934	221.572
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	292.240	295.198
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	356.583	360.071
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	530.132	535.422
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	238.938	250.195
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	314.568	329.357
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.198	1258.958	1318.191
	Gasoline	MC	Motorcycles	0.281	0.048	215.644	236.865
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.016	0.011	312.320	315.913
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.026	0.017	398.298	404.135
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.035	0.025	585.650	594.066
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.042	266.854	279.448
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.056	356.561	373.347
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.146	928.029	971.838
	Gasoline	MC	Motorcycles	0.383	0.053	239.247	264.605

5321

5322 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	292.817	295.476
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	358.118	361.807
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.016	491.197	496.247
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.383	249.604
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.926	326.590
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.216	1370.135	1434.535
	Gasoline	MC	Motorcycles	0.228	0.043	205.818	224.248
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	298.073	301.095
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	365.511	369.321
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	553.258	558.912
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.920	248.076
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	314.105	328.873
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.195	1238.366	1296.630
	Gasoline	MC	Motorcycles	0.275	0.047	215.473	236.355
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	282.061	285.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	348.729	352.775
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.017	512.189	517.887
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.561	241.418
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.484	321.940
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.229	1455.906	1524.359
	Gasoline	MC	Motorcycles	0.283	0.048	213.171	234.521
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	291.296	294.009
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	357.186	361.087
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.017	493.757	499.195
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	240.962	252.306
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	312.201	326.876
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.214	1360.661	1424.617
	Gasoline	MC	Motorcycles	0.239	0.044	207.521	226.670
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	305.385	308.166
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	378.857	382.710
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	548.672	553.712
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	254.753	266.756
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.054	340.614	356.640
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.187	1187.299	1243.166
	Gasoline	MC	Motorcycles	0.265	0.044	220.555	240.217
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	301.271	304.256
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	370.666	374.233
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	571.648	576.409
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	257.854	270.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.055	348.756	365.159
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.200	1271.403	1331.184
	Gasoline	MC	Motorcycles	0.282	0.046	223.995	244.632
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	294.197	297.054
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	360.035	363.906
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	519.308	524.902
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.238	247.363
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.408	322.912
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.215	1367.523	1431.830
	Gasoline	MC	Motorcycles	0.274	0.046	213.717	234.361
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	290.125	293.170
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	361.679	365.837
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	539.721	545.679
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	240.496	251.819
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	325.476	340.779
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.162	1028.160	1076.596
	Gasoline	MC	Motorcycles	0.298	0.051	220.232	242.835

5323

5324 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	281.370	284.348
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	337.488	340.787
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	498.256	502.459
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.227	243.157
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	303.861	318.143
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.170	1076.417	1127.046
	Gasoline	MC	Motorcycles	0.205	0.040	202.873	219.795
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	281.170	284.412
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	349.584	354.172
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	536.500	542.886
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	225.102	235.701
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	303.142	317.394
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.180	1143.126	1196.923
	Gasoline	MC	Motorcycles	0.263	0.048	208.548	229.397
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	284.716	287.630
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	349.855	353.597
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	512.391	517.518
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.398	243.341
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.133	322.618
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.201	1273.077	1332.944
	Gasoline	MC	Motorcycles	0.224	0.042	204.161	222.369
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.011	293.522	297.068
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	365.245	370.114
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	544.135	550.854
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	252.279	264.179
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	332.597	348.240
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.173	1098.165	1149.869
	Gasoline	MC	Motorcycles	0.319	0.051	222.159	245.270
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	292.442	295.405
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	361.324	365.551
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	541.047	547.184
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.569	246.662
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.865	321.293
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.205	1301.907	1363.167
	Gasoline	MC	Motorcycles	0.296	0.051	217.545	240.015
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	316.814	320.167
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.016	397.285	402.463
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.032	0.023	583.064	590.708
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.043	273.328	286.226
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.056	354.147	370.815
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.142	899.050	941.499
	Gasoline	MC	Motorcycles	0.359	0.051	239.164	263.270
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	313.499	316.900
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.016	391.648	396.839
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.023	575.867	583.379
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.042	269.470	282.185
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.055	350.140	366.625
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.218	1383.818	1448.920
	Gasoline	MC	Motorcycles	0.362	0.052	237.879	262.484
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.238	294.144
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	357.892	361.657
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	532.493	537.862
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	241.137	252.493
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.597	331.476
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.213	1350.014	1413.509
	Gasoline	MC	Motorcycles	0.259	0.047	212.521	233.023

5325

5326 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	285.971	289.138
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	354.207	358.573
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	554.032	560.219
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	241.297	252.667
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	322.838	338.021
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.172	1093.243	1144.714
	Gasoline	MC	Motorcycles	0.283	0.048	213.055	234.510
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	281.906	284.756
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	349.104	353.223
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	515.758	521.485
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	221.115	231.525
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	291.481	305.187
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.203	1287.503	1348.071
	Gasoline	MC	Motorcycles	0.264	0.047	205.295	226.001
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	298.032	301.033
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	365.023	369.180
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	530.178	535.944
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.249	248.422
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.433	325.031
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.208	1321.397	1383.547
	Gasoline	MC	Motorcycles	0.270	0.047	214.530	235.145
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	298.028	301.050
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	368.697	373.159
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	540.951	547.117
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	243.353	254.818
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	319.995	335.052
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.213	1350.620	1414.158
	Gasoline	MC	Motorcycles	0.307	0.050	222.074	244.620
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.015	0.010	333.171	336.604
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.024	0.016	416.646	422.122
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.022	601.214	608.494
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.046	291.959	305.753
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.060	380.560	398.486
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.200	1272.320	1332.210
	Gasoline	MC	Motorcycles	0.376	0.051	247.722	272.345
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	285.639	288.417
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.014	353.977	358.462
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.018	507.544	513.465
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	231.699	242.607
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.744	316.980
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.204	1294.790	1355.701
	Gasoline	MC	Motorcycles	0.256	0.047	206.002	226.365
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.016	0.011	303.686	307.366
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.024	0.017	381.957	387.702
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.035	0.026	578.555	587.238
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	249.684	261.462
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.052	329.435	344.941
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.137	869.780	910.863
	Gasoline	MC	Motorcycles	0.367	0.055	230.637	256.106
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	284.564	287.410
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	351.281	355.171
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.017	489.856	495.369
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	239.117	250.374
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	320.646	335.720
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.162	1030.104	1078.549
	Gasoline	MC	Motorcycles	0.251	0.045	209.273	229.033

5327

5328 **Table 5-44. EMFAC County-Specific On-Road Vehicle GHG EFs - 2024 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	294.257	296.972
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	362.834	366.567
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	531.071	536.219
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.999	249.206
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.167	329.984
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.193	1227.625	1285.377
	Gasoline	MC	Motorcycles	0.280	0.048	215.953	237.129
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	292.785	295.717
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.014	362.005	366.477
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.020	522.979	529.411
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.968	241.847
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.139	312.159
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.158	1001.307	1048.512
	Gasoline	MC	Motorcycles	0.291	0.050	215.306	237.479

5329

5330 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	280.297	283.159
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	342.034	345.478
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	511.279	516.006
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.802	246.907
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.707	321.125
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.216	1367.860	1432.163
	Gasoline	MC	Motorcycles	0.231	0.043	206.637	225.210
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	272.503	275.573
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	338.065	342.270
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	523.302	529.534
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	222.315	232.788
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.300	306.046
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.213	1354.616	1418.333
	Gasoline	MC	Motorcycles	0.286	0.048	211.004	232.371
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	276.179	279.518
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.017	352.063	357.770
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.022	548.207	555.437
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	216.764	226.975
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.229	300.741
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.150	949.950	994.767
	Gasoline	MC	Motorcycles	0.292	0.052	209.278	232.111
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	287.487	290.463
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	357.180	361.561
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.018	527.352	533.284
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.643	248.836
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.322	324.919
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1232.517	1290.518
	Gasoline	MC	Motorcycles	0.282	0.048	214.969	236.365
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	289.030	292.347
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.023	0.018	370.115	375.989
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.022	554.464	561.787
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	238.100	249.326
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	312.665	327.380
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.153	969.974	1015.737
	Gasoline	MC	Motorcycles	0.330	0.052	221.085	244.938
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	287.596	290.311
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	352.741	356.517
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	522.226	527.522
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.986	243.959
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.784	314.927
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.204	1295.129	1356.051
	Gasoline	MC	Motorcycles	0.241	0.044	208.867	228.124
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	279.823	282.621
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	342.899	346.311
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	501.840	506.751
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.491	244.479
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.237	325.867
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.191	1213.151	1270.219
	Gasoline	MC	Motorcycles	0.241	0.044	207.418	226.578
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	299.644	302.975
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.023	0.017	377.594	383.187
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	553.198	559.867
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	252.014	263.896
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.052	329.964	345.499
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.137	866.696	907.631
	Gasoline	MC	Motorcycles	0.328	0.052	228.469	252.054

5331

5332 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	283.567	286.428
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	355.145	359.170
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	527.739	533.562
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.100	247.219
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.684	326.337
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.153	970.630	1016.382
	Gasoline	MC	Motorcycles	0.311	0.050	220.801	243.618
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	284.996	287.666
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	350.758	354.422
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.015	507.941	513.013
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	225.903	236.539
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	291.106	304.791
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.221	1401.717	1467.620
	Gasoline	MC	Motorcycles	0.243	0.045	207.965	227.486
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	292.956	295.722
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	357.614	361.356
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	526.039	531.516
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.598	246.694
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.380	320.791
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.196	1241.479	1299.896
	Gasoline	MC	Motorcycles	0.266	0.046	214.387	234.656
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	287.512	290.889
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.016	361.067	366.317
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.020	537.112	543.631
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.179	256.747
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.723	328.487
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.173	1099.460	1151.256
	Gasoline	MC	Motorcycles	0.320	0.052	221.447	245.073
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	301.852	304.569
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.013	369.166	373.346
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	498.878	504.052
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.361	256.922
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.295	322.787
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.217	1375.066	1439.698
	Gasoline	MC	Motorcycles	0.218	0.042	205.984	223.873
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	298.555	301.452
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	368.831	372.929
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	548.779	554.736
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.657	257.237
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.230	330.055
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.187	1188.137	1244.067
	Gasoline	MC	Motorcycles	0.273	0.047	218.342	239.040
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	285.672	288.377
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	348.236	351.826
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	518.168	523.263
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.527	239.284
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.438	308.278
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.229	1456.341	1524.805
	Gasoline	MC	Motorcycles	0.237	0.045	206.805	226.018
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	294.061	296.676
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.012	361.165	364.954
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	518.418	523.336
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.297	248.470
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.494	320.906
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.230	1459.204	1527.805
	Gasoline	MC	Motorcycles	0.240	0.045	212.415	231.703

5333

5334 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.015	0.011	299.531	303.337
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.017	373.099	378.595
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.023	553.496	560.958
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.039	250.191	262.003
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	319.409	334.441
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.149	948.219	992.956
	Gasoline	MC	Motorcycles	0.332	0.053	224.649	248.657
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	298.959	302.064
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.014	373.989	378.642
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.021	558.822	565.767
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	249.606	261.367
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	329.619	345.130
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.138	878.528	920.001
	Gasoline	MC	Motorcycles	0.325	0.050	228.293	251.285
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	290.479	293.193
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	352.298	355.870
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	492.357	497.319
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	249.083	260.824
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.254	331.127
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.190	1204.706	1261.334
	Gasoline	MC	Motorcycles	0.221	0.040	207.987	225.487
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	288.900	291.567
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	357.030	360.973
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	529.360	534.942
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.670	243.619
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.217	314.326
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.217	1376.292	1441.016
	Gasoline	MC	Motorcycles	0.260	0.047	213.313	233.940
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	279.247	282.255
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	343.815	347.350
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	518.692	523.568
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.547	248.731
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	321.874	337.001
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.166	1052.650	1102.194
	Gasoline	MC	Motorcycles	0.240	0.044	208.352	227.511
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.015	0.011	297.746	301.291
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.025	0.018	382.068	388.049
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.036	0.027	583.835	592.839
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	250.581	262.403
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.051	326.699	342.080
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.139	879.894	921.464
	Gasoline	MC	Motorcycles	0.371	0.055	231.191	256.903
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	283.272	286.475
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	355.541	360.439
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	534.229	540.762
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	244.020	255.537
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.497	331.389
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.191	1214.672	1271.847
	Gasoline	MC	Motorcycles	0.297	0.050	216.812	239.042
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	282.235	284.928
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	351.920	356.217
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.018	510.999	516.818
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	221.247	231.660
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	286.859	300.349
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.233	1479.424	1548.975
	Gasoline	MC	Motorcycles	0.251	0.046	206.032	226.117

5335

5336 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	320.126	323.385
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.015	398.956	403.854
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.023	594.400	601.934
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.044	279.990	293.201
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.058	365.071	382.263
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.150	951.628	996.526
	Gasoline	MC	Motorcycles	0.356	0.050	242.616	266.418
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	286.599	289.736
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.013	359.676	364.158
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.020	542.277	548.902
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	243.278	254.741
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	323.651	338.872
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.203	1286.701	1347.244
	Gasoline	MC	Motorcycles	0.312	0.049	224.435	246.980
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	283.654	286.741
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	353.975	358.388
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.019	527.199	533.316
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	242.216	253.626
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	318.579	333.554
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.188	1190.309	1246.311
	Gasoline	MC	Motorcycles	0.254	0.046	210.981	230.987
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	275.273	278.055
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	343.805	347.546
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	530.816	536.439
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	234.645	245.704
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.968	326.633
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.186	1180.039	1235.573
	Gasoline	MC	Motorcycles	0.260	0.046	208.609	228.927
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	280.348	283.451
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	360.277	365.037
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.021	538.545	545.329
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.597	241.458
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.877	330.735
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.196	1242.420	1300.896
	Gasoline	MC	Motorcycles	0.333	0.053	222.366	246.624
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	280.315	282.878
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	342.361	345.581
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.014	487.356	491.834
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.159	246.228
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.340	324.929
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.002	0.168	1066.682	1116.824
	Gasoline	MC	Motorcycles	0.213	0.040	203.176	220.493
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	285.766	288.592
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	348.520	351.823
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	518.106	523.078
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	236.971	248.136
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.539	323.044
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.198	1254.190	1313.194
	Gasoline	MC	Motorcycles	0.274	0.047	214.798	235.626
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	305.113	308.490
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.024	0.016	390.361	395.822
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.033	0.024	573.991	581.924
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.042	264.407	276.882
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.055	350.301	366.791
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.147	935.828	979.993
	Gasoline	MC	Motorcycles	0.376	0.052	238.606	263.590

5337

5338 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	286.877	289.438
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.011	349.274	352.735
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.015	479.739	484.457
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.470	247.600
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	305.129	319.472
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.214	1357.706	1421.520
	Gasoline	MC	Motorcycles	0.223	0.042	205.030	223.132
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.987	294.876
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	357.233	360.824
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	539.069	544.341
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.526	245.567
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.298	321.745
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1230.179	1288.053
	Gasoline	MC	Motorcycles	0.269	0.046	214.664	235.153
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	276.147	278.990
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	340.092	343.844
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.016	502.102	507.452
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.254	240.049
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	301.577	315.756
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.227	1443.754	1511.634
	Gasoline	MC	Motorcycles	0.279	0.047	213.005	234.110
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	285.388	287.991
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	348.183	351.825
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.016	481.682	486.736
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.691	249.927
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	304.968	319.302
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.212	1346.740	1410.041
	Gasoline	MC	Motorcycles	0.233	0.043	206.601	225.384
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	298.955	301.622
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	370.110	373.749
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	535.863	540.552
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	252.993	264.912
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.053	334.136	349.858
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.185	1174.704	1229.974
	Gasoline	MC	Motorcycles	0.260	0.043	219.914	239.294
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	294.584	297.447
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.010	362.788	366.207
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.014	552.667	557.104
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	256.030	268.093
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.054	343.012	359.145
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.197	1250.965	1309.783
	Gasoline	MC	Motorcycles	0.278	0.045	223.607	243.996
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	288.314	291.045
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	351.009	354.613
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	508.242	513.447
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.871	244.883
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	301.068	315.225
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.214	1357.649	1421.489
	Gasoline	MC	Motorcycles	0.267	0.045	212.840	233.068
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	283.872	286.768
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	354.128	358.045
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	527.831	533.432
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	239.455	250.728
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	320.934	336.023
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.163	1033.054	1081.714
	Gasoline	MC	Motorcycles	0.292	0.050	219.449	241.668

5339

5340 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	275.569	278.457
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	329.500	332.673
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.012	486.035	490.031
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.732	240.542
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	296.371	310.301
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.167	1058.603	1108.391
	Gasoline	MC	Motorcycles	0.200	0.039	202.304	218.911
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	275.343	278.408
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	342.026	346.320
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.018	523.587	529.536
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.579	234.104
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.825	312.874
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.180	1140.572	1194.244
	Gasoline	MC	Motorcycles	0.258	0.047	207.945	228.453
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	278.775	281.564
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	341.873	345.427
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	500.238	505.008
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.948	240.774
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	301.891	316.083
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.198	1257.346	1316.471
	Gasoline	MC	Motorcycles	0.219	0.042	203.463	221.339
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	287.567	290.922
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	357.850	362.422
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	531.102	537.386
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	250.367	262.175
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	327.361	342.757
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.173	1098.682	1150.403
	Gasoline	MC	Motorcycles	0.314	0.050	221.872	244.707
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	286.033	288.843
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	352.909	356.863
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	528.820	534.563
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.752	244.759
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.340	314.461
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.205	1299.513	1360.655
	Gasoline	MC	Motorcycles	0.290	0.050	216.882	238.985
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	310.096	313.293
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.015	388.485	393.328
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.021	568.792	575.843
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.043	271.076	283.867
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.055	347.700	364.065
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.142	902.499	945.098
	Gasoline	MC	Motorcycles	0.352	0.050	238.367	262.077
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	306.698	309.922
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.015	383.212	388.079
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.021	563.176	570.206
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.042	267.109	279.711
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.054	342.459	358.580
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.217	1375.965	1440.692
	Gasoline	MC	Motorcycles	0.354	0.051	236.975	261.151
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	285.428	288.200
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	349.525	353.056
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	520.879	525.894
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.957	250.208
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.364	324.950
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.211	1337.793	1400.710
	Gasoline	MC	Motorcycles	0.253	0.046	211.497	231.602

5341

5342 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	280.029	283.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	346.555	350.671
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.018	541.586	547.389
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	239.356	250.633
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.971	331.876
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1096.105	1147.704
	Gasoline	MC	Motorcycles	0.276	0.048	212.306	233.376
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	276.140	278.859
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	340.614	344.447
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	505.544	510.906
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	218.898	229.202
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	285.300	298.714
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.202	1283.258	1343.622
	Gasoline	MC	Motorcycles	0.258	0.046	204.486	224.781
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.589	294.439
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	355.788	359.648
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	519.424	524.840
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.666	245.715
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	303.941	318.233
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.207	1315.682	1377.559
	Gasoline	MC	Motorcycles	0.263	0.046	213.721	233.953
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.593	294.460
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	359.864	364.018
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	529.402	535.187
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	241.579	252.959
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.608	328.363
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.212	1345.754	1409.059
	Gasoline	MC	Motorcycles	0.300	0.049	221.146	243.266
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	326.095	329.352
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.015	407.355	412.471
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.021	587.917	594.704
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.046	290.050	303.753
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.059	372.463	390.006
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.200	1271.960	1331.825
	Gasoline	MC	Motorcycles	0.368	0.050	246.904	271.140
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.968	282.624
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.013	345.173	349.322
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	498.576	504.115
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.890	239.663
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	295.510	309.404
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.203	1288.411	1349.019
	Gasoline	MC	Motorcycles	0.248	0.046	204.843	224.746
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.010	296.605	300.034
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.023	0.016	374.573	379.959
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.033	0.025	567.942	576.154
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	247.619	259.297
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	321.762	336.905
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.138	876.691	918.091
	Gasoline	MC	Motorcycles	0.362	0.054	230.281	255.451
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	278.545	281.263
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	342.935	346.597
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	478.715	483.871
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.414	248.589
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.163	329.978
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.162	1025.131	1073.338
	Gasoline	MC	Motorcycles	0.245	0.045	208.385	227.773

5343

5344 **Table 5-45. EMFAC County-Specific On-Road Vehicle GHG EFs - 2025 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	287.891	290.479
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	354.603	358.116
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	519.849	524.708
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.777	246.878
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	309.513	324.065
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.193	1223.945	1281.520
	Gasoline	MC	Motorcycles	0.274	0.047	215.268	236.100
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	286.621	289.387
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	352.865	356.976
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.018	512.387	518.420
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.619	239.385
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	291.453	305.158
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.159	1006.233	1053.663
	Gasoline	MC	Motorcycles	0.286	0.049	214.795	236.662

5345

5346 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	274.428	277.177
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	334.434	337.720
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	498.430	502.856
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.273	244.257
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.246	314.360
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.213	1350.215	1413.688
	Gasoline	MC	Motorcycles	0.225	0.042	205.675	223.871
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	266.765	269.718
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	330.637	334.628
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	511.392	517.277
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	219.685	230.032
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	286.733	300.217
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.212	1342.928	1406.091
	Gasoline	MC	Motorcycles	0.279	0.047	210.276	231.250
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.010	269.934	273.077
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.016	345.408	350.777
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.021	538.051	544.879
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	215.655	225.813
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	279.605	292.752
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.151	958.911	1004.140
	Gasoline	MC	Motorcycles	0.287	0.051	208.726	231.230
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	281.014	283.838
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	349.045	353.153
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	515.511	521.100
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.200	246.275
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.611	316.843
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1234.012	1292.077
	Gasoline	MC	Motorcycles	0.277	0.047	214.321	235.371
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	282.576	285.712
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.017	363.230	368.764
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.021	544.439	551.382
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	236.057	247.185
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	307.890	322.379
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.154	978.427	1024.579
	Gasoline	MC	Motorcycles	0.327	0.052	220.950	244.578
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	281.503	284.107
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	344.457	348.005
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	511.952	516.944
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.491	241.344
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.626	308.478
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.203	1286.652	1347.172
	Gasoline	MC	Motorcycles	0.235	0.044	208.020	226.915
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	273.857	276.541
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	335.356	338.606
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	491.346	495.961
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.314	242.198
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	305.374	319.727
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.189	1202.632	1259.202
	Gasoline	MC	Motorcycles	0.234	0.043	206.440	225.209
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.010	293.186	296.340
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.016	370.015	375.257
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	542.920	549.226
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	248.934	260.666
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.051	323.693	338.931
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.138	872.776	913.988
	Gasoline	MC	Motorcycles	0.322	0.051	227.854	251.111

5347

5348 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	276.957	279.689
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	348.179	352.019
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	517.210	522.738
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.766	244.774
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.276	320.675
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.154	977.898	1023.982
	Gasoline	MC	Motorcycles	0.305	0.050	220.154	242.595
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	279.079	281.653
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	342.579	346.026
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	497.672	502.434
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	222.164	232.620
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	284.872	298.263
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.219	1388.960	1454.261
	Gasoline	MC	Motorcycles	0.237	0.044	206.976	226.077
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	286.710	289.355
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	349.179	352.694
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	515.103	520.261
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.392	244.382
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	299.976	314.085
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.195	1238.321	1296.585
	Gasoline	MC	Motorcycles	0.260	0.045	213.606	233.512
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.010	281.518	284.718
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	354.270	359.222
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	526.911	533.070
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	241.956	253.367
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	307.867	322.353
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.174	1105.897	1157.988
	Gasoline	MC	Motorcycles	0.315	0.052	220.908	244.204
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	296.029	298.641
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.012	360.771	364.681
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.015	488.656	493.507
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	241.794	253.182
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	301.730	315.912
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.214	1360.604	1424.555
	Gasoline	MC	Motorcycles	0.213	0.041	205.294	222.868
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	292.304	295.082
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	360.789	364.663
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	536.962	542.580
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	242.801	254.244
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.747	323.267
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.187	1184.419	1240.168
	Gasoline	MC	Motorcycles	0.267	0.046	217.582	237.919
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	279.577	282.178
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	340.157	343.539
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	507.426	512.221
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.053	236.692
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	288.412	301.968
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.227	1440.441	1508.156
	Gasoline	MC	Motorcycles	0.231	0.044	205.857	224.676
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	287.955	290.472
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	352.698	356.254
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	508.253	512.887
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.064	245.081
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.175	314.289
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.228	1444.091	1511.980
	Gasoline	MC	Motorcycles	0.234	0.044	211.398	230.297

5349

Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.014	0.011	293.472	297.060
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	365.319	370.430
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.021	542.419	549.432
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	246.994	258.649
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.262	328.002
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.151	955.519	1000.590
	Gasoline	MC	Motorcycles	0.326	0.052	224.100	247.781
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	292.537	295.507
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	366.217	370.610
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.020	547.694	554.296
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	247.492	259.152
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	323.577	338.802
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.139	885.127	926.901
	Gasoline	MC	Motorcycles	0.318	0.049	227.595	250.225
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	284.575	287.191
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	344.089	347.473
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	480.300	484.925
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.422	256.987
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	309.548	324.105
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.187	1186.829	1242.615
	Gasoline	MC	Motorcycles	0.216	0.040	207.358	224.596
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	282.887	285.444
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	348.645	352.329
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	519.142	524.370
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.081	240.906
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.061	307.880
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.215	1366.582	1430.847
	Gasoline	MC	Motorcycles	0.253	0.047	212.222	232.416
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	273.172	276.056
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	336.724	340.114
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	506.241	510.823
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.046	247.158
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	317.686	332.617
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.165	1045.051	1094.233
	Gasoline	MC	Motorcycles	0.234	0.043	207.432	226.213
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	290.953	294.276
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.024	0.017	374.844	380.453
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.034	0.026	573.406	581.959
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	248.262	259.972
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.051	321.100	336.216
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.140	887.237	929.144
	Gasoline	MC	Motorcycles	0.365	0.055	230.607	255.994
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	277.290	280.335
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	348.411	353.026
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	523.107	529.255
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	240.646	251.999
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.877	325.504
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.192	1216.704	1273.969
	Gasoline	MC	Motorcycles	0.291	0.049	216.229	238.109
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	276.556	279.128
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	343.336	347.310
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.017	501.448	506.866
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	218.826	229.123
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	280.784	293.986
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.231	1463.534	1532.337
	Gasoline	MC	Motorcycles	0.244	0.045	204.912	224.546

5352 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	313.279	316.387
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.014	390.302	394.904
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.021	582.220	589.311
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.044	277.407	290.495
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.056	357.826	374.676
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.151	957.619	1002.788
	Gasoline	MC	Motorcycles	0.348	0.049	241.628	265.034
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	280.282	283.279
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	351.967	356.210
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	530.411	536.658
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	240.907	252.255
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	318.070	333.028
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.202	1279.294	1339.483
	Gasoline	MC	Motorcycles	0.305	0.049	223.408	245.527
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	277.842	280.788
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	346.387	350.531
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.018	516.865	522.627
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	239.750	251.040
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.107	327.824
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.187	1187.026	1242.868
	Gasoline	MC	Motorcycles	0.248	0.045	210.103	229.732
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	269.339	272.001
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	336.683	340.235
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	519.629	524.931
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	231.967	242.896
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.374	321.823
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.185	1177.196	1232.592
	Gasoline	MC	Motorcycles	0.253	0.046	207.724	227.652
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	273.761	276.693
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	354.078	358.607
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.020	527.637	534.064
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.245	238.993
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.880	326.549
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.196	1243.366	1301.879
	Gasoline	MC	Motorcycles	0.329	0.053	222.137	246.125
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	274.419	276.886
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	334.831	337.908
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	476.095	480.317
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.915	243.877
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	304.919	319.253
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.002	0.166	1055.381	1104.990
	Gasoline	MC	Motorcycles	0.209	0.040	202.669	219.724
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.443	282.153
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	340.818	343.968
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	506.572	511.269
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.380	245.419
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.576	316.801
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.197	1248.617	1307.354
	Gasoline	MC	Motorcycles	0.268	0.046	213.922	234.361
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	298.220	301.419
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.015	382.631	387.757
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.023	562.906	570.429
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	262.296	274.669
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.054	344.094	360.293
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.149	943.716	988.242
	Gasoline	MC	Motorcycles	0.369	0.052	238.070	262.709

5353

5354 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	280.763	283.239
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	340.789	344.062
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.014	468.426	472.852
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.711	244.708
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.419	312.447
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.212	1344.510	1407.703
	Gasoline	MC	Motorcycles	0.218	0.041	204.102	221.883
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	285.918	288.694
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	349.292	352.700
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	525.545	530.494
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.022	242.943
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.950	315.099
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.193	1222.143	1279.634
	Gasoline	MC	Motorcycles	0.263	0.045	213.878	233.993
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	270.363	273.099
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	332.022	335.534
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.015	492.223	497.264
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.099	238.839
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	295.796	309.703
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.225	1430.544	1497.802
	Gasoline	MC	Motorcycles	0.275	0.047	212.803	233.653
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	279.664	282.173
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	339.994	343.423
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.015	470.459	475.183
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.003	247.110
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.589	312.622
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.210	1332.832	1395.478
	Gasoline	MC	Motorcycles	0.228	0.043	205.786	224.223
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	292.206	294.771
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	361.373	364.830
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	523.434	527.823
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	250.172	261.956
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	326.983	342.367
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.183	1162.711	1217.413
	Gasoline	MC	Motorcycles	0.254	0.043	218.946	238.021
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	288.013	290.770
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	355.321	358.620
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	536.058	540.237
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	253.735	265.688
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.053	337.121	352.977
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.194	1231.657	1289.567
	Gasoline	MC	Motorcycles	0.273	0.045	223.177	243.314
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	282.448	285.073
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	342.568	345.953
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	497.508	502.376
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.235	242.120
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.683	308.540
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.212	1347.984	1411.367
	Gasoline	MC	Motorcycles	0.260	0.045	211.960	231.790
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	277.723	280.493
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	346.835	350.547
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	516.367	521.653
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.050	249.255
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.232	331.099
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.164	1037.769	1086.642
	Gasoline	MC	Motorcycles	0.286	0.049	218.581	240.398

5355

5356 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	270.164	272.979
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.009	322.462	325.546
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.012	475.395	479.238
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.071	237.754
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	289.767	303.386
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.164	1043.111	1092.168
	Gasoline	MC	Motorcycles	0.196	0.038	201.901	218.266
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	269.040	271.948
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	334.102	338.136
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	510.520	516.080
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	220.638	231.021
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.496	307.293
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.179	1137.523	1191.045
	Gasoline	MC	Motorcycles	0.249	0.046	206.707	226.767
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	272.916	275.599
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	334.372	337.770
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	489.051	493.528
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.110	237.800
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	295.792	309.697
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.196	1241.106	1299.466
	Gasoline	MC	Motorcycles	0.214	0.041	202.806	220.379
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	281.687	284.882
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	350.657	354.975
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.018	518.628	524.529
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	247.711	259.390
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	321.807	336.941
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1098.698	1150.412
	Gasoline	MC	Motorcycles	0.309	0.050	221.500	244.039
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.801	282.484
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	344.927	348.654
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	517.075	522.482
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.822	241.687
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.161	307.991
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.204	1296.108	1357.085
	Gasoline	MC	Motorcycles	0.284	0.049	216.170	237.897
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	303.528	306.590
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	380.149	384.709
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.020	556.384	563.022
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.042	268.535	281.204
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.054	341.486	357.559
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.143	906.025	948.778
	Gasoline	MC	Motorcycles	0.344	0.049	237.549	260.868
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	300.047	303.121
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.014	375.150	379.738
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.020	551.147	557.769
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.042	264.385	276.856
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.053	334.848	350.609
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.215	1366.813	1431.105
	Gasoline	MC	Motorcycles	0.346	0.051	235.998	259.736
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.590	282.247
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	341.573	344.909
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	509.707	514.413
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.330	247.455
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	304.309	318.610
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.209	1325.636	1387.979
	Gasoline	MC	Motorcycles	0.246	0.045	210.455	230.167

5357

5358 **Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	274.207	277.076
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	339.213	343.115
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	529.703	535.176
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.379	248.560
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	311.330	325.969
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1098.073	1149.758
	Gasoline	MC	Motorcycles	0.270	0.047	211.526	232.214
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	270.401	273.010
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	332.568	336.160
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	495.466	500.506
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	216.215	226.391
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	279.601	292.747
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.202	1279.393	1339.570
	Gasoline	MC	Motorcycles	0.251	0.046	203.684	223.584
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	285.269	287.995
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	347.144	350.757
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	508.935	514.044
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.500	243.445
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.900	311.908
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.206	1309.067	1370.629
	Gasoline	MC	Motorcycles	0.257	0.045	212.935	232.798
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	285.292	288.029
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	351.514	355.408
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	518.176	523.622
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.788	250.034
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.111	321.558
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.211	1339.975	1403.004
	Gasoline	MC	Motorcycles	0.293	0.048	220.228	241.932
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.009	319.185	322.292
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.014	398.497	403.298
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.019	575.297	581.662
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.045	286.145	299.658
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.057	364.755	381.934
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.200	1270.340	1330.121
	Gasoline	MC	Motorcycles	0.360	0.050	246.025	269.872
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	274.339	276.892
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.012	336.878	340.743
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	489.669	494.870
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	225.552	236.165
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	288.914	302.496
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.202	1282.512	1342.838
	Gasoline	MC	Motorcycles	0.241	0.045	203.782	223.264
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	289.759	292.979
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.015	367.325	372.393
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.031	0.024	557.510	565.309
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.513	257.090
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	314.454	329.251
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.139	883.649	925.368
	Gasoline	MC	Motorcycles	0.356	0.053	229.680	254.492
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	272.580	275.188
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	335.081	338.551
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	467.990	472.831
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.222	246.292
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	309.773	324.334
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.161	1020.236	1068.211
	Gasoline	MC	Motorcycles	0.239	0.044	207.499	226.532

5359

Table 5-46. EMFAC County-Specific On-Road Vehicle GHG EFs - 2026 (cont.)

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	281.597	284.077
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	346.715	350.041
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	508.941	513.547
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.025	245.043
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	303.998	318.290
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.192	1219.711	1277.082
	Gasoline	MC	Motorcycles	0.268	0.046	214.558	235.048
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	280.495	283.124
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	344.127	347.932
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	501.868	507.535
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.148	236.795
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	285.204	298.613
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.159	1011.654	1059.330
	Gasoline	MC	Motorcycles	0.281	0.049	214.234	235.782

5362 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	268.882	271.532
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	327.406	330.553
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	486.319	490.482
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.212	241.048
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.555	307.353
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.210	1331.611	1394.209
	Gasoline	MC	Motorcycles	0.219	0.042	204.794	222.651
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	261.434	264.288
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.011	323.809	327.617
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	499.896	505.477
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	216.719	226.923
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	281.206	294.428
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.209	1329.552	1392.083
	Gasoline	MC	Motorcycles	0.271	0.046	209.425	229.985
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	264.026	266.999
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.015	338.940	343.997
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	527.963	534.432
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	214.033	224.114
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.043	274.059	286.943
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.152	967.485	1013.109
	Gasoline	MC	Motorcycles	0.282	0.051	208.204	230.386
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	274.982	277.680
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	341.382	345.250
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	503.861	509.138
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.330	243.267
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.737	308.594
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1233.168	1291.187
	Gasoline	MC	Motorcycles	0.271	0.047	213.654	234.362
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	276.525	279.500
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.016	356.546	361.767
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.020	533.767	540.333
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	233.723	244.737
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	301.781	315.978
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.155	986.276	1032.787
	Gasoline	MC	Motorcycles	0.322	0.051	220.643	244.003
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	275.788	278.298
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	336.872	340.223
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	501.850	506.577
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.758	238.480
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	288.466	302.027
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.201	1276.785	1336.838
	Gasoline	MC	Motorcycles	0.230	0.043	207.179	225.729
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	268.196	270.780
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	328.326	331.433
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	481.191	485.544
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.889	239.658
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	299.497	313.573
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.188	1191.393	1247.432
	Gasoline	MC	Motorcycles	0.228	0.043	205.507	223.914
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	286.986	289.989
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	362.778	367.707
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	532.557	538.528
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	246.456	258.068
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	316.391	331.280
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.138	878.745	920.227
	Gasoline	MC	Motorcycles	0.317	0.050	227.247	250.185

5363

5364 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	271.161	273.783
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	341.901	345.578
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	507.219	512.478
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.454	242.350
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	301.436	315.606
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.155	984.317	1030.694
	Gasoline	MC	Motorcycles	0.299	0.049	219.630	241.694
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.279	275.769
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	334.830	338.092
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	487.295	491.786
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	218.511	228.793
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	278.514	291.605
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.216	1373.312	1437.875
	Gasoline	MC	Motorcycles	0.230	0.043	205.848	224.531
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	280.826	283.368
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	341.442	344.763
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	504.281	509.147
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.148	242.031
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.527	307.331
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1233.420	1291.449
	Gasoline	MC	Motorcycles	0.254	0.044	212.857	232.425
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	275.730	278.779
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	347.703	352.388
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	516.679	522.514
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	238.883	250.144
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	299.721	313.815
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.175	1110.980	1163.302
	Gasoline	MC	Motorcycles	0.309	0.051	220.220	243.158
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	290.997	293.517
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	353.669	357.348
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.014	479.310	483.875
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	239.657	250.939
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.175	311.140
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.212	1345.772	1409.025
	Gasoline	MC	Motorcycles	0.209	0.041	204.890	222.183
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	286.449	289.124
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	353.316	356.995
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	525.497	530.812
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	239.650	250.941
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.375	316.593
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.186	1179.069	1234.560
	Gasoline	MC	Motorcycles	0.262	0.045	216.820	236.811
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.893	276.402
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	332.849	336.053
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	496.916	501.446
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	222.883	233.371
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	282.221	295.484
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.224	1421.619	1488.448
	Gasoline	MC	Motorcycles	0.225	0.043	204.917	223.353
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	282.142	284.575
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	344.962	348.321
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.013	498.138	502.520
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.212	241.045
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.363	307.153
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.225	1425.973	1493.009
	Gasoline	MC	Motorcycles	0.228	0.043	210.333	228.848

5365

5366 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.013	0.010	287.614	291.008
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	357.814	362.580
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.020	531.347	537.953
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	243.609	255.100
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.171	320.573
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.152	962.170	1007.545
	Gasoline	MC	Motorcycles	0.320	0.051	223.392	246.714
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	286.524	289.378
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	358.937	363.104
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.019	536.848	543.145
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.206	256.757
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	317.386	332.317
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.140	891.535	933.600
	Gasoline	MC	Motorcycles	0.313	0.049	226.979	249.277
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	279.166	281.697
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	336.842	340.066
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	469.166	473.504
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	241.494	252.869
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	303.598	317.873
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.184	1170.688	1225.715
	Gasoline	MC	Motorcycles	0.213	0.039	206.825	223.839
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	277.231	279.693
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	340.945	344.406
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	509.036	513.949
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.274	237.964
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.000	0.045	288.047	301.582
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.213	1353.400	1417.043
	Gasoline	MC	Motorcycles	0.246	0.046	211.156	230.922
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	267.507	270.282
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	330.072	333.336
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	494.776	499.111
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.086	245.103
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	313.110	327.825
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.163	1037.695	1086.526
	Gasoline	MC	Motorcycles	0.228	0.043	206.529	224.955
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	284.550	287.681
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.022	0.016	367.750	373.023
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.032	0.025	562.828	570.965
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.909	257.506
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	312.248	326.939
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.010	0.141	894.761	937.013
	Gasoline	MC	Motorcycles	0.360	0.054	230.159	255.248
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	271.658	274.570
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	341.643	346.005
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	512.110	517.915
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	237.122	248.304
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	304.058	318.359
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.192	1216.597	1273.850
	Gasoline	MC	Motorcycles	0.286	0.048	215.673	237.221
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.008	269.620	272.086
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	333.538	337.228
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	489.825	494.885
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	215.074	225.194
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.043	272.173	284.967
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.228	1444.621	1512.534
	Gasoline	MC	Motorcycles	0.236	0.044	202.804	221.946

5367

5368 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	306.838	309.818
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	382.226	386.566
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.027	0.020	570.482	577.213
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.043	274.514	287.463
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.055	349.782	366.249
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.152	963.564	1009.002
	Gasoline	MC	Motorcycles	0.338	0.049	240.372	263.330
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	274.471	277.352
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	344.757	348.789
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.018	518.909	524.821
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	238.286	249.509
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	312.359	327.048
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.200	1270.091	1329.843
	Gasoline	MC	Motorcycles	0.297	0.048	222.388	244.095
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	272.288	275.115
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	339.212	343.122
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.017	506.635	512.082
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	237.351	248.526
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.265	321.706
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.186	1182.601	1238.230
	Gasoline	MC	Motorcycles	0.242	0.044	209.308	228.600
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	263.763	266.322
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	329.893	333.276
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	508.503	513.516
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.691	239.462
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.504	316.722
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.185	1173.201	1228.404
	Gasoline	MC	Motorcycles	0.246	0.045	206.712	226.235
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	267.667	270.457
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	347.990	352.307
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.023	0.019	516.775	522.884
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.063	236.706
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.920	321.353
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.196	1241.849	1300.285
	Gasoline	MC	Motorcycles	0.325	0.052	221.756	245.441
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	269.332	271.717
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	328.505	331.461
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	465.690	469.688
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.612	241.463
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	299.997	314.099
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.002	0.165	1044.962	1094.079
	Gasoline	MC	Motorcycles	0.206	0.039	202.479	219.317
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	273.894	276.503
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	334.056	337.074
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	495.850	500.301
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	231.892	242.812
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.280	311.255
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.196	1241.319	1299.708
	Gasoline	MC	Motorcycles	0.262	0.045	213.315	233.402
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	291.867	294.916
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.021	0.014	375.260	380.091
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.030	0.022	552.126	559.303
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	258.340	270.521
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.053	337.978	353.888
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.150	950.653	995.495
	Gasoline	MC	Motorcycles	0.363	0.051	237.487	261.778

5369

5370 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	275.472	277.873
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.010	333.660	336.770
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	458.354	462.525
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.060	241.931
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.100	305.829
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.209	1328.578	1391.022
	Gasoline	MC	Motorcycles	0.213	0.041	203.483	220.971
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	280.456	283.134
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	342.271	345.521
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	512.934	517.601
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.808	240.624
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	295.337	309.221
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.191	1213.596	1270.680
	Gasoline	MC	Motorcycles	0.257	0.045	213.377	233.156
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	264.918	267.560
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	324.632	327.945
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.014	482.165	486.921
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	225.160	235.759
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	289.664	303.282
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.223	1415.061	1481.588
	Gasoline	MC	Motorcycles	0.271	0.046	212.490	233.072
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	274.407	276.833
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	332.811	336.060
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.014	460.019	464.453
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.143	244.112
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.872	306.636
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.208	1318.498	1380.469
	Gasoline	MC	Motorcycles	0.223	0.042	205.157	223.280
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	286.681	289.160
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	354.339	357.641
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	512.724	516.857
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.039	248.305	259.999
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	321.349	336.468
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.181	1150.652	1204.783
	Gasoline	MC	Motorcycles	0.251	0.042	218.714	237.573
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	281.895	284.557
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	348.387	351.581
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	521.060	525.025
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	250.717	262.527
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.052	330.805	346.363
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.191	1214.194	1271.280
	Gasoline	MC	Motorcycles	0.269	0.044	222.740	242.636
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	278.118	280.656
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	336.421	339.628
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	488.623	493.200
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.816	240.633
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	290.912	304.592
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.210	1335.106	1397.881
	Gasoline	MC	Motorcycles	0.256	0.044	212.091	231.623
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	271.893	274.552
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	339.899	343.431
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	505.115	510.118
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.864	246.964
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.657	325.260
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.164	1041.354	1090.389
	Gasoline	MC	Motorcycles	0.279	0.048	217.605	239.017

5371

5372 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	265.426	268.181
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.009	316.408	319.426
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.011	465.925	469.651
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	224.260	234.809
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	283.617	296.947
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.162	1029.092	1077.489
	Gasoline	MC	Motorcycles	0.193	0.038	201.613	217.788
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	263.534	266.315
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.012	327.237	331.050
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	498.359	503.579
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	218.734	229.026
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	288.641	302.207
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.179	1134.009	1187.362
	Gasoline	MC	Motorcycles	0.243	0.046	205.911	225.611
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	267.396	269.987
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	327.469	330.730
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	478.507	482.732
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	224.156	234.704
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	289.458	303.063
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.193	1225.072	1282.675
	Gasoline	MC	Motorcycles	0.209	0.040	202.173	219.469
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	276.060	279.118
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	343.766	347.861
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.017	506.490	512.049
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	245.126	256.679
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.232	330.053
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1097.992	1149.666
	Gasoline	MC	Motorcycles	0.304	0.049	221.092	243.343
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.961	276.536
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	337.477	341.004
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	505.510	510.612
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.092	238.826
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.893	301.427
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.203	1290.306	1351.005
	Gasoline	MC	Motorcycles	0.279	0.048	215.419	236.774
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	297.398	300.347
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	372.360	376.670
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.019	544.253	550.516
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.042	265.672	278.204
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.053	335.245	351.023
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.143	909.693	952.608
	Gasoline	MC	Motorcycles	0.336	0.049	236.751	259.694
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	293.824	296.773
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	367.576	371.914
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.019	539.581	545.852
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	260.487	272.768
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	326.807	342.186
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.214	1355.166	1418.906
	Gasoline	MC	Motorcycles	0.338	0.050	234.965	258.268
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.954	276.509
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	334.164	337.331
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	498.779	503.210
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.632	244.627
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.000	0.047	298.216	312.230
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.207	1311.685	1373.369
	Gasoline	MC	Motorcycles	0.240	0.045	209.423	228.755

5373

5374 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	268.703	271.458
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	332.287	335.999
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	517.860	523.034
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.538	245.582
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	304.436	318.747
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1098.961	1150.682
	Gasoline	MC	Motorcycles	0.264	0.046	210.721	231.040
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	264.690	267.197
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	324.834	328.210
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	485.057	489.803
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.033	212.465	222.460
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.043	272.797	285.620
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.200	1271.237	1331.027
	Gasoline	MC	Motorcycles	0.242	0.045	202.464	221.879
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.676	282.298
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	339.664	343.069
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	499.024	503.860
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.510	241.360
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.263	306.004
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.205	1300.258	1361.402
	Gasoline	MC	Motorcycles	0.252	0.044	212.427	231.958
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	279.370	281.996
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	343.784	347.455
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	507.054	512.191
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.414	247.545
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.534	314.669
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.210	1331.711	1394.348
	Gasoline	MC	Motorcycles	0.286	0.047	219.259	240.550
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	312.716	315.697
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	390.236	394.761
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.018	563.080	569.076
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.044	280.657	293.902
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.056	356.336	373.114
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.200	1266.650	1326.251
	Gasoline	MC	Motorcycles	0.353	0.049	245.164	268.638
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.008	269.066	271.530
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	329.376	332.995
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	480.838	485.737
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	221.832	232.267
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	281.935	295.186
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.201	1273.138	1333.019
	Gasoline	MC	Motorcycles	0.234	0.044	202.680	221.725
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	283.338	286.386
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.014	360.284	365.063
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.029	0.022	546.843	554.253
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	242.281	253.702
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.231	322.735
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.140	890.536	932.570
	Gasoline	MC	Motorcycles	0.350	0.053	229.114	253.579
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	267.443	269.955
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	328.473	331.780
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	458.339	462.899
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.750	244.748
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	305.639	320.004
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.160	1015.196	1062.930
	Gasoline	MC	Motorcycles	0.234	0.043	206.978	225.697

5375

5376 **Table 5-47. EMFAC County-Specific On-Road Vehicle GHG EFs - 2027 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	276.007	278.396
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	339.770	342.936
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	498.692	503.072
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	231.750	242.658
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.786	312.832
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.191	1214.940	1272.084
	Gasoline	MC	Motorcycles	0.263	0.046	214.069	234.237
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	274.635	277.149
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	335.944	339.484
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	491.343	496.675
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.141	233.642
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	278.829	291.937
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.160	1015.721	1063.580
	Gasoline	MC	Motorcycles	0.276	0.048	213.602	234.819

5377

5378 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Alameda	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	263.759	266.324
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	320.996	324.024
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	475.217	479.163
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.585	237.247
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.896	301.427
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.207	1312.778	1374.489
	Gasoline	MC	Motorcycles	0.214	0.041	204.006	221.560
Alpine	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	256.532	259.299
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.011	317.583	321.234
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.020	0.016	489.039	494.350
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	213.479	223.529
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	276.218	289.206
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.207	1314.180	1375.984
	Gasoline	MC	Motorcycles	0.265	0.046	208.775	228.993
Amador	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.009	258.581	261.402
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.015	332.742	337.509
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	517.743	523.886
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.033	211.188	221.133
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.042	268.002	280.599
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.154	975.431	1021.418
	Gasoline	MC	Motorcycles	0.277	0.050	207.553	229.381
Butte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	269.516	272.113
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	334.311	337.971
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.015	492.745	497.745
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.740	240.553
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	288.231	301.781
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.194	1230.786	1288.687
	Gasoline	MC	Motorcycles	0.265	0.046	212.929	233.289
Calaveras	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	271.050	273.890
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.015	350.127	355.048
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.025	0.019	523.985	530.231
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.036	231.243	242.139
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.370	311.360
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.157	993.775	1040.630
	Gasoline	MC	Motorcycles	0.318	0.051	220.363	243.458
Colusa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	270.561	272.993
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	330.016	333.200
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	492.120	496.613
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	224.762	235.341
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	283.050	296.356
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.199	1265.727	1325.256
	Gasoline	MC	Motorcycles	0.225	0.042	206.441	224.681
Contra Costa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	262.974	265.473
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	321.868	324.855
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	471.671	475.802
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.130	236.767
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	293.925	307.739
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.186	1179.171	1234.632
	Gasoline	MC	Motorcycles	0.222	0.042	204.672	222.753
Del Norte	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	281.211	284.087
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.014	355.911	360.555
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	522.574	528.255
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.039	244.764	256.296
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	310.917	325.547
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.139	884.761	926.516
	Gasoline	MC	Motorcycles	0.312	0.050	226.691	249.325

5379

5380 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
El Dorado	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	265.150	267.679
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	335.012	338.540
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.015	496.965	501.990
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.368	239.118
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	295.655	309.554
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.156	989.889	1036.519
	Gasoline	MC	Motorcycles	0.292	0.048	218.513	240.181
Fresno	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	268.083	270.503
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	328.016	331.125
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	477.566	481.823
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	214.626	224.722
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.043	273.111	285.946
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.214	1357.354	1421.165
	Gasoline	MC	Motorcycles	0.224	0.043	204.951	223.264
Glenn	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	275.434	277.893
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	334.446	337.604
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	493.935	498.546
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.516	239.274
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.775	301.308
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.193	1227.178	1284.909
	Gasoline	MC	Motorcycles	0.249	0.044	212.178	231.431
Humboldt	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	270.293	273.216
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	341.446	345.889
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	506.801	512.357
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	236.023	247.148
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.784	308.646
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.006	0.176	1115.069	1167.576
	Gasoline	MC	Motorcycles	0.303	0.050	219.620	242.223
Imperial	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.008	285.688	288.132
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.011	346.464	349.947
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	469.669	473.987
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.120	247.234
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.000	0.046	291.788	305.500
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.209	1328.730	1391.182
	Gasoline	MC	Motorcycles	0.205	0.040	204.118	221.144
Inyo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	281.094	283.683
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	346.466	349.976
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.015	514.617	519.660
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	235.778	246.884
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	296.754	310.708
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.185	1172.461	1227.635
	Gasoline	MC	Motorcycles	0.256	0.045	216.147	235.821
Kern	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	268.634	271.065
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	326.226	329.282
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	486.767	491.067
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	219.820	230.162
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	277.286	290.317
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.221	1402.318	1468.238
	Gasoline	MC	Motorcycles	0.219	0.042	204.041	222.128
Kings	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	276.789	279.149
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.010	338.047	341.242
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	488.512	492.677
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.075	236.710
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.549	301.065
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.222	1407.244	1473.399
	Gasoline	MC	Motorcycles	0.222	0.042	209.373	227.538

5381

5382 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Lake	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.010	282.120	285.352
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.013	350.696	355.154
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.019	520.696	526.951
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	239.312	250.596
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.380	314.508
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.153	968.384	1014.042
	Gasoline	MC	Motorcycles	0.315	0.051	222.881	245.890
Lassen	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	281.049	283.808
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	352.189	356.156
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.018	526.256	532.268
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.038	242.783	254.218
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	312.055	326.735
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.141	897.517	939.853
	Gasoline	MC	Motorcycles	0.307	0.048	226.350	248.321
Los Angeles	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	274.228	276.687
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	330.474	333.566
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.013	459.177	463.275
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	236.928	248.084
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.330	312.357
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.002	0.182	1155.126	1209.421
	Gasoline	MC	Motorcycles	0.209	0.039	206.408	223.236
Madera	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	271.917	274.301
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	333.841	337.113
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	499.096	503.736
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.844	234.371
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.000	0.045	282.960	296.256
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.211	1339.974	1402.983
	Gasoline	MC	Motorcycles	0.239	0.045	210.005	229.346
Marin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	262.362	265.046
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	323.911	327.066
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	484.247	488.375
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.287	242.171
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	308.454	322.950
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.162	1030.141	1078.613
	Gasoline	MC	Motorcycles	0.223	0.042	205.757	223.872
Mariposa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	278.691	281.662
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.020	0.015	360.831	365.785
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.030	0.023	552.523	560.277
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	243.581	255.066
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	306.711	321.141
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.142	902.723	945.339
	Gasoline	MC	Motorcycles	0.353	0.053	229.451	254.180
Mendocino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.009	266.476	269.277
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.013	335.302	339.439
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.021	0.017	501.591	507.096
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.037	233.083	244.070
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.410	312.444
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.191	1214.907	1272.075
	Gasoline	MC	Motorcycles	0.280	0.048	215.114	236.337
Merced	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	264.437	266.815
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.011	326.162	329.611
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.015	480.441	485.197
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.033	211.983	221.956
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.042	267.515	280.090
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.225	1425.123	1492.119
	Gasoline	MC	Motorcycles	0.229	0.044	201.737	220.460

5383

5384 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Modoc	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	300.919	303.790
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	374.795	378.908
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.026	0.019	558.951	565.330
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.043	271.341	284.139
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.054	340.903	356.950
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.153	969.682	1015.399
	Gasoline	MC	Motorcycles	0.330	0.048	239.249	261.798
Mono	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	269.236	272.018
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	338.122	341.973
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.017	508.033	513.646
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	234.427	245.465
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	307.042	321.481
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.198	1259.793	1319.057
	Gasoline	MC	Motorcycles	0.290	0.047	221.459	242.784
Monterey	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	267.123	269.849
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	332.531	336.238
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.016	496.621	501.788
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.874	244.882
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.053	316.249
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.186	1177.430	1232.811
	Gasoline	MC	Motorcycles	0.237	0.044	208.571	227.547
Napa	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	258.665	261.136
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	323.519	326.755
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	497.798	502.550
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	224.931	235.521
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	297.661	311.652
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.184	1167.575	1222.508
	Gasoline	MC	Motorcycles	0.240	0.044	205.887	225.062
Nevada	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	262.178	264.851
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.016	0.012	342.112	346.238
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.018	506.328	512.157
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.681	234.210
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.705	316.939
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.195	1238.426	1296.694
	Gasoline	MC	Motorcycles	0.319	0.052	221.258	244.617
Orange	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	264.229	266.542
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.010	0.009	322.239	325.091
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.012	0.012	455.416	459.222
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.336	238.031
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.710	308.563
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.002	0.163	1034.025	1082.628
	Gasoline	MC	Motorcycles	0.202	0.039	201.969	218.597
Placer	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	267.969	270.490
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	326.809	329.713
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	484.535	488.766
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.118	238.859
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	291.018	304.699
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.194	1232.887	1290.875
	Gasoline	MC	Motorcycles	0.255	0.045	212.093	231.808
Plumas	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.012	0.009	286.154	289.082
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	368.324	372.894
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.021	541.683	548.544
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.040	255.232	267.264
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.052	332.226	347.864
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.151	957.136	1002.273
	Gasoline	MC	Motorcycles	0.356	0.050	236.837	260.774

5385

5386 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Riverside	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	270.400	272.736
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.010	0.009	327.086	330.060
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	448.424	452.373
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.111	238.842
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.023	300.513
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.207	1313.710	1375.454
	Gasoline	MC	Motorcycles	0.209	0.040	202.802	220.021
Sacramento	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	274.441	277.036
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.009	334.663	337.776
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	499.895	504.315
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.305	236.954
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	289.070	302.659
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.190	1204.592	1261.249
	Gasoline	MC	Motorcycles	0.251	0.044	212.224	231.646
San Benito	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	259.955	262.520
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	317.982	321.134
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	472.844	477.370
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	223.046	233.545
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	284.518	297.893
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.220	1398.219	1463.953
	Gasoline	MC	Motorcycles	0.267	0.046	212.148	232.462
San Bernardino	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	269.290	271.646
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	326.076	329.171
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	449.934	454.116
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	229.886	240.701
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	287.784	301.309
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.205	1302.792	1364.024
	Gasoline	MC	Motorcycles	0.218	0.042	204.330	222.145
San Diego	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	281.175	283.577
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	347.411	350.578
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	502.215	506.127
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.039	245.476	257.036
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	315.586	330.434
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.179	1138.590	1192.151
	Gasoline	MC	Motorcycles	0.247	0.042	218.149	236.771
San Francisco	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	276.356	278.936
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.009	342.019	345.124
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.012	507.624	511.414
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.039	246.629	258.243
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.051	324.932	340.214
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.188	1192.548	1248.616
	Gasoline	MC	Motorcycles	0.264	0.044	222.256	241.909
San Joaquin	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	272.871	275.332
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	329.488	332.542
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.013	478.186	482.509
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	226.622	237.287
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	285.657	299.091
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.208	1322.289	1384.459
	Gasoline	MC	Motorcycles	0.250	0.043	211.287	230.465
San Luis Obispo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	266.516	269.082
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	333.399	336.775
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	494.355	499.110
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.659	244.654
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	305.767	320.138
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.164	1043.670	1092.807
	Gasoline	MC	Motorcycles	0.273	0.048	216.716	237.744

5387

5388 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
San Mateo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.008	261.175	263.881
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	311.212	314.181
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.013	0.011	457.485	461.119
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	221.386	231.798
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	278.474	291.562
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.160	1016.367	1064.164
	Gasoline	MC	Motorcycles	0.191	0.038	201.462	217.496
Santa Barbara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	258.419	261.094
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	320.839	324.460
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	486.733	491.660
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	216.620	226.810
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	284.288	297.650
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.178	1129.223	1182.346
	Gasoline	MC	Motorcycles	0.238	0.045	205.167	224.524
Santa Clara	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	262.322	264.836
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	321.195	324.339
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.012	468.736	472.753
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	220.695	231.079
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	284.009	297.358
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.191	1209.198	1266.053
	Gasoline	MC	Motorcycles	0.205	0.040	201.634	218.690
Santa Cruz	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	270.797	273.737
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.015	0.012	337.237	341.134
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.019	0.016	494.954	500.211
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	242.060	253.466
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.049	309.806	324.371
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1096.182	1147.765
	Gasoline	MC	Motorcycles	0.299	0.049	220.601	242.546
Shasta	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	268.643	271.129
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.010	330.654	334.008
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	494.474	499.310
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	225.661	236.279
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	282.353	295.626
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.202	1282.996	1343.347
	Gasoline	MC	Motorcycles	0.273	0.048	214.636	235.619
Sierra	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	291.812	294.668
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	365.222	369.317
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.018	532.859	538.811
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	262.751	275.144
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.052	329.619	345.132
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.008	0.144	913.788	956.885
	Gasoline	MC	Motorcycles	0.330	0.048	236.044	258.639
Siskiyou	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	288.154	290.999
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.017	0.012	360.575	364.696
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.024	0.018	528.458	534.412
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.041	257.678	269.825
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.050	320.395	335.471
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.211	1341.648	1404.748
	Gasoline	MC	Motorcycles	0.330	0.049	234.063	256.971
Solano	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.008	268.683	271.150
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	327.353	330.377
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	488.387	492.577
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	230.685	241.540
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.000	0.046	292.766	306.523
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.204	1297.031	1358.024
	Gasoline	MC	Motorcycles	0.234	0.044	208.464	227.441

5389

5390 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Sonoma	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.010	0.008	263.620	266.279
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.014	0.011	325.833	329.379
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.015	506.582	511.496
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	232.003	242.925
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	298.745	312.788
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.173	1098.794	1150.501
	Gasoline	MC	Motorcycles	0.258	0.045	209.921	229.882
Stanislaus	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	259.569	261.997
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	318.043	321.246
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	475.267	479.768
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.033	209.577	219.436
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.042	267.741	280.326
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.199	1263.108	1322.512
	Gasoline	MC	Motorcycles	0.236	0.044	201.620	220.654
Sutter	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.642	276.177
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	331.823	335.050
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.017	0.014	488.236	492.828
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	227.042	237.728
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.045	286.026	299.474
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.203	1290.043	1350.704
	Gasoline	MC	Motorcycles	0.246	0.044	211.313	230.504
Tehama	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.009	0.008	273.950	276.484
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.013	0.011	336.733	340.212
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	496.523	501.394
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.037	233.706	244.709
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	294.769	308.632
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.208	1321.882	1384.053
	Gasoline	MC	Motorcycles	0.279	0.047	218.333	239.230
Trinity	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	306.795	309.669
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.018	0.013	382.621	386.903
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.022	0.017	551.496	557.172
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.003	0.044	276.714	289.770
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.002	0.055	348.097	364.486
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.005	0.199	1261.292	1320.636
	Gasoline	MC	Motorcycles	0.345	0.049	244.312	267.423
Tulare	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	264.030	266.419
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	322.466	325.876
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.016	0.014	472.027	476.665
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.034	218.243	228.507
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.044	276.276	289.260
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.199	1263.823	1323.262
	Gasoline	MC	Motorcycles	0.228	0.043	201.627	220.276
Tuolumne	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.011	0.009	277.471	280.377
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.019	0.014	353.560	358.075
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.028	0.021	536.678	543.729
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.002	0.038	238.962	250.225
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.048	302.132	316.347
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.009	0.141	897.222	939.562
	Gasoline	MC	Motorcycles	0.344	0.052	228.547	252.662
Ventura	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	262.342	264.771
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.010	322.000	325.164
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.015	0.013	448.790	453.101
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	231.023	241.891
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.047	300.384	314.502
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.003	0.159	1009.398	1056.858
	Gasoline	MC	Motorcycles	0.229	0.043	206.220	224.637

5391

5392 **Table 5-48. EMFAC County-Specific On-Road Vehicle GHG EFs - 2028 (cont.)**

County	Fuel Type	Vehicle Type		Emission Factors (g/mi) Greenhouse Gas Species			
				CH_4	N_2O	CO_2	CO_2e
Yolo	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	269.963	272.273
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.011	0.009	332.259	335.288
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.014	0.013	487.627	491.802
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.036	228.104	238.839
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.046	292.750	306.512
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.004	0.190	1208.843	1265.696
	Gasoline	MC	Motorcycles	0.257	0.045	212.962	232.790
Yuba	Gasoline	LDGV	Light-Duty Vehicles (Passenger Cars)	0.008	0.007	269.134	271.556
	Gasoline	LDGT	Light-Duty Trucks (0-8,500 lbs)	0.012	0.010	328.361	331.678
	Gasoline	HDGV	Heavy-Duty Vehicles (8,501 + lbs)	0.018	0.015	481.005	486.033
	Diesel	LDDV	Light-Duty Vehicles (Passenger Cars)	0.001	0.035	220.816	231.208
	Diesel	LDDT	Light-Duty Trucks (0-8,500 lbs)	0.001	0.043	273.927	286.804
	Diesel	HDDV	Heavy-Duty Vehicles (8,501 + lbs)	0.007	0.161	1019.344	1067.365
	Gasoline	MC	Motorcycles	0.272	0.047	212.943	233.849

5393

Table 5-49. OCONUS On-Road Composite Vehicle Emission Factors – POV

Year	Vehicle Type	Emission Factors (g/mi)										
		Criteria Pollutants and Ozone Precursors										
		CO	VOC	NO_x	SO_X	PM_{10}	$PM_{2.5}$	NH_3	CH_4	N_2O	CO_2	CO_2e
2024	All Vehicles	4.055	0.305	0.272	0.002	0.007	0.006	0.049	0.020	0.011	402.495	406.179
2025	All Vehicles	3.881	0.296	0.247	0.002	0.007	0.006	0.047	0.019	0.010	395.747	399.311
2026	All Vehicles	3.653	0.269	0.215	0.002	0.006	0.006	0.046	0.017	0.010	389.978	393.446
2027	All Vehicles	3.513	0.262	0.197	0.002	0.006	0.005	0.044	0.016	0.010	384.105	387.507
2028	All Vehicles	3.344	0.249	0.176	0.002	0.006	0.005	0.043	0.015	0.010	379.141	382.472

Table 5-50. OCONUS On-Road Composite Vehicle Emission Factors – GOV

Year	Vehicle Type	Emission Factors (g/mi)										
		Criteria Pollutants and Ozone Precursors										
		CO	VOC	NO_x	SO_X	PM_{10}	$PM_{2.5}$	NH_3	CH_4	N_2O	CO_2	CO_2e
2024	All Vehicles	3.815	0.238	0.787	0.002	0.017	0.016	0.047	0.024	0.039	611.575	623.933
2025	All Vehicles	3.685	0.229	0.738	0.002	0.015	0.014	0.046	0.024	0.040	601.646	614.012
2026	All Vehicles	3.426	0.201	0.676	0.002	0.014	0.013	0.045	0.022	0.040	593.072	605.449
2027	All Vehicles	3.298	0.188	0.619	0.002	0.012	0.011	0.044	0.021	0.040	584.430	596.811
2028	All Vehicles	2.923	0.167	0.518	0.002	0.010	0.009	0.044	0.021	0.040	573.055	585.454

5399

Table 5-51. On-Road Vehicle Speciated VOC Weight Fractions

VOC	HAP	LDGV[a]	LDDV[b]	LDGT[a]	LDDT[b]	HDGV[a]	HDDV[b]	MC[c]
Acetylene		4.05%	8.02%	3.61%	8.52%	2.90%	---	---
Acetaldehyde	X	0.29%	---	1.64%	---	---	---	---
Acrolein	X	0.24%	---	0.40%	---	---	---	---
Alpha-pinene		0.06%	---	0.08%	---	---	---	---
Benzaldehyde		0.29%	---	1.19%	---	---	---	---
Benzene	X	5.89%	2.23%	5.61%	2.91%	1.91%	---	3.99%
Beta-pinene		0.03%	---	0.02%	---	---	---	---
1,3-Butadiene	X	0.57%	1.08%	0.62%	1.44%	---	---	---
Butane		0.37%	0.46%	0.41%	0.32%	24.42%	---	0.65%
1-Butene		2.22%	1.68%	2.47%	2.01%	1.21%	---	2.32%
cis-2-Butene		0.14%	0.61%	0.14%	0.77%	0.73%	---	0.48%
trans-2-Butene		0.35%	2.25%	0.30%	0.24%	0.97%	---	0.29%
Butylbenzene		---	---	---	---	0.23%	---	---
o-tert-Butyltoluene		---	---	---	0.19%	---	1.09%	---
tert-Butyl-m-Xylene		---	---	---	---	---	0.74%	---
Butyraldehyde		0.04%	---	0.42%	---	---	---	---
C6 olefin		---	2.80%	---	2.23%	---	---	---
Crotonaldehyde		0.02%	---	0.06%	---	---	---	---
Cyclohexane		0.50%	---	0.32%	---	---	1.72%	0.19%
Cyclohexene		0.07%	---	0.04%	---	1.72%	0.32%	---
Cyclopentadiene		---	0.53%	---	0.24%	---	---	---
Cyclopentane		0.22%	0.57%	0.20%	0.44%	0.52%	1.09%	1.09%
Cyclopentene		0.12%	0.53%	0.12%	0.39%	0.32%	0.51%	0.31%
Cyclopentylcyclopentane		---	---	---	---	0.50%	---	---
Decane		0.25%	1.30%	0.17%	1.65%	0.12%	1.39%	---
Diethylbenzene		---	0.31%	---	0.39%	---	1.46%	---
1,2-Diethylbenzene		0.09%	0.15%	0.05%	---	0.33%	---	---
1,3-Diethylbenzene		0.29%	---	0.30%	---	0.25%	---	---
1,4-Diethylbenzene		0.12%	---	0.07%	---	---	---	---
Dimethyl Ethylbenzene		---	0.23%	---	0.29%	---	2.30%	---
2,2-Dimethylbutane		0.55%	---	0.49%	---	0.24%	1.13%	1.70%
2,3-Dimethylbutane		0.88%	0.69%	0.87%	0.53%	1.07%	0.61%	1.78%
3,3-Dimethyl-1-butene		---	0.53%	---	---	---	---	---
1,1-Dimethylcyclohexane		0.06%	---	0.06%	---	---	---	---
cis-1,2-Dimethylcyclohexane		---	---	---	---	---	0.32%	---
trans-1,2-Dimethylcyclohexane		---	0.15%	---	0.39%	---	1.50%	---
cis-1,3-Dimethylcyclohexane		---	---	---	---	---	2.07%	---
Cis-1,4-Dimethylcyclohexane		---	---	---	---	0.09%	0.23%	---
cis-1,3-Dimethylcyclopentane		---	---	---	0.68%	---	0.72%	---
Dimethylheptane		0.08%	0.88%	0.08%	1.11%	0.09%	---	---
2,5-Dimethylheptane		---	0.15%	---	0.19%	---	---	---
2,6-Dimethylheptane		---	0.23%	---	0.58%	---	---	---
2,3-Dimethylheptane		---	---	---	---	---	0.65%	---
2,5-Dimethylheptane		0.19%	---	0.18%	---	0.14%	---	---
2,6-Dimethylheptane		---	---	---	---	---	---	---
3,3-Dimethylheptane		0.05%	---	0.04%	---	---	---	---

VOC	HAP	LDGV[a]	LDDV[b]	LDGT[a]	LDDT[b]	HDGV[a]	HDDV[b]	MC[c]
3,5-Dimethylheptane		---	---	---	---	---	2.18%	---
4,4-Dimethylheptane		---	0.08%	---	---	---	---	---
2,3-Dimethylhexane		0.29%	---	0.36%	---	---	0.38%	---
2,4-Dimethylhexane		0.58%	0.46%	0.68%	0.23%	0.46%	0.25%	---
2,5-Dimethylhexane		0.39%	---	0.45%	---	---	0.21%	---
3,3-Dimethylhexane		---	---	---	---	---	0.11%	---
Dimethyloctane		0.08%	0.31%	0.05%	0.39%	0.08%	---	---
2,2-Dimethyloctane		---	---	---	---	---	0.43%	---
2,3-Dimethyloctane		---	---	---	---	0.57%	---	---
2,4-Dimethyloctane		---	0.15%	---	0.19%	---	2.56%	---
2,4-Dimethylpentane		0.85%	0.08%	0.90%	---	0.70%	0.22%	2.29%
2,2-Dimethylpentane		---	0.08%	---	---	---	---	---
2,3-Dimethylpentane		1.25%	0.15%	1.32%	0.44%	---	1.36%	0.95%
3,3-Dimethylpentane		---	---	---	---	---	0.59%	---
2,2-Dimethylpropane		---	0.33%	---	0.68%	---	---	---
Dipente		0.42%	---	0.33%	---	---	---	---
Dodecane		0.48%	0.50%	0.22%	0.61%	---	3.01%	---
Ethene		---	28.13%	---	30.07%	---	---	---
Ethyl tert-butyl ether		---	---	---	0.39%	---	2.98%	---
Ethylbenzene	X	2.56%	0.38%	2.28%	0.48%	0.73%	1.29%	1.99%
Ethylcyclohexane		---	---	---	---	---	7.69%	---
Ethylene		7.39%	---	6.59%	---	4.74%	---	---
3-Ethylhexane		---	0.15%	---	0.29%	---	0.70%	---
cis-1-Ethyl-2-Methylcyclopentane		---	0.15%	---	---	---	---	---
3-Ethylpentane		0.31%	---	0.27%	---	---	---	---
3-Ethyltoluene		2.02%	---	1.71%	---	0.17%	---	---
Formaldehyde	X	1.06%	---	3.37%	---	---	---	---
Glyoxal		0.03%	---	0.01%	---	---	---	---
Heptane		1.11%	0.08%	1.06%	0.19%	0.79%	0.77%	2.19%
1-Heptene		0.16%	---	0.08%	---	---	---	---
cis-2-Heptene		---	0.15%	---	---	---	---	---
trans-2-Heptene		---	0.15%	---	---	---	---	---
Trans-3-Heptene		0.03%	---	0.04%	---	---	---	---
Hexaldehyde		0.09%	---	0.11%	---	---	---	---
Hexane	X	1.51%	---	1.83%	0.19%	1.67%	2.40%	1.42%
1-Hexene		0.16%	0.94%	0.16%	0.83%	0.30%	1.77%	---
cis-2-Hexene		0.08%	0.23%	0.08%	---	0.12%	---	0.06%
trans-2-Hexene		0.14%	0.46%	0.14%	---	---	---	0.10%
cis-3-Hexene		0.02%	---	0.02%	---	---	---	---
Hexyne		---	---	---	---	0.02%	---	---
Indan		0.24%	---	0.17%	---	0.35%	---	---
Isohexane		---	---	2.66%	---	3.06%	---	---
Isopropylcyclohexane		0.04%	---	0.02%	---	---	---	---
Methylbenzaldehyde		0.02%	---	0.17%	---	---	---	---
2-Methyl-1,3-Butadiene		---	0.54%	---	0.58%	0.11%	---	---
2-Methylbutane		0.27%	0.31%	0.24%	0.39%	12.02%	---	14.59%

5400
5401

5402 **Table 5-51. On-Road Vehicle Speciated VOC Weight Fractions**

VOC	HAP	LDGV[a]	LDDV[b]	LDGT[a]	LDDT[b]	HDGV[a]	HDDV[b]	MC[c]
2-Methyl-1-Butene		1.71%	4.20%	1.53%	2.27%	---	---	---
2-Methyl-2-Butene		0.32%	0.23%	0.39%	---	0.12%	---	1.08%
3-Methyl-1-Butene		6.54%	---	5.86%	---	0.15%	---	0.14%
Methyl-tert-Butyl Ether	X	0.02%	---	0.05%	---	---	---	---
Methylcyclohexane		0.44%	0.28%	0.40%	0.43%	0.28%	1.62%	0.43%
Methylcyclooctane		---	---	---	---	0.36%	---	---
Methylcyclopentane		1.10%	0.08%	1.04%	0.10%	1.21%	0.44%	1.83%
1-Methylcyclopentene		---	0.23%	---	---	0.03%	---	---
2-Methyldecane		---	---	---	---	0.69%	---	---
Methylethylbenzene	X	0.19%	0.53%	0.15%	0.68%	---	2.39%	0.40%
1-Methyl-2-Ethylbenzene		0.75%	---	0.62%	---	---	---	---
cis-1-Methyl-3-Ethylcyclopentane		---	1.22%	---	0.74%	---	---	---
1-Methyl-4-Ethylbenzene		0.92%	---	0.78%	---	---	---	---
Methyl ethyl ketone		0.05%	---	0.07%	---	---	---	---
2-Methylheptane		0.67%	0.15%	0.53%	---	0.28%	0.44%	1.61%
3-Methylheptane		0.75%	---	0.69%	---	0.38%	0.44%	1.67%
4-Methylheptane		0.28%	0.08%	0.28%	---	0.27%	---	---
2-Methylhexane		1.39%	---	1.34%	---	---	0.52%	3.18%
3-Methylhexane		1.54%	0.61%	1.38%	---	---	1.72%	2.57%
3-Methyl-1-Hexene		---	---	---	0.58%	---	---	---
4-Methyl-1-Hexene		0.03%	---	0.03%	---	---	---	---
1-Methyl-2-Isopropylbenzene		0.03%	---	0.02%	---	---	---	---
1-Methyl-3-isopropylbenzene		0.09%	---	0.06%	---	---	---	---
1-Methyl-4-Isopropylbenzene		0.02%	---	0.02%	---	---	---	---
2-Methyloctane		0.38%	0.15%	0.23%	---	0.04%	0.92%	---
3-Methyloctane		0.34%	0.08%	0.29%	---	0.34%	1.81%	---
4-Methyloctane		---	---	---	---	0.42%	---	---
2-Methylpentane		2.68%	0.28%	---	0.32%	---	3.80%	5.81%
3-Methylpentane		1.85%	0.53%	1.80%	1.21%	1.68%	1.20%	3.48%
3-Methyl-cis-2-Pentene		0.09%	---	0.09%	---	---	---	---
2-Methyl-1-Pentene		0.11%	1.30%	0.11%	0.74%	---	---	0.22%
2-Methyl-2-Pentene		0.10%	0.08%	0.08%	---	0.37%	---	---
3-Methyl-trans-2-Pentene		0.10%	---	0.08%	---	---	0.23%	---
4-Methyl-1-Pentene		---	0.79%	---	0.90%	---	---	---
4-Methyl-trans-2-Pentene		---	---	---	---	---	2.62%	---
2-Methylpropane		0.30%	0.15%	0.31%	0.19%	3.74%	---	0.20%
2-Methyl-2-Propenal		0.04%	---	0.17%	---	---	---	---
2-Methylpropene		---	2.29%	---	2.01%	---	---	---
(1-methylpropyl)benzene		0.06%	---	0.04%	---	0.05%	---	---
(2-methylpropyl)benzene		0.06%	---	0.05%	---	---	---	---
1-Methyl-3-propylbenzene		0.16%	---	0.11%	---	0.17%	---	---
Methylpyrene		---	---	---	---	---	1.11%	---
Methylfluoranthene		---	---	---	---	---	---	---
Methylpyrene		---	---	---	---	---	---	---
Naphthalene	X	0.07%	---	0.03%	---	---	---	---

VOC	HAP	LDGV[a]	LDDV[b]	LDGT[a]	LDDT[b]	HDGV[a]	HDDV[b]	MC[c]
Nonanal		0.53%	---	0.29%	---	---	---	---
Nonane		0.33%	0.64%	0.24%	0.77%	0.12%	0.98%	0.56%
Nonene		---	0.73%	---	0.92%	---	---	---
1-Nonene		0.11%	0.69%	0.10%	0.29%	---	1.22%	---
trans-2-Nonene		---	---	---	---	0.19%	---	---
Octanal		0.03%	---	0.02%	---	---	---	---
Octane		0.60%	0.20%	0.51%	0.45%	0.26%	1.55%	0.89%
1-Octene		0.03%	---	0.05%	---	---	---	---
Pentane		0.06%	1.91%	0.08%	1.52%	5.29%	---	8.14%
1-Pentene		0.37%	2.98%	0.38%	3.23%	0.45%	---	0.27%
cis-2-Pentene		0.20%	0.15%	0.20%	---	1.06%	---	0.35%
trans-2-Pentene		0.39%	1.30%	0.37%	0.97%	0.89%	---	0.58%
Pentylbenzene		---	---	---	---	---	1.62%	---
Pentyne		---	---	---	---	0.21%	---	---
trans-1-Phenylbutene		---	---	---	---	0.25%	---	---
4-Phenyl-1-Butene		---	---	---	---	0.28%	---	---
1,2-Propadiene		---	---	---	---	0.12%	---	---
Propane		0.24%	0.31%	0.23%	3.00%	---	---	---
Propene		4.23%	9.08%	4.56%	8.79%	1.71%	---	1.11%
Propionaldehyde	X	0.04%	---	0.11%	---	---	---	---
Propylbenzene		0.59%	0.20%	0.49%	0.29%	0.34%	0.51%	0.65%
Propylcyclopentane		---	---	---	---	---	---	---
Propyltoluene		---	---	---	---	---	3.37%	---
Propyne		---	0.38%	---	0.10%	0.26%	---	---
Styrene	X	0.13%	0.84%	0.10%	---	---	2.04%	0.23%
Tetramethylbenzene		0.26%	0.27%	0.18%	0.42%	---	14.53%	---
1,2,3,4-Tetramethylbenzene		0.18%	---	0.09%	---	---	---	---
1,2,4,5-Tetramethylbenzene		0.20%	---	0.13%	---	---	---	---
Toluene	X	11.19%	1.62%	10.57%	2.06%	3.25%	---	12.52%
Trimethylbenzene		3.28%	0.31%	2.55%	0.39%	1.57%	4.27%	1.43%
1,2,3-Trimethylbenzene		0.34%	0.23%	0.30%	---	0.28%	---	---
1,3,5-Trimethylbenzene		0.89%	---	0.78%	0.39%	1.32%	---	1.99%
2,2,3-Trimethylbutane		0.03%	---	0.03%	---	---	0.23%	---
1,2,3-Trimethylcyclopentane		---	0.61%	---	---	---	---	---
2,2,5-Trimethylhexane		0.38%	0.15%	0.43%	---	0.26%	0.46%	---
2,3,5-Trimethylhexane		---	0.15%	---	0.19%	0.09%	---	---
2,2,4-Trimethylpentane	X	2.25%	0.94%	4.04%	0.77%	1.63%	0.24%	1.45%
2,3,3-Trimethylpentane		---	---	---	0.10%	0.46%	---	---
2,3,4-Trimethylpentane		0.67%	0.46%	0.92%	0.24%	0.28%	0.33%	0.71%
2,4,4-Trimethyl-1-pentene		0.02%	0.08%	0.04%	---	1.88%	---	---
2,4,4-Trimethyl-2-pentene		---	0.31%	---	---	---	---	---
Undecane		0.13%	1.11%	0.09%	1.40%	0.15%	2.64%	---
1-Undecene		---	---	---	---	0.15%	---	---
Valeraldehyde		0.01%	---	0.01%	---	---	---	---
Xylenes (Mixed Isomers)	X	9.50%	1.90%	8.20%	2.08%	3.02%	---	10.11%

5403
5404 a. SOURCE: Data provided by the EPA's *SPECIATE* database version 4.4.
5405 b. SOURCE: *Diesel Unregulated Emissions Characterization.* CRC Report No. E-75-2, Coordinating Research Council, Inc., July 2010.
5406 c. SOURCE: *Air Pollutant Emission Factors from New and In-Use Motorcycles.* Atmospheric Environment, April 2000.
5407 "X" Indicates compound is a HAP
5408 "---" Indicates No Data Available

5.6 References

AGA, "Natural Gas Vehicles," Arkansas Gas Association

AE 2000; Tsai, Jiun-Horng, Yih-Chyun Hsu, Hung-Cheng Weng, Wen-Yinn Lin, and Fu-Tien Jeng. "Air Pollutant Emission Factors from New and In-Use Motorcycles." Atmospheric Environment, April 2000

CCAR 2007, "California Climate Action Registry General Reporting Protocol Version 2.2," California Climate Action Registry (CCAR), 2007

CRC 2010, "Diesel Unregulated Emissions Characterization. CRC Report No. E-75-2," Coordinating Research Council, Inc., July 2010.

DoD 2006, "Effect of Biodiesel on Diesel Engine Nitrogen Oxide and Other Regulated Emissions (Project Number WP-0308)," Department of Defense Department of Defense Environmental Security Technology Certification Program, May 2006

ECARS 2021, "Employee-Certification and Reporting System (ECARS)," data collected on November 2021.

Mobile6.2, "Particulate Emission Factor Model Technical Description: Emission Factor tables"

USAF 2003a, "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (IERA/RSEQ, IERA-RS-BR-SR-2001-0010)," United States Air Force. January 2003 (Revised December 2003)

USAF 2009, "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations," United States Air Force, December 2009

USDoE 2002, "Clean Alternative Fuels: Compressed Natural Gas," Energy Efficiency and Renewable Energy, Alternative Fuel Data Center, U.S. Department of Energy (USDoE), 2002

USEPA 2011, " Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources (AP-42), Section 13.2.1, "Paved Roads," U.S. Environmental Protection Agency, January 2011

USEPA 1998, "Emission Facts: Idling Vehicle Emissions (EPA420-F-98-014)," U.S. Environmental Protection Agency, April 1998

USEPA 2001a, "Certification and Fuel Economy Information System," U.S. Environmental Protection Agency, Office of Transportation Air Quality, March 2001

5438 USEPA 2001b, "Fleet Characterization Data for MOBILE6: Development and Use of Age
5439 Distributions, Average Annual Mileage Accumulation Rates, and Projected Vehicle Counts for
5440 Use in MOBILE6 (EPA420-R-01-047)," U.S. Environmental Protection Agency, September
5441 2001

5442 USEPA 2002a, "Clean Alternative Fuels: Ethanol (EPA 420-F-00-035)," U.S. Environmental
5443 Protection Agency, Office of Transportation and Air Quality, March 2002

5444 USEPA 2002b, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions (EPA
5445 420-P-02-001)," U.S. Environmental Protection Agency, October 2002

5446 USEPA 2002c, "Clean Alternative Fuels: Compressed Natural Gas (EPA 420- F-00-033)," U.S.
5447 Environmental Protection Agency, March 2002

5448 USEPA 2003b, "Users Guide to MOBILE6.1 and MOBILE6.2 Mobile Source Emission Factor
5449 Model (EPA 420-R-03-010)," U.S. Environmental Protection Agency, August 2003

5450 USEPA 2006a, "E85 and Flex Fuel Vehicles (EPA 420-F-06-047)," United States
5451 Environmental Protection Agency, Office of Transportation Air Quality, October 2006.

5452 USEPA 2006b, "Biodiesel (EPA 420-F- 06-044)," U.S. Environmental Protection Agency,
5453 Office of Transportation Air Quality, October 2006.

5454 USEPA 2006c, "Compilation of Air Pollutant Emission Factors -Volume I (AP-42, Volume I),
5455 5th Edition, Chapter 13.2.1, Miscellaneous Sources - Paved Roads," U.S. Environmental
5456 Protection Agency, November 2006

5457 USEPA 2006d, " Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point
5458 and Area Sources (AP-42), Section 13.2.2, "Unpaved Roads," U.S. Environmental Protection
5459 Agency, November 2006

5460 USEPA 2007, "Guidance on the Use of Models and Other Analyses for Demonstrating
5461 Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze (EPA454/B-07-002),"
5462 U.S. Environmental Protection Agency, April 2007

5463 USEPA 2014, "SPECIATE, Version 4.4," U.S. Environmental Protection Agency, February
5464 2014

5465 USEPA, Mobile 6, MOBILE6 Vehicle Emission Modeling Software, United States
5466 Environmental Protection Agency

5467 VEMSO, "Air Force Vehicle and Equipment Management Office"

5468

5469 **This page intentionally left blank.**

5470

6.0 FUEL TRANSFER (FDSP, FLD) – EXCLUDES ON-ROAD VEHICLE REFUELING

- *Fugitive Source*
- *Mobile Source* – When fuel is dispensed to mobile equipment.
- *Stationary Source* – Fuel spills and when dispensed to stationary equipment.

***The USAF recommends that most emissions generated during the transfer (dispensing) of fuel into *on-road* vehicles be classified as mobile emissions. However, if the regulator insists this category be included as a stationary source, subtract those emissions from the Mobile AEI, and add them to the Stationary AEI to avoid duplicate reporting. This is accomplished by manually calculating emissions generated from on-road vehicle refueling using the procedures given in this section, then subtracting those values from the emissions generated by on-road vehicles covered in the previous section. ***

6.1 Introduction

Fuel transfer includes the dispensing of fuel into non-road engines and equipment, aircraft, and fuel trucks. **Note that the emissions from the refueling of *VEHEs* are not addressed here since those emissions are accounted for in the EFs generated by the MOVES4 model as explained in the previous chapter.** Emissions from fuel dispensing are the result of vapors being displaced as fuel is added to the fuel tank. The amount of vapor released to the atmosphere is a function of the gas and fuel tank temperatures, the vapor pressure of the fuel, the dispensing rate, and the presence of vapor emission control devices. **The vapor that is emitted into the atmosphere is composed of both VOCs and HAPs and is considered fugitive in nature.**

Minor fuel spills are an inevitable consequence of fuel dispensing. Typically, these spills are individually insignificant though may collectively result in a substantial release of VOC and HAP emissions. **Emissions from minor spills are accounted for in the "Fuel Transfer" section of the Stationary Guide to produce a conservative emissions calculation. Emissions from significant spills, which are those spills that are reported to the Environmental or Civil Engineering Environmental office, are not addressed here but described in the "Fuel Spills" section of the Transitory Guide.** The vapor emissions of concern from fuel dispensing operations are described by the simple control volume given in Figure 6-1.

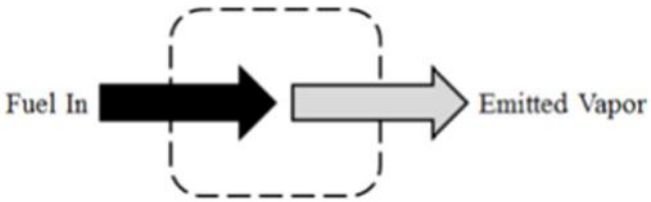


Figure 6-1. Simple Fuel Dispensing Control Volume

The loading method used in the fuel transfer process has a significant effect on the amount of vapor emissions generated during the transfer activity. There are two main fuel loading methods: splash loading and submerged loading. The splash loading method involves the lowering of the fill pipe into the tank and **above the liquid level**. The loading of the fuel using the splash method results in significant turbulence, which increases the amount of vapor released into the atmosphere. The alternative method, submerged loading, may be further subdivided into two techniques: the submerged fill pipe method and the bottom-loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the storage tank. In the bottom loading method, a fill pipe is permanently attached to the bottom of the storage tank. In both cases, the fill pipe is **below the liquid level.** Therefore, turbulence is minimized, and vapor emissions are greatly reduced when compared to the splash loading method. Each method is shown in Figure 6-2.

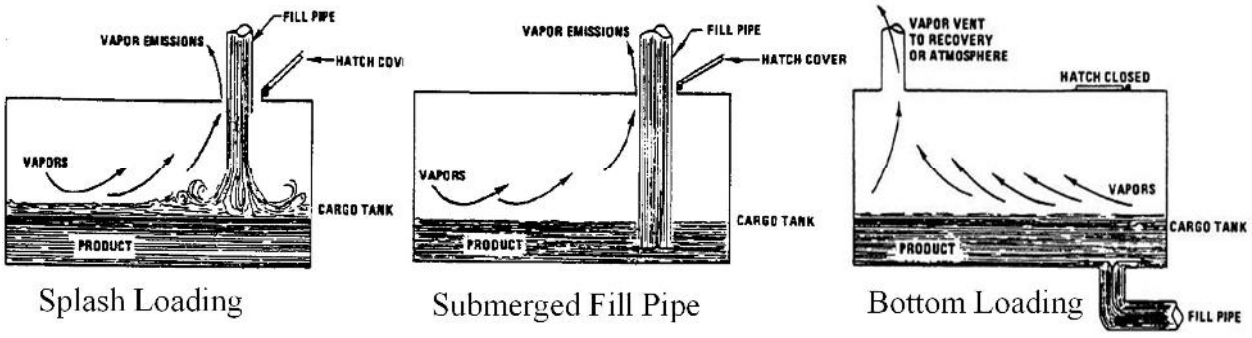


Figure 6-2. Splash Loading, Submerged Fill Pipe, and Bottom Loading Methods

There are several challenges to calculating evaporative emissions from fuel transfer activities. These challenges include the use of several different fuels used on base, such as gasoline, diesel, or JP-8 fuel, and their different vapor pressures. Furthermore, there are multiple destinations for fuels on base that may make it more difficult to gather data or determine what emissions are classified as mobile or stationary. To simplify how each base should calculate fuel transfer emissions, a diagram of the typical transfer methods and destinations of fuel on base is provided in Figure 6-3.

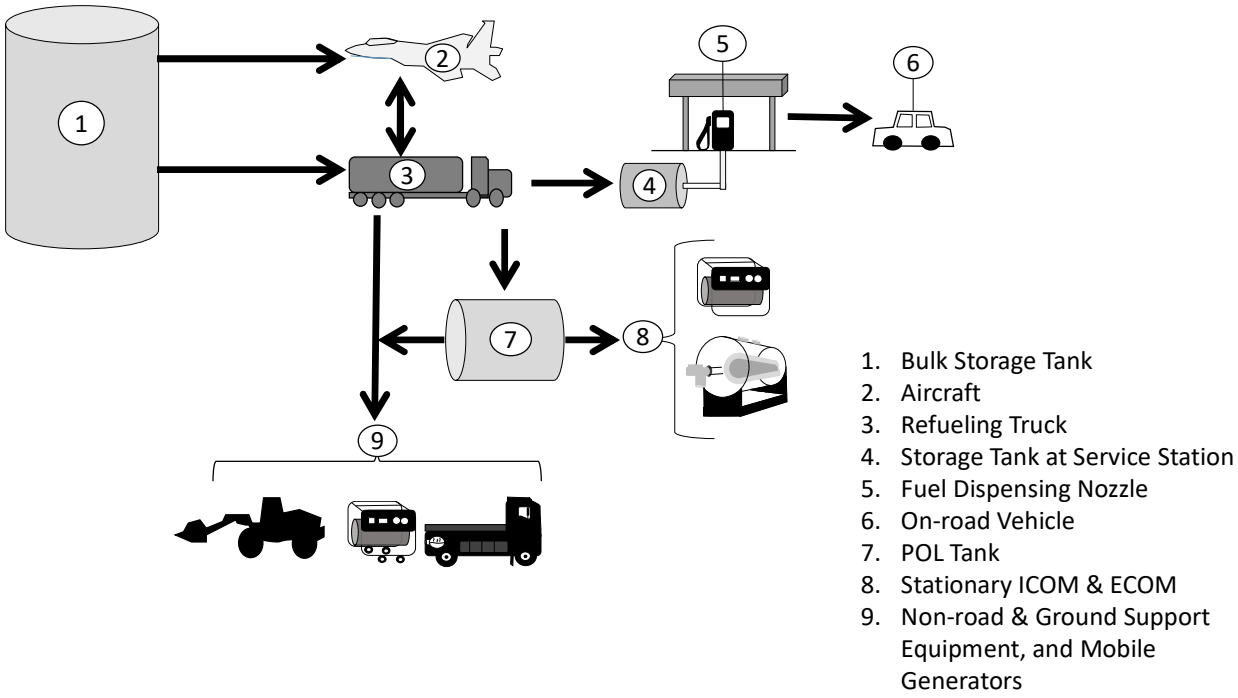
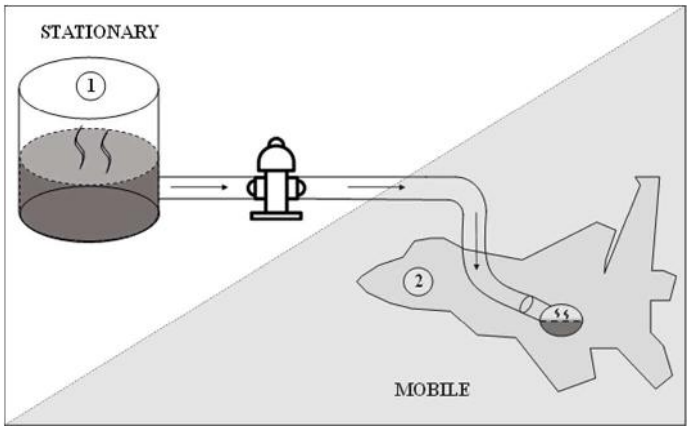


Figure 6-3. Typical On-Base Fuel Transfer Activities and Destinations

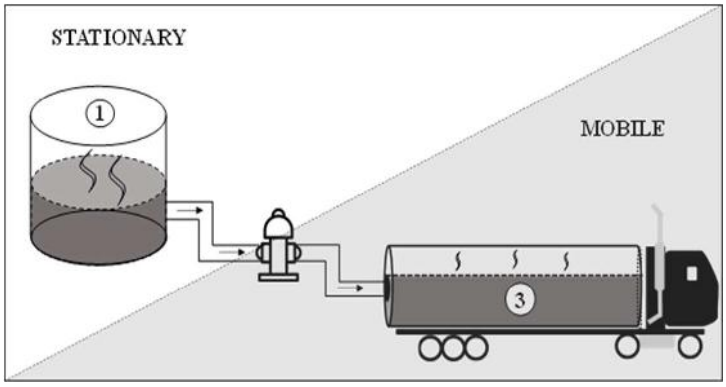
Figure 6-3 shows the typical fuel transfer paths that fuel may go through at a USAF installation. The transfer of the fuel into different equipment results in the generation and release of pollutant emissions. The classification (mobile vs. stationary) of this equipment determines whether the generated emissions are regarded as mobile or stationary source emissions. It is important to note that **significant** fuel spills may occur at any point in the fuel transfer process, which will contribute to VOC and HAP emissions as the fuel evaporates. However, since these are uncommon occurrences, emissions from fuel spills are addressed in the *Air Emissions Guide for Air Force Transitory Sources*. The specific pathways illustrated in Figure 6-3 are described below and categorized as either mobile (shaded) or stationary (not shaded) sources of emissions.



1 (Bulk Storage Tank) → 2 (Aircraft)

The figure above illustrates fuel transferred to refuel an aircraft from a bulk storage tank via a hydrant system. The vapors displaced within the storage tank as the liquid level lowers or rises are known as "working losses." The vapors generated in the space above the stored liquid are known as "breathing losses." These are **stationary emissions** and are calculated using the equations provided in Chapter 7 of AP-42. Refer to the *Air Emissions Guide for Air Force Stationary Sources* for more information regarding the calculation of these emissions.

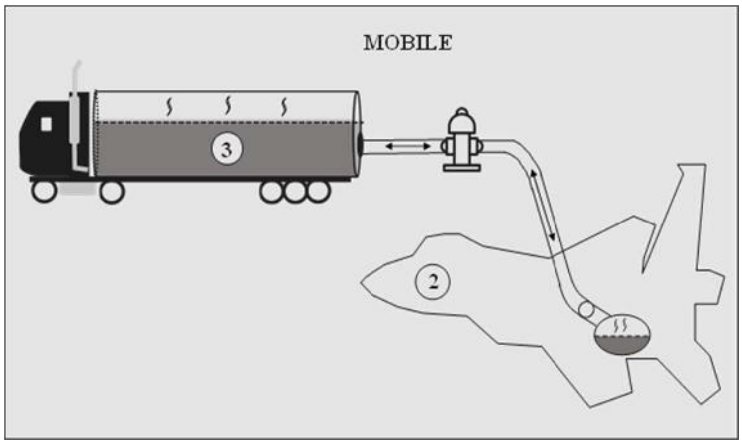
Mobile emissions are generated from the displaced vapor in the aircraft fuel tank. These emissions should be reported in the mobile AEI and are calculated as described later in this chapter.



1 (Bulk Storage Tank) → 3 (Refueling Truck)

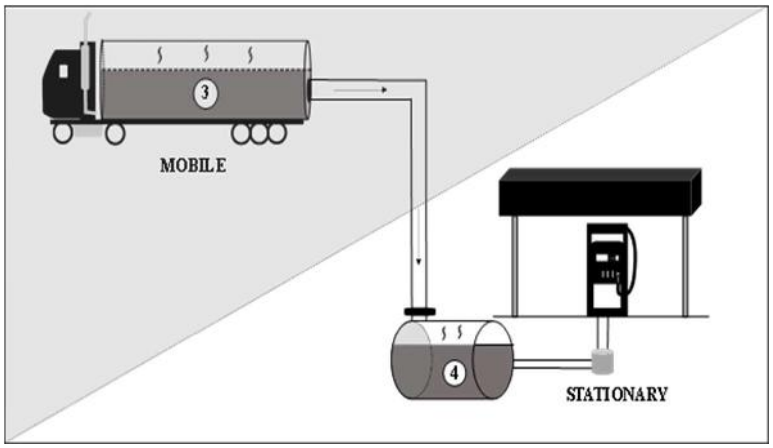
The **stationary source of emissions** is the bulk storage tank producing working losses and breathing losses from the liquid fuel. The methodology for calculating these emissions is provided in the *Air Emissions Guide for Air Force Stationary Sources*.

The **mobile emissions** from loading fuel into refueling trucks are generated from the displaced vapor in the fuel truck. These emissions should be reported in the mobile AEI and are calculated as described later in this chapter.



2 (Refueling Truck) ↔ 3 (Aircraft)

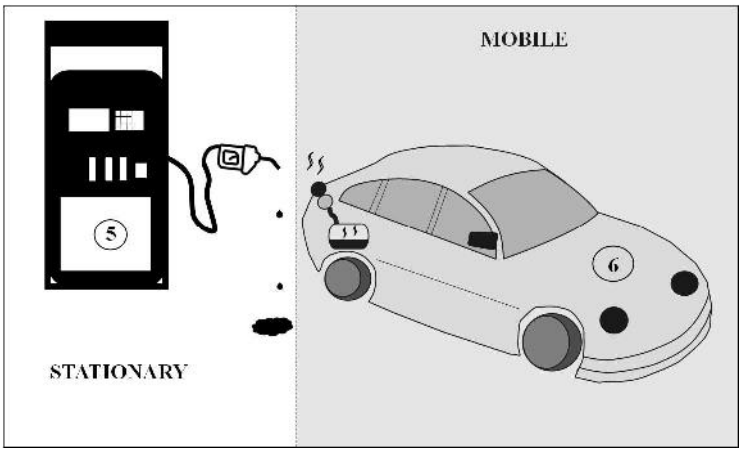
The figure above illustrates the fueling and defueling of aircraft via a refueling truck. Both pieces of equipment are classified as **mobile**, therefore all emissions generated from these activities should be reported in the mobile AEI and are calculated as described later in this chapter. Emissions from both mobile pieces of equipment come from displaced vapors in the refueling truck and aircraft fuel tanks.



3 (Refueling Truck) → 4 (Storage Tank and Service Station)

The figure above illustrates the loading of a refueling truck into a storage tank at a fuel service station. The **stationary emissions** from refilling of a storage tank at a fuel dispensing location include breathing and working losses from the storage tank. The methodology for calculating these emissions is provided in the *Air Emissions Guide for Air Force Stationary Sources*.

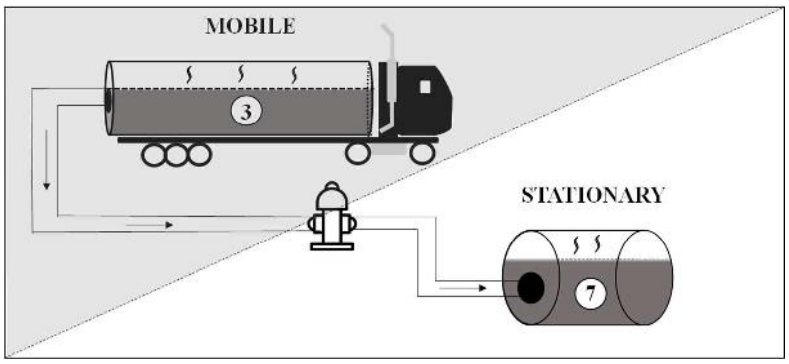
The only substantial **mobile emissions** from the fueling of the tank via the refueling truck are generated from any significant fuel spills which are addressed in the *Air Emissions Guide for Air Force Transitory Sources*.



5 (Fuel Dispensing Nozzle) → 6 (On-Road Vehicle)

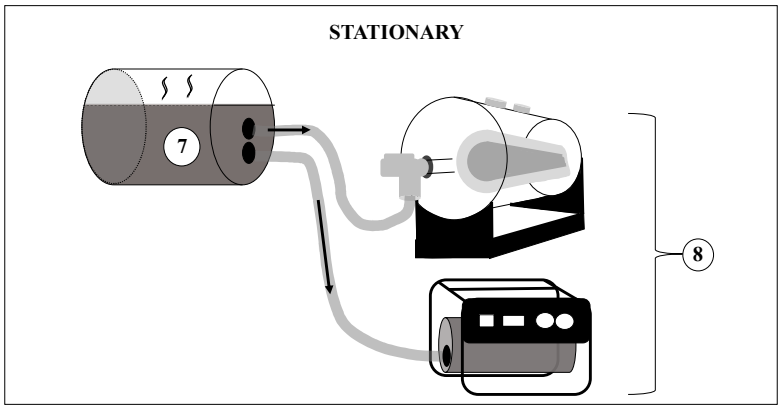
The figure above illustrates the refueling of a vehicle at a service station. The **stationary emissions** are the result of the evaporation of spilled fuel from the fuel nozzle whose calculations are described in the *Air Emissions Guide for Air Force Stationary Sources*.

The **mobile emissions** are generated from the displaced vapors in the vehicle fuel tank. The displaced vapor emissions should be included in a mobile AEI and are already accounted for in the MOVES model used to calculate VEHE emissions. AP-42 states that the motor vehicle refueling emissions equation is incorporated into the MOBILE model, which has been integrated into the MOVES model. The MOVES4 model is the model used for estimating emissions for VEHEs. This version of the model allows for disabling the refueling emissions calculations if these emissions are included in a stationary AEI, rather than in a mobile AEI. **This should only be done if the regulator insists that this category be included as a stationary source. Otherwise, these emissions are already accounted for in the EFs found in the "ON-ROAD VEHICLES (VEHE)" chapter of this guide.**

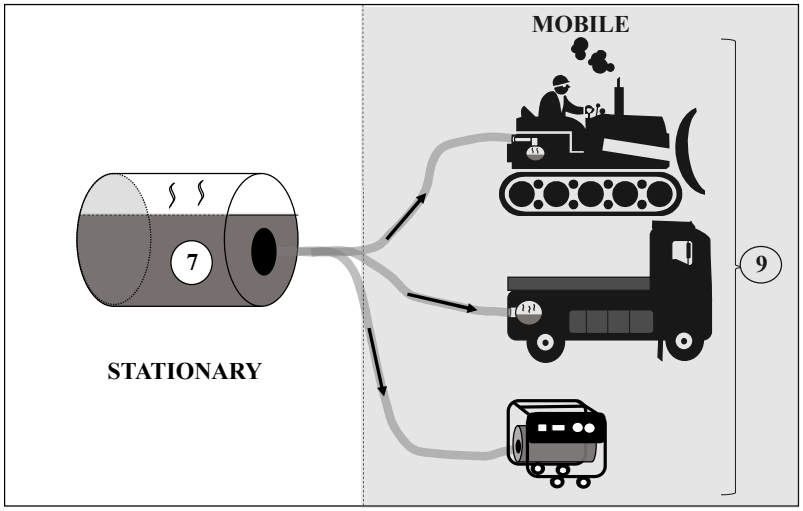


3 (Refueling Truck) → 7 (POL Tank) This fuel transfer pathway illustrates the loading of fuel from a refueling truck into a Petroleum, Oil, and Lubricants (POL) storage tank. The **stationary emissions** include the breathing and working losses from smaller storage tanks on base. The methodology for calculating these emissions is provided in the *Air Emissions Guide for Air Force Stationary Sources*.

Likely, the only **mobile emissions** generated from this pathway are from any significant fuel spills associated with the refueling truck (a mobile source). Such emissions would be considered transitory in nature and are addressed in the *Air Emissions Guide for Air Force Transitory Sources*.



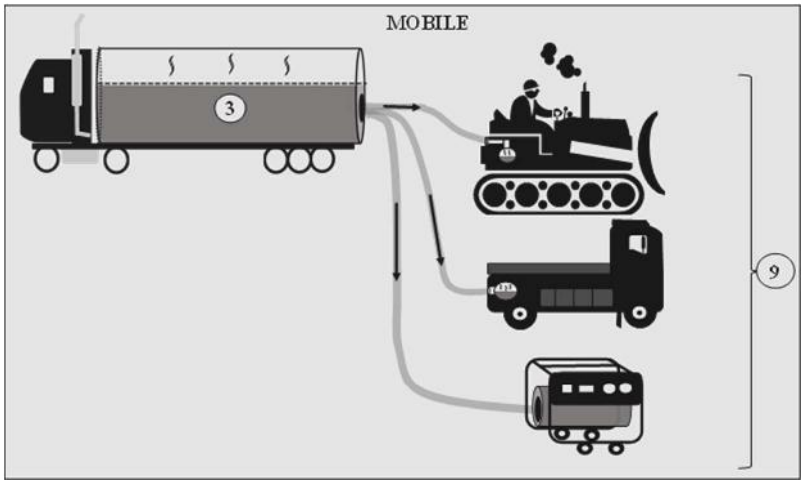
7 (POL Tank) → 8 (Stationary ICOM/ECOM) The figure above illustrates the loading of fuel from a storage tank into a stationary Internal Combustion (ICOM) equipment, such as a generator, or External Combustion (ECOM) equipment, such as a boiler. The **stationary emissions** from the fuel outlet (of the storage tank) are the result of any significant fuel spills and breathing or working losses. The breathing/working losses are calculated using the methodology described in Chapter 7 of AP-42 while emissions from significant fuel spills are described in the *Air Emissions Guide for Air Force Transitory Sources*. The **stationary emissions** from the fuel loading inlet (of the stationary ICOM or ECOM unit) are generated from the displaced vapor in the fuel tanks. The methodology for calculating these emissions is provided in the *Air Emissions Guide for Air Force Stationary Sources*.



7 (POL Tank) → 9 (Non-Road & Ground Support Equipment / Mobile Generators)

During this fuel transfer process, fuel is moved from a storage tank to a mobile piece of equipment, such as non-road equipment, Ground Support Equipment (GSE), or a mobile generator. The **stationary emissions** from the storage tank are the result of any significant fuel spills and the working and breathing losses from the tank. The methodology for calculating these emissions is provided in Chapter 7 of AP-42 and in the *Air Emissions Guide for Air Force Stationary Sources*, while fuel spill emissions are addressed in the *Air Emissions Guide for Air Force Transitory Sources*.

The **mobile emissions** from the fuel loading inlet (of the non-road and ground support equipment or mobile generator) are produced by the displaced vapor in the fuel tanks and should be reported in a mobile AEI. Emissions are calculated as described later in this chapter.



3 (Refueling Trucks) -> (Non-Road & Ground Support Equipment / Mobile Generators)

The figure illustrates the transfer of fuel from a mobile fuel loading outlet (refueling truck) into either non-road equipment, GSE, or a mobile generator, **all of which are considered mobile sources**. These emissions should be reported in a mobile AEI, the calculation methodology for which is described later in this chapter.

6.2 Emission Factors

Section 5.2 of AP-42 describes both the emissions from the loading of fuel into fuel trucks and the evaporative emissions from the fueling of a gasoline vehicle. Since the emissions from fueling gasoline vehicles is covered in the MOVES4 model, the EFs for vehicle refueling are not provided here, but may be found in Table 5.2-7 of AP-42. For non-road engines and fuel trucks, the most appropriate method for calculating emissions from fuel dispensing is to calculate the loading loss. The loading loss is the primary source of evaporative emissions from the loading of fuel. These losses are the result of organic vapors within a fuel tank that are displaced into the atmosphere as the tank is loaded with fuel. To calculate these losses, the saturation factor, vapor pressure of the fuel molecular weight of the vapors, and the temperature of the bulk liquid must be known. A detailed description of how to calculate these losses is provided in the next section.

The saturation factor refers to the ratio of the saturated value of the expelled vapor to the unsaturated value. These values vary based on the method of fuel loading. A tank that is filled with only one fuel, or fuels with similar characteristics, is said to be practicing "dedicated normal service." When loading vapors are returned to the loading terminal after the fuel is unloaded to a storage tank, it is known as "dedicated vapor balance service." Section 5.2 of AP-42 provides the saturation factors, which are included below in Table 6-1.

Table 6-1. Fuel Loading Saturation Factors

Loading Method	Loading Parameters	S Factor
Submerged Loading	Clean Tank	0.50
	Dedicated Normal Service	0.60
	Dedicated Vapor Balance Service	1.00
Splash Loading	Clean Tank	1.45
	Dedicated Normal Service	1.45
	Dedicated Vapor Balance Service	1.00

SOURCE: U.S. EPA. "Transportation and Marketing of Petroleum Liquids." *Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources*. Fifth Edition. 1995. Section 5.2.

The vapor emissions resulting from fuel transfer is a function of the vapor pressure of the fuel. The vapor pressure is indicative of the evaporation rate of a liquid. Vapor pressures for select fuels and their respective vapor molecular weights are provided in Table 6-2.

Table 6-2. Vapor Pressures for Various Fuels

Petroleum Liquid	Vapor Molecular Weight (lb/lb-Mol)	True Vapor Pressure (psia)						
		40°F	50°F	60°F	70°F	80°F	90°F	100°F
Crude Oil RVP 5 [a]	50	1.80	2.30	2.80	3.40	4.00	4.80	5.70
Gas RVP 6	69	1.90	2.37	2.93	3.60	4.38	5.29	6.35
Gas RVP 7	68	2.30	2.90	3.50	4.30	5.20	6.20	7.40
Gas RVP 7.8	68	2.59	3.21	3.94	4.79	5.79	6.96	8.30
Gas RVP 8	68	2.67	3.30	4.04	4.92	5.94	7.13	8.50
Gas RVP 8.3	68	2.79	3.44	4.22	5.13	6.19	7.42	8.83
Gas RVP 9	67	3.06	3.77	4.61	5.59	6.74	8.06	9.58
Gas RVP 10	66	3.40	4.20	5.20	6.20	7.40	8.80	10.50
Gas RVP 11	65	3.87	4.75	5.77	6.96	8.34	9.92	11.74
Gas RVP 11.5	65	4.09	5.00	6.07	7.31	8.75	10.41	12.29
Gas RVP 12	64	4.29	5.24	6.36	7.65	9.15	10.86	12.82
Gas RVP 13	62	4.70	5.70	6.90	8.30	9.90	11.70	13.80
Gas RVP 13.5	62	4.93	6.01	7.26	8.71	10.38	12.29	14.46
Gas RVP 15	60	5.58	6.77	8.16	9.77	11.61	13.71	16.09
Diesel	130	3.10E-03	4.50E-03	6.50E-03	9.00E-03	1.20E-02	1.60E-02	2.20E-02
JP-8/Jet A [b]	130	1.58E-02	2.19E-02	3.01E-02	4.08E-02	5.48E-02	7.27E-02	9.54E-02

SOURCE: (unless otherwise stated): Data taken from TANKS version 4.0.9d.

a. SOURCE: U.S. EPA. "Organic Liquid Storage Tanks." Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources. Fifth Edition. 1997. Section 7.1.

b. SOURCE: USAF Environmental Analysis Division. JP-8 Volatility Study, IERA-RS-BR-SR-2001-0002. San Antonio, 2001. Vapor pressures calculated using the composite data calculation, an average flash point temperature of 118.238 °F, and atmospheric pressure of 760mm Hg. Flash point temperature the average provided by Defense Energy Support Center. "Petroleum Quality Information System." Defense Logistics Agency, 1996.

6.3 Control and Capture Efficiencies

Emissions from fuel dispensing may be controlled using a variety of techniques. Estimating emissions in which a control device is utilized is more challenging since the capture efficiency must also be considered. Additionally, since portions of fuel transfer are regarded as either stationary or mobile sources, using the control and capture efficiencies appropriately may be confusing. For example, in Step 1-2 from Figure 6-3, fuel is loaded from a loading terminal storage tank and into a fuel truck. The displaced vapor may be captured with a blower system and run through a vapor recovery unit before being returned to the storage tank. In this case, the capture efficiency of the truck and the control efficiency of the vapor recovery unit are used to determine the emissions from this process. The control efficiency is taken from the stationary

unit, although the emissions are classified as mobile since the emissions are the result of displaced vapor in the mobile fuel truck. Typical capture and control efficiencies can be found in Table 6-3 and Table 6-4 respectively.

Table 6-3. Typical Fuel Truck Capture Efficiencies

Fuel Truck Capture System	Capture Efficiency (%)
Untested	70.0
EPA standards (NSPS Subpart XX) leak test	98.7
MACT-level annual leak test	99.2
Trucks with installed blower system	100.0 [a]

SOURCE (unless otherwise stated): U.S. EPA. "Transportation and Marketing of Petroleum Liquids." Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources. Fifth Edition. 1995. Section 5.2.

a. SOURCE: TCEQ. "Tank Truck Loading of Crude Oil or Condensate." 2013. 14 December 2013. <http://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/tank-truck-load.pdf>.

Table 6-4. Typical Fuel Transfer Control Efficiencies

Control Techniques		Control Efficiency (%)
Flares[1]	Compounds ≤ 3 Carbon atoms	99.0
	Other Organic Compounds	98.0
Thermal Oxidizers[2]		99.0
Carbon Systems[3]		98.0
Vapor Recovery Units		100.0

SOURCE: TCEQ. "Tank Truck Loading of Crude Oil or Condensate." 2013. 14 December 2013. <http://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/tank-truck-load.pdf>.

a. Flares must meet 40 CFR 60.18 requirements of minimum heating value of waste gas and a maximum flare tip velocity.

b. Must be designed for the variability of the waste gas stream and basic monitoring which consists of a temperature monitor that indicates the device is achieving a satisfactory minimum temperature.

c. Must have an alarm system that will prevent break through.

Alternatively, EFs for the loading of fuel trucks have been developed for several fuels likely to be distributed on base. These EFs are based on an assumed temperature of 60°F and may be used as an alternative to calculate the loading loss. Table 5.2-5 of AP-42 provides these EFs, which have been reproduced here in Table 6-5.

Table 6-5. VOC Emission Factors for Fuel Dispensing/Loading

Loading Method	Loading Parameters	Emission Factors (lb/10^3 gal)		
		Gasoline [a]	Diesel/No. 2 Fuel Oil	JP-8/Jet A
Submerged Loading	Dedicated Normal Service	5	0.014	0.016
	Vapor Balance Service	8	---	---
Splash Loading	Dedicated Normal Service	12	0.03	0.04
	Vapor Balance Service	8	---	---

SOURCE: U.S. EPA. "Transportation and Marketing of Petroleum Liquids." *Compilation of Air Pollutant Emission Factors – Volume I: Stationary Point and Area Sources*. Fifth Edition. 1995. Section 5.2.

a. Gasoline has an RVP of 10 psia.

"---" Indicates No Data Available

6.4 Emission Calculations

Emissions of concern from fuel transfer operations are VOCs and HAPs. The volumes of VOCs and HAPs emitted are related to the amount of VOC and HAP constituents within the fuel. Calculations of emissions of VOCs and HAPs from fuel transfer are outlined below.

6.4.1 VOC Emissions Calculations (Preferred Method)

The preferred method for calculating VOC emissions from the transfer of fuel is to use the fuel vapor pressure, saturation factor, temperature, and total throughput to estimate the loading loss. VOCs are calculated as follows:

$$\mathbf{E}(\boldsymbol{VOC}) = \mathbf{Q} \times \frac{\mathbf{1}}{\mathbf{1000}} \times \mathbf{12.46} \times \frac{\boldsymbol{S} \times \boldsymbol{P} \times \boldsymbol{M}}{\boldsymbol{T}} \times \left\{\mathbf{1} - \left[\left(\frac{\boldsymbol{Cap}}{\mathbf{100}}\right) \times \left(\frac{\boldsymbol{CE}}{\mathbf{100}}\right)\right]\right\}$$

Equation 6-1

Where,

E(VOC) = Annual emissions of VOCs (lb/yr)
Q = Annual quantity of fuel transferred (gal/yr)
1000 = Factor converting gallons to 10^3 gallons (gal/10^3 gal)
12.46 = Equation constant (°R lb-mol/psia 10^3 gal)
S = Saturation factor. Provided in Table 6-1
P = True vapor pressure of fuel (psia). Provided in Table 6-2
M = Vapor molecular weight of the fuel (lb/lb-mol). (Table 6-2)
T = Temperature of bulk liquid loaded (°R)
Cap = Capture efficiency of the loading terminal (%). (Table 6-3)
CE = Efficiency of the control device (%). Provided in Table 6-4
100 = Factor for converting a percent to a fraction (%)

A detailed control volume outlining the emissions from fuel transfer operations is provided in Figure 6-4.

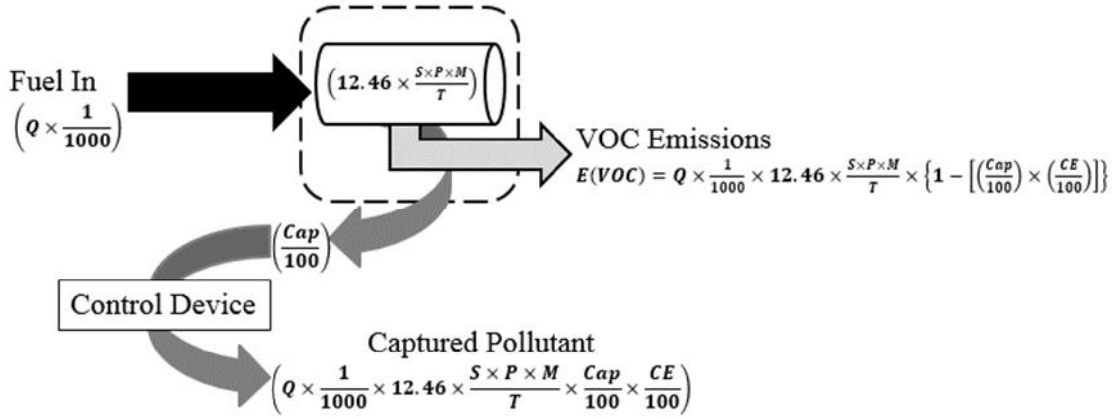


Figure 6-4. Fuel Transfer Control Volume – Preferred Method

6.4.2 VOC Emissions Calculations (Emission Factor Alternative Method)

Using the EF method, the appropriate EF selected from Table 6-5 and the total quantity of fuel transferred, the emissions are calculated as follows:

$$\mathbf{E}(\boldsymbol{VOC}) = \mathbf{Q} \times \frac{\mathbf{1}}{\mathbf{1000}} \times \mathbf{EF}(\boldsymbol{VOC}) \times \left\{\mathbf{1} - \left[\left(\frac{\boldsymbol{Cap}}{\mathbf{100}}\right) \times \left(\frac{\boldsymbol{CE}}{\mathbf{100}}\right)\right]\right\}$$

Equation 6-2

Where,

EF(VOC)= VOC emission factor as provided in Table 6-5 (lb/10^3 gal)

A detailed control volume is provided in Figure 6-5.

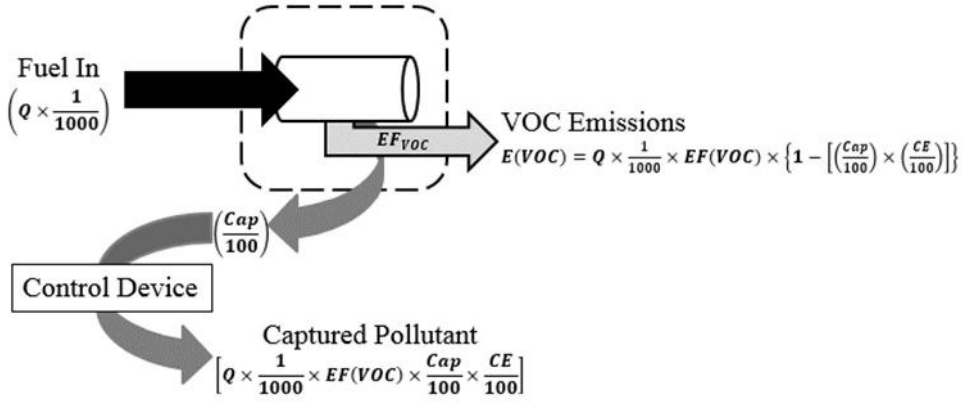


Figure 6-5. Fuel Transfer Control Volume – Emission Factor Method

6.4.3 HAP Emissions Calculation

The number of HAPs released into the environment from fuel transfer operations may be estimated using the total VOCs emitted, as calculated above, and the weight percent of HAPs in the fuel itself (APIMS and the Air Conformity Applicability Model, or ACAM, automatically calculate these values). Contact the fuel supplier for specific information regarding the weight percent of HAPs in fuels commonly used at USAF installations. In the absence of available data, Table 6-6 provides the typical weight percent of individual HAPs found in several fuels used at USAF installations. Using the total VOCs and weight percent HAP in the fuel, the total HAP emissions from fuel transfer operations is calculated using Equation 6-3 below.

$$\mathbf{E}(\boldsymbol{HAP}) = \mathbf{E}(\boldsymbol{VOC}) \times \frac{\mathbf{WP}(\boldsymbol{HAP})}{\mathbf{100}}$$

Equation 6-3

Where,

E(HAP) = HAP emissions from fuel dispensing (lb/yr)

WP(HAP) = Weight percent HAP in the fuel (%)

Table 6-6. Weight Percent of HAPs in Fuels commonly used at Air Force Installations

Compound	Molecular Weight	Vapor Pressure (psi) [a]	Typical wt. %					
			Diesel		Gasoline		JP-8/Jet A [b]	
			Liquid Phase	Vapor Phase [c]	Liquid Phase	Vapor Phase [c]	Liquid Phase	Vapor Phase [c]
Anthracene	178.22	1.27E-07	2.82E-03 [d]	5.76E-08	---	---	---	---
Benzene	78.11	1.51E+00	8.00E-04	1.94E-01	1.80E+00	6.10E-01	3.36E-02	1.55E+00
1,3-Butadiene	54.09	3.61E+01	---	---	2.19E-04 [d]	1.78E-03	---	---
Cumene (Isopropylbenzene)	120.20	6.93E-02	---	---	5.00E-01	7.79E-03	1.80E-01	3.81E-01
Dibenzofuran	168.20	4.80E-05	1.64E-02 [d]	1.26E-04	---	---	---	---
Ethylbenzene	106.17	1.48E-01	1.30E-02	3.10E-01	1.40E+00	4.67E-02	1.58E-01	7.16E-01
Fluorene	166.21	1.16E-05	2.94E-02 [d]	5.48E-05	---	---	3.42E-03	1.21E-06
Hexane	86.17	2.44E+00	1.00E-04	3.91E-02	1.00E+00	5.48E-01	---	---
Isooctane (2,2,4-Trimethyl Pentane)	114.23	5.38E-02	---	---	4.00E+00	4.84E-02	1.22E-03	2.00E-03
Naphthalene	128.20	3.94E-03	3.39E-01 [d]	2.15E-01	1.74E-01 [d]	1.54E-04	2.66E-01	3.20E-02
Phenanthrene	178.22	2.34E-06	3.22E-02 [d]	1.21E-05	---	---	---	---
Phenylbenzene (1,1'-biphenyl)	154.21	3.78E-04	---	---	---	---	6.74E-02	7.79E-04
Pyrene	202.24	8.70E-08	3.62E-02 [d]	5.06E-07	---	---	1.24E-05	3.31E-11
Toluene	92.13	4.25E-01	3.20E-02	2.19E+00	7.00E+00	6.69E-01	2.18E-01	2.83E+00
Xylenes	106.17	1.30E-01	2.90E-01	6.06E+00	7.00E+00	2.05E-01	1.18E+00	4.69E+00

SOURCE (unless otherwise stated): Data taken from USEPA 2005, TANKS, Version 4.09d, U.S. Environmental Protection Agency, October 2005. wt% = weight percent

a. Vapor pressure of pure species used in calculations were taken at 70°F and provided either by TANKS, the Hazardous Substance Data Bank (HSDB), or were calculated using Antoine equation constants provided either by the National Institute of Standards and Technology (NIST) or Perry's Chemical Engineer's Handbook Seventh Ed., Perry, Robert H, 1997.

b. SOURCE: "JP-8 Composition and Variability," Armstrong Laboratory, Environics Directorate, Environmental Research Division, May 1996. An average density of 6.71 pounds per gallon (lb/gal) was used for unit conversion.

c. The vapor phase speciation data was estimated using the liquid phase speciation data and equations found in Section 7.1.4 of AP-42, Fifth Edition, Volume I last updated November 2006. Physical properties for fuels used for calculations can be found in Table 6-7.

d. SOURCE: SPECIATE, Version 4.4, U.S. Environmental Protection Agency, February 2014. For diesel, profile 4673 was referenced. For gasoline, profile 8748 was referenced.

"---" Indicates No Data Available

Table 6-7. Fuel Properties

Fuel	Liquid Molecular Weight	Vapor Molecular Weight	Vapor Pressure (psia) [b]
JP-8/Jet A	162	130	4.08E-02 [c]
Diesel	188	130	9.00E-03
Gasoline [a]	92	66	6.20E+00

SOURCE (unless otherwise stated): Data taken from USEPA 2005, TANKS, Version 4.09d, U.S. Environmental Protection Agency, October 2005.

a. Based on gasoline with a Reid Vapor Pressure of 10.

b. Based on temperature of 70°F

c. SOURCE: "JP-8 Volatility Study," Southwest Research Institute (SWRI), March 2001. Vapor pressures calculated using the composite data calculations, an average flash point temperature of 118.238°F, and atmospheric pressure of 760mmHg. Flash point temperature average provided by "Petroleum Quality Information System Fuels Data (2005)," Defense Logistics Agency (DLA), Defense Energy Support Center, Technology and Standardization Division, 2006.

6.5 Information Resources

Information regarding the annual fuel throughput may be collected from the fuel service station supervisor. The supervisor may also be able to provide specific information regarding the fuel vapor pressure and HAP constituent data. If this information is unavailable, contact the fuel supplier to gather this data for more precise emissions calculations.

6.6 Example Problems

6.6.1 Problem 1 – Preferred Method

A total of 150,000 gal of gasoline and 85,000 gal of diesel were dispensed from a POL tank into non-road equipment during the previous year. Based on the location of the installation, the gasoline used has an average Reid Vapor Pressure (RVP) of 10 and the average fuel temperature at the installation is 60°F. Calculate the total VOCs and xylene emissions.

Step 1 – Convert the temperature to the correct units. The temperature was given in terms of °F; however, to calculate the EFs needed, the temperature must be converted to the correct units (degrees Rankin [°R]) as follows:

$$T(°R) = T(°\mathrm{F}) + 460.67$$

$$\boldsymbol{T(°R) = 60 + 460.67 = 520.67°R}$$

Step 2 – Record the vapor pressures and vapor molecular weights. These values are needed for EF calculations and are given in Table 6-2. For RVP 10 gasoline, the molecular weight and

vapor pressure at 60°F are given as **66 lb/lb-mol** and **5.20 psia**, respectively. Similarly, for diesel, the vapor molecular weight and vapor pressure at 60°F are given as **130 lb/lb-mol** and **6.50E-03 psia,** respectively.

Step 3 – Select and record the saturation factor. The saturation factor is a function of the load method employed. Knowing that this fuel was loaded into non-road equipment from a POL tank, it may be assumed that the fuel was splash loaded without vapor balance. This gives a saturation factor of **1.45**.

Step 4 – Calculate emissions. Using the data from the previous steps and Equation 6-1, the total VOCs are calculated as follows:

$$E(VOC) = Q \times \frac{1}{1000} \times 12.46 \times \frac{S \times P \times M}{T} \times \left\{1 - \left[\left(\frac{Cap}{100}\right) \times \left(\frac{CE}{100}\right)\right]\right\}$$

For Gasoline:

$$E(VOC) = 150{,}000 \frac{\cancel{gal}}{yr} \times \frac{1}{1000}\left(\frac{10^3 gal}{\cancel{gal}}\right) \times 12.46 \left(\frac{°R\ lb-mol}{psia\ 10^3 gal}\right) \times \frac{1.45 \times 5.20(psia) \times 66\left(\frac{lb}{lb-m}\right)}{520.67°R}\left\{1 - \left[\left(\frac{0\%}{100\%}\right) \times \left(\frac{0\%}{100\%}\right)\right]\right\}$$

$$E(VOC) = 150\left(\frac{\cancel{10^3 gal}}{yr}\right) \times 12.46 \left(\frac{°R\ lb-mol}{psia\ \cancel{10^3 gal}}\right) \times \frac{1.45 \times 5.20(psia) \times 66\left(\frac{lb}{lb-mol}\right)}{520.67°R}\{1\}$$

$$\boldsymbol{E(VOC) = 1869\left(\frac{\cancel{°R\ lb-mol}}{\cancel{psia}\ yr}\right) \times 0.956\left(\frac{\cancel{psia}\ lb}{\cancel{°R\ lb-mol}}\right) = 1{,}786.8 \frac{lb}{yr}}$$

For Diesel:

$$E(VOC) = 85{,}000 \frac{\cancel{gal}}{yr} \times \frac{1}{1000}\left(\frac{10^3 gal}{\cancel{gal}}\right) \times 12.46 \left(\frac{°R\ lb-mo}{psia\ 10^3 gal}\right) \times \frac{1.45 \times 0.0065(psia) \times 130\left(\frac{lb}{lb-}\right)}{520.67°R}\left\{1 - \left[\left(\frac{0\%}{100\%}\right) \times \left(\frac{0\%}{100\%}\right)\right]\right\}$$

$$E(VOC) = 85\left(\frac{\cancel{10^3 gal}}{yr}\right) \times 12.46 \left(\frac{°R\ lb-mol}{psia\ \cancel{10^3 gal}}\right) \times \frac{1.45 \times 0.0065(psia) \times 130\left(\frac{lb}{lb-}\right)}{520.67°R}\{1\}$$

$$\boldsymbol{E(VOC) = 1059.1\left(\frac{\cancel{°R\ lb-mol}}{\cancel{psia}\ yr}\right) \times 0.002\left(\frac{\cancel{psia}\ lb}{\cancel{°R\ lb-mol}}\right) = 2.12 \frac{lb}{yr}}$$

Step 5 – Record xylene weight percent. Table 6-6 states that the vapor weight percent xylene in gasoline and diesel fuel is **0.205%** and **6.06%** respectively.

Step 6 – Calculate xylene emissions. Using the VOC emissions for gasoline and diesel fuel calculated in Step 4 and the vapor weight percent xylene in each fuel as recorded in Step 5, the total xylene emissions are calculated using Equation 6-3 as shown:

$$E(HAP) = E(VOC) \times \frac{WP(HAP)}{100}$$

For Gasoline:

$$E(Xylene) = 1786.8\frac{lb}{yr} \times \frac{.205\%}{100\%}$$

$$\boldsymbol{E(Xylene) = 1786.8\frac{lb}{yr} \times 0.00205 = 3.66\frac{lb}{yr}}$$

For Diesel:

$$E(Xylene) = 2.12\frac{lb}{yr} \times \frac{6.06\%}{100\%}$$

$$\boldsymbol{E(Xylene) = 2.12\frac{lb}{yr} \times 0.0606 = 0.13\frac{lb}{yr}}$$

Step 7 – Calculate total VOC emissions. The total VOC emissions from fuel dispensing are the sum of evaporative emissions from each fuel calculated in Step 4.

$$E(VOC) = \sum_{i=1}^{n}[E(VOC)_i]$$

$$E(VOC) = \left(1786.8\frac{lb}{yr} + 2.12\frac{lb}{yr}\right)$$

$$\boxed{\boldsymbol{E(VOC) = 1,788.9\frac{lb}{yr}}}$$

Step 8 – Calculate total xylene emissions. The total xylene emissions from fuel dispensing are the sum of evaporative emissions from each fuel calculated in Step 6.

$$E(HAP) = \sum_{i=1}^{n}[E(HAP)_i]$$

$$E(Xylene) = \left(3.66\frac{lb}{yr} + 0.13\frac{lb}{yr}\right)$$

$$\boxed{\boldsymbol{E(Xylene) = 3.79\,\frac{lb}{yr}}}$$

6.6.2 Problem 2 – Emission Factor Method

Using the same throughput for gasoline and diesel as given in Problem 1, re-calculate the VOC emissions using the EF method.

Step 1 – Select and record appropriate EF. Again, since the fuel was loaded into non-road equipment, the loading method is assumed to be splash loading without vapor balance. The EFs for gasoline and diesel are **12** and **0.03 lb/10^3 gal**, respectively.

Step 2 – Calculate VOC emissions. Using Equation 6-2 and the EFs as recorded in Step 1, the total VOCs emitted are calculated as follows:

$$E(VOC) = Q \times \frac{1}{1000} \times EF(VOC) \times \left\{1 - \left[\left(\frac{Cap}{100}\right) \times \left(\frac{CE}{100}\right)\right]\right\}$$

For Gasoline:

$$E(VOC) = 150{,}000\,\frac{\cancel{gal}}{yr} \times \frac{1}{1000}\left(\frac{10^3 gal}{\cancel{gal}}\right) \times 12\,\frac{lb}{10^3 gal} \times \left\{1 - \left[\left(\frac{0\%}{100\%}\right) \times \left(\frac{0\%}{100\%}\right)\right]\right\}$$

$$\boldsymbol{E(VOC)} = 150\,\frac{\cancel{10^3 gal}}{yr} \times 12\,\frac{lb}{\cancel{10^3 gal}} \times \{1\} = \boldsymbol{1{,}800\,\frac{lb}{yr}}$$

For Diesel:

$$E(VOC) = 85{,}000\,\frac{\cancel{gal}}{yr} \times \frac{1}{1000}\left(\frac{10^3 gal}{\cancel{gal}}\right) \times 0.03\,\frac{lb}{10^3 gal} \times \left\{1 - \left[\left(\frac{0\%}{100\%}\right) \times \left(\frac{0\%}{100\%}\right)\right]\right\}$$

$$\boldsymbol{E(VOC)} = 85\,\frac{\cancel{10^3 gal}}{yr} \times 0.03\,\frac{lb}{\cancel{10^3 gal}} \times \{1\} = \boldsymbol{2.55\,\frac{lb}{yr}}$$

Step 3 – Sum the VOC emissions. Adding the calculated emissions from Step 2, the total VOCs, as determined by the EF method is calculated as follows:

$$E(VOC) = \sum_{i=1}^{n} [E(VOC)_i]$$

$$E(VOC) = \left(1800\,\frac{lb}{yr} + 2.55\,\frac{lb}{yr}\right)$$

$$\boxed{\boldsymbol{E(VOC) = 1{,}802.55\,\frac{lb}{yr}}}$$

6.7 References

AFCEC 2016, Solutio Environmental "Air Emissions Guide for Air Force Transitory Sources" Air Force Civil Engineering Center, 2016

DLA 1996, "Defense Energy Support Center. "Petroleum Quality Information System." Defense Logistics Agency, 1996

DLA 2006, "Petroleum Quality Information System Fuels Data (2005)," Defense Logistics Agency (DLA), Defense Energy Support Center, Technology and Standardization Division, 2006

MacDonald, Hatch Mott MacDonald. "http://www.hatchmott.com/sites/dev.hatchmott.com /files/brochures/Aviation_Fueling_09_w.pdf."

Mayfield 1996, "JP-8 Composition and Variability," Armstrong Laboratory, Environics Directorate, Environmental Research Division, May 1996

SWRI 2001, "JP-8 Volatility Study," Southwest Research Institute (SWRI), March 2001

TCEQ 2013. "Tank Truck Loading of Crude Oil or Condensate," Texas Center for Environmental Quality, 14 December 2013. http://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/tank-truck-load.pdf

TCEQ, "http://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/tank-truck-load.pdf," Texas Commission on Environmental Quality

USAF 2001, "Environmental Analysis Division. JP-8 Volatility Study, IERA-RS-BR-SR-2001-0002," United States Air Force, San Antonio, 2001.

USAF 2009, "Air Emissions Factor Guide to Air Force Stationary Sources," United States Air Force, December 2009

"USEPA 2005, "TANKS, Version 4.09d," U.S. Environmental Protection Agency, October 2005. "

USEPA 2006, Section 7.1- "Organic Liquid Storage Tanks," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, November 2006

USEPA 2008, Section 5.2- "Transportation and Marketing of Petroleum Liquids," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, June 2008

5942 USEPA 2008. "Transportation and Marketing of Petroleum Liquids." Compilation of Air
5943 Pollutant Emission Factors - Volume I: Stationary Point and Area Sources. Fifth Edition 1995.
5944 Section 5.2, July 2008

5945 USEPA 2014, “SPECIATE, Version 4.4,” U.S. Environmental Protection Agency, February
5946 2014

This page intentionally left blank.

APPENDIX A – EPA HAP LIST

CAS No.	Chemical/Compound
75070	Acetaldehyde
60355	Acetamine
75058	Acetonitrile
98862	Acetophenone
53963	2-Acetylaminofluorene
107028	Acrolein
79061	Acrylamide
79107	Acrylic Acid
107131	Acrylonitrile
107051	Allyl Chloride
92671	4-Aminobiphenyl
62533	Aniline
90040	o-Anisidine
1332214	Asbestos
71432	Benzene
92875	Benzidine
98077	Benzotrichloride
100447	Benzyl Chloride
92524	Biphenyl
117817	Bis(2-ethylhexyl)phthalate
542881	Bis(chloromethyl)ether
75252	Bromoform
106945	1-Bromopropane
106990	1,3-Butadiene
156627	Calcium Cyanamide
133062	Captan
63252	Carbaryl
75150	Carbon Disulfide
56235	Carbon Tetrachloride
463581	Carbonyl Sulfide
120809	Catechol
133904	Chloramben
57749	Chlordane
7782505	Chlorine
79118	Chloroacetic Acid
532274	2-Chloroacetophenone
108907	Chlorobenzene
510156	Chlorobenzilate
67663	Chloroform
107302	Chloromethyl methyl ether
126998	Chloroprene
1319773	Cresylic Acid
95487	o-Cresol
108394	m-Cresol
106445	p-Cresol
98828	Cumene
94757	2,4-D
3547044	DDE

CAS No.	Chemical/Compound
334883	Diazomethane
132649	Dibenzofurans
96128	1,2-Dibromo-3-chloropane
84742	Dibutylphthalate
106467	1,4-Dichlorobenzene
91941	3,3-Dichlorobenzidene
111444	Dichloroethyl ether
542756	1,3-Dichloropropene
62737	Dichlorvos
111422	Diethanolamine
121697	N,N-Dimethylaniline
64675	Diethyl Sulfate
119904	3,3-Dimethoxybenzidine
60117	Dimethyl Aminoazobenzene
119937	3,3'-Dimethyl Benzidine
79447	Dimethyl Carbamoyl Chloride
68122	Dimethyl Formamide
57147	1,1-Dimethyl Hydrazine
13113	Dimethyl Phthalate
77781	Dimethyl Sulfate
534521	4,6-Dinitro-o-cresol
51285	2,4-Dinitrophenol
121142	2,4-Dinitrotoluene
123911	1,4-Dioxane
122667	1,2-Diphenylhydrazine
106898	Epicholohydrin
106887	1,2-Epoxybutane
140885	Ethyl Acrylate
100414	Ethyl Benzene
51796	Ethyl Carbamate
75003	Ethyl Chloride
106934	Ethylene Dibromide
107062	Ethylene Dichloride
107211	Ethylene Glycol
151564	Ethylene Imine
75218	Ethylene Oxide
96457	Ethylene Thiourea
75343	Ethylidene Dichloride
50000	Formaldehyde
76448	Heptachlor
118741	Hexachlorobenzene
87683	Hexachlorobutadiene
77474	Hexachlorocyclopentadiene
67721	Hexachloroethane
822060	Hexamethylene-1,6-diisocyanate
680319	Hexamethylphosphoramide
110543	Hexane
302012	Hydrazine

CAS No.	Chemical/Compound
7647010	Hydrochloric Acid
7664393	Hydrogen Fluoride
123319	Hydroquinone
78591	Isophorone
58899	Lindane
108316	Maleic Anhydride
67561	Methanol
72435	Methoxychlor
74839	Methyl Bromide
74839	Methyl Chloride
74873	Methyl Chloroform
71556	Methyl Ethyl Ketone
60344	Methyl Hydrazine
74884	Methyl Iodide
108101	Methyl Isobutyl Ketone
624839	Methyl Isocyanate
80626	Methyl Methacrylate
1634044	Methyl tert Butyl Ether
101144	4,4-Methylene bis(2-Chloroaniline)
75092	Methylene Chloride
101688	Methylene Diphenyl Diisocyanate
101779	4,4'-Methylenedianiline
91203	Naphthalene
98953	Nitrobenzene
92933	4-Nitrobiphenyl
100027	4-Nitrophenol
79469	2-Nitropropane
684935	N-Nitroso-N-Methylurea
62759	N-Nitrosodimethylamine
59892	N-Nitrosomorpholine
56382	Parathion
82688	Pentachloronitrobenzene
87865	Pentachlorophenol
108952	Phenol
106503	p-Phenylenediamine
75445	Phosgene
7803512	Phosphine
7723140	Phosphorus
85449	Phthalic Anhydride
1336363	Polychlorinated Biphenyls
1120714	1,3-Propane Sultone
57578	beta-Propiolactone
123386	Propionaldehyde
114261	Propoxur
78875	Propylene Dichloride
75569	Propylene Oxide
75558	1,2-Proplenimine
91225	Quinoline

Appendix A – EPA HAP List

CAS No.	Chemical/Compound
106514	Quinone
100425	Styrene
96093	Styrene Oxide
1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin
79345	1,1,2,2-Tetrachloroethane
127184	Tetrachloroethylene
7550450	Titanium Tetrachloride
108883	Toluene
95807	2,4-Toluene Diamine
584849	2,4-Toluene Diisocyanate
95534	o-Toluidine
8001352	Toxaphene
120821	1,2,4-Trichlorobenzene
79005	1,1,2-Trichloroethane
79016	Trichloroethylene

CAS No.	Chemical/Compound
95954	2,4,5-Trichlorophenol
88062	2,4,6-Trichlorophenol
121448	Triethylamine
1582098	Trifluralin
540841	2,2,4-Trimethylpentane
108054	Vinyl Acetate
593602	Vinyl Bromide
75014	Vinyl Chloride
75354	Vinylidene Chloride
1330207	Xylenes
95476	o-Xylene
108383	m-Xylene
106423	p-Xylene
---	Antimony Compounds
---	Arsenic Compounds

CAS No.	Chemical/Compound
---	Beryllium Compounds
---	Cadmium Compounds
---	Chromium Compounds
---	Cobalt Compounds
---	Coke Oven Emissions
---	Cyanide Compounds [1]
---	Glycol Ethers [2]
---	Lead Compounds
---	Manganese Compounds
---	Mercury Compounds
---	Fine Mineral Fibers [3]
---	Nickel Compounds
---	Polycyclic Organic Matter [4]
---	Radionuclides (including Radon) [5]
---	Selenium Compounds

1. X'CN where X=H' or any other group where a formal dissociation may occur. For example, KCN or Ca(CN)2.
2. Includes mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH2CH2)-OR', where:
   n = 1, 2, or 3;
   R = alkyl C7 or less; or R = phenyl or alkyl-substituted phenyl;
   R' = H or alkyl C7 or less; or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.
3. Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.
4. Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100°C.
5. A type of atom which spontaneously undergoes radioactive decay.