

Annual 2014 Statewide (Non-road) Misc. Non-Road Engines Inventory

Compiled 9/1/16

Misc Non-Road Mobile - TONS PER YEAR

County	FIPs	CO	NOx	PM10	PM2.5	SO2	VOC
				Exhaust	Exhaust		
Beaver	49001	209.30	51.77	4.61	4.44	0.07	15.32
Box Elder	49003	6,016.00	681.70	57.66	54.33	1.62	1,433.00
Cache	49005	3,709.00	476.60	60.67	57.57	1.08	812.10
Carbon	49007	886.20	131.90	16.85	16.13	0.23	161.00
Daggett	49009	543.60	22.31	7.35	6.80	0.09	217.60
Davis	49011	7,869.00	928.80	94.24	89.84	2.01	929.00
Duchesne	49013	1,204.00	111.20	18.49	17.38	0.24	335.40
Emery	49015	391.20	111.90	13.05	12.55	0.16	97.23
Garfield	49017	2,151.00	84.41	34.07	31.55	0.30	894.60
Grand	49019	3,127.00	74.56	46.20	42.64	0.37	1,280.00
Iron	49021	1,270.00	193.70	22.98	21.87	0.38	266.70
Juab	49023	679.60	68.87	10.80	10.17	0.15	193.80
Kane	49025	2,136.00	83.15	28.01	25.88	0.31	821.40
Millard	49027	1,541.00	221.50	19.97	18.93	0.43	388.90
Morgan	49029	205.70	34.23	2.90	2.80	0.06	11.22
Piute	49031	102.70	17.69	1.89	1.80	0.03	31.22
Rich	49033	1,776.00	96.90	23.66	22.00	0.31	607.30
Salt Lake	49035	34,980.00	2,805.00	321.00	305.00	6.96	2,824.00
San Juan	49037	1,602.00	102.90	20.82	19.37	0.28	534.10
Sanpete	49039	976.00	107.90	16.32	15.38	0.24	292.70
Sevier	49041	1,725.00	202.20	34.65	32.75	0.37	496.80
Summit	49043	2,754.00	227.10	39.89	37.50	0.59	743.50
Tooele	49045	2,277.00	251.70	22.39	21.14	0.58	500.60
Uintah	49047	1,562.00	161.50	18.02	17.08	0.35	261.30
Utah	49049	11,633.00	1,340.00	156.60	148.90	2.89	1,534.00
Wasatch	49051	1,313.00	125.80	20.80	19.56	0.35	456.60
Washington	49053	6,476.00	573.10	94.86	89.43	1.31	1,371.00
Wayne	49055	756.00	35.22	11.97	11.12	0.11	288.00
Weber	49057	7,260.00	592.80	79.99	75.56	1.55	1,157.00
	SUM	107,131.30	9,916.41	1,300.71	1,229.46	23.41	18,955.39

Notes

1. VOC emissions are shown as follows:

- a. "VOC including refuel" means VOC exhaust + VOC evap, where VOC evap includes, as a sub-component, VOC refueling emissions.
- b. "VOC refueling emissions" are defined as VOC evaporative emissions that are released when individual vehicles refuel at gasoline stations.

VOC refueling emissions have traditionally been reported in the Area Source (Non-point) inventory, and are not considered part of the on-road mobile source inventory.

However, VOC refueling emissions are computed by the MOVES2010b model.

- c. On-road mobile source emissions are shown above as "VOC LESS Refuel" emissions.
- d. The ratio (VOC refuel/VOC ORMS) is a statewide average of 0.0926, or 9.26%. This means that VOC refueling emissions are about 9.26% as large as on-road mobile source VOC emissions.

Refueling emissions are released to atmosphere when fresh gasoline enters the gasoline tank. Fresh gasoline displaces vaporous gasoline emissions. Vehicles equipped with "On-board Refueling Vapor Recovery" canisters capture about 98% of refueling emissions. ORVR phase-in began with the 1998 model year in light-duty passenger vehicles. ORVR on light-duty trucks began to phase in with the 2001 model year, and on heavy-duty gasoline vehicles beginning with model year 2004.

Refueling emissions are relatively high in counties showing the following:

- 1) Older vehicles
- 2) Large fractions of light-duty gasoline trucks II (6, 000 to 8,500 lb GVWR) and larger fractions of heavy-duty gasoline vehicles (> 8,500 lb GVWR).

2. Vehicle Miles Traveled

Vehicle Miles Traveled were reported for calendar year 2011 by UT Department of Transportation. Units are Average Annual Daily Traffic (AADT), or simply average daily traffic, i.e., the average daily traffic over the 365 days in calendar year 2011.

3. Greenhouse Gases

The major greenhouse gas in terms of mass is CO2.

However, in terms of global warming potential, methane (CH4) and nitrous oxide (N2O) each have a much higher "global warming potential":

4. Global Warming Potential (GWP)

"Global warming potential" is defined as follows:

"Global Warming Potential (GWP) is intended as a quantified measure of the globally averaged relative radiative forcing impacts of a particular greenhouse gas. It is defined as the cumulative radiative forcing--both direct and indirect effects--integrated over a period of time from the emission of a unit mass of gas relative to some reference gas (IPCC 1996). Carbon dioxide (CO2) was chosen as this reference gas." (7)

Compound	GWP (20-yr)
CO2	1.00
CH4	56
N2O	280

5. CO2 and CO2 Equivalents

CO2 emissions are comprised of carbon dioxide emissions only. CO2 equivalents include emissions of CO2, methane (CH4) and nitrous oxide (N2O). CH4 and N2O emissions are converted to "equivalent" CO2 emissions based on their higher global warming potentials. For example, 1 ton of methane has approximately the same effect on global warming as 56 tons of CO2, based on its 20-year global warming potential (GWP). One ton of nitrous oxide has about the same effect on global warming as 280 tons of CO2 (based on the 20-yr GWP).

References

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