
AIRCRAFT EMISSIONS RATES OR TOTAL GSE EMISSION PER LANDING/TAKEOFF CYCLE

			Geomode 1 - Takeoff	(kg/hr/eng)
Aircraft	AIRCFT	747	Geomode 2 - Runway Queue	(kg/hr/eng)
Geographic mode	GEOMODE		1 Geomode 3 - Touch & Go	(kg/hr/eng)
			Geomode 4 - Taxi in/out	(kg/hr/eng)
Fuel	FUEL.CD	13	Geomode 5 - Grnd supp equip	(kg/LTO)
Number of engines	ENG.NUM	4	Geomode 6 - Test	(kg/hr/eng)
			Geomode 7 - Climb	(kg/hr/eng)
			Geomode 8 - Approach	(kg/hr/eng)

Time in mode TIMEMOD .70 minutes

Sum of GSE costs per LTO GSE .00 dollars/hours

Aircraft engine emissions per unit time (kg/hr/eng) or
emissions from all ground support equipment per aircraft LTO (kg/LTO)

CO	3.120751
HC	2.340563
NOx	358.886395
SOx	4.213014
Part	.000000

AIRCRAFT EMISSIONS RATES OR TOTAL GSE EMISSION PER LANDING/TAKEOFF CYCLE

			Geomode 1 - Takeoff	(kg/hr/eng)
Aircraft	AIRCFT	DC10	Geomode 2 - Runway Queue	(kg/hr/eng)
Geographic mode	GEOMODE		1 Geomode 3 - Touch & Go	(kg/hr/eng)
			Geomode 4 - Taxi in/out	(kg/hr/eng)
Fuel	FUEL.CD	13	Geomode 5 - Grnd supp equip	(kg/LTO)
Number of engines	ENG.NUM	3	Geomode 6 - Test	(kg/hr/eng)
			Geomode 7 - Climb	(kg/hr/eng)
			Geomode 8 - Approach	(kg/hr/eng)

Time in mode TIMEMOD .70 minutes

Sum of GSE costs per LTO GSE .00 dollars/hours

Aircraft engine emissions per unit time (kg/hr/eng) or
emissions from all ground support equipment per aircraft LTO (kg/LTO)

CO	1.758124
HC	1.758124
NOx	277.783548
SOx	4.746934
Part	.000000

APPENDIX: EMISSIONS BY SOURCE

This section provides detailed emissions for each source type:

- Auxiliary Power Units
- Ground Support Equipment
- Stationary Sources
- Parking Traffic
- Roadway Traffic

Table A3-1
AIRCRAFT ENGINE EMISSIONS BY ARRIVALS/DEPARTURES AND REMAIN-OVER-NIGHTS

SHORT TONS OF POLLUTANTS (2014)

EMISSION SOURCE	NO _x	VOC	CO	SO _x	PM-10	PM-2.5	TOTAL
Aircraft Engines	<u>1,623</u>	<u>242</u>	<u>1,329</u>	<u>158</u>	<u>22</u>	<u>22</u>	<u>3,395</u>
Arrivals/Departures	1,435	224	1,208	141	20	20	3,047
RONs	188	18	121	17	2	2	348

*Note: APUs = Auxiliary Power Units; RON = Remain-Over-Night
 Numbers may not add up to due rounding.*

Source: LeighFisher, 2016

Table A3-2
AUXILIARY POWER UNITS EMISSIONS BY ARRIVALS/DEPARTURES AND REMAIN-OVER-NIGHTS

SHORT TONS OF POLLUTANTS (2014)

EMISSION SOURCE	NO _x	VOC	CO	SO _x	PM-10	PM-2.5	TOTAL
APUs (Total)	<u>72</u>	<u>5</u>	<u>48</u>	<u>9</u>	<u>8</u>	<u>8</u>	<u>149</u>
Arrivals/Departures	65	4	44	8	8	8	136
RONs	7	0	3	1	1	1	13

*Note: APUs = Auxiliary Power Units; RON = Remain-Over-Night
 Numbers may not add up to due rounding.*

Source: LeighFisher, 2016

vehicular traffic was modeled on a *per vehicle* basis. The annualized VMT was divided by 1,000 vehicles to model emissions on a per 1,000 vehicle basis.

3 EMISSIONS INVENTORY FOR 2014

Table 3-1 summarizes the criteria pollutant emissions for all sources in the year 2014 at the Airport. Criteria pollutants are NO_x, volatile organic compounds (VOCs), CO, particulate matter with aerodynamic diameters equal to or less than 2.5 micrometers (PM_{2.5}) or 10 micrometers (PM₁₀), sulfur oxides (SO_x) and lead. Because very little AvGas, the only fuel that contains lead, is dispensed at Sea-Tac, the evaluation did not include consideration of lead emissions.

Table 3-1
CRITERIA POLLUTANT EMISSION INVENTORY, 2014

SHORT TONS OF POLLUTANTS (2014)

EMISSION SOURCE	NO_x	VOC	CO	SO_x	PM-10	PM-2.5	TOTAL
Aircraft Engines	1,623	242	1,329	158	8	8	3,395
APUs	72	5	48	9	22	22	149
GSE	307	78	2,292	21	20	19	2,738
Stationary Sources	17	1	12	0	22	23	34
Parking	1	2	36	0	1	1	39
Ground Transport	<u>32</u>	<u>19</u>	<u>462</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>516</u>
Total	2,052	347	4,178	54	53	187	6,871

Source: LeighFisher, 2016

TABLE D-3
Page 1 of 4

Seattle - Tacoma International Airport
Environmental Impact Statement

EMISSION INVENTORY
1994 EXISTING CONDITIONS
TONS/YEAR

1994 Do-Nothing SOURCES	CO	VOC'S	NOx	SOx	PM10	TOTAL
Roadways	16,676.00	1,402.50	2,163.70	1.37	9.12	20,252.69
Parking Lots	502 175.78	37.2 14.07	23.03 12.30	.018 0.01	.118 0.05	202.21
Heating Plants	3.36 3.25	2.77 0.53	.012 13.00	.003 0.06	.371 0.28	17.12
Training Fires	42.72	24.48	0.32	9.79	0.08	77.38
Surf. Coating	0.00	3.58	0.00	0.00	0.00	3.58
Tank Farms	0.00	.006 27.51	0.00	0.00	0.00	27.51
Grnd. Sup. Equip.	548.35	120.78	105.85	2.30	6.67	783.95
Aircraft	3121 1,365.10	1277 406.89	1874 1,378.30	162 54.67	.371 0.23	3,205.19
TOTALS	18,811.20	2,000.34	3,673.47	68.20	16.42	24,569.63

91 EDMS

4 annual

Source: Emission Dispersion Modeling System (EDMS) Version 944
 Landrum & Brown Inc., March, 1995

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State Air Cargo Study
Impact Mitigation Study ~~Proc~~

Ultrafine Particulate Study

FAA PSRC Alternate Regional site study

Start -
AEDT model -

Noise studies
re-do of DNL

FAA Community ~~Outreach~~ outreach

1990's

HOK impact mitigation

AQ model

Agreed Order

Weekday delay study

Traffic analysis