
APPENDIX F: AIR QUALITY & CLIMATE ASSESSMENT

Sikorsky Memorial Airport – Runway 11-29 Safety Improvements Environmental Assessment Air Quality Documentation

The proposed Project was evaluated under the Aviation Emissions and Air Quality Handbook (Handbook) published by the Federal Aviation Administration (FAA)¹. The air quality assessment process is outlined in Section 4.

The first step of the process is to determine the need for the assessment based on four factors:

1. Project Definition
2. FAA Involvement
3. Emissions Increase
4. Ambient Air Quality

1. Project Definition

The purpose of the project is to improve the runway safety area (RSA) for Runway 11-29 at the Sikorsky Memorial Airport (BDR) in Bridgeport, CT. Runway 11-29 will be shifted 250' to the west and an engineered materials arresting system (EMAS) will be installed on both ends of the runway. Excess pavement areas will also be removed.

2. FAA Involvement

The project is being partially funded through the FAA's Airport Improvement Program.

3. Emissions Increase

Although the project will not increase the airport capacity, temporary increases in emissions will occur during construction activities.

4. Ambient Air Quality

The airport is located in Fairfield County, CT. Fairfield County is designated by the Environmental Protection Agency (EPA) as a nonattainment area for the National Ambient Air Quality Standard for ozone. Fairfield County is also designated as a maintenance area for carbon monoxide and fine particulates (PM_{2.5}).

Federal actions in nonattainment and maintenance areas may be subject to the General Conformity requirements of 40 CFR 93, Subpart B. Routine maintenance and repair activities are exempt from the General Conformity requirements at §93.153(c)(2)(iv). The FAA has determined that “[a]irport maintenance, repair, removal, replacement, and installation work that matches the characteristics, size, and function of a facility as it existed before the replacement or repair activity typically qualifies as routine maintenance and repair for purposes of general conformity. Such activity does not increase the capacity of the airport or change the operational environment of the airport.”²

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https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/media/Air_Quality_Handbook_Appendices.pdf

² FAA, Federal Presumed To Conform Actions Under General Conformity, Federal Register / Vol. 72, No. 145 / Monday, July 30, 2007 (72 FR 41565)

Using these factors and the flowchart in Figure 4-3 of the Handbook, the level of assessment required was determined to be a construction emission inventory.

Emission Inventory Methodology

Emissions from construction activities were estimated using the Airport Construction Emissions Inventory Tool (ACEIT) published by the Airport Cooperative Research Program in Report 102³. ACEIT estimates the construction equipment activity that will be required based on the type and amount of construction being performed. This activity is used with emission factors for construction and other mobile vehicles to estimate the emissions that will result during construction of the project.

ACEIT has been configured with default construction equipment assignments based on the type of construction activity being performed. For example, for demolition of an asphalt area, ACEIT assumes the use of a bulldozer, excavator, and truck. The use of each piece of equipment is based on the amount of the activity being performed. In the asphalt demolition example, the square footage of the demolition area is input by the user. ACEIT assumes that 8 hours of bulldozer use is required for every 8,000 square feet and estimates the equipment runtime based on the project size. The estimated runtime is used with the equipment engine size and EPA emission factors to estimate the emissions.

The estimated equipment types and activities may be edited by the user. For the purposes of this analysis the default options were used. This approach will produce conservative results according to the ACEIT guidance.

Four major construction activities in ACEIT were identified as part of the project:

- Demolition – Asphalt
- Rehabilitate Runway
- Runway Extension
- Landscaping (Tree Removal)

For these construction activities, ACEIT estimates the equipment use based on the cost of the project and the area being demolished, rehabilitated, or constructed. For tree removal, the number of trees removed is also input. The cost of the project is estimated at \$11 million dollars. The area affected for each construction activity was estimated from Figures 3-4 and 3-5. The number of trees removed was conservatively estimated as 500. The detailed ACEIT report is attached.

Emission Inventory Results

The estimated emissions are shown in the table below. The exemption thresholds from 40 CFR 93, Subpart B are shown for reference.

Contaminants included in the analysis were nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO₂), particulate matter less than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}), carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

³ <http://www.trb.org/ACRP/Blurbs/170234.aspx>

Source	Contaminant (tons/yr)								
	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
Construction	1.90	8.44	6.99	0.02	0.48	0.12	2,410	0.13	0.02
Exemption Threshold	100	100	50	100	100	100	N/A	N/A	N/A

The estimated emissions are not significant and support a Finding of No Significant Impact (FONSI) for the project.

Airport Construction Emissions Inventory Tool (ACEIT)

Version 1.0

Run Date & Time: 1/20/2022 11:02:39 AM

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STUDY

Study Name

BDR

Study Description

Runway 11-29 Safety Improvements

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EMISSIONS INVENTORY - SUMMARY

Total Emissions by Year

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Year	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
2022	8.436029	1.895446	0.024345	0.482191	0.116142	6.994376	2185.629	0.116191	0.01551

Total Emissions by Source Categories

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases Emission: Metric Ton

Year	Emission Source	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
2022	NonRoad	1.940207	1.355418	0.007844	0.108756	0.100055	0.693711	1333.317	--	--
2022	OnRoad	6.109572	0.515928	0.012064	0.017135	0.016086	0.366617	852.312	0.116191	0.01551
2022	Fugitive	0.38625	0.0241	0.004438	0.3563	--	5.934049	--	--	--
2022	TOTAL	8.436029	1.895446	0.024345	0.482191	0.116142	6.994376	2185.629	0.116191	0.01551

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Demolition - Asphalt	Asphalt Demolition	Dozer	Diesel	175	0.59	342.23	0.0097	0.0216	0.0001	0.0016	0.0015	0.0057	18.9532
1	2022	Demolition - Asphalt	Asphalt Demolition	Excavator	Diesel	175	0.59	342.23	0.008	0.018	0.0001	0.0011	0.001	0.0056	18.9535
1	2022	Demolition - Asphalt	Asphalt Demolition	Pickup Truck	Diesel	600	0.59	684.45	0.0462	0.1154	0.0007	0.0044	0.004	0.0374	129.9687
1	2022	Landscaping	Tree Pruning	Aerial Lift	Diesel	75	0.21	519.48	0.0308	0.0399	3.7E-05	0.004	0.0037	0.006	5.6782
1	2022	Landscaping	Tree Pruning	Chipper/Stump Grinder	Diesel	100	0.43	519.48	0.0361	0.0631	0.0001	0.0061	0.0056	0.0075	13.1668
1	2022	Landscaping	Tree Pruning	Dump Truck	Diesel	600	0.59	519.48	0.0351	0.0875	0.0005	0.0033	0.0031	0.0284	98.643
1	2022	Landscaping	Tree Pruning	Other General Equipment	Diesel	175	0.43	519.48	0.012	0.0433	0.0001	0.0027	0.0025	0.0069	20.7399
1	2022	Landscaping	Tree Pruning	Pickup Truck	Diesel	600	0.59	519.48	0.0351	0.0875	0.0005	0.0033	0.0031	0.0284	98.643
1	2022	Landscaping	Tree Pruning	Pruning Saw/Chain Saw	Diesel	11	0.7	519.48	1.2943	0.0058	0.0006	0.043	0.0395	0.2766	2.744
1	2022	Rehabilitate Runway	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	7.4	0.0002	0.0006	2.3E-06	4.5E-05	4.2E-05	0.0001	0.41
1	2022	Rehabilitate Runway	Asphalt Placement	Dump Truck	Diesel	600	0.59	26.67	0.0018	0.0045	2.7E-05	0.0002	0.0002	0.0015	5.0635
1	2022	Rehabilitate Runway	Asphalt Placement	Other General Equipment	Diesel	175	0.43	14.81	0.0003	0.0012	3.4E-06	0.0001	0.0001	0.0002	0.5912
1	2022	Rehabilitate Runway	Asphalt Placement	Pickup Truck	Diesel	600	0.59	7.4	0.0005	0.0012	7.5E-06	4.7E-05	4.4E-05	0.0004	1.4059
1	2022	Rehabilitate Runway	Asphalt Placement	Roller	Diesel	100	0.59	7.4	0.0004	0.0004	1.5E-06	4.2E-05	3.9E-05	0.0001	0.2602
1	2022	Rehabilitate Runway	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	7.4	0.0005	0.0006	5.3E-07	0.0001	0.0001	0.0001	0.0809
1	2022	Rehabilitate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	9.48	0.0004	0.0007	6.2E-07	0.0001	0.0001	0.0001	0.0831
1	2022	Rehabilitate Runway	Cold Milling	Cold Planer	Diesel	175	0.59	11.85	0.0004	0.0009	3.6E-06	0.0001	0.0001	0.0002	0.6561

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Rehabilitate Runway	Cold Milling	Dump Truck	Diesel	600	0.59	11.85	0.0008	0.002	1.2E-05	0.0001	0.0001	0.0007	2.2494
1	2022	Rehabilitate Runway	Cold Milling	Pickup Truck	Diesel	600	0.59	11.85	0.0008	0.002	1.2E-05	0.0001	0.0001	0.0007	2.2494
1	2022	Rehabilitate Runway	Cold Milling	Sweepers	Diesel	175	0.43	11.85	0.0002	0.0006	2.6E-06	3.3E-05	3.E-05	0.0002	0.473
1	2022	Rehabilitate Runway	Cold Milling	Water Truck	Diesel	600	0.59	11.85	0.0008	0.002	1.2E-05	0.0001	0.0001	0.0007	2.2494
1	2022	Rehabilitate Runway	Dust Control	Water Truck	Diesel	600	0.59	1440	0.0973	0.2427	0.0015	0.0092	0.0085	0.0788	273.4383
1	2022	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dozer	Diesel	175	0.59	3.95	0.0001	0.0002	1.2E-06	1.9E-05	1.7E-05	0.0001	0.2187
1	2022	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dump Truck (12 cy)	Diesel	600	0.59	13.16	0.0009	0.0022	1.3E-05	0.0001	0.0001	0.0007	2.4994
1	2022	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Excavator	Diesel	175	0.59	3.95	0.0001	0.0002	1.2E-06	1.3E-05	1.2E-05	0.0001	0.2187
1	2022	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Pickup Truck	Diesel	600	0.59	3.95	0.0003	0.0007	4.E-06	2.5E-05	2.3E-05	0.0002	0.7498
1	2022	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Roller	Diesel	100	0.59	3.95	0.0002	0.0002	7.8E-07	2.3E-05	2.1E-05	0.0001	0.1388
1	2022	Rehabilitate Runway	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	1.86	0.0001	0.0001	5.6E-07	8.8E-06	8.1E-06	4.3E-05	0.1029
1	2022	Rehabilitate Runway	Grading	Dozer	Diesel	175	0.59	1.29	3.7E-05	0.0001	3.9E-07	6.1E-06	5.6E-06	3.3E-05	0.0714
1	2022	Rehabilitate Runway	Grading	Grader	Diesel	300	0.59	1.29	4.4E-05	0.0001	6.6E-07	5.7E-06	5.2E-06	4.8E-05	0.1224
1	2022	Rehabilitate Runway	Grading	Roller	Diesel	100	0.59	1.29	0.0001	0.0001	2.5E-07	7.4E-06	6.8E-06	2.6E-05	0.0453

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Rehabilitate Runway	Hydroseeding	Hydroseeder	Diesel	600	0.59	0.13	8.7E-06	2.2E-05	1.3E-07	8.3E-07	7.6E-07	2.3E-05	0.0245
1	2022	Rehabilitate Runway	Hydroseeding	Off-Road Truck	Diesel	600	0.59	0.13	8.7E-06	2.2E-05	1.3E-07	8.3E-07	7.6E-07	2.3E-05	0.0245
1	2022	Rehabilitate Runway	Lighting	Dump Truck	Diesel	600	0.59	6.16	0.0004	0.001	6.3E-06	3.9E-05	3.6E-05	0.0004	1.1697
1	2022	Rehabilitate Runway	Lighting	Loader	Diesel	175	0.59	6.16	0.0002	0.0005	1.9E-06	4.3E-05	4.E-05	0.0001	0.3411
1	2022	Rehabilitate Runway	Lighting	Other General Equipment	Diesel	175	0.43	6.16	0.0001	0.0005	1.4E-06	3.2E-05	2.9E-05	0.0001	0.2459
1	2022	Rehabilitate Runway	Lighting	Pickup Truck	Diesel	600	0.59	6.16	0.0004	0.001	6.3E-06	3.9E-05	3.6E-05	0.0004	1.1697
1	2022	Rehabilitate Runway	Lighting	Skid Steer Loader	Diesel	75	0.21	6.16	0.0004	0.0005	4.4E-07	0.0001	0.0001	0.0001	0.0673
1	2022	Rehabilitate Runway	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	6.16	0.0005	0.0004	5.6E-07	0.0001	0.0001	0.0002	0.0898
1	2022	Rehabilitate Runway	Markings	Flatbed Truck	Diesel	600	0.59	121.97	0.0082	0.0206	0.0001	0.0008	0.0007	0.0067	23.1602
1	2022	Rehabilitate Runway	Markings	Other General Equipment	Diesel	175	0.43	121.97	0.0028	0.0102	2.8E-05	0.0006	0.0006	0.0016	4.8695
1	2022	Rehabilitate Runway	Markings	Pickup Truck	Diesel	600	0.59	121.97	0.0082	0.0206	0.0001	0.0008	0.0007	0.0067	23.1602
1	2022	Rehabilitate Runway	Sealing Random Cracks	Crack Cleaner	Diesel	40	0.59	0.66	6.3E-06	0.0001	5.1E-08	7.4E-07	6.8E-07	2.8E-06	0.0093
1	2022	Rehabilitate Runway	Sealing Random Cracks	Crack Filler (Trailer Mounted)	Diesel	100	0.43	0.66	8.5E-06	8.8E-06	8.9E-08	3.6E-07	3.3E-07	4.4E-06	0.0167
1	2022	Rehabilitate Runway	Sealing Random Cracks	Flatbed Truck	Diesel	600	0.59	0.66	4.5E-05	0.0001	6.7E-07	4.2E-06	3.9E-06	0.0001	0.1253
1	2022	Rehabilitate Runway	Sealing Random Cracks	Other General Equipment	Diesel	175	0.43	0.66	1.5E-05	0.0001	1.5E-07	3.4E-06	3.2E-06	2.8E-05	0.0264
1	2022	Rehabilitate Runway	Sealing Random Cracks	Pickup Truck	Diesel	600	0.59	0.66	4.5E-05	0.0001	6.7E-07	4.2E-06	3.9E-06	0.0001	0.1253
1	2022	Rehabilitate Runway	Soil Erosion/Sediment Control	Other General Equipment	Diesel	175	0.43	1.2	2.8E-05	0.0001	2.8E-07	6.2E-06	5.7E-06	3.5E-05	0.0479
1	2022	Rehabilitate Runway	Soil Erosion/Sediment Control	Pickup Truck	Diesel	600	0.59	2.4	0.0002	0.0004	2.4E-06	1.5E-05	1.4E-05	0.0001	0.4557

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Rehabilitate Runway	Soil Erosion/Sediment Control	Pumps	Diesel	11	0.43	1.2	2.8E-05	2.8E-05	2.5E-08	2.4E-06	2.2E-06	5.E-06	0.0033
1	2022	Rehabilitate Runway	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	Diesel	100	0.21	1.2	0.0001	0.0001	1.1E-07	1.2E-05	1.1E-05	0.0001	0.0175
1	2022	Rehabilitate Runway	Subbase Placement	Dozer	Diesel	175	0.59	12.47	0.0004	0.0008	3.8E-06	0.0001	0.0001	0.0002	0.6906
1	2022	Rehabilitate Runway	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	87.75	0.0059	0.0148	0.0001	0.0006	0.0005	0.0048	16.6629
1	2022	Rehabilitate Runway	Subbase Placement	Pickup Truck	Diesel	600	0.59	12.47	0.0008	0.0021	1.3E-05	0.0001	0.0001	0.0007	2.3678
1	2022	Rehabilitate Runway	Subbase Placement	Roller	Diesel	100	0.59	12.15	0.0007	0.0007	2.4E-06	0.0001	0.0001	0.0001	0.427
1	2022	Rehabilitate Runway	Topsoil Placement	Dozer	Diesel	175	0.59	2.87	0.0001	0.0002	8.7E-07	1.4E-05	1.2E-05	0.0001	0.1587
1	2022	Rehabilitate Runway	Topsoil Placement	Dump Truck	Diesel	600	0.59	2.87	0.0002	0.0005	2.9E-06	1.8E-05	1.7E-05	0.0002	0.5441
1	2022	Rehabilitate Runway	Topsoil Placement	Pickup Truck	Diesel	600	0.59	2.87	0.0002	0.0005	2.9E-06	1.8E-05	1.7E-05	0.0002	0.5441
1	2022	Runway Extension	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	14.75	0.0005	0.0011	4.5E-06	0.0001	0.0001	0.0003	0.8166
1	2022	Runway Extension	Asphalt Placement	Dump Truck	Diesel	600	0.59	53.11	0.0036	0.009	0.0001	0.0003	0.0003	0.0029	10.0845
1	2022	Runway Extension	Asphalt Placement	Other General Equipment	Diesel	175	0.43	29.49	0.0007	0.0025	6.8E-06	0.0002	0.0001	0.0004	1.1774
1	2022	Runway Extension	Asphalt Placement	Pickup Truck	Diesel	600	0.59	14.75	0.001	0.0025	1.5E-05	0.0001	0.0001	0.0008	2.8
1	2022	Runway Extension	Asphalt Placement	Roller	Diesel	100	0.59	14.75	0.0008	0.0008	2.9E-06	0.0001	0.0001	0.0002	0.5182
1	2022	Runway Extension	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	14.75	0.0009	0.0011	1.E-06	0.0001	0.0001	0.0002	0.1612
1	2022	Runway Extension	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	18.87	0.0007	0.0014	1.2E-06	0.0001	0.0001	0.0001	0.1656
1	2022	Runway Extension	Clearing and Grubbing	Chain Saw	Diesel	11	0.7	31.2	0.0777	0.0004	3.7E-05	0.0026	0.0024	0.0202	0.1648
1	2022	Runway Extension	Clearing and Grubbing	Chipper/Stump Grinder	Diesel	100	0.43	31.2	0.0022	0.0038	5.E-06	0.0004	0.0003	0.0005	0.7908

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Runway Extension	Clearing and Grubbing	Pickup Truck	Diesel	600	0.59	41.6	0.0028	0.007	4.2E-05	0.0003	0.0002	0.0023	7.8993
1	2022	Runway Extension	Drainage - 24 inch SICPP	Dozer	Diesel	175	0.59	10.75	0.0003	0.0007	3.3E-06	0.0001	4.7E-05	0.0002	0.5955
1	2022	Runway Extension	Drainage - 24 inch SICPP	Dump Truck	Diesel	600	0.59	10.75	0.0007	0.0018	1.1E-05	0.0001	0.0001	0.0006	2.0417
1	2022	Runway Extension	Drainage - 24 inch SICPP	Excavator	Diesel	175	0.59	10.75	0.0003	0.0006	3.2E-06	3.5E-05	3.2E-05	0.0002	0.5955
1	2022	Runway Extension	Drainage - 24 inch SICPP	Loader	Diesel	175	0.59	10.75	0.0004	0.0009	3.3E-06	0.0001	0.0001	0.0002	0.5954
1	2022	Runway Extension	Drainage - 24 inch SICPP	Other General Equipment	Diesel	175	0.43	10.75	0.0002	0.0009	2.5E-06	0.0001	0.0001	0.0002	0.4293
1	2022	Runway Extension	Drainage - 24 inch SICPP	Pickup Truck	Diesel	600	0.59	10.75	0.0007	0.0018	1.1E-05	0.0001	0.0001	0.0006	2.0417
1	2022	Runway Extension	Drainage - 24 inch SICPP	Roller	Diesel	100	0.59	10.75	0.0006	0.0006	2.1E-06	0.0001	0.0001	0.0001	0.3779
1	2022	Runway Extension	Drainage - 6 inch Perforated Underdrain	Dump Truck	Diesel	600	0.59	5.97	0.0004	0.001	6.1E-06	3.8E-05	3.5E-05	0.0003	1.1343
1	2022	Runway Extension	Drainage - 6 inch Perforated Underdrain	Loader	Diesel	175	0.59	5.97	0.0002	0.0005	1.9E-06	4.2E-05	3.8E-05	0.0001	0.3308
1	2022	Runway Extension	Drainage - 6 inch Perforated Underdrain	Other General Equipment	Diesel	175	0.43	5.97	0.0001	0.0005	1.4E-06	3.1E-05	2.9E-05	0.0001	0.2385
1	2022	Runway Extension	Drainage - 6 inch Perforated Underdrain	Pickup Truck	Diesel	600	0.59	5.97	0.0004	0.001	6.1E-06	3.8E-05	3.5E-05	0.0003	1.1343
1	2022	Runway Extension	Drainage - 6 inch Perforated Underdrain	Tractors/Loader/Backhoe	Diesel	100	0.21	5.97	0.0005	0.0003	5.4E-07	0.0001	0.0001	0.0002	0.0871
1	2022	Runway Extension	Dust Control	Water Truck	Diesel	600	0.59	1440	0.0973	0.2427	0.0015	0.0092	0.0085	0.0788	273.4383
1	2022	Runway Extension	Excavation (Borrow)	Dozer	Diesel	175	0.59	65.54	0.0019	0.0041	2.E-05	0.0003	0.0003	0.0011	3.6296
1	2022	Runway Extension	Excavation (Borrow)	Dump Truck (12 cy)	Diesel	600	0.59	65.54	0.0044	0.011	0.0001	0.0004	0.0004	0.0036	12.4447
1	2022	Runway Extension	Excavation (Borrow)	Pickup Truck	Diesel	600	0.59	65.54	0.0044	0.011	0.0001	0.0004	0.0004	0.0036	12.4447

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Runway Extension	Excavation (Borrow)	Roller	Diesel	100	0.59	30.25	0.0017	0.0017	6.E-06	0.0002	0.0002	0.0003	1.0631
1	2022	Runway Extension	Excavation (Cut to Fill)	Dozer	Diesel	175	0.59	49.15	0.0014	0.0031	1.5E-05	0.0002	0.0002	0.0008	2.7222
1	2022	Runway Extension	Excavation (Cut to Fill)	Dump Truck (12 cy)	Diesel	600	0.59	131.07	0.0089	0.0221	0.0001	0.0008	0.0008	0.0072	24.8895
1	2022	Runway Extension	Excavation (Cut to Fill)	Excavator	Diesel	175	0.59	39.32	0.0009	0.0021	1.2E-05	0.0001	0.0001	0.0006	2.1778
1	2022	Runway Extension	Excavation (Cut to Fill)	Pickup Truck	Diesel	600	0.59	39.32	0.0027	0.0066	4.E-05	0.0003	0.0002	0.0022	7.4668
1	2022	Runway Extension	Excavation (Cut to Fill)	Roller	Diesel	100	0.59	39.32	0.0022	0.0022	7.7E-06	0.0002	0.0002	0.0004	1.382
1	2022	Runway Extension	Excavation (Cut to Fill)	Scraper	Diesel	600	0.59	49.15	0.0074	0.019	0.0001	0.001	0.0009	0.0029	9.3331
1	2022	Runway Extension	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	18.5	0.0005	0.0012	5.6E-06	0.0001	0.0001	0.0003	1.0248
1	2022	Runway Extension	Grading	Dozer	Diesel	175	0.59	12.53	0.0004	0.0008	3.8E-06	0.0001	0.0001	0.0002	0.694
1	2022	Runway Extension	Grading	Grader	Diesel	300	0.59	12.53	0.0004	0.0012	6.4E-06	0.0001	0.0001	0.0004	1.1898
1	2022	Runway Extension	Grading	Roller	Diesel	100	0.59	12.53	0.0007	0.0007	2.5E-06	0.0001	0.0001	0.0001	0.4404
1	2022	Runway Extension	Hydroseeding	Hydroseeder	Diesel	600	0.59	11.29	0.0008	0.0019	1.2E-05	0.0001	0.0001	0.0006	2.1438
1	2022	Runway Extension	Hydroseeding	Off-Road Truck	Diesel	600	0.59	11.29	0.0008	0.0019	1.2E-05	0.0001	0.0001	0.0006	2.1438
1	2022	Runway Extension	Lighting	Dump Truck	Diesel	600	0.59	8.69	0.0006	0.0015	8.9E-06	0.0001	0.0001	0.0005	1.6508
1	2022	Runway Extension	Lighting	Loader	Diesel	175	0.59	8.69	0.0003	0.0007	2.7E-06	0.0001	0.0001	0.0002	0.4814
1	2022	Runway Extension	Lighting	Other General Equipment	Diesel	175	0.43	8.69	0.0002	0.0007	2.E-06	4.5E-05	4.2E-05	0.0001	0.3471
1	2022	Runway Extension	Lighting	Pickup Truck	Diesel	600	0.59	8.69	0.0006	0.0015	8.9E-06	0.0001	0.0001	0.0005	1.6508
1	2022	Runway Extension	Lighting	Skid Steer Loader	Diesel	75	0.21	8.69	0.0006	0.0007	6.2E-07	0.0001	0.0001	0.0002	0.095
1	2022	Runway Extension	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	8.69	0.0007	0.0005	7.9E-07	0.0001	0.0001	0.0002	0.1268

Scen. ID	Year	Project	Construction Activity	Equipment	Fuel	HP Avg	Load Factor	Hours of Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2022	Runway Extension	Markings	Flatbed Truck	Diesel	600	0.59	242.92	0.0164	0.0409	0.0002	0.0016	0.0014	0.0133	46.1269
1	2022	Runway Extension	Markings	Other General Equipment	Diesel	175	0.43	242.92	0.0056	0.0202	0.0001	0.0013	0.0012	0.0033	9.6983
1	2022	Runway Extension	Markings	Pickup Truck	Diesel	600	0.59	242.92	0.0164	0.0409	0.0002	0.0016	0.0014	0.0133	46.1269
1	2022	Runway Extension	Soil Erosion/Control	Other General Equipment	Diesel	175	0.43	10.4	0.0002	0.0009	2.4E-06	0.0001	5.E-05	0.0002	0.4152
1	2022	Runway Extension	Soil Erosion/Control	Pickup Truck	Diesel	600	0.59	20.8	0.0014	0.0035	2.1E-05	0.0001	0.0001	0.0012	3.9497
1	2022	Runway Extension	Soil Erosion/Control	Pumps	Diesel	11	0.43	10.4	0.0002	0.0002	2.2E-07	2.1E-05	1.9E-05	3.5E-05	0.0289
1	2022	Runway Extension	Soil Erosion/Control	Tractors/Loader/Backhoe	Diesel	100	0.21	10.4	0.0008	0.0006	9.4E-07	0.0001	0.0001	0.0002	0.1517
1	2022	Runway Extension	Subbase Placement	Dozer	Diesel	175	0.59	24.83	0.0007	0.0016	7.5E-06	0.0001	0.0001	0.0004	1.3754
1	2022	Runway Extension	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	174.76	0.0118	0.0295	0.0002	0.0011	0.001	0.0096	33.1856
1	2022	Runway Extension	Subbase Placement	Pickup Truck	Diesel	600	0.59	24.83	0.0017	0.0042	2.5E-05	0.0002	0.0001	0.0014	4.7159
1	2022	Runway Extension	Subbase Placement	Roller	Diesel	100	0.59	24.2	0.0014	0.0014	4.8E-06	0.0001	0.0001	0.0003	0.8504
1	2022	Runway Extension	Topsoil Placement	Dozer	Diesel	175	0.59	27.85	0.0008	0.0018	8.5E-06	0.0001	0.0001	0.0005	1.5423
1	2022	Runway Extension	Topsoil Placement	Dump Truck	Diesel	600	0.59	27.85	0.0019	0.0047	2.8E-05	0.0002	0.0002	0.0015	5.288
1	2022	Runway Extension	Topsoil Placement	Pickup Truck	Diesel	600	0.59	27.85	0.0019	0.0047	2.8E-05	0.0002	0.0002	0.0015	5.288

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

Scen. ID	Year	Project	Equipment	Equipment Category	On-road Activity	Fuel	Roadway Type	Round Trip Distance (miles)	Distance for fugitive PM	Number of Vehicles	Number of Employees Or \$M* 11 (Whichever larger)	Number of Project Days	VMT
1	2022	Demolition - Asphalt	Dump Truck	Single Unit Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	8	--	129	76050
1	2022	Demolition - Asphalt	Passenger Car	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	--	121	121	129	468270
1	2022	Landscaping	Flatbed Truck	Combination Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	0
1	2022	Landscaping	Passenger Car	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	--	121	121	129	468270
1	2022	Rehabilitate Runway	Asphalt 18 Wheeler	Combination Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	774
1	2022	Rehabilitate Runway	Dump Truck - Asphalt	Single Unit Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	1097
1	2022	Rehabilitate Runway	Dump Truck Subbase Material	Single Unit Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	6581
1	2022	Rehabilitate Runway	Passenger Car	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	--	121	121	129	468270
1	2022	Runway Extension	Asphalt 18 Wheeler	Combination Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	1542
1	2022	Runway Extension	Dump Truck - Asphalt	Single Unit Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	1	--	129	2185
1	2022	Runway Extension	Dump Truck Subbase Material	Single Unit Short-haul Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	5	2	--	129	13107
1	2022	Runway Extension	Passenger Car	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	--	121	121	129	468270

Scen. ID	Year	Project	Equipment	Equipment Category	On-road Activity	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
1	2022	Demolition - Asphalt	Dump Truck	Single Unit Short-haul Truck	Material Delivery	0.0811	0.122	0.0008	0.0045	0.0044	0.001	104.9975	0.0113	0.0054
1	2022	Demolition - Asphalt	Passenger Car	Passenger Car	Employee Commute	1.4958	0.0873	0.0027	0.0027	0.0025	0.0906	177.3943	0.0252	0.0021
1	2022	Landscaping	Flatbed Truck	Combination Short-haul Truck	Material Delivery	0.0032	0.0001	3.1E-07	4.4E-06	4.3E-06	0.0009	0.0381	0	0
1	2022	Landscaping	Passenger Car	Passenger Car	Employee Commute	1.4958	0.0873	0.0027	0.0027	0.0025	0.0906	177.3943	0.0252	0.0021
1	2022	Rehabilitate Runway	Asphalt 18 Wheeler	Combination Short-haul Truck	Material Delivery	0.004	0.0027	1.5E-05	0.0001	0.0001	0.0009	1.9818	0.0002	0.0001
1	2022	Rehabilitate Runway	Dump Truck - Asphalt	Single Unit Short-haul Truck	Material Delivery	0.0041	0.0018	1.2E-05	0.0001	0.0001	0.0001	1.5467	0.0002	0.0001
1	2022	Rehabilitate Runway	Dump Truck Subbase Material	Single Unit Short-haul Truck	Material Delivery	0.008	0.0106	0.0001	0.0004	0.0004	0.0001	9.0971	0.001	0.0005
1	2022	Rehabilitate Runway	Passenger Car	Passenger Car	Employee Commute	1.4958	0.0873	0.0027	0.0027	0.0025	0.0906	177.3943	0.0252	0.0021
1	2022	Runway Extension	Asphalt 18 Wheeler	Combination Short-haul Truck	Material Delivery	0.0049	0.0052	3.E-05	0.0003	0.0003	0.0009	3.9104	0.0003	0.0001
1	2022	Runway Extension	Dump Truck - Asphalt	Single Unit Short-haul Truck	Material Delivery	0.0049	0.0035	2.3E-05	0.0001	0.0001	0.0001	3.0447	0.0003	0.0002
1	2022	Runway Extension	Dump Truck Subbase Material	Single Unit Short-haul Truck	Material Delivery	0.016	0.021	0.0001	0.0008	0.0008	0.0002	18.1186	0.0019	0.0009
1	2022	Runway Extension	Passenger Car	Passenger Car	Employee Commute	1.4958	0.0873	0.0027	0.0027	0.0025	0.0906	177.3943	0.0252	0.0021

Fugitive Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID	Year	Project	Fugitive Source Type	Number of Months	CO	NOx	SO2	PM10	VOC
1	2022	Demolition - Asphalt	Material Movement (Paved Roads)	6	0	0	0	0.02395	0
1	2022	Demolition - Asphalt	Material Movement (Unpaved Roads)	6	0	0	0	0.0765	0
1	2022	Demolition - Asphalt	Soil Handling	6	0	0	0	0.09685	0
1	2022	Demolition - Asphalt	Unstabilized Land and Wind Erosion	6	0	0	0	6.91E-08	0
1	2022	Rehabilitate Runway	Asphalt Drying	6	0	0	0	0	1.97955
1	2022	Rehabilitate Runway	Asphalt Storage and Batching	6	0.1291	0.00805	0.001484	0.00885	0.003999
1	2022	Rehabilitate Runway	Material Movement (Paved Roads)	6	0	0	0	0.009	0
1	2022	Rehabilitate Runway	Material Movement (Unpaved Roads)	6	0	0	0	0.027	0
1	2022	Rehabilitate Runway	Soil Handling	6	0	0	0	0.0151	0
1	2022	Rehabilitate Runway	Unstabilized Land and Wind Erosion	6	0	0	0	1.08E-08	0
1	2022	Runway Extension	Asphalt Drying	6	0	0	0	0	3.94255
1	2022	Runway Extension	Asphalt Storage and Batching	6	0.25715	0.01605	0.002954	0.0176	0.00795
1	2022	Runway Extension	Material Movement (Paved Roads)	6	0	0	0	0.01195	0
1	2022	Runway Extension	Material Movement (Unpaved Roads)	6	0	0	0	0.0394	0
1	2022	Runway Extension	Soil Handling	6	0	0	0	0.0301	0
1	2022	Runway Extension	Unstabilized Land and Wind Erosion	6	0	0	0	2.14E-08	0

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INPUT DATA AND SPECIFICATIONS

State/County
 Connecticut
 Fairfield County
 Scenarios

Scenario ID	Year	Number of Months	Season	Average Daily Temp (degF)	Max Daily Temp Change (degF)	Min Daily Temp Change (degF)
1	2022	6	Summer	50 < T <= 80	20 <= Change in T	10 <= Change in T < 20

Project Final Selections

Scenario ID	Project	Construction Activity	Equipment	Fuel Type
1	Demolition - Asphalt	Asphalt Demolition	Dozer	Diesel
1	Demolition - Asphalt	Asphalt Demolition	Excavator	Diesel
1	Demolition - Asphalt	Asphalt Demolition	Pickup Truck	Diesel
1	Landscaping	Tree Pruning	Aerial Lift	Diesel
1	Landscaping	Tree Pruning	Chipper/Stump Grinder	Diesel
1	Landscaping	Tree Pruning	Dump Truck	Diesel
1	Landscaping	Tree Pruning	Other General Equipment	Diesel
1	Landscaping	Tree Pruning	Pickup Truck	Diesel
1	Landscaping	Tree Pruning	Pruning Saw/Chain Saw	Diesel
1	Rehabilitate Runway	Asphalt Placement	Asphalt Paver	Diesel
1	Rehabilitate Runway	Asphalt Placement	Dump Truck	Diesel
1	Rehabilitate Runway	Asphalt Placement	Other General Equipment	Diesel
1	Rehabilitate Runway	Asphalt Placement	Pickup Truck	Diesel
1	Rehabilitate Runway	Asphalt Placement	Roller	Diesel
1	Rehabilitate Runway	Asphalt Placement	Skid Steer Loader	Diesel
1	Rehabilitate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel
1	Rehabilitate Runway	Cold Milling	Cold Planer	Diesel
1	Rehabilitate Runway	Cold Milling	Dump Truck	Diesel
1	Rehabilitate Runway	Cold Milling	Pickup Truck	Diesel

Scenario ID	Project	Construction Activity	Equipment	Fuel Type
1	Rehabilitate Runway	Cold Milling	Sweepers	Diesel
1	Rehabilitate Runway	Cold Milling	Water Truck	Diesel
1	Rehabilitate Runway	Dust Control	Water Truck	Diesel
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dozer	Diesel
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dump Truck (12 cy)	Diesel
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Excavator	Diesel
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Pickup Truck	Diesel
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Roller	Diesel
1	Rehabilitate Runway	Excavation (Topsoil Stripping)	Dozer	Diesel
1	Rehabilitate Runway	Grading	Dozer	Diesel
1	Rehabilitate Runway	Grading	Grader	Diesel
1	Rehabilitate Runway	Grading	Roller	Diesel
1	Rehabilitate Runway	Hydroseeding	Hydroseeder	Diesel
1	Rehabilitate Runway	Hydroseeding	Off-Road Truck	Diesel
1	Rehabilitate Runway	Lighting	Dump Truck	Diesel
1	Rehabilitate Runway	Lighting	Loader	Diesel
1	Rehabilitate Runway	Lighting	Other General Equipment	Diesel
1	Rehabilitate Runway	Lighting	Pickup Truck	Diesel
1	Rehabilitate Runway	Lighting	Skid Steer Loader	Diesel
1	Rehabilitate Runway	Lighting	Tractors/Loader/Backhoe	Diesel
1	Rehabilitate Runway	Markings	Flatbed Truck	Diesel
1	Rehabilitate Runway	Markings	Other General Equipment	Diesel
1	Rehabilitate Runway	Markings	Pickup Truck	Diesel
1	Rehabilitate Runway	Sealing Random Cracks	Crack Cleaner	Diesel
1	Rehabilitate Runway	Sealing Random Cracks	Crack Filler (Trailer Mounted)	Diesel
1	Rehabilitate Runway	Sealing Random Cracks	Flatbed Truck	Diesel
1	Rehabilitate Runway	Sealing Random Cracks	Other General Equipment	Diesel

Scenario ID	Project	Construction Activity	Equipment	Fuel Type
1	Rehabilitate Runway	Sealing Random Cracks	Pickup Truck	Diesel
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Other General Equipment	Diesel
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pickup Truck	Diesel
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pumps	Diesel
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	Diesel
1	Rehabilitate Runway	Subbase Placement	Dozer	Diesel
1	Rehabilitate Runway	Subbase Placement	Dump Truck (12 cy)	Diesel
1	Rehabilitate Runway	Subbase Placement	Pickup Truck	Diesel
1	Rehabilitate Runway	Subbase Placement	Roller	Diesel
1	Rehabilitate Runway	Topsoil Placement	Dozer	Diesel
1	Rehabilitate Runway	Topsoil Placement	Dump Truck	Diesel
1	Rehabilitate Runway	Topsoil Placement	Pickup Truck	Diesel
1	Runway Extension	Asphalt Placement	Asphalt Paver	Diesel
1	Runway Extension	Asphalt Placement	Dump Truck	Diesel
1	Runway Extension	Asphalt Placement	Other General Equipment	Diesel
1	Runway Extension	Asphalt Placement	Pickup Truck	Diesel
1	Runway Extension	Asphalt Placement	Roller	Diesel
1	Runway Extension	Asphalt Placement	Skid Steer Loader	Diesel
1	Runway Extension	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel
1	Runway Extension	Clearing and Grubbing	Chain Saw	Diesel
1	Runway Extension	Clearing and Grubbing	Chipper/Stump Grinder	Diesel
1	Runway Extension	Clearing and Grubbing	Pickup Truck	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Dozer	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Dump Truck	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Excavator	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Loader	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Other General Equipment	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Pickup Truck	Diesel
1	Runway Extension	Drainage - 24 inch SICPP	Roller	Diesel

Scenario ID	Project	Construction Activity	Equipment	Fuel Type
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Dump Truck	Diesel
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Loader	Diesel
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Other General Equipment	Diesel
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Pickup Truck	Diesel
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Tractors/Loader/Backhoe	Diesel
1	Runway Extension	Dust Control	Water Truck	Diesel
1	Runway Extension	Excavation (Borrow)	Dozer	Diesel
1	Runway Extension	Excavation (Borrow)	Dump Truck (12 cy)	Diesel
1	Runway Extension	Excavation (Borrow)	Pickup Truck	Diesel
1	Runway Extension	Excavation (Borrow)	Roller	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Dozer	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Dump Truck (12 cy)	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Excavator	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Pickup Truck	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Roller	Diesel
1	Runway Extension	Excavation (Cut to Fill)	Scraper	Diesel
1	Runway Extension	Excavation (Topsoil Stripping)	Dozer	Diesel
1	Runway Extension	Grading	Dozer	Diesel
1	Runway Extension	Grading	Grader	Diesel
1	Runway Extension	Grading	Roller	Diesel
1	Runway Extension	Hydroseeding	Hydroseeder	Diesel
1	Runway Extension	Hydroseeding	Off-Road Truck	Diesel
1	Runway Extension	Lighting	Dump Truck	Diesel
1	Runway Extension	Lighting	Loader	Diesel
1	Runway Extension	Lighting	Other General Equipment	Diesel
1	Runway Extension	Lighting	Pickup Truck	Diesel
1	Runway Extension	Lighting	Skid Steer Loader	Diesel
1	Runway Extension	Lighting	Tractors/Loader/Backhoe	Diesel
1	Runway Extension	Markings	Flatbed Truck	Diesel

Scenario ID	Project	Construction Activity	Equipment	Fuel Type
1	Runway Extension	Markings	Other General Equipment	Diesel
1	Runway Extension	Markings	Pickup Truck	Diesel
1	Runway Extension	Soil Erosion/Control	Other General Equipment	Diesel
1	Runway Extension	Soil Erosion/Control	Pickup Truck	Diesel
1	Runway Extension	Soil Erosion/Control	Pumps	Diesel
1	Runway Extension	Soil Erosion/Control	Tractors/Loader/Backhoe	Diesel
1	Runway Extension	Subbase Placement	Dozer	Diesel
1	Runway Extension	Subbase Placement	Dump Truck (12 cy)	Diesel
1	Runway Extension	Subbase Placement	Pickup Truck	Diesel
1	Runway Extension	Subbase Placement	Roller	Diesel
1	Runway Extension	Topsoil Placement	Dozer	Diesel
1	Runway Extension	Topsoil Placement	Dump Truck	Diesel
1	Runway Extension	Topsoil Placement	Pickup Truck	Diesel

Overall Size

Scenario ID	Project	Project Size Questions	User Input	Unit
1	Demolition - Asphalt	What is the estimated cost of the project?	11	\$ Million(s)
1	Demolition - Asphalt	What is the maximum length of demolition area (L) in feet?	585	Feet
1	Demolition - Asphalt	What is the maximum width of demolition area (W) in feet?	585	Feet
1	Landscaping	What is the estimated cost of the project?	11	\$ Million(s)
1	Landscaping	What is the maximum length of the project area (L) in feet?	3000	Feet
1	Landscaping	What is the maximum width of the project area (W) in feet?	500	Feet
1	Landscaping	What is the number of trees planted?	0	---
1	Landscaping	What is the number of trees pruned?	500	---
1	Rehabilitate Runway	What is the estimated cost of the project?	11	\$ Million(s)
1	Rehabilitate Runway	What is the maximum length of rehibition (L) in feet?	231	Feet
1	Rehabilitate Runway	What is the maximum width of rehibition (W) in feet?	231	Feet
1	Runway Extension	What is the estimated cost of the project?	11	\$ Million(s)
1	Runway Extension	What is the maximum length of the runway extension (L) in feet?	326	Feet
1	Runway Extension	What is the maximum width of the runway extension (W) in feet?	326	Feet

Size Detail (Estimated based on engineering experience)

Scenario ID	Project	Construction Activity	Default Activity Size	Unit
1	Demolition - Asphalt	Asphalt Demolition	342225	Square Feet
1	Landscaping	Tree Pruning	500	Trees
1	Rehabilitate Runway	Asphalt Placement	5923.1	Square Yards
1	Rehabilitate Runway	Cold Milling	5923.1	Square Yards
1	Rehabilitate Runway	Dust Control	180	Days
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	493.6	Cubic Yards
1	Rehabilitate Runway	Excavation (Topsoil Stripping)	1184.6	Square Yards
1	Rehabilitate Runway	Grading	1289.4	Square Yards
1	Rehabilitate Runway	Hydroseeding	1289.4	Square Feet
1	Rehabilitate Runway	Lighting	924	Linear Feet
1	Rehabilitate Runway	Markings	53361	Square Feet
1	Rehabilitate Runway	Sealing Random Cracks	231	Linear Feet
1	Rehabilitate Runway	Soil Erosion/Sediment Control	0.3	Acres
1	Rehabilitate Runway	Subbase Placement	5923.1	Square Yards
1	Rehabilitate Runway	Subbase Placement	1974.4	Cubic Yards
1	Rehabilitate Runway	Topsoil Placement	214.9	Cubic Yards
1	Runway Extension	Asphalt Placement	11796.6	Square Yards
1	Runway Extension	Clearing and Grubbing	2.6	Acres
1	Runway Extension	Drainage - 24 inch SICPP	336	Linear Feet
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	672	Linear Feet
1	Runway Extension	Dust Control	180	Days
1	Runway Extension	Excavation (Borrow)	4915.3	Cubic Yards
1	Runway Extension	Excavation (Cut to Fill)	4915.3	Cubic Yards
1	Runway Extension	Excavation (Topsoil Stripping)	11796.6	Square Yards
1	Runway Extension	Grading	12531.5	Square Yards
1	Runway Extension	Hydroseeding	112896	Square Feet
1	Runway Extension	Lighting	1304	Linear Feet
1	Runway Extension	Markings	106276	Square Feet
1	Runway Extension	Soil Erosion/Control	2.6	Acres
1	Runway Extension	Subbase Placement	11796.6	Square Yards
1	Runway Extension	Subbase Placement	3932.2	Cubic Yards
1	Runway Extension	Topsoil Placement	2088.6	Cubic Yards

Activity: Non-Road (Estimated based on engineering experience)

Scenario ID	Project	Construction Activity	Equipment	Fuel Type	Activity Size	Activity Rate	Default Activity	Activity Unit
1	Demolition - Asphalt	Asphalt Demolition	Dozer	Diesel	342225.00 SF	8 Hours per 8000.00 SF	342.23	hours
1	Demolition - Asphalt	Asphalt Demolition	Excavator	Diesel	342225.00 SF	8 Hours per 8000.00 SF	342.23	hours
1	Demolition - Asphalt	Asphalt Demolition	Pickup Truck	Diesel	342225.00 SF	8 Hours per 4000.00 SF	684.45	hours
1	Landscaping	Tree Pruning	Aerial Lift	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Landscaping	Tree Pruning	Chipper/Stump Grinder	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Landscaping	Tree Pruning	Dump Truck	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Landscaping	Tree Pruning	Other General Equipment	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Landscaping	Tree Pruning	Pickup Truck	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Landscaping	Tree Pruning	Pruning Saw/Chain Saw	Diesel	500.00 Trees	8 Hours per 7.70 Trees	519.48	hours
1	Rehabilitate Runway	Asphalt Placement	Asphalt Paver	Diesel	5923.10 SY	8 Hours per 6400.00 SY	7.4	hours
1	Rehabilitate Runway	Asphalt Placement	Dump Truck	Diesel	5923.10 SY	8 Hours per 1777.00 SY	26.67	hours
1	Rehabilitate Runway	Asphalt Placement	Other General Equipment	Diesel	5923.10 SY	16 Hours per 6400.00 SY	14.81	hours
1	Rehabilitate Runway	Asphalt Placement	Pickup Truck	Diesel	5923.10 SY	8 Hours per 6400.00 SY	7.4	hours
1	Rehabilitate Runway	Asphalt Placement	Roller	Diesel	5923.10 SY	8 Hours per 6400.00 SY	7.4	hours
1	Rehabilitate Runway	Asphalt Placement	Skid Steer Loader	Diesel	5923.10 SY	8 Hours per 6400.00 SY	7.4	hours
1	Rehabilitate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	5923.10 SY	8 Hours per 5000.00 SY	9.48	hours
1	Rehabilitate Runway	Cold Milling	Cold Planer	Diesel	5923.10 SY	8 Hours per 4000.00 SY	11.85	hours
1	Rehabilitate Runway	Cold Milling	Dump Truck	Diesel	5923.10 SY	8 Hours per 4000.00 SY	11.85	hours
1	Rehabilitate Runway	Cold Milling	Pickup Truck	Diesel	5923.10 SY	8 Hours per 4000.00 SY	11.85	hours
1	Rehabilitate Runway	Cold Milling	Sweepers	Diesel	5923.10 SY	8 Hours per 4000.00 SY	11.85	hours
1	Rehabilitate Runway	Cold Milling	Water Truck	Diesel	5923.10 SY	8 Hours per 4000.00 SY	11.85	hours
1	Rehabilitate Runway	Dust Control	Water Truck	Diesel	180.00 Day	8 Hours per 1.00 Day	1440	hours
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dozer	Diesel	493.60 CY	8 Hours per 1000.00 CY	3.95	hours
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dump Truck (12 cy)	Diesel	493.60 CY	8 Hours per 300.00 CY	13.16	hours

Scenario ID	Project	Construction Activity	Equipment	Fuel Type	Activity Size	Activity Rate	Default Activity	Activity Unit
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Excavator	Diesel	493.60 CY	8 Hours per 1000.00 CY	3.95	hours
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Pickup Truck	Diesel	493.60 CY	8 Hours per 1000.00 CY	3.95	hours
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Roller	Diesel	493.60 CY	8 Hours per 1000.00 CY	3.95	hours
1	Rehabilitate Runway	Excavation (Topsoil Stripping)	Dozer	Diesel	1184.60 SY	8 Hours per 5100.00 SY	1.86	hours
1	Rehabilitate Runway	Grading	Dozer	Diesel	1289.40 SY	8 Hours per 8000.00 SY	1.29	hours
1	Rehabilitate Runway	Grading	Grader	Diesel	1289.40 SY	8 Hours per 8000.00 SY	1.29	hours
1	Rehabilitate Runway	Grading	Roller	Diesel	1289.40 SY	8 Hours per 8000.00 SY	1.29	hours
1	Rehabilitate Runway	Hydroseeding	Hydroseeder	Diesel	1289.40 SF	8 Hours per 80000.00 SF	0.13	hours
1	Rehabilitate Runway	Hydroseeding	Off-Road Truck	Diesel	1289.40 SF	8 Hours per 80000.00 SF	0.13	hours
1	Rehabilitate Runway	Lighting	Dump Truck	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Lighting	Loader	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Lighting	Other General Equipment	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Lighting	Pickup Truck	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Lighting	Skid Steer Loader	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Lighting	Tractors/Loader/Backhoe	Diesel	924.00 LF	8 Hours per 1200.00 LF	6.16	hours
1	Rehabilitate Runway	Markings	Flatbed Truck	Diesel	53361.00 SF	8 Hours per 3500.00 SF	121.97	hours
1	Rehabilitate Runway	Markings	Other General Equipment	Diesel	53361.00 SF	8 Hours per 3500.00 SF	121.97	hours
1	Rehabilitate Runway	Markings	Pickup Truck	Diesel	53361.00 SF	8 Hours per 3500.00 SF	121.97	hours
1	Rehabilitate Runway	Sealing Random Cracks	Crack Cleaner	Diesel	231.00 LF	8 Hours per 2800.00 LF	0.66	hours
1	Rehabilitate Runway	Sealing Random Cracks	Crack Filler (Trailer Mounted)	Diesel	231.00 LF	8 Hours per 2800.00 LF	0.66	hours
1	Rehabilitate Runway	Sealing Random Cracks	Flatbed Truck	Diesel	231.00 LF	8 Hours per 2800.00 LF	0.66	hours
1	Rehabilitate Runway	Sealing Random Cracks	Other General Equipment	Diesel	231.00 LF	8 Hours per 2800.00 LF	0.66	hours
1	Rehabilitate Runway	Sealing Random Cracks	Pickup Truck	Diesel	231.00 LF	8 Hours per 2800.00 LF	0.66	hours
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Other General Equipment	Diesel	0.30 Acre	4 Hours per 1.00 Acre	1.2	hours

Scenario ID	Project	Construction Activity	Equipment	Fuel Type	Activity Size	Activity Rate	Default Activity	Activity Unit
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pickup Truck	Diesel	0.30 Acre	8 Hours per 1.00 Acre	2.4	hours
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pumps	Diesel	0.30 Acre	4 Hours per 1.00 Acre	1.2	hours
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	Diesel	0.30 Acre	4 Hours per 1.00 Acre	1.2	hours
1	Rehabilitate Runway	Subbase Placement	Dozer	Diesel	5923.10 SY	8 Hours per 3800.00 SY	12.47	hours
1	Rehabilitate Runway	Subbase Placement	Dump Truck (12 cy)	Diesel	1974.40 CY	8 Hours per 180.00 CY	87.75	hours
1	Rehabilitate Runway	Subbase Placement	Pickup Truck	Diesel	5923.10 SY	8 Hours per 3800.00 SY	12.47	hours
1	Rehabilitate Runway	Subbase Placement	Roller	Diesel	1974.40 CY	8 Hours per 1300.00 CY	12.15	hours
1	Rehabilitate Runway	Topsoil Placement	Dozer	Diesel	214.90 CY	8 Hours per 600.00 CY	2.87	hours
1	Rehabilitate Runway	Topsoil Placement	Dump Truck	Diesel	214.90 CY	8 Hours per 600.00 CY	2.87	hours
1	Rehabilitate Runway	Topsoil Placement	Pickup Truck	Diesel	214.90 CY	8 Hours per 600.00 CY	2.87	hours
1	Runway Extension	Asphalt Placement	Asphalt Paver	Diesel	11796.60 SY	8 Hours per 6400.00 SY	14.75	hours
1	Runway Extension	Asphalt Placement	Dump Truck	Diesel	11796.60 SY	8 Hours per 1777.00 SY	53.11	hours
1	Runway Extension	Asphalt Placement	Other General Equipment	Diesel	11796.60 SY	16 Hours per 6400.00 SY	29.49	hours
1	Runway Extension	Asphalt Placement	Pickup Truck	Diesel	11796.60 SY	8 Hours per 6400.00 SY	14.75	hours
1	Runway Extension	Asphalt Placement	Roller	Diesel	11796.60 SY	8 Hours per 6400.00 SY	14.75	hours
1	Runway Extension	Asphalt Placement	Skid Steer Loader	Diesel	11796.60 SY	8 Hours per 6400.00 SY	14.75	hours
1	Runway Extension	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	11796.60 SY	8 Hours per 5000.00 SY	18.87	hours
1	Runway Extension	Clearing and Grubbing	Chain Saw	Diesel	2.60 Acre	12 Hours per 1.00 Acre	31.2	hours
1	Runway Extension	Clearing and Grubbing	Chipper/Stump Grinder	Diesel	2.60 Acre	12 Hours per 1.00 Acre	31.2	hours
1	Runway Extension	Clearing and Grubbing	Pickup Truck	Diesel	2.60 Acre	16 Hours per 1.00 Acre	41.6	hours
1	Runway Extension	Drainage - 24 inch SICPP	Dozer	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Dump Truck	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Excavator	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Loader	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Other General Equipment	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Pickup Truck	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours
1	Runway Extension	Drainage - 24 inch SICPP	Roller	Diesel	336.00 LF	8 Hours per 250.00 LF	10.75	hours

Scenario ID	Project	Construction Activity	Equipment	Fuel Type	Activity Size	Activity Rate	Default Activity	Activity Unit
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Dump Truck	Diesel	672.00 LF	8 Hours per 900.00 LF	5.97	hours
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Loader	Diesel	672.00 LF	8 Hours per 900.00 LF	5.97	hours
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Other General Equipment	Diesel	672.00 LF	8 Hours per 900.00 LF	5.97	hours
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Pickup Truck	Diesel	672.00 LF	8 Hours per 900.00 LF	5.97	hours
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Tractors/Loader/Backhoe	Diesel	672.00 LF	8 Hours per 900.00 LF	5.97	hours
1	Runway Extension	Dust Control	Water Truck	Diesel	180.00 Day	8 Hours per 1.00 Day	1440	hours
1	Runway Extension	Excavation (Borrow)	Dozer	Diesel	4915.30 CY	8 Hours per 600.00 CY	65.54	hours
1	Runway Extension	Excavation (Borrow)	Dump Truck (12 cy)	Diesel	4915.30 CY	8 Hours per 600.00 CY	65.54	hours
1	Runway Extension	Excavation (Borrow)	Pickup Truck	Diesel	4915.30 CY	8 Hours per 600.00 CY	65.54	hours
1	Runway Extension	Excavation (Borrow)	Roller	Diesel	4915.30 CY	8 Hours per 1300.00 CY	30.25	hours
1	Runway Extension	Excavation (Cut to Fill)	Dozer	Diesel	4915.30 CY	8 Hours per 800.00 CY	49.15	hours
1	Runway Extension	Excavation (Cut to Fill)	Dump Truck (12 cy)	Diesel	4915.30 CY	8 Hours per 300.00 CY	131.07	hours
1	Runway Extension	Excavation (Cut to Fill)	Excavator	Diesel	4915.30 CY	8 Hours per 1000.00 CY	39.32	hours
1	Runway Extension	Excavation (Cut to Fill)	Pickup Truck	Diesel	4915.30 CY	8 Hours per 1000.00 CY	39.32	hours
1	Runway Extension	Excavation (Cut to Fill)	Roller	Diesel	4915.30 CY	8 Hours per 1000.00 CY	39.32	hours
1	Runway Extension	Excavation (Cut to Fill)	Scraper	Diesel	4915.30 CY	8 Hours per 800.00 CY	49.15	hours
1	Runway Extension	Excavation (Topsoil Stripping)	Dozer	Diesel	11796.60 SY	8 Hours per 5100.00 SY	18.5	hours
1	Runway Extension	Grading	Dozer	Diesel	12531.50 SY	8 Hours per 8000.00 SY	12.53	hours
1	Runway Extension	Grading	Grader	Diesel	12531.50 SY	8 Hours per 8000.00 SY	12.53	hours
1	Runway Extension	Grading	Roller	Diesel	12531.50 SY	8 Hours per 8000.00 SY	12.53	hours
1	Runway Extension	Hydroseeding	Hydroseeder	Diesel	112896.00 SF	8 Hours per 80000.00 SF	11.29	hours
1	Runway Extension	Hydroseeding	Off-Road Truck	Diesel	112896.00 SF	8 Hours per 80000.00 SF	11.29	hours
1	Runway Extension	Lighting	Dump Truck	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours
1	Runway Extension	Lighting	Loader	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours
1	Runway Extension	Lighting	Other General Equipment	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours
1	Runway Extension	Lighting	Pickup Truck	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours

Scenario ID	Project	Construction Activity	Equipment	Fuel Type	Activity Size	Activity Rate	Default Activity	Activity Unit
1	Runway Extension	Lighting	Skid Steer Loader	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours
1	Runway Extension	Lighting	Tractors/Loader/Backhoe	Diesel	1304.00 LF	8 Hours per 1200.00 LF	8.69	hours
1	Runway Extension	Markings	Flatbed Truck	Diesel	106276.00 SF	8 Hours per 3500.00 SF	242.92	hours
1	Runway Extension	Markings	Other General Equipment	Diesel	106276.00 SF	8 Hours per 3500.00 SF	242.92	hours
1	Runway Extension	Markings	Pickup Truck	Diesel	106276.00 SF	8 Hours per 3500.00 SF	242.92	hours
1	Runway Extension	Soil Erosion/Control	Other General Equipment	Diesel	2.60 Acre	4 Hours per 1.00 Acre	10.4	hours
1	Runway Extension	Soil Erosion/Control	Pickup Truck	Diesel	2.60 Acre	8 Hours per 1.00 Acre	20.8	hours
1	Runway Extension	Soil Erosion/Control	Pumps	Diesel	2.60 Acre	4 Hours per 1.00 Acre	10.4	hours
1	Runway Extension	Soil Erosion/Control	Tractors/Loader/Backhoe	Diesel	2.60 Acre	4 Hours per 1.00 Acre	10.4	hours
1	Runway Extension	Subbase Placement	Dozer	Diesel	11796.60 SY	8 Hours per 3800.00 SY	24.83	hours
1	Runway Extension	Subbase Placement	Dump Truck (12 cy)	Diesel	3932.20 CY	8 Hours per 180.00 CY	174.76	hours
1	Runway Extension	Subbase Placement	Pickup Truck	Diesel	11796.60 SY	8 Hours per 3800.00 SY	24.83	hours
1	Runway Extension	Subbase Placement	Roller	Diesel	3932.20 CY	8 Hours per 1300.00 CY	24.2	hours
1	Runway Extension	Topsoil Placement	Dozer	Diesel	2088.60 CY	8 Hours per 600.00 CY	27.85	hours
1	Runway Extension	Topsoil Placement	Dump Truck	Diesel	2088.60 CY	8 Hours per 600.00 CY	27.85	hours
1	Runway Extension	Topsoil Placement	Pickup Truck	Diesel	2088.60 CY	8 Hours per 600.00 CY	27.85	hours

Activity: On-Road (Estimated based on engineering experience)

Scen. ID	Year	Project	Equipment	Equipment Category	On-road Activity	Fuel	Roadway Type	Round Trip Distance (miles)	Distance for fugitive PM	Number of Vehicles	# of Emp. Or \$M*11 (Whichever larger)	Number of Project Days	Default VMT	User VMT
1	Demolition - Asphalt	Dump Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	585	585	--	--	--	--
1	Demolition - Asphalt	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	121	129	--	--	--	--	--	--
1	Landscaping	Flatbed Truck	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	--	--	--	--	--	--
1	Landscaping	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	121	129	--	--	--	--	--	--
1	Rehabilitate Runway	Asphalt 18 Wheeler	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	231	231	--	--	--	--
1	Rehabilitate Runway	Dump Truck - Asphalt	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	231	231	--	--	--	--
1	Rehabilitate Runway	Dump Truck Subbase Material	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	231	231	--	--	--	--
1	Rehabilitate Runway	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	121	129	--	--	--	--	--	--
1	Runway Extension	Asphalt 18 Wheeler	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	326	326	--	--	--	--
1	Runway Extension	Dump Truck - Asphalt	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	326	326	--	--	--	--
1	Runway Extension	Dump Truck Subbase Material	Material Delivery	Diesel	Urban Unrestricted Access	40	--	129	326	326	--	--	--	--
1	Runway Extension	Passenger Car	Employee Commute	Gasoline	Urban Unrestricted Access	30	121	129	--	--	--	--	--	--

Emission Factor: Non-Road (from NONROAD)

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)
1	Demolition - Asphalt	Asphalt Demolition	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Demolition - Asphalt	Asphalt Demolition	Excavator	Diesel	175	0.59	0.204499	0.462851	536.3984	0.002635
1	Demolition - Asphalt	Asphalt Demolition	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Landscaping	Tree Pruning	Aerial Lift	Diesel	75	0.21	3.419819	4.426363	694.0007	0.00409
1	Landscaping	Tree Pruning	Chipper/Stump Grinder	Diesel	100	0.43	1.465585	2.563027	589.4462	0.003377
1	Landscaping	Tree Pruning	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Landscaping	Tree Pruning	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Landscaping	Tree Pruning	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Landscaping	Tree Pruning	Pruning Saw/Chain Saw	Diesel	11	0.7	293.535	1.322993	685.9964	0.140192
1	Rehabilitate Runway	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	0.292728	0.659212	536.3779	0.002702
1	Rehabilitate Runway	Asphalt Placement	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Asphalt Placement	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Rehabilitate Runway	Asphalt Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Asphalt Placement	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Rehabilitate Runway	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	3.70577	4.370932	693.8795	0.004092
1	Rehabilitate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	2.362993	4.460575	594.7293	0.004009
1	Rehabilitate Runway	Cold Milling	Cold Planer	Diesel	175	0.59	0.292728	0.659212	536.3779	0.002702
1	Rehabilitate Runway	Cold Milling	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Cold Milling	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Cold Milling	Sweepers	Diesel	175	0.43	0.177355	0.584454	530.6009	0.002651
1	Rehabilitate Runway	Cold Milling	Water Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Dust Control	Water Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dump Truck (12 cy)	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Excavator	Diesel	175	0.59	0.204499	0.462851	536.3984	0.002635
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Rehabilitate Runway	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Rehabilitate Runway	Grading	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Rehabilitate Runway	Grading	Grader	Diesel	300	0.59	0.17518	0.503427	536.3978	0.002637
1	Rehabilitate Runway	Grading	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Rehabilitate Runway	Hydroseeding	Hydroseeder	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Hydroseeding	Off-Road Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Lighting	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Lighting	Loader	Diesel	175	0.59	0.321426	0.753125	536.3686	0.002725
1	Rehabilitate Runway	Lighting	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Rehabilitate Runway	Lighting	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Lighting	Skid Steer Loader	Diesel	75	0.21	3.70577	4.370932	693.8795	0.004092
1	Rehabilitate Runway	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	3.383463	2.522138	694.4591	0.00392
1	Rehabilitate Runway	Markings	Flatbed Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Markings	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Rehabilitate Runway	Markings	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Sealing Random Cracks	Crack Cleaner	Diesel	40	0.59	0.366622	3.143353	595.6983	0.00296
1	Rehabilitate Runway	Sealing Random Cracks	Crack Filler (Trailer Mounted)	Diesel	100	0.43	0.272048	0.281981	589.9443	0.002847
1	Rehabilitate Runway	Sealing Random Cracks	Flatbed Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Sealing Random Cracks	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Rehabilitate Runway	Sealing Random Cracks	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pumps	Diesel	11	0.43	4.453222	4.480019	588.4947	0.003967
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	Diesel	100	0.21	3.383463	2.522138	694.4591	0.00392
1	Rehabilitate Runway	Subbase Placement	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Rehabilitate Runway	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Subbase Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Subbase Placement	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Rehabilitate Runway	Topsoil Placement	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Rehabilitate Runway	Topsoil Placement	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Rehabilitate Runway	Topsoil Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	0.292728	0.659212	536.3779	0.002702
1	Runway Extension	Asphalt Placement	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Asphalt Placement	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Runway Extension	Asphalt Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Asphalt Placement	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	3.70577	4.370932	693.8795	0.004092
1	Runway Extension	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	2.362993	4.460575	594.7293	0.004009
1	Runway Extension	Clearing and Grubbing	Chain Saw	Diesel	11	0.7	293.535	1.322993	685.9964	0.140192
1	Runway Extension	Clearing and Grubbing	Chipper/Stump Grinder	Diesel	100	0.43	1.465585	2.563027	589.4462	0.003377
1	Runway Extension	Clearing and Grubbing	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Drainage - 24 inch SICPP	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Drainage - 24 inch SICPP	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Drainage - 24 inch SICPP	Excavator	Diesel	175	0.59	0.204499	0.462851	536.3984	0.002635
1	Runway Extension	Drainage - 24 inch SICPP	Loader	Diesel	175	0.59	0.321426	0.753125	536.3686	0.002725
1	Runway Extension	Drainage - 24 inch SICPP	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)
1	Runway Extension	Drainage - 24 inch SICPP	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Drainage - 24 inch SICPP	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Loader	Diesel	175	0.59	0.321426	0.753125	536.3686	0.002725
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Tractors/Loader/Backhoe	Diesel	100	0.21	3.383463	2.522138	694.4591	0.00392
1	Runway Extension	Dust Control	Water Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Excavation (Borrow)	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Excavation (Borrow)	Dump Truck (12 cy)	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Excavation (Borrow)	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Excavation (Borrow)	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Excavation (Cut to Fill)	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Excavation (Cut to Fill)	Dump Truck (12 cy)	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Excavation (Cut to Fill)	Excavator	Diesel	175	0.59	0.204499	0.462851	536.3984	0.002635
1	Runway Extension	Excavation (Cut to Fill)	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Excavation (Cut to Fill)	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Excavation (Cut to Fill)	Scraper	Diesel	600	0.59	0.38491	0.98857	536.3827	0.002768
1	Runway Extension	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Grading	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Grading	Grader	Diesel	300	0.59	0.17518	0.503427	536.3978	0.002637
1	Runway Extension	Grading	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Hydroseeding	Hydroseeder	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Hydroseeding	Off-Road Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Lighting	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)
1	Runway Extension	Lighting	Loader	Diesel	175	0.59	0.321426	0.753125	536.3686	0.002725
1	Runway Extension	Lighting	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Runway Extension	Lighting	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Lighting	Skid Steer Loader	Diesel	75	0.21	3.70577	4.370932	693.8795	0.004092
1	Runway Extension	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	3.383463	2.522138	694.4591	0.00392
1	Runway Extension	Markings	Flatbed Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Markings	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Runway Extension	Markings	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Soil Erosion/Control	Other General Equipment	Diesel	175	0.43	0.27741	1.004369	530.5561	0.002766
1	Runway Extension	Soil Erosion/Control	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Soil Erosion/Control	Pumps	Diesel	11	0.43	4.453222	4.480019	588.4947	0.003967
1	Runway Extension	Soil Erosion/Control	Tractors/Loader/Backhoe	Diesel	100	0.21	3.383463	2.522138	694.4591	0.00392
1	Runway Extension	Subbase Placement	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Subbase Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Subbase Placement	Roller	Diesel	100	0.59	0.879721	0.864262	595.6768	0.003026
1	Runway Extension	Topsoil Placement	Dozer	Diesel	175	0.59	0.249255	0.555745	536.3896	0.002669
1	Runway Extension	Topsoil Placement	Dump Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613
1	Runway Extension	Topsoil Placement	Pickup Truck	Diesel	600	0.59	0.173071	0.431886	536.406	0.002613

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Demolition - Asphalt	Asphalt Demolition	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Demolition - Asphalt	Asphalt Demolition	Excavator	Diesel	175	0.59	0.028667	0.026373	0.14264	0.056053
1	Demolition - Asphalt	Asphalt Demolition	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Landscaping	Tree Pruning	Aerial Lift	Diesel	75	0.21	0.448661	0.412768	0.659484	0.149699
1	Landscaping	Tree Pruning	Chipper/Stump Grinder	Diesel	100	0.43	0.246074	0.226388	0.30459	0.339961
1	Landscaping	Tree Pruning	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Landscaping	Tree Pruning	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Landscaping	Tree Pruning	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Landscaping	Tree Pruning	Pruning Saw/Chain Saw	Diesel	11	0.7	9.748189	8.968334	61.88836	26.45543
1	Rehabilitate Runway	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	0.053594	0.049307	0.149391	0.107958
1	Rehabilitate Runway	Asphalt Placement	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Asphalt Placement	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Rehabilitate Runway	Asphalt Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Asphalt Placement	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Rehabilitate Runway	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	0.525808	0.483743	0.699489	0.382412
1	Rehabilitate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	0.353346	0.325078	0.471215	0.001541
1	Rehabilitate Runway	Cold Milling	Cold Planer	Diesel	175	0.59	0.053594	0.049307	0.149391	0.107958
1	Rehabilitate Runway	Cold Milling	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Cold Milling	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Cold Milling	Sweepers	Diesel	175	0.43	0.033437	0.030762	0.145813	0.07398
1	Rehabilitate Runway	Cold Milling	Water Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Dust Control	Water Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Dump Truck (12 cy)	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Excavator	Diesel	175	0.59	0.028667	0.026373	0.14264	0.056053

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Excavation (Cut to Fill) (Assume 20% reconstruction)	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Rehabilitate Runway	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Rehabilitate Runway	Grading	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Rehabilitate Runway	Grading	Grader	Diesel	300	0.59	0.022592	0.020785	0.142815	0.086433
1	Rehabilitate Runway	Grading	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Rehabilitate Runway	Hydroseeding	Hydroseeder	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Hydroseeding	Off-Road Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Lighting	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Lighting	Loader	Diesel	175	0.59	0.061391	0.05648	0.152457	0.125168
1	Rehabilitate Runway	Lighting	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Rehabilitate Runway	Lighting	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Lighting	Skid Steer Loader	Diesel	75	0.21	0.525808	0.483743	0.699489	0.382412
1	Rehabilitate Runway	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	0.44673	0.410992	0.508148	0.568851
1	Rehabilitate Runway	Markings	Flatbed Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Markings	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Rehabilitate Runway	Markings	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Sealing Random Cracks	Crack Cleaner	Diesel	40	0.59	0.042901	0.039469	0.151331	0.001165
1	Rehabilitate Runway	Sealing Random Cracks	Crack Filler (Trailer Mounted)	Diesel	100	0.43	0.011494	0.010574	0.140158	0
1	Rehabilitate Runway	Sealing Random Cracks	Flatbed Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Sealing Random Cracks	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Rehabilitate Runway	Sealing Random Cracks	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Pumps	Diesel	11	0.43	0.387437	0.356442	0.618624	0.007853
1	Rehabilitate Runway	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	Diesel	100	0.21	0.44673	0.410992	0.508148	0.568851
1	Rehabilitate Runway	Subbase Placement	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Rehabilitate Runway	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Subbase Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Subbase Placement	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Rehabilitate Runway	Topsoil Placement	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Rehabilitate Runway	Topsoil Placement	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Rehabilitate Runway	Topsoil Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Asphalt Placement	Asphalt Paver	Diesel	175	0.59	0.053594	0.049307	0.149391	0.107958
1	Runway Extension	Asphalt Placement	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Asphalt Placement	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Asphalt Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Asphalt Placement	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Asphalt Placement	Skid Steer Loader	Diesel	75	0.21	0.525808	0.483743	0.699489	0.382412
1	Runway Extension	Asphalt Placement	Surfacing Equipment (Grooving)	Diesel	25	0.59	0.353346	0.325078	0.471215	0.001541
1	Runway Extension	Clearing and Grubbing	Chain Saw	Diesel	11	0.7	9.748189	8.968334	61.88836	26.45543
1	Runway Extension	Clearing and Grubbing	Chipper/Stump Grinder	Diesel	100	0.43	0.246074	0.226388	0.30459	0.339961
1	Runway Extension	Clearing and Grubbing	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Drainage - 24 inch SICPP	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Runway Extension	Drainage - 24 inch SICPP	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Drainage - 24 inch SICPP	Excavator	Diesel	175	0.59	0.028667	0.026373	0.14264	0.056053
1	Runway Extension	Drainage - 24 inch SICPP	Loader	Diesel	175	0.59	0.061391	0.05648	0.152457	0.125168
1	Runway Extension	Drainage - 24 inch SICPP	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Drainage - 24 inch SICPP	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Drainage - 24 inch SICPP	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Loader	Diesel	175	0.59	0.061391	0.05648	0.152457	0.125168
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Drainage - 6 inch Perforated Underdrain	Tractors/Loader/Backhoe	Diesel	100	0.21	0.44673	0.410992	0.508148	0.568851
1	Runway Extension	Dust Control	Water Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Excavation (Borrow)	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Excavation (Borrow)	Dump Truck (12 cy)	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Excavation (Borrow)	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Excavation (Borrow)	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Excavation (Cut to Fill)	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Excavation (Cut to Fill)	Dump Truck (12 cy)	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Runway Extension	Excavation (Cut to Fill)	Excavator	Diesel	175	0.59	0.028667	0.026373	0.14264	0.056053
1	Runway Extension	Excavation (Cut to Fill)	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Excavation (Cut to Fill)	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Excavation (Cut to Fill)	Scraper	Diesel	600	0.59	0.053516	0.049235	0.147805	0.485182
1	Runway Extension	Excavation (Topsoil Stripping)	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Grading	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Grading	Grader	Diesel	300	0.59	0.022592	0.020785	0.142815	0.086433
1	Runway Extension	Grading	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Hydroseeding	Hydroseeder	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Hydroseeding	Off-Road Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Lighting	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Lighting	Loader	Diesel	175	0.59	0.061391	0.05648	0.152457	0.125168
1	Runway Extension	Lighting	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Lighting	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Lighting	Skid Steer Loader	Diesel	75	0.21	0.525808	0.483743	0.699489	0.382412
1	Runway Extension	Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	0.44673	0.410992	0.508148	0.568851
1	Runway Extension	Markings	Flatbed Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Markings	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Markings	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Soil Erosion/Control	Other General Equipment	Diesel	175	0.43	0.062613	0.057604	0.160595	0.134067
1	Runway Extension	Soil Erosion/Control	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Soil Erosion/Control	Pumps	Diesel	11	0.43	0.387437	0.356442	0.618624	0.007853
1	Runway Extension	Soil Erosion/Control	Tractors/Loader/Backhoe	Diesel	100	0.21	0.44673	0.410992	0.508148	0.568851
1	Runway Extension	Subbase Placement	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Subbase Placement	Dump Truck (12 cy)	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Subbase Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311

Scen. ID	Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exhaust (g/hp-hr)	VOC Evaporative (g/equipment-day)
1	Runway Extension	Subbase Placement	Roller	Diesel	100	0.59	0.088155	0.081103	0.15841	0.092287
1	Runway Extension	Topsoil Placement	Dozer	Diesel	175	0.59	0.041541	0.038218	0.145548	0.083954
1	Runway Extension	Topsoil Placement	Dump Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311
1	Runway Extension	Topsoil Placement	Pickup Truck	Diesel	600	0.59	0.01641	0.015097	0.140145	0.111311

Emission Factors: On-Road (from MOVES)

Scen. ID	Project Type	Equipment	Fuel Type	Roadway Type	CO(g/mi)	NOx(g/mi)	CO2(g/mi)	SO2(g/mi)	PM10(g/mi)	PM2.5(g/mi)	CH4(g/mi)	N2O(g/mi)
1	Demolition - Asphalt	Dump Truck	Diesel	Urban Unrestricted Access	0.65121	1.45384	1376.819	0.009553	0.053344	0.051745	0.148735	0.070388
1	Demolition - Asphalt	Passenger Car	Gasoline	Urban Unrestricted Access	2.049855	0.109608	369.0627	0.005177	0.004191	0.003859	0.053919	0.004474
1	Landscaping	Flatbed Truck	Diesel	Urban Unrestricted Access	0.976523	3.041914	2511.181	0.017539	0.154053	0.149437	0.202592	0.068948
1	Landscaping	Passenger Car	Gasoline	Urban Unrestricted Access	2.049855	0.109608	369.0627	0.005177	0.004191	0.003859	0.053919	0.004474
1	Rehabilitate Runway	Asphalt 18 Wheeler	Diesel	Urban Unrestricted Access	0.976523	3.041914	2511.181	0.017539	0.154053	0.149437	0.202592	0.068948
1	Rehabilitate Runway	Dump Truck - Asphalt	Diesel	Urban Unrestricted Access	0.65121	1.45384	1376.819	0.009553	0.053344	0.051745	0.148735	0.070388
1	Rehabilitate Runway	Dump Truck Subbase Material	Diesel	Urban Unrestricted Access	0.65121	1.45384	1376.819	0.009553	0.053344	0.051745	0.148735	0.070388
1	Rehabilitate Runway	Passenger Car	Gasoline	Urban Unrestricted Access	2.049855	0.109608	369.0627	0.005177	0.004191	0.003859	0.053919	0.004474
1	Runway Extension	Asphalt 18 Wheeler	Diesel	Urban Unrestricted Access	0.976523	3.041914	2511.181	0.017539	0.154053	0.149437	0.202592	0.068948
1	Runway Extension	Dump Truck - Asphalt	Diesel	Urban Unrestricted Access	0.65121	1.45384	1376.819	0.009553	0.053344	0.051745	0.148735	0.070388
1	Runway Extension	Dump Truck Subbase Material	Diesel	Urban Unrestricted Access	0.65121	1.45384	1376.819	0.009553	0.053344	0.051745	0.148735	0.070388
1	Runway Extension	Passenger Car	Gasoline	Urban Unrestricted Access	2.049855	0.109608	369.0627	0.005177	0.004191	0.003859	0.053919	0.004474

Scen. ID	Project Type	Equipment	Fuel Type	Roadway Type	VOC(g/mi)	RV CO(g/veh-day)	RV NOx(g/veh-day)	RV CO2(g/veh-day)	RV SO2(g/veh-day)	RV PM10(g/veh-day)	RV PM2.5(g/veh-day)	RV VOC(g/veh-day)	RP VOC(g/veh-day)
1	Demolition - Asphalt	Dump Truck	Diesel	Urban Unrestricted Access	0.003464	23.26733	0.144417	281.4117	0.002009	0.01817	0.017626	0.609129	0
1	Demolition - Asphalt	Passenger Car	Gasoline	Urban Unrestricted Access	0.001705	25.44133	1.783194	292.9921	0.00411	0.03225	0.029696	5.215852	0
1	Landscaping	Flatbed Truck	Diesel	Urban Unrestricted Access	0.003463	22.53319	0.393667	295.4258	0.002164	0.030899	0.029973	6.10891	0
1	Landscaping	Passenger Car	Gasoline	Urban Unrestricted Access	0.001705	25.44133	1.783194	292.9921	0.00411	0.03225	0.029696	5.215852	0
1	Rehabilitate Runway	Asphalt 18 Wheeler	Diesel	Urban Unrestricted Access	0.003463	22.53319	0.393667	295.4258	0.002164	0.030899	0.029973	6.10891	0
1	Rehabilitate Runway	Dump Truck - Asphalt	Diesel	Urban Unrestricted Access	0.003464	23.26733	0.144417	281.4117	0.002009	0.01817	0.017626	0.609129	0
1	Rehabilitate Runway	Dump Truck Subbase Material	Diesel	Urban Unrestricted Access	0.003464	23.26733	0.144417	281.4117	0.002009	0.01817	0.017626	0.609129	0
1	Rehabilitate Runway	Passenger Car	Gasoline	Urban Unrestricted Access	0.001705	25.44133	1.783194	292.9921	0.00411	0.03225	0.029696	5.215852	0
1	Runway Extension	Asphalt 18 Wheeler	Diesel	Urban Unrestricted Access	0.003463	22.53319	0.393667	295.4258	0.002164	0.030899	0.029973	6.10891	0
1	Runway Extension	Dump Truck - Asphalt	Diesel	Urban Unrestricted Access	0.003464	23.26733	0.144417	281.4117	0.002009	0.01817	0.017626	0.609129	0
1	Runway Extension	Dump Truck Subbase Material	Diesel	Urban Unrestricted Access	0.003464	23.26733	0.144417	281.4117	0.002009	0.01817	0.017626	0.609129	0
1	Runway Extension	Passenger Car	Gasoline	Urban Unrestricted Access	0.001705	25.44133	1.783194	292.9921	0.00411	0.03225	0.029696	5.215852	0

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario ID	Project	Fugitive Type	Variable	Default Values	Units
1	Demolition - Asphalt	Soil Handling	u = Wind speed	5	mph
1	Demolition - Asphalt	Soil Handling	m = Moisture content	0.25	fraction
1	Demolition - Asphalt	Soil Handling	T = Mass of aggregate storage pile = $L \times W \times 0.5 \times 110 / 2000$	9411.2	tons
1	Demolition - Asphalt	Soil Handling	$PM_{10} = T \times 0.35 \times 0.0032 \times [(u/5)^{1.3}] / [(m/2)^{1.4}]$	193.7	lbs
1	Demolition - Asphalt	Unstabilized Land and Wind Erosion	A = Area affected = $L \times W / 43560.0$	7.856	acres
1	Demolition - Asphalt	Unstabilized Land and Wind Erosion	TPConv = TSP/PM10 conversion	0.5	fraction
1	Demolition - Asphalt	Unstabilized Land and Wind Erosion	CE = Control efficiency	0.63	fraction
1	Demolition - Asphalt	Unstabilized Land and Wind Erosion	t = year (e.g. 0.65 year)	0.5	years
1	Demolition - Asphalt	Unstabilized Land and Wind Erosion	$PM_{10} = 0.38 \times A \times TPConv \times (1-CE) \times t / 2000$	0	lbs
1	Demolition - Asphalt	Material Movement (Unpaved Roads)	s = Surface material silt content	0.043	fraction
1	Demolition - Asphalt	Material Movement (Unpaved Roads)	Wt. = Mean vehicle weight	32	tons
1	Demolition - Asphalt	Material Movement (Unpaved Roads)	VMT = Vehicle miles traveled	5587.8	miles
1	Demolition - Asphalt	Material Movement (Unpaved Roads)	$PM_{10} = 1.5 \times [(s/12)^{0.9}] \times [(Wt./3)^{0.45}] \times VMT$	153	lbs
1	Demolition - Asphalt	Material Movement (Paved Roads)	sL = Road surface silt loading	0.1	g/m3
1	Demolition - Asphalt	Material Movement (Paved Roads)	Wt. = Mean vehicle weight	32	tons
1	Demolition - Asphalt	Material Movement (Paved Roads)	VMT = Vehicle miles traveled	5160	miles
1	Demolition - Asphalt	Material Movement (Paved Roads)	$PM_{10} = 0.0022 \times (sL^{0.91}) \times (Wt^{1.02}) \times VMT$	47.9	lbs
1	Rehabilitate Runway	Asphalt Drying	A = Area of land affected = $L \times W \times 0.0929$	4957.2	m2
1	Rehabilitate Runway	Asphalt Drying	AR = Application rate of liquefied asphalt over area	1.811	l/m2

Scenario ID	Project	Fugitive Type	Variable	Default Values	Units
1	Rehabilitate Runway	Asphalt Drying	VD = Volume fraction of diluent in liquefied asphalt	0.35	fraction
1	Rehabilitate Runway	Asphalt Drying	EF = Mass fraction of diluent which evaporates and becomes VOC	0.7	fraction
1	Rehabilitate Runway	Asphalt Drying	D = Density of solvent utilized	1.8	lbs/l
1	Rehabilitate Runway	Asphalt Drying	VOC = A x AR x VD x EF x D	3959.1	lbs
1	Rehabilitate Runway	Asphalt Storage and Batching	T = Mass of asphalt loaded = L x W x 0.1667 x 145 / 2000	644.9	tons
1	Rehabilitate Runway	Asphalt Storage and Batching	PM10 = (0.027 + 0.00042) x T	17.7	lbs
1	Rehabilitate Runway	Asphalt Storage and Batching	CO = (0.4 + 0.0004) x T	258.2	lbs
1	Rehabilitate Runway	Asphalt Storage and Batching	NOx = (0.025) x T	16.1	lbs
1	Rehabilitate Runway	Asphalt Storage and Batching	SOx = (0.0046) x T	2.967	lbs
1	Rehabilitate Runway	Asphalt Storage and Batching	VOC = (0.0082 + 0.0042) x T	7.997	lbs
1	Rehabilitate Runway	Material Movement (Unpaved Roads)	s = Surface material silt content	0.043	fraction
1	Rehabilitate Runway	Material Movement (Unpaved Roads)	Wt. = Mean vehicle weight	32	tons
1	Rehabilitate Runway	Material Movement (Unpaved Roads)	VMT = Vehicle miles traveled	1971.6	miles
1	Rehabilitate Runway	Material Movement (Unpaved Roads)	PM10 = 1.5 x [(s/12) ^{0.9}] x [(Wt./3) ^{0.45}] x VMT	54	lbs
1	Rehabilitate Runway	Material Movement (Paved Roads)	sL = Road surface silt loading	0.1	g/m3
1	Rehabilitate Runway	Material Movement (Paved Roads)	Wt. = Mean vehicle weight	32	tons
1	Rehabilitate Runway	Material Movement (Paved Roads)	VMT = Vehicle miles traveled	1935	miles
1	Rehabilitate Runway	Material Movement (Paved Roads)	PM10 = 0.0022 x (sL ^{0.91}) x (Wt ^{1.02}) x VMT	18	lbs
1	Rehabilitate Runway	Unstabilized Land and Wind Erosion	A = Area affected = L x W / 43560.0	1.225	acres

Scenario ID	Project	Fugitive Type	Variable	Default Values	Units
1	Rehabilitate Runway	Unstabilized Land and Wind Erosion	TPConv = TSP/PM10 conversion	0.5	fraction
1	Rehabilitate Runway	Unstabilized Land and Wind Erosion	CE = Control efficiency	0.63	fraction
1	Rehabilitate Runway	Unstabilized Land and Wind Erosion	t = year (e.g. 0.65 year)	0.5	years
1	Rehabilitate Runway	Unstabilized Land and Wind Erosion	PM10 = $0.38 \times A \times \text{TPConv} \times (1 - \text{CE}) \times t / 2000$	0	lbs
1	Rehabilitate Runway	Soil Handling	u = Wind speed	5	mph
1	Rehabilitate Runway	Soil Handling	m = Moisture content	0.25	fraction
1	Rehabilitate Runway	Soil Handling	T = Mass of aggregate storage pile = $L \times W \times 0.5 \times 110 / 2000$	1467.4	tons
1	Rehabilitate Runway	Soil Handling	PM10 = $T \times 0.35 \times 0.0032 \times [(u/5)^{1.3}] / [(m/2)^{1.4}]$	30.2	lbs
1	Runway Extension	Asphalt Drying	A = Area of land affected = $L \times W \times 0.0929$	9873	m2
1	Runway Extension	Asphalt Drying	AR = Application rate of liquefied asphalt over area	1.811	l/m2
1	Runway Extension	Asphalt Drying	VD = Volume fraction of diluent in liquefied asphalt	0.35	fraction
1	Runway Extension	Asphalt Drying	EF = Mass fraction of diluent which evaporates and becomes VOC	0.7	fraction
1	Runway Extension	Asphalt Drying	D = Density of solvent utilized	1.8	lbs/l
1	Runway Extension	Asphalt Drying	VOC = $A \times \text{AR} \times \text{VD} \times \text{EF} \times \text{D}$	7885.1	lbs
1	Runway Extension	Asphalt Storage and Batching	T = Mass of asphalt loaded = $L \times W \times 0.1667 \times 145 / 2000$	1284.4	tons
1	Runway Extension	Asphalt Storage and Batching	PM10 = $(0.027 + 0.00042) \times T$	35.2	lbs
1	Runway Extension	Asphalt Storage and Batching	CO = $(0.4 + 0.0004) \times T$	514.3	lbs
1	Runway Extension	Asphalt Storage and Batching	NOx = $(0.025) \times T$	32.1	lbs
1	Runway Extension	Asphalt Storage and Batching	SOx = $(0.0046) \times T$	5.908	lbs

Scenario ID	Project	Fugitive Type	Variable	Default Values	Units
1	Runway Extension	Asphalt Storage and Batching	$VOC = (0.0082 + 0.0042) \times T$	15.9	lbs
1	Runway Extension	Material Movement (Unpaved Roads)	s = Surface material silt content	0.043	fraction
1	Runway Extension	Material Movement (Unpaved Roads)	Wt. = Mean vehicle weight	32	tons
1	Runway Extension	Material Movement (Unpaved Roads)	VMT = Vehicle miles traveled	2878.8	miles
1	Runway Extension	Material Movement (Unpaved Roads)	$PM_{10} = 1.5 \times [(s/12)^{0.9}] \times [(Wt./3)^{0.45}] \times VMT$	78.8	lbs
1	Runway Extension	Material Movement (Paved Roads)	sL = Road surface silt loading	0.1	g/m3
1	Runway Extension	Material Movement (Paved Roads)	Wt. = Mean vehicle weight	32	tons
1	Runway Extension	Material Movement (Paved Roads)	VMT = Vehicle miles traveled	2580	miles
1	Runway Extension	Material Movement (Paved Roads)	$PM_{10} = 0.0022 \times (sL^{0.91}) \times (Wt^{1.02}) \times VMT$	23.9	lbs
1	Runway Extension	Unstabilized Land and Wind Erosion	A = Area affected = L x W / 43560.0	2.44	acres
1	Runway Extension	Unstabilized Land and Wind Erosion	TPConv = TSP/PM10 conversion	0.5	fraction
1	Runway Extension	Unstabilized Land and Wind Erosion	CE = Control efficiency	0.63	fraction
1	Runway Extension	Unstabilized Land and Wind Erosion	t = year (e.g. 0.65 year)	0.5	years
1	Runway Extension	Unstabilized Land and Wind Erosion	$PM_{10} = 0.38 \times A \times TPConv \times (1-CE) \times t / 2000$	0	lbs
1	Runway Extension	Soil Handling	u = Wind speed	5	mph
1	Runway Extension	Soil Handling	m = Moisture content	0.25	fraction
1	Runway Extension	Soil Handling	T = Mass of aggregate storage pile = L x W x 0.5 x 110 / 2000	2922.6	tons
1	Runway Extension	Soil Handling	$PM_{10} = T \times 0.35 \times 0.0032 \times [(u/5)^{1.3}] / [(m/2)^{1.4}]$	60.2	lbs

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- | | |
|-------------------------------------|--|
| Asphalt Deliveries/Ten Wheelers | Pickup Truck |
| Bulldozer | Scraper |
| Concrete Ready Mix Trucks | Seed Truck Spreader |
| Concrete Ready Trucks Mix for Cores | Small Dozer |
| Concrete Truck | Survey Crew Trucks |
| Crack Filler (Trailer Mounted) | Ten Wheelers |
| Delivery of Tanks (3) | Ten Wheelers- Material Delivery |
| Distributing Tanker | Tool Truck |
| Dozer | Tractor Trailer- Equipment Delivery |
| Dump Truck | Tractor Trailer- Material Delivery |
| Dump Truck (12 cy) | Tractor Trailer- Steel Deliveries |
| Excavator | Tractor Trailer- Stone Delivery |
| Excavator for U/G Services/Tanks | Tractor Trailer- Topsoil & Seed |
| Flat Bed or Dump Trucks | Tractor Trailer- Truck Delivery |
| Flatbed Truck | Tractor Trailer with Boom Hoist- Curbs Del & Place |
| Grader | Tractor Trailer with Boom Hoist- Delivery |
| Grout Wheel Truck | Tractor Trailers- Rebar Deliveries |
| Hoist Equipment with 40 Ton Rig | Tractor Trailers Temp Fac. |
| Hydraulic Hammer | Truck for Topsoil & Seed Del&Spread |
| Hydroseeder | Water Truck |
| Line Painting Truck and Sprayer | Excavator with Bucket |
| Material Deliveries | Excavator with Hoe Ram |
| Off-Road Truck | |

Sikorsky Memorial Airport (BDR) – Runway 11-29 Safety Improvements Environmental Assessment Climate & Greenhouse Gas Inventory Documentation

FAA Order 1050.1F Desk Reference guidance states that a discussion of the potential climate impacts be documented in a NEPA document. Any projected GHG emissions associated with proposed actions can be used to assess a proposed action's climate change effects. A significance threshold for climate and greenhouse gas emissions has not been established. A greenhouse gas inventory was prepared to provide an assessment of emissions from the Airport.

The purpose of the inventory is to provide a baseline assessment of greenhouse gas emissions associated with airport operations. Emissions associated with the airport occur as a result of the following activities:

- Aircraft operations
- Ground support equipment operations
- Ground access vehicles (e.g. people driving to the airport)
- Stationary sources (e.g. combustion, refrigerants, fire suppressants)
- Electricity use

This inventory has been prepared for the six principal greenhouse gases (GHG): carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFC), and perfluorocarbons (PFC).

1.0 Greenhouse Gas Inventory and Forecast Procedures

The greenhouse gas inventory was prepared using the guidance in the Airport Cooperative Research Program Report 11 – Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories (ACRP, 2009). Due to the potential effects of COVID-19 on airport operations, calendar year 2019 was identified as the baseline year for the inventory.

The ACRP guidance states that airport GHG inventories should be categorized and allocated by ownership/control of the emission source. The City owns the airport land and many of the buildings and other facilities (e.g. fuel tanks). However, many facilities are operated by tenants and the City's role is limited to management activities. As a result, the City is responsible for a small portion of the emissions from building heating, electricity use and maintenance/support vehicles. It should be noted, however, that specific use data for City-controlled spaces was not available.

1.1 Aircraft Operations

Greenhouse gas emissions result from the combustion of fuel during aircraft operations. In order to simplify the inventory process, emissions from aircraft are assigned to an airport based on fuel sales at that airport, regardless of where the fuel is consumed. To provide an estimate of GHG emissions that occur in the vicinity of the airport, aircraft emissions are divided into the cruise and landing/takeoff (LTO) modes of operation. LTO operation is defined as all activities taking place below 3,000 feet. LTO emissions were based on fuel consumption factors from the FAA's Aviation Environmental Design Tool (AEDT) model (FAA, 2021).

Taxi-in and taxi-out times were assumed to be 5 minutes. The glide slope was set to 3 degrees, which is the angle specified by the glide slope indicators for Primary Runway 6-24. APU emissions were included for aircraft equipped with an APU in the AEDT inventory.

Data on flight operations was obtained from the FAA ASPM and OPSNET systems for the 2019 calendar year and input into AEDT (FAA, 2022). The detailed calculations for the emissions from aircraft operations are provided in Appendix A.

1.2 Ground Support Equipment

Emissions resulting from the operation of ground support equipment (GSE) operations also contribute to the total GHG emissions at the Airport. There are various GSE located at BDR, including fuel trucks, aircraft tugs, deicing equipment, and ground power units. The amount of gasoline and diesel fuel used at the airport for GSE was not available. AEDT was used to estimate GSE fuel use. Emission factors for CO₂ from gasoline and diesel combustion were obtained from the ACRP guidance. Factors from the Climate Registry's General Reporting Protocol (GRP) were used for CH₄ and N₂O (TCR, 2019).

The detailed calculations for emissions from GSE are provided in Appendix A.

1.3 Ground Access Vehicles

One of the largest contributors of GHG emissions at BDR is operations from ground access vehicles (vehicles used to transport people/goods to and from the airport). These may be considered to be aircraft owners/operators, tenants, or the general public (passengers, deliveries, etc.). Data was not available to determine each group's share of the total ground access vehicle emissions. Limited traffic data was available. Based on Connecticut Department of Transportation traffic data and aircraft operations data, the daily passenger car traffic to the airport was estimated at 700 trips.

For the purposes of this inventory, an average trip distance of 20 miles was assumed. Additionally, the national average for vehicle fuel economy, 22.2 miles per gallon (BTS, 2021), was used as the assumption. It was assumed that all GAV used gasoline. Emissions related to GAV air conditioning were not included in the inventory as these emissions are not substantially related to access of the airport by vehicles.

Emission factors for CO₂ from GAV were obtained from the ACRP guidance. Factors from the GRP were used for CH₄ and N₂O (TCR, 2019). The detailed calculations for the emissions from GAV are provided in Appendix A.

1.4 Stationary Sources

Greenhouse gas emissions also result from the combustion of fuel in stationary sources such as boilers, furnaces, water heaters, and generators. Emissions may also result from operation and maintenance of air conditioning and fire-fighting systems.

Utility records for on-site fuel use were not available. Fuel use was estimated based on building square footage and intensity factors from the GRP. The primary building use at the Airport is aircraft hangars. Specific emission factors for aircraft hangars are not included in the GRP. The factors for

storage/warehouse buildings were determined to be the most representative. It was assumed that a 750 HP emergency generator is present and operates for 50 hours per year. Emission factors for stationary sources were obtained from EPA's AP-42 Compilation of Air Pollutant Emission Factors, the GRP, and the ACRP guidance (EPA, 1995).

Finally, it should be noted that there was not sufficient data to estimate emissions from air conditioning and fire-fighting systems.

The detailed calculations for emissions from stationary sources are provided in Appendix A.

1.5 Electricity Use

The generation of electricity for the Airport also contributes to the total emissions count. Utility records for on-site electricity use were not available. Electricity use was estimated based on building square footage and intensity factors from the GRP. The primary building use at the Airport is aircraft hangars. Specific emission factors for aircraft hangars are not included in the GRP. The factors for storage/warehouse buildings were determined to be the most representative. The EPA's eGRID database was used to obtain greenhouse gas emission factors for the Connecticut power grid (EPA, 2021).

The detailed calculations for emissions from electricity use are provided in Appendix A.

1.6 Global Warming Potentials

Different greenhouse gases emitted from human and natural sources have different impacts on climate. For example, one ton of CO₂ has a different effect on the climate than one ton of methane. Using results from complex computer simulations, scientists have developed equivalency methods for estimating the relative impacts on climate change of different chemicals. The most commonly-used equivalency method is the Global Warming Potential (GWP). The GWP for a chemical is a ratio of the chemical's warming potential to the warming potential of CO₂. Applying these GWPs to all of the estimated GHGs allows for the summation of emissions on a "CO₂-equivalent" basis.

GWPs were obtained from the ACRP guidance. The detailed calculations for CO₂-equivalent emissions are provided in Appendix A.

2.0 Summary of Results

The estimated greenhouse gas emissions associated with operations at Sikorsky Memorial Airport in 2019 are provided in Table 1 below.

Table 1 – Estimated Greenhouse Gas Emissions (metric tons) Sikorsky Memorial Airport Baseline (2019)			
Activity	CO₂	CH₄	N₂O
Aircraft Operations (Total)	11,591	0.91	0.25
Aircraft Operations (LTO/APU)	2,928	0.50	0.06
Aircraft Operations (Cruise)	8,662	0.42	0.19
Ground Support Equipment	269	0.01	0.01
Ground Access Vehicles	4,085	0.07	0.09
Stationary Sources (Total)	365	0.03	0.002
Natural Gas Use	345	0.03	0.001
Emergency Generators	20	0.001	0.001
Electricity Use	476	0.07	0.01
Total Emissions	16,785	1.11	0.36
Total Emissions (CO₂-equivalent)	16,920		

References

ACRP, 2009. Guidebook on Preparing Greenhouse Gas Emissions Inventories. Available from the Airports Council International – North America web site - http://aci-na.org/static/entransit/acrp_guidebook_on_greenhouse_gases_april09.pdf, 2009.

BTS, 2021. National Transportation Statistics, Table 4-23. Available from BTS's web site <https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>, February 2021.

EPA, 1995. AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors. Available from EPA's web site - <http://www.epa.gov/ttnchie1/ap42/>, January, 1995.

EPA, 2021. Emissions and Generation Resource Integrated Database (eGRID). Available from EPA's web site - <http://www.epa.gov/egrid/>, February, 2021.

FAA, 2021. Aviation Environmental Design Tool (AEDT). Available via FAA (fee required) - <https://aedt.faa.gov/>, March 2021.

FAA, 2022. Aviation System Performance Metrics (ASPM). Available via FAA (registration required) - <https://aspm.faa.gov/>, January 2022.

TCR, 2019. The Climate Registry – General Reporting Protocol, Default Emission Factors. Available from the Climate Registry web site (registration required)- <http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/>, May 2019.

Appendix A

Emission Estimate Spreadsheet

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

The greenhouse gas inventory was prepared using the guidance in the Airport Cooperative Research Program Report 11 – Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories (ACRP, 2009). The inventory has been prepared for the six principal greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFC), and perfluorocarbons (PFC). No sources of SF₆ were identified at the airport. In addition, there was insufficient data to estimate emissions of HFC and PFC.

Due to the potential effects of COVID-19 on airport operations, a baseline year of 2019 was used.

Aircraft Operations

Sample Calculation

$$Emissions (metric tons) = Fuel Use (gal) * Emission Factor \left(\frac{lb}{gal} \right) * 0.00045359 \left(\frac{metric tons}{lb} \right)$$

Emission Factors

	Jet A (lb/gal)	Avgas (lb/gal)	Source
CO ₂	21.095	18.355	ACRP, 2009
CH ₄	5.95E-04	0.016	ACRP, 2009
N ₂ O	4.63E-04	2.43E-04	ACRP, 2009

2019 Total Fuel Use

Total fuel use for passenger and general operations is based on the total fuel dispensed at the airport in 2019.

Jet A (gal):	1,136,263
Avgas (gal):	86,264

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Total Emissions - Aircraft Operations

CO ₂	11,591 metric tons
CH ₄	0.91 metric tons
N ₂ O	0.25 metric tons

Landing-Takeoff Operation (LTO) and Auxiliary Power Unit (APU) Fuel Use

LTO/APU fuel use is based on fuel consumption data from FAA's AEDT model.

Jet A (gal):	253,248
Avgas (gal):	60,682

Landing-Takeoff Operation (LTO)/Auxiliary Power Unit Emissions

CO ₂	2,928 metric tons
CH ₄	0.50 metric tons
N ₂ O	0.06 metric tons

Cruise Emissions (Total Emissions - LTO/APU Emissions)

CO ₂	8,662 metric tons
CH ₄	0.42 metric tons
N ₂ O	0.19 metric tons

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Ground Support Equipment

Sample Calculation

$$\text{Emissions (metric tons)} = \text{Fuel Use (gal)} * \text{Emission Factor} \left(\frac{\text{lb}}{\text{gal}} \right) * 0.00045359 \left(\frac{\text{metric tons}}{\text{lb}} \right)$$

Emission Factors

	Diesel fuel (lb/gal)	Gasoline (lb/gal)	Source
CO ₂	22.384	19.564	ACRP, 2009
CH ₄	6.48E-04	6.05E-03	TCR, 2019 (Table 2.7)
N ₂ O	1.08E-03	5.53E-04	TCR, 2019 (Table 2.7)

Estimated 2019 Fuel Consumption

Diesel:	24,300 gallons
Gasoline:	2,500 gallons

Total Emissions - Ground Support Equipment

CO ₂	269 metric tons
CH ₄	0.01 metric tons
N ₂ O	0.01 metric tons

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Ground Access Vehicles

Sample Calculation

$$Emissions (metric tons) = Mileage(mi) * Emission Factor \left(\frac{lb}{mi} \right) * 0.00045359 \left(\frac{metric tons}{lb} \right)$$

Emission Factors

	Gasoline Source (lb/mi)
CO ₂	0.88 ACRP, 2009 (lb/gal) and average fuel economy (BTS, 2021)
CH ₄	1.59E-05 TCR, 2019 (Table 2.5)
N ₂ O	1.92E-05 TCR, 2019 (Table 2.5)

Estimate Passenger Car Mileage

Average daily trips to airport:	700
Average trip distance (one-way, assumed):	20 miles
annual passenger car (gasoline) mileage:	10,220,000 miles

Total Emissions - Ground Access Vehicles

CO ₂	4,085 metric tons
CH ₄	0.07 metric tons
N ₂ O	0.09 metric tons

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Stationary Sources

Emergency Generators - Sample Calculation

$$\text{Emissions (metric tons)} = \text{Hours (hrs)} * \text{Horsepower (HP)} * \text{Emission factor} \left(\frac{\text{lb}}{\text{hp} - \text{hr}} \right) * 0.00045359 \left(\frac{\text{metric tons}}{\text{lb}} \right)$$

Emergency Generators - Emission Factors

	Generators Source (lb/hp-hr)
CO ₂	1.15 EPA, 1995
CH ₄	3.20E-05 TCR, 2019 (Table 2.7, converted based on 7,000 btu/hp-hr and 137,000 btu/gal)
N ₂ O	5.46E-05 TCR, 2019 (Table 2.7, converted based on 7,000 btu/hp-hr and 137,000 btu/gal)

2019 Emergency Generator Use

Total generator hours: 50 hours (assumed, 50 hr per unit)
Generator horsepower: 750 HP (assumed)

Total generator use: 37,500 hp-hr

Total Emissions - Emergency Generators

CO ₂	20 metric tons
CH ₄	0.001 metric tons
N ₂ O	0.001 metric tons

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Natural Gas - Sample Calculation

Emissions (metric tons) =

$$\text{Bldg Area (ft}^2\text{)} * \text{Intensity} \left(\frac{\text{MMSCF}}{\text{ft}^2} \right) * \text{Emission Factor} \left(\frac{\text{lb}}{\text{MMSCF}} \right) \\ * 0.00045359 \left(\frac{\text{metric tons}}{\text{lb}} \right)$$

Building Area

325,000 ft²

Natural Gas - Intensity Factor

1.94E-05 MMSCF/ft² (TCR, 2019 Table 3.7)

Natural Gas - Emission Factors

	Natural Gas Source (lb/MMSCF)
CO ₂	120,593 ACRP, 2009
CH ₄	11.86 ACRP, 2009
N ₂ O	2.37E-01 ACRP, 2009

2019 Estimated Natural Gas Use

6.3 MMSCF

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Total Emissions - Natural Gas

CO ₂	345 metric tons
CH ₄	0.03 metric tons
N ₂ O	0.001 metric tons

Total Emissions - Stationary Sources

CO ₂	364 metric tons
CH ₄	0.03 metric tons
N ₂ O	0.002 metric tons

Electricity Use

Sample Calculation

$$\text{Emissions (metric tons)} = \text{Electricity Usage (MWh)} * \text{Emission Factor} \left(\frac{\text{lb}}{\text{MWh}} \right) * 0.00045359 \left(\frac{\text{metric tons}}{\text{lb}} \right)$$

Building Area

325,000 ft²

Electricity Use - Intensity Factor

6.60E-03 MWh/ft² (TCR, 2019 Table 3.7)

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Emission Factors

	Electricity Source (lb/MWh)
CO ₂	488.90 EPA, 2021
CH ₄	7.70E-02 EPA, 2021
N ₂ O	1.00E-02 EPA, 2021

2019 Estimated Electricity Use

2,145.0 MWh

Total Emissions - Electricity Use

CO ₂	476 metric tons
CH ₄	0.07 metric tons
N ₂ O	0.01 metric tons

Total Emissions & CO₂ Equivalences

Total Emissions

CO ₂	16,785 metric tons
CH ₄	1.11 metric tons
N ₂ O	0.36 metric tons

**Sikorsky Memorial Airport (BDR)
Greenhouse Gas Inventory
Baseline Year 2019**

Sample Calculation

$$CO_2e \text{ (metric tons)} = \sum \text{Pollutant Emissions (metric tons)} * \text{Global Warming Potential}$$

Global Warming Potentials (GWP)

	GWP	Source
CO ₂	1	ACRP, 2009
CH ₄	25	ACRP, 2009
N ₂ O	298	ACRP, 2009

Total Emissions - CO₂e

CO₂e 16,920 metric tons

References

ACRP, 2009. Guidebook on Preparing Greenhouse Gas Emissions Inventories. Available from the Airports Council International – North America web site - http://aci-na.org/static/entransit/acrp_guidebook_on_greenhouse_gases_april09.pdf, 2009.

BTS, 2014. National Transportation Statistics, Table 4-23. Available from BTS’s web site <https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>, February 2021.

EPA, 1995. AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors. Available from EPA’s web site - <http://www.epa.gov/ttnchie1/ap42/>, January, 1995.

EPA, 2021. Emissions and Generation Resource Integrated Database (eGRID). Available from EPA’s web site - <http://www.epa.gov/egrid/>, February, 2021.

TCR, 2019. The Climate Registry – General Reporting Protocol, Default Emission Factors. Available from the Climate Registry web site (registration required)- <http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/>, May 2019.