
Appendix B-2

Opening Year Emissions Memo

April 18, 2023

Mr. Timothy Reeves
Meridian Park D-1, LLC
1156 N. Mountain Avenue
Upland, CA 91786

**SUBJECT: MERIDIAN D-1 GATEWAY AVIATION CENTER OPENING YEAR EMISSIONS COMPARISON
MEMORANDUM**

Dear Mr. Timothy Reeves:

Urban Crossroads, Inc. is pleased to provide the following Opening Year Emissions Comparison Memorandum (referred to as **Memo**) to compare Project construction and operational emissions associated with the construction and operation of the Meridian D-1 Gateway Aviation Center development. This memo compares emissions that would occur assuming a 2026 opening year compared to a 2024 opening year as originally evaluated.

CONSTRUCTION

Emissions resulting from the use of construction equipment, worker commuting, vendor trips, and hauling were calculated using CalEEMod. Under the original Project opening year of 2024 that was assumed in the *Meridian D-1 Gateway Aviation Center Air Quality Impact Analysis (AQIA)*, it was assumed that construction would begin in 2023 and be completed in 2024. With an opening year of 2026, it was assumed that activities would be pushed forward two years such that construction would begin in 2024 and be completed in 2026.

Due to the gradual retirement and replacement of older, dirtier construction equipment with newer equipment with reduced emissions, it is assumed that average construction equipment emissions will be reduced over time. Similarly, the model assumes that emissions from worker vehicles, vendor trucks, and haul trucks will be reduced slightly with each year as older, more polluting vehicles are replaced with newer vehicles meeting higher emissions standards.

Table 1 presents the CalEEMod default emission factors for each piece of construction equipment that would be used during Project construction. As shown in Table 1, in almost every case emission factors would be the same or lower for construction activities taking place under the assumed 2026 Project opening year compared to the 2024 opening year that was evaluated in the AQIA.

TABLE 1: CONSTRUCTION EQUIPMENT EMISSION FACTOR COMPARISON

Construction Activity	Equipment Type	Year	Emission Factor (grams per horsepower hour)								
			VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
Site Preparation/ Demolition	Crawler Tractor	2023	0.548	4.682	3.852	0.005	0.367	0.338	528.908	0.021	0.004
		2025	0.443	3.876	3.747	0.005	0.279	0.256	528.471	0.021	0.004
		% Chg	-19.16%	-17.21%	-2.73%	0.00%	-23.98%	-24.26%	-0.08%	0.00%	0.00%
	Concrete/Industrial Saw	2023	0.507	3.862	4.426	0.007	0.137	0.126	575.299	0.023	0.005
		2025	0.439	3.635	4.348	0.007	0.101	0.093	575.013	0.023	0.005
		% Chg	-13.41%	-5.88%	-1.76%	0.00%	-26.28%	-26.19%	-0.05%	0.00%	0.00%
	Excavator	2023	0.448	3.587	4.226	0.005	0.139	0.128	586.882	0.024	0.005
		2025	0.402	3.446	4.211	0.005	0.107	0.098	587.138	0.024	0.005
		% Chg	-10.27%	-3.93%	-0.35%	0.00%	-23.02%	-23.44%	0.04%	0.00%	0.00%
	Rubber Tired Dozer	2023	0.445	4.462	3.582	0.005	0.201	0.185	532.214	0.022	0.004
		2025	0.371	3.506	2.902	0.005	0.154	0.142	532.172	0.022	0.004
		% Chg	-16.63%	-21.43%	-18.98%	0.00%	-23.38%	-23.24%	-0.01%	0.00%	0.00%
Grading	Crawler Tractor	2023	0.548	4.682	3.852	0.005	0.367	0.338	528.908	0.021	0.004
		2025	0.443	3.876	3.747	0.005	0.279	0.256	528.471	0.021	0.004
		% Chg	-19.16%	-17.21%	-2.73%	0.00%	-23.98%	-24.26%	-0.08%	0.00%	0.00%
	Excavator	2023	0.448	3.587	4.226	0.005	0.139	0.128	586.882	0.024	0.005
		2025	0.402	3.446	4.211	0.005	0.107	0.098	587.138	0.024	0.005
		% Chg	-10.27%	-3.93%	-0.35%	0.00%	-23.02%	-23.44%	0.04%	0.00%	0.00%
	Grader	2023	0.385	3.506	3.42	0.005	0.193	0.177	529.994	0.021	0.004
		2025	0.340	2.859	3.419	0.005	0.159	0.146	531.194	0.022	0.004
		% Chg	-11.69%	-18.45%	-0.03%	0.00%	-17.62%	-17.51%	0.23%	4.76%	0.00%
	Rubber Tired Dozer	2023	0.445	4.462	3.582	0.005	0.201	0.185	532.214	0.022	0.004
		2025	0.371	3.506	2.902	0.005	0.154	0.142	532.172	0.022	0.004

Construction Activity	Equipment Type	Year	Emission Factor (grams per horsepower hour)								
			VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
		% Chg	-16.63%	-21.43%	-18.98%	0.00%	-23.38%	-23.24%	-0.01%	0.00%	0.00%
	Scraper	2023	0.237	2.474	1.761	0.005	0.095	0.087	529.06	0.021	0.004
		2025	0.204	1.909	1.576	0.005	0.074	0.068	528.942	0.021	0.004
		% Chg	-13.92%	-22.84%	-10.51%	0.00%	-22.11%	-21.84%	-0.02%	0.00%	0.00%
Building Construction	Crane	2023	0.213	2.232	1.703	0.005	0.089	0.082	527.516	0.021	0.004
		2025	0.201	1.95	1.663	0.005	0.079	0.073	527.585	0.021	0.004
		% Chg	-5.63%	-12.63%	-2.35%	0.00%	-11.24%	-10.98%	0.01%	0.00%	0.00%
	Crawler Tractor	2023	0.548	4.682	3.852	0.005	0.367	0.338	528.908	0.021	0.004
		2025	0.443	3.876	3.747	0.005	0.279	0.256	528.471	0.021	0.004
		% Chg	-19.16%	-17.21%	-2.73%	0.00%	-23.98%	-24.26%	-0.08%	0.00%	0.00%
	Forklift	2023	0.316	2.981	3.63	0.005	0.182	0.168	527.097	0.021	0.004
		2025	0.269	2.551	3.599	0.005	0.135	0.124	527.108	0.021	0.004
		% Chg	-14.87%	-14.42%	-0.85%	0.00%	-25.82%	-26.19%	0.00%	0.00%	0.00%
	Generator Set	2023	0.55	4.402	2.894	0.008	0.184	0.17	568.318	0.023	0.005
		2025	0.542	4.347	2.869	0.008	0.177	0.163	568.322	0.023	0.005
		% Chg	-1.45%	-1.25%	-0.86%	0.00%	-3.80%	-4.12%	0.00%	0.00%	0.00%
	Welder	2023	0.577	3.891	4.596	0.007	0.151	0.139	568.291	0.023	0.005
		2025	0.498	3.676	4.525	0.007	0.113	0.104	568.301	0.023	0.005
		% Chg	-13.69%	-5.53%	-1.54%	0.00%	-25.17%	-25.18%	0.00%	0.00%	0.00%
Paving	Paver	2023	0.233	2.711	3.396	0.005	0.137	0.126	525.783	0.021	0.004
		2025	0.248	2.646	3.445	0.005	0.139	0.128	526.537	0.021	0.004
		% Chg	6.44%	-2.40%	1.44%	0.00%	1.46%	1.59%	0.14%	0.00%	0.00%
	Paving Equipment	2023	0.247	2.584	3.452	0.005	0.129	0.119	528.729	0.021	0.004
		2025	0.202	2.216	3.418	0.005	0.089	0.082	527.686	0.021	0.004
		% Chg	-18.22%	-14.24%	-0.98%	0.00%	-31.01%	-31.09%	-0.20%	0.00%	0.00%
	Roller	2023	0.659	3.911	4.241	0.005	0.211	0.194	586.831	0.024	0.005

Construction Activity	Equipment Type	Year	Emission Factor (grams per horsepower hour)								
			VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
Architectural Coating	Air Compressor	2025	0.567	3.678	4.113	0.005	0.166	0.153	586.902	0.024	0.005
		% Chg	-13.96%	-5.96%	-3.02%	0.00%	-21.33%	-21.13%	0.01%	0.00%	0.00%
		2024	0.581	3.865	4.881	0.007	0.136	0.125	568.361	0.023	0.005
		2026	0.512	3.646	4.822	0.007	0.099	0.091	568.287	0.023	0.005
		% Chg	-11.88%	-5.67%	-1.21%	0.00%	-27.21%	-27.20%	-0.01%	0.00%	0.00%

OPERATION

Operational emissions associated with the Project were calculated using CalEEMod, which relies on emission factors provided by EMFAC 2021. Similar to the fleet of construction equipment, the model assumes that each year overall vehicle emission rates are lower as older, higher emitting vehicles are replaced with newer, cleaner vehicles. Table 2 presents a comparison of emission rates for each vehicle type between 2024 and 2026. As shown in Table 2, overall emission rates are lower in 2026 compared to 2024. As such, the opening year of 2024 that was analyzed in the AQIA represents a conservative estimate of emissions, and it is expected that emissions would be reduced with each passing year.

CONCLUSION

As shown in Tables 1 and 2, due to continual improvements in emission standards and construction equipment and vehicle fleet turnover, emissions would improve should the Project opening year be pushed out. As a result, should the Project opening year be pushed out from 2024 to 2026, the results of the previously prepared Air Quality Impact Assessment, Greenhouse Gas Assessment, Health Risk Assessment, and Energy Assessment would not change.

TABLE 2: VEHICLE EMISSION FACTOR COMPARISON

Vehicle Class	Year	Emission Factor (grams per mile)								
		VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
LDA	2024	0.00843	0.03828	0.00118	0.00279	0.00128	0.00118	282.68	0.00230	0.00450
	2026	0.00699	0.03283	0.00111	0.00268	0.00120	0.00111	271.15	0.00196	0.00414
	% Chg	-17.12%	-14.22%	-6.30%	-4.08%	-6.30%	-6.30%	-4.08%	-14.60%	-8.04%
LDT1	2024	0.04190	0.18828	0.00206	0.00336	0.00224	0.00206	340.11	0.00943	0.01308
	2026	0.03353	0.15280	0.00180	0.00323	0.00196	0.00180	326.96	0.00764	0.01104
	% Chg	-19.97%	-18.85%	-12.68%	-3.86%	-12.68%	-12.68%	-3.86%	-19.03%	-15.58%
LDT2	2024	0.01144	0.06780	0.00120	0.00341	0.00130	0.00120	345.20	0.00298	0.00598
	2026	0.00940	0.05525	0.00111	0.00324	0.00121	0.00111	327.69	0.00252	0.00528
	% Chg	-17.82%	-18.52%	-7.32%	-5.07%	-7.32%	-7.32%	-5.07%	-15.47%	-11.69%
MDV	2024	0.01844	0.11292	0.00125	0.00425	0.00136	0.00125	429.52	0.00447	0.00853
	2026	0.01462	0.08872	0.00116	0.00405	0.00126	0.00116	409.78	0.00364	0.00720
	% Chg	-20.72%	-21.43%	-7.17%	-4.59%	-7.17%	-7.17%	-4.59%	-18.62%	-15.58%
MCY	2024	1.13101	0.58818	0.00171	0.00187	0.00183	0.00171	189.36	0.17171	0.04030
	2026	1.06125	0.56286	0.00175	0.00186	0.00187	0.00175	188.15	0.16357	0.03920
	% Chg	-6.17%	-4.30%	2.13%	-0.64%	2.22%	2.13%	-0.64%	-4.74%	-2.72%
LHDT1	2024	0.11223	1.90192	0.02723	0.00463	0.02846	0.02723	489.14	0.00521	0.07706
	2026	0.10038	1.59336	0.02456	0.00460	0.02567	0.02456	485.42	0.00466	0.07648
	% Chg	-10.56%	-16.22%	-9.82%	-0.76%	-9.82%	-9.82%	-0.76%	-10.56%	-0.76%
LHDT2	2024	0.09925	1.43046	0.02485	0.00556	0.02598	0.02485	587.18	0.00461	0.09251
	2026	0.09098	1.23390	0.02303	0.00550	0.02407	0.02303	580.34	0.00423	0.09143
	% Chg	-8.34%	-13.74%	-7.35%	-1.17%	-7.35%	-7.35%	-1.17%	-8.34%	-1.17%
MHDT	2024	0.01589	0.87605	0.01116	0.01026	0.01166	0.01116	1,083.00	0.00074	0.17063
	2026	0.01247	0.71766	0.00913	0.01015	0.00954	0.00913	1,072.39	0.00058	0.16895
	% Chg	-21.52%	-18.08%	-18.18%	-0.98%	-18.18%	-18.18%	-0.98%	-21.52%	-0.98%

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 Meridian Park D-1, LLC
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Vehicle Class	Year	Emission Factor (grams per mile)								
		VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
HHDT	2024	0.01311	1.59396	0.02690	0.01484	0.02812	0.02690	1,566.94	0.00061	0.24687
	2026	0.01241	1.49846	0.02655	0.01445	0.02775	0.02655	1,526.42	0.00058	0.24049
	% Chg	-5.35%	-5.99%	-1.32%	-2.59%	-1.32%	-1.32%	-2.59%	-5.35%	-2.59%

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April 18, 2023
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If you have any questions, please contact me directly at (949) 336-5987.

Respectfully submitted,

URBAN CROSSROADS, INC.



Haseeb Qureshi,
Principal

ATTACHMENT A:

EMFAC OPERATIONAL EMISSIONS MODEL OUTPUTS

Source: EMFAC2021 (v1.0.2) Emission Rates

Region Type: Sub-Area

Region: Riverside (SC)

Calendar Year: 2024, 2026

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Year	Vehicle Cat	Model Year	Speed	Fuel	NOx_RUNEX	PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	CO_RUNEX	SOx_RUNEX	SOx_IDLEX
Riverside (S	2024	HHDT	Aggregate	Aggregate	Diesel	1.593959302	0.026903423	0.02812	1566.937	0.000609	0.246872	0.013107	0.063903	0.014838	0.117887
Riverside (S	2024	LDA	Aggregate	Aggregate	Gasoline	0.038276923	0.001180073	0.001283	282.6767	0.002297	0.004504	0.008433	0.747245	0.002795	0
Riverside (S	2024	LDT1	Aggregate	Aggregate	Gasoline	0.188281421	0.002060562	0.002241	340.1085	0.009432	0.01308	0.041896	1.993575	0.003362	0
Riverside (S	2024	LDT2	Aggregate	Aggregate	Gasoline	0.067804862	0.001198057	0.001303	345.2022	0.002983	0.005979	0.011439	0.876342	0.003413	0
Riverside (S	2024	LHDT1	Aggregate	Aggregate	Diesel	1.901924492	0.027233248	0.028465	489.1415	0.005213	0.077064	0.11223	0.361386	0.004635	0.001271
Riverside (S	2024	LHDT2	Aggregate	Aggregate	Diesel	1.430456965	0.024853487	0.025977	587.1777	0.00461	0.09251	0.099254	0.269956	0.005564	0.002039
Riverside (S	2024	MCY	Aggregate	Aggregate	Gasoline	0.588179705	0.001709165	0.001827	189.3589	0.171711	0.040299	1.131014	13.46544	0.001872	0
Riverside (S	2024	MDV	Aggregate	Aggregate	Gasoline	0.112918269	0.001251283	0.001361	429.519	0.004469	0.008527	0.018436	1.111265	0.004246	0
Riverside (S	2024	MHDT	Aggregate	Aggregate	Diesel	0.876047692	0.011160185	0.011665	1083.002	0.000738	0.170627	0.015889	0.064067	0.010255	0.021059
Riverside (S	2026	HHDT	Aggregate	Aggregate	Diesel	1.498459561	0.026547819	0.027748	1526.418	0.000576	0.240488	0.012406	0.05744	0.014454	0.113755
Riverside (S	2026	LDA	Aggregate	Aggregate	Gasoline	0.032833048	0.00110567	0.001203	271.1501	0.001962	0.004142	0.00699	0.681796	0.002681	0
Riverside (S	2026	LDT1	Aggregate	Aggregate	Gasoline	0.152798727	0.001799185	0.001957	326.9643	0.007637	0.011043	0.033529	1.682464	0.003232	0
Riverside (S	2026	LDT2	Aggregate	Aggregate	Gasoline	0.055250561	0.001110367	0.001208	327.6927	0.002522	0.00528	0.0094	0.781127	0.00324	0
Riverside (S	2026	LHDT1	Aggregate	Aggregate	Diesel	1.593360958	0.024559493	0.02567	485.4159	0.004663	0.076477	0.100381	0.310028	0.0046	0.001252
Riverside (S	2026	LHDT2	Aggregate	Aggregate	Diesel	1.233895224	0.023025702	0.024067	580.3367	0.004226	0.091432	0.090977	0.240307	0.005499	0.002009
Riverside (S	2026	MCY	Aggregate	Aggregate	Gasoline	0.562862075	0.001745651	0.001868	188.1505	0.163573	0.039202	1.06125	12.71863	0.00186	0
Riverside (S	2026	MDV	Aggregate	Aggregate	Gasoline	0.08872101	0.001161548	0.001263	409.7836	0.003637	0.007199	0.014616	0.968166	0.004051	0
Riverside (S	2026	MHDT	Aggregate	Aggregate	Diesel	0.717656555	0.009130804	0.009544	1072.385	0.000579	0.168955	0.01247	0.054464	0.010155	0.020687

