

APPENDIX F

CONSTRUCTION EMISSIONS ESTIMATES

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Summary

Description	Emissions (tons)								
	Criteria Pollutants						GHGs	HAPs	
	NOx	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}	CO ₂ e	Formaldehyde	Total
Crane BESS									
Off-Road Engine Emissions	10.81	2.21	0.59	0.01	0.35	0.35	481.53	0.07	0.10
Unpaved Roads	--	--	--	--	0.56	0.06	--	--	--
Earthmoving	--	--	--	--	5.48	0.58	--	--	--
Substation, Gen-Tie Line & Access Roads									
Off-Road Engine Emissions	3.58	0.69	0.22	0.00	0.12	0.12	162.70	0.03	0.04
Unpaved Roads	--	--	--	--	0.22	0.02	--	--	--
Earthmoving	--	--	--	--	--	--	--	--	--
CRANE PROJECT TOTAL	14.39	2.91	0.81	0.01	6.73	1.13	644.23	0.09	0.14
Sandhill BESS									
Off-Road Engine Emissions	10.81	2.21	0.59	0.01	0.35	0.35	481.53	0.07	0.10
Unpaved Roads	--	--	--	--	0.56	0.06	--	--	--
Earthmoving	--	--	--	--	6.00	0.63	--	--	--
Substation, Gen-Tie Line & Access Roads									
Off-Road Engine Emissions	3.58	0.69	0.22	0.00	0.12	0.12	162.70	0.03	0.04
Unpaved Roads	--	--	--	--	0.22	0.02	--	--	--
Earthmoving	--	--	--	--	--	--	--	--	--
SANDHILL PROJECT TOTAL	14.39	2.91	0.81	0.01	7.25	1.18	644.23	0.09	0.14

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Construction Equipment Usage Estimates

Equipment	Construction Equipment associated with the Crane BESS				Construction Equipment associated with the Sandhill BESS			
	Quantity ^a	Hours per Day	Numbers of Days	Total Hours Used ^b	Quantity ^a	Hours per Day	Numbers of Days	Total Hours Used ^b
Bulldozer	2	10	60	1,200	2	10	60	1,200
Compactor	1	10	150	1,500	1	10	150	1,500
Fork Lift	1.1	10	450	4,950	1.1	10	450	4,950
Concrete Pump				0				0
Dump Truck	1	10	60	600	1	10	60	600
Excavator	2	10	75	1,500	2	10	75	1,500
Front End Loader	1	10	60	600	1	10	60	600
Pickup Truck	2.6	10	420	10,920	2.6	10	420	10,920
Water truck	1	10	120	1,200	1	10	120	1,200
Grader	1	10	60	600	1	10	60	600
Large Crane	2	10	30	600	2	10	30	600
Medium Crane				0				0
Construction Commuters/Commuter Vehicles Per Day	70 max 31 avg				70 max 31 avg			
Construction Delivery Vehicles Daily	8 avg				8 avg			
Daily Facility Employees/Commuters	70 max 31 avg				70 max 31 avg			

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Construction Equipment Usage Estimates

Equipment	Construction Equipment associated with the Substation				Construction Equipment associated with the Gen-Tie Line			
	Quantity ^a	Hours per Day	Numbers of Days	Total Hours Used ^b	Quantity ^a	Hours per Day	Numbers of Days	Total Hours Used ^b
Bulldozer	1	10	60	600				0
Compactor	1	10	30	300				0
Fork Lift	1	10	90	900	1	10	60	600
Concrete Pump	1	10	10	100	1	10	5	50
Dump Truck				0				0
Excavator				0				0
Front End Loader	1	10	60	600				0
Pickup Truck	1	10	90	900	1	10	90	900
Water truck				0				0
Grader				0				0
Large Crane	1	10	15	150				0
Medium Crane				0	1	10	15	150
Construction Commuters/Commuter Vehicles Per Day	NA				NA			
Construction Delivery Vehicles Daily	NA				NA			
Daily Facility Employees/Commuters	NA				NA			

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Construction Equipment Usage Estimates

Equipment	Construction Equipment associated with the Access Road			
	Quantity ^a	Hours per Day	Numbers of Days	Total Hours Used ^b
Bulldozer	1	10	10	100
Compactor				0
Fork Lift				0
Concrete Pump				0
Dump Truck	1	10	15	150
Excavator				0
Front End Loader	1	10	10	100
Pickup Truck				0
Water truck				0
Grader				0
Large Crane				0
Medium Crane				0
Construction Commuters/Commuter Vehicles Per Day	NA			
Construction Delivery Vehicles Daily	NA			
Daily Facility Employees/Commuters	NA			

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Emission Factors for Construction Engines

Equipment	Max Power (HP)	Load Factor ^c	Loaded Power (HP)	VOC	CO	NOx	Emission Factors ^{d,e} (g/hp-hr)					
							PM ₁₀	PM _{2.5}	SO ₂	CO ₂	CH ₄	N ₂ O
Bulldozer	250	1	250	0.309	0.748	4.000	0.132	0.132	0.002	188.262	0.008	0.002
Compactor	300	1	300	0.167	0.843	4.335	0.132	0.132	0.002	188.262	0.008	0.002
Fork Lift	120	1	120	0.167	0.843	4.335	0.132	0.132	0.002	188.262	0.008	0.002
Concrete Pump	300	1	300	0.338	0.867	4.100	0.180	0.180	0.002	188.262	0.008	0.002
Dump Truck	325	0.8	260	0.338	0.867	4.100	0.180	0.180	0.002	188.262	0.008	0.002
Excavator	138	1	138	0.309	0.748	4.000	0.132	0.132	0.002	188.262	0.008	0.002
Front End Loader	196	1	196	0.309	0.748	4.000	0.132	0.132	0.002	188.262	0.008	0.002
Pickup Truck	150	0.25	38	0.167	0.843	4.335	0.132	0.132	0.002	188.262	0.008	0.002
Water truck	100	0.5	50	0.637	2.366	4.700	0.240	0.240	0.002	188.262	0.008	0.002
Grader	35	0.8	28	0.438	2.161	4.44	0.267	0.259	0.002	188.262	0.008	0.002
Large Crane	15	0.21	3	0.438	2.161	4.44	0.267	0.259	0.002	188.262	0.008	0.002
Medium Crane	450	0.7	315	0.3085	0.7475	4.0	0.132	0.128	0.002	188.262	0.008	0.002

^a Equipment counts based on experience with construction of a similar projects.

^b Generally assumes work will occur 7 am - 7 pm, Monday through Saturday, for a total of 72 work hours per week over 20 weeks

^c Load Factors from Appendix A of EPA 420_P-04-005, Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling , USEPA, April 2004.

^d EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^e GHG emission factors from Title 40 Subchapter C Part 98 Subpart C Table C-1 and C-2 to Subpart C.

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Emission Estimates from Construction Engines

Equipment	Crane BESS Potential Emissions (tons)									
	VOC	CO	NOx	PM ₁₀	PM _{2.5}	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Bulldozer	1.02E-01	0.247	1.323	0.044	0.044	0.001	62.26	2.5E-03	5.0E-04	62.46
Compactor	8.28E-02	0.418	2.150	0.065	0.065	0.001	93.39	3.8E-03	7.6E-04	93.69
Fork Lift	1.09E-01	0.552	2.839	0.086	0.086	0.001	123.27	5.0E-03	1.0E-03	123.67
Concrete Pump	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
Dump Truck	5.82E-02	0.149	0.705	0.031	0.031	0.000	32.37	1.3E-03	2.6E-04	32.48
Excavator	7.04E-02	0.171	0.913	0.030	0.030	0.000	42.96	1.7E-03	3.5E-04	43.10
Front End Loader	4.00E-02	0.097	0.519	0.017	0.017	0.000	24.40	9.9E-04	2.0E-04	24.48
Pickup Truck	7.53E-02	0.380	1.957	0.059	0.059	0.001	84.98	3.4E-03	6.9E-04	85.26
Water truck	4.21E-02	0.156	0.311	0.016	0.016	0.000	12.45	5.1E-04	1.0E-04	12.49
Grader	8.11E-03	0.040	0.082	0.005	0.005	0.000	3.49	1.4E-04	2.8E-05	3.50
Large Crane	9.13E-04	0.005	0.009	0.001	0.001	0.000	0.39	1.6E-05	3.2E-06	0.39
Medium Crane	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
TOTAL	0.59	2.21	10.81	0.35	0.35	0.01	479.96	1.9E-02	3.9E-03	481.53

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Emission Estimates from Construction Engines

Equipment	Sandhill BESS Potential Emissions (ton)									
	VOC	CO	NOx	PM ₁₀	PM _{2.5}	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Bulldozer	1.02E-01	0.247	1.323	0.044	0.044	0.001	62.26	2.5E-03	5.0E-04	62.46
Compactor	8.28E-02	0.418	2.150	0.065	0.065	0.001	93.39	3.8E-03	7.6E-04	93.69
Fork Lift	1.09E-01	0.552	2.839	0.086	0.086	0.001	123.27	5.0E-03	1.0E-03	123.67
Concrete Pump	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
Dump Truck	5.82E-02	0.149	0.705	0.031	0.031	0.000	32.37	1.3E-03	2.6E-04	32.48
Excavator	7.04E-02	0.171	0.913	0.030	0.030	0.000	42.96	1.7E-03	3.5E-04	43.10
Front End Loader	4.00E-02	0.097	0.519	0.017	0.017	0.000	24.40	9.9E-04	2.0E-04	24.48
Pickup Truck	7.53E-02	0.380	1.957	0.059	0.059	0.001	84.98	3.4E-03	6.9E-04	85.26
Water truck	4.21E-02	0.156	0.311	0.016	0.016	0.000	12.45	5.1E-04	1.0E-04	12.49
Grader	8.11E-03	0.040	0.082	0.005	0.005	0.000	3.49	1.4E-04	2.8E-05	3.50
Large Crane	9.13E-04	0.005	0.009	0.001	0.001	0.000	0.39	1.6E-05	3.2E-06	0.39
Medium Crane	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
TOTAL	0.59	2.21	10.81	0.35	0.35	0.01	479.96	1.9E-02	3.9E-03	481.53

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Emission Estimates from Construction Engines

Equipment	Substation, Gen-Tie Line, and Access Roads Potential Emissions (ton)									
	VOC	CO	NOx	PM ₁₀	PM _{2.5}	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Bulldozer	5.95E-02	0.144	0.772	0.025	0.025	0.000	36.32	1.5E-03	2.9E-04	36.44
Compactor	1.66E-02	0.084	0.430	0.013	0.013	0.000	18.68	7.6E-04	1.5E-04	18.74
Fork Lift	3.31E-02	0.167	0.860	0.026	0.026	0.000	37.35	1.5E-03	3.0E-04	37.48
Concrete Pump	1.68E-02	0.043	0.203	0.009	0.009	0.000	9.34	3.8E-04	7.6E-05	9.37
Dump Truck	1.45E-02	0.037	0.176	0.008	0.008	0.000	8.09	3.3E-04	6.6E-05	8.12
Excavator	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
Front End Loader	4.67E-02	0.113	0.605	0.020	0.020	0.000	28.47	1.2E-03	2.3E-04	28.57
Pickup Truck	1.24E-02	0.063	0.323	0.010	0.010	0.000	14.01	5.7E-04	1.1E-04	14.05
Water truck	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
Grader	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00	0.0E+00	0.0E+00	0.00
Large Crane	2.28E-04	0.001	0.002	0.000	0.000	0.000	0.10	4.0E-06	8.0E-07	0.10
Medium Crane	1.61E-02	0.039	0.208	0.007	0.007	0.000	9.81	4.0E-04	8.0E-05	9.84
TOTAL	0.22	0.69	3.58	0.12	0.12	0.00	162.16	6.6E-03	1.3E-03	162.70

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Equipment	Quantity ^a	Total Days Used	VMT ^b	W	Emission Factor		Emissions	
					(lb/VMT) ^c		(ton)	
					PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Crane BESS								
ATV	0	0	0	20	1.73	0.17	0.00	0.00
Backhoe	0	0	0	50	2.62	0.26	0.00	0.00
Bulldozer	2	60	30	20	1.73	0.17	0.03	0.00
Fork Lift	1.1	450	225	20	1.73	0.17	0.20	0.02
Concrete Mixer Truck	0	0	0	20	1.73	0.17	0.00	0.00
Dump Truck	1	60	30	21	1.77	0.18	0.03	0.00
Excavator	2	75	38	22	1.81	0.18	0.03	0.00
Front End Loader	1	60	30	23	1.85	0.18	0.03	0.00
Pickup Truck	2.6	420	210	24	1.88	0.19	0.20	0.02
Piping Truck	0	0	0	25	1.92	0.19	0.00	0.00
Skid steer loader	0	0	0	26	1.95	0.20	0.00	0.00
Water truck	1	120	60	20	1.73	0.17	0.05	0.01
Welding Machine	0	0	0	20	1.73	0.17	0.00	0.00
CRANE BESS TOTAL	--	--	--	--	--	--	0.56	0.06
Sandhill BESS								
ATV	0	0	0	20	1.73	0.17	0.00	0.00
Backhoe	0	0	0	50	2.62	0.26	0.00	0.00
Bulldozer	2	60	30	20	1.73	0.17	0.03	0.00
Fork Lift	1.1	450	225	20	1.73	0.17	0.20	0.02
Concrete Mixer Truck	0	0	0	20	1.73	0.17	0.00	0.00
Dump Truck	1	60	30	21	1.77	0.18	0.03	0.00
Excavator	2	75	38	22	1.81	0.18	0.03	0.00
Front End Loader	1	60	30	23	1.85	0.18	0.03	0.00
Pickup Truck	2.6	420	210	24	1.88	0.19	0.20	0.02
Piping Truck	0	0	0	25	1.92	0.19	0.00	0.00
Skid steer loader	0	0	0	26	1.95	0.20	0.00	0.00
Water truck	1	120	60	20	1.73	0.17	0.05	0.01
Welding Machine	0	0	0	20	1.73	0.17	0.00	0.00
SANDHILL BESS TOTAL	--	--	--	--	--	--	0.56	0.06

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Fugitive Dust Emissions from Unpaved Roads

Equipment	Quantity ^a	Total Days Used	VMT ^b	W	Emission Factor		Emissions	
					(lb/VMT) ^c		(ton)	
					PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Substation, Gen-Tie Line, Access Road								
ATV	0	0	0	20	1.73	0.17	0.00	0.00
Backhoe	0	0	0	50	2.62	0.26	0.00	0.00
Bulldozer	2	70	35	20	1.73	0.17	0.03	0.00
Fork Lift	2	150	75	20	1.73	0.17	0.07	0.01
Concrete Mixer Truck	0	0	0	20	1.73	0.17	0.00	0.00
Dump Truck	1	15	8	21	1.77	0.18	0.01	0.00
Excavator	0	0	0	22	1.81	0.18	0.00	0.00
Front End Loader	2	70	35	23	1.85	0.18	0.03	0.00
Pickup Truck	2	180	90	24	1.88	0.19	0.08	0.01
Piping Truck	0	0	0	25	1.92	0.19	0.00	0.00
Skid steer loader	0	0	0	26	1.95	0.20	0.00	0.00
Water truck	0	0	0	20	1.73	0.17	0.00	0.00
Welding Machine	0	0	0	20	1.73	0.17	0.00	0.00
SUBSTATION, GEN-TIE LINE, ACCESS ROAD TOTAL	--	--	--	--	--	--	0.22	0.02
^a Equipment counts are estimated based current construction plan.								
^b Each vehicle is assumed to travel 0.5 mile per day on site.								
^c AP-42 Section 13.2.2 Unpaved Roads, dated November 2006, Equations 1a and 2 TOTALS 11.19 1.12 Surface Silt content based on Table 13.2.2-1 - construction sites.								

Eq 1a: $E = k * (s/12)^a * (W/3)^b$

Eq 2: $E_{ext} = E * [(365-P)/365]$

where:

VMT = Vehicle Miles Traveled

W = Mean Vehicle Weight, tons

S = Mean Vehicle Speed, mph

P = 120 days with at least 0.01 inches rain, EPA's AP-42 Figure 13.2.2-1

s = 8.5 surface material silt content (%) for construction sites, EPA's AP-42 Table 13.2.2-1

E = size-specific emission factor, lb/ VMT

E_{ext} = annual size-specific emission factor extrapolated for natural migration, lb/VMT

Constants	PM	PM ₁₀	PM _{2.5}
k (lb/VMT)	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Fugitive Dust Emissions from Earthmoving Activities

Summary of Fugitive Dust Emissions From Earthmoving Activities							
	Daily Material Handling		Average Exposed Area	Emission Factors ^{b - f}		Emissions	
	Construction Rate ^a	Handling Time		(lb/ton)		(ton)	
Construction Activity				(ton/day)	(days)	(acres)	PM ₁₀
CRANE PROJECT							
Topsoil removed by scraper ^g	174.3	420	---	0.058	0.0061	2.12	0.22
Cable trench and project excavation and loading to storage piles	1.8	420	---	0.037	0.0039	0.01	0.00
Backfilling pipe trench and well	1.8	420	---	0.012	0.0013	0.00	0.00
Topsoil replacement	174.3	420	---	0.012	0.0013	0.44	0.05
Wind erosion of exposed areas	--	420	36.30	0.38	0.03999	2.90	0.30
CRANE PROJECT TOTAL						5.48	0.58
SANDHILL PROJECT							
Topsoil removed by scraper ^g	191.1	420	---	0.058	0.0061	2.33	0.24
Cable trench and project excavation and loading to storage piles	1.8	420	---	0.037	0.0039	0.01	0.00
Backfilling pipe trench and well	1.8	420	---	0.012	0.0013	0.00	0.00
Topsoil replacement	191.1	420	---	0.012	0.0013	0.48	0.05
Wind erosion of exposed areas	--	420	39.80	0.38	0.03999	3.18	0.33
SANDHILL TOTAL						6.00	0.63
Notes and Assumptions:							
^a Soil density: 1.25 tons per yard							
^b Trench excavation and loading to storage piles emission factor: AP-42 Section 11.9 Western Surface Coal Mining, Table 11.9-4, July 1998, truck loading by batch dump							
^c Backfilling trench and topsoil replacement emission factor: AP-42 Section 11.9 Western Surface Coal Mining, Table 11.9-4, July 1998, overburden replacement							
^d As worst case, PM ₁₀ is set equal to Total Particulate Matter. PM _{2.5} is set to 0.105 times PM ₁₀ per Table 11.9-1							
^e Emission factor: AP-42 Section 11.9 Western Surface Coal Mining, Table 11.9-4, July 1998, topsoil removal by scraper							
^f Wind Erosion Exposed Areas emission factor: AP-42 Section 11.9 Western Surface Coal Mining, Table 11.9-4, July 1998, wind erosion of exposed areas (ton/yr/acre)							
^g Assumes the entire workspace is cleared to 1 foot deep, 1.25 tons per cubic yard.							

Construction Schedule			
Work Hours:	10	7 am - 7 pm	
Work Days	6	Monday through Saturday	
Hours per week	60		
Crews:	1		
Total Days:	420		

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Fugitive Dust Emissions from Earthmoving Activities

Topsoil Removed by Scraper ^a				
County/Facility	Total (Acres)	Soil Volume (yd ³)	Soil Weight (ton)	Daily Material Handling Rate (ton/day)
Crane Land Control Area	36.3	58,564	73,205	174
Sandhill Land Control Area	39.8	64,211	80,263	191
TOTAL	76.1	122,775	153,468	365

^a Acreages from Resource Report 1, Table 1.4-1. Each project includes acres for the shared facilities, so earthmoving emissions are overly conservative.

Cable Trench and Project Excavation and Loading to Storage Piles						
Project Segment	Length ^b (ft)	Depth (ft)	Total Volume ^a (ft ³)	Total Volume (yd ³)	Soil Weight (ton)	Daily Material Handling Rate (ton/day)
Crane Trench	2,000	4	16,000	593	741	1.8
Sandhill Trench	2,000	4	16,000	593	741	1.8
TOTAL			32,000	1,185	1,481	3.5

^aassumes trench is 2 feet wide

^bconservatively assumes cabling is 2,000 feet long below ground.

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Summary of Greenhouse Gas Emissions From Construction Engines (tons)

Description	CO ₂	CH ₄	N ₂ O	CO ₂ e ^a
Crane BESS				
Off-Road Engine Emissions	479.96	0.02	0.00	481.53
Commuters and Delivery Vehicles	1,144.43	0.00	0.00	1144.43
CRANE BESS TOTAL	1624.38	0.02	0.00	1625.96
Sandhill BESS				
Off-Road Engine Emissions	479.96	0.02	0.00	481.53
Commuters and Delivery Vehicles	1,144.43	0.00	0.00	1144.43
SANDHILL BESS TOTAL	1624.38	0.02	0.00	1625.96
Subsation, Gen-Tie Line & Access Road				
Off-Road Engine Emissions	162.16	0.01	0.00	162.70
Commuters and Delivery Vehicles	--	--	--	--
Subsation, Gen-Tie Line & Access Road TOTAL	162.16	0.01	0.00	162.70
^a CO ₂ e = carbon dioxide equivalent. Includes global warming potentials.				

Global Warming Potentials		
CO ₂	CH ₄	N ₂ O
1	28	265

Source: EPA's 2024 GHG emission factor hub

Crane and Sandhill Battery Energy Storage Systems
Construction Emission Calculations
Greenhouse Gas Emissions from On Road Construction Traffic

On-Road Vehicles					
	Vehicles	Miles	Number	Fuel Used	CO ₂ Emissions ^a
	per day	per vehicle	of Days	(gallons)	(tons)
Crane BESS					
Commuter Vehicles - Gasoline ^{b,c}	70	60	450	78,750	771
Delivery Trucks - Diesel ^d	8	60	450	33,231	373
Sandhill BESS					
Commuter Vehicles - Gasoline ^{b,c}	70	60	450	78,750	771
Delivery Trucks - Diesel ^d	8	60	450	33,231	373
^a Assumes 1 gallon of gasoline = 8,887 grams CO ₂ and 1 gallon of diesel = 10,180 g CO ₂ , per US EPA's "Greenhouse Gas Emissions from a Typical Passenger Vehicle," available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100U8YT.pdf					
^b Assumes commuters travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 24 miles per gallon, per US EPA and US Department of Energy Fuel Economy data for combined city and highway driving in 2023, available online at: https://www.fueleconomy.gov/feg/download.shtml .					
^c Assumes commuters will travel for 450 days.					
^d Assumes delivery trucks travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 6.5 miles per gallon, industry average.					
^e Assumes concrete mixer trucks travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 3.4 miles per gallon, industry average. http://ascpro0.ascweb.org/archives/cd/2012/paper/CPRT221002012.pdf#:~:text=The%20National%20Ready%20Mix%20Concrete%20Association%20%28NRMCA%29%20in,average%203.4%20miles%20per%20gallon%20of%20diesel%20fuel.					