

Appendix G

Air Quality and Greenhouse Gas Emissions Calculations

Sum of Total Operating Hours (units x hr/dy x 5 dy/wk x wks)	Average Hours Per Day Average operating equipment per day				Project Portion		Average One-way Trips Per Day (15 mile length) Average Workers per day (assuming 1 round trip per day)			
	(300 days)	(220 days)	(300 days)	(220 days)	Project Portion	Total One-way Trips	(300 days)	(220 days)	(300 days)	(220 days)
5128	17.09	23.31	2.36	3.22	Sunnyvale East	24232	80.77	110.15	40.39	55.07
536	1.79	2.44			Sunnyvale West	11186	37.29	50.85	18.64	25.42
72	0.24	0.33	0.03	0.04	Total	35418.00	118.06	160.99	59.03	80.50
48	0.16	0.22	6.34	8.65						
792	2.64	3.60								
44232	147.44	201.05								
880	2.93	4.00	0.37	0.50						
3144	10.48	14.29								
144	0.48	0.65	3.32	4.53						
120	0.40	0.55								
48	0.16	0.22								
1912	6.37	8.69								
12680	42.27	57.64								
11208	37.36	50.95								
432	1.44	1.96								
2308	7.69	10.49	3.25	4.43						
1400	4.67	6.36								
4080	13.60	18.55								
1400	4.67	6.36								
4808	16.03	21.85								
800	2.67	3.64								
11988	39.96	54.49								
1816	6.05	8.25	0.76	1.03						
1400	4.67	6.36								
3188	10.63	14.49								
384	1.28	1.75	0.78	1.06						
1360	4.53	6.18								
80	0.27	0.36								
7176	23.92	32.62								
648	2.16	2.95								
10356	34.52	47.07								
8	0.03	0.04								
680	2.27	3.09								
48	0.16	0.22								

Project Portion	Total Hauling VMT	Average VMT/day		Average Roundtrips per day (assuming 10 mile roundtrip length)	
		(300 days)	(220 days)	(300 days)	(220 days)
Sunnyvale East	123704	412.35	562.29	41.23	56.23
Sunnyvale West	60720	202.40	276.00	20.24	27.60
Total	184424	614.75	838.29	61.47	83.83

Water Trucks	Average Total Hours per Day		Average vehicles operating per day (assuming 8 hours/day/vehicle)	
	(300 days)	(220 days)	(300 days)	(220 days)
	36.81	50.20	4.60	6.28

Road Construction Emissions Model

Version 7.1.3

Data Entry Worksheet

Note: Required data input sections have a yellow background.

Optional data input sections have a blue background. Only areas with a

yellow or blue background can be modified. Program defaults have a white background.

The user is required to enter information in cells C10 through C25.



Input Type

Project Name	Sunnyvale Channels (220 Days)	
Construction Start Year	2014	Enter a Year between 2009 and 2025 (inclusive)
Project Type	3	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	10.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	8.1	miles
Total Project Area	59.9	acres
Maximum Area Disturbed/Day	2.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	434.5	yd ³ /day
Soil Exported	339.9	yd ³ /day
Average Truck Capacity	11.2	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of	Program
	Construction Months	Calculated Months
Grubbing/Land Clearing	0.00	1.00
Grading/Excavation	10.00	4.00
Drainage/Utilities/Sub-Grade	0.00	3.50
Paving	0.00	1.50
Totals	10.00	10.00

2005	%	2006	%	2007	%
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions		User Override of					
User Input	Soil Hauling Defaults	Default Values					
Miles/round trip	10.00	30					
Round trips/day	83.83	69					
Vehicle miles traveled/day (calculated)			838.3				
Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate (grams/mile)	0.28	10.43	1.26	0.25	0.18	1713.35	
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day	0.5	19.3	2.3	0.5	0.3	3163.7	
Tons per construction period	0.06	2.12	0.26	0.05	0.04	348.00	

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions		User Override of Worker					
	Commute Default Values	Default Values					
Miles/ one-way trip	20.00	20					
One-way trips/day	2.00	2					
No. of employees: Grubbing/Land Clearing	66.00	25					
No. of employees: Grading/Excavation	66.00	48					
No. of employees: Drainage/Utilities/Sub-Grade	0.00	38					
No. of employees: Paving	0.00	28					
	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate - Grubbing/Land Clearing (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grading/Excavation (grams/mile)	0.182	0.249	2.208	0.047	0.020	443.370	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grubbing/Land Clearing (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grading/Excavation (grams/trip)	0.616	0.407	5.187	0.004	0.003	95.481	
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Grubbing/Land Clearing	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Grading/Excavation	1.417	1.684	15.854	0.277	0.118	2633.709	
Tons per const. Period - Grading/Excavation	0.156	0.185	1.744	0.030	0.013	289.708	
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000	
tons per construction period	0.156	0.185	1.744	0.030	0.013	289.708	

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values			
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day			
Grubbing/Land Clearing - Exhaust	0.00	1	0.00	40			
Grading/Excavation - Exhaust	6.28	1	2.00	40			
Drainage/Utilities/Subgrade	0.00	1	0.00	40			
	ROG		NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Grading/Excavation (grams/mile)	0.28	10.43	1.26	0.25	0.18	1713.35	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00	
Pound per day - Grading/Excavation	0.01	0.29	0.03	0.01	0.00	47.40	
Tons per const. Period - Grading/Excavation	0.00	0.03	0.00	0.00	0.00	5.21	
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		2	20.0	0.9	4.2	0.2
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	Program-estimate							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Grading/Excavation		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
3.22		Air Compressors	2.59	11.16	16.11	1.42	1.31	1635.58
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
0.50	1	Cranes	0.40	1.50	4.51	0.21	0.19	300.88
0.00	2	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
4.43	4	Excavators	1.98	12.35	22.58	1.11	1.02	2537.37
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
1.03	2	Graders	1.15	3.59	11.28	0.63	0.58	692.48
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.04		Pavers	0.02	0.11	0.21	0.01	0.01	19.26
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
4.53	3	Rollers	1.75	6.84	15.41	1.15	1.06	1266.42
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
1.06	17	Signal Boards	0.48	1.54	1.51	0.12	0.11	166.88
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
8.65	2	Tractors/Loaders/Backhoes	1.20	13.62	11.60	0.47	0.43	2907.48
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	9.6	50.7	83.2	5.1	4.7	9526.3
	Grading	tons per phase	1.1	5.6	9.2	0.6	0.5	1047.9

Drainage/Utilities/Subgrade	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Program-estimate						
Override of Default Number of Vehicles								
0.00	1	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2	
	Override of Default Number of Vehicles	Number of Vehicles <i>Program-estimate</i>	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
			Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
			Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
			Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
			Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
			Cranes	0.00	0.00	0.00	0.00	0.00	0.00
			Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
			Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Excavators	0.00	0.00	0.00	0.00	0.00	0.00
			Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
			Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
			Graders	0.00	0.00	0.00	0.00	0.00	0.00
			Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
			Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
			Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
			Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
			Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
			Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
			Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
			Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
			Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
			Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
			Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
			Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
			Welders	0.00	0.00	0.00	0.00	0.00	0.00
		Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
		Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>				1.1	5.6	9.2	0.6	0.5	1047.9

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment	Default Values Horsepower	Default Values Hours/day
Aerial Lifts	63	8
Air Compressors	106	8
Bore/Drill Rigs	206	8
Cement and Mortar Mixers	10	8
Concrete/Industrial Saws	64	8
Cranes	226	8
Crawler Tractors	208	8
Crushing/Proc. Equipment	142	8
Excavators	163	8
Forklifts	89	8
Generator Sets	66	8
Graders	175	8
Off-Highway Tractors	123	8
Off-Highway Trucks	400	8
Other Construction Equipment	172	8
Other General Industrial Equipment	88	8
Other Material Handling Equipment	167	8
Pavers	126	8
Paving Equipment	131	8
Plate Compactors	8	8
Pressure Washers	26	8
Pumps	53	8
Rollers	81	8
Rough Terrain Forklifts	100	8
Rubber Tired Dozers	255	8
Rubber Tired Loaders	200	8
Scrapers	362	8
Signal Boards	20	8
Skid Steer Loaders	65	8
Surfacing Equipment	254	8
Sweepers/Scrubbers	64	8
Tractors/Loaders/Backhoes	98	8
Trenchers	81	8
Welders	45	8

0

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sunnyvale Channels (220 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	11.5	68.9	104.4	25.9	5.9	20.0	9.3	5.2	4.2	15,371.1
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	11.5	68.9	104.4	25.9	5.9	20.0	9.3	5.2	4.2	15,371.1
Total (tons/construction project)	1.3	7.6	11.5	1.5	0.6	0.9	0.8	0.6	0.2	1,690.8

Notes: Project Start Year -> 2014
 Project Length (months) -> 10
 Total Project Area (acres) -> 60
 Maximum Area Disturbed/Day (acres) -> 2
 Total Soil Imported/Exported (yd³/day)-> 774

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sunnyvale Channels (220 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	5.2	31.3	47.5	11.8	2.7	9.1	4.2	2.3	1.9	6,986.9
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	5.2	31.3	47.5	11.8	2.7	9.1	4.2	2.3	1.9	6,986.9
Total (megagrams/construction project)	1.1	6.9	10.4	1.4	0.6	0.8	0.7	0.5	0.2	1,533.6

Notes: Project Start Year -> 2014
 Project Length (months) -> 10
 Total Project Area (hectares) -> 24
 Maximum Area Disturbed/Day (hectares) -> 1
 Total Soil Imported/Exported (meters³/day)-> 592

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model

Version 7.1.3

Data Entry Worksheet

Note: Required data input sections have a yellow background.

Optional data input sections have a blue background. Only areas with a

yellow or blue background can be modified. Program defaults have a white background.

The user is required to enter information in cells C10 through C25.



Input Type

Project Name	Sunnyvale Channels (300 Days)	
Construction Start Year	2014	Enter a Year between 2009 and 2025 (inclusive)
Project Type	3	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	14.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	8.1	miles
Total Project Area	59.9	acres
Maximum Area Disturbed/Day	2.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	318.7	yd ³ /day
Soil Exported	249.3	yd ³ /day
Average Truck Capacity	11.2	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of	Program
	Construction Months	Calculated Months
Grubbing/Land Clearing	0.00	1.40
Grading/Excavation	14.00	5.60
Drainage/Utilities/Sub-Grade	0.00	4.90
Paving	0.00	2.10
Totals	14.00	14.00

2005	%	2006	%	2007	%
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions		User Override of					
User Input	Soil Hauling Defaults	Default Values					
Miles/round trip	10.00	30					
Round trips/day	61.47	51					
Vehicle miles traveled/day (calculated)			614.7				
Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate (grams/mile)	0.28	10.28	1.24	0.25	0.17	1710.68	
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day	0.4	13.9	1.7	0.3	0.2	2316.2	
Tons per construction period	0.06	2.14	0.26	0.05	0.04	356.70	

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions		User Override of Worker					
	Commute Default Values	Default Values					
Miles/ one-way trip	20.00	20					
One-way trips/day	2.00	2					
No. of employees: Grubbing/Land Clearing	66.00	25					
No. of employees: Grading/Excavation	0.00	48					
No. of employees: Drainage/Utilities/Sub-Grade	0.00	38					
No. of employees: Paving	0.00	28					
	ROG	NOx	CO	PM10	PM2.5	CO2	
Emission rate - Grubbing/Land Clearing (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grading/Excavation (grams/mile)	0.179	0.245	2.172	0.047	0.020	443.391	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grubbing/Land Clearing (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Grading/Excavation (grams/trip)	0.608	0.401	5.113	0.004	0.003	95.487	
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Grubbing/Land Clearing	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Grading/Excavation	1.396	1.655	15.602	0.277	0.118	2633.836	
Tons per const. Period - Grading/Excavation	0.215	0.255	2.403	0.043	0.018	405.611	
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000	
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000	
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000	
tons per construction period	0.215	0.255	2.403	0.043	0.018	405.611	

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values			
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day			
Grubbing/Land Clearing - Exhaust	0.00	1	0.00	40			
Grading/Excavation - Exhaust	4.60	1	2.00	40			
Drainage/Utilities/Subgrade	0.00	1	0.00	40			
	ROG		NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Grading/Excavation (grams/mile)	0.28	10.28	1.24	0.25	0.17	1710.68	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00	
Pound per day - Grading/Excavation	0.01	0.21	0.03	0.01	0.00	34.67	
Tons per const. Period - Grading/Excavation	0.00	0.03	0.00	0.00	0.00	5.34	
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		2	20.0	1.2	4.2	0.3
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	Program-estimate							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Grading/Excavation		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
2.36		Air Compressors	1.87	8.17	11.68	1.03	0.94	1198.75
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
0.37	1	Cranes	0.29	1.11	3.33	0.15	0.14	222.65
0.00	2	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
3.24	4	Excavators	1.44	9.03	16.43	0.81	0.74	1855.79
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.76	2	Graders	0.85	2.65	8.31	0.47	0.43	510.92
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.03		Pavers	0.01	0.09	0.16	0.01	0.01	14.44
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
3.32	3	Rollers	1.28	5.01	11.26	0.84	0.77	928.14
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.78	17	Signal Boards	0.35	1.13	1.10	0.09	0.08	122.80
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
6.34	2	Tractors/Loaders/Backhoes	1.10	9.98	10.41	0.54	0.50	2131.27
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	7.2	37.2	62.7	3.9	3.6	6984.8
	Grading	tons per phase	1.1	5.7	9.7	0.6	0.6	1075.7

Drainage/Utilities/Subgrade	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Program-estimate						
Override of Default Number of Vehicles								
0.00	1	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2	
	Override of Default Number of Vehicles	Number of Vehicles <i>Program-estimate</i>	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
			Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
			Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
			Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
			Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
			Cranes	0.00	0.00	0.00	0.00	0.00	0.00
			Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
			Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Excavators	0.00	0.00	0.00	0.00	0.00	0.00
			Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
			Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
			Graders	0.00	0.00	0.00	0.00	0.00	0.00
			Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
			Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
			Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
			Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
			Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
			Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
			Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
			Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
			Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
			Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
			Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
			Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
			Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
			Welders	0.00	0.00	0.00	0.00	0.00	0.00
		Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
		Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>				1.1	5.7	9.7	0.6	0.6	1075.7

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment	Default Values Horsepower	Default Values Hours/day
Aerial Lifts	63	8
Air Compressors	106	8
Bore/Drill Rigs	206	8
Cement and Mortar Mixers	10	8
Concrete/Industrial Saws	64	8
Cranes	226	8
Crawler Tractors	208	8
Crushing/Proc. Equipment	142	8
Excavators	163	8
Forklifts	89	8
Generator Sets	66	8
Graders	175	8
Off-Highway Tractors	123	8
Off-Highway Trucks	400	8
Other Construction Equipment	172	8
Other General Industrial Equipment	88	8
Other Material Handling Equipment	167	8
Pavers	126	8
Paving Equipment	131	8
Plate Compactors	8	8
Pressure Washers	26	8
Pumps	53	8
Rollers	81	8
Rough Terrain Forklifts	100	8
Rubber Tired Dozers	255	8
Rubber Tired Loaders	200	8
Scrapers	362	8
Signal Boards	20	8
Skid Steer Loaders	65	8
Surfacing Equipment	254	8
Sweepers/Scrubbers	64	8
Tractors/Loaders/Backhoes	98	8
Trenchers	81	8
Welders	45	8

0

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sunnyvale Channels (300 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	9.0	54.5	78.5	24.5	4.5	20.0	8.1	4.0	4.2	11,969.5
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	9.0	54.5	78.5	24.5	4.5	20.0	8.1	4.0	4.2	11,969.5
Total (tons/construction project)	1.4	8.4	12.1	1.9	0.7	1.2	0.9	0.6	0.3	1,843.3

Notes: Project Start Year -> 2014
 Project Length (months) -> 14
 Total Project Area (acres) -> 60
 Maximum Area Disturbed/Day (acres) -> 2
 Total Soil Imported/Exported (yd³/day)-> 568

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sunnyvale Channels (300 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	4.1	24.8	35.7	11.2	2.1	9.1	3.7	1.8	1.9	5,440.7
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	4.1	24.8	35.7	11.2	2.1	9.1	3.7	1.8	1.9	5,440.7
Total (megagrams/construction project)	1.3	7.6	11.0	1.8	0.6	1.1	0.8	0.6	0.2	1,671.9

Notes: Project Start Year -> 2014
 Project Length (months) -> 14
 Total Project Area (hectares) -> 24
 Maximum Area Disturbed/Day (hectares) -> 1
 Total Soil Imported/Exported (meters³/day)-> 434

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model

Version 7.1.3

Data Entry Worksheet

Note: Required data input sections have a yellow background.

Optional data input sections have a blue background. Only areas with a

yellow or blue background can be modified. Program defaults have a white background.

The user is required to enter information in cells C10 through C25.



Input Type

Project Name	Sunnyvale Channels (500 Days)	
Construction Start Year	2014	Enter a Year between 2009 and 2025 (inclusive)
Project Type	3	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	24.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	8.1	miles
Total Project Area	59.9	acres
Maximum Area Disturbed/Day	2.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	183.8	yd ³ /day
Soil Exported	143.8	yd ³ /day
Average Truck Capacity	11.2	yd ³ (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of	Program
	Construction Months	Calculated Months
Grubbing/Land Clearing	0.00	2.40
Grading/Excavation	24.00	9.60
Drainage/Utilities/Sub-Grade	0.00	8.40
Paving	0.00	3.60
Totals	24.00	24.00

2005	%	2006	%	2007	%
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values			
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day			
Grubbing/Land Clearing - Exhaust	0.00	1	0.00	40			
Grading/Excavation - Exhaust	3.45	1	2.00	40			
Drainage/Utilities/Subgrade	0.00	1	0.00	40			
	ROG		NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Grading/Excavation (grams/mile)	0.27	9.92	1.17	0.24	0.16	1704.01	
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.15	0.02	0.00	0.00	25.90	
Tons per const. Period - Grading/Excavation	0.00	0.04	0.00	0.00	0.00	6.84	
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		2	20.0	2.1	4.2	0.4
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	Program-estimate							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Grading/Excavation		Default	ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	Number of Vehicles	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	<i>Program-estimate</i>							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
1.36		Air Compressors	1.04	4.69	6.55	0.57	0.53	690.81
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
0.21	1	Cranes	0.16	0.63	1.87	0.09	0.08	126.37
0.00	2	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
1.87	4	Excavators	0.83	5.21	9.35	0.46	0.42	1071.11
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.44	2	Graders	0.49	1.53	4.80	0.27	0.25	295.74
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.02		Pavers	0.01	0.06	0.10	0.01	0.00	9.63
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.92	3	Rollers	0.74	2.90	6.47	0.48	0.44	536.75
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.45	17	Signal Boards	0.19	0.64	0.63	0.05	0.05	70.85
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
3.66	2	Tractors/Loaders/Backhoes	0.95	5.76	8.76	0.59	0.55	1230.71
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	4.4	21.4	38.5	2.5	2.3	4032.0
	Grading	tons per phase	1.2	5.7	10.2	0.7	0.6	1064.4

Drainage/Utilities/Subgrade	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Program-estimate						
Override of Default Number of Vehicles								
0.00	1	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
	Number of Vehicles	Type						
Override of Default Number of Vehicles	Program-estimate							
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			1.2	5.7	10.2	0.7	0.6	1064.4

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment	Default Values Horsepower	Default Values Hours/day
Aerial Lifts	63	8
Air Compressors	106	8
Bore/Drill Rigs	206	8
Cement and Mortar Mixers	10	8
Concrete/Industrial Saws	64	8
Cranes	226	8
Crawler Tractors	208	8
Crushing/Proc. Equipment	142	8
Excavators	163	8
Forklifts	89	8
Generator Sets	66	8
Graders	175	8
Off-Highway Tractors	123	8
Off-Highway Trucks	400	8
Other Construction Equipment	172	8
Other General Industrial Equipment	88	8
Other Material Handling Equipment	167	8
Pavers	126	8
Paving Equipment	131	8
Plate Compactors	8	8
Pressure Washers	26	8
Pumps	53	8
Rollers	81	8
Rough Terrain Forklifts	100	8
Rubber Tired Dozers	255	8
Rubber Tired Loaders	200	8
Scrapers	362	8
Signal Boards	20	8
Skid Steer Loaders	65	8
Surfacing Equipment	254	8
Sweepers/Scrubbers	64	8
Tractors/Loaders/Backhoes	98	8
Trenchers	81	8
Welders	45	8

0

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sunnyvale Channels (500 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	4.6	22.4	46.4	22.7	2.7	20.0	6.6	2.4	4.2	5,389.2
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	4.6	22.4	46.4	22.7	2.7	20.0	6.6	2.4	4.2	5,389.2
Total (tons/construction project)	1.2	5.9	12.3	2.8	0.7	2.1	1.1	0.6	0.4	1,422.7

Notes: Project Start Year -> 2014
 Project Length (months) -> 24
 Total Project Area (acres) -> 60
 Maximum Area Disturbed/Day (acres) -> 2
 Total Soil Imported/Exported (yd³/day)-> 328

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sunnyvale Channels (500 Days)				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	2.1	10.2	21.1	10.3	1.2	9.1	3.0	1.1	1.9	2,449.6
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	2.1	10.2	21.1	10.3	1.2	9.1	3.0	1.1	1.9	2,449.6
Total (megagrams/construction project)	1.1	5.4	11.1	2.6	0.6	1.9	1.0	0.6	0.4	1,290.5

Notes: Project Start Year -> 2014
 Project Length (months) -> 24
 Total Project Area (hectares) -> 24
 Maximum Area Disturbed/Day (hectares) -> 1
 Total Soil Imported/Exported (meters³/day)-> 250

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Equipment Type	Sum of Total Operating Hours (units x hr/dy x 5 dy/wk x wks)	Average Hours Per Day				Average operating equipment per day				Project Portion
		(300 days)	(220 days)	(400 days)	(520 days)	(300 days)	(220 days)	(400 days)	(520 days)	
Air Hoses and Compressor	5128	17.09	23.31	12.82	9.86	2.36	3.22	1.77	1.36	Sunnyvale East
Air Hoses and Compressor	536	1.79	2.44	1.34	1.03					Sunnyvale West
Asphalt Concrete Paver	72	0.24	0.33	0.18	0.14	0.03	0.04	0.02	0.02	Total
Backhoe	48	0.16	0.22	0.12	0.09	6.34	8.65	4.76	3.66	
Concrete Truck	792	2.64	3.60	1.98	1.52					
Concrete Trucks	44232	147.44	201.05	110.58	85.06					
Crane	880	2.93	4.00	2.20	1.69	0.37	0.50	0.28	0.21	Project Portion
Dbl Bottom Dumps (20 CY)	3144	10.48	14.29	7.86	6.05					Sunnyvale East
Drum Rollers	144	0.48	0.65	0.36	0.28	3.32	4.53	2.49	1.92	Sunnyvale West
Dump Truck	120	0.40	0.55	0.30	0.23					Total
Dump Truck (12 CY)	48	0.16	0.22	0.12	0.09					
Dump Trucks	1912	6.37	8.69	4.78	3.68					
Dump Trucks (10 CY)	12680	42.27	57.64	31.70	24.38					
Dump Trucks (12 CY)	11208	37.36	50.95	28.02	21.55					
Dump Trucks (8 CY)	432	1.44	1.96	1.08	0.83					Water Trucks
Excavator	2308	7.69	10.49	5.77	4.44	3.25	4.43	2.43	1.87	
Excavator w/Vibratory Hammer	1400	4.67	6.36	3.50	2.69					
Excavators	4080	13.60	18.55	10.20	7.85					
Flatbed Boom Truck	1400	4.67	6.36	3.50	2.69					
Flatbed Boom Truck (Rebar/Forms)	4808	16.03	21.85	12.02	9.25					
Flatbed Truck	800	2.67	3.64	2.00	1.54					
Front End Loader	11988	39.96	54.49	29.97	23.05					
Grader	1816	6.05	8.25	4.54	3.49	0.76	1.03	0.57	0.44	
Semi Flatbed Truck	1400	4.67	6.36	3.50	2.69					
Tractor/Dozer	3188	10.63	14.49	7.97	6.13					
Traffic Control Message Boards	384	1.28	1.75	0.96	0.74	0.78	1.06	0.59	0.45	
Traffic Control Message Boards	1360	4.53	6.18	3.40	2.62					
Traffic Control Message Boards	80	0.27	0.36	0.20	0.15					
Vibratory roller	7176	23.92	32.62	17.94	13.80					
Vibratory Roller w/ Blade	648	2.16	2.95	1.62	1.25					
Water Truck	10356	34.52	47.07	25.89	19.92					
Water Truck	8	0.03	0.04	0.02	0.02					
Water Truck	680	2.27	3.09	1.70	1.31					
Traffic Control Message Board	48	0.16	0.22	0.12	0.09					

Average One-way Trips Per Day (15 mi length)

Average Workers per day (assuming 1 round trip per day)

Total One-way Trips	Average One-way Trips Per Day (15 mi length)				Average Workers per day (assuming 1 round trip per day)			
	(300 days)	(220 days)	(400 days)	(520 days)	(300 days)	(220 days)	(400 days)	(520 days)
24232	80.77	110.15	60.58	46.60	40.39	55.07	30.29	23.30
11186	37.29	50.85	27.97	21.51	18.64	25.42	13.98	10.76
35418.00	118.06	160.99	88.55	68.11	59.03	80.50	44.27	34.06

Average VMT/day

Average Roundtrips per day (assuming 10 mile roundtrip length)

Total Hauling VMT	Average VMT/day				Average Roundtrips per day (assuming 10 mile roundtrip length)			
	(300 days)	(220 days)	(400 days)	(520 days)	(300 days)	(220 days)	(400 days)	(520 days)
123704	412.35	562.29	309.26	237.89	41.23	56.23	30.93	23.79
60720	202.40	276.00	151.80	116.77	20.24	27.60	15.18	11.68
184424	614.75	838.29	461.06	354.66	61.47	83.83	46.11	35.47

Average Total Hours per Day

Average vehicles operating per day (assuming 8 hours/day/vehicle)

Average Total Hours per Day				Average vehicles operating per day (assuming 8 hours/day/vehicle)			
(300 days)	(220 days)	(400 days)	(520 days)	(300 days)	(220 days)	(400 days)	(520 days)
36.81	50.20	27.61	21.24	4.60	6.28	3.45	2.65