

Appendix A Summary of Forecast Travel Activities

The following information was obtained from the Traffic Operations Analysis report prepared by TJKM.

Traffic Operations Analysis Report

**I-80 Gilman Street
Interchange Improvement Project Approval &
Environmental Document**

Alameda County, California

June 22, 2017



3.3. Intersection Turning Movement Volumes

To support the modeling and analysis of the study intersections, TJKM collected existing roadway geometric data and traffic volumes along the study intersections on January 27, 2016, covering both AM peak periods (6:00-10:00 AM) and PM peak periods (3:00-7:00 PM). Intersection turning movement counts along Gilman Street were balanced among all study intersections and with I-80 ramps at the Gilman Street interchange. Intersection turning movement volumes after balancing are shown in **Figure 3**.

3.4. Truck Volume and Percentage

In the project area, there are three locations included in the “2014 Annual Average Daily Truck Traffic on the California State Highway System”, as listed in **Table 2**. On average, the truck percentage on I-80 in this project area is about 4.8 percent and average truck percentage on Gilman Street is about 6.2 percent.

Table 2: Truck Percentages and Volumes on I-80 and Gilman Street

Route	County	Post Mile	Leg	Description	Vehicle AADT	Truck AADT	% Truck
I-80	Alameda	3.786	A	Emeryville, Powell Rd	277,000	13,267	4.79
I-80	Alameda	4.582	B	Berkeley, Jct. Rte. 13 East	277,000	13,325	4.81
I-80	Alameda	4.582	A	Berkeley, Jct. Rte. 13 East	269,000	12,831	4.77
I-80	Alameda	6.62	B	Berkeley, Gilman Street St	267,000	N/A	N/A
I-80	Alameda	6.62	A	Berkeley, Gilman Street St	274,000	N/A	N/A
Gilman Street	Alameda	-	-	Gilman Street, East of I-80	17,121	N/A	8
Gilman Street	Alameda	-	-	Gilman Street, West of 6 th Street	17,121	N/A	5

Source: 2014 Caltrans Annual Average Daily Truck Traffic

3.5. Intersection Level-of-Service

In order to determine study intersection performance, Synchro models were developed based on the geometry obtained from the aerial photos and field observation. Signal timing cards received from the City of Berkeley were used to code the signal timing for signalized intersection within study area. The AM and PM peak hour LOS for each study intersections was determined using Synchro and the procedures from the 2000 Highway Capacity Manual (HCM) Operational Methodology. As a part of this methodology, the average delay per vehicle is used to determine the intersection LOS. The AM peak hour is from 8:00-9:00 AM while the PM peak hour is from 5:00-6:00 PM. The results of this analysis are presented in **Table 3**. Synchro outputs files and approach LOS are attached in **Appendix B**.

Table 3: Intersection Existing Level-of-Services

ID	Intersection	Control Type	AM Peak		PM Peak	
			Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b
1	Gilman St. at Frontage Rd.	TWSC ^c	>50.0	F	>50.0	F
2	Gilman St. at WB I-80 Ramps	TWSC ^c	>50.0	F	>50.0	F
3	Gilman St. at EB I-80 Ramps	TWSC ^c	18.9	C	>50.0	F
4	Gilman St. at Eastshore Hwy.	TWSC ^c	>50.0	F	>50.0	F
5	Gilman St. at Second St.	TWSC ^c	26.8	D	41.1	E
6	Gilman St. at 4 th St.	TWSC ^c	74.2	F	>50.0	F
7	Gilman St. at 6 th St.	Signal	15.3	B	23.7	C
8	Gilman St. at 8 th St.	Signal	8.3	A	7.6	A
9	Gilman St. at 9 th St.	Signal	8.8	A	9.8	A
10	Gilman St. at 10 th St.	TWSC ^c	27.7	D	49.8	E
11	Gilman St. at San Pablo Ave.	Signal	31.6	C	35.6	D
12	Eastshore Hwy. at Harrison St.	AWSC ^d	12.3	B	8.2	A
13	Second St. at Harrison St.	AWSC ^d	6.9	A	6.8	A

Source: TJKM, 2016

Notes:

- a. Delay in seconds per vehicle. For Signalized and all-way-stop controlled intersections, overall (intersection) delay reported. For two-way stop-control intersections, the worst approach is reported.
- b. LOS-Level of Service.
- c. TWSC-Two-way-stop-control. Delay and LOS of the worst approach are reported.
- d. AWSC-All-way-stop-control.

All the signalized and all-way-stop intersections operate at LOS D or better, while most of the two-way-stop-control intersections operate at LOS E or F during at least one peak hour, due to the high traffic volumes on Gilman Street and delay on the worst approach was reported. Under existing conditions, the queue on westbound I 80 off-ramp spills back to the mainline during the AM peak hour.

The intersection 95 percent queue length was extracted from Simtraffic as shown in **Table 4**.

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Table 5: Intersection Level-of-Services in 2020

ID	Intersections	Control Type		2020 AM Peak Hour				2020 PM Peak Hour			
				No Build		Build		No Build		Build	
		No Build	Build	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b
1	Gilman St. at Frontage Rd.	TWSC ^c	Roundabout	>50.0	F	27.9	C	>50.0	F	43.2	D
2	Gilman St. at WB I-80 Ramps	TWSC ^c	Roundabout	>50.0	F			>50.0	F		
3	Gilman St. at EB I-80 Ramps	TWSC ^c	Roundabout	27.3	D	10.9	B	>50.0	F	17.1	B
4	Gilman St. at Eastshore Hwy.	TWSC ^c	Roundabout	>50.0	F			>50.0	F		
5	Gilman St. at Second St.	TWSC ^c	TWSC ^c	32.2	D	32.2	D	>50.0	F	>50.0	F
6	Gilman St. at Fourth St.	Signal	Signal	7.8	A	7.8	A	9.7	A	9.7	A
7	Gilman St. at Sixth St.	Signal	Signal	15.6	B	15.6	B	25.5	C	25.5	C
8	Gilman St. at Eighth St.	Signal	Signal	9.1	A	9.1	A	8.2	A	8.2	A
9	Gilman St. at Ninth St.	Signal	Signal	9.0	A	9.0	A	10.5	B	10.5	B
10	Gilman St. at 10 th St.	TWSC ^c	TWSC ^c	27.7	D	27.7	D	>50.0	F	>50.0	F
11	Gilman St. at San Pablo Ave.	Signal	Signal	41.2	D	41.2	D	42.6	D	42.6	D
12	Eastshore Hwy. at Harrison St.	AWSC ^d	AWSC ^d	12.2	B	12.2	B	8.4	A	8.4	A
13	Second St. at Harrison St.	AWSC ^d	AWSC ^d	6.9	A	6.9	A	7.0	A	7.0	A

Source: TJKM, 2016

Notes:

- a. Delay in seconds per vehicle. For Signalized and all-way stop controlled intersections, over-all (intersection) delay reported. For two-way-stop-control intersections, the worst approach are reported.
- b. LOS - Level of Service.
- c. TWSC - Two-way-stop-control. Delay and LOS of the worst approach are reported.
- d. AWSC - All-way-stop-control.

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Table 6: Intersection Level-of-Services in 2040

ID	Intersections	Control Type		2040 AM Peak Hour				2040 PM Peak Hour			
				No Build		Build		No Build		Build	
		No Build	Build	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b	Delay ^a (sec/veh)	LOS ^b
1	Gilman St. at Frontage Rd.	TWSC ^c	Roundabout	>50.0	F	123.2	F	>50.0	F	59.9	E
2	Gilman St. at WB I-80 Ramps	TWSC ^c	Roundabout	>50.0	F			>50.0	F		
3	Gilman St. at EB I-80 Ramps	TWSC ^c	Roundabout	24.7	C	9.6	A	27.6	C	17.3	B
4	Gilman St. at Eastshore Hwy.	TWSC ^c	Roundabout	>50.0	F			>50.0	F		
5	Gilman St. at Second St.	TWSC ^c	TWSC ^c	38.0	E	38.0	E	>50.0	F	>50.0	F
6	Gilman St. at Fourth St.	Signal	Signal	7.9	A	7.9	A	8.3	A	8.3	A
7	Gilman St. at Sixth St.	Signal	Signal	14.5	B	14.5	B	32.5	C	32.5	C
8	Gilman St. at Eighth St.	Signal	Signal	28.1	C	28.1	C	14.3	B	14.3	B
9	Gilman St. at Ninth St.	Signal	Signal	9.9	A	9.9	A	13.0	B	13.0	B
10	Gilman St. at 10 th St.	TWSC ^c	TWSC ^c	>50.0	F	>50.0	F	>50.0	F	>50.0	F
11	Gilman St. at San Pablo Ave.	Signal	Signal	>50.0	F	>50.0	F	>50.0	F	>50.0	F
12	Eastshore Hwy. at Harrison St.	AWSC ^d	AWSC ^d	12.3	B	12.3	B	9.7	A	9.7	A
13	Second St. at Harrison St.	AWSC ^d	AWSC ^d	7.0	A	7.0	A	6.9	A	6.9	A

Source: TJKM, 2016

Notes:

^a Delay in seconds per vehicle. For Signalized and all-way stop controlled intersections, over-all (intersection) delay reported. For two-way-stop-control intersections, the worst approach are reported.

^b LOS - Level of Service.

^c TWSC - Two-way-stop-control. Delay and LOS of the worst approach are reported.

^d AWSC - All-way-stop-control.

Appendix B Construction Emissions Calculation

Construction emissions were estimated for the project alternatives using detailed equipment inventories and project construction scheduling information provided by the project engineering team combined with emissions factors from the EMFAC2014 and OFFROAD models. Construction emissions were estimated using the latest Sacramento Metropolitan Air Quality Management District's Road Construction Model (<http://www.airquality.org/ceqa/>, Version 8.1.0). The following table shows the assumed construction schedule and off-road equipment used in each phase of the Roundabout Alternative.

Duration and Equipment for Construction Activities

Construction Activity	Duration (months)	Equipment Used
Grubbing/Land Clearing	2.4	Crawler Tractor, Excavators, Signal Boards
Grading/Excavation	9.6	Auger Drill, Crane, Crawler Tractors, Excavators, Graders, Roller, Rubber Tired Loader, Signal Boards, Tractors/Loaders/Backhoes
Drainage/Utilities	8.4	Air Compressor, Generator Set, Grader, Plate Compactor, Pump, Rough Terrain Forklift, Scrapers, Signal Boards, Tractors/Loaders/Backhoes
Paving	3.6	Paver, Paving Equipment, Roller, Signal Boards, Tractors/Loaders/Backhoes

Additional model inputs were developed by the project engineering team and include the following:

- Year 2020 start date
- 24-month construction period
- 0.55-mile length
- 6-acre project area
- 1.5 acres maximum area disturbed per day
- Up to 360 cubic yards of import and/or export per day during grubbing/clearing, grading/excavation, and drainage/utilities/sub-grade
- Up to 280 cubic yards imported per day for drainage/utilities/sub-grade and 200 cubic yards per day for paving.
- Water trucks used as control measure for fugitive dust

**Road Construction Emissions Model
Data Entry Worksheet**

Version 8.1.0

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 D10 through D24, E28 through G35, and D38 through D41 for all project types.
 Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name
I-80/Gilman Interchange

Construction Start Year
2020

Project Type
3

Project Construction Time
Working Days per Month
24.00
22.00

Predominant Soil/Site Type: Enter 1, 2, or 3
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length
0.55 miles

Total Project Area
6.00 acres

Maximum Area Disturbed/Day
1.50 acres

Water Trucks Used?
1

Enter a Year between 2014 and 2025 (inclusive)

1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
 2) Road Widening : Project to add a new lane to an existing roadway
 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane
 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction

months
days (assume 22 if unknown)

1) Sand Gravel : Use for quaternary deposits (Delta/West County)
 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta)
 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)

1. Yes
2. No

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.

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd/day)	Export Volume (yd/day)
Soil	Grubbing/Land Clearing	20.00	0.00	100.00
	Grading/Excavation	20.00	0.00	220.00
	Drainage/Utilities/Sub-Grade	20.00	280.00	360.00
	Paving	20.00	0.00	0.00
Asphalt	Grubbing/Land Clearing	20.00	0.00	0.00
	Grading/Excavation	20.00	0.00	0.00
	Drainage/Utilities/Sub-Grade	20.00	0.00	0.00
	Paving	20.00	200.00	160.00

Mitigation Options

On-road Fleet Emissions Mitigation

Off-road Equipment Emissions Mitigation

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer

Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (<http://www.airquality.org/ceqa/mitigation.shtml>).

Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

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 D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing		2.40		1/1/2020
Grading/Excavation		9.60		3/14/2020
Drainage/Utilities/Sub-Grade		8.40		12/31/2020
Paving		3.60		9/13/2021
Totals (Months)		24		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		30.00			5	150.00					
Miles/round trip: Grading/Excavation		30.00			11	330.00					
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00			32	960.00					
Miles/round trip: Paving		30.00			0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79	
Grading/Excavation (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79	
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Paving (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Hauling Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.02	0.12	0.48	0.03	0.01	0.00	519.62	0.00	0.02	524.74	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.01	0.00	0.00	0.00	13.72	0.00	0.00	13.85	
Pounds per day - Grading/Excavation	0.05	0.27	1.06	0.07	0.03	0.01	1,143.17	0.00	0.04	1,154.43	
Tons per const. Period - Grading/Excavation	0.01	0.03	0.11	0.01	0.00	0.00	120.72	0.00	0.00	121.91	
Pounds per day - Drainage/Utilities/Sub-Grade	0.14	0.78	3.02	0.22	0.09	0.03	3,300.73	0.01	0.11	3,333.25	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.01	0.07	0.28	0.02	0.01	0.00	304.99	0.00	0.01	307.99	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.02	0.10	0.40	0.03	0.01	0.00	439.42	0.00	0.01	443.75	

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		30.00			0	0.00					
Miles/round trip: Grading/Excavation		30.00			0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00			0	0.00					
Miles/round trip: Paving		30.00			18	540.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79	
Grading/Excavation (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79	
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Paving (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.08	0.44	1.70	0.12	0.05	0.02	1,856.66	0.00	0.06	1,874.95	
Tons per const. Period - Paving	0.00	0.02	0.07	0.00	0.00	0.00	73.52	0.00	0.00	74.25	
Total tons per construction project	0.00	0.02	0.07	0.00	0.00	0.00	73.52	0.00	0.00	74.25	

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> I-80/Gilman Interchange														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.63	22.35	24.06	16.28	1.28	15.00	4.32	1.20	3.12	0.05	4,603.87	0.72	0.06	4,638.28
Grading/Excavation	3.52	27.00	37.93	16.84	1.84	15.00	4.70	1.58	3.12	0.07	7,177.40	1.62	0.10	7,247.73
Drainage/Utilities/Sub-Grade	2.28	21.81	21.65	16.30	1.30	15.00	4.20	1.08	3.12	0.07	6,947.50	0.52	0.14	7,003.49
Paving	1.14	13.16	12.13	0.73	0.73	0.00	0.58	0.58	0.00	0.04	3,980.98	0.56	0.08	4,020.17
Maximum (pounds/day)	3.52	27.00	37.93	16.84	1.84	15.00	4.70	1.58	3.12	0.07	7,177.40	1.62	0.14	7,247.73
Total (tons/construction project)	0.70	5.98	7.12	3.74	0.38	3.37	1.02	0.32	0.70	0.02	1,679.07	0.26	0.03	1,694.13

Notes: Project Start Year -> 2020
 Project Length (months) -> 24
 Total Project Area (acres) -> 6
 Maximum Area Disturbed/Day (acres) -> 2
 Water Truck Used? -> Yes

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	100	0	150	0	280	40
Grading/Excavation	220	0	330	0	1,160	40
Drainage/Utilities/Sub-Grade	640	0	960	0	760	40
Paving	0	360	0	540	360	40

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 G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> I-80/Gilman Interchange														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.07	0.59	0.64	0.43	0.03	0.40	0.11	0.03	0.08	0.00	121.54	0.02	0.00	111.09
Grading/Excavation	0.37	2.85	4.01	1.78	0.19	1.58	0.50	0.17	0.33	0.01	757.93	0.17	0.01	694.33
Drainage/Utilities/Sub-Grade	0.21	2.01	2.00	1.51	0.12	1.39	0.39	0.10	0.29	0.01	641.95	0.05	0.01	587.07
Paving	0.05	0.52	0.48	0.03	0.03	0.00	0.02	0.02	0.00	0.00	157.65	0.02	0.00	144.42
Maximum (tons/phase)	0.37	2.85	4.01	1.78	0.19	1.58	0.50	0.17	0.33	0.01	757.93	0.17	0.01	694.33
Total (tons/construction project)	0.70	5.98	7.12	3.74	0.38	3.37	1.02	0.32	0.70	0.02	1,679.07	0.26	0.03	1,536.91

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 G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker		Default Values		Calculated		Calculated												
User Input		Commute Default Values				Daily Trips		Daily VMT												
Miles/one-way trip			20																	
One-way trips/day			7																	
No. of employees: Grubbing/Land Clearing						14		280.00												
No. of employees: Grading/Excavation						58		1,160.00												
No. of employees: Drainage/Utilities/Sub-Grade						38		760.00												
No. of employees: Paving						18		360.00												
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e									
Grubbing/Land Clearing (grams/mile)		0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08									
Grading/Excavation (grams/mile)		0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08									
Draining/Utilities/Sub-Grade (grams/mile)		0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48									
Paving (grams/mile)		0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48									
Grubbing/Land Clearing (grams/trip)		1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84									
Grading/Excavation (grams/trip)		1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84									
Draining/Utilities/Sub-Grade (grams/trip)		0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35									
Paving (grams/trip)		0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35									
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e									
Pounds per day - Grubbing/Land Clearing		0.04	0.74	0.08	0.03	0.01	0.00	231.90	0.01	0.00	232.98									
Tons per const. Period - Grubbing/Land Clearing		0.00	0.02	0.00	0.00	0.00	0.00	6.12	0.00	0.00	6.15									
Pounds per day - Grading/Excavation		0.18	3.08	0.32	0.12	0.05	0.01	960.71	0.02	0.01	965.20									
Tons per const. Period - Grading/Excavation		0.02	0.33	0.03	0.01	0.01	0.00	101.45	0.00	0.00	101.93									
Pounds per day - Drainage/Utilities/Sub-Grade		0.11	1.85	0.19	0.08	0.03	0.01	610.10	0.01	0.01	612.73									
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.01	0.17	0.02	0.01	0.00	0.00	56.37	0.00	0.00	56.62									
Pounds per day - Paving		0.05	0.88	0.09	0.04	0.02	0.00	288.99	0.01	0.00	290.24									
Tons per const. Period - Paving		0.00	0.03	0.00	0.00	0.00	0.00	11.44	0.00	0.00	11.49									
Total tons per construction project		0.03	0.55	0.06	0.02	0.01	0.00	175.39	0.00	0.00	176.19									

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of		Program Estimate of		User Override of Truck		Default Values		Calculated										
User Input		Default # Water Trucks		Number of Water Trucks		Miles Traveled/Vehicle/Day		Miles Traveled/Vehicle/Day		Daily VMT										
Grubbing/Land Clearing - Exhaust			1					40.00		40.00										
Grading/Excavation - Exhaust			1					40.00		40.00										
Drainage/Utilities/Subgrade			1					40.00		40.00										
Paving			1					40.00		40.00										
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e									
Grubbing/Land Clearing (grams/mile)		0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79									
Grading/Excavation (grams/mile)		0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79									
Draining/Utilities/Sub-Grade (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93									
Paving (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93									
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e									
Pounds per day - Grubbing/Land Clearing		0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93									
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	3.66	0.00	0.00	3.69									
Pounds per day - Grading/Excavation		0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93									
Tons per const. Period - Grading/Excavation		0.00	0.00	0.01	0.00	0.00	0.00	14.63	0.00	0.00	14.78									
Pounds per day - Drainage/Utilities/Sub-Grade		0.01	0.03	0.13	0.01	0.00	0.00	137.53	0.00	0.00	138.89									
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.01	0.00	0.00	0.00	12.71	0.00	0.00	12.83									
Pounds per day - Paving		0.01	0.03	0.13	0.01	0.00	0.00	137.53	0.00	0.00	138.89									
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	5.45	0.00	0.00	5.50									
Total tons per construction project		0.00	0.01	0.03	0.00	0.00	0.00	36.44	0.00	0.00	36.80									

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max		Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day						
Fugitive Dust - Grubbing/Land Clearing			1.50	15.00	0.40	3.12	0.08
Fugitive Dust - Grading/Excavation			1.50	15.00	1.58	3.12	0.33
Fugitive Dust - Drainage/Utilities/Subgrade			1.50	15.00	1.39	3.12	0.29

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option												
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
	Override of Default Number of Vehicles	Program-estimate	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
2.00			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Air Compressors	0.65	4.88	4.49	0.30	0.01	750.53	0.06	0.01	753.66	
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2.00			Model Default Tier	Concrete/Industrial Saws	0.84	7.37	6.60	0.40	0.40	0.01	1,185.33	0.08	0.01	1,189.86
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	1		Model Default Tier	Crawler Tractors	0.57	2.45	7.31	0.28	0.25	0.01	746.04	0.24	0.01	754.08
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	2		Model Default Tier	Excavators	0.51	6.74	4.98	0.24	0.22	0.01	1,031.89	0.33	0.01	1,043.01
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
	Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Grubbing/Land Clearing		pounds per day	2.56	21.45	23.37	1.21	1.17	0.04	3,713.79	0.71	0.03	3,740.63
		Grubbing/Land Clearing		tons per phase	0.07	0.57	0.62	0.03	0.03	0.00	98.04	0.02	0.00	98.75

Grading/Excavation	Default		Mitigation Option		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Override of	Default										
	Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier										
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.26	1.94	3.28	0.09	0.09	0.01	848.06	0.27	0.01	857.23
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Cranes	0.44	2.07	5.27	0.22	0.20	0.01	546.70	0.18	0.00	552.59
1.00		2	Model Default Tier	Crawler Tractors	0.57	2.45	7.31	0.28	0.25	0.01	746.04	0.24	0.01	754.08
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00		4	Model Default Tier	Excavators	0.51	6.74	4.98	0.24	0.22	0.01	1,031.89	0.33	0.01	1,043.01
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		2	Model Default Tier	Graders	0.72	4.58	7.00	0.39	0.36	0.01	604.94	0.20	0.01	611.44
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		3	Model Default Tier	Rollers	0.21	1.92	2.11	0.13	0.12	0.00	257.24	0.08	0.00	260.01
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		3	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		4	Model Default Tier	Rubber Tired Loaders	0.37	1.61	4.34	0.14	0.13	0.01	596.22	0.19	0.01	602.65
0.00		2	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		2	Model Default Tier	Tractors/Loaders/Backhoes	0.21	2.30	2.13	0.13	0.12	0.00	303.87	0.10	0.00	307.14
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles			Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	3.28	23.62	36.42	1.63	1.50	0.05	4,934.95	1.60	0.04	4,988.17
	Grading/Excavation			tons per phase	0.35	2.49	3.85	0.17	0.16	0.01	521.13	0.17	0.00	526.75

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles		Program-estimate			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		1		Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.29	2.42	2.04	0.13	0.13	0.00	375.26	0.03	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1		Model Default Tier	Generator Sets	0.36	3.68	3.17	0.17	0.17	0.01	623.04	0.03	0.00
1.00		2		Model Default Tier	Graders	0.64	4.50	6.12	0.34	0.31	0.01	605.56	0.20	0.01
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1		Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1		Model Default Tier	Pumps	0.38	3.74	3.21	0.18	0.18	0.01	623.04	0.03	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1		Model Default Tier	Rough Terrain Forklifts	0.12	2.29	1.61	0.06	0.06	0.00	333.77	0.11	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		4		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		2		Model Default Tier	Tractors/Loaders/Backhoes	0.19	2.28	1.92	0.11	0.10	0.00	304.00	0.10	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab									
Number of Vehicles		Equipment Tier		Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade					pounds per day	2.02	19.14	18.32	1.00	0.96	2,899.14	0.50	0.02	2,918.62
Drainage/Utilities/Sub-Grade					tons per phase	0.19	1.77	1.69	0.09	0.09	267.88	0.05	0.00	269.68
Default		Mitigation Option												

Paving	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
					pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	Override of Default Number of Vehicles	Program-estimate	Equipment Tier	Type										
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pavers	0.24	2.82	2.52	0.12	0.11	0.00	441.06	0.14	0.00	445.81
	1		Model Default Tier	Paving Equipment	0.19	2.52	1.93	0.10	0.09	0.00	391.47	0.13	0.00	395.69
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.19	1.90	1.95	0.12	0.11	0.00	257.27	0.08	0.00	260.04
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.38	4.57	3.83	0.23	0.21	0.01	608.00	0.20	0.01	614.55
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab									
	Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		pounds per day	1.00	11.81	10.22	0.56	0.52	0.02	1,697.80	0.55	0.02	1,716.09
		Paving		tons per phase	0.04	0.47	0.40	0.02	0.02	0.00	67.23	0.02	0.00	67.96
Total Emissions all Phases (tons per construction period) =>					0.64	5.30	6.56	0.32	0.30	0.01	954.29	0.25	0.01	963.14

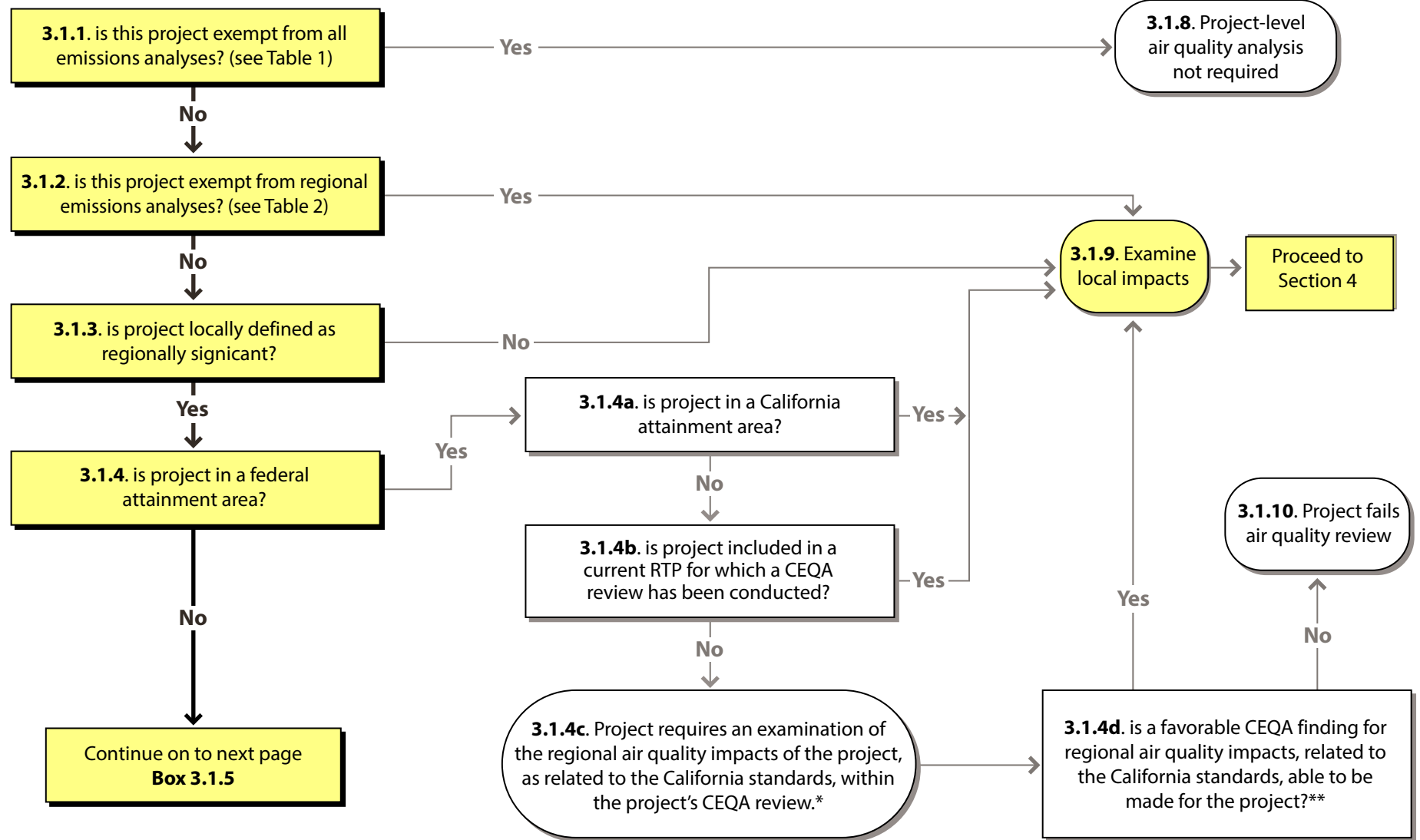
Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		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		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

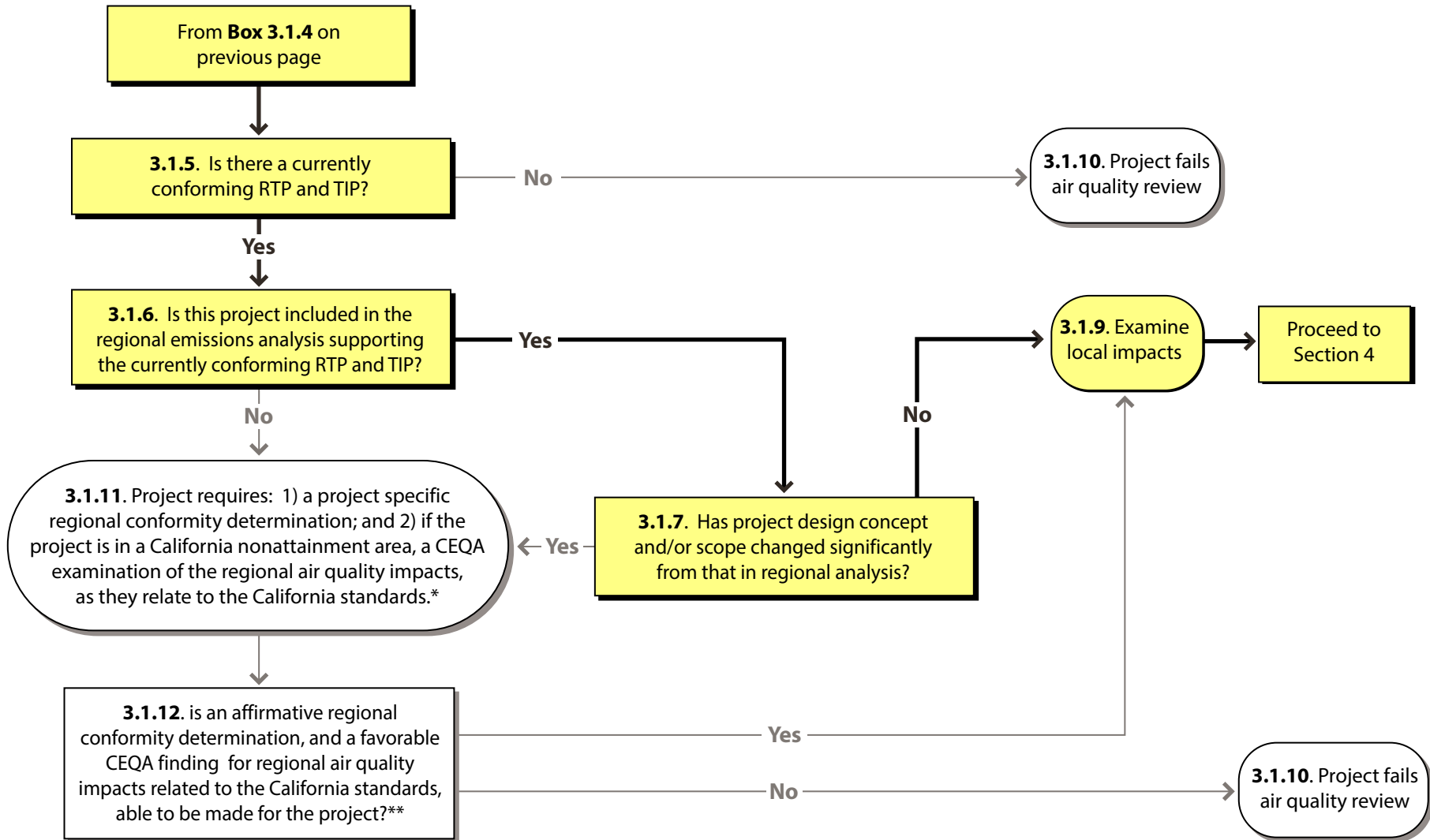
Appendix C CO Protocol Flow Chart

REQUIREMENTS FOR NEW PROJECTS



Indicates Selected Choice in Worksheet Methodology.

REQUIREMENTS FOR NEW PROJECTS

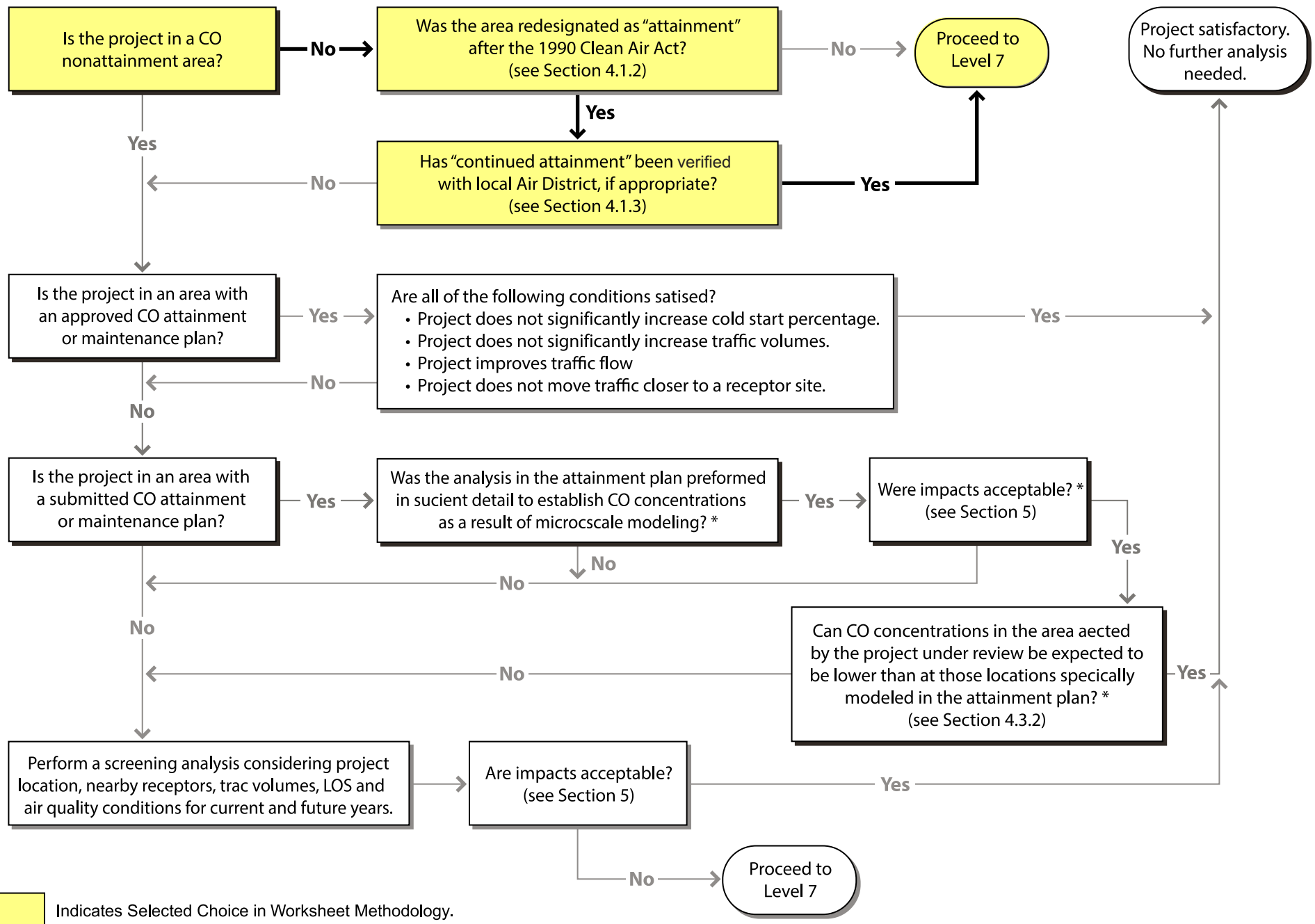


* In consultation w/MPO and Caltrans

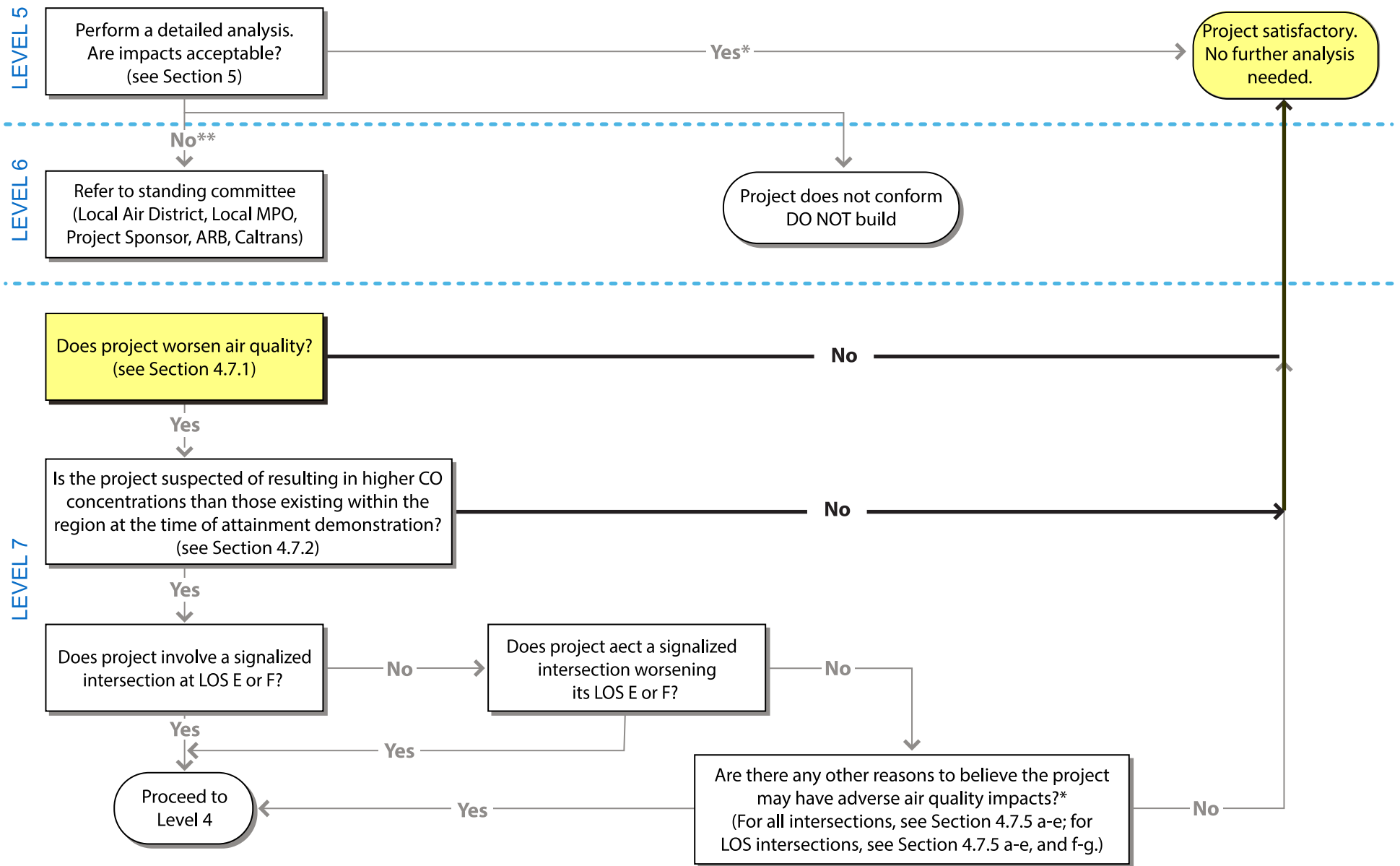
** In consultation w/MPO, local air district, CARB and Caltrans

Indicates Selected Choice in Worksheet Methodology.

LOCAL CO ANALYSIS



LOCAL CO ANALYSIS



* Consultation with MPO and Local Air District required in addition to normal NEPA/CEQA requirements.

** Consultation with MPO, Local Air District, CARB and Caltrans (District & Headquarters) required in addition to normal NEPA/CEQA.

Indicates Selected Choice in Worksheet Methodology.

Appendix D Summary Tables for Estimated Regional
Emissions of GHG, PM, and Other Pollutants

Operational Emissions

	Delay (Seconds/Vehicle)				
	Existing	2020 No Build	2020 Roundabout	2040 No Build	2040 Roundabout
AM Peak Hour					
Gilman St. at Frontage Rd.	50.0	50.0	27.9	50.0	123.2
Gilman St. at WB I-80 Ramps	50.0	50.0		50.0	
Gilman St. at EB I-80 Ramps	18.9	27.3	10.9	24.7	9.6
Gilman St. at Eastshore Hwy.	50.0	50.0		50.0	
PM Peak Hour					
Gilman St. at Frontage Rd.	50.0	50.0	43.2	50.0	59.9
Gilman St. at WB I-80 Ramps	50.0	50.0		50.0	
Gilman St. at EB I-80 Ramps	50.0	50.0	17.1	27.6	17.3
Gilman St. at Eastshore Hwy.	50.0	50.0		50.0	

	Volume				
	Existing	2020 No Build	2020 Roundabout	2040 No Build	2040 Roundabout
AM Peak Hour					
Gilman St. at Frontage Rd.	1,110	1,332	2,438	1,947	3,088
Gilman St. at WB I-80 Ramps	1,976	2,282		3,046	
Gilman St. at EB I-80 Ramps	2,085	2,275	2,471	2,469	2,317
Gilman St. at Eastshore Hwy.	2,238	2,417		2,644	
PM Peak Hour					
Gilman St. at Frontage Rd.	1,265	1,395	2,111	1,754	2,213
Gilman St. at WB I-80 Ramps	1,896	2,132		2,204	
Gilman St. at EB I-80 Ramps	2,575	2,471	2,505	2,582	2,715
Gilman St. at Eastshore Hwy.	2,265	2,358		2,505	

	Seconds of Delay per Peak Hours				
	Existing	2020 No Build	2020 Roundabout	2040 No Build	2040 Roundabout
AM Peak Hour					
Gilman St. at Frontage Rd.	55,500	66,600	68,020	97,350	380,442
Gilman St. at WB I-80 Ramps	98,800	114,100		152,300	
Gilman St. at EB I-80 Ramps	39,407	62,108	26,934	60,984	22,243
Gilman St. at Eastshore Hwy.	111,900	120,850		132,200	
PM Peak Hour					
Gilman St. at Frontage Rd.	63,250	69,750	91,195	87,700	132,559
Gilman St. at WB I-80 Ramps	94,800	106,600		110,200	
Gilman St. at EB I-80 Ramps	128,750	123,550	42,836	71,263	46,970
Gilman St. at Eastshore Hwy.	113,250	117,900		125,250	
Total	705,657	781,458	228,985	837,248	582,213

CT-EMFAC							
	ROG	CO	NOx	PM10	PM2.5	CO2	CH4
2016 Emission Factors							
Idle Exhaust (grams/veh-idle hour)	0.9938	9.394455	4.32752	0.055761	0.052367	3212.83667	0.282081
Running Loss (grams/veh-hour)	2.3152						
2020 Emission Factors							
Idle Exhaust (grams/veh-idle hour)	0.703536	6.424376	3.306712	0.045929	0.042953	2895.78638	0.206065
Running Loss (grams/veh-hour)	1.750913						
2040 Emission Factors							
Idle Exhaust (grams/veh-idle hour)	0.334801	2.804134	1.551638	0.016059	0.01495	1914.43799	0.084735
Running Loss (grams/veh-hour)	0.718291						

Emissions (Pounds per Day)									
Scenario	ROG	CO	NOx	PM10	PM2.5	CO2	CH4	CO2e (PPD)	CO2e (MTY)
Existing (2016)	1.43	4.06	1.87	0.02	0.02	1,388.40	0.12	1,391.82	164.14
2020 Emissions									
No Build Alternative	1.17	3.07	1.58	0.02	0.02	1,385.82	0.10	1,388.58	163.76
Roundabout Alternative	0.34	0.90	0.46	0.01	0.01	406.08	0.03	406.88	47.99
Net Change from No Build Alternative	(0.83)	(2.17)	(1.12)	(0.02)	(0.01)	(979.74)	(0.07)	(981.69)	(115.78)
Net Change from Existing Condition	(1.09)	(3.16)	(1.41)	(0.02)	(0.02)	(982.33)	(0.09)	(984.93)	(116.16)
2040 Emissions									
No Build Alternative	0.54	1.44	0.80	0.01	0.01	981.59	0.04	982.80	115.91
Roundabout Alternative	0.38	1.00	0.55	0.01	0.01	682.59	0.03	683.43	80.60
Net Change from No Build Alternative	(0.16)	(0.44)	(0.24)	(0.00)	(0.00)	(299.00)	(0.01)	(299.37)	(35.31)
Net Change from Existing Condition	(1.05)	(3.06)	(1.32)	(0.02)	(0.02)	(705.82)	(0.09)	(708.39)	(83.54)

File Name: Alameda (SF) - 2016 - Annual.EF
 CT-EMFAC Version: 6.0.0.29548
 Run Date: 2/9/2017 2:31:43 PM
 Area: Alameda (SF)
 Analysis Year: 2016
 Season: Annual

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Vehicle Category      VMT Fraction      Diesel VMT Fraction
                     Across Category   Within Category
Truck 1              0.024             0.444
Truck 2              0.056             0.964
Non-Truck            0.920             0.012
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Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	75 mph
ROG	0.401847	0.278750	0.180679	0.121529	0.091597	0.072959	0.060477	0.052344	0.047511	0.045405	0.045801	0.048809	0.054483	0.058695	0.058695
CO	3.224551	2.723469	2.315673	2.014901	1.793971	1.622083	1.485357	1.377501	1.295037	1.236833	1.204173	1.201988	1.238495	1.276219	1.276219
NOx	1.486443	1.245838	0.943280	0.756834	0.663849	0.609698	0.572766	0.547516	0.531201	0.522356	0.520205	0.525876	0.537608	0.546429	0.546429
CO2	1293.762817	995.651001	773.593384	627.086060	531.449707	466.630646	423.881256	396.391418	381.445190	378.649597	387.351288	408.500641	444.872345	469.653931	469.653931
CH4	0.092351	0.061294	0.040659	0.028262	0.021228	0.016800	0.013919	0.012090	0.011027	0.010582	0.010696	0.011403	0.012786	0.013816	0.013816
PM10	0.030645	0.023369	0.016324	0.011667	0.009394	0.008039	0.007159	0.006672	0.006535	0.006727	0.007243	0.007745	0.008119	0.008479	0.008479
PM2.5	0.028921	0.022105	0.015447	0.011042	0.008898	0.007621	0.006791	0.006332	0.006206	0.006391	0.006884	0.007361	0.007713	0.008054	0.008054

Fleet Average Idling Exhaust Emission Factors (grams/veh-idle hour)

Pollutant Name	Emission Factor
ROG	0.993800
CO	9.394455
NOx	4.327520
CO2	3212.836670
CH4	0.282081
PM10	0.055761
PM2.5	0.052367

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
ROG	2.315200

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.009146
PM2.5	0.002286

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.043389
PM2.5	0.018595

=====-END=====

File Name: Alameda (SF) - 2020 - Annual.EF
 CT-EMFAC Version: 6.0.0.29548
 Run Date: 2/9/2017 2:34:14 PM
 Area: Alameda (SF)
 Analysis Year: 2020
 Season: Annual

```

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Vehicle Category      VMT Fraction      Diesel VMT Fraction
                     Across Category   Within Category
Truck 1              0.021             0.508
Truck 2              0.059             0.967
Non-Truck            0.920             0.013
=====

```

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	75 mph
ROG	0.254573	0.174922	0.116539	0.080968	0.060719	0.047789	0.039163	0.033506	0.030032	0.028304	0.028133	0.029800	0.033425	0.036123	0.036123
CO	2.153499	1.836905	1.563735	1.361880	1.212889	1.095523	1.000772	0.924413	0.863920	0.818140	0.787279	0.774319	0.783074	0.797834	0.797834
NOx	1.286994	1.054409	0.764719	0.577579	0.470267	0.411593	0.374169	0.349116	0.332298	0.321572	0.315773	0.317156	0.324163	0.329442	0.329442
CO2	1166.976807	899.377014	700.001038	568.833679	483.297180	425.214661	386.805664	362.000732	348.348206	345.438599	352.779419	371.389954	403.733765	425.778015	425.778015
CH4	0.066578	0.044247	0.029450	0.020541	0.015370	0.012096	0.009962	0.008599	0.007794	0.007435	0.007475	0.007959	0.008943	0.009673	0.009673
PM10	0.017730	0.012677	0.009008	0.006682	0.005367	0.004551	0.004026	0.003714	0.003573	0.003581	0.003730	0.003956	0.004250	0.004520	0.004520
PM2.5	0.016564	0.011875	0.008450	0.006274	0.005047	0.004285	0.003795	0.003504	0.003373	0.003382	0.003524	0.003737	0.004012	0.004266	0.004266

Fleet Average Idling Exhaust Emission Factors (grams/veh-idle hour)

Pollutant Name	Emission Factor
ROG	0.703536
CO	6.424376
NOx	3.306712
CO2	2895.786377
CH4	0.206065
PM10	0.045929
PM2.5	0.042953

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
ROG	1.750913

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.009199
PM2.5	0.002300

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.042754
PM2.5	0.018323

=====-END=====

File Name: Alameda (SF) - 2040 - Annual.EF
 CT-EMFAC Version: 6.0.0.29548
 Run Date: 2/9/2017 2:33:41 PM
 Area: Alameda (SF)
 Analysis Year: 2040
 Season: Annual

```

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Vehicle Category      VMT Fraction      Diesel VMT Fraction
                    Across Category   Within Category
Truck 1              0.013             0.666
Truck 2              0.067             0.975
Non-Truck            0.920             0.014
=====

```

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph	75 mph
ROG	0.130615	0.089855	0.060404	0.042361	0.031500	0.024474	0.019788	0.016701	0.014774	0.013756	0.013532	0.014285	0.016060	0.017345	0.017345
CO	1.006100	0.852450	0.703920	0.598506	0.525458	0.469349	0.424509	0.388556	0.359999	0.338030	0.322467	0.315083	0.316954	0.321811	0.321811
NOx	1.176849	0.899285	0.551954	0.322979	0.189410	0.128886	0.096355	0.077140	0.065092	0.057296	0.052242	0.050875	0.052031	0.052835	0.052835
CO2	781.332642	609.814697	478.026917	391.326416	335.950043	298.753632	273.826660	257.246155	247.878281	244.952423	248.169342	258.753021	278.432831	291.873108	291.873108
CH4	0.033718	0.022978	0.015332	0.010677	0.007922	0.006155	0.004985	0.004219	0.003745	0.003500	0.003456	0.003653	0.004107	0.004437	0.004437
PM10	0.005558	0.003757	0.002626	0.001938	0.001517	0.001248	0.001071	0.000954	0.000883	0.000846	0.000841	0.000877	0.000959	0.001024	0.001024
PM2.5	0.005150	0.003489	0.002443	0.001805	0.001415	0.001166	0.001001	0.000893	0.000826	0.000792	0.000787	0.000820	0.000895	0.000956	0.000956

Fleet Average Idling Exhaust Emission Factors (grams/veh-idle hour)

Pollutant Name	Emission Factor
ROG	0.334801
CO	2.804134
NOx	1.551638
CO2	1914.437988
CH4	0.084735
PM10	0.016059
PM2.5	0.014950

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
ROG	0.718291

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.009358
PM2.5	0.002340

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM10	0.041793
PM2.5	0.017911

=====-END=====

Appendix E Interagency Consultation Documentation

VIEW PROJECT: **I-80 Gilman Interchange Reconfiguration**

- Project Search**
- Project Detail
- Funding
- Air Quality**
- Project Documents
- Contacts
- Delivery Milestones
- Location
- Screening Criteria
- Comments
- RTP I

TIP ID	ALA050079	Status	ACTIVE	County	Alameda	Project name	I-80 Gilman Interchange Reconfiguration
FMS ID	163.00	Version	11	Implementing Agency	ACTC	Sponsor	Berkeley

Regional Conformity

Air Quality Code	Air Quality Description
5.04	EXEMPT (40 CFR 93.127) - Changes in vertical and horizontal alignment

AQCTF Regional Conformity Review

Air Basin	Air District
San Francisco Bay Area	Bay Area AQMD

TCM	TCM Number	VOC	NOX	CO	PM10	PM2.5	CO2
		0.0	0.0	0.0	0.0	0.0	0.0

Conformity Analysis Year	Regionally Significant
2040	No

**** Based on RTP ID of the project**

Project Conformity

Overview: The San Francisco Bay Area has been designated as non-attainment for the 24-hour PM2.5 standard. Beginning December 14, 2010, certain projects are required to complete a PM2.5 hot-spot analysis as part of the project-level conformity determination process. Project sponsors must engage in interagency consultation on the PM2.5 hot-spot analysis through MTC's Air Quality Conformity Task Force. The Conformity Task Force will (1) determine if a project meets the definition of a project of air quality concern and if the project requires undergoing a project-level PM2.5 hot-spot analysis, and (2) review the methods, assumptions and analysis of the PM2.5 hot-spot analysis. The EPA and either FHWA or FTA must concur with the recommendations from the Conformity Task Force. Upon completion of the interagency consultation, project sponsors must seek approval from FHWA or FTA on the PM2.5 hot-spot analysis.

Project Conformity Analysis Summary

Next Step	Responsible Party	
Project Conformity Analysis complete		
Milestone	Status	Comments
Step 1 - Project Identification		
Sponsor Input	Completed	
System Determination	Completed	Project exempt from regional air quality conformity per 40 CFR 93.127: (Interchange reconfiguration projects.). However, this project may still require project level conformity and is therefore subject to interagency consultation
Task Force Determination	Completed	
Step 2 - Interagency Consultation		
Sponsor Input	Completed	Project Assessment Form: 2aii I-80 Gilman Interchange Reconfiguration Project Assessment Form (9-27-17).pdf Requested Date of Consultation: SEP 2017
Task Force Determination	Completed	Project is NOT a POAQC Date of Consultation: 9/28/2017 Date of Action: 9/29/2017
Step 3 - PM 2.5 Hot Spot Analysis		
Sponsor Input	N/A	
Task Force Review		

Roadway Projects
Alameda County
 State Highway Projects

TIP ID: ALA050079 **County:** Alameda **System:** State Highway **RTP ID:** 21144 **CTIPS ID:** 20600003665
Sponsor: Berkeley **Implementing Agency:** Alameda County Transportation
Project Name: I-80 Gilman Interchange Reconfiguration
Description: Berkeley: On Gilman Avenue at I-80; Reconfigure interchange providing dual roundabout at the entrance & exits from I-80 as well as the Eastshore Highway and West Frontage Road.
Air Quality Exempt Code: 5.04 - EXEMPT (40 CFR 93.127) - Changes in vertical and horizontal alignment
Route: 80 **Post Mile From:** 6.62 **Post Mile To:** 6.62 **Toll Credits:**

All funding in thousands of dollars								
Phase	Fund Source	Prior Years	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	Future Years	Total Programmed
ENV	OTHER LOCAL	\$ 740						\$ 740
PE	EARMARK	\$ 1,080						\$ 1,080
PE	OTHER LOCAL	\$ 300						\$ 300
PE	OTHER STATE	\$ 12						\$ 12
PE	SALESTAX-MEASURE	\$ 2,165						\$ 2,165
PSE	SALESTAX-MEASURE			\$ 3,671				\$ 3,671
ROW	SALESTAX-MEASURE			\$ 1,475				\$ 1,475
CON	RTP-LRP						\$ 8,418	\$ 8,418
CON	SALESTAX-MEASURE						\$ 8,271	\$ 8,271
Total Programmed Funding:				\$ 5,146			\$ 16,689	\$ 26,132

TIP ID: ALA170002 **County:** Alameda **System:** State Highway **RTP ID:** 240318 **CTIPS ID:** 20600006072
Sponsor: Alameda County Transportation Commission (ACTC) **Implementing Agency:** Alameda County Transportation
Project Name: I-80/Ashby Avenue Interchange Improvements
Description: Alameda County: I-80/Ashby IC: Reconstruct the interchange including constructing new bridge, two roundabouts and bike/ped improvements
Air Quality Exempt Code: 5.03 - EXEMPT (40 CFR 93.127) - Interchange reconfiguration projects
Route: 80 **Post Mile From:** **Post Mile To:** **Toll Credits:**

All funding in thousands of dollars								
Phase	Fund Source	Prior Years	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	Future Years	Total Programmed
PE	SALESTAX-MEASURE		\$ 4,000		\$ 2,000			\$ 6,000
ROW	SALESTAX-MEASURE				\$ 1,500			\$ 1,500
CON	RTP-LRP						\$ 46,060	\$ 46,060
Total Programmed Funding:			\$ 4,000		\$ 3,500		\$ 46,060	\$ 53,560

TIP ID: ALA050014 **County:** Alameda **System:** State Highway **RTP ID:** 22776 **CTIPS ID:** 20600002800
Sponsor: Alameda County Transportation Commission (ACTC) **Implementing Agency:** Alameda County Transportation
Project Name: SR 84 Expressway Widening
Description: In Livermore: Widen Route 84 from Jack London Blvd. to Pigeon Pass.
Air Quality Exempt Code: NON-EXEMPT
Route: 84 **Post Mile From:** 22.3 **Post Mile To:** 27.3 **Toll Credits:** \$ 4,247,341

All funding in thousands of dollars								
Phase	Fund Source	Prior Years	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	Future Years	Total Programmed
ENV	XTRAN	\$ 3,000						\$ 3,000
PSE	XTRAN	\$ 9,000						\$ 9,000
ROW	SALESTAX-MEASURE		\$ 7,311					\$ 7,311
ROW	XTRAN	\$ 17,510						\$ 17,510
CON-CT	XTRAN	\$ 3,852						\$ 3,852
CON	PROP	\$ 20,000						\$ 20,000
CON	RIP	\$ 42,130						\$ 42,130
CON	SALESTAX-MEASURE		\$ 2,689					\$ 2,689
CON	XTRAN	\$ 9,927						\$ 9,927
CON-CE	RIP	\$ 4,900						\$ 4,900
Total Programmed Funding:			\$ 10,000					\$ 120,319



Application of Criteria for a Project of Air Quality Concern
Project Title: Interstate 80 (I-80)/Gilman Street Interchange Improvements Project
Project Summary for Air Quality Conformity Task Force Meeting: September 28, 2017

Description

- Project will reconfigure the I-80/Gilman Street interchange located in northwest Berkeley near its boundary with the City of Albany
- Replace non-signalized intersection configuration with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals
- Reconstruct portions of Gilman Street, West Frontage Road and Eastshore Highway to allow for the minimum amount of spacing between ramp intersections and local intersections
- Construct shared-use Class I path on the south side of the Gilman Street undercrossing to Eastshore Highway
- Construct two-way cycle track on the south side of Gilman Street between eastern roundabout and 4th Street
- Build pedestrian/bicycle overcrossing over I-80, connecting to the Bay Trail, Class I path, and two-way cycle track
- PG&E utility relocations
- EBMUD pipeline relocation and extension
- No change to I-80 mainline

Background

- NEPA process for Initial Study/Environmental Assessment (IS/EA) is ongoing; Draft IS/EA anticipated to be circulated for public review in early 2018
- Seeking air quality conformity determination on or before January 2018

Not a Project of Air Quality Concern (40 CFR 93.123(b)(1))

(i) New or expanded highway projects with significant number/increase in diesel vehicles?

- Not a new or expanded highway project
- Interchange improvement – no change to I-80 mainline
- No change in traffic volume or truck percentages

(ii) Affects intersections at LOS D, E, or F with a significant number of diesel vehicles?

- Intersections at LOS D, E, or F improve and delays decrease
- No project changes to land use that would affect diesel traffic percentage

(iii) New bus and rail terminals and transfer points?—Not Applicable

(iv) Expanded bus and rail terminals and transfer points?—Not Applicable

(v) Affects areas identified in PM₁₀ or PM_{2.5} implementation plan as site of violation?

- The intersection area has not been identified as a possible violation site

RTIP ID# 21144

TIP ID# ALA050079

Air Quality Conformity Task Force Consideration

Date September 28, 2017

Project Description (*clearly describe project*)

The Interstate-80 (I-80)/Gilman Street Interchange Improvement Project would reconfigure the interchange located in northwest Berkeley near its boundary with the City of Albany. The project includes one build alternative, the Roundabout Alternative. The Roundabout Alternative includes the reconfiguration of I-80 ramps and intersections at Gilman Street. The existing non-signalized intersection configuration with stop-controlled ramp terminuses would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form one single roundabout intersection. Gilman Street would be reconstructed from approximately 300 feet west of West Frontage Road to approximately 100 feet east of 4th Street. Work would also include reconstruction of West Frontage Road and Eastshore Highway to allow for the minimum amount of spacing between ramp intersections and local intersections. Eastshore Highway would be converted from two lanes to one lane entering the roundabout in order to reduce the number of conflicts. During this reconfiguration, pavement preservation (mill and overlay) would be implemented. There are no proposed improvements to the freeway mainline.

A shared-use Class I path for pedestrians and bicyclists would be constructed on the south side of the Gilman Street undercrossing. The shared-use path would extend south along Eastshore Highway, where it would then connect to a proposed bicycle/pedestrian overcrossing. The overcrossing would be constructed over I-80, merging into the existing San Francisco Bay Trail (Bay Trail) that runs parallel to West Frontage Road. The shared-use path would terminate at the Bay Trail on the west and at the eastern roundabout on the east side of the project. From the eastern roundabout, it would join a two-way cycle track and the existing sidewalk. The Roundabout Alternative also includes a two-way cycle track on the south side of Gilman Street between the eastern roundabout and 4th Street.

Figures 1 and 2 show the regional and local project location. The Roundabout Alternative is shown in Figure 3. The figures are presented below at the end of this form.

Type of Project: Reconfigure Existing Interchange

County	<i>Narrative Location/Route & Postmiles</i>
Alameda	The project is located in Alameda County at the I-80/Gilman Street interchange in the City of Berkeley (Post Miles 6.4 to 6.82).
	Caltrans Projects – EA# 04-0A7700

Lead Agency: California Department of Transportation

<i>Contact Person</i>	<i>Phone#</i>	<i>Fax#</i>	<i>Email</i>
Paul Herman	(510) 286-5701		Paul.Herman@dot.ca.gov

Federal Action for which Project-Level PM Conformity is Needed (*check appropriate box*)

<i>Categorical Exclusion (NEPA)</i>	X	EA or Draft EIS	FONSI or Final EIS	PS&E or Construction	<i>Other</i>
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Scheduled Date of Federal Action: June 2018

NEPA Delegation – Project Type <i>(check appropriate box)</i>				
	Section 326 – Categorical Exclusion	X	Section 327 – Non- Categorical Exclusion	
Current Programming Dates <i>(as appropriate)</i>				
	PE/Environmental	ENG	ROW	CON
Start	10/15	10/15	3/18	10/19
End	6/18	1/19	4/19	11/21
Project Purpose and Need (Summary): (please be brief)				
Purpose				
<ul style="list-style-type: none"> • Simplify and improve navigation and traffic operations on Gilman Street between the West Frontage Road and 2nd Street through the I-80 interchange • Reduce congestion, vehicle queues, and conflicts • Improve safety at Gilman Street intersections; • Improve local and regional bicycle and pedestrian facilities through the I-80/Gilman Street interchange • Improve safety at the I-80/Gilman Street interchange 				
Project goal				
<ul style="list-style-type: none"> • A goal of the proposed project is to improve and enhance the Gilman Street entry corridor into west Berkeley 				
Need				
<ul style="list-style-type: none"> • Nonstandard spacing between I-80 ramp intersections and frontage roads combined with free-flow traffic on Gilman Street without turn channelization creates poor intersection operations due to short weaving lengths, left turn storage in through lanes, and complex vehicle navigation through multiple points of conflict; • Existing and future poor Level of Service (LOS) conditions at the I-80 ramp intersections and Eastshore Highway intersections with Gilman Street during weekday and weekend peak hours due to stop-controlled intersections; • Existing vehicle queue spillback from the I-80/Gilman Street ramp intersections onto the freeway off-ramps, especially in the westbound I-80 direction; • Gap in the local and regional bikeway system exists on Gilman Street between the Class II facility east of 2nd Street and the Class I Bay Trail facility. 				
Surrounding Land Use/Traffic Generators <i>(especially effect on diesel traffic)</i>				
<p>The project area is bounded by a mix of industrial, commercial, and recreational developments. I-80 is a transcontinental east-west freeway. Gilman Street is an east-west arterial that extends from Buchanan Street Extension to the west and Hopkins Street to the east, and is a major vehicle route for accessing the freeway. Gilman Street provides primary access from the Cities of Berkeley and Albany to Golden Gate Fields horse racing track, the Tom Bates Recreational Complex, and the waterfront shoreline areas. Diesel traffic in the project area is related to commercial and light industrial land uses.</p>				

Brief summary of assumptions and methodology used for conducting analysis

The information presented in this form was obtained from the Traffic Operations Analysis Report (Traffic Report) prepared by TJKM on June 22, 2017. The Traffic Report focused on peak hour traffic volumes instead of average annual daily traffic (AADT) because peak hour volumes are pertinent to assessing operations of the Roundabout Alternative. However, the Traffic Report provided existing AADT for I-80 and Gilman Street. The project would not change truck AADT in the interchange area. There may be a slight change in peak period truck volumes due to improved traffic flow associated with the Roundabout Alternative. However, on a daily basis, the implementation of a roundabout would not affect local truck trip generation and roadway volumes. Therefore, truck volumes were derived using the existing truck percentage relative to total AADT.

Opening Year: If facility is a highway or street, Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility

NOT APPLICABLE (facility is not a highway or street)

RTP Horizon Year / Design Year: If facility is a highway or street, Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility

NOT APPLICABLE (facility is not a highway or street)

RTP Horizon Year / Design Year: If facility is an interchange (s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT

Segment	AADT					
	Existing (2014)			Build/No Build (2040)		
	Total AADT	Trucks AADT	% Trucks	Total AADT	Trucks AADT	% Trucks
I-80 Mainline	274,000	10,960	4%	290,430	11,617	4%
I-80 EB Off Ramp at Gilman	5,900	236	4%	5,900	236	4%
I-80 EB On Ramp at Gilman	9,000	360	4%	9,920	397	4%
I-80 WB Off Ramp at Gilman	10,600	424	4%	21,160	846	4%
I-80 WB On Ramp at Gilman	6,300	252	4%	13,300	532	4%
Gilman St Between 2nd and 4th Sts EB	9,532	763	8%	13,656	1,092	8%
Gilman St Between 2nd and 4th Sts WB	9,532	477	5%	13,656	683	5%
Gilman St Between 7th and 8th Sts EB	7,589	607	8%	9,486	759	8%
Gilman St Between 7th and 8th Sts WB	7,589	379	5%	9,486	474	5%

Opening Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses

NOT APPLICABLE (facility is not an intermodal facility/terminal/transfer point)

RTP Horizon Year / Design Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses

NOT APPLICABLE (facility is not an intermodal facility/terminal/transfer point)

Opening Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses

NOT APPLICABLE (facility is not an intermodal facility/terminal/transfer point)

RTP Horizon Year / Design Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses

NOT APPLICABLE (facility is not an intermodal facility/terminal/transfer point)

Describe potential traffic redistribution effects of congestion relief (impact on other facilities)

The decisive goal of the project is to simplify and improve navigation, mobility, reduce congestion, and improve safety at the I-80/Gilman Street interchange. The short- and long-term benefits related to congestion relief are summarized below from the Traffic Report.

2020 Opening Year

- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections improve from LOS F to LOS A during the AM peak hour.
- The Gilman Street/eastbound I-80 ramps intersection improves from LOS D to LOS A and the Gilman Street/Eastshore Highway intersections improves from LOS F to LOS A during the AM peak hour.
- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections improve from LOS F to LOS A during the PM peak hour.
- The Gilman Street/eastbound I-80 ramps and the Gilman Street/Eastshore Highway intersections improve from LOS F to LOS B during the PM peak hour.

2040 Horizon Year

- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections improve from LOS F to LOS C during the AM peak hour.
- The Gilman Street/eastbound I-80 ramps intersection improves from LOS C to LOS A and the Gilman Street/Eastshore Highway intersections improves from LOS F to LOS A during the AM peak hour.
- The Gilman Street/Frontage Road and the Gilman Street/westbound I-80 ramps intersections improve from LOS F to LOS A during the PM peak hour.
- The Gilman Street/eastbound I-80 ramps intersection level of service remains the same at LOS C and the Gilman Street/Eastshore Highway intersections improve from LOS F to LOS C during the AM peak hour.

Roundabout Alternative Level of Service Analysis

Intersection	2020 Opening Year Roundabout Alternative Level of Service		2040 Horizon Year Roundabout Alternative Level of Service	
	AM Peak	AM Peak	AM Peak	PM Peak
	LOS	LOS	LOS	LOS
Gilman Street at Frontage Road	A	C	C	A
Gilman Street at westbound I-80 ramps				
Gilman Street at eastbound I-80 ramps	A	A	A	C
Gilman Street at Eastshore Highway				

It is also important to recognize that the queue lengths are projected to reduce significantly on the I-80 eastbound off-ramp and on the I-80 westbound off-ramp to Gilman Street under both 2020 and 2040 Conditions.

Comments/Explanation/Details (please be brief)

For the following reasons, the project would not be considered a “project of air quality concern” (according to 40 CRF 93.123(b)(1)) and would not trigger the need for a PM_{2.5} hot-spot modeling analysis:

1. New or expanded highway projects that have a significant number of or significant increase in diesel vehicles (significant number is defined as greater than 125,000 AADT and 8 percent or more of such AADT is diesel truck traffic, or in practice 10,000 truck AADT or more regardless of total AADT; significant increase is defined in practice as a 10 percent increase in heavy duty truck traffic);

The Roundabout Alternative would reconfigure the existing non-signalized intersection configuration with stop-controlled ramp terminuses with two hybrid single-lane roundabouts with multi-lane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form one single roundabout intersection. According to the Traffic Report, this action would improve peak hour traffic flow. As discussed above, the Roundabout Alternative would not change the AADT on Gilman Street or I-80. On Gilman Street, the No Build and Roundabout Alternative truck AADT is between 1,342 and 1,977 trucks in 2020 and 1,469 and 2,470 trucks in 2040

2. Projects affecting intersections that are at a Level of Service D, E, or F, with a significant number of diesel vehicles, or that that will change to Level of Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

The purpose of the Roundabout Alternative is to simplify and improve navigation, mobility and traffic operations, reduce congestion, vehicle queues and conflicts, improve local and regional bicycle connections and pedestrian facilities, and improve safety at the I-80/Gilman Street interchange. The Traffic Report determined that the Roundabout Alternative would result in 2020 and 2040 benefits at the following intersections: Gilman Street/Frontage Road, Gilman Street/Westbound I-80 Ramps, Gilman Street/Eastbound I-80 Ramps, and Gilman Street /Eastshore Highway. The traffic study also concluded that the queue lengths would be reduced significantly on the I-80 eastbound off-ramp and on the I-80 westbound off-ramp to Gilman Street under both 2020 and 2040 conditions. The reduced delay and improved flow would improve localized PM emissions by reducing engine idling and associated exhaust emissions;

3. New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

The Roundabout Alternative does not include a new bus or rail terminal or transfer point.

4. Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or

The Roundabout Alternative does not include an expanded bus or rail terminal or transfer point.

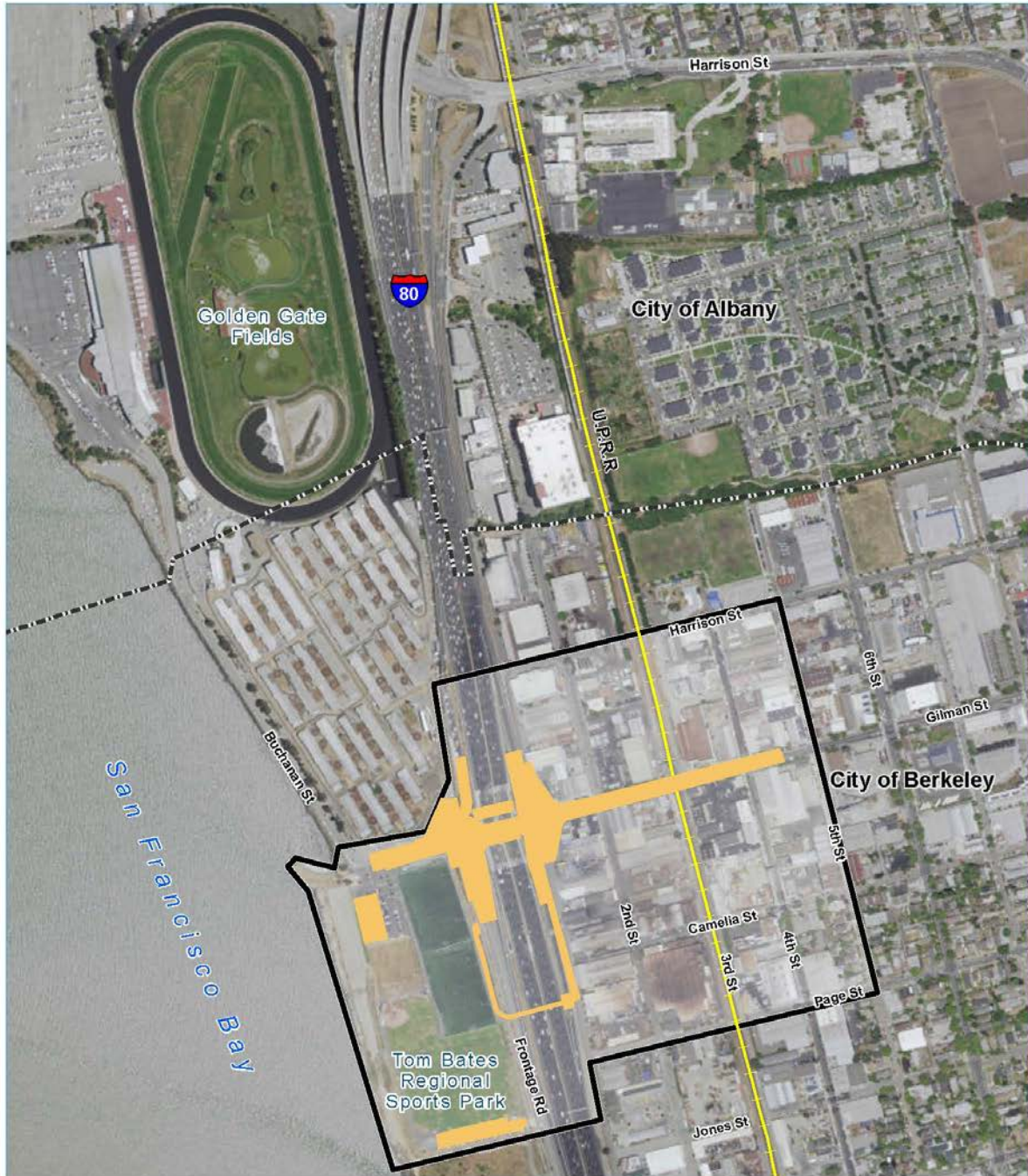
5. Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{2.5} or PM₁₀ Implementation Plan or Implementation Plan submission, as appropriate, as sites of possible violation;





The intersection area has not been identified as a possible violation site.

Figure 1. Regional Location



Figure 2. Project Location



-  Project Area
-  Project Study Area
-  City Limits
-  Rail

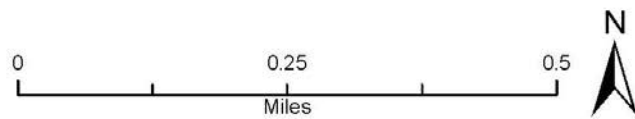


Figure 3. Roundabout Alternative

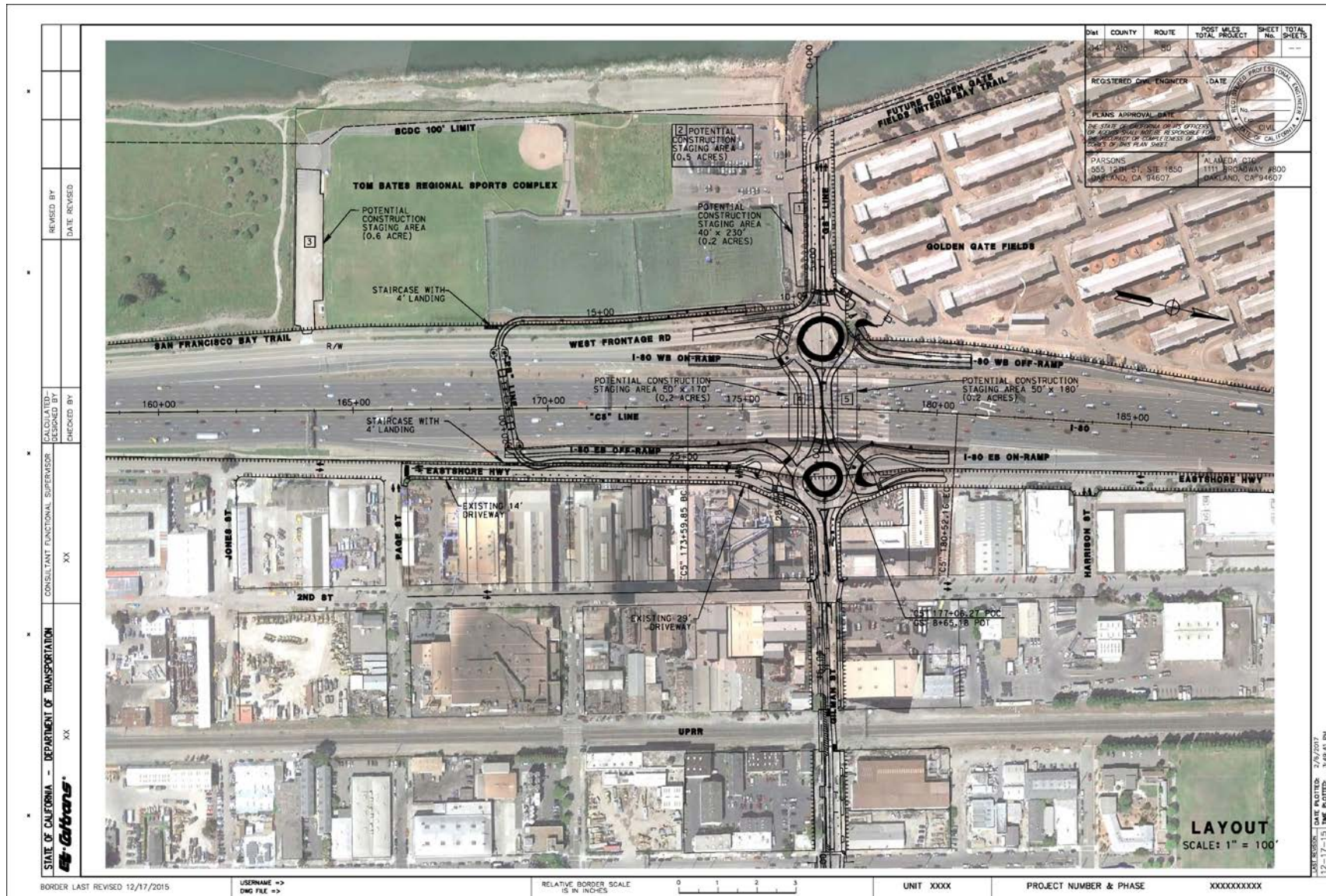


Figure 4. Land Use

