



METROPOLITAN  
TRANSPORTATION  
COMMISSION

Joseph P. Bort MetroCenter  
101 Eighth Street  
Oakland, CA 94607-4700  
TEL 510.817.5700  
TDD/TTY 510.817.5769  
FAX 510.817.5848  
E-MAIL [info@mtc.ca.gov](mailto:info@mtc.ca.gov)  
WEB [www.mtc.ca.gov](http://www.mtc.ca.gov)

## *Memorandum*

TO: Air Quality Conformity Task Force

DATE: April 11, 2013

FR: Harold Brazil and Brenda Dix

W.I.:

RE: Draft Approach to Allocate Commercial Truck Count Data

**Background** – When a project does not qualify for a project level PM<sub>2.5</sub> exemption code, the project sponsor is asked to complete a project assessment form for the Air Quality Conformity Task Force’s review. This form includes a request for total AADT and truck AADT in the project area for build and no build conditions in the opening year and RTP horizon year. The intent of the truck AADT request is for the Task Force to have a general understanding of the quantity of diesel traffic moving through the project area. For some projects, the sponsor has conducted traffic counts in the area and therefore has easy access to this information. In other situations, the project sponsor may have to rely on Caltrans traffic counts. Caltrans counts contain information on total AADT and 3+ axle truck AADT. This 3+ axle count does not give the Task Force a thorough understanding of all diesel traffic in the corridor since there are many 2-axle trucks that run on diesel and are not included in these counts.

In response to this issue, MTC has created a methodology for using EMFAC 2011 fleet mix data to extrapolate from the 3-axle truck counts a more complete picture of all diesel trucks in the project area. To explain the approach we will use the SR 92/El Camino Real (SR 82) Ramp Modifications project that went before the Task Force in February 2013 as an example project. The sponsor’s project assessment form can be found here:

[http://apps.mtc.ca.gov/meeting\\_packet\\_documents/agenda\\_2007/2ai\\_SM110047\\_SR92ElCamino\\_Ramp\\_Modifications\\_Revised\\_2.pdf](http://apps.mtc.ca.gov/meeting_packet_documents/agenda_2007/2ai_SM110047_SR92ElCamino_Ramp_Modifications_Revised_2.pdf)

**Step 1:** Attached is a series of Excel workbooks with information on truck data from EMFAC 2011 in years: 2015, 2020 and 2040. Each tab in the workbooks represents one county. Included are tables on the ratios of diesel and gas, light-duty and medium-heavy/heavy-heavy trucks necessary to utilize the approach outlined in this memo. For the project opening year calculation, the sponsor should use the Excel workbook that is closest to the project’s opening year. The current RTP horizon year is 2035 but this will change to 2040 with the adoption on Plan Bay Area (anticipated to occur in July).

For the sample project, data specific to the opening year (2018) was provided since this was the first time this methodology was used. This is not necessary for subsequent projects since the ratios between the different truck types change only slightly over a five year period.

**Step 2:** Project sponsors should calculate the 3-axle truck percentage from the Caltrans traffic counts. For our sample project this was **0.87%** (information can be found starting on page 4 of the project assessment form) on the mainline of SR 92/El Camino Real. The sample project had nearly equivalent shares of *Gas and Diesel* Medium-Heavy and Heavy-Heavy trucks as in the default EMFAC2011 fleet data for San Mateo County. EMFAC 2011 definitions of Medium-Heavy and Heavy-Heavy truck classifications can be found in Appendix B.

3-Axle Trucks %age <sup>1</sup>	Year 2018 EMFAC 2011 San Mateo County Diesel Medium-Heavy & Heavy-Heavy Trucks %age
0.87%	1.13%

**Step 3:** MTC makes the assumption that the EMFAC 2011 county level Gas *and* Diesel Medium-Heavy & Heavy-Heavy Trucks vehicles represent ALL 3-axle truck vehicles.

School and transit buses, in addition to motor homes, were not included in this allocation calculation approach due to their small contributions to the on-road vehicle fleet. For the sample project, the year 2018 EMFAC 2011 San Mateo County vehicle population data shows that 0.2% and 0.3% of the vehicles were buses or motorhomes, respectively. In addition, nationwide buses contribute only 0.7% of all vehicles travelling on urban mainline freeway roadway segments.<sup>2</sup>

**Step 4:** The project sponsor should locate the year closest to their opening year in the appropriate Excel workbook for their county in order to obtain the appropriate proportional relationship between Gas and Diesel Medium-Heavy and Heavy-Heavy Truck vehicle shares. The table below includes this information for San Mateo County, where the sample project is located.

	Total Year 2018 EMFAC San Mateo County Gas & Diesel Medium-Heavy & Heavy-Heavy Trucks	Year 2018 EMFAC San Mateo County Gas Medium-Heavy & Heavy-Heavy Trucks	Year 2018 EMFAC San Mateo County Diesel Medium-Heavy & Heavy-Heavy Trucks
Total Vehicles	6,751	1,000	5,751
Share	100.0%	14.81%	85.19%

**Step 5:** The project sponsor should multiply the EMFAC *Gas* Medium-Heavy & Heavy-Heavy Truck Share (**14.81%** for the sample project) by the Caltrans 3-axle counts to obtain the number of *Gas* 3-axle trucks in the roadway segment. The same calculation should be conducted with the *Diesel* Medium-Heavy & Heavy-Heavy Truck Share (**85.19%** for the sample project) to obtain the number of *Diesel* 3-axle trucks in the roadway segment.

<sup>1</sup> Caltrans' Annual Average Daily Truck Traffic on the California State Highway System

<sup>2</sup> 2011 Reporting Highway Statistics, Federal Highway Administration

Truck Type	Year 2018 EMFAC San Mateo County Trucks	Year 2018 EMFAC San Mateo County Truck %age	Ratio to Calculate Allocation
Gas & Diesel Medium-Heavy & Heavy-Heavy Trucks	6,751	1.13%	N/A
<i>Diesel</i> Light-Heavy Trucks	5,002	0.84%	74.09%
<i>Gas</i> Light-Heavy Trucks	13,182	2.20%	195.25%

**Step 7:** The project sponsor should multiply the Ratio to Calculate Allocation of *Diesel* Light-Heavy Trucks (74.09% for the sample project) by the Caltrans 3-axle counts to obtain the number of *Diesel* Light-Heavy (or 2-axle) trucks in the roadway segment. The same calculation should be conducted with the Ratio to Calculate Allocation of *Gas* Light-Heavy Trucks (195.25% for the sample project) to obtain the number of *Gas* Light-Heavy (or 2-axle) trucks in the roadway segment.

**Step 8:** Repeat this process for all roadway segments and the RTP horizon year.

In the file “Yr20XX\_Project Level E2011 VehType Data.xlsx” and in cells from C74 to F74 and from C81 to F81, the above mentioned truck allocation ratio percentages for each individual Bay Area county and the region are listed. The “XX” portion of the filename above denotes the analysis year for the data (e.g., “15” for the 2015 analysis year and “40” for the 2040 analysis year).

Ratios:	
Diesel LH Trucks	Diesel MH & HH Ts
74.09%	85.19%
Gas LH Trucks	Gas MH & HH Ts
195.25%	14.81%

**Appendix B – EMFAC2011 Vehicle Category Classification**

Index	EMFAC2011 Veh & Tech	EMFAC2011 Vehicle	Description	Source	EMFAC2007 Vehicle	CTEMFAC Vehicle	
1	LDA - DSL	LDA	Passenger Cars	EMFAC2011-LDV	LDA	Non-Trucks	
2	LDA - GAS			EMFAC2011-LDV		Non-Trucks	
3	LDT1 - DSL	LDT1	Light-Duty Trucks (0-3750 lbs)	EMFAC2011-LDV	LDT1	Non-Trucks	
4	LDT1 - GAS			EMFAC2011-LDV		Non-Trucks	
5	LDT2 - DSL	LDT2	Light-Duty Trucks (3751-5750 lbs)	EMFAC2011-LDV	LDT2	Non-Trucks	
6	LDT2 - GAS			EMFAC2011-LDV		Non-Trucks	
7	LHD1 - DSL	LHD1	Light-Heavy-Duty Trucks (8501-10000 lbs)	EMFAC2011-LDV	LHDT1	Trucks	
8	LHD1 - GAS			EMFAC2011-LDV		Trucks	
9	LHD2 - DSL	LHD2	Light-Heavy-Duty Trucks (10001-14000 lbs)	EMFAC2011-LDV	LHDT2	Trucks	
10	LHD2 - GAS			EMFAC2011-LDV		Trucks	
11	MCY - GAS	MCY	Motorcycles	EMFAC2011-LDV	MCY	Non-Trucks	
12	MDV - DSL	MDV	Medium-Duty Trucks (5751-8500 lbs)	EMFAC2011-LDV	MDV	Trucks	
13	MDV - GAS			EMFAC2011-LDV		Trucks	
14	MH - DSL	MH	Motor Homes	EMFAC2011-LDV	MH	Non-Trucks	
15	MH - GAS			EMFAC2011-LDV		Non-Trucks	
16	T6 Ag - DSL	T6 Ag	Medium-Heavy Duty Diesel Agriculture Truck	EMFAC2011-HD	MHDT	Trucks	
17	T6 CAIRP heavy - DSL	T6 CAIRP heavy	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>26000 lbs	EMFAC2011-HD		Trucks	
18	T6 CAIRP small - DSL	T6 CAIRP small	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR<=26000 lbs	EMFAC2011-HD		Trucks	
19	T6 instate construction heavy - DSL	T6 instate construction heavy	Medium-Heavy Duty Diesel Instate construction Truck with GVWR>26000 lbs	EMFAC2011-HD		Trucks	
20	T6 instate construction small - DSL	T6 instate construction small	Medium-Heavy Duty Diesel Instate construction Truck with GVWR<=26000 lbs	EMFAC2011-HD		Trucks	
21	T6 instate heavy - DSL	T6 instate heavy	Medium-Heavy Duty Diesel instate Truck with GVWR>26000 lbs	EMFAC2011-HD		Trucks	
22	T6 instate small - DSL	T6 instate small	Medium-Heavy Duty Diesel instate Truck with GVWR<=26000 lbs	EMFAC2011-HD		Trucks	
23	T6 OOS heavy - DSL	T6 OOS heavy	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR>26000 lbs	EMFAC2011-HD		Trucks	
24	T6 OOS small - DSL	T6 OOS small	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR<=26000 lbs	EMFAC2011-HD		Trucks	
25	T6 Public - DSL	T6 Public	Medium-Heavy Duty Diesel Public Fleet Truck	EMFAC2011-HD		Trucks	
26	T6 utility - DSL	T6 utility	Medium-Heavy Duty Diesel Utility Fleet Truck	EMFAC2011-HD		Trucks	
27	T6TS - GAS	T6TS		EMFAC2011-LDV		Trucks	
28	T7 Ag - DSL	T7 Ag	Heavy-Heavy Duty Diesel Agriculture Truck	EMFAC2011-HD		Trucks	
29	T7 CAIRP - DSL	T7 CAIRP	Heavy-Heavy Duty Diesel CA International Registration Plan Truck	EMFAC2011-HD		Trucks	
30	T7 CAIRP construction - DSL	T7 CAIRP construction	Heavy-Heavy Duty Diesel CA International Registration Plan Construction Truck	EMFAC2011-HD		Trucks	
31	T7 NNOOS - DSL	T7 NNOOS	Heavy-Heavy Duty Diesel Non-Neighboring Out-of-state Truck	EMFAC2011-HD		Trucks	
32	T7 NOOS - DSL	T7 NOOS	Heavy-Heavy Duty Diesel Neighboring Out-of-state Truck	EMFAC2011-HD		Trucks	
33	T7 other port - DSL	T7 other port	Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	EMFAC2011-HD		Trucks	
34	T7 POAK - DSL	T7 POAK	Heavy-Heavy Duty Diesel Drayage Truck in Bay Area	EMFAC2011-HD		Trucks	
35	T7 POLA - DSL	T7 POLA	Heavy-Heavy Duty Diesel Drayage Truck near South Coast	EMFAC2011-HD		Trucks	
36	T7 Public - DSL	T7 Public	Heavy-Heavy Duty Diesel Public Fleet Truck	EMFAC2011-HD		HHDT	Trucks
37	T7 Single - DSL	T7 Single	Heavy-Heavy Duty Diesel Single Unit Truck	EMFAC2011-HD		Trucks	
38	T7 single construction - DSL	T7 single construction	Heavy-Heavy Duty Diesel Single Unit Construction Truck	EMFAC2011-HD		Trucks	
39	T7 SWCV - DSL	T7 SWCV	Heavy-Heavy Duty Diesel Solid Waste Collection Truck	EMFAC2011-HD		Trucks	
40	T7 tractor - DSL	T7 tractor	Heavy-Heavy Duty Diesel Tractor Truck	EMFAC2011-HD	Trucks		
41	T7 tractor construction - DSL	T7 tractor construction	Heavy-Heavy Duty Diesel Tractor Construction Truck	EMFAC2011-HD	Trucks		
42	T7 utility - DSL	T7 utility	Heavy-Heavy Duty Diesel Utility Fleet Truck	EMFAC2011-HD	Trucks		
43	T7IS - GAS	T7IS	Medium-Heavy Duty Gasoline Instate Truck with GVWR>26000 lbs	EMFAC2011-LDV	Trucks		
44	PTO - DSL	PTO	Power Take Off	EMFAC2011-HD	Trucks		
45	SBUS - DSL	SBUS	School Buses	EMFAC2011-HD	SBUS	Non-Trucks	
46	SBUS - GAS		EMFAC2011-LDV	Non-Trucks			
47	UBUS - DSL	UBUS	Urban Buses	EMFAC2011-LDV	UBUS	Non-Trucks	
48	UBUS - GAS			EMFAC2011-LDV		Non-Trucks	
49	Motor Coach - DSL	Motor Coach	Motor Coach	EMFAC2011-HD	OBUS	Non-Trucks	
50	OBUS - GAS	OBUS	Other Buses	EMFAC2011-LDV		Non-Trucks	
51	All Other Buses - DSL	All Other Buses	All Other Buses	EMFAC2011-HD		Non-Trucks	