EMFAC2011-SG

2014 RTP Conformity Analysis and SB-375 Analysis Instructions for the San Joaquin Valley MPOs

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NOTE: The 2012 instructions have been updated for use in the 2014 RTP/2015 FTIP Update analysis. It is assumed that the VMT recession adjustment methodology will be "approved" by EPA for use in the San Joaquin Valley and that NO conformity budget updates will be available, including the 2012 PM2.5 Plan.

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INTRODUCTION:

These instructions are intended to provide an overview of how to use EMFAC 2011-SG to estimate on-road mobile source emissions for regional conformity analysis and SB-375. In addition, this version of the instructions addresses Environmental Impact Report (EIR) emissions modeling that should be done concurrently with conformity and SB 375 analyses. More detailed information on the EMFAC2011-SG Module is available in the User's Guide (http://www.arb.ca.gov/msei/emfac2011-sg-module-users-guide-final.pdf).

These instructions assume that EMFAC 2011 has already been installed. If not, please download from the ARB website (see Section 4, 5, and 6 of the EMFAC2011-SG User's Guide for instructions on how to do this). The download and installation procedure takes approximately 1.5 hours. Note that EMFAC2011 requires Microsoft XP operating system or newer, as well as Microsoft Access and Excel 2003 or newer.

TRANSPORTATION DATA TEMPLATE (TDT):

Transportation Data Templates (TDTs) were provided to each SJV MPO in October 2013. There are two separate TDTs (conformity and SB-375) which include an EMFAC2011-SG tab, which auto fills transportation data that will be used for EMFAC input. The TDTs incorporate the ARB VMT recession adjustment methodology developed for the San Joaquin Valley when utilizing EMFAC 2011 for SIP development. The methodology redistributes a portion of heavy-duty VMT to all other vehicle classes, but maintains the total county VMT entered into EMFAC 2011. Each TDT (for both conformity and SB-375) includes a "HD VMT Shift" tab that adjusts the VMT accordingly.

Kern: four separate TDT files (Kern SJV Conformity, Kern MD Conformity, Kern IWV Conformity and Kern County SB-375).

NOTE: It is recommended that SJV MPOs confirm a positive conformity demonstration with SCS scenarios prior to completing the SB-375 analysis. It is important to confirm that the land use for the intermediate years (e.g., 2017, 2023, 2025, 2032) supports the development of the SCS scenarios as modeled for 2020 and 2035. The SCS scenario should be projected out to 2040 as well. For 2014 RTP EIR analysis, EIR base year and RTP 2040 horizon year should be included in both conformity and SB375 emissions modeling. The EIR base year is generally when the NOP was released and varies from MPO to MPO.

EMFAC 2011 MODELING INSTRUCTIONS:

For conformity and/or SB-375, total VMT, VMT by vehicle class and VMT by speed bin will need to be modified with user-supplied data. In order to do this, users should first run EMFAC2011-SG for the desired area(s) (county), season, and calendar year(s) using the model defaults in the 'Default Model' mode, and export the default input parameters. The default input parameters outputted during this run will then be edited with the user-supplied total VMT and speed distribution data (from the MPO travel model). A step-by-step procedure is shown below for seven out of eight Valley MPOs. For modeling emissions in the sub-areas of Kern County, see highlighted text.

1. Generate Default EMFAC Input Data

Seven of Eight MPOs, Excluding Kern:

Run EMFAC2011-SG (EMFAC2011-SG (Ver 1.0).mdb) for the desired region(s) and calendar year(s) using default input parameters for all inputs except total VMT and speed distribution as follows:

a. From the Main Menu, create if new or load a previously saved regional scenario file containing the areas and calendar years of interest (see Section 7.2 "Create Regional Scenarios" beginning on Page 35 of the EMFAC2011-SG User's Guide). If a new scenario is created, then users may add multiple regional scenarios (e.g., for multiple calendar years) as part of the same model run (see Section 7.2, Page 38 of the User's Guide). Step-by-step Scenario Builder instructions:

   1) Area Type = MPO
   2) Area = MPO name
   3) Calendar Year = see list below.

The EIR base year should now be included as part of the conformity run (see table below for applicable EIR base year by MPO).

MPO	EIR Base Year
Fresno	2012
Kern	2013
Kings	2013
Madera	2010
Merced	2013
San Joaquin	2012
Stanislaus	2012
Tulare	2013

For Conformity: EIR base year, 2014, 2017, 2020, 2023, 2025, 2032, 2035 (8 scenarios); 2040 (1 scenario);

> NOTE: EMFAC2011 can be run only for years up to 2035. In order to complete a run for calendar year 2040, a separate default run must be created by selecting "2035" under "Calendar Year" in EMFAC. Then when updating default VMT, VMT by vehicle class, and speed distribution as described later in the document, 2040 transportation data should be used.

For SB-375 Base Case: EIR base year, 2005, 2020, 2035 = 4 scenarios); 2040 (1 scenario).

For SB-375 Alternative Scenario (e.g., transit oriented development): 2020, 2035 = 2 scenarios); 2040 (1 scenario).

NOTE: The 2040 analysis year has been included for SB-375 for the purposes of the EIR analysis. Once the first alternative analysis is completed, the input file can be updated (e.g., blueprint), saved with another file name, and then "load" regional scenario.

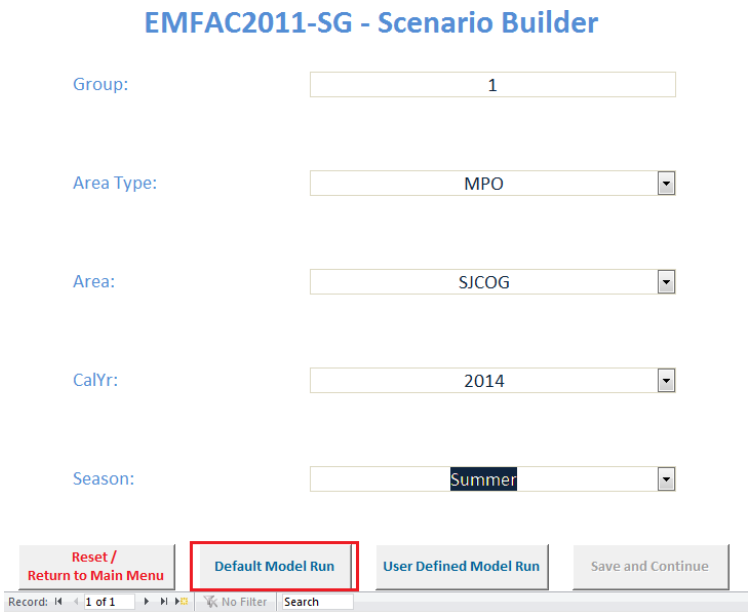
4) Season = see below.

If creating a new conformity scenario, begin with the "Summer" season for the first default run. Other seasons can be run by changing parameters manually in the input spreadsheets generated by the first default run as described later in this document.

If creating a new SB-375 scenario, begin with the "Annual" season for the default run.

b. Once the regional scenario data are entered or loaded from the Scenario Builder window, click the "Default Model Run" button at the bottom as shown below.

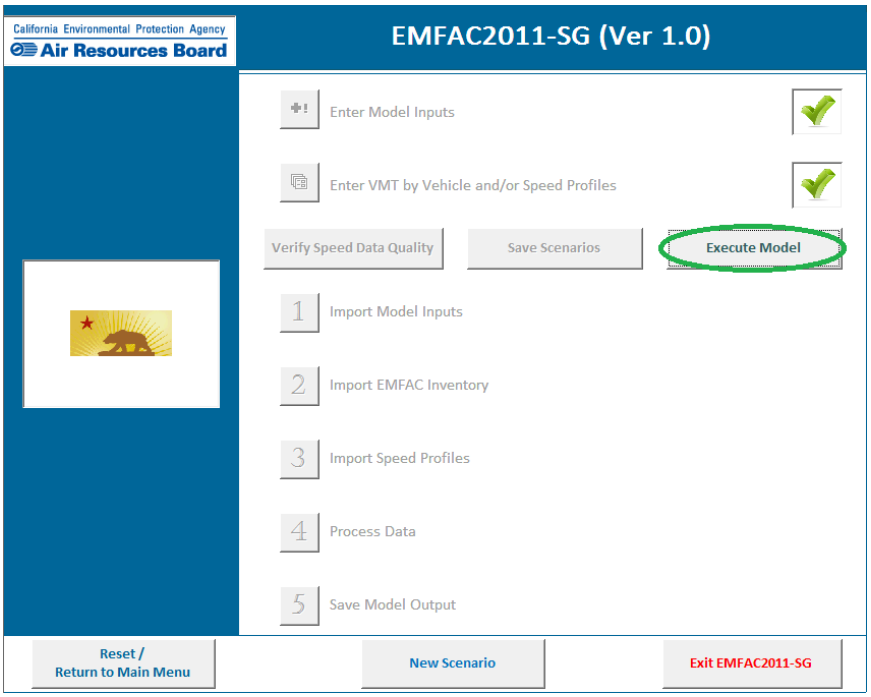
NOTE: Use the "New (blank) record" button at the bottom left corner of the screen to create multiple scenarios in one run.



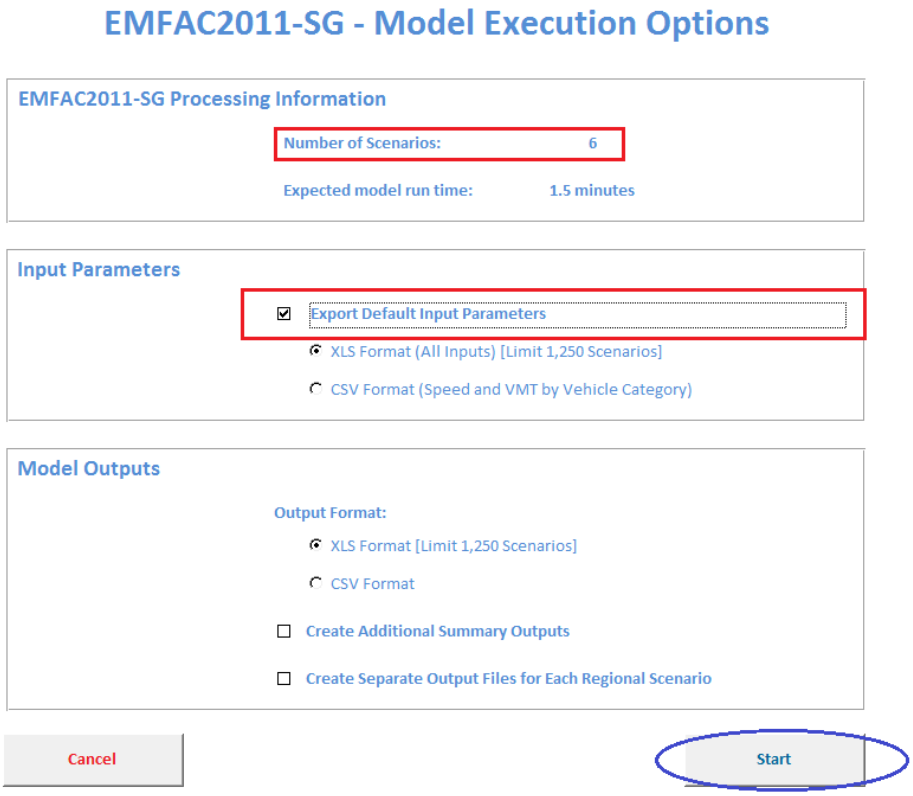
All MPOs:

c. From the scenario execution screen, click the "Save Scenarios" button as shown below and save the scenario file to disk. Name the first conformity default run as follows: "MPO 2014 RTP season", e.g., "Fresno 2014 RTP summer.xls". For 2040 runs, include a calendar year at the end of the file name (e.g., "Fresno 2014 RTP summer 2040.xls"). For SB-375, name files as "MPO SB375 Base" or "MPO SB375 Scenario X."

d. Once the file has been saved, click the "Execute Model" button (which is now active) as shown below.



e. In the "Model Execution Options" window, confirm the number of scenarios (e.g., 6) and check the "Export Default Input Parameters" option (this will create an additional file which contains the default input parameters for subsequent modifications). Then start the model run.



Kern:

A. Conformity - Run EMFAC2011-SG (EMFAC2011-SG (Ver 1.0).mdb) for the desired sub-area(s) (Kern Mojave Desert [MD] and Kern San Joaquin Valley [SJV]) and calendar year(s) using default input parameters as follows. Reminder: no EMFAC runs are required for the Indian Wells Valley and East Kern PM-10 nonattainment areas.

a. From the Main Menu, create if new or load a previously saved sub-area scenario file containing the areas and calendar years of interest (see Section 7.1 "Create Sub-Area Scenarios" beginning on Page 25 of the EMFAC2011-SG User's Guide). If a new scenario is created, then users may add multiple sub-area scenarios (e.g., for multiple calendar years) as part of the same model run (see Section 7.1, Page 29 of the User's Guide). Note that Kern SJV and Kern MD must be run separately.

Step-by-step model input instructions:

1) Sub-Area = Kern SJV, Kern MD
2) Calendar Year = see list below.

Kern SJV: 2013, 2014, 2017, 2020, 2023, 2025, 2032, 2035 (8 scenarios); 2040 (1 scenario)

NOTE: EMFAC2011 can be run only for years up to 2035. In order to complete a run for calendar year 2040, a separate default run must be created by selecting "2035" under "Calendar Year" in EMFAC. Then when updating default VMT, VMT by vehicle class, and speed distribution as described later in the document, 2040 transportation data should be used.

Kern MD: 2013, 2017, 2025, 2035 (4 scenarios); 2040 (1 scenario).

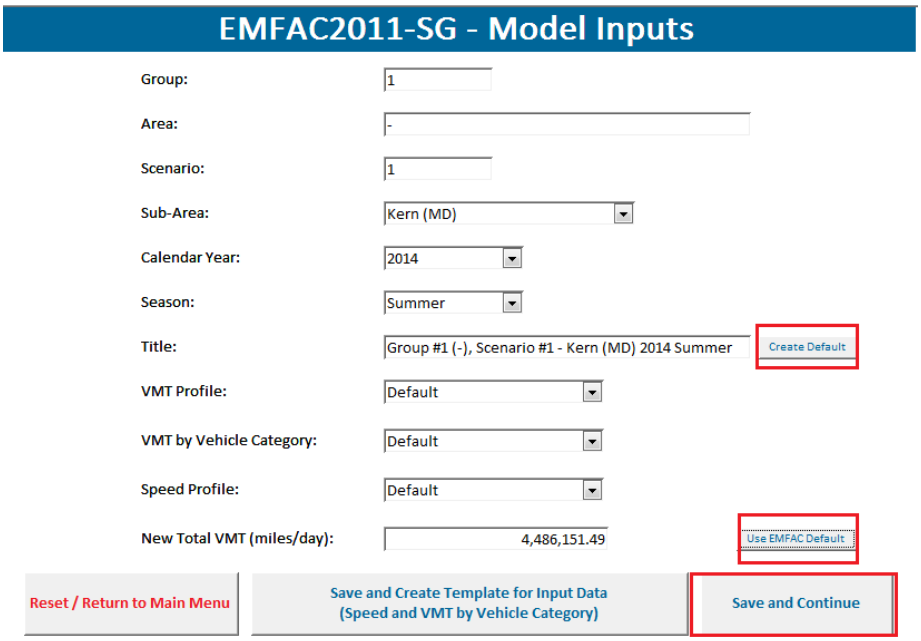
3) Season = see below.

If creating a new conformity scenario, begin with the "Summer" season for the first default run. Other seasons can be run by changing parameters manually in the input spreadsheets generated by the first default run as described later in this document.

4) Title= click "Create Default"
5) VMT Profile = "Default"
6) VMT By Vehicle Category="Default"
7) Speed Profile="Default"
8) New Total VMT=click "Use Default"

b. Once the regional scenario data are entered or loaded from the Model Inputs window, click the "Save and Continue" button at the bottom as shown below.

NOTE: Use the "New (blank) record" button at the bottom left corner of the screen to create multiple scenarios in one run.



c. Follow steps (c) through (e) as described above for 7 out of 8 MPOs. Name the first default run as follows; "MPO sub-area 2014 RTP season", e.g. "Kern MD 2014 RTP summer.xls." For 2040 runs, include a calendar year at the end of the file name (e.g., "Kern MD 2014 RTP summer 2040.xls").

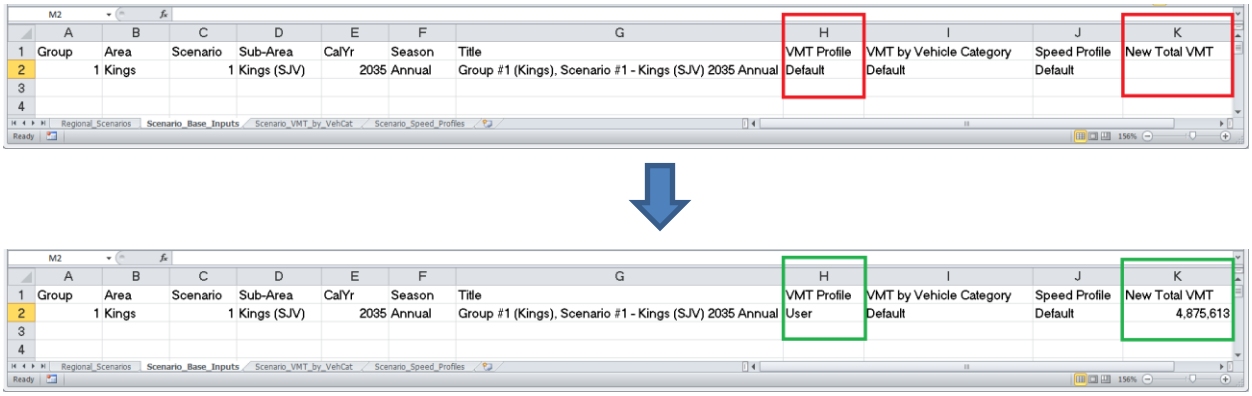
B. SB-375 – Since provisions of SB-375 apply to the entire MPO, EMFAC 2011 must be run as a whole county/MPO for SB-375. Although this option can be selected from the user interface of the model, EMFAC 2011 generates all input and output files for Kern county using only two sub-areas: SJV and MD. Therefore, the Indian Wells Valley and East Kern PM-10 nonattainment areas are not included in the model. However, based on discussion with ARB, the best currently available methodology is to complete a "Regional Scenario" run in EMFAC 2011 for the entire Kern county following conformity instructions, as outlined in steps (a) through (e) for the other seven MPOs.

2. Edit Default Data With User-Supplied Total VMT and Speed Distribution (all MPOs)

a. Once the default model execution is completed, open the corresponding "EMFAC2011-SG Input Parameters" file. (For example, if the default scenario file was named "Fresno 2014 RTP summer.xls", running EMFAC2011-SG with the "Export Default Input Parameters" option generates a file called "EMFAC2011-SG Input Parameters – Fresno 2014 RTP summer.xls.") Once this spreadsheet file is opened, check the data records in the first worksheet, "Regional Scenarios," to ensure default run completed successfully for all calendar years intended. Also check the "Season" column to ensure the appropriate season for the analysis has been selected. If the scenario records are OK, click "Save As" and save the spreadsheet with a different filename (e.g., "EMFAC2011-SG Input Parameters – Fresno 2014 RTP summer *user*.xls"). NOTE: Do NOT save as .xlsx.

Kern Conformity: Note that there will not be any data in the "Regional Scenarios" worksheet, due to running sub-area scenarios. However, it is recommended that the scenarios be confirmed in the second tab, "Scenario_Base_Inputs."

b. Open the "Scenario Base Inputs" worksheet (2nd sheet in the workbook file). Manually edit the "VMT Profile" option in Column H from "Default" to "User". Copy highlighted "New Total VMT" data from Column B of the "EMFAC2011-SG" tab in the TDT and paste them <u>as values</u> in the "New Total VMT" Column K as shown in the following figure (red shows before edits, green shows after edits). Use "EMFAC2011-SG (2040)" tab for 2040 runs.

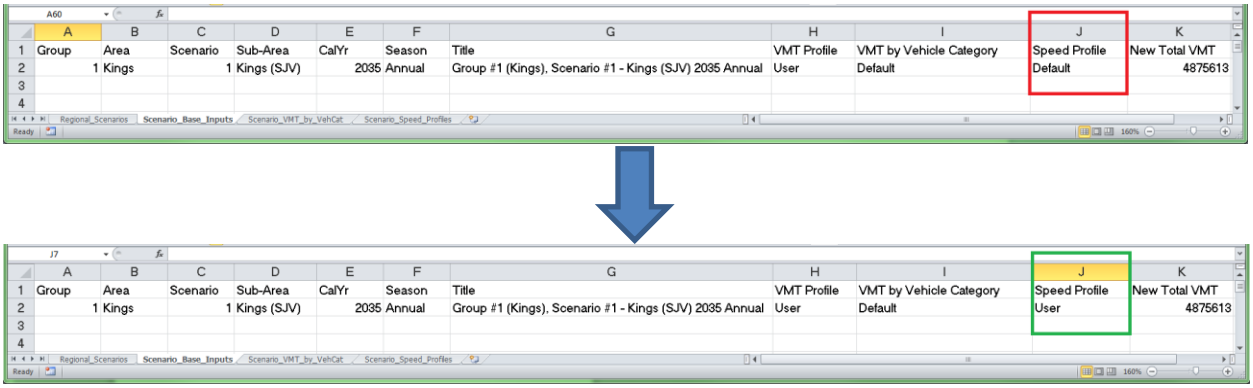


	A	B	C	D	E	F	G	H	I	J	K
1	Group	Area	Scenario	Sub-Area	CalYr	Season	Title	VMT Profile	VMT by Vehicle Category	Speed Profile	New Total VMT
2	1	Kings	1	Kings (SJV)	2035	Annual	Group #1 (Kings), Scenario #1 - Kings (SJV) 2035 Annual	Default	Default	Default	
3											
4											

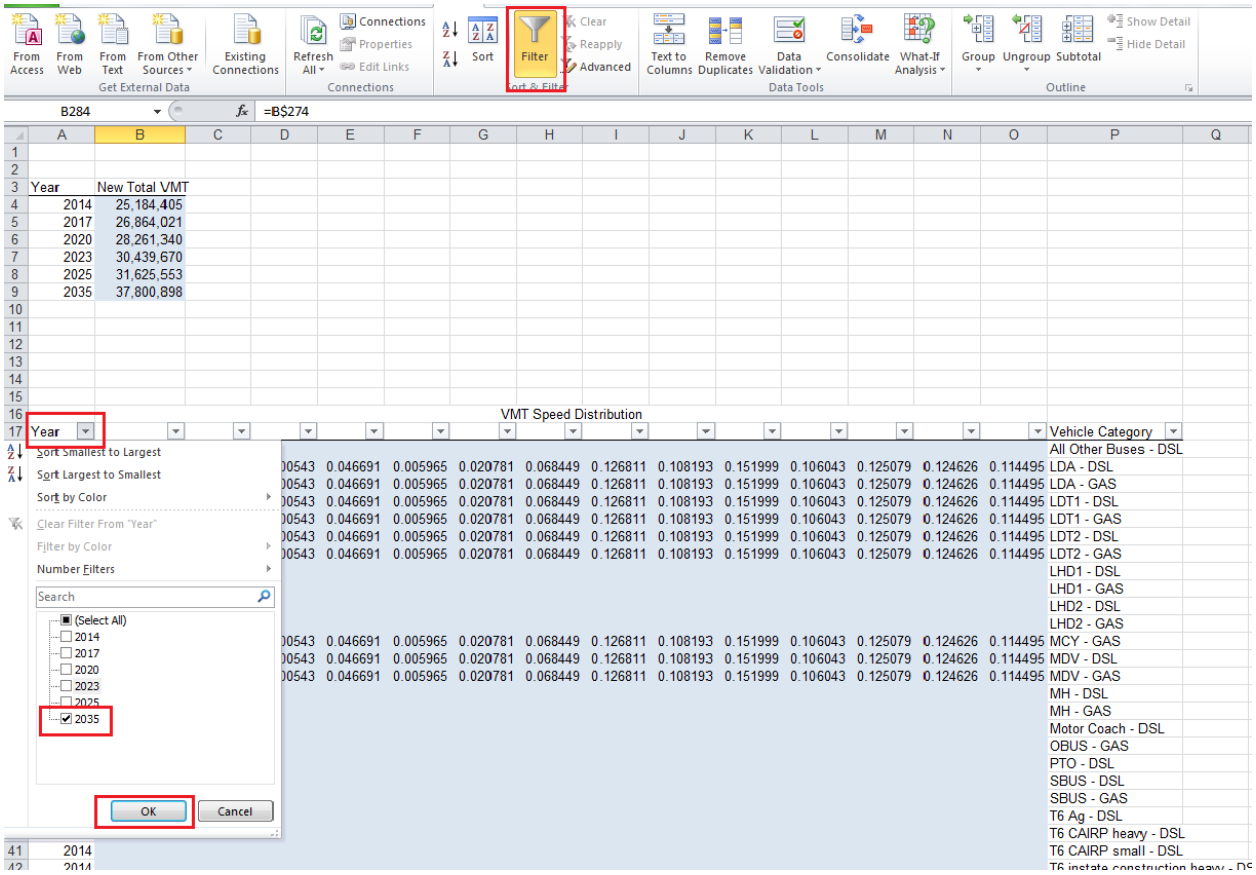
	A	B	C	D	E	F	G	H	I	J	K
1	Group	Area	Scenario	Sub-Area	CalYr	Season	Title	VMT Profile	VMT by Vehicle Category	Speed Profile	New Total VMT
2	1	Kings	1	Kings (SJV)	2035	Annual	Group #1 (Kings), Scenario #1 - Kings (SJV) 2035 Annual	User	Default	Default	4,875,613
3											
4											

Save the file after the edits are complete.

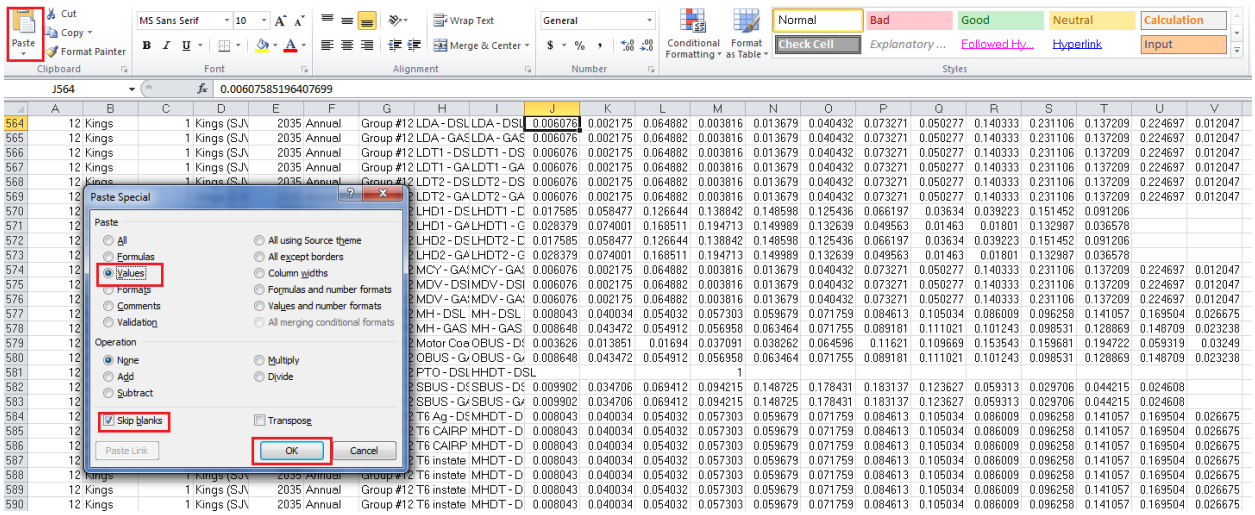
c. In the "Scenario_Base_Inputs" worksheet, manually edit the "Speed Profile" option (Column J) from "Default" to "User" for all the scenario records in the file as shown in the following figure (red shows before edit, green shows after edit).



NOTE: If not all conformity analysis years are being modeled, go to the "EMFAC2011-SG" tab in the TDT and using the "Filter" function under the Data tab (shortcut Ctrl+Shift"L"), select calendar years under analysis (see figure below). Use "EMFAC2011-SG (2040)" tab for 2040 runs.



Copy all of the speed distribution data highlighted in blue in Columns B through O in the "EMFAC2011-SG" tab, go to the "Scenario_Speed_Profiles" tab of the EMFAC Input file, select cell J2, and paste these data using "Paste Special" function as "Values" by checking the "Skip blanks" box.



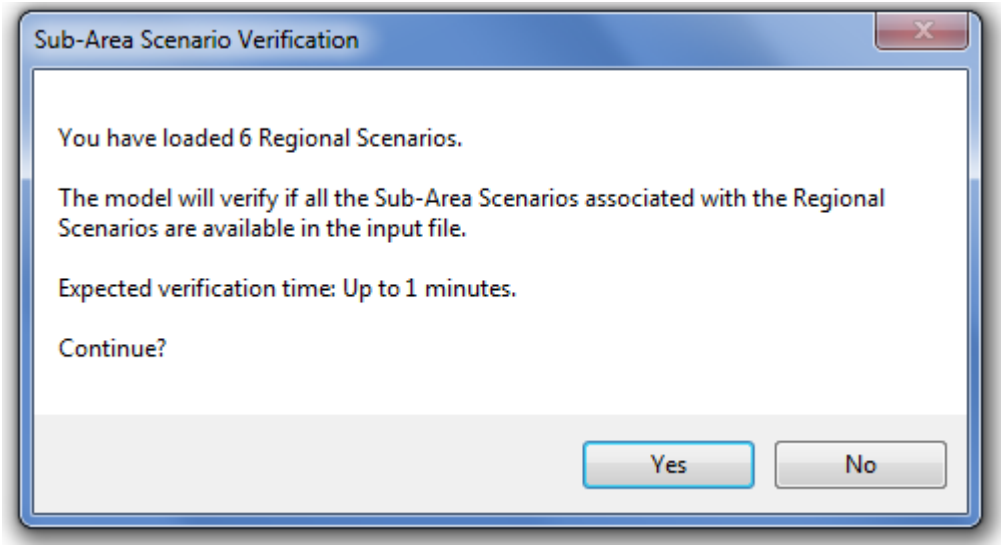
Save the file after the edits are complete.

3. <u>Generate User-Supplied VMT by Vehicle Class</u>

   a. In EMFAC2011-SG, press “New Scenario” button and load the saved input file (…user.xls) by clicking the “Load Regional Scenarios” button.

      Kern Conformity: use “Load Sub-Area Scenarios” and follow the same procedures.

   b. Click the “Save and Continue” button at the bottom of the Scenario Builder screen as shown below. A pop-up window will open requiring scenario verification such as that shown in the following figure. Click “Yes”.



Scenario QA:

1) Conformity: 8 regional scenarios (7 conformity years, 1 EIR base year); 1 scenario when modeling 2040 separately.

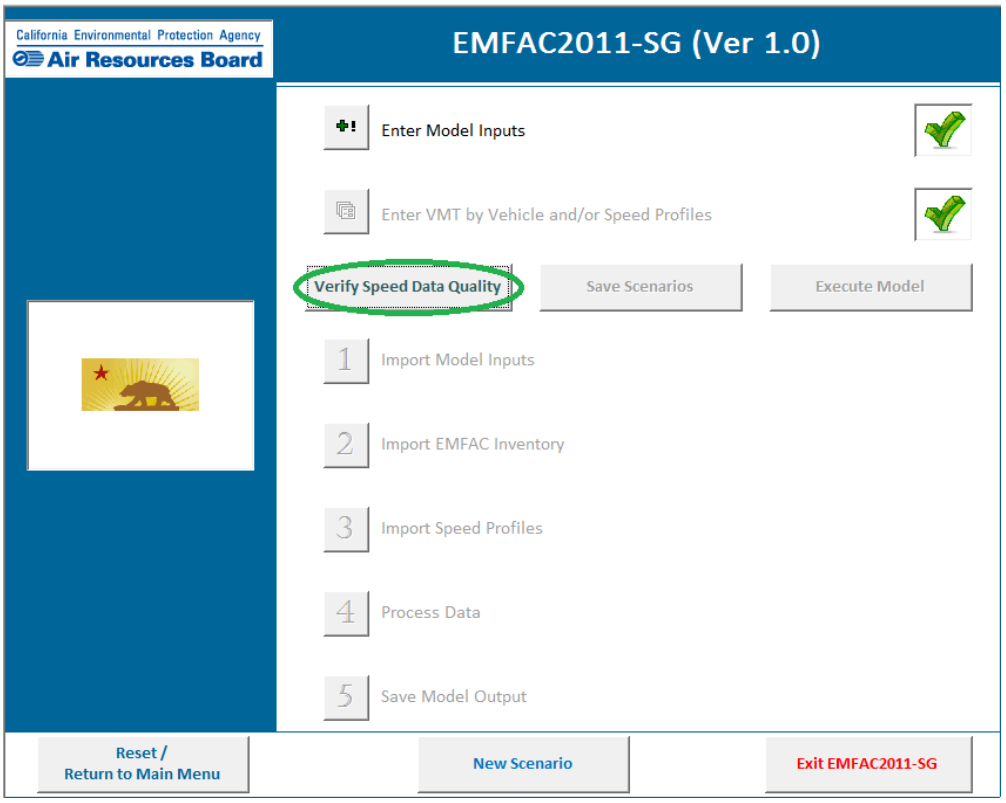
2) Kern SJV Conformity: 8 sub-area scenarios (7 conformity years, 1 EIR base year); 1 scenario when modeling 2040 separately.

3) Kern MD Conformity: 4 sub-area scenarios (3 conformity years, 1 EIR base year); 1 when modeling 2040 separately.

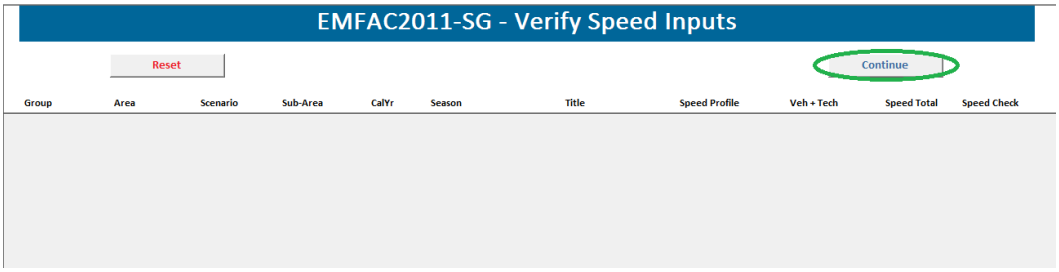
4) SB-375 Base Case and Scenario: 4 regional scenarios (3 SB-375 analysis years, 1 EIR base year); 1 scenario when modeling 2040 separately

6) Kern SB-375 Base Case and Scenario: 4 regional scenarios; 1 when modeling 2040 separately.

c. At the Scenario Execution screen, click the "Verify Speed Data Quality" button as shown below.



If the user-supplied speed distribution data was correctly loaded and the VMT fractions for each entered vehicle category correctly sum to 1 (100%), an empty "Verify Speed Inputs" screen will appear as shown below. Click the "Continue" button to proceed.

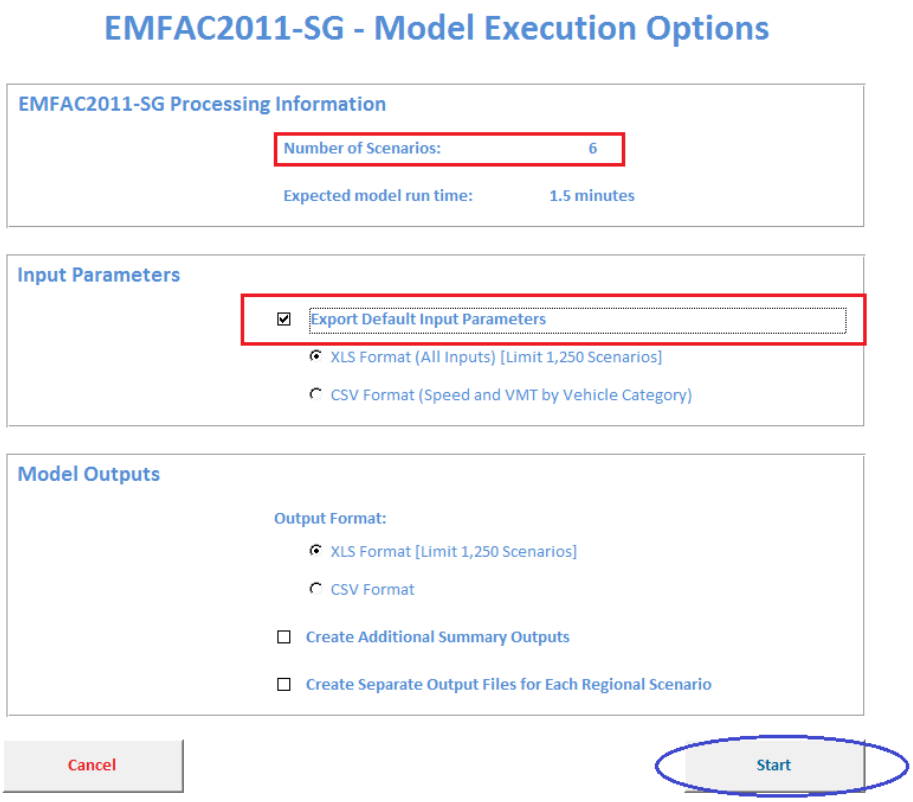


If the speed distribution inputs for any vehicle category do not sum to 100%, they will be displayed in the Verify Speed Inputs screen and have to re-input them as explained on Page 45 of the EMFAC2011-SG User's Guide.

Kern MD Conformity: If the "Verify Speed Inputs" table is populated with some vehicle categories where "Speed Total" is 0 (speed profiles will be empty), then open the input parameters file and assign 100% of the speed for those vehicle categories to Speed Bin **5MPH** (enter 1 in each speed profile row, Column J for which there are no entries) and save file. In EMFAC, select "New Scenario" and load the revised input file.

d. Click the "Save Scenario" button and save with the same name as the default run with the addition of "user" at the end of the file, e.g. "Fresno 2014 RTP summer *user*" or "Fresno SB 375 Scenario X *user*". Click the "Execute Model" button (which is now activated).

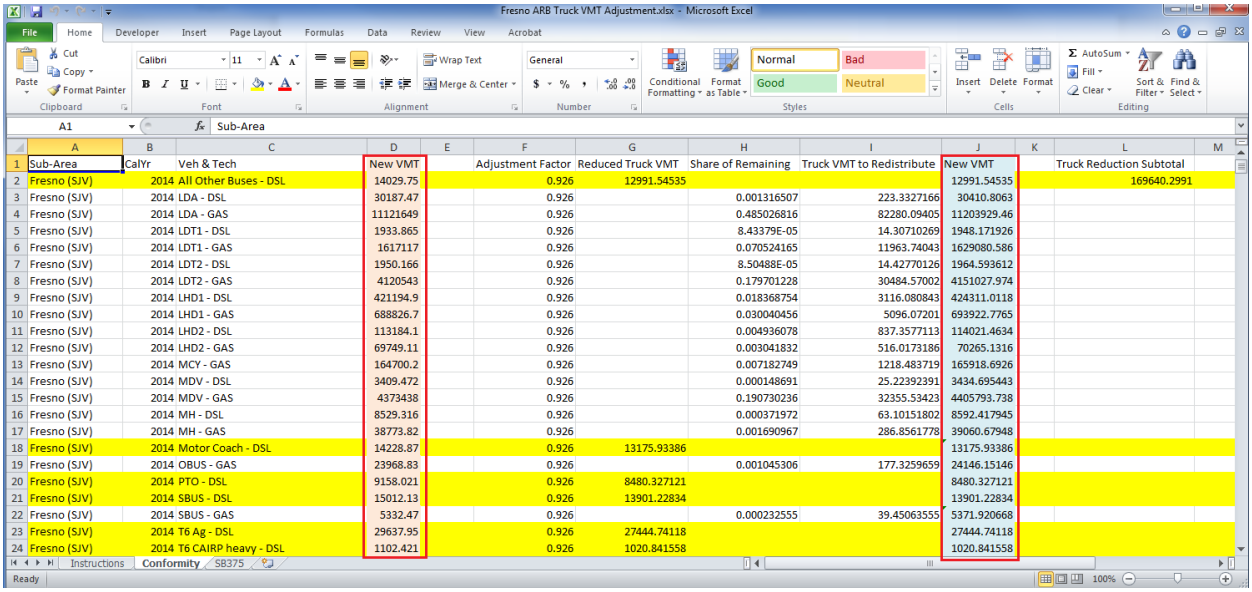
e. From the Model Execution Options screen, select "Export Default Input Parameters" under the "Input Parameters" as shown below.



4. Edit Default Data With User-Supplied VMT by Vehicle Class (all MPOs)

    a. Once model execution is completed, open the "EMFAC2011-SG Input Parameters…user" file and copy the entire "New VMT" Column I in the "Scenario_VMT_by_VehCat" tab.

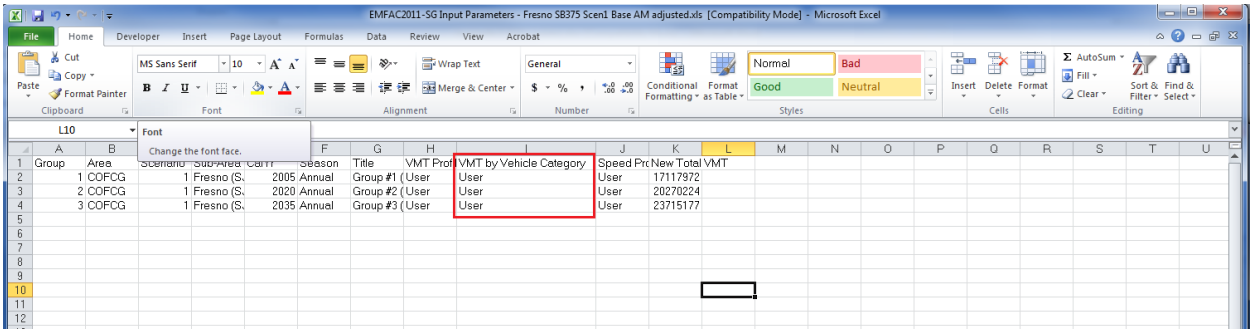
    b. Paste as values VMT by vehicle class data to Column D (highlighted in red) of the "HD VMT Shift" tab in the TDT as shown below. The workbook automatically applies ARB HD VMT adjustment factors to Diesel truck categories and redistributes this VMT to all other classes. Use "HD VMT Shift (2040)" tab for 2040 runs. NOTE: Make sure to delete analysis years that are not modeled prior to inputting VMT data to the "HD VMT Shift" tab.



Sub-Area	CalYr	Veh & Tech	New VMT	Adjustment Factor	Reduced Truck VMT	Share of Remaining	Truck VMT to Redistribute	New VMT	Truck Reduction Subtotal
Fresno (SJV)	2014	All Other Buses - DSL	14029.75	0.926	12991.54535			12991.54535	169640.2991
Fresno (SJV)	2014	LDA - DSL	30187.47	0.926		0.001316507	223.3327166	30410.8063	
Fresno (SJV)	2014	LDA - GAS	11121649	0.926		0.485026816	82280.09405	11203929.46	
Fresno (SJV)	2014	LDT1 - DSL	1933.865	0.926		8.43379E-05	14.30710269	1948.171926	
Fresno (SJV)	2014	LDT1 - GAS	1617117	0.926		0.070524165	11963.74043	1629080.586	
Fresno (SJV)	2014	LDT2 - DSL	1950.166	0.926		8.50488E-05	14.42770126	1964.593612	
Fresno (SJV)	2014	LDT2 - GAS	4120543	0.926		0.179701228	30484.57002	4151027.974	
Fresno (SJV)	2014	LHD1 - DSL	421194.9	0.926		0.018368754	3116.080843	424311.0118	
Fresno (SJV)	2014	LHD1 - GAS	688826.7	0.926		0.030040456	5096.07201	693922.7765	
Fresno (SJV)	2014	LHD2 - DSL	113184.1	0.926		0.004936078	837.3577113	114021.4634	
Fresno (SJV)	2014	LHD2 - GAS	69749.11	0.926		0.003041832	516.0173186	70265.1316	
Fresno (SJV)	2014	MCY - GAS	164700.2	0.926		0.007182749	1218.483719	165918.6926	
Fresno (SJV)	2014	MDV - DSL	3409.472	0.926		0.000148691	25.22392391	3434.695443	
Fresno (SJV)	2014	MDV - GAS	4373438	0.926		0.190730236	32355.53423	4405793.738	
Fresno (SJV)	2014	MH - DSL	8529.316	0.926		0.000371972	63.10151802	8592.417945	
Fresno (SJV)	2014	MH - GAS	38773.82	0.926		0.001690967	286.8561778	39060.67948	
Fresno (SJV)	2014	Motor Coach - DSL	14228.87	0.926	13175.93386			13175.93386	
Fresno (SJV)	2014	OBUS - GAS	23968.83	0.926		0.001045306	177.3259659	24146.15146	
Fresno (SJV)	2014	PTO - DSL	9158.021	0.926	8480.327121			8480.327121	
Fresno (SJV)	2014	SBUS - DSL	15012.13	0.926	13901.22834			13901.22834	
Fresno (SJV)	2014	SBUS - GAS	5332.47	0.926		0.000232555	39.45063555	5371.920668	
Fresno (SJV)	2014	T6 Ag - DSL	29637.95	0.926	27444.74118			27444.74118	
Fresno (SJV)	2014	T6 CAIRP heavy - DSL	1102.421	0.926	1020.841558			1020.841558	

c. Copy VMT data highlighted in blue in Column J of the "HD VMT Shift" tab and paste it as values back to the "New VMT" column of the user-modified "EMFAC2011-SG Input Parameters…user" file. Use "HD VMT Shift (2040)" tab for 2040 runs.

d. In the "Scenario Base Inputs" worksheet (2nd sheet in the workbook file) manually edit the "VMT by Vehicle Category" option in Column I from "Default" to "User" as shown below.



Group	Area	Scenario	Sub-Area	Calyr	Season	Title	VMT Prof	VMT by Vehicle Category	Speed Pro	New Total VMT
1	COFCG	1	Fresno (S.	2005	Annual	Group #1 (	User	User	User	17117972
2	COFCG	1	Fresno (S.	2020	Annual	Group #2 (	User	User	User	20270224
3	COFCG	1	Fresno (S.	2035	Annual	Group #3 (	User	User	User	23715177

e. Save the new Input file as "EMFAC2011-SG Input Parameters…*user adjusted*".

5. Run EMFAC2011 with User-Supplied Total VMT, VMT by Vehicle Class, and Speed Distribution

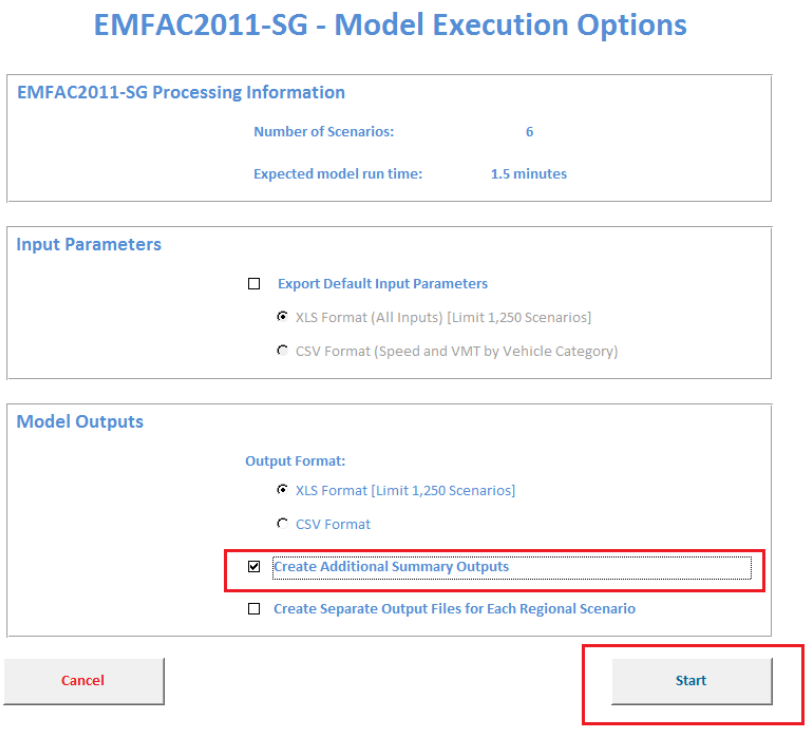
a. To import the final Input file into EMFAC2011-SG, select "New Scenario" button and load the saved file (EMFAC2011-SG Input Parameters…user adjusted.xls) by clicking the "Load Regional Scenarios" button.

Kern Conformity: use "Load Sub-Area Scenarios" and follow the same procedures.

b. Proceed to verify the number of scenarios loaded and check speed data quality as described in the last section.

c. Click the "Save Scenario" button and save with the same name as the default run with the addition of "user adjusted" at the end of the file, e.g. "Fresno 2014 RTP summer *user adjusted*" or "Fresno SB 375 Scenario X *user adjusted".* Click the "Execute Model" button (which is now activated).

d. From the Model Execution Options screen, select "Create Additional Summary Outputs" under the "Model Output" as shown below. When ready, click the "Start" button and execution begins.



Once the model run has completed, the primary output is contained in a spreadsheet file that begins with "EMFAC2011-SG Summary…". If the analysis is complete, see Section 4 for post-processing for conformity and Section 5 for post-processing for SB-375.

e. To run additional seasons for conformity, (e.g., annual for PM10 and 1996/2006 PM2.5, winter for CO), open the "EMFAC2011-SG Input...user adjusted" file and modify the following in each tab:

    1. Under "Regional_Scenarios" (tab 1), manually change season in Column E to desired season and drag down if running multiple calendar years or double click on the right bottom corner of the selected cell.

       Kern Conformity: this tab will be empty; thus, no need to make any changes.

    2. Under "Scenario_Base_Inputs" (tab 2), repeat the same procedure for Column F.
    3. Under "Scenario_VMT_by_VehCat" (tab 3), repeat the same procedure for Column F.
    4. Under "Scenario_Speed_Profile" (tab 4), repeat the same procedure for Column F.

f. Save this file with appropriate season name in the file name, e.g. "EMFAC2011-SG Input Parameters - Fresno 2014 RTP **summer** user adjusted.xls" should be saved as "EMFAC2011-SG Input Parameters - Fresno 2014 RTP **annual** user adjusted.xls" etc.
g. Repeat steps as described in Section 5. Although not all years will be needed for annual and winter conformity analysis as for the summer run, it is recommended that all years are still modeled with EMFAC2011 to avoid potential user error while selecting analysis years in the input file or EMFAC2011-SG tabs of the TDT.

6. Modify EMFAC 2011 Output Summary for Conformity Post-Processing

a. Begin by opening the "EMFAC2011-SG Summary … .xls" file in Excel that was generated. Use the "Filter" function under the Data tab and uncheck Scenario 0 in Column C; select and delete rows with Scenario 1. Then go back to the drop-down menu in Column C and turn on Scenario 0; click ok. This step ensures that emissions will not be double counted.

b. Hide Columns A, C, D, G, K, S - U.

c. Hide all other data columns except for the ones with emissions data relevant to each modeling season, as listed below.

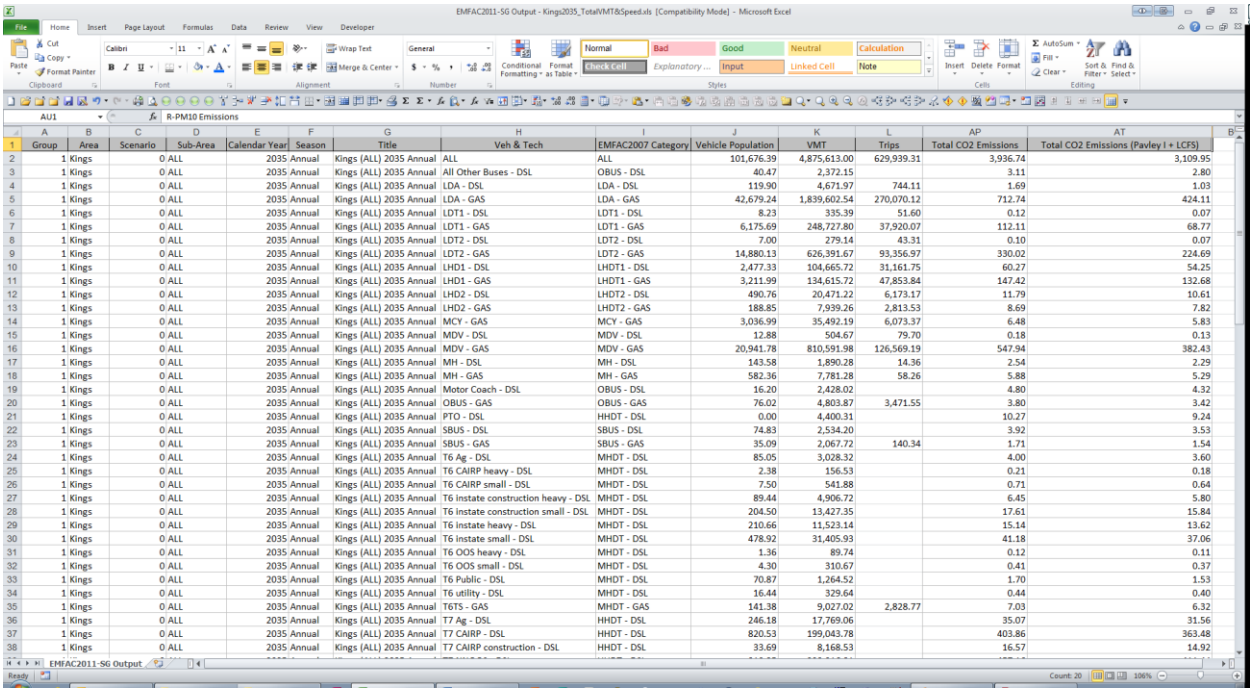
Summer: keep columns L, N (Total ROG & NOx)
Annual: keep columns N, Q, R (Total NOx, PM10, & PM2.5)
Winter: keep column M (Total CO)

Page Layout: landscape, fit to 1 page wide by 1 page tall, save, or;

File, Print: landscape orientation, fit sheet on 1 page, save.

5. Modify EMFAC 2011 Output for SB-375 Post-Processing

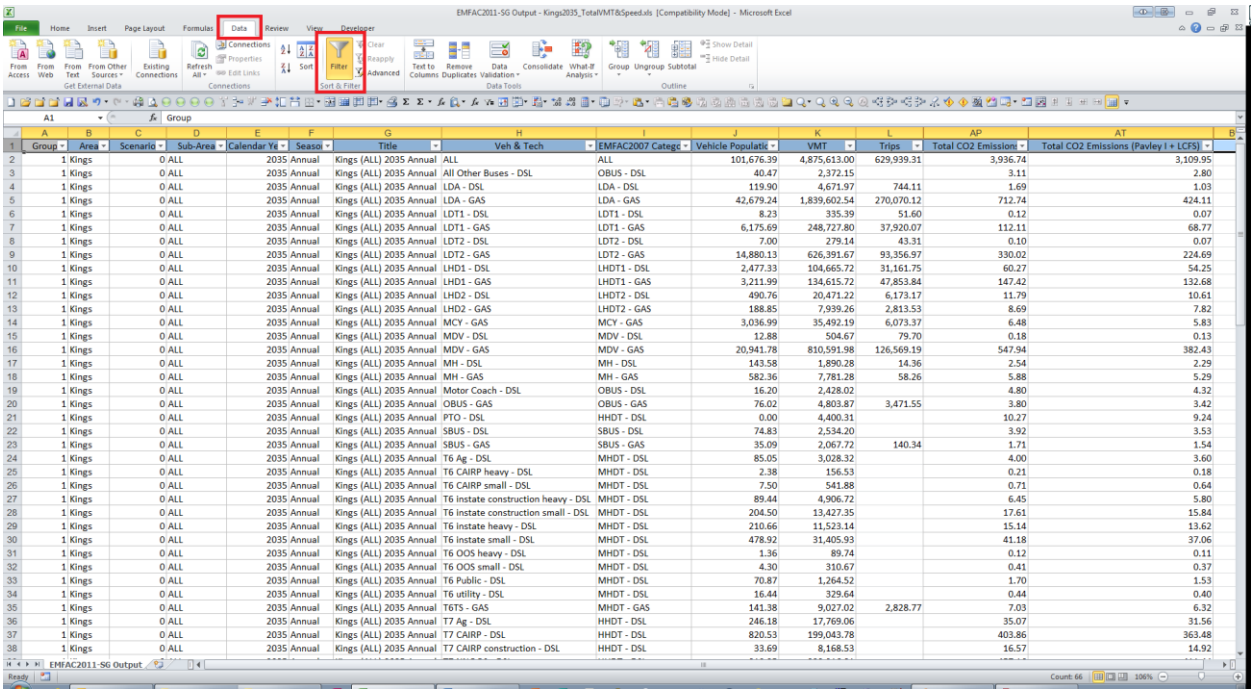
a. Open Output Spreadsheet in Excel – Begin by opening the "EMFAC2011-SG Output … .xls" file in Excel that was generated. An example output file loaded in Excel is shown below (selected columns for criteria pollutant emissions and fuel consumption have been hidden to simplify the display).



Group	Area	Scenario	Sub-Area	Calendar Year	Season	Title	Veh & Tech	EMFAC2007 Category	Vehicle Population	VMT	Trips	Total CO2 Emissions	Total CO2 Emissions (Pavley I + LCFS)
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	ALL	ALL	101,676.39	4,875,613.00	629,939.31	3,936.74	3,109.95
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	All Other Buses - DSL	OBUS - DSL	40.47	2,372.15		3.11	2.80
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDA - DSL	LDA - DSL	119.90	4,671.97	744.11	1.69	1.03
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDA - GAS	LDA - GAS	42,679.24	1,839,602.54	270,070.12	712.74	424.11
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT1 - DSL	LDT1 - DSL	8.23	335.39	51.60	0.12	0.07
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT1 - GAS	LDT1 - GAS	6,175.69	248,727.80	37,920.07	112.11	68.77
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT2 - DSL	LDT2 - DSL	7.00	279.14	43.31	0.10	0.07
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT2 - GAS	LDT2 - GAS	14,880.13	626,391.67	93,356.97	330.02	224.69
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD1 - DSL	LHDT1 - DSL	2,477.33	104,665.72	31,161.75	60.27	54.25
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD1 - GAS	LHDT1 - GAS	3,211.99	134,615.72	47,853.84	147.42	132.68
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD2 - DSL	LHDT2 - DSL	490.76	20,471.22	6,173.17	11.79	10.61
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD2 - GAS	LHDT2 - GAS	188.85	7,939.26	2,813.53	8.69	7.82
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MCY - GAS	MCY - GAS	3,036.99	35,492.19	6,073.37	6.48	5.83
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MDV - DSL	MDV - DSL	12.88	504.67	79.70	0.18	0.13
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MDV - GAS	MDV - GAS	20,941.78	810,591.98	126,569.19	547.94	382.43
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MH - DSL	MH - DSL	143.58	1,890.28	14.36	2.54	2.29
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MH - GAS	MH - GAS	582.36	7,781.28	58.26	5.88	5.29
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	Motor Coach - DSL	OBUS - DSL	16.20	2,428.02		4.80	4.32
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	OBUS - GAS	OBUS - GAS	76.02	4,803.87	3,471.55	3.80	3.42
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	PTO - DSL	HHDT - DSL	0.00	4,400.31		10.27	9.24
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	SBUS - DSL	SBUS - DSL	74.83	2,534.20		3.92	3.53
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	SBUS - GAS	SBUS - GAS	35.09	2,067.72	140.34	1.71	1.54
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 Ag - DSL	MHDT - DSL	85.05	3,028.32		4.00	3.60
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 CAIRP heavy - DSL	MHDT - DSL	2.38	156.53		0.21	0.18
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 CAIRP small - DSL	MHDT - DSL	7.50	541.88		0.71	0.64
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate construction heavy - DSL	MHDT - DSL	89.44	4,906.72		6.45	5.80
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate construction small - DSL	MHDT - DSL	204.50	13,427.35		17.61	15.84
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate heavy - DSL	MHDT - DSL	210.66	11,523.14		15.14	13.62
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate small - DSL	MHDT - DSL	478.92	31,405.93		41.18	37.06
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 OOS heavy - DSL	MHDT - DSL	1.36	89.74		0.12	0.11
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 OOS small - DSL	MHDT - DSL	4.30	310.67		0.41	0.37
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 Public - DSL	MHDT - DSL	70.87	1,264.52		1.70	1.53
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 utility - DSL	MHDT - DSL	16.44	329.64		0.44	0.40
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6TS - GAS	MHDT - GAS	141.38	9,027.02	2,828.77	7.03	6.32
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 Ag - DSL	HHDT - DSL	246.18	17,769.06		35.07	31.56
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 CAIRP - DSL	HHDT - DSL	820.53	199,043.78		403.86	363.48
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 CAIRP construction - DSL	HHDT - DSL	33.69	8,168.53		16.57	14.92

b. Prepare for Filtering – First, select the header row (Row #1). Then, click the Data tab on the Excel main menu and click the "Filter" button (Shortcut: Ctrl + Shift + L) as shown on the following page. Drop-down filtering arrows will appear for each field in the header record (Row #1).

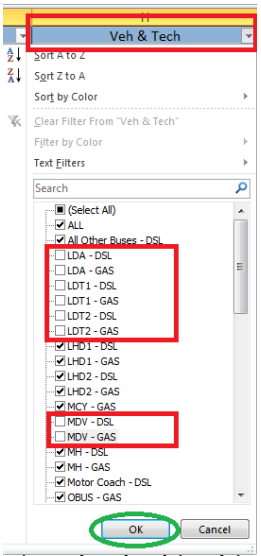
c. For Column C, uncheck Scenario 0; select and delete rows with Scenario 1. Then go back to the drop-down menu in Column C and turn on Scenario 0; click ok. This step ensures that CO_2 emission results will not be double counted.



Group	Area	Scenario	Sub-Area	Calendar Yr	Season	Title	Veh & Tech	EMFAC2007 Categ	Vehicle Populatic	VMT	Trips	Total CO2 Emission	Total CO2 Emissions (Pavley I + LCFS)
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	ALL	ALL	101,676.39	4,875,613.00	629,939.31	3,936.74	3,109.95
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	All Other Buses - DSL	OBUS - DSL	40.47	2,372.15		3.11	2.80
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDA - DSL	LDA - DSL	119.90	4,671.97	744.11	1.69	1.03
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDA - GAS	LDA - GAS	42,679.24	1,839,602.54	270,070.12	712.74	424.11
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT1 - DSL	LDT1 - DSL	8.23	335.39	51.60	0.12	0.07
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT1 - GAS	LDT1 - GAS	6,175.69	248,727.80	37,920.07	112.11	68.77
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT2 - DSL	LDT2 - DSL	7.00	279.14	43.31	0.10	0.07
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LDT2 - GAS	LDT2 - GAS	14,880.13	626,391.67	93,356.97	330.02	224.69
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD1 - DSL	LHDT1 - DSL	2,477.33	104,665.72	31,161.75	60.27	54.25
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD1 - GAS	LHDT1 - GAS	3,211.99	134,615.72	47,853.84	147.42	132.68
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD2 - DSL	LHDT2 - DSL	490.76	20,471.22	6,173.17	11.79	10.61
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	LHD2 - GAS	LHDT2 - GAS	188.85	7,939.26	2,813.53	8.69	7.82
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MCY - GAS	MCY - GAS	3,036.99	35,492.19	6,073.37	6.48	5.83
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MDV - DSL	MDV - DSL	12.88	504.67	79.70	0.18	0.13
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MDV - GAS	MDV - GAS	20,941.78	810,591.98	126,569.19	547.94	382.43
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MH - DSL	MH - DSL	143.58	1,890.28	14.36	2.54	2.29
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	MH - GAS	MH - GAS	582.36	7,781.28	58.26	5.88	5.29
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	Motor Coach - DSL	OBUS - DSL	16.20	2,428.02		4.80	4.32
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	OBUS - GAS	OBUS - GAS	76.02	4,803.87	3,471.55	3.80	3.42
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	PTO - DSL	HHDT - DSL	0.00	4,400.31		10.27	9.24
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	SBUS - DSL	SBUS - DSL	74.83	2,534.20		3.92	3.53
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	SBUS - GAS	SBUS - GAS	35.09	2,067.72	140.34	1.71	1.54
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 Ag - DSL	MHDT - DSL	85.05	3,028.32		4.00	3.60
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 CAIRP heavy - DSL	MHDT - DSL	2.38	156.53		0.21	0.18
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 CAIRP small - DSL	MHDT - DSL	7.50	541.88		0.71	0.64
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate construction heavy - DSL	MHDT - DSL	89.44	4,906.72		6.45	5.80
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate construction small - DSL	MHDT - DSL	204.50	13,427.35		17.61	15.84
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate heavy - DSL	MHDT - DSL	210.66	11,523.14		15.14	13.62
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 instate small - DSL	MHDT - DSL	478.92	31,405.93		41.18	37.06
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 OOS heavy - DSL	MHDT - DSL	1.36	89.74		0.12	0.11
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 OOS small - DSL	MHDT - DSL	4.30	310.67		0.41	0.37
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 Public - DSL	MHDT - DSL	70.87	1,264.52		1.70	1.53
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6 utility - DSL	MHDT - DSL	16.44	329.64		0.44	0.40
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T6TS - GAS	MHDT - GAS	141.38	9,027.02	2,828.77	7.03	6.32
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 Ag - DSL	HHDT - DSL	246.18	17,769.06		35.07	31.56
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 CAIRP - DSL	HHDT - DSL	820.53	199,043.78		403.86	363.48
1	Kings	0	ALL	2035	Annual	Kings (ALL) 2035 Annual	T7 CAIRP construction - DSL	HHDT - DSL	33.69	8,168.53		16.57	14.92

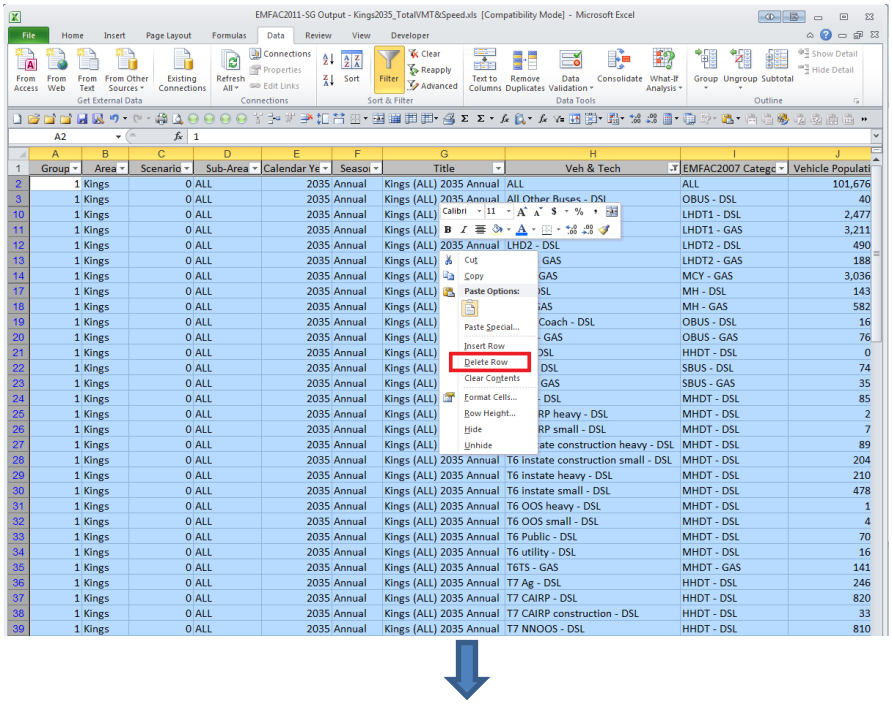
d. Filter Non-SB-375 Categories – Next, use the drop-down menu under the "Veh & Tech" column (Column H) and <u>uncheck</u> the eight vehicle categories listed below.

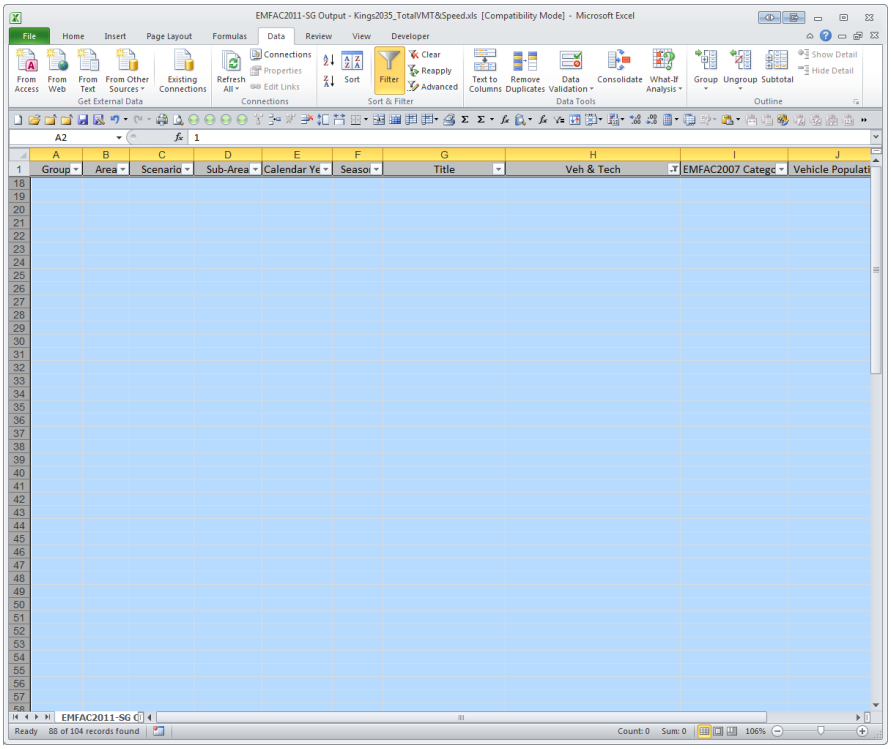
1. LDA-DSL
2. LDA-GAS
3. LDT1-DSL
4. LDT1-GAS
5. LDT2-DSL
6. LDT2-GAS
7. MDV-DSL
8. MDV-GAS



It is simpler to leave the non-SB-375 categories checked in this case since they will be deleted in the next step. When finished, click the "OK" button as shown.

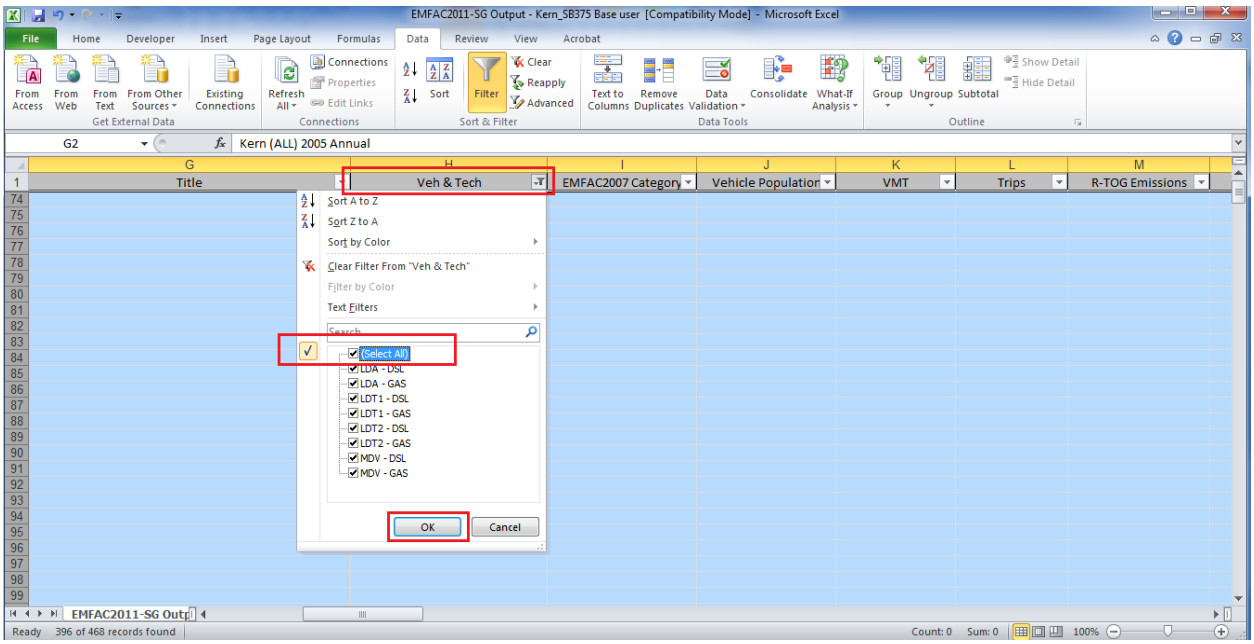
e. Remove Records for Non-SB-375 Categories – The displayed records are the filtered non-SB-375 vehicle category records. Select all rows from row 2 to the end of the report and right-click on the displayed data records and select the "Delete Row" option from the pop-up menu as shown below.





The selected non-SB375 vehicle records are now deleted.

f. Remove Filter and Save File – Remove the data filter by clicking on the "Filter" button for Veh & Tech column (in row 1, column H) and "Select All" remaining vehicle classes. As shown below, the remaining records in the file should be just those for the eight SB-375 vehicle categories (LDA, LDT1, LDT2, MDV, each both DSL and GAS). Click ok.



Now save this modified version with a different filename (e.g., MPO SB375 Base Case Summary). This file now contains EMFAC2011-SG VMT and CO_2 emissions (both with and without Pavley I + LCFS benefits; however, only "without" Pavley I + LCFS should be used for post-processing) for just the SB-375 vehicle categories.

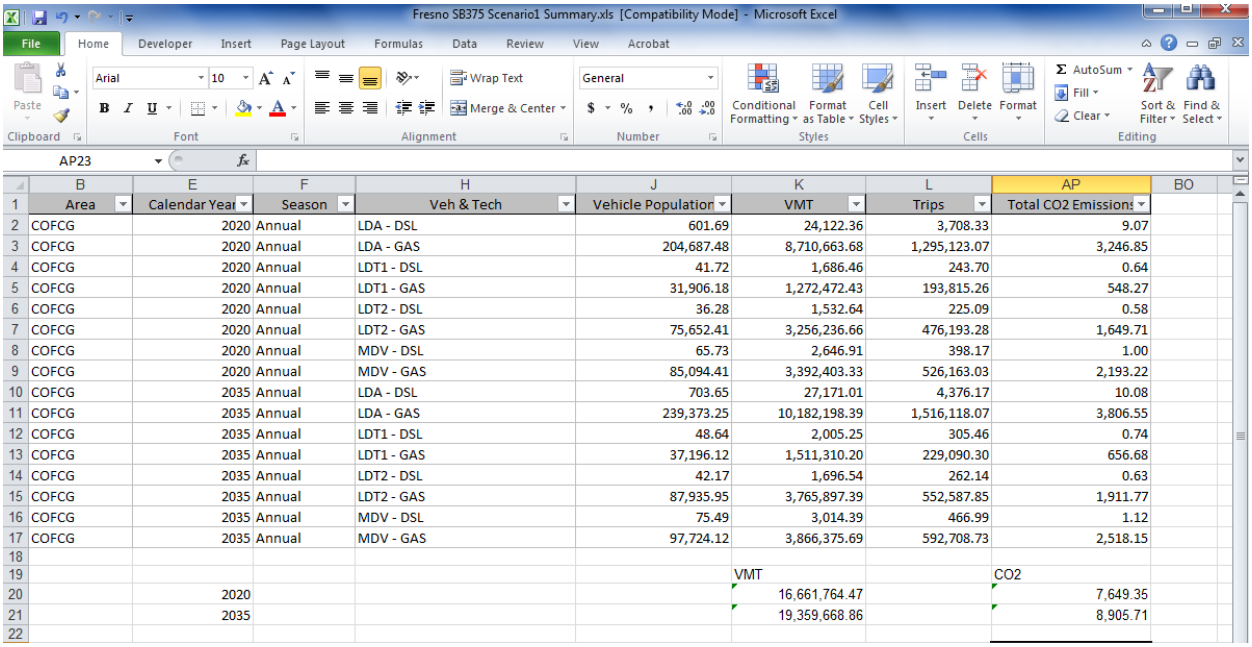
g. Hide Columns: A, C, D, G, I, L – AO, AQ – BN.

Remaining Columns should be B, E, F, H, J, K, and AP.

h. Sum columns J, K, AP by analysis year (e.g., EIR base year, 2005, 2020, 2035, 2040). Format cells: number, zero decimals, use comma separator. See figure below.

Page Layout: landscape, fit to 1 page wide by 1 page tall, save or;

File, Print: landscape orientation, fit sheet on 1 page, save.



	B	E	F	H	J	K	L	AP	BO
1	Area	Calendar Year	Season	Veh & Tech	Vehicle Population	VMT	Trips	Total CO2 Emissions	
2	COFCG	2020	Annual	LDA - DSL	601.69	24,122.36	3,708.33	9.07	
3	COFCG	2020	Annual	LDA - GAS	204,687.48	8,710,663.68	1,295,123.07	3,246.85	
4	COFCG	2020	Annual	LDT1 - DSL	41.72	1,686.46	243.70	0.64	
5	COFCG	2020	Annual	LDT1 - GAS	31,906.18	1,272,472.43	193,815.26	548.27	
6	COFCG	2020	Annual	LDT2 - DSL	36.28	1,532.64	225.09	0.58	
7	COFCG	2020	Annual	LDT2 - GAS	75,652.41	3,256,236.66	476,193.28	1,649.71	
8	COFCG	2020	Annual	MDV - DSL	65.73	2,646.91	398.17	1.00	
9	COFCG	2020	Annual	MDV - GAS	85,094.41	3,392,403.33	526,163.03	2,193.22	
10	COFCG	2035	Annual	LDA - DSL	703.65	27,171.01	4,376.17	10.08	
11	COFCG	2035	Annual	LDA - GAS	239,373.25	10,182,198.39	1,516,118.07	3,806.55	
12	COFCG	2035	Annual	LDT1 - DSL	48.64	2,005.25	305.46	0.74	
13	COFCG	2035	Annual	LDT1 - GAS	37,196.12	1,511,310.20	229,090.30	656.68	
14	COFCG	2035	Annual	LDT2 - DSL	42.17	1,696.54	262.14	0.63	
15	COFCG	2035	Annual	LDT2 - GAS	87,935.95	3,765,897.39	552,587.85	1,911.77	
16	COFCG	2035	Annual	MDV - DSL	75.49	3,014.39	466.99	1.12	
17	COFCG	2035	Annual	MDV - GAS	97,724.12	3,866,375.69	592,708.73	2,518.15	
18									
19						VMT		CO2	
20		2020				16,661,764.47		7,649.35	
21		2035				19,359,668.86		8,905.71	
22									

SUMMARY OF RECOMMENDED NAMING CONVENTIONS:

Conformity:

1. Default run

   "MPO 2014 RTP season" (if running all years)

   "MPO 2014 RTP season year" (if running one year; i.e. 2040)

2. User-specified input

Total VMT and Speed Distribution Modified:

   "EMFAC2011-SG Input Parameters - MPO 2014 RTP season user" (if running all years)

   "EMFAC2011-SG Input Parameters - MPO 2014 RTP season year user" (if running one year; i.e. 2040)

Total VMT and Speed Distribution AND VMT by Vehicle Class Modified:

   "EMFAC2011-SG Input Parameters - MPO 2014 RTP season user adjusted" (if running all years)

"EMFAC2011-SG Input Parameters - MPO 2014 RTP season year user adjusted" (if running one year; i.e. 2040)

3. User-specified run

   "MPO 2014 RTP season user adjusted" (if running all years)

   "MPO 2014 RTP season year user adjusted" (if running one year, i.e. 2040)

4. Post-processing

   Overwrite "EMFAC2011-SG Summary - MPO 2014 RTP season user" after cleaning it up

SB375:

1. Default run

   "MPO SB375" (if running base)

   "MPO SB375 year" (if running base for one year, i.e. 2040)

   "MPO SB375 Scenario X" (if running scenarios)

"MPO SB375 Scenario X year" (if running a scenario for one year, i.e. 2040)

2. User-specified input

"EMFAC2011-SG Input Parameters - MPO SB375 user" (if running base)

"EMFAC2011-SG Input Parameters - MPO SB375 year user" (if running base for one year, i.e. 2040)

"EMFAC2011-SG Input Parameters - MPO SB375 Scenario X" (if running scenarios)

"EMFAC2011-SG Input Parameters - MPO SB375 Scenario X year" (if running a scenario for one year, i.e. 2040)

3. User-specified run

"MPO SB375 user" (if running base)

"MPO SB375 year user" (if running base for one year, i.e. 2040) "MPO SB375 Scenario X" (if running scenarios)

"MPO SB375 Scenario X" (if running a scenario for one year, i.e. 2040)

4. Post-processing

Save the cleaned-up "EMFAC2011-SG Output…" as a new file –

"MPO SB375 Summary" (if running base)

"MPO SB375 year Summary" (if running base for one year, i.e. 2040)"MPO SB375 Scenario X Summary" (if running scenarios)

"MPO SB375 Scenario X year Summary" (if running a scenario for one year, i.e. 2040)

CONFORMITY AND SB-375 POST-PROCESSING:

1. <u>Conformity</u>

The purpose of these instructions is to provide a quick overview of the associated spreadsheets developed for the San Joaquin Valley MPOs to estimate mobile source emissions for compliance with emission budgets for the Conformity Analysis. For all spreadsheets below, save with MPO name, retain the instructions and explanation tabs, and delete other MPO tabs.

a. 2014 RTP Conformity EMFAC: copy/paste emission results generated with EMFAC2011 above. The spreadsheet automatically calculates exhaust emission reductions for state and local control measures consistent with the applicable SIP. The final emission estimates are automatically rounded off to two decimal places.

b. 2014 RTP Conformity Paved Road, Unpaved Road, and Construction Dust Spreadsheets

c. 2014 RTP Conformity Totals
    a. If there is a failure for PM10 and/or PM2.5, request Trading Spreadsheets

2. SB-375

The RTAC worksheets used in the SJV MPO May 2010 submittal have been used maintaining the "minus XX only" VMT calculation approach. The RTAC worksheets have been modified and provided to each SJV MPO individually to summarize both Base Case, RTP/SCS Scenario and two additional Alternatives.

a. Start with the "mpo data sum" tab and update household population for the EIR base year, 2020, 2035 and 2040. *Household population and 2005 base data should not change at this point.* Insert new entries as follows for the EIR base year, 2020, 2035 and 2040 analysis years:

- CO2 Emissions per Weekday – LDA, LDT1, LDT2, and MDV (Tons)
- Vehicle Miles Traveled per Weekday – LDA, LDT1, LDT2, and MDV (Miles, in Thousands)
- CO2 Emissions per Weekday – all vehicle classes (Tons). These data will be in Column O of the "EMFAC2011-SG Summary…" spreadsheet generated by EMFAC2011-SG.
- Total Vehicle Miles Traveled per Weekday – All Vehicles and Purposes (Miles, in Thousands). These data will be in Column I of the "EMFAC2011-SG Summary…" spreadsheet generated by EMFAC2011-SG.

b. The remaining entries will auto-calculate based on the new data.

NOTE: the VMT percent reduction from total provides an APPROXIMATION only; the emission results using the VMT percent reduction from total will vary when accounting for the speed distribution.