Caltrans District 6 & 10 Forecasting On-Call
In-Person Wrap-up Training
Wednesday, August 9, 2017
9:00 am – 4:00 pm

Location: DOT Room 215/D6 - Manchester Computer Lab https://goo.gl/maps/m99p44Jgi5J2

1. **Logistics**
   - Sign-in Sheet
   - Restrooms and Safety
   - Breaks and Lunch
   - Overview of training agenda

2. **Comparison of VMIP 1 to VMIP 2**
   - Land Use: Simplified residential and employment categories and addition of group quarters population
   - Socio-economic: Employee salary and household income relationship for home-work trips
   - Inter-regional Travel: Improved control over scenario evaluation of inter-regional assumptions
   - Updated Scenario Development: Created single scenario spreadsheets and clear documentation
   - Sensitivity to the "Ds:" Used GIS centerline network and included accessibility variables
   - Refined Post-Processors: Added flexibility to summary processes including select link assignment
     Exercise 1: Updating catalog and inputs from previous model

3. **Network\Transit Editing and Data Transferring**
   - Exporting data from geodatabase
   - Updated .NET and .LIN
   - Importing data into geodatabase
     Exercise 2: Modify roadway and create new geodatabase

4. **Review Inputs in ArcGIS**
   - Verifying path to geodabase
   - Scenario Lanes, Speed, Facility Type
   - Changes from scenario to base
   - TAZ boundary and land use
     Exercise 3: View model network in scenario MXD and comparison in Master MXD

5. **Post-processors and Viewing Results**
   - Select link and FRATAR
   - Bandwidth
   - Compute V/C
     Exercise 4: Prepare, run, and review network outputs

6. **Model Validation**
    - Scenario Summary Spreadsheet
        - Person trips, mode choice, VMT
        - SED vs DOF
    - Model and Count Validation
      Exercise 5: Review model output in scenario summary spreadsheet

7. **VMT Summaries**
    - Types of VMT
    - Model vs HPMS vs CHTS
    - Model, Zone, Study Area, Corridor
      Exercise 6: Summarize VMT

8. **Other Topics**
    - Subarea Extraction

      Exercise 7: CSTDM Example of Sub-Area extraction

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EXERCISE 1: UPDATING CATALOG AND INPUTS FROM PREVIOUS MODEL

This exercise covers the use of a previous model inputs for the new model structure. Confirming that the zone system is the same between networks and TAZs is important so that the trips are located in the correct geography and use the corresponding centroid.

Note that the results may be inconsistent since the model was calibrated using the MIP 2 network and land use categories.

Network and Transit Line

1. Create a new child scenario (FC15_Alt1) from the most similar year (i.e. 2015)
2. Update the highway, turn penalty and transit to refer to the appropriate files
   a. Highway network
      Exercise01\FC_MASTER_NETWORK_HWY_20130302_MB_Proj_wEJ.NET
   b. Turn penalty Exercise01\FC10_Base_TurnPen.csv
   c. Transit line (for both peak and off-peak) Exercise01\FC14_PT_New.LIN
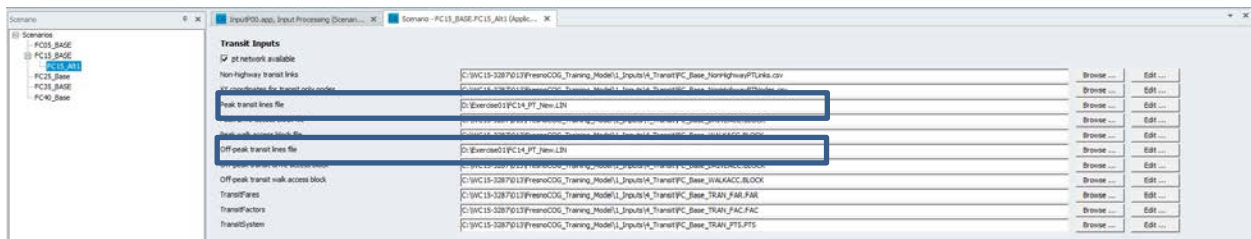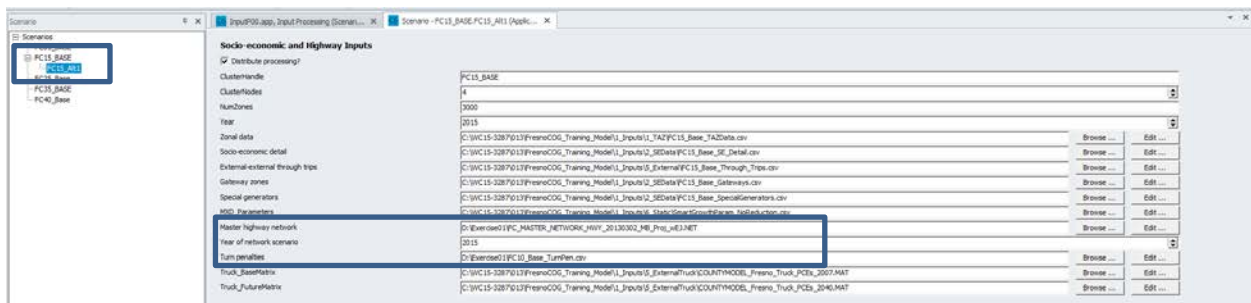
3. Save the new scenario
4. Run the Input Prep
5. Review the outputs

Land Use and Demographics

Residential demographics for each TAZ were based on Census. The only change from VMIP 1 for residential was the percentage of trips that enter or exit the model area by zone. If only the number of households were changed, the current demographics would not need to change. For land use in VMIP 1 that included demographic changes, the Cross-class percentages may also need to be updated.

As part of the VMIP 2 update, the employment categories were aggregated based on the table below. When using VMIP 1 land use with the VMIP 2 model, the categories should align so that the trip generation and other factors function properly.

NON-RESIDENTIAL LAND USE CATEGORY AGGREGATION STRUCTURE					
VMIP 2	**VMIP 1**	**Description**	**NAICS**	**CTPP**	**CSTDM**
EMPEDU	EDUCATION	Educational Services (Schools, Junior Colleges, Colleges, Universities, Professional Schools)	61	Edu / Health	Education and health
EMPFOO	ACCOMODTNS	Accommodation	721	Arts/Rec/Accom/Food	Leisure and hospitality
	FOOD	Food Services	722	Arts/Rec/Accom/Food	Leisure and hospitality
	ENT_REC	Arts, Entertainment, and Recreation	71	Arts/Rec/Accom/Food	Leisure and hospitality
EMPGOV	PUBLIC	Public Administration	92	Government	Office
EMPIND	CONSTRUCTN	Construction	23	Construction	Primary and Secondary
	UTILITIES	Utilities	22	Trans / Util.	Trans / Util.
	SVC_OTHER	Other Services (except Public Administration)	81	Other Service	Other Service
	WHOLESALE	Wholesale Trade	42	Wholesale	Wholesale
	WAREHOUSE	Transportation and Warehousing	48-49	Trans / Util.	Trans / Util.
EMPMED	HEALTH	Health Care and Social Assistance	62	Edu / Health	Education and health
EMPOFC	INFORMATN	Information	51	Information	Office

NON-RESIDENTIAL LAND USE CATEGORY AGGREGATION STRUCTURE					
VMIP 2	VMIP 1	Description	NAICS	CTPP	CSTDM
	FINAN_INSR	Finance and Insurance	52	FIRE	Office
	REALESTATE	Real Estate and Rental and Leasing	53	FIRE	Office
	SVC_PROF	Professional, Scientific, and Technical Services	54	Prof Sci, Admin	Office
	SVC_MNGMNT	Management of Companies and Enterprises	55	Prof Sci, Admin	Office
	SVC_ADMIN	Administrative and Support and Waste Management and Remediation Services	56	Prof Sci, Admin	Office
EMPRET	RETAIL	Retail Trade	44-45	Retail	Retail
EMPOTH	MANUFACTUR	Manufacturing	31-33	Manufacturing	Primary and Secondary
	MINING	Mining, Quarrying, and Oil and Gas Extraction	21	Ag_Mining	Primary and Secondary
EMPAGR	AGRICULTUR	Agriculture, Forestry, Fishing and Hunting	11	Ag_Mining	Primary and Secondary

EXERCISE 2: MODIFY ROADWAY AND CREATE NEW GEODATABASE

This exercise exports a .NET and .SHP from the geodatabase for editing the .NET and exports a .LIN for the transit geodatabase. After editing, the second step in the process is importing both files back into the geodatabase.

Export the Highway Network
1. Open the script (Exercise02\ExportNetwork_Fresno.s) in Cube
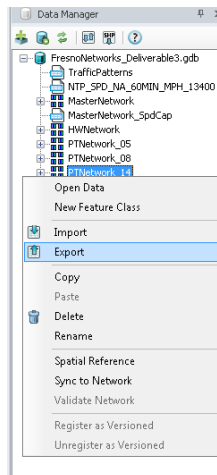2. Edit the path to the geodatabase network to export and the file name for the exported file
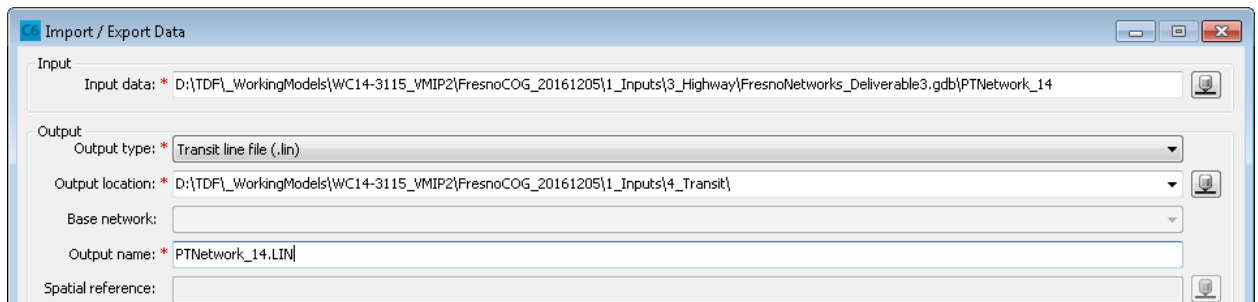

3. Run the script to export a .NET and .SHP

Export the Transit Line
1. To export the transit line, open the geodabase in the data viewer
2. Right click on the transit line to export

3. Enter the path and filename to export to (making sure not to export to the geodatabase and making sure to add .lin at the end of the filename)
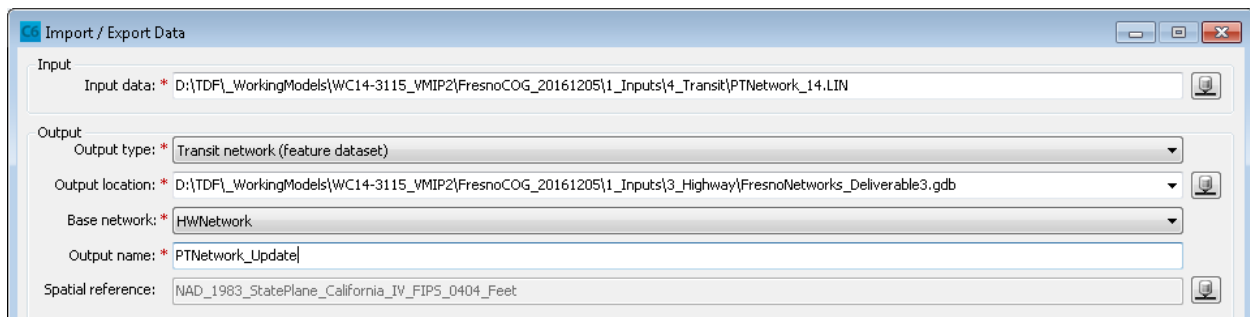
Import the Highway Network
1. Open the script (Exercise02\ImportNetwork_Fresno.s) in Cube
2. Edit the path to the .NET and .SHP from the network export step
3. For a new geodatabase, copy the original and rename. For the existing geodatabase, change the network name and refer to the original database.

```
1   NETIN="C:\WC15-3287\013\FresnoCOG_Training_Model\1_Inputs\3_Highway\Fresno_Updated.NET" ; Include .net
2   NETOUT="C:\WC15-3287\013\FresnoCOG_Training_Model\1_Inputs\3_Highway\FresnoNetworks_Deliverable3.gdb\Fresno_Updated" ; Include .net or path to geodatabase and feature, if in the same
3   geodatabase as the original, a new name should be used for the network layer.
    GEOMITRY="C:\WC15-3287\013\FresnoCOG_Training_Model\1_Inputs\3_Highway\Fresno_Updated.SHP" ; path to geometry source including .shp
4
5   RUN PGM=NETWORK MSG="Import Highway Network from .net and .shp"
6
7   FILEI NETI[1]="@NETIN@"
8   FILEI GEOMI[1]="@GEOMITRY@"
9   FILEO NETO="@NETOUT@"
10  phase=linkmerge
11     GEOMETRYSOURCE=1
12   endphase
13  ENDRUN
```

Import the Transit Line
1. Right click in the data manager and select Import
2. Edit the path to refer to the edited transit line, the output geodatabase with new transit line name, and the updated master network in the Base network drop down menu


Remember to update the catalog key for the highway network and transit lines to refer to the updated file.

EXERCISE 3: VIEW MODEL NETWORK IN SCENARIO MXD AND COMPARISON IN MASTER MXD

Each scenario contains a results geodatabase and MXD file. The GIS directory references these files. GIS paths are either absolute or relative and sometimes the data need to be refreshed.

1. Open the SCENARIO.MXD in ArcGIS
2. If the data are not displayed, there will be a red mark showing the data cannot be found.
3. Right click the layer and select Properties
4. Select the Source tab and update the path to the correct location and layer
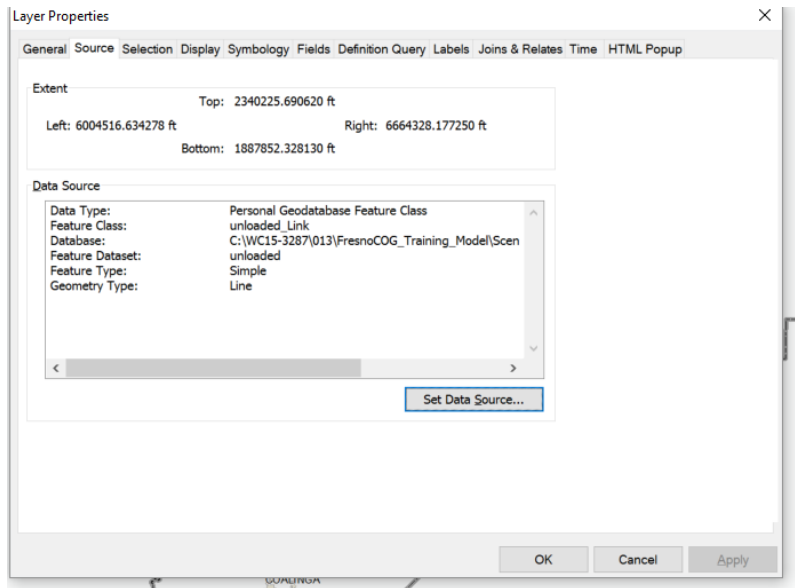
Depending on which steps of the model were run, some of the other scenario data may not exist, so the Input Processing step may need to be run first.

## EXERCISE 4: PREPARE, RUN, AND REVIEW POST-PROCESSOR OUTPUTS

Creates select link or zone analysis for review in personal geodatabase file. If desired, select zone can be adjusted to match ITE control totals for easier review of select zone. The high level steps for this process are:

- Full model run with land use representing the project

- Prepare trip generation target and input file

- Define Scenario detail in Cube Application keys and running the post-process

- Review results

Full Model Run Preparing for Select Link/Fratar

The Select Link and Fratar post-process is based on a full model run for a given scenario and tracks the route/distribution of auto trips for a single zone or a group of zones. Before running the model, it is recommended to review the TAZ boundary to determine which zone(s) reflect the project, the land use in the zone(s), and if additional zones should be created.

- The MODELNAME.MXD in the GIS directory contains a later for the TAZ boundary. (TAZ 1842 in the example below)
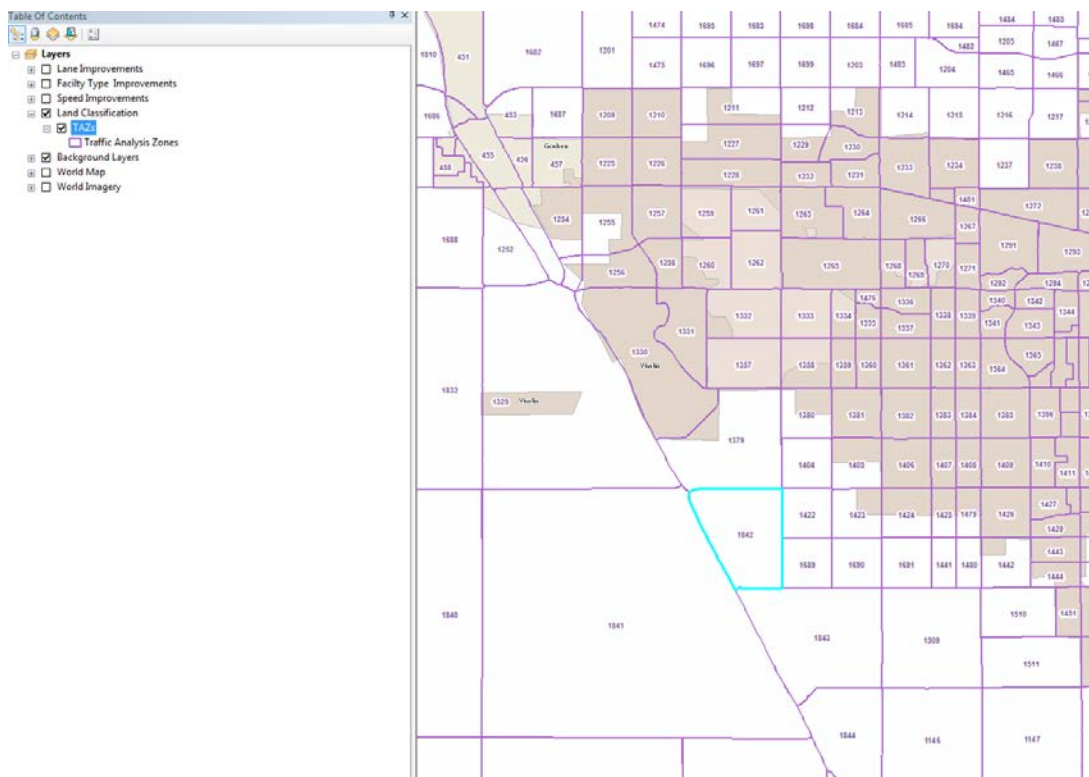
- Use the Parameters Workbook to review the land use in the zone and compare with the project land use. Typical projects fall into one of the following cases.

o   Case A: The land use is similar in type and magnitude and if the project represents the entire zone. No additional changes are needed.

o   Case B: The land use is not similar in type and magnitude, but represents the entire TAZ. Update the land use to reflect the project.

o   Case C: The land use is similar in type and magnitude, but does not represent the entire TAZ. Identify a vacant TAZ within the same zone range, modify the land use in the original zone and project zone to match the type and magnitude of land use, add a centroid and connector to the master network using the same attributes as the original zone.

o   Case D: The land use is not similar in type and magnitude and the project does not represent the entire original zone, or the entire project is in addition to the existing land use in the zone. Identify a vacant TAZ within the same zone range, leave the land use in the original zone and add the project land use to the vacant zone, add a centroid and connector to the master network using the same attributes as the original zone.

Prepare trip generation target and input file

- Determine the net new project vehicle trips for AM Peak 1hr, PM Peak 1hr, and Daily using empirical data, regionally validated trip generation rates, ITE, MXD+, or other methods.

- Copy and rename the 1_Inputs_Support\Tools\FratarTrips.DBF to a project specific name, and open in Cube.

- Edit the Zone number(s) and inbound/outbound trips by time of day to reflect the project. Save the file and close.

ZONE	A1_IN	A1_OUT	P1_IN	P1_OUT	DAY_IN	DAY_OUT
1842	593	527	506	497	7943	7943

FratarTrips_YR2016_Zone1842.dbf (\\fp...

Define Scenario detail in Cube Application keys and running the post-process

- Select the scenario for evaluation
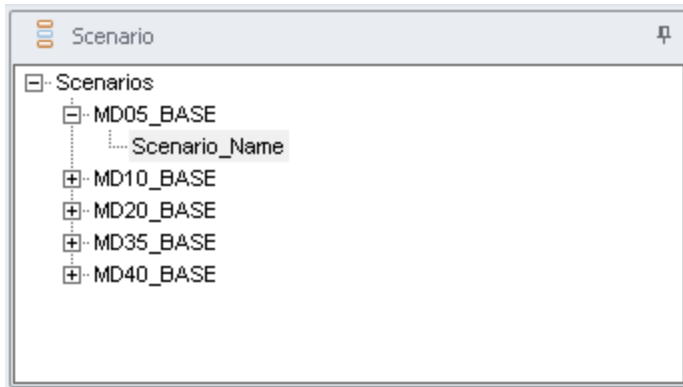
- Click **Next** for second page of scenario keys

- Define ITE Match and Select Link/Zone options to compare

- Update the Select Link text file for assignment (1_Inputs\3_Highway\SelectLink_Assign.txt)

  - Copy or Save As the current example file

  - Copy and paste the block of text for the number of select links/nodes desired

  - Update the matrix numbers incrementing by 1 and keeping the matrix and assignment values consistent

  - Update the select link/node value

  - Save the file

```
SelectLink_Assign.txt - Notepad

File  Edit  Format  View  Help

/* Examples
L=10005-10006 - This option selects the volume on link the link in direction from node 10005-10006
L=10005-10006* - This option selects the volume on link the both directions (from node 10005-10006 and from node 10006-10005)
A=101-105 | B=101-105 - This option selects the inbound and outbound links (centroids in this case) with nodes 101-105
N=101-105 - This option selects trips to/from nodes 101-105
*/
                                                                    Select node group. Note MW[6] in the definition on the
                                                                    left corresponds to VOL[6] in the assignment set.
      PHASE=ILOOP                                                   Increasing by 1 for each assignment set.
          ; Total trips - do not modify this section
            PATH=LW.GT_Pk_DA_2Veh, EXCLUDEGRP=23, VOL[1]=MI.1.D1_TOT, PENI=1 ; D1 Trips
            PATH=LW.GT_Pk_S2_2Veh, EXCLUDEGRP=3,  VOL[2]=MI.1.S2_TOT, PENI=1 ; SR2 trips
            PATH=LW.GT_Pk_S3_2Veh, EXCLUDEGRP=5,  VOL[3]=MI.1.S3_TOT, PENI=1 ; SR3 trips
            PATH=LW.GT_Pk_DA_2Veh, EXCLUDEGRP=23, VOL[4]=MI.1.XX, PENI=1      ; external
            PATH=LW.GT_Truck, EXCLUDEGRP=23, VOL[5]=MI.1.TOTTRK, PENI=1    ; Truck Trips

          ; Begin of select links/zone - remove, add, modify as needed

          ; Select link/zone trips - Node 101 Description of location
            PATH=LW.GT_Pk_DA_2Veh, EXCLUDEGRP=23, MW[6]=MI.1.D1_TOT+MI.1.XX  ,SELECTLINK=(N=101),VOL[6]=MW[6],PENI=1 ; DA and XX
            PATH=LW.GT_Pk_S2_2Veh, EXCLUDEGRP=3,  MW[7]=MI.1.S2_TOT,SELECTLINK=(N=101),VOL[7]=MW[7],PENI=1 ; SR2 trips
            PATH=LW.GT_Pk_S3_2Veh, EXCLUDEGRP=5,  MW[8]=MI.1.S3_TOT,SELECTLINK=(N=101),VOL[8]=MW[8],PENI=1 ; SR3 trips
            PATH=LW.GT_Truck,      EXCLUDEGRP=23, MW[9]=MI.1.TOTTRK ,SELECTLINK=(N=101),VOL[9]=MW[9],PENI=1   ; Truck Trips

          ; Select link/zone trips - One way on link 14522->14531 Description of location
            PATH=LW.GT_Pk_DA_2Veh, EXCLUDEGRP=23, MW[10]=MI.1.D1_TOT+MI.1.XX  ,SELECTLINK=(L=14522-14531),VOL[10]=MW[10],PENI=1 ; DA and XX
            PATH=LW.GT_Pk_S2_2Veh, EXCLUDEGRP=3,  MW[11]=MI.1.S2_TOT,SELECTLINK=(L=14522-14531),VOL[11]=MW[11],PENI=1 ; SR2 trips
            PATH=LW.GT_Pk_S3_2Veh, EXCLUDEGRP=5,  MW[12]=MI.1.S3_TOT,SELECTLINK=(L=14522-14531),VOL[12]=MW[12],PENI=1 ; SR3 trips
            PATH=LW.GT_Truck,      EXCLUDEGRP=23, MW[13]=MI.1.TOTT                             ],PENI=1   ; Truck Trips
                                                            Define the select node or link
          ; Select link/zone trips - Both ways on link 14522<->1
            PATH=LW.GT_Pk_DA_2Veh, EXCLUDEGRP=23, MW[14]=MI.1.D1_TOT+MI.1.XX  ,SELECTLINK=(L=14522-14531*),VOL[14]=MW[14],PENI=1 ; DA and XX
            PATH=LW.GT_Pk_S2_2Veh, EXCLUDEGRP=3,  MW[15]=MI.1.S2_TOT,SELECTLINK=(L=14522-14531*),VOL[15]=MW[15],PENI=1 ; SR2 trips
            PATH=LW.GT_Pk_S3_2Veh, EXCLUDEGRP=5,  MW[16]=MI.1.S3_TOT,SELECTLINK=(L=14522-14531*),VOL[16]=MW[16],PENI=1 ; SR3 trips
            PATH=LW.GT_Truck,      EXCLUDEGRP=23, MW[17]=MI.1.TOTTRK ,SELECTLINK=(L=14522-14531*),VOL[17]=MW[17],PENI=1   ; Truck Trips
      ENDPHASE
```

- Update the Select Link summary file (1_Inputs\3_Highway\SelectLink_Summary.txt)

    o Copy or Save As the current example file

    o Copy and paste the block of text for the number of select links/nodes desired

    o Update the volume set numbers with the clean name to refer to the appropriate Select Link volume group

    o Save the file

```
; Select Link 1 Trips
; AM Peak Period
; Directional
A03_DA_SL1=LI.1.V6_1
A03_SR2_SL1=LI.1.V7_1
A03_SR3_SL1=LI.1.V8_1
A03_TRK_SL1=LI.1.V9_1
A03_PAS_SL1=A03_DA_SL1+A03_SR2_SL1+A03_SR3_SL1
A03_VOL_SL1=A03_PAS_SL1+A03_TRK_SL1

; Non-Directional
TOT_A03_DA_SL1=LI.1.V6T_1
TOT_A03_SR2_SL1=LI.1.V7T_1
TOT_A03_SR3_SL1=LI.1.V8T_1
TOT_A03_TRK_SL1=LI.1.V9T_1
TOT_A03_PAS_SL1=TOT_A03_DA_SL1+TOT_A03_SR2_SL1+TOT_A03_SR3_SL1
TOT_A03_VOL_SL1=TOT_A03_PAS_SL1+TOT_A03_TRK_SL1

; Mid-Day Period
; Directional
M07_DA_SL1=LI.1.V6_2
M07_SR2_SL1=LI.1.V7_2
M07_SR3_SL1=LI.1.V8_2
M07_TRK_SL1=LI.1.V9_2
M07_PAS_SL1=M07_DA_SL1+M07_SR2_SL1+M07_SR3_SL1
M07_VOL_SL1=M07_PAS_SL1+M07_TRK_SL1

; Non-Directional
TOT_M07_DA_SL1=LI.1.V6T_2
TOT_M07_SR2_SL1=LI.1.V7T_2
TOT_M07_SR3_SL1=LI.1.V8T_2
TOT_M07_TRK_SL1=LI.1.V9T_2
TOT_M07_PAS_SL1=TOT_M07_DA_SL1+TOT_M07_SR2_SL1+TOT_M07_SR3_SL1
TOT_M07_VOL_SL1=TOT_M07_PAS_SL1+TOT_M07_TRK_SL1
```

Define the text description and the volume set to be summarized based on the assignment. For AM peak period (_1 in the assignment), V6 is Drive Alone for Select Link 1

The total volume is the same as the directional, with the addition of T in the volume set name. V6 is directional, V6T is non-directional.

Define the text description and the volume set to be summarized based on the assignment. For Mid-Day period (_2 in the assignment), V6 is Drive Alone for Select Link 1

- Update the scenario key Cube Catalog for the scenario being evaluated

  o Check "Adjust Trips to match value" for Fratar to be active

  o Enter zone number(s) for Fratar trips, or leave box unchecked and zone as 101 for no change from model generated trips

- Browse to reference file created and modified to reflect the project trips for the scenario. Note that the full path should show in the box, unlike the example below which uses only the file name as an example.

- Refer to the Select Link text file for traffic assignment. The file includes samples of select node/zone, a link in one direction, and a link in both directions. By using a text file, multiple select links can be conducted with the same run of the post-processor.

ITE Match and Select Link/Zone

☐ Adjust trips to match value.

|	
Zones to adjust to match (ex. 101-105, 107)	101
Trip targets by zone (DBF with Zone A1_IN_A1_OUT_P1_IN_P1_OUT_DAY_IN_DAY_OUT)	C:\VMIP\Training\TCM\1_Inputs_Support\Tools\FratarTrips.dbf
Select Link/Zone Listing	C:\VMIP\Training\TCM\1_Inputs\3_Highway\SelectLink_Assign.txt
Select Zone/Link Summary	C:\VMIP\Training\TCM\1_Inputs\3_Highway\SelectLink_Summary.txt

- Save and exit the scenario

- Select the scenario for evaluation

Scenario 📌

Scenarios
  MD05_BASE
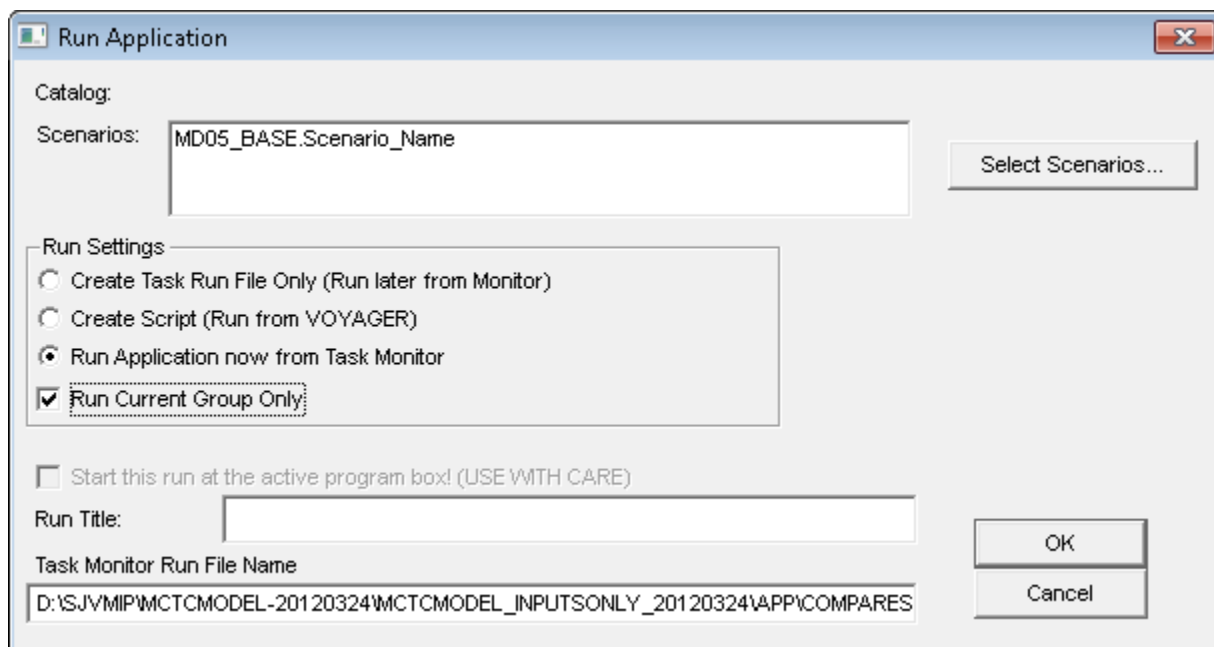   Scenario_Name
  MD10_BASE
  MD20_BASE
  MD35_BASE
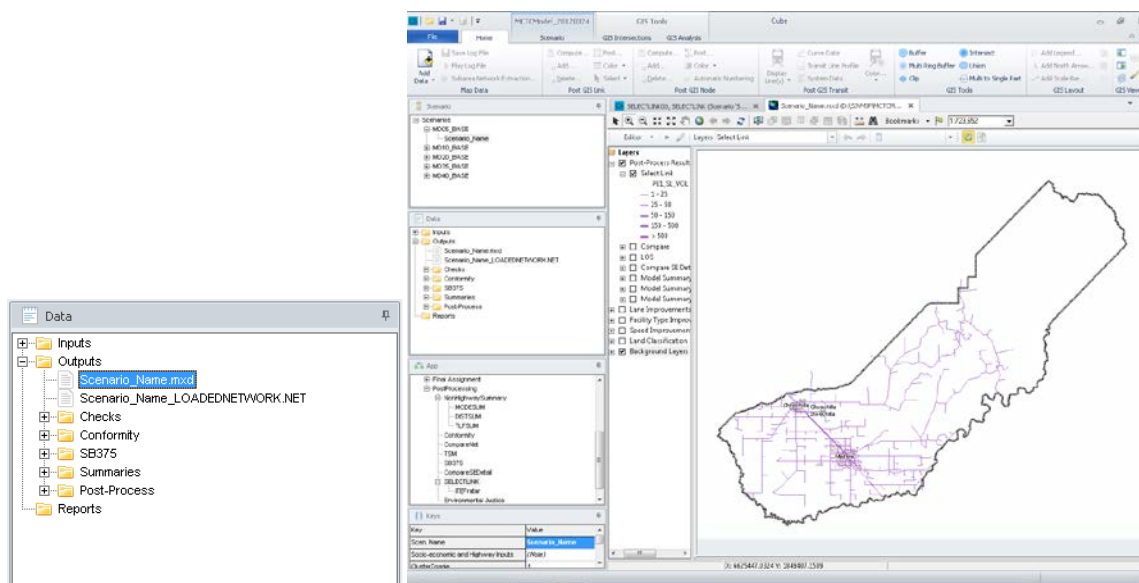 MD40_BASE
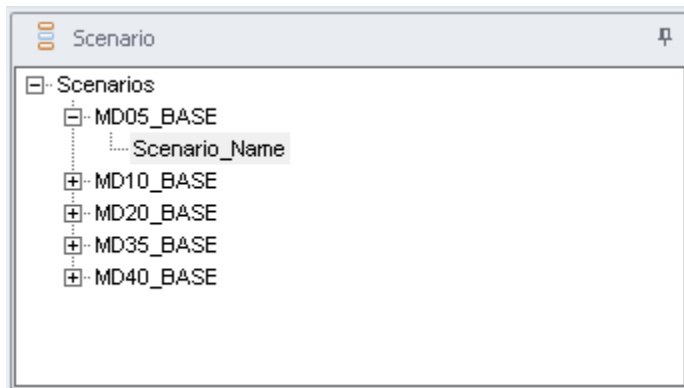
- Browse in the Applications to SelectLink
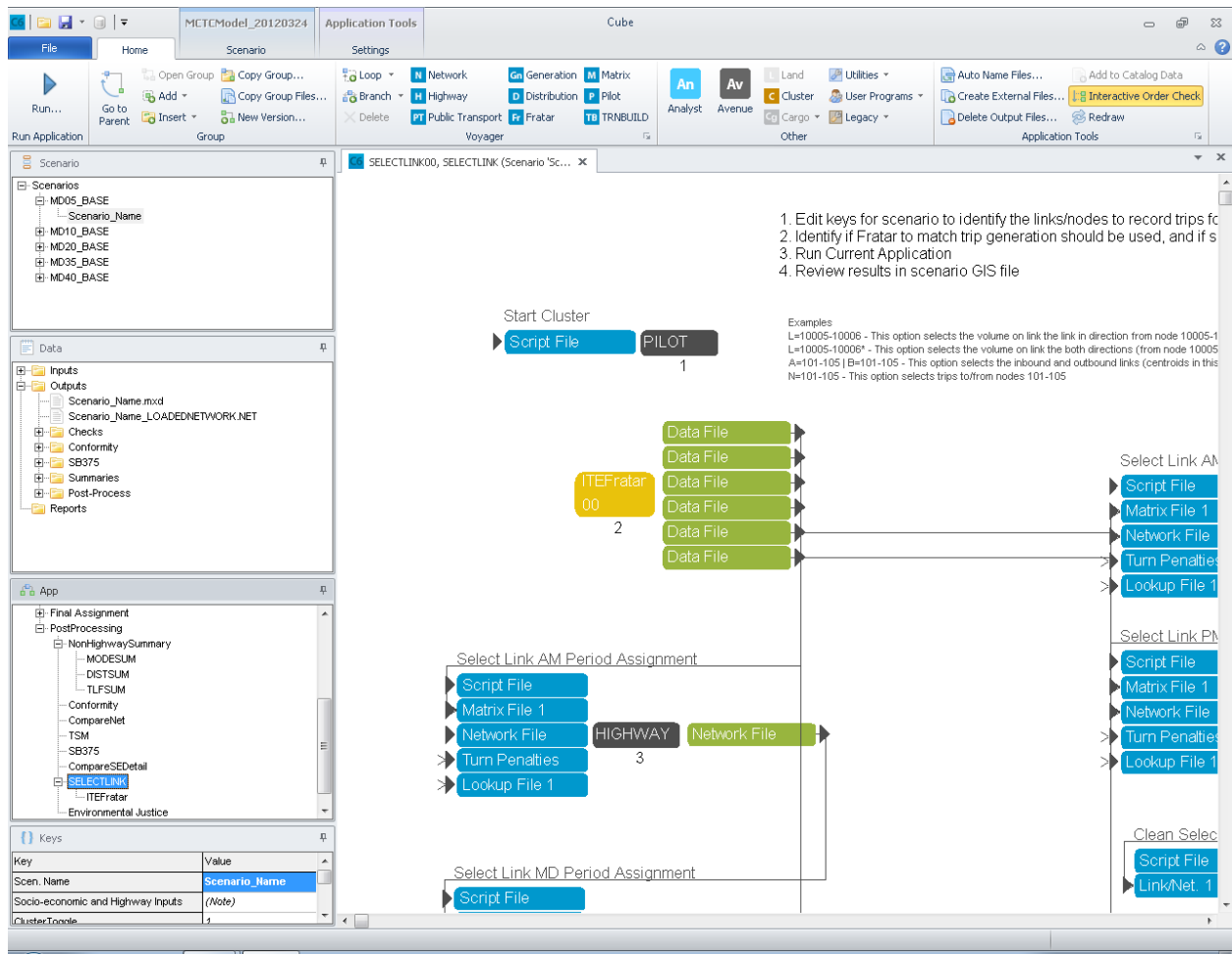
- Click on the **Run…** button located on the top **Home** ribbon. This will open the Run Application window.
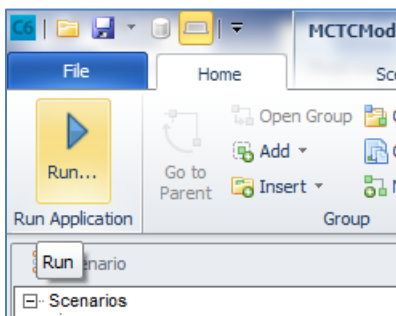

- Check the **Run Current Group Only** button.

- Click **OK** and proceed with model run.

- To view results double click on the personal geodatabase in the Data pane

- To view results on the Cube Network, open 09_Assignment\SCENARIO_SL_LinkVolumes.NET

- The variables can be posted using multi-bandwidth and/or labels and use the same naming convention as the full assignment, with the exception that project trip variables include _SL at the end. For example, P01_DA_SL is the PM peak 1hr (P01) Drive Alone (DA) select link (SL).

- For multi-bandwidth, select Analysis and then Multi-Bandwidth, and one or more variables to be posted. Click ok and zoom to the study zone(s) to view the results.
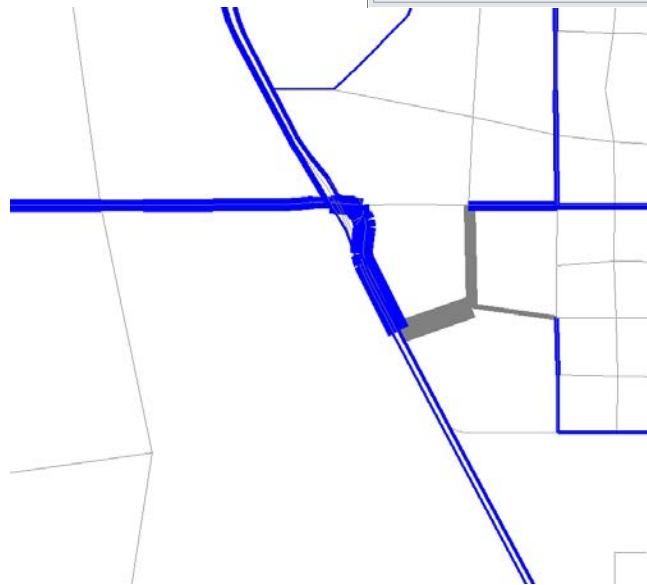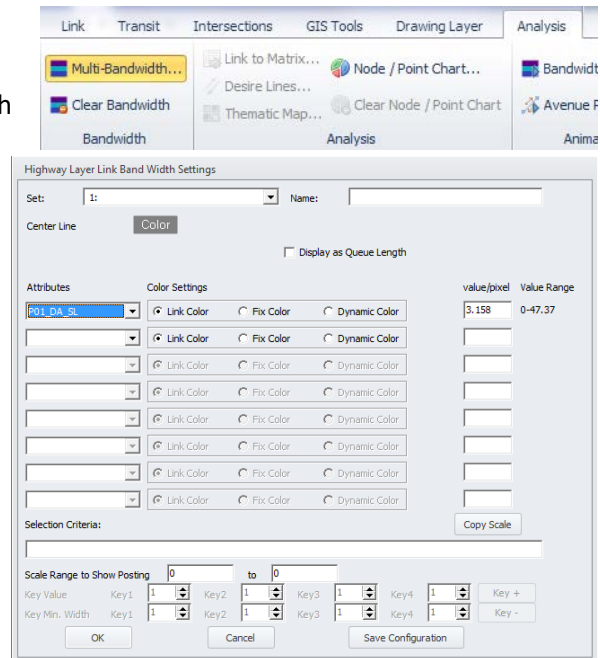
- Next, to post the values, select Home and then Post All in the Link section, and one or more variables to be posted. Click ok and zoom to the study zone(s) to view the results.
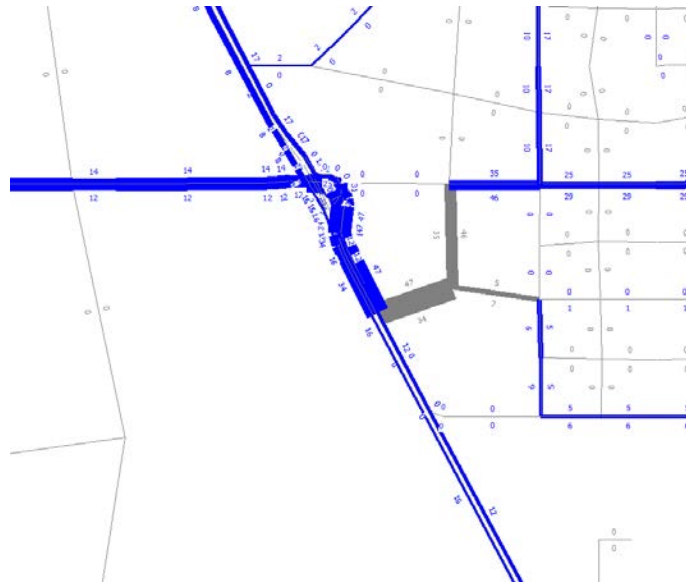
- Percentage of project trip distributions can be calculated using the Link Calculation functions, as needed.

- If the result are not matching the target, verify that the Catalog Keys and the input file are correct. The ITEFratar step applies the targets to the AM 1hr, PM 1hr, and proportional to the times of day that add to create daily.
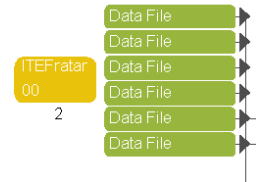
  o Review the inputs (FRATARIN is the original and SL is the output) and outputs of this step to confirm the results match what is expected for the row and column totals.

  o The auto trips (drive alone, shared ride 2, and shared ride 3+) and truck trips are all adjusted based on the land use trip generation. Only XX trips are not adjusted.
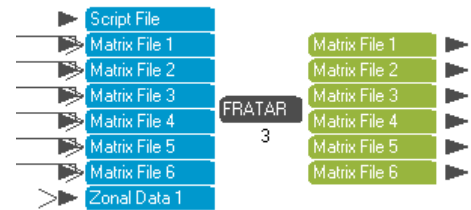
  o The example below, the AM 1hr row total (outbound) and column total (inbound) for the original matrix file (left) was adjusted to match the target values, as shown on the output matrix file (right).

  o Although comparing each mode is possible, the total on the first tab for each time period is the most effective in QA since mode share by zone may vary and quickly determining if the trips match by mode is more difficult than total vehicles.

C6	TU17_DOF_VEHTRIPS_AM1_FRATIN.mat... ✕		
✓ *1 AM1	2 D1_Tot	3 S2_Tot	4 S3_Tot	5 XX
	Sum	1842	1843	1844
	55361.24	4.97	19.12	1.53
1842	4.56	0.00	0.00	0.00
1843	13.44	0.00	0.01	0.00
1844	1.16	0.00	0.00	0.00
1845	3.33	0.00	0.00	0.00

C6	TU17_DOF_VEHTRIPS_AM1_SL.mat-*1 A... ✕		
✓ *1 AM1	2 D1_Tot	3 S2_Tot	4 S3_Tot	5 XX
	Sum	1842	1843	1844
	56471.73	592.64	19.12	1.53
1842	527.38	0.00	0.00	0.00
1843	13.44	0.00	0.01	0.00
1844	1.16	0.00	0.00	0.00
1845	3.33	0.00	0.00	0.00

EXERCISE 5: REVIEW MODEL OUTPUT IN SCENARIO SUMMARY SPREADSHEET

This exercise covers use of the Scenario Summary Metrics spreadsheet.

Scenario Summary Metrics

The MPO_SCENARIOSummaryMetrics.XLSM spreadsheet contains multiple worksheets that summarize detailed model data into tabular form for comparison with CHTS or between scenarios. The validation year spreadsheet is included for each model developed and the spreadsheet is named MPO_YYValidationSummaryMetrics.XLSM (ex. FresnoCOG_15ValidationSummary.xlsm). This spreadsheet contains four main types of worksheets: Setup, Outputs, Inputs, and Calculations. The metrics included and instructions for updating are described below.
FresnoCOG_Training_Model\1_Inputs_Support\Validation\FresnoCOG_14ValidationSummary.xlsm

Notes

- This worksheet describes the various metrics and where the output files are located
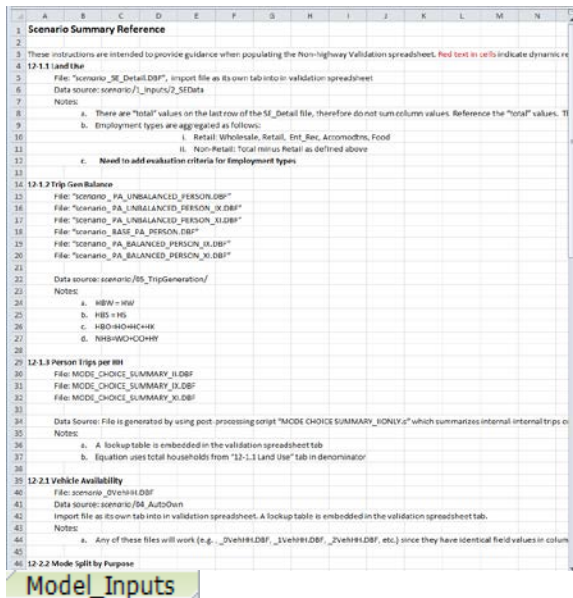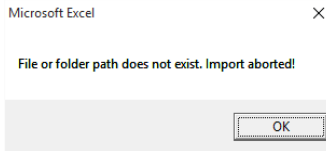

Model_Inputs

- This worksheet defines the scenario, path to model run files, and model outputs to be summarized for each scenario. For most mode runs, only the scenario description, path, and scenario prefix for input files needs to be changed. It is recommended practice that all input worksheets start without data prior to importing new scenario data and the template delivered with the model is clear of scenario data.

- Open the VMIP2_SCENARIOSummaryMetrics.xlsm workbook and Saved As for the new scenario prior to importing scenario data.

- After updating the scenario name, path, and prefix or input file names, click [Import Model Variables / Import All Variables] to import the files.

- After the data are imported a message will appear.

- If the filenames or path contain an error will appear. If the path is correct, files without an error will be processed.

Microsoft Excel   ×

File or folder path does not exist. Import aborted!

OK

For Compare

- Summary of model scenario and CHTS for the model, San Joaquin Valley, and State.

  o Land use, trip generation, vehicle availability, mode split, travel time and distance, and VMT

  o Some metrics reported for all trip types (internal, exported, imported) and also internal only.

	A	B	C	D	E	AG	AH	AI	AJ	AK	AL	AM	AN
1	**Model Summary**					II TRIPS ONLY							
2		**Geography**	**Auto Ownership**		**Purpose**	Mode Share by Trip Purpose (Daily)							
3						DA	SR2	SR3+	Transit	Bike	Walk	Other	All Modes
11					WBO	72%	14%	11%	2%	0%	1%	0%	100%
12					OBO	29%	35%	27%	1%	1%	7%	0%	100%
13					**Total**	**39%**	**21%**	**24%**	**2%**	**1%**	**11%**	**2%**	**100%**
14													
15													
16	**CHTS Summary**												
17			0-Veh	5%	**HBW**	83%	6%	2%	0%	5%	4%	0%	100%
18			1-Veh	28%	**HBO**	25%	20%	25%	1%	1%	20%	9%	100%
19			2-Veh	41%	HBC	54%	0%	46%	0%	0%	0%	0%	100%
20			3-Veh	18%	HBK	1%	10%	17%	0%	1%	24%	47%	100%
21			4+-Veh	8%	HBS	29%	30%	36%	0%	3%	2%	0%	100%
22		Madera County			HBO	31%	20%	24%	1%	1%	23%	0%	100%
23					**NHB**	**52%**	**19%**	**23%**	**0%**	**0%**	**6%**	**1%**	**100%**
24					WBO	95%	3%	2%	0%	0%	0%	0%	100%
25	CHTS 2012/2013				OBO	36%	24%	30%	0%	0%	8%	1%	100%
26			**HPMS VMT**	4,084,820	**Total**	**38%**	**18%**	**21%**	**0%**	**2%**	**15%**	**6%**	**100%**
27					HBW	81%	9%	4%	1%	2%	3%	0%	100%
28		SJV region			HBO	28%	26%	29%	1%	2%	13%	2%	100%
29					NHB	40%	27%	26%	1%	1%	5%	1%	100%
30					**Total**	**39%**	**24%**	**24%**	**1%**	**1%**	**10%**	**2%**	**100%**
31					HBW	76%	8%	2%	8%	2%	3%	0%	100%
32		Statewide			HBO	30%	25%	25%	3%	2%	13%	1%	100%
33					NHB	42%	25%	20%	2%	1%	10%	1%	100%
34					**Total**	**40%**	**23%**	**20%**	**4%**	**2%**	**11%**	**1%**	**100%**
35													

Worksheets **12-1.1** through **12-5.1** correspond to the numbering of the validation report and contain the same values as on the For Compare worksheet in more manageable pieces for the validation report.

- 12-1.1 Land Use

- 12-1.2 Trip Gen - P-A balance

- 12-1.3 Person Trips per HH

- 12-2.1 Vehicle Availability

- 12-2.2 Mode Split by Purpose

- 12-2.3 Purposes by Mode

- 12-3.8 Travel Time

- 12-3.6 VMT

- 12-4.1 Transit Assignment: note that the pivot table needs to be refreshed

- 12-5.1 Trip Distribution

- Worksheets **in blue** are used during the import of model data and should not be changed in name or color.

- Worksheets **in purple** are calculations of model inputs to match the CHTS comparisons and should not be changed in name or color.

EXERCISE 6: SUMMARIZE VMT

The model network VMT can be summarized in a few different ways.

Airbasin Variable

The airbasin variable automatically calculates the VMT on roadways. The summary spreadsheets are only setup for the number of airbasins in the original model. To use the airbasin variable, the catalog and network must also be updated.

1. Identify the number of areas to summarize VMT
2. Update the catalog to reflect the number of air basins

3. Use the polygon and link computation to flag the airbasins
4. Re-running the SB 375 summary step will update only the final output VMT by speed bin for each air basin

Airbasin Variable and Network Statistics

By deleting the links with a set value, the VMT only on links remaining can be summarized.

1. After calculating the airbasin value, link compute for only the airbasin in the study area
2. The equation $DELETE=T will delete links where the condition (i.e. Airbasin=1 full network, Airbasin=2 for study area) is true. To keep the study area, delete Airbasin=1
3. Press F8 to see a summary of network statistics and copy\past to Excel to add the appropriate volumes, then multiply by distance
4. If the airbasin value was on centroids and they should not be included, use the $DELETE=T where _Centroid=1 to delete centroids and repeat Step 3

EXERCISE 7: CSTDM EXAMPLE OF SUB-AREA EXTRACTION

This exercise uses the sub-area extraction and assignment example from the CSTDM for use as an example for sub-area extraction for traffic operations projects.