Santa Cruz County Travel Model User Guide

Santa Cruz County Regional Transportation Commission

July 2016

Santa Cruz County Travel Model User Guide

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Funded Provided By:

California Department of Transportation (Caltrans)
Partnership Planning Grant

County of Santa Cruz Planning Department

Santa Cruz County Regional Transportation Commission

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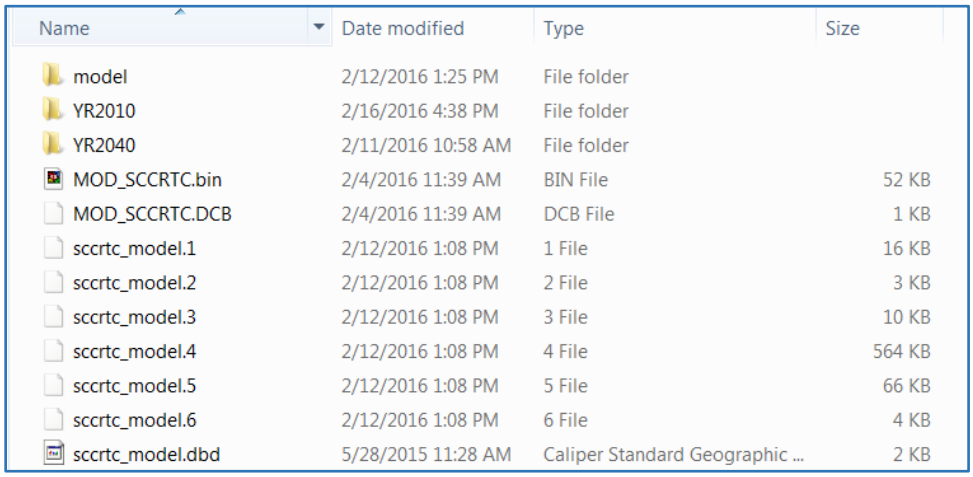
Table of Contents

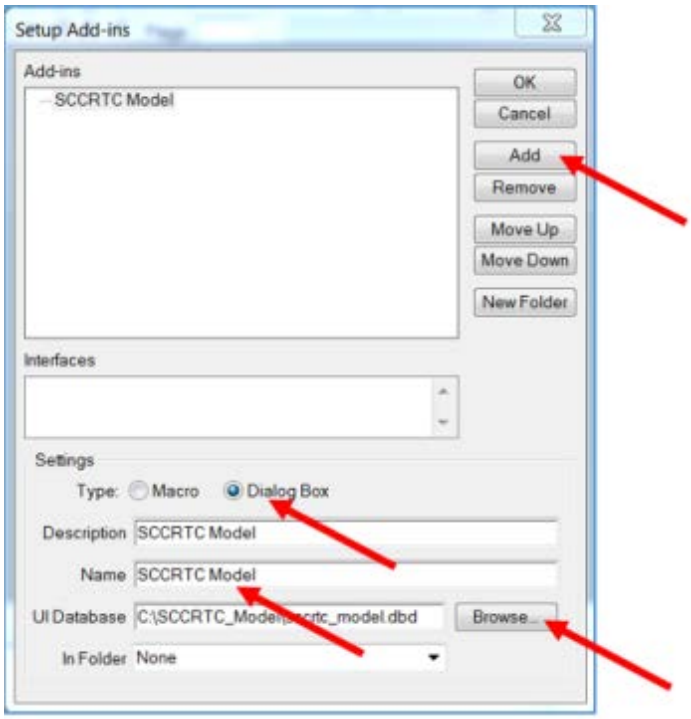
1 SCCRTC County-Wide Model Installation Instructions

Step 1: Unzip the package to C drive, and save to a folder called "SCCRTC_Model" so that the resulting file path is C:\SCCRTC_Model\. Under this folder, the following files and subfolders should be included. Copy the SCCRTC.bmp file to the TransCAD\bmp folder located here: C:\Program Files\TransCAD 6.0\bmp.



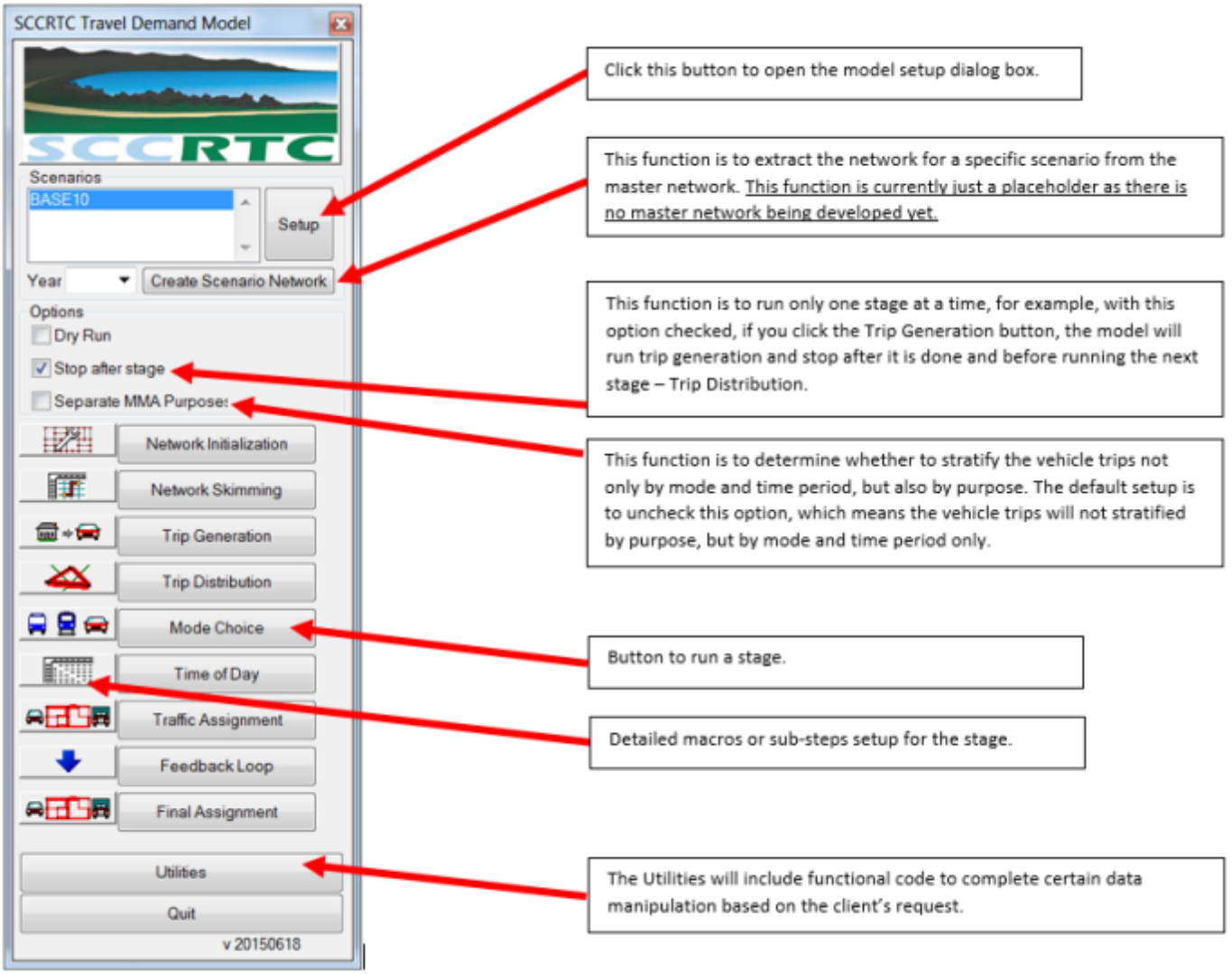
Name	Date modified	Type	Size
model	2/12/2016 1:25 PM	File folder	
YR2010	2/16/2016 4:38 PM	File folder	
YR2040	2/11/2016 10:58 AM	File folder	
MOD_SCCRTC.bin	2/4/2016 11:39 AM	BIN File	52 KB
MOD_SCCRTC.DCB	2/4/2016 11:39 AM	DCB File	1 KB
sccrtc_model.1	2/12/2016 1:08 PM	1 File	16 KB
sccrtc_model.2	2/12/2016 1:08 PM	2 File	3 KB
sccrtc_model.3	2/12/2016 1:08 PM	3 File	10 KB
sccrtc_model.4	2/12/2016 1:08 PM	4 File	564 KB
sccrtc_model.5	2/12/2016 1:08 PM	5 File	66 KB
sccrtc_model.6	2/12/2016 1:08 PM	6 File	4 KB
sccrtc_model.dbd	5/28/2015 11:28 AM	Caliper Standard Geographic ...	2 KB

Step 2: Open TransCAD version 6, click **Tools** -> **Setup Add-Ins**, add SCCRTC Model in the Add-in dialog box by selecting **Add**. The model will initially show as "Untitled" in the dialog box. Give the model a description and name as shown below. Next select the **Browse** button and navigate to the SCCRTC_model.dbd file located on the C drive under C:\SCCRTC_Model. Select **OK** to complete the Setup process. Make sure the Dialog Box option is selected and not Macro.

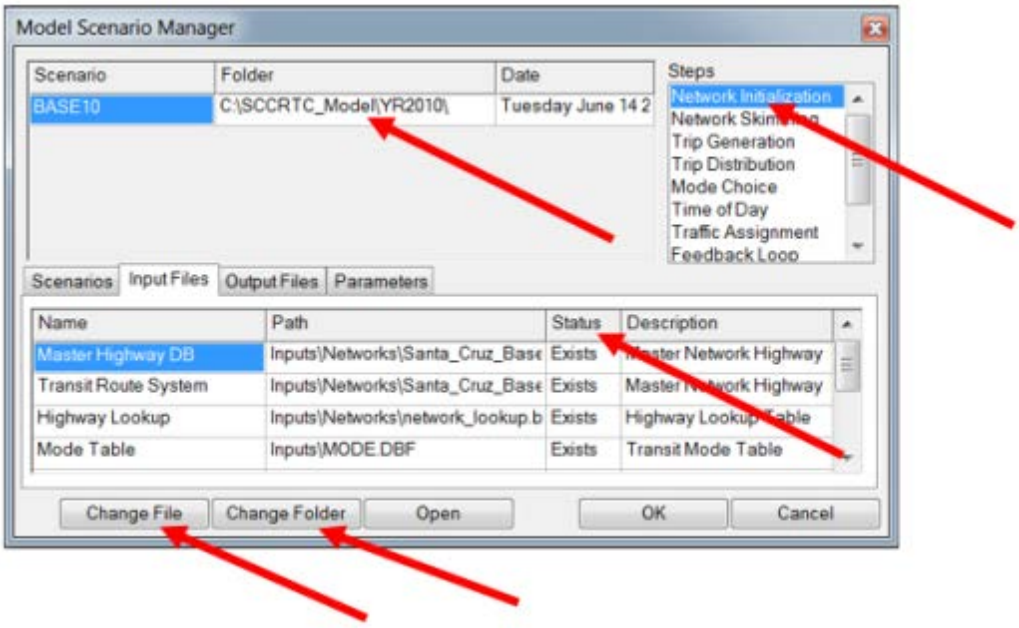


If you want to re-compile the model, click  and select the file named **SCCRTC_Model.lst** under C:\SCCRTC_Model\model\, and you will be asked for the file names for the interface, you can select **sccrtc_model.dbd** file under C:\SCCRTC_Model\ and overwrite the existing interface. Then go through the step above to set up the model. If the icon  is not shown on the TransCAD menu, click Tools -> GIS Developer's Kit, and this icon will appear.

Step 3: After setting up the model, go back to the TransCAD interface, click **Tools** -> **Add-Ins**, select **SCCRTC Model**, the SCCRTC model graphic user interface (GUI) will be shown as follows. For the first time opening the SCCRTC model, the model will open a dialog box to ask for the model table, the model table is named **MOD_SCCRTC.bin** under C:\SCCRTC_Model\.

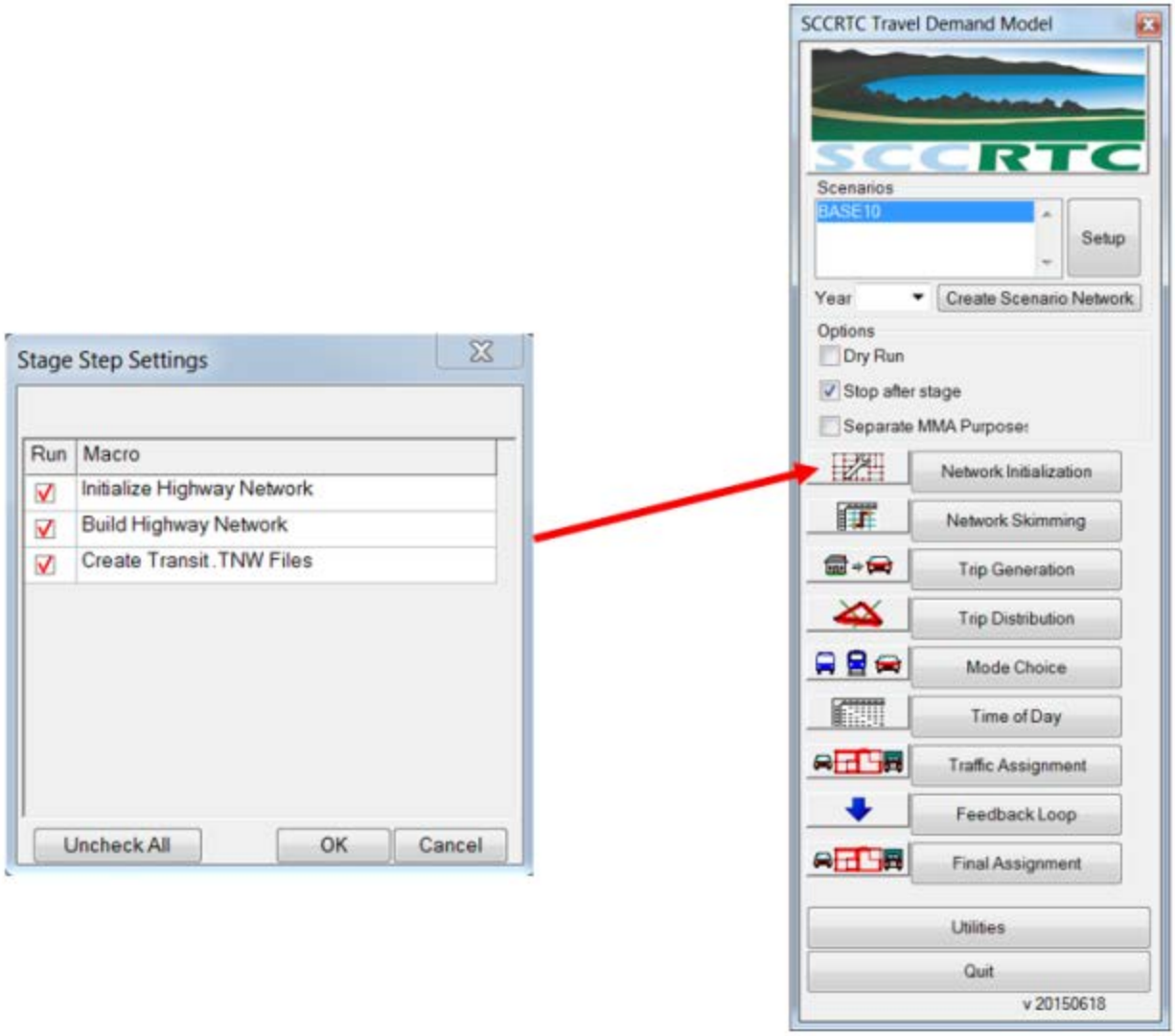


Step 4: Click **Setup** on the top right corner of the GUI, the Model Scenario Manager box shows up with all the detailed setup for each stage, as shown below. At this interface, you can change the scenario by double clicking the folder that you want to change. You can also change the input and output files for a specific stage under the tabs of Input Files and Output Files by clicking Change File or Change Folder at the bottom of the Scenario Manager. Parameters can be directly revised under the tab of Parameters. Detailed description of the major input/output files and parameters used in the model are included in next section.



Step 5: To run a complete model run, select a scenario under **Scenarios** in the main model GUI, and then click **Setup** to open the Model Scenario Manager box. In the Scenario Manager box, make sure all the inputs/outputs and parameters are set up correctly for each stage and the status of each input files listed for each step should be "Exists". Then click **OK** to get back to the main model GUI, uncheck **Stop after stage** on the main model GUI and then click **Network Initialization** and the model starts running all the way to the end.

Step 6: If you only want to run specific steps, first click the button left of the Stage button on the main model GUI. As shown below, a **Stage Step Settings** dialog box shows up, which includes all the sub-steps in this stage. You can check or uncheck these sub-steps based on your needs. Once it is done, click OK and get back to the main model GUI, then click the stage button and all the checked sub-steps will be run.



Although it should not be needed in most cases, the GUI can be recompiled as needed after making changes to the script changes, if it lost, or for different versions of TransCAD using the GISDK tool and selecting the SCCRTC_Model.lst which reads in the associated RSC files.

2 Components of the Model

The SCCRTC model consists of four types of components, namely input data, model steps, model outputs, and parameters. The input data are files prepared by the modeler. The model outputs are data files produced by the model. Some of the output files are also used as inputs into the subsequent steps in the model.

2.1 Input Files

The following is a list of the model input files and their descriptions. The column "Module" provides the model steps that use the corresponding input file.

Table 2.1: Important Inputs for SCCRTC model

File	Module	Description
Santa_Cruz_BaseYear_Highway.dbd	Network Initialization	Base Year Initial highway network for Santa Cruz County – the current version is generated from AMBAG highway network. Detailed information of the variables in the input highway network are included in the Travel Model Development Report.
Santa_Cruz_BaseYear_Transit.rts	Network Initialization Network Skimming Transit Assignment	Base Year transit routes system for Santa Cruz County – the current version is generated from AMBAG transit route system. Detailed information of the variables in the transit network are included in the Travel Model Development Report.
SCC_Base_Year_TAZ.dbd	Trip Generation	TAZ system for Santa Cruz County
Network_Lookup.csv	Network Initialization	The speed, capacity, lanes, alpha, and beta are coded on each link to maximize the calibration ability of local conditions. For facilities that are missing values and as the starting point of calibration, a lookup file to determine hourly capacity, volume delay function parameters and bike speed (mph) based on link functional classification, speed, area type and lane width. This lookup table is directly from AMBAG model, and is only applied to the highway links with missing values on those variables.
MODE.DBF	Network Initialization Network Skimming Transit Assignment	Defines transit modes, modes of highway links for transit access, and associated parameters used in the transit path building process.
Turn_Penalties_AM/PM/MD/NT_2010.csv	Network Initialization	Turning penalty for each time period. Currently not used but available for project application.
Data_TAZ_2010.csv	Network Skimming	Provides origin and destination terminal times (in minute) at TAZ level. Terminal times are additional time at either trip end to account for things such as walking to the garage to get your car after you leave your house on the origin and finding a parking spot and walking to the sidewalk on the destination.
CrossClassPA.csv	Trip Generation	Includes trip rates for cross-classification models and

		coefficients of the regression models used in the trip generation stage, generated from CHTS database. The units of trip rates vary and depend on the variables those rates are applied to, e.g., for HBW/HBS/HBO production the unit is # of trips per household, while # of trips per person by age group for HBK and HBC production, or # of trips per employment (regression model) for OBO and WBO production
SED_SCC.csv	Trip Generation	Socioeconomic input data, generated from AMBAG model population synthesizer and the census data. Detailed information of the variables in the land use data file are included in the Travel Model Development Report.
IXXI_Split.csv	Trip Generation	Fractions of the total trips that represent trips that enter (XI) and exit (IX) the model area for each zone by purpose, generated from the CHTS database. This data is used to calculate the XI and IX productions and attractions from the overall productions and attractions generated based on the trip rates in CrossClassPA.csv.
SpecialGenerators.csv	Trip Generation	Zonal level productions and attractions by purpose from special generators, including visitor PAs (directly from the AMBAG model) and Group Quarter PAs.
K_Factors_SCC.mtx	Trip Distribution	K factors used in trip distribution
SCC_ObsModeSplit.csv	Trip Distribution	Observed distance-based auto mode split for each service population category for internal and external trips, generated from the CHTS dataset. This data is used to calculate the composite travel time used as the impedance in the trip distribution model. This calculation is to generate the combined travel time used as impedance for trip distribution. Because auto modes dominate, the bike and pedestrian travel times will have very limit impact on the combined travel time, therefore they are not included in the composite. If significant HOV facilities that would result in a different trip time by mode are planned or implemented in the future, the values can be updated to reflect the forecast mode split.
SCC_ObsTodFactors.csv	Mode Choice	Time of day factors by purpose for II, IX and XI trips respectively, generated from the CHTS dataset. This data is used to split the daily trips to trips in peak and off-peak periods for use in mode choice.
SCCRTC_MC_PK/OP.mdl	Mode Choice	Mode choice nested logit model structure with the utility function setup for each choice by purpose and time period (i.e., peak and off-peak periods).
Through_Trips_2010.mtx	Time of Day	Trips traveling completely through (XX trips) the Santa Cruz County model area, generated from the AMBAG model.

Gateways_IXXI_SCC.csv	Time of Day	External gateway productions and attractions by time period, based on the AMBAG model data.
Hourly.bin	Time of Day	Include PA to OD factors and time of day factors
SCC_IXXI_ObsModeShare.csv	Time of Day	Observed mode share for IX and XI trips, generated from the CHTS dataset
CriticalLink.qry	Traffic Assignment	Include selectlink/selectzone queries if perform select link/zone analysis

2.2 Model Stages

The model stages, shown here in the user interface, are individually described below.

Network Initialization: The process calculates all the required variables in the networks, such as capacity for each time period in the highway network and initial wait time in the transit network, and creates a virtual highway network (the set of .net files) and virtual transit networks by time period (the set of .tnw files) from the input roadway network and route system. These outputs are used in the following skimming and assignment processes.

Network Skimming: The model develops link costs associated with every roadway segment which are used to test various routes and modes of travel to determine the lowest cost combination to travel from each specific TAZ to every other TAZ in the model via both highway and transit paths. The link cost is in dollars and calculated as the combination of travel time and distance. This data is stored in a matrix which is used by subsequent stages of the model.

In the highway skim, the cost is in dollar, including both distance and time. It doesn't include parking cost, as these data is not available in the highway network. It can be incorporated if the parking cost is coded in the link layer.

Transit fare is included in the cost of transit path when building transit skim. Transit amenities do not clearly apply to the mode choice model as an independent variables. Its impact is included in the alternative specific constant of each transit mode.

Trip Generation: The model uses the input socioeconomic data and associated trip rates to calculate trip productions and attractions for each traffic analysis zone (TAZ). The trip productions and attractions are then split to internal-internal (II), internal-external (IX) and external-internal (XI) trips based on split ratios from IXXI_Split.csv. This is the total number of person trips produced or attracted regardless of destination.

Trip Distribution: The model uses a gravity model to estimate the number of total person trips regardless of mode from each TAZ to every other TAZ in the model. The gravity model utilizes the composite skim data from the network skimming stage along with friction factors and k-factors. The friction factors are generated from the Gamma Function.

Mode Choice: The daily trips from Trip Distribution step are disaggregated to peak and off-peak periods, using the factors in SCC_ObsTodFactors.csv. The mode choice model utilizes the outputs from skimming process and trip distribution, and estimates the mode for each person trip using the nested logit model, with utility functions estimated for each travel mode by purpose and time period (i.e., peak and off-peak periods).

Time of Day: This model utilizes outputs from mode choice, and convert the trips from PA format to OD format. It also segregates the trips by time of day and then converts the person trips to vehicle trips. In addition, this model includes the external module, which generates the IX and XI trips by mode for both peak and off-peak periods, and converts the IX/XI trips to vehicle trips from PA to OD format for each time period. The IX and XI vehicle trips are combined with II vehicle trips in the final OD matrix file, which are used in the assignment.

Traffic Assignment: The model uses an iterative assignment procedure whereby the quickest route is determined for each of the trips in the Origin-Destination (O-D) matrix, taking into account traffic congestion caused by other trips, for AM and midday time periods. This step is part of the feedback loop process, i.e., AM loaded network represents the peak period condition, while the MD loaded network represents the off-peak period condition in the next feedback loop.

Feedback Loop: The model uses a feedback stage to input estimated congested travel speeds from the previous AM peak period and midday period vehicle assignment into the network skimming stage of the model. The model then runs through mode choice and time of day. The O-D matrices are once again estimated and assigned to the roadway network to produce a new set of assignment results and congested speeds, ready for the next feedback loop if not the last loop.

Final Assignment: After the feedback loops is complete, the traffic assignment for PM and night time periods are executed. In addition, the AM and PM peak hour trip tables are generated and assigned. The daily assignment results are calculated and exported to the loaded network shape file. In addition, the transit trip tables are generated based on the mode choice outputs and assigned to the transit system. At the end, major model outputs, such as outputs from mode choice, highway assignment and transit assignment, are summarized and reported.

2.3 Important Output Files

The following is a list of the major model output files and their descriptions. Note that in all the files, the cost related variables are in dollars, while the time and distance related variables are in minutes and in miles respectively.

Table 2.2: Important outputs from SCCRTC model

File	Module	Description
Skim_AM/MD_DA.mtx	Network Skimming	Highway skims for Drive Alone for AM and MD time periods respectively, including cost, time and distance skim matrices.
Skim_AM/MD_SR2.mtx	Network Skimming	Highway skims for Shared Ride 2 for AM and MD time periods respectively, including cost, time and distance skim matrices.
Skim_AM/MD_SR3.mtx	Network Skimming	Highway skims for Shared Ride 3+ for AM and MD time periods respectively, including cost, time and distance skim matrices.
Skim_AM/MD_Walk.mtx	Network Skimming	Walk skims for AM and MD time periods respectively, including time and distance skim matrices.

Skim_AM/MD_Bike.mtx	Network Skimming	Bike skims for AM and MD time periods respectively, including time and distance skim matrices.
TrnSkim_WLOC_AM/MD.mtx	Network Skimming	Walk to local bus transit skims for AM and MD time periods respectively, including skims for wait time, walk time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_WEXP_AM/MD.mtx	Network Skimming	Walk to express bus transit skims for AM and MD time periods respectively, including skims for wait time, walk time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_WLRT_AM/MD.mtx	Network Skimming	Walk to Light Rail transit skims for AM and MD time periods respectively, including skims for wait time, walk time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_WCRT_AM/MD.mtx	Network Skimming	Walk to Commuter Rail transit skims for AM and MD time periods respectively, including skims for wait time, walk time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_ALOC_AM/MD.mtx	Network Skimming	Drive to local bus transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_AEXP_AM/MD.mtx	Network Skimming	Drive to express bus transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_ALRT_AM/MD.mtx	Network Skimming	Drive to Light Rail transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_ACRT_AM/MD.mtx	Network Skimming	Drive to Commuter Rail transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_WALL_AM/MD.mtx	Network Skimming	Walk to transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
TrnSkim_AALL_AM/MD.mtx	Network Skimming	Drive to transit skims for AM and MD time periods respectively, including skims for wait time, walk time, drive time, in-vehicle time, total time, fare, transfer, etc.
PA_II_Balanced.bin	Trip Generation	Balanced productions and attractions for the internal trips
PA_II.mtx	Trip Distribution	Daily Person trip table
PA_II_PK.mtx	Mode Choice	Person trip table for peak period

PA_II_OP.mtx	Mode Choice	Person trip table for off-peak period
HW_Trips_PK/OP.mtx	Mode Choice	Home-based work trips by mode for peak and off-peak periods respectively.
HS_Trips_PK/OP.mtx	Mode Choice	Home-based shopping trips by mode for peak and off-peak periods respectively.
HK_Trips_PK/OP.mtx	Mode Choice	Home-based school trips by mode for peak and off-peak periods respectively.
HC_Trips_PK/OP.mtx	Mode Choice	Home-based college trips by mode for peak and off-peak periods respectively.
HO_Trips_PK/OP.mtx	Mode Choice	Home-based other trips by mode for peak and off-peak periods respectively.
WO_Trips_PK/OP.mtx	Mode Choice	Work-based other trips by mode for peak and off-peak periods respectively.
OO_Trips_PK/OP.mtx	Mode Choice	Other-based other trips by mode for peak and off-peak periods respectively.
PA_IXXI_PK.mtx	Time of Day	Person trip table for IX and XI trips for peak period
PA_IXXI_OP.mtx	Time of Day	Person trip table for IX and XI trips for off-peak period
OD_AM/PM/MD/NT.mtx	Time of Day	Internal OD vehicle trip tables for DA, SR2 and SR3+, for AM, PM, midday and night time periods respectively.
OD_AM/PM/MD/NT_IXXI.mtx	Time of Day	IX and XI OD vehicle trip tables for DA, SR2 and SR3+, for AM, PM, midday and night time periods respectively.
Final_OD_AM/PM/MD/NT.mtx	Time of Day	Final OD vehicle trip tables including II, IX, XI and XX trips for DA, SR2, SR3+ and EE, for AM, PM, midday and night time periods respectively.
Final_OD_AM/PM_PH.mtx	Time of Day	Final OD vehicle trip tables including II, IX, XI and XX trips for DA, SR2, SR3+ and EE, for AM and PM peak hour respectively.
Assignment_AM/MD/PM/NT.bin	Traffic Assignment Final Assignment	Flow table for AM, PM, midday and night time periods respectively, in binary format.
Assignment_AM/MD/PM/NT.dbf	Traffic Assignment Final Assignment	Flow table for AM, PM, midday and night time periods respectively, in DBF format.
Turning_Vol_AM/MD/PM/NT.dbf	Traffic Assignment Final Assignment	Turning movements for pre-defined intersections in the AM, PM, midday and night time periods respectively.
Assignment_AM/PM_PH.bin	Final Assignment	Flow table for AM and PM peak hour respectively, in binary format.
Assignment_AM/PM_PH.dbf	Final Assignment	Flow table for AM and PM peak hour respectively, in DBF format.
Turning_Vol_AM/PMPH.dbf	Final Assignment	Turning movements for pre-defined intersections in the AM and PM peak hour respectively.
Assignment_daily.bin	Final Assignment	Daily flow table in the binary format

Assignment_daily.csv	Final Assignment	Daily flow table in the .CSV format
Trn_PKTrips.mtx	Final Assignment	Transit trip table for peak period
Trn_OPTrips.mtx	Final Assignment	Transit trip table for off-peak period
WLOC_ONOFPK/OP.bin	Final Assignment	Walk to local bus assignment output – ons and offs for peak and off-peak time periods respectively.
WEXP_ONOFPK/OP.bin	Final Assignment	Walk to express bus assignment output – ons and offs for peak and off-peak time periods respectively.
DLOC_ONOFPK/OP.bin	Final Assignment	Drive to local bus assignment output – ons and offs for peak and off-peak time periods respectively.
DEXP _ONOFPK/OP.bin	Final Assignment	Drive to express bus assignment output – ons and offs for peak and off-peak time periods respectively.
Loaded_net.shp	Final Assignment	Loaded network shape file.
MC_Summary	Final Assignment	Summary of Mode Choice model results
HwyVol_AM/MD/PM/NT_Summary.bin (or .xls)	Final Assignment	Summary of Highway assignment results for AM, Midday, PM, and night time periods.
HwyVol_AMPH/PMPH_Summary.bin (or .xls)	Final Assignment	Summary of Highway assignment results for AM and PM peak hour.
HwyVol_DY_Summary.bin (or .xls)	Final Assignment	Summary of daily Highway assignment results.
TrnAsgn_Summary.bin (or .xls)	Final Assignment	Summary of transit assignment results.

Note: DA=Drive Alone, SR2=Shared Ride 2 people, SR3+=Shared ride 3+ people, II=Internal-Internal (trips within the model area), IX=Internal-External (trips exported from the model area), XI=External-Internal (trips imported to the model area), EE=External-External (trips traveling through the model area)

2.4 Major Model Parameters

Two types of parameters are used in the model, one is the parameters used in the mathematical function that needs to be estimated and/or calibrated, such as parameters used in the gamma function in the trip distribution, and parameters used in the mode choice nested logit model; while the other is the generic parameters to set up the model run. The first type of parameters are described in details in the Travel Model Development Report. For scenario testing or future uprates, the parameters are available for modification within the User interface on the Parameters tab of the Module and can be accessed through the Setup button. The second type of the parameters are preset in the model table, which can be further adjusted by the users, as shown in Table 2.3.

Table 2.3: Major Parameters from SCCRTC model

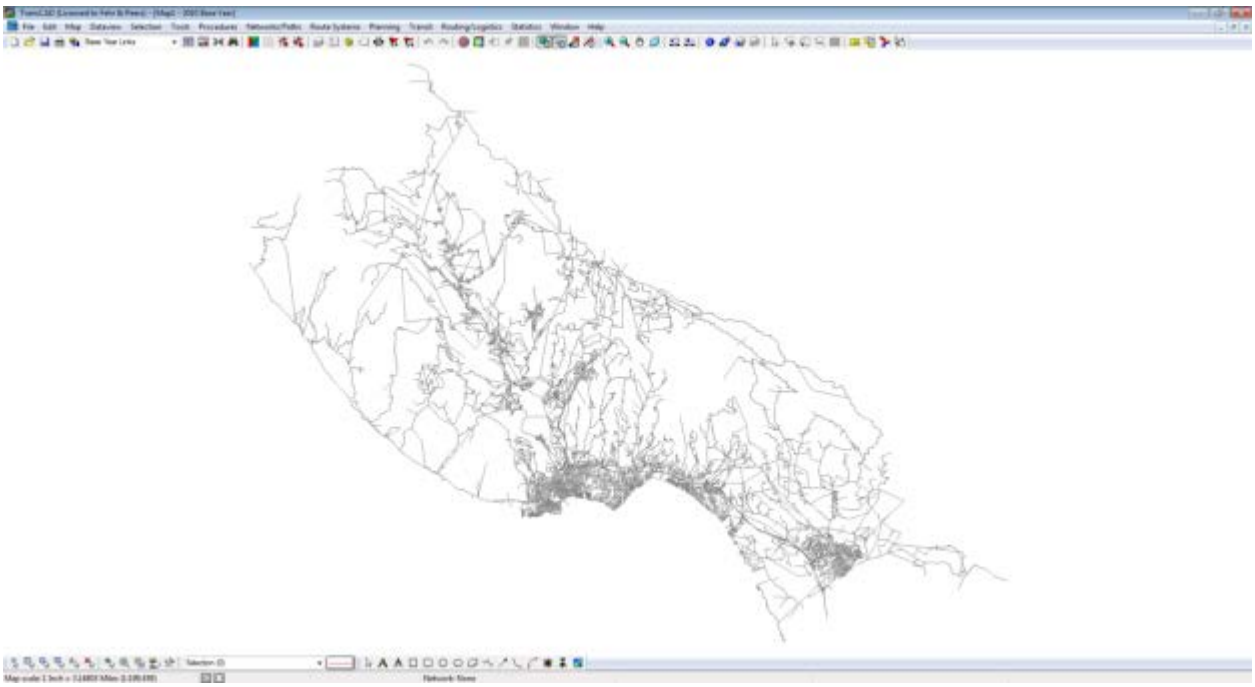
Parameter	Value	Module	Description
Transit Time Factors	1.3,1.1,1.0,1.0	Network Initialization	Transit travel time factors to highway time for modes of Local Bus, Express Bus, LRT, and CRT
Time Period Factors	2.5,4,2.5,5	Network Initialization	Factors to convert hourly capacity to the capacity for each time period
Walk Speed	3	Network Initialization	Walk speed
Bike Speed	10	Network Initialization	Bike speed
Max Driving Distance	5.5	Network Initialization	Maximum driving distance to from an origin to a transit station
Value of Time	0.083,0.083,0.083,0.083, 0.083,0.083,0.083,0.083	Network Initialization	Value of Time ($) for DA, SR2, SR3+, Local Bus, Express Bus, LRT, CRT, and general
Auto Operating Cost	0.147	Network Initialization	Auto Operation Cost ($/Mile)
Transit Mode Flag	1,1,0,0	Network Skimming	If any of Local Bus, Express Bus, LRT or CRT exists
Gravity Model Iterations	10	Trip Distribution	Max. # of iterations for Gravity Model
HOV3 Occupancies	3.28, 3.48, 3.45, 3.28, 3.77, 3.50, 3.50,3.50,3.50	Time of Day Traffic Assignment	HOV3 vehicle occupancy rates for HBW, HBS, HBK, HBC, HBO, WBO, OBO, EE, and average
Peak Hours	7,17	Time of Day Traffic Assignment	AM and PM peak-hour start hours: 7 for 7-8am, 17 for 17-18pm
Max Assignment Iterations	200	Traffic Assignment Final Assignment	Max. # of iterations for highway assignment
Assignment Convergence	0.0001	Traffic Assignment Final Assignment	Convergence for highway assignment
Max Feedback Iteration	3	Feedback Loop	Max. # of Feedback Loops
Max Assignment Iterations Peak Hour	10	Final Assignment	Max. # of iterations for peak hour highway assignment
Peak Hour Factor	0.34,0.26	Final Assignment	Peak hour factor for AM and PM

3 TransCAD Basics

The most common task for model users is to display data produced by the model. The sections below explain how to display various types of data produced by TransCAD models.

3.1 Opening a Roadway Network

1) To open a roadway network, start TransCAD.
2) Open the location of the roadway network named Santa_Cruz_BaseYear_Highway.dbd., under YR2010/inputs/Networks.
3) Double-click on the file or drag it into the grey space in TransCAD, you will see a little "+" sign notifying that it will be added to map.
4) Now, the roadway network is displayed and below is what should be on the screen.



3.2 Commonly Used Tools

When a roadway network is opened, the Toolbox Toolbar also opens by default. If it does not, it can be opened by pressing **F8** or going to **Tools > Toolbox.** The Toolbox is shown below, and several of the most commonly utilized tools are described.

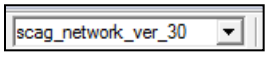
Zoom Tools: Allow you to zoom in and out by creating a zoom extent box on the map. Alternatively, the scroll wheel can be used to zoom.

Pan Tool: Allows you to pan across a map. Alternatively, the scroll wheel can be used for panning by pressing it and panning.

Info Tool: Allows you to select on a map feature and view its' attributes in a dataview window that automatically opens.

At the top of the TransCAD window are the Standard Tools. These include common tools such as new document, open, save, and print on the left hand side, as can be seen below:

Other commonly used tools are:



Working Layer: This is the working layer manager; sets the active working layer.


New Dataview: Opens a new dataview with the attributes of the active working layer.


Join Dataviews: Joins two dataviews together based on a common identifier. This tool is used extensively to join model outputs to a roadway network for displaying results.


Map Layers: Displays the layers in the map in order of display and allows for hiding or showing individual layers, as well as setting styles and labels for each layer.

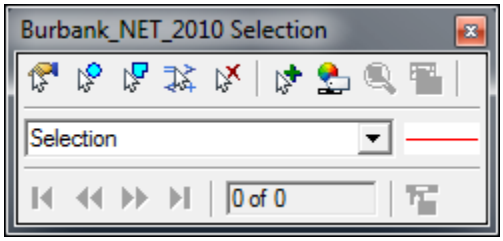

Show or hide the legend: Toggles a legend with the visible layers and map scale on and off.


Layer Styles: Shortcut to the style menu of the active working layer where style, width, color, and arrowheads can be modified.

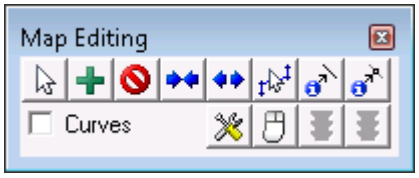

Automatic Labels: Shortcut to the labels menu of the active working layer where labels can be modified for all available fields.

 **Main Toolbox:** Shortcut to the Toolbox Toolbar, alternative to pressing F8.

 **Selection Toolbox:** Shortcut to the Selection Toolbox (shown below) for the active working layer. The toolbox has tools for several different methods of selection including select by pointing, select by circle, select by shape, etc.

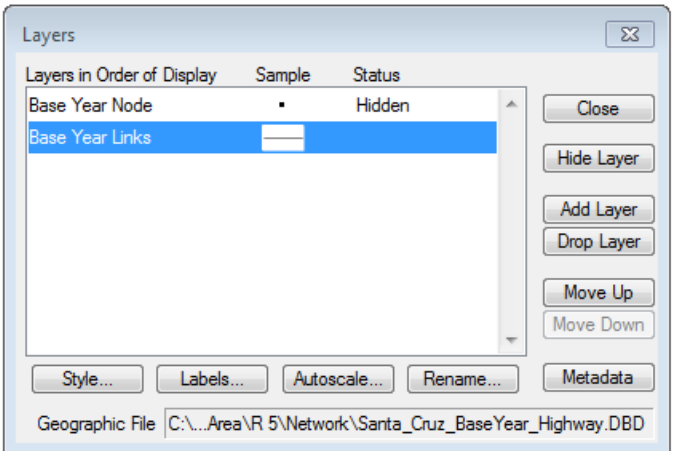


 **Map Editing Toolbox:** Shortcut to the Map Editing Toolbox (shown below) for the active working layer which has tools for adding, deleting, splitting, joining, and modifying or attributes.

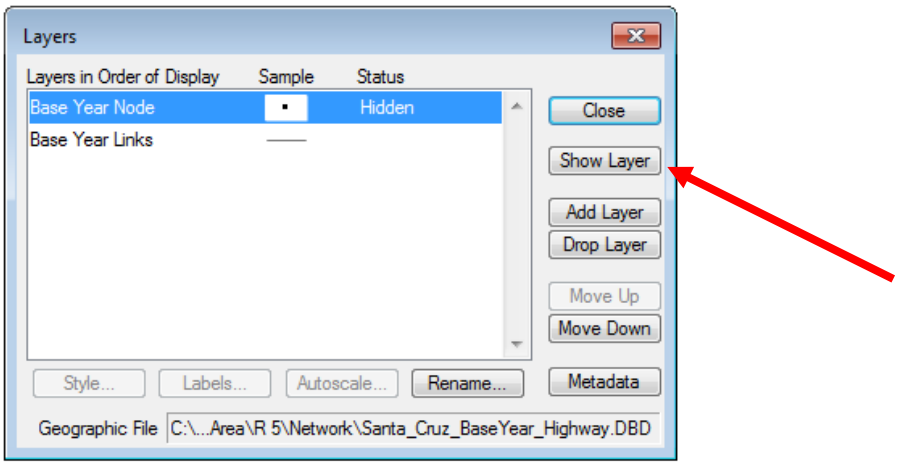


3.3 Displaying Nodes

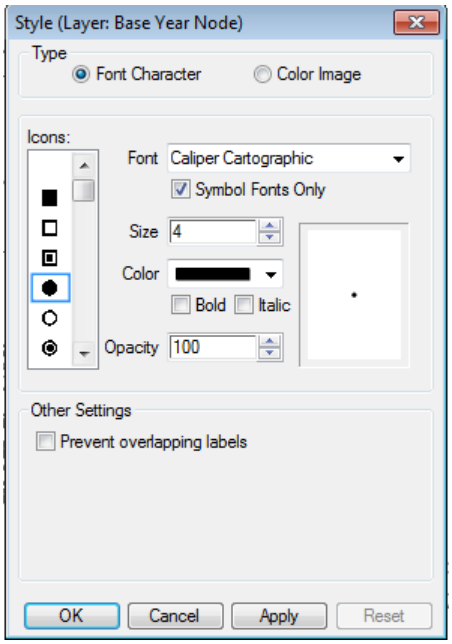
Once a roadway network is open in TransCAD, by default, only the links are displayed. To display the nodes, click on the Map Layers Button  and the window below will come up.



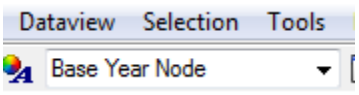
Here, you can see that the Base Year Node layer is currently hidden. To show the layer, select the layer and click on show layer.



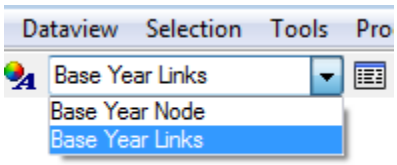
Once the node layer is shown, the node style can be modified from within this window by clicking the Style button. In the Style window, as shown below, settings such as the node icon, size, and color can be modified. You can "preview" what the nodes will look like by clicking on Apply. If you like the changes, click OK, and you are taken back to the Layers window, and then click Close to return to the network.



Now, you will notice that the working layer has changed to Base Year Nodes from the Base Year Links, as shown below.



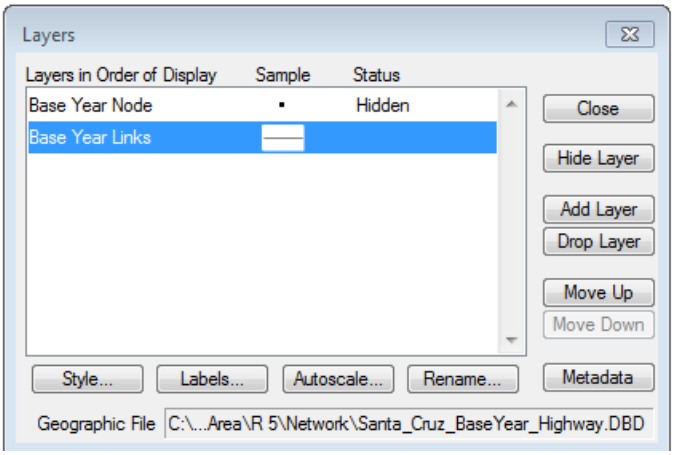
The working layer pull down menu will have as many layers as are visible in the map layers. In order to select or modify anything within a specific layer, that layer must be selected under the working layers folder. To switch between working layer, simply click on the pull down menu and select the desired layer to activate, as shown below.



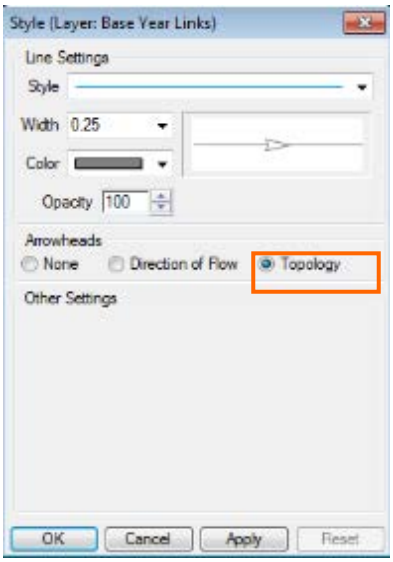
3.4 Displaying Link Topology

Link topology specifies the direction in which the link was drawn. The AB direction is the direction starting at A and ending at B and BA is the reverse direction. This is important because the AB and BA designations specify the attributes for the roadways in both directions of travel as they may differ. When topology is displayed, an arrow displays the direction in which the link was drawn, the AB direction. To display link topology:

1) Click on the Map Layers Button  and the window below will display.



2) Select the Base Year Links layer and click on Style.
3) Select Topology and click OK.



4) Click Close and now topology is displayed for all roadway network links.

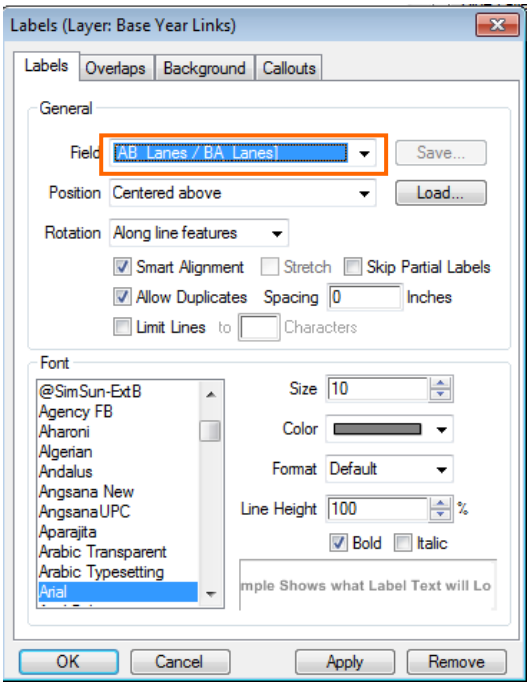
It is important to note that Direction of Flow is not the same as Topology. A link can be a one-way link and have the flow traveling in the BA direction.

Within the same style window, the line settings of the roadway network can also be changed to a different line style, different thickness, and different color.

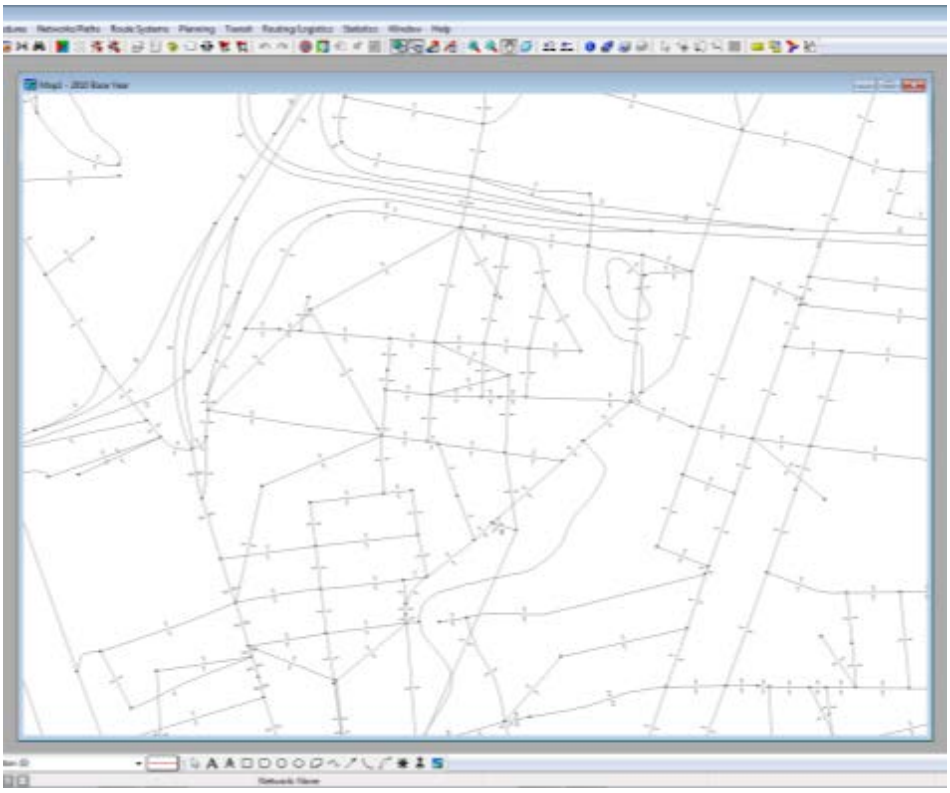
3.5 Displaying Roadway Link Attributes

Posting link attributes is a good way to visually inspect the roadway network for the number of lanes (AM, PM, MD, and OP), posted speed, facility type, roadway name, and much more. To post any link attribute:

1) Click on the Map Layers Button  , select the Base Year Links layer and click labels.
2) The Automatic Labels window will appear. Under field, select any field, in this example we are displaying facility type, [AB_Lanes / BA_Lanes], and click Apply.



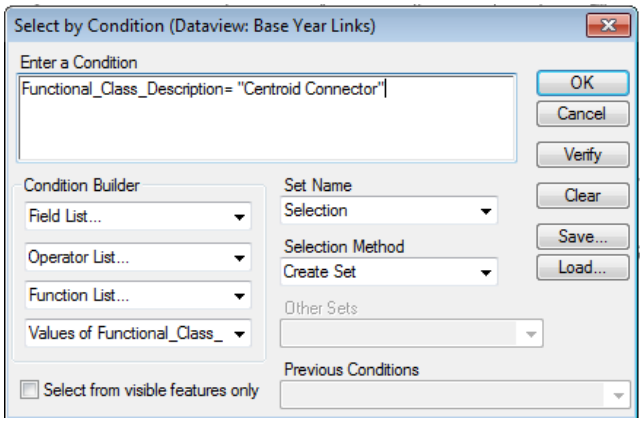
In this same window, the font size, position, and color can also be customized for the labels to be as desired. Once all of the changes have been made, click OK and you are taken back to the map with the number of lanes displayed, as shown below. Similarly, posted speed, road names, and traffic volumes can be displayed using the procedure above.



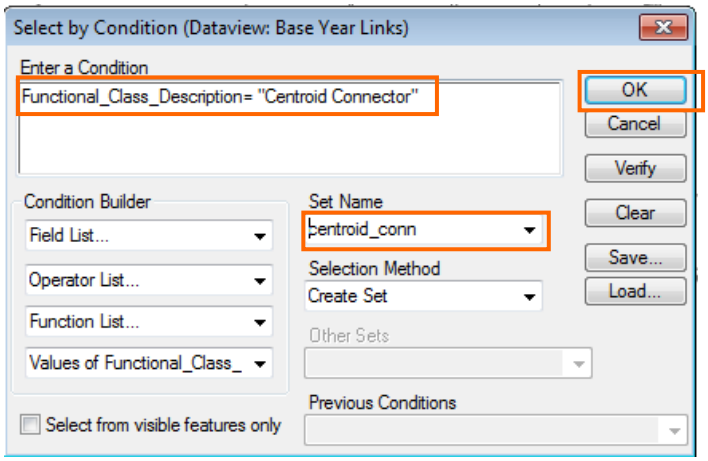
3.6 Selecting Centroid Connectors

Centroid connectors connect TAZ centroids to the roadway network. All zone centroid connectors have a "Road Type" of "Centroid Connector" as a link attribute. Differentiating the centroid connectors from the roads is very important and makes modifying and inspecting the roadway network much easier. By default, all roadway network links, including centroid connectors are displayed with a common line type, color, and width. To select just the centroid connectors in the roadway network:

1) Ensure the working layer is set to Base Year Links.
2) Go to **Selection > Select By Condition**. At the top of the window you can confirm that the correct layer is about to be queried.

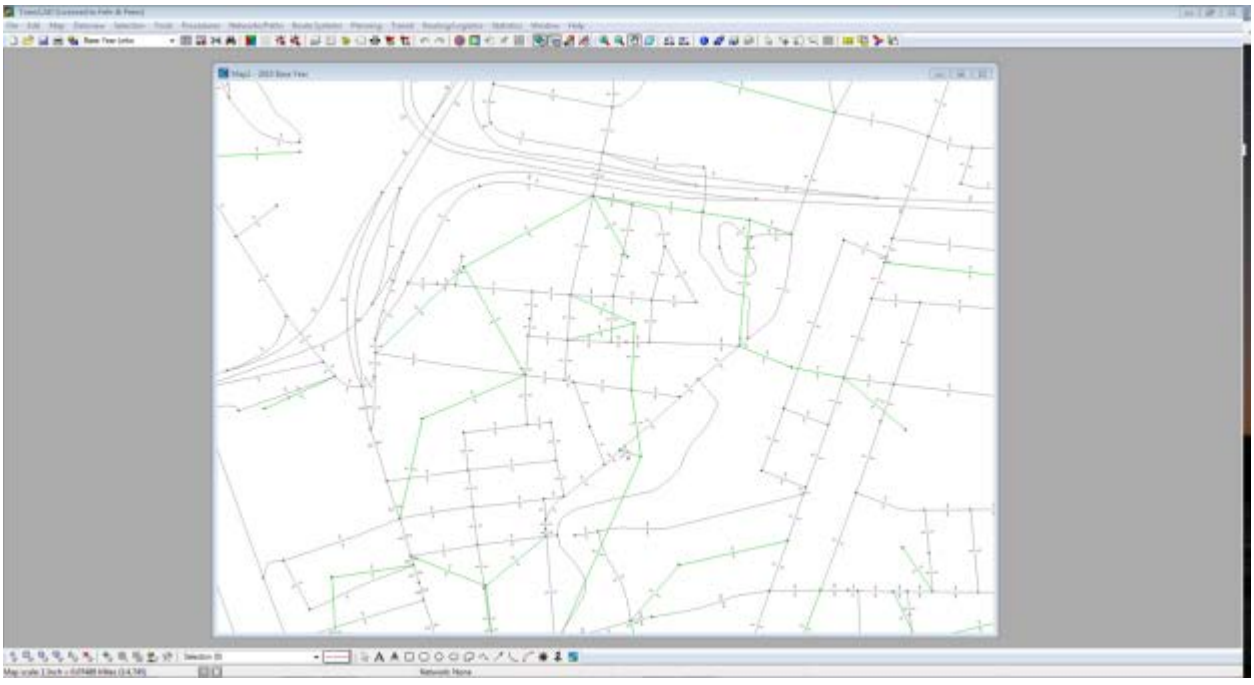


3) A condition must now be created to select roadway links that are centroid connectors. To create a condition, we will use the condition builder.
    a. A field under the field list must be selected. In this case, we will select "Functunal_Class_Description".
    b. Select an operator, in this case "=".
    c. Type in "Centroid Connector" to complete the query (quotes are needed and it is case sensitive). The syntax should look like the one below. You can check to ensure the syntax is correct by clicking on Verify.



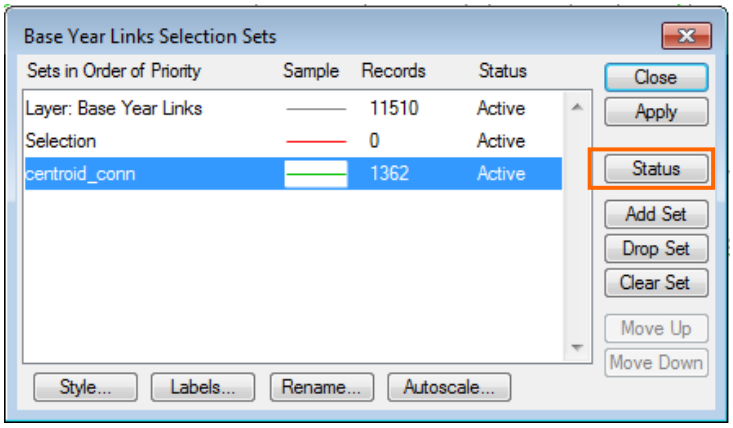
    d. The default name for this selection will always be Selection, but a different name can be created by typing it in under Set Name. In this case, let's call it Centroid Connector. Click OK to execute the query.

You will now notice that now some links are a different color, representing the centroid connectors, as seen below.



These centroid connectors can now be hidden, displayed as a different color, line type, and width than the rest of the roadway network by:

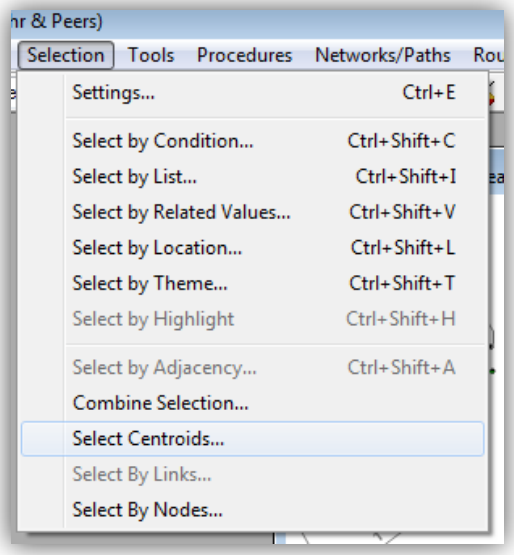
1) Go to **Selection > Setting**. There, you will see the Centroid Connector selection.



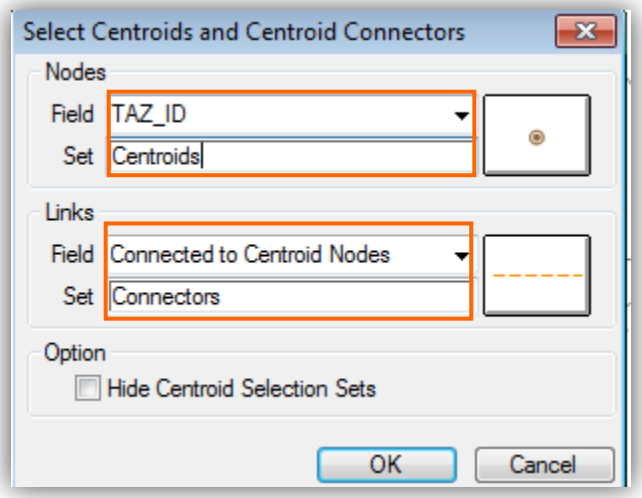
2) To hide or modify the centroid connectors, select the selection and click Style.
3) To hide the centroid connectors, change the Status to Invisible.
4) In this same window, you can also change the style, width, and color of just the centroid connects. In this example, the centroid connects are all orange and dashed to easily differentiate them.

To drop (remove) or clear a selection set, simply got to **Selection > Setting**, select the desired layer, and click on Drop Set to remove, or Clear Set to clear it.

A simpler way to select centroids and centroid connectors is to access TransCAD's Selection Menu, by going to Selection – Select Centroid as shown below:



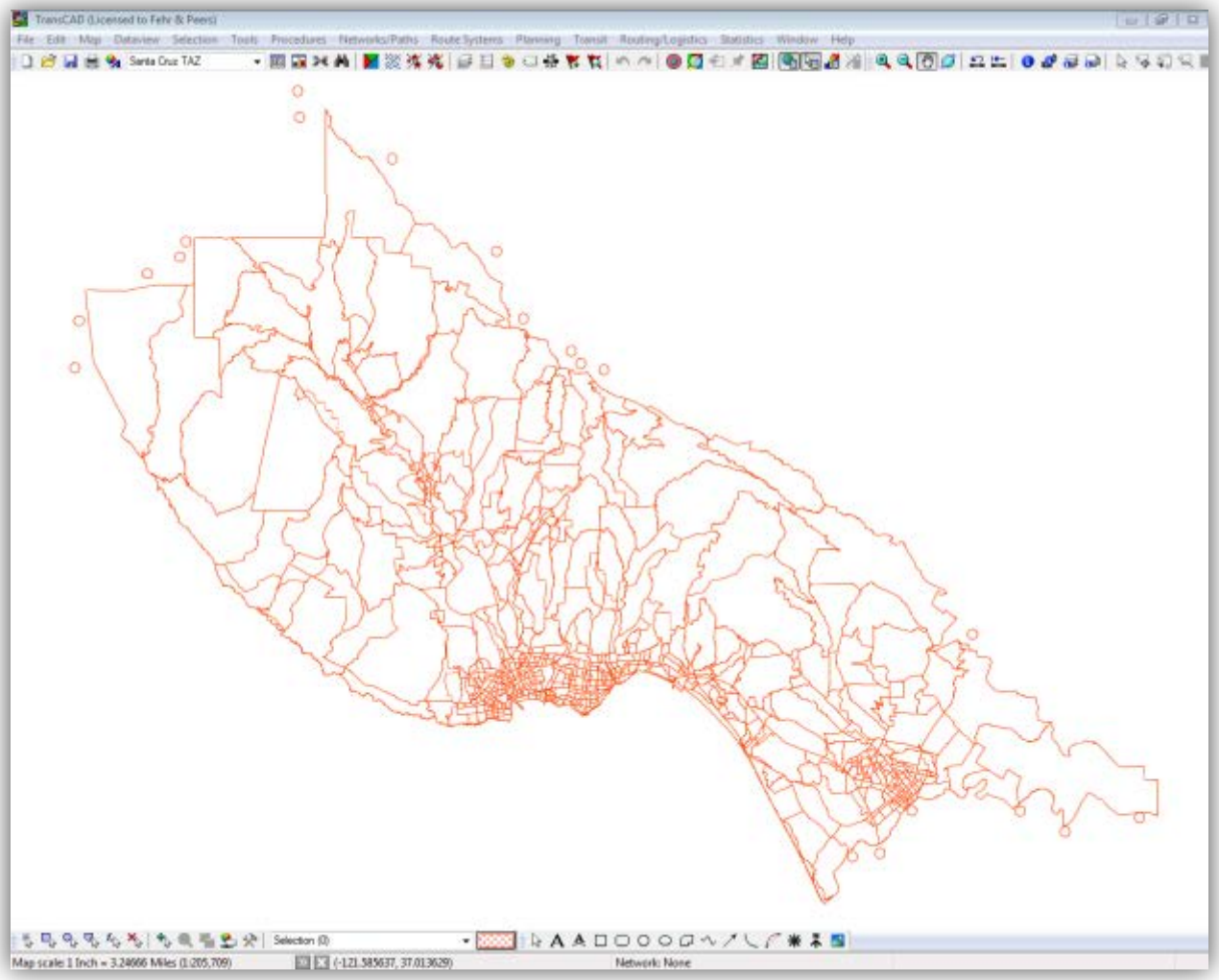
This new function of TransCAD allows the user to automatically select centroids and centroid connectors by accessing the node and network layer simultaneously. By following the set up below, you can query the centroids for the Santa Cruz model.



3.7 Displaying TAZ Land Use Data

TAZ data is stored in tabular format in the land use file (SED_SCC.csv). However, it is sometimes useful to display this data graphically using a TAZ boundary layer file. To do this:

1) In TransCAD, open the TAZ boundary layer file named SCC_Base_Year_TAZ.dbd under the inputs/TAZ folder. Note that the objects in this file are polygons; not lines (as in a road layer) or points (as in a nodes layer).



2) Now bring in the land use data (SED_SCC.csv) located in the inputs folder into TransCAD by dragging it into the grey space in TransCAD. The table below will be displayed:

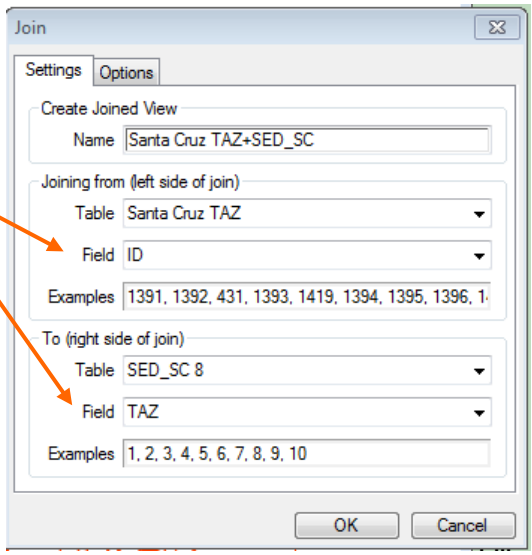
Dataview1 - SED_SC 8

TAZ	TotHH	HHSIZE1	HHSIZE2	HHSIZE3	HHSIZE4	HHInc1	HHInc2	HHInc3
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
101	274.0000	18.5763	36.2237	31.5797	187.6203	9.2881	29.7220	95.6678
102	485.0000	81.4575	106.7375	69.2857	227.5193	26.2162	45.8784	142.3166
103	196.0000	26.1897	60.8276	33.7931	75.1897	1.6897	20.2759	67.5862
111	353.0000	60.5409	150.8865	55.8839	85.6887	1.8628	22.3536	38.1873
112	335.0000	74.7521	126.4325	50.7576	83.0579	0.0000	3.6915	62.7548
113	8.0000	0.0000	5.6000	2.4000	0.0000	0.8000	0.8000	0.8000
114	5.0000	0.7143	0.0000	2.8571	1.4286	0.7143	0.7143	1.4286
115	141.0000	35.4663	42.3865	31.1411	32.0061	0.0000	40.6564	9.5153
116	35.0000	15.0000	15.0000	2.0000	3.0000	9.0000	6.0000	3.0000
117	305.0000	64.8730	109.4127	53.2540	77.4603	7.7460	69.7143	30.0159
118	156.0000	36.2143	74.2857	25.0714	20.4286	0.0000	14.8571	22.2857
119	219.0000	76.1286	76.1286	28.1571	38.5857	14.6000	27.1143	23.9857
120	112.0000	42.4516	35.2258	18.0645	16.2581	0.9032	11.7419	22.5806
121	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
122	352.0000	114.1362	109.3406	61.3842	67.1390	23.9782	39.3243	67.1390
123	9.0000	1.0000	5.0000	2.0000	1.0000	0.0000	0.0000	1.0000

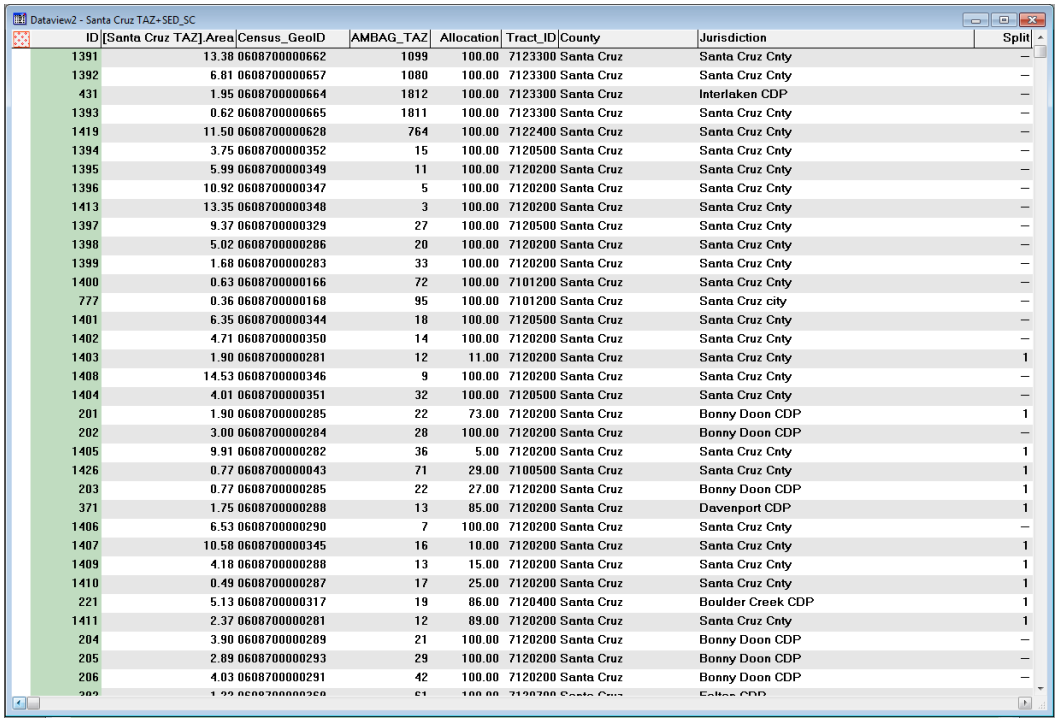
3) Make the TAZ geography file window the active window by clicking on it.

4) Click the "Join Dataviews" button  , and select the field in each file that identifies the TAZ number. TransCAD will use these fields to correlate the records in the boundary layer with the records in the tabular file. The fields selected should be the ones shown below. Click "OK."

Field names that identify corresponding records



5) A window will appear like the one below, which will display the combined data from the joined files, with the two connecting fields and all new fields from joined table highlighted in green.

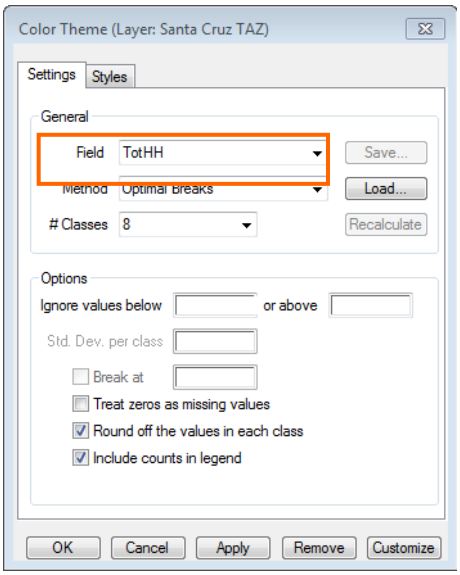


Dataview2 - Santa Cruz TAZ+SED_SC

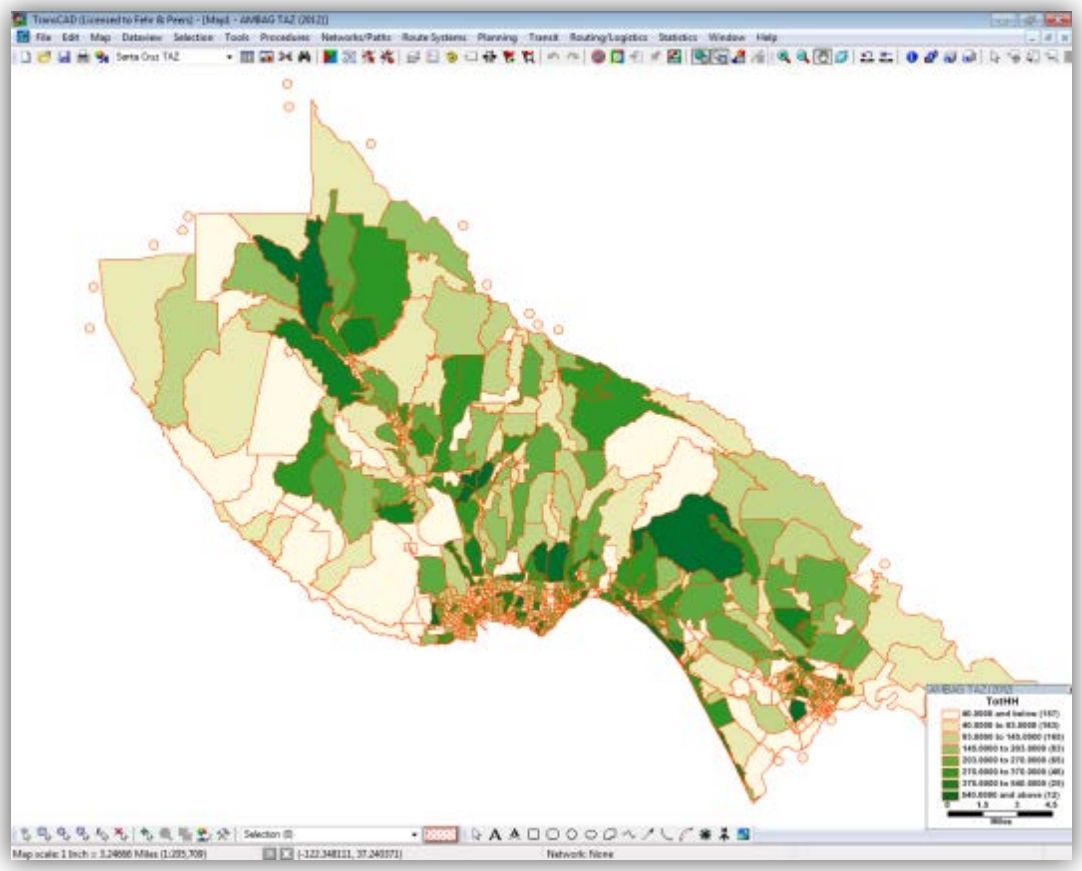
ID	[Santa Cruz TAZ].Area	Census_GeoID	AMBAG_TAZ	Allocation	Tract_ID	County	Jurisdiction	Split
1391	13.38	0608700000662	1099	100.00	7123300	Santa Cruz	Santa Cruz Cnty	–
1392	6.81	0608700000657	1080	100.00	7123300	Santa Cruz	Santa Cruz Cnty	–
431	1.95	0608700000664	1812	100.00	7123300	Santa Cruz	Interlaken CDP	–
1393	0.62	0608700000665	1811	100.00	7123300	Santa Cruz	Santa Cruz Cnty	–
1419	11.50	0608700000628	764	100.00	7122400	Santa Cruz	Santa Cruz Cnty	–
1394	3.75	0608700000352	15	100.00	7120500	Santa Cruz	Santa Cruz Cnty	–
1395	5.99	0608700000349	11	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1396	10.92	0608700000347	5	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1413	13.35	0608700000348	3	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1397	9.37	0608700000329	27	100.00	7120500	Santa Cruz	Santa Cruz Cnty	–
1398	5.02	0608700000286	20	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1399	1.68	0608700000283	33	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1400	0.63	0608700000166	72	100.00	7101200	Santa Cruz	Santa Cruz Cnty	–
777	0.36	0608700000168	95	100.00	7101200	Santa Cruz	Santa Cruz city	–
1401	6.35	0608700000344	18	100.00	7120500	Santa Cruz	Santa Cruz Cnty	–
1402	4.71	0608700000350	14	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1403	1.90	0608700000281	12	11.00	7120200	Santa Cruz	Santa Cruz Cnty	1
1408	14.53	0608700000346	9	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1404	4.01	0608700000351	32	100.00	7120500	Santa Cruz	Santa Cruz Cnty	–
201	1.90	0608700000285	22	73.00	7120200	Santa Cruz	Bonny Doon CDP	1
202	3.00	0608700000284	28	100.00	7120200	Santa Cruz	Bonny Doon CDP	–
1405	9.91	0608700000282	36	5.00	7120200	Santa Cruz	Santa Cruz Cnty	1
1426	0.77	0608700000043	71	29.00	7100500	Santa Cruz	Santa Cruz Cnty	1
203	0.77	0608700000285	22	27.00	7120200	Santa Cruz	Bonny Doon CDP	1
371	1.75	0608700000288	13	85.00	7120200	Santa Cruz	Davenport CDP	1
1406	6.53	0608700000290	7	100.00	7120200	Santa Cruz	Santa Cruz Cnty	–
1407	10.58	0608700000345	16	10.00	7120200	Santa Cruz	Santa Cruz Cnty	1
1409	4.18	0608700000288	13	15.00	7120200	Santa Cruz	Santa Cruz Cnty	1
1410	0.49	0608700000287	17	25.00	7120200	Santa Cruz	Santa Cruz Cnty	1
221	5.13	0608700000317	19	86.00	7120400	Santa Cruz	Boulder Creek CDP	1
1411	2.37	0608700000281	12	89.00	7120200	Santa Cruz	Santa Cruz Cnty	1
204	3.90	0608700000289	21	100.00	7120200	Santa Cruz	Bonny Doon CDP	–
205	2.89	0608700000293	29	100.00	7120200	Santa Cruz	Bonny Doon CDP	–
206	4.03	0608700000291	42	100.00	7120200	Santa Cruz	Bonny Doon CDP	–

To remove the join go to **Dataview>Drop Join** in the toolbar….Also closing the dataview of the SED_SCC removes the table from the work space and removes the join.

6) Now click on the boundary layer to re-activate it. You can now display data from the tabular file using the layer file. For example, to color-code the TAZ map by Total Households (TotHH), you would click on the Color Theme Map Wizard button  . Then, pick "TotHH" as the field, "Optimal Breaks" as the method, and choose any number of classes greater than four (TransCAD will ignore any extras). You can also select a style, such as a color scheme, using the "Styles" tab.



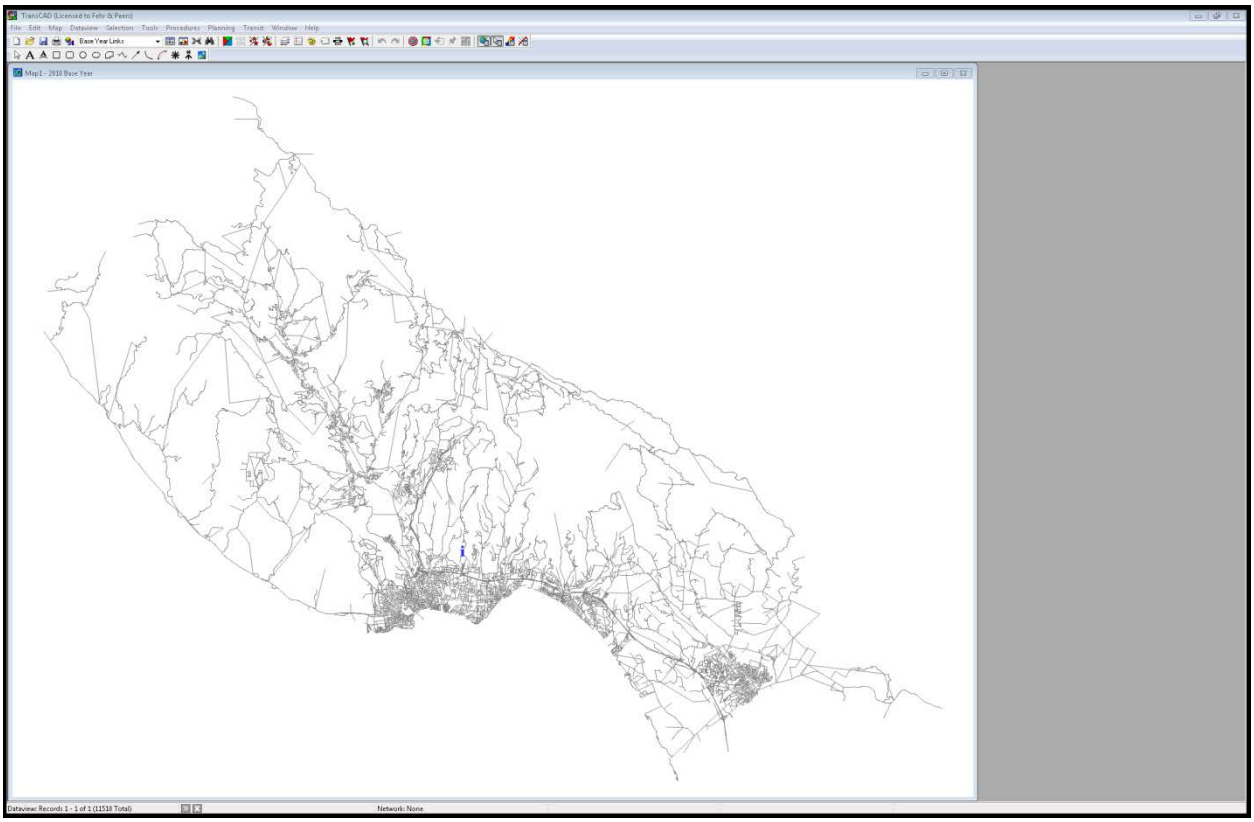
7) The resulting display should look something like the figure below, depending on what style options you selected.



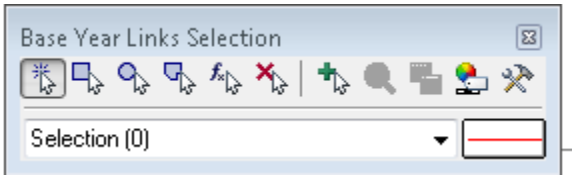
The most common task for model users is to display data produced by the model. Section 5 below explains how to display various types of data produced by TransCAD models.

3.8 Summarizing Route and Origin-Destination Travel Times

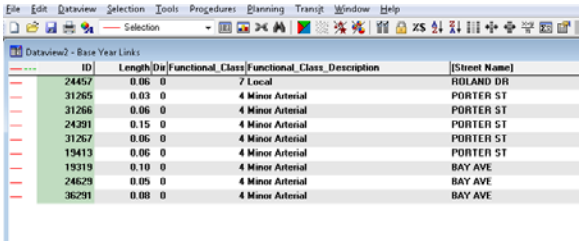
Open the loaded highway geographic file in Outputs\Networks



Select the roadways links making up the route/OD for summary using the Select by Pointing tool



Open the dataview for the roadway network, and change the All Records data to Selected .



ID	Length	Dir	Functional_Class	Functional_Class_Description	[Street Name]
24457	0.06	0	7	Local	ROLAND DR
31265	0.03	0	4	Minor Arterial	PORTER ST
31266	0.06	0	4	Minor Arterial	PORTER ST
24391	0.15	0	4	Minor Arterial	PORTER ST
31267	0.06	0	4	Minor Arterial	PORTER ST
19413	0.06	0	4	Minor Arterial	PORTER ST
19319	0.10	0	4	Minor Arterial	BAY AVE
24629	0.05	0	4	Minor Arterial	BAY AVE
36291	0.08	0	4	Minor Arterial	BAY AVE

Click on the Compute Statistics Button 

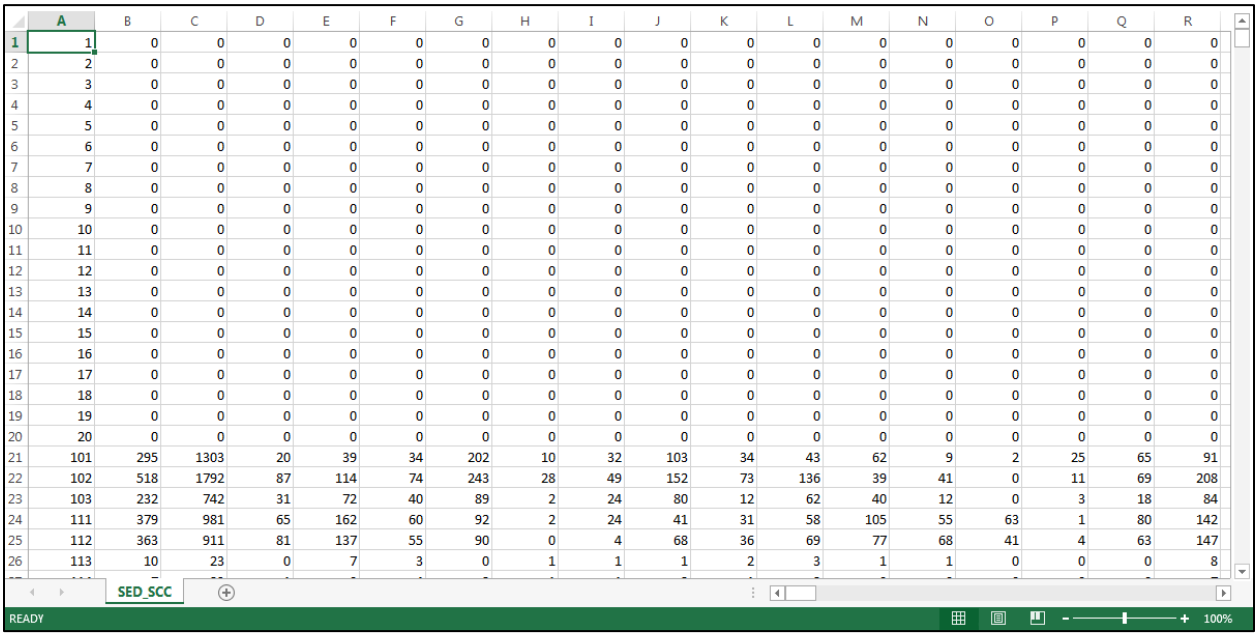
The resulting table will summarize all of the statistics for the selected roadways, including travel time, average speed, average volume for each time period.

Field	Count	Sum	Minimum	Maximum	Mean	[Std. Dev.]
AB_PKTIME	9	1.565	0.091	0.366	0.17385	0.0782
BA_PKTIME	9	1.557	0.088	0.365	0.17301	0.0783
AB_OPTIME	9	1.582	0.094	0.364	0.17580	0.0775
BA_OPTIME	9	1.579	0.087	0.364	0.17543	0.0784
AB_FREESPD	9	225.000	25.000	25.000	25.00000	0.0000
BA_FREESPD	9	225.000	25.000	25.000	25.00000	0.0000
AB_FREETIME	9	1.544	0.083	0.364	0.17158	0.0789
BA_FREETIME	9	1.544	0.083	0.364	0.17158	0.0789

4 EDITING THE LANDUSE DATA

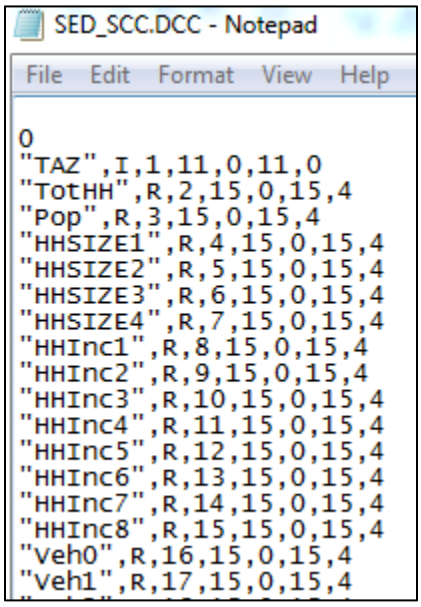
The socio economic data (SED_SCC.csv) is in *.csv format. Users can open this file in excel and modify the household, population and employment data if needed using the SED_SC.xls. This file uses AMBAG data as the base, but can be modified as needed.

1) Open SED_SCC.csv file in Microsoft excel.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	101	295	1303	20	39	34	202	10	32	103	34	43	62	9	2	25	65	91
22	102	518	1792	87	114	74	243	28	49	152	73	136	39	41	0	11	69	208
23	103	232	742	31	72	40	89	2	24	80	12	62	40	12	0	3	18	84
24	111	379	981	65	162	60	92	2	24	41	31	58	105	55	63	1	80	142
25	112	363	911	81	137	55	90	0	4	68	36	69	77	68	41	4	63	147
26	113	10	23	0	7	3	0	1	1	1	2	3	1	1	0	0	0	8

2) The corresponding headings are stored in “SED_SCC.DCC” file. Users can open this file in a text editor such as notepad to view the headings.



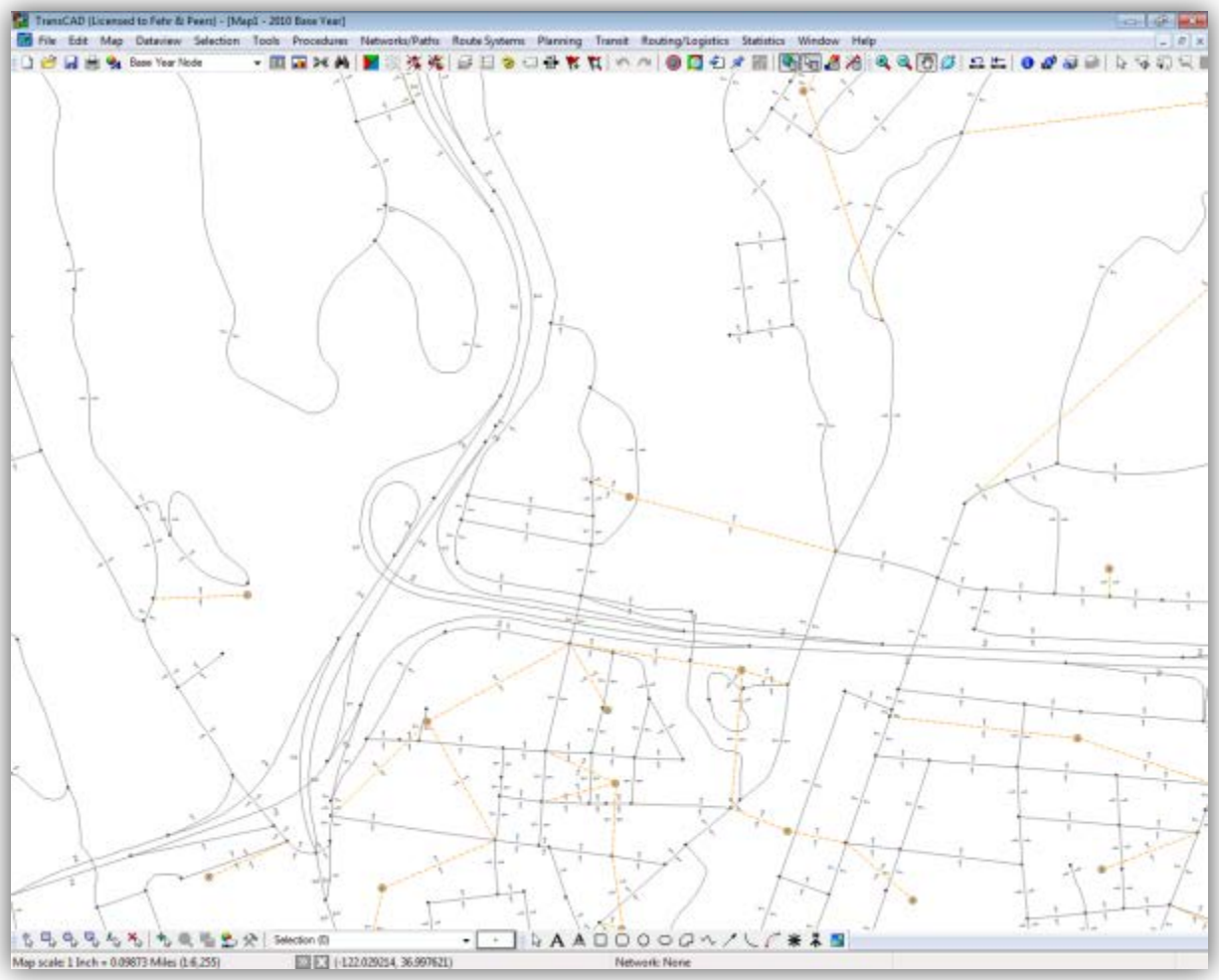
3) Users can edit the land use data directly in the "SED_SCC.csv " file.

Note: While editing the SED data users should edit all dependent variables (if needed). For example if the number of households changes then all household-related variables such as household income (HHInc), Household size (HHsize) and those cross-classified household variables should be updated accordingly, to match the total number of households.

5 EDITING THE NETWORK FILE

5.1 Checking Network Coding

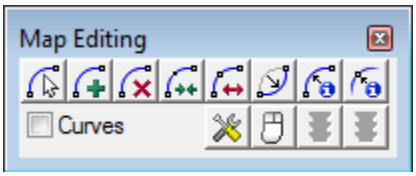
Using a combination of selection sets and displaying different information such as roadway name, facility type, number of lanes, speed, etc. and comparing it to the City's aerial imagery, from Google Maps or Goggle Earth is an effective way of checking the roadway network. Below is a screenshot of the roadway network with centroids being displayed and the AM number of lanes displayed. Similarly, fieldwork or any other data can be used to check the information in the roadway network.


TransCAD (Licensed to Fehr & Peers) - [Map1 - 2010 Base Year]
File Edit Map Dataview Selection Tools Procedures Networks/Paths Route Systems Planning Transit Routing/Logistics Statistics Window Help
Base Year Node
Selection (0)
Map scale: 1 inch = 0.09873 Miles (1:6,255)
(-122.029214, 36.997621)
Network: None

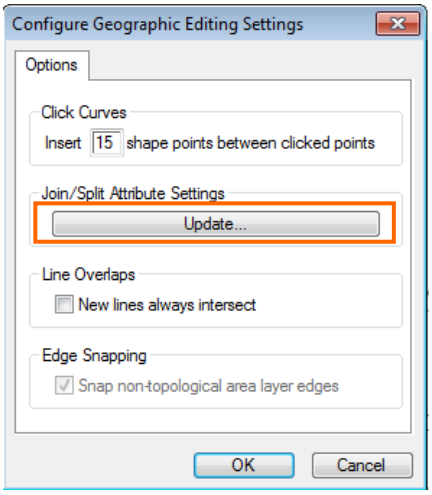
5.2 Configuring the Settings before Editing

Before you edit the network file in TransCAD, you need to configure the Geographic Editing Setting that tells TransCAD how to handle the link attribute data when links are merged or split.

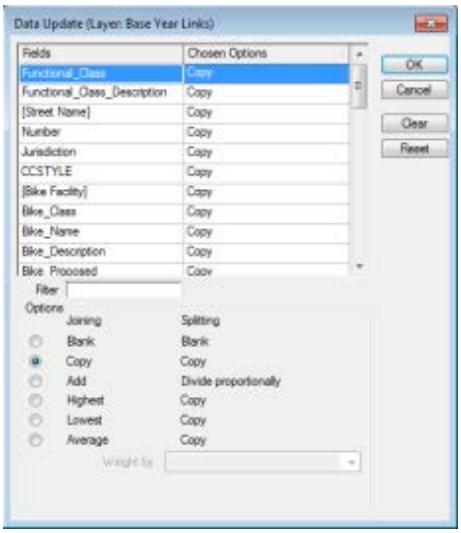
1) Open the Map Editing Toolbox by clicking **Toolbox** under **Tools - Map Editing**. Refer to the *TransCAD User's Guide* for a detailed description of each icon in the Toolbox.



2) Click the **Configure Settings** icon  in the Map Editing Toolbox. Then, click the **Update** button.



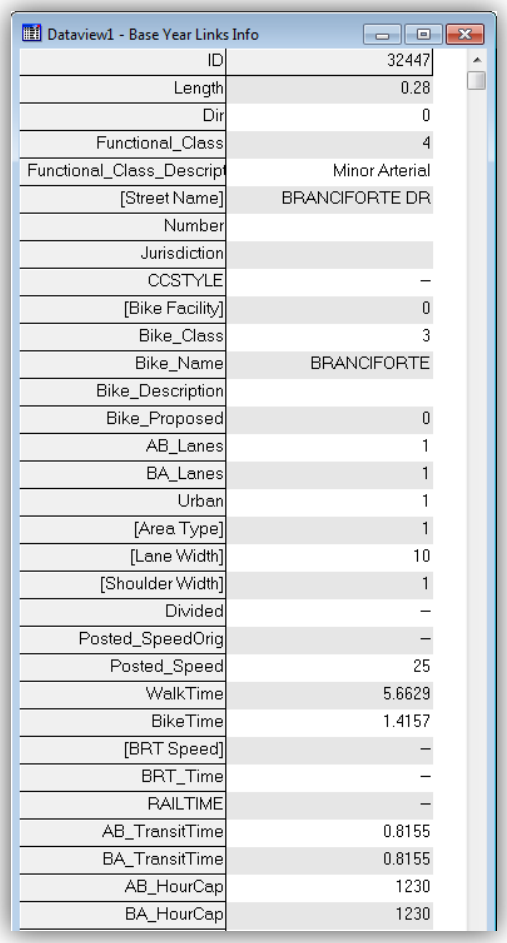
3) Choose an appropriate option for each data field. For example, splitting a link should not change the speeds, so select "Copy" for that field. In contrast, splitting a link should change the length, so for that field you should select "Divide proportionally." When finished, click "OK".



5.3 Editing the Roadway Network Attributes

A roadway link attribute may need to be modified for several different reasons, including errors found utilizing the methods described in the previous section, modeling a future roadway network change, or simply testing out a proposed roadway project. Attributes such as facility type, number of lanes, peak hour parking restrictions, and speed can be modified in the roadway network. To modify a link attribute:

1) Select the network link you want to modify using the Info tool  in the Tools window.
    a. The tools windows, shown in Section 2.2, should automatically display when you open the roadway network. If the window is not displayed, simply press F8 to display.
2) Click on the Info button to activate the tool
3) Select the desired link to be modified. The roadway link will now be selected and a data view window will open which shows all of the attributes associated with that roadway link



4) To modify any attributes, click on the desired attribute and type in the desired amount. In this example, the AB and BA lanes will be changed to three lanes from one.

    a. Type “3” into the appropriate boxes and click enter. This will automatically update the network.

5) This same method can be used to modify any attribute in the roadway network, with the exception of the ID field.

5.4 Deleting Roadway Links

To delete a roadway link, the Map Editing Toolbox will be used, and can be activated by pressing F10, or going to **Tools - Map Editing – Toolbox**.

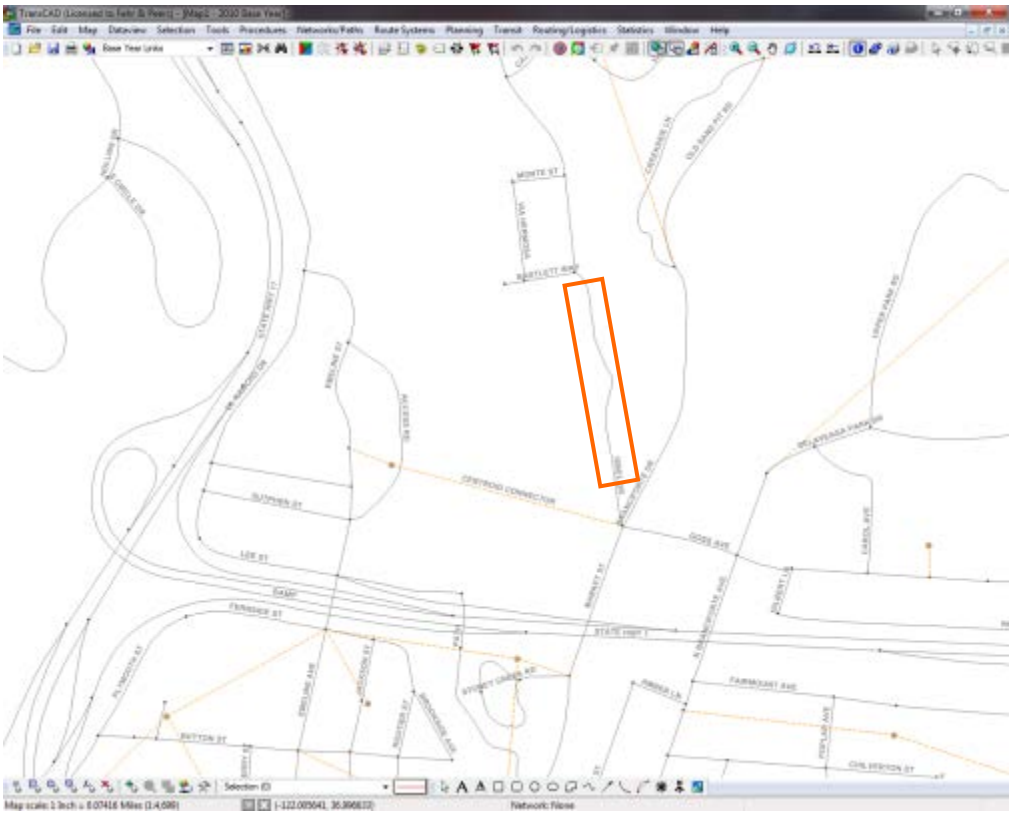
To delete a link:

1) Click the  delete line button and select the link to be deleted.

2) If the correct link was selected, as shown by it being highlighted, click on  save edit, if not click on the  cancel edits button and select again.

5.5 Splitting and Joining Roadway Links

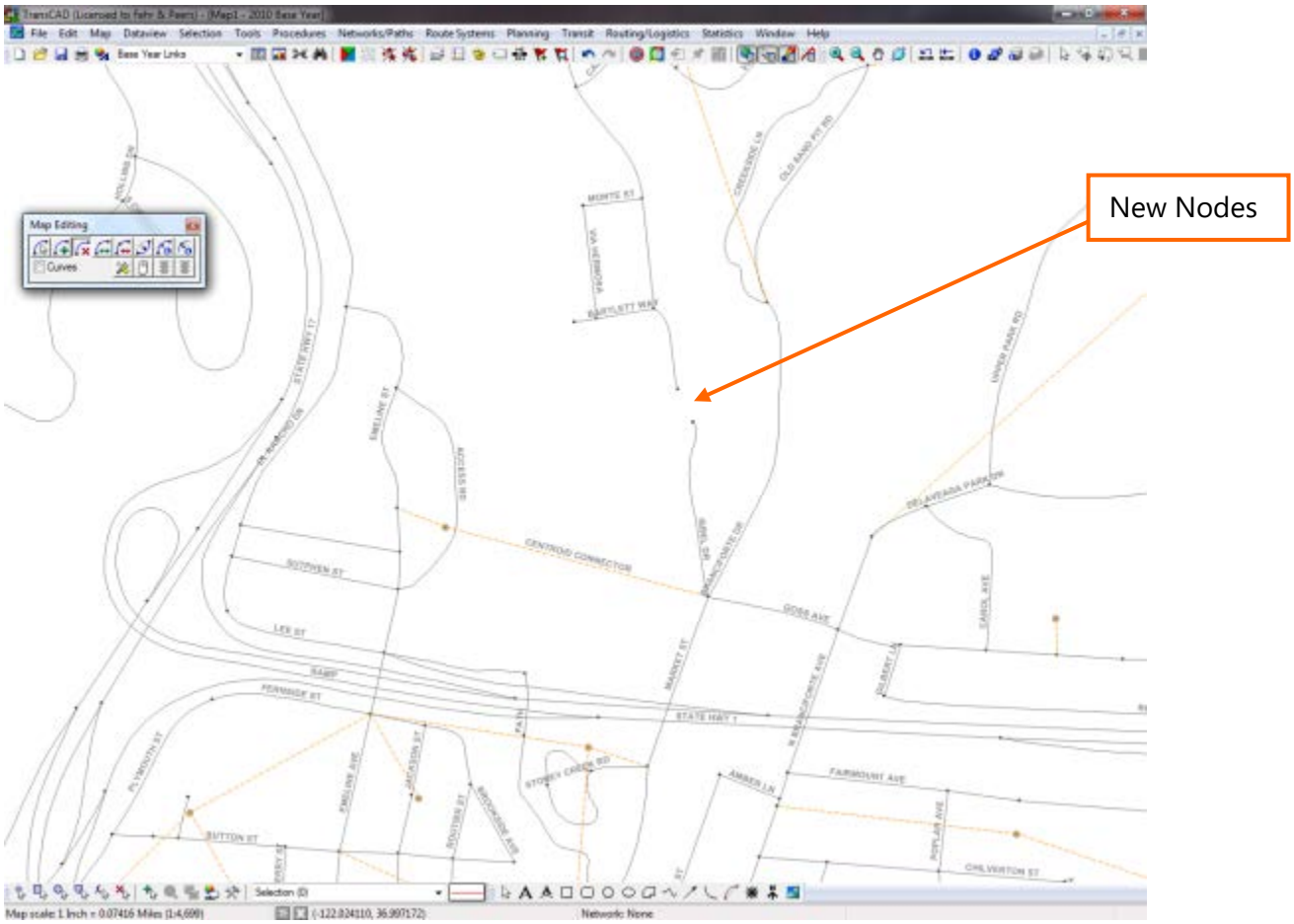
Splitting a link is sometimes necessary at a specific location. In this example, we will be splitting Isbel Drive, North of Market Street.



To split a link:

1) Enable the split link by clicking on the split line button  .
2) Click on the link at the point at which the split is desired. The link will be selected, and will show the place of the split. If the link selected is not correct or the location of the split is not correct, the changes can be cancelled by clicking on the  cancel edits button. If the split is correct, the edit can be finalized and saved by clicking on the  save edits button.
3) To create a “gap” split the link again using the process in 1 and 2 above.

As can be seen below, the link has been split and new nodes have been added at the location of the split.



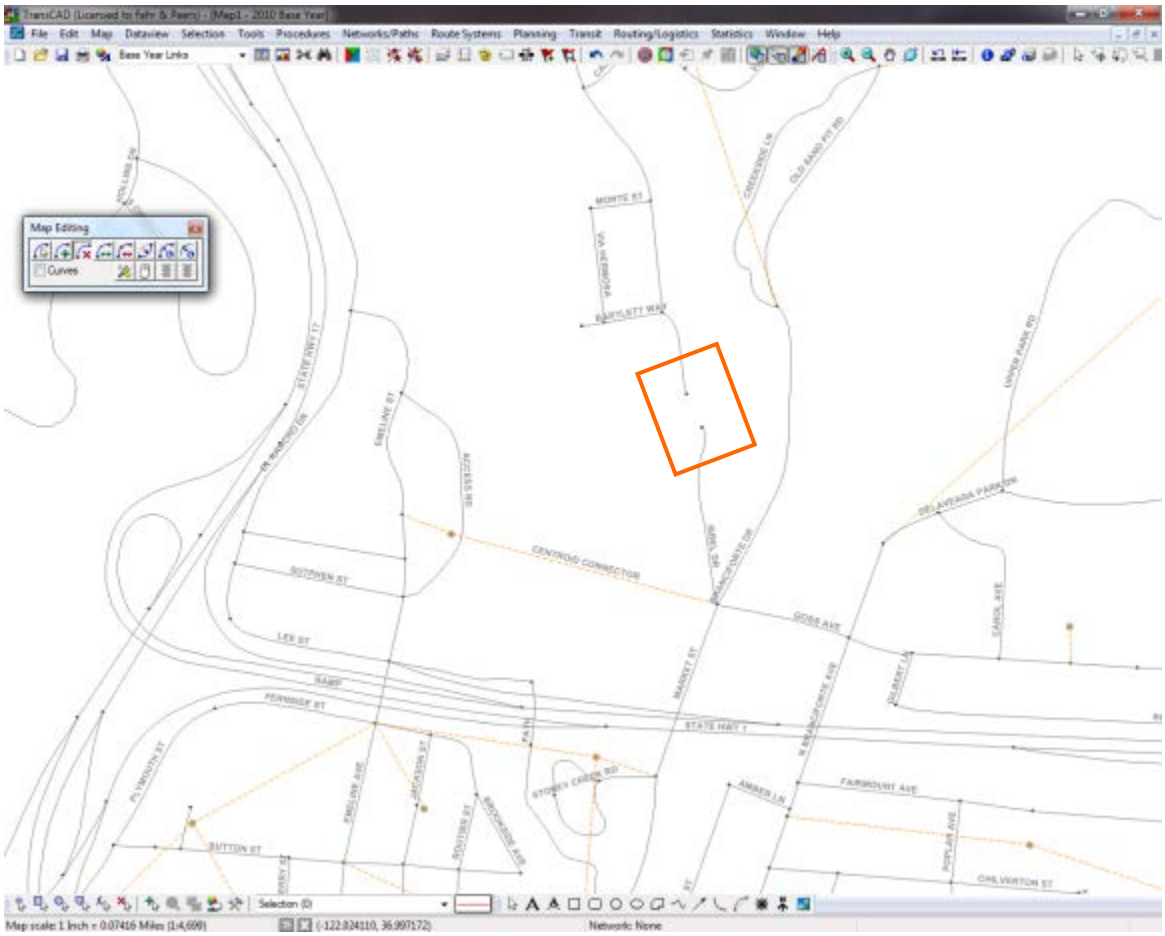
To join two or more lines together:

1) Activate the  Join lines editor.
2) Select the point that both lines share, and both of the lines with be selected.
3) Save edits and the joined link will be saved.

5.6 Adding Roadway Links

The need to model a roadway not currently in the model or a new proposed roadway are just two reasons why adding a link to the roadway network would be necessary. In this example, we want to add a roadway connection by connecting Isbel Drive. To do so:

1) Open the roadway network
    a. In this example, the centroid connectors are differentiated for ease.
    b. Turn on the node layer and make them a visible color and size.
2) Zoom to where Isbel Drive needs to be connected. In the screenshot below, the orange square is where we will add Isbel Drive.



3) When adding links to the roadway network, an important thing to keep in mind is that both the start and end point of a link must snap to end existing node in order for there to be a connection between the two links.

4) Within the map editing toolbox, select the add line editor  .

5) Click on one of the nodes that will serve as an endpoint, then double click on the other endpoint to finish the line. Click save edits,

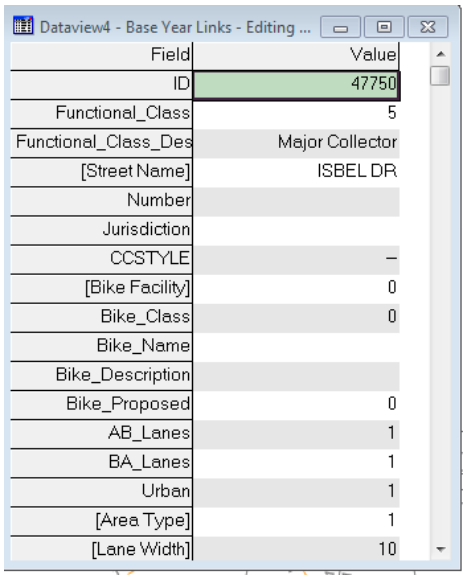
    a. It is important to note the direction in which the link is drawn. The AB direction will be in the direction in which the link is drawn, and BA the opposite.

6) Now there is a roadway link that has no attributes

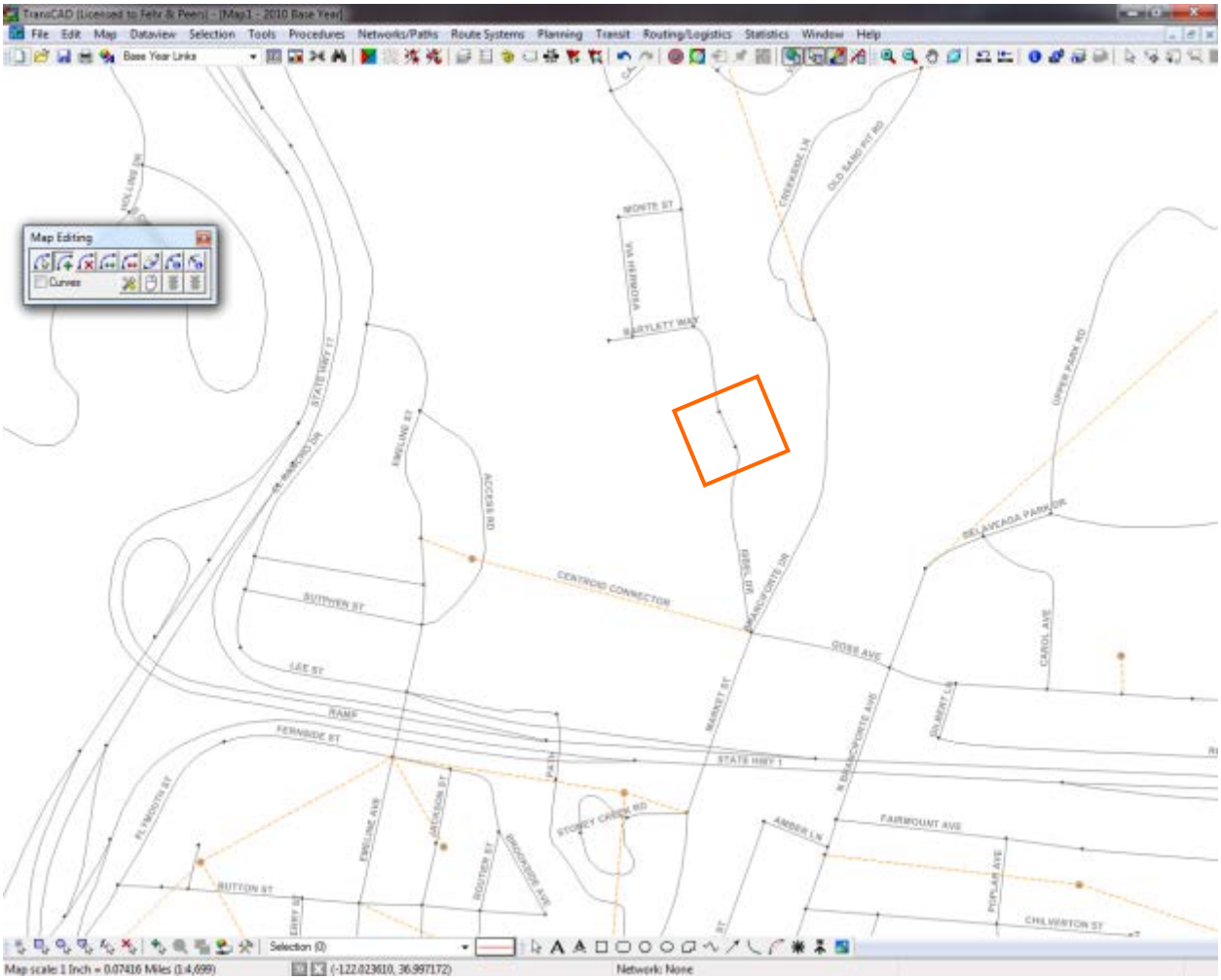
    a. Using the edit line attributes tool,  , first select the link you want to copy the attributes from, hold shift and select the new link with no attributes.

    b. The dataview should have two links showing. Now, highlight the link with the values to copy, right click, and click copy values.

    c. Any attributes that need to be further modified, i.e., if the new road has more lanes than the link that was used to copy the values from, can be done manually from within this dataview.



7) Now, as can be seen below, a new connection to Isbel Drive has been added to the roadway. Any TAZs that should be loading to Isbel Drive can now be connected to it and any erroneous centroid connectors can be removed.



5.7 Changing functional class Bike/HOV Links

New bike links can be added as described in section 5.6 above, and update the functional classifications of those new links to 88.

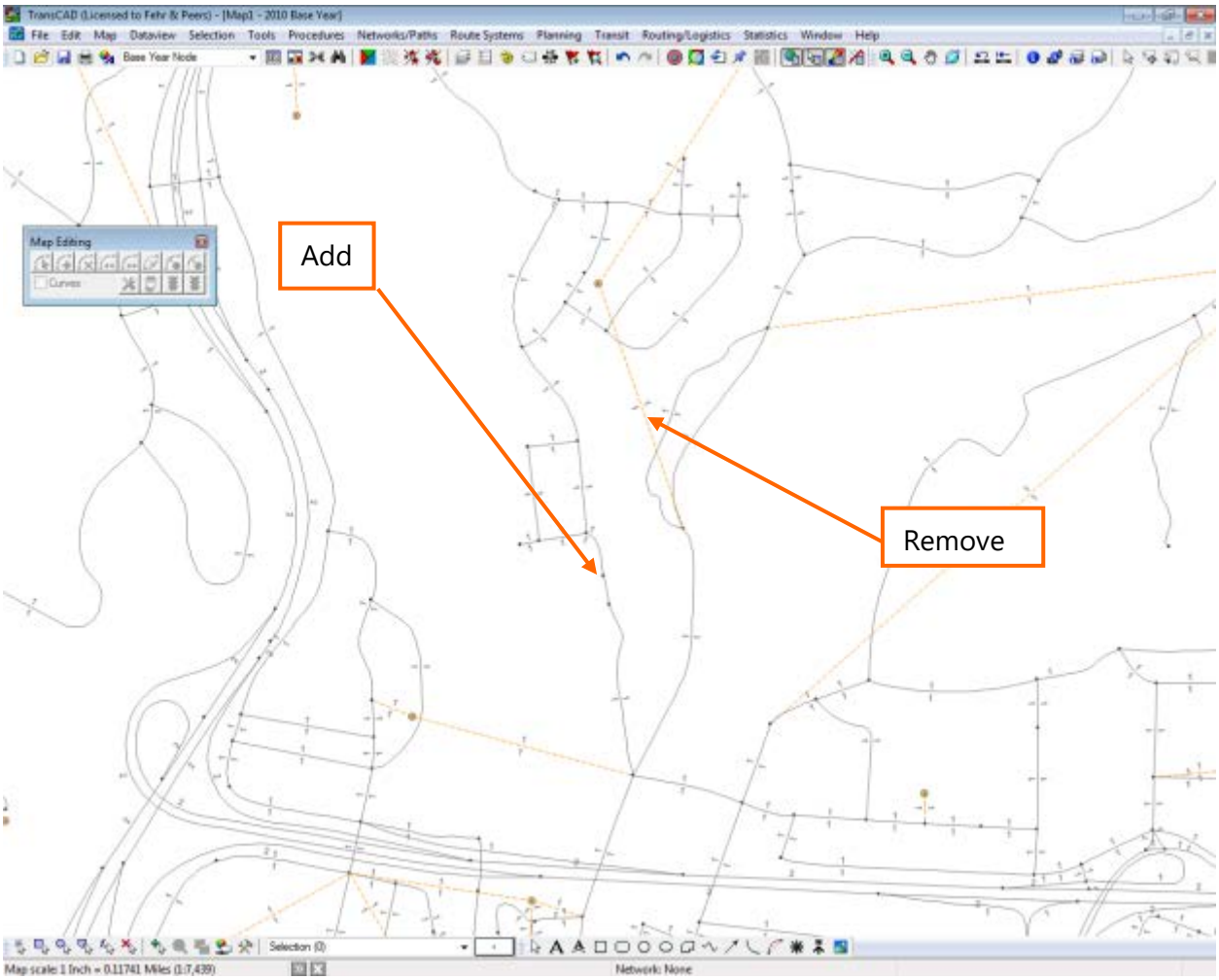
Similarly, HOV only links can be added to the highway network as described in section 5.6 above and updating their functional classification to 8 for HOV2 and 9 for HOV3+.

5.8 Transit only links

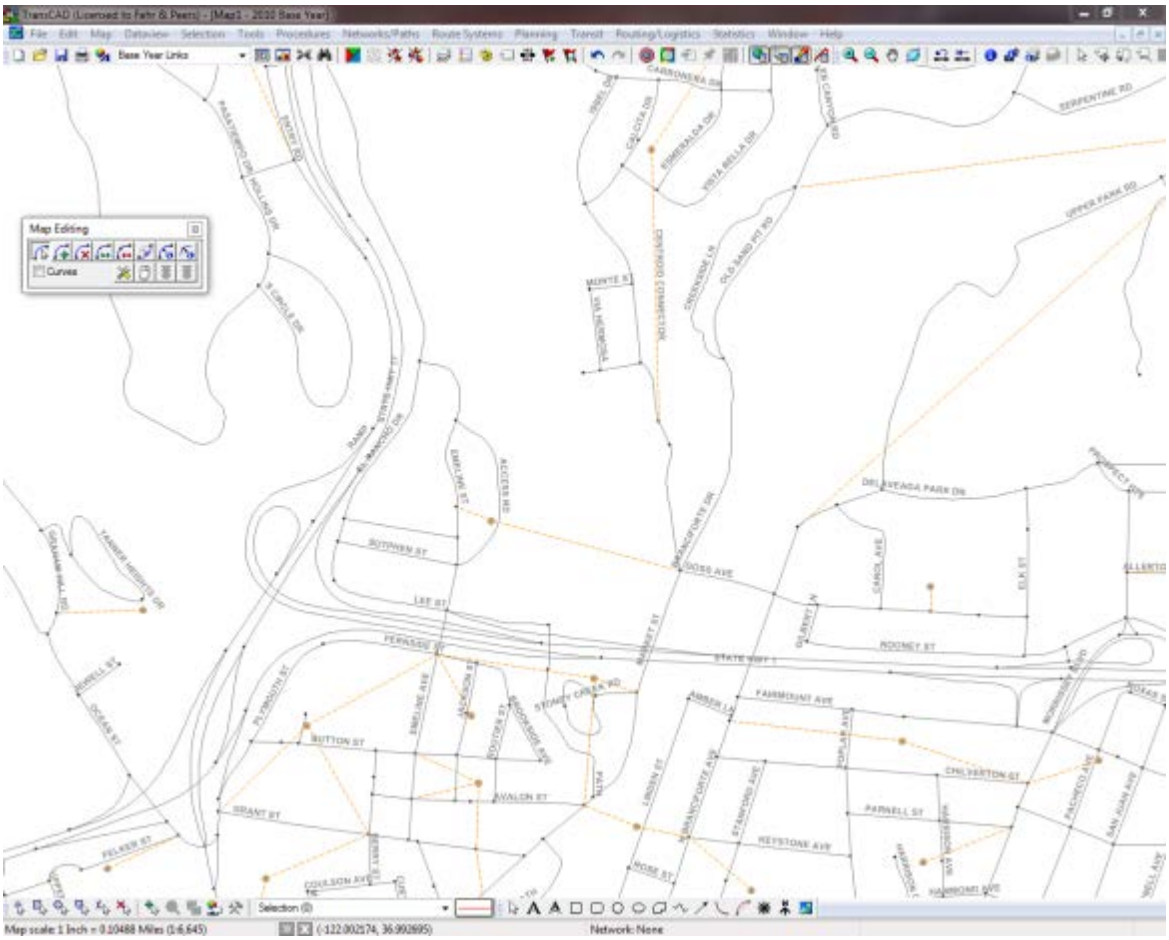
Transit only links are required to code rail transit services or other fixed guideway services with exclusive right of way. These links represent the alignments that those fixed guideway services operate on, with no access for auto trips. Transit only links are coded just as any highway link (see section 5.6). However the functional classification should be set to 44.

5.9 Modifying Centroid Connector Loading

In this example, we will add a centroid connector for TAZ 843 that connects to Isbel Drive, and remove the centroid connector that loads to the intersection of Branciforte and Creek Side Lane, as shown below. It is important to connect a new centroid connector before deleting the original centroid connector because if all centroid connectors are deleted, the TAZ will automatically be removed and will require re-exporting the entire roadway network to fix.

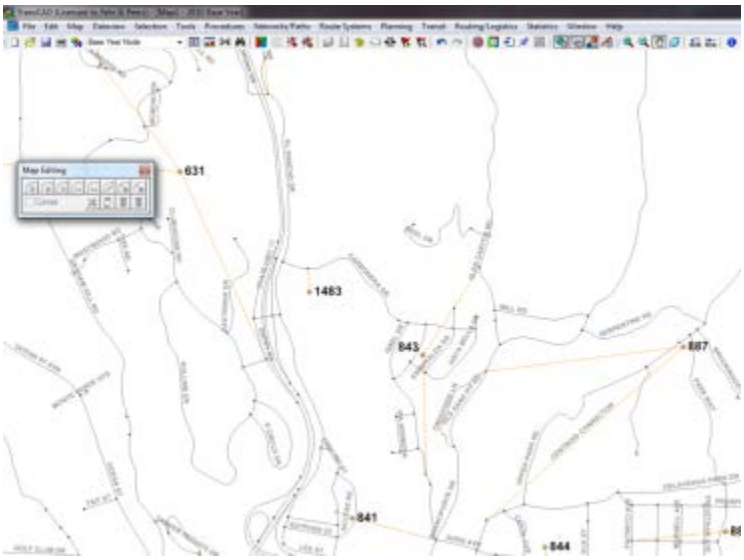


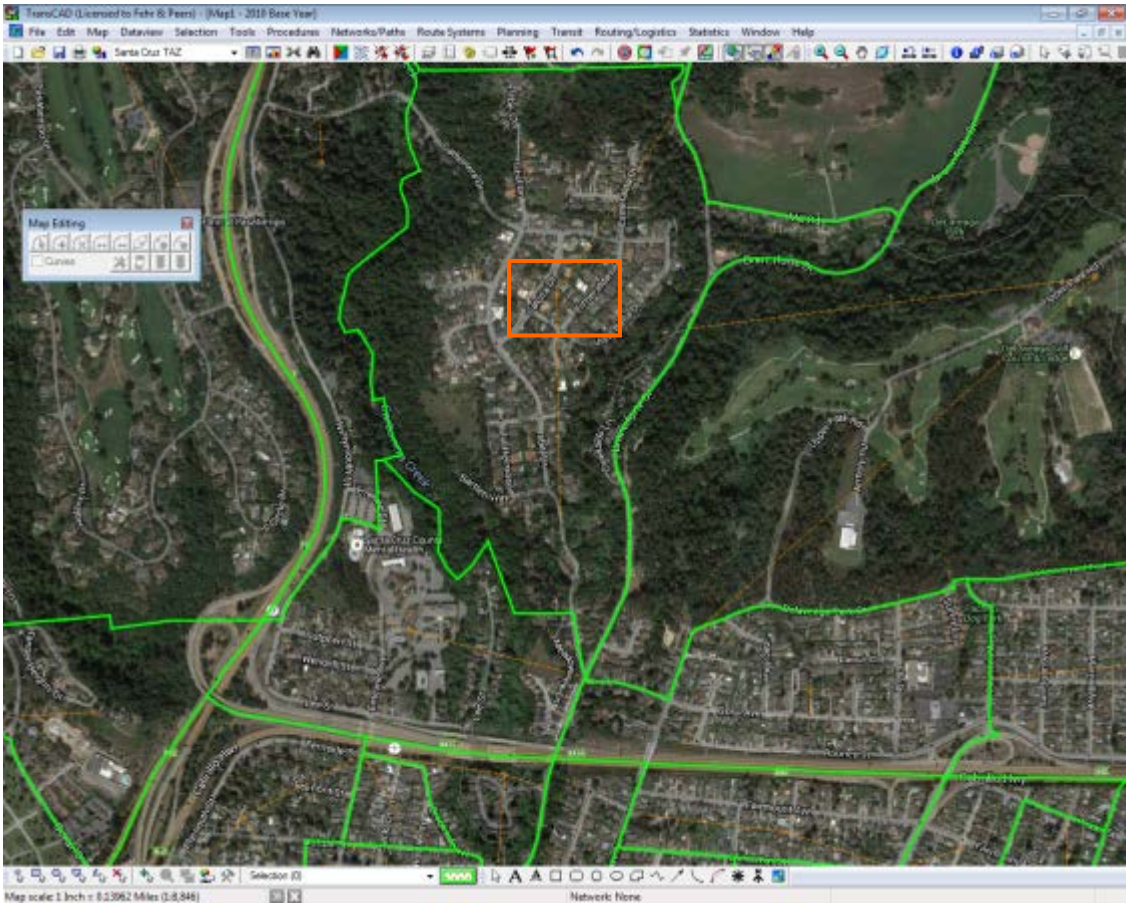
1) Enable the Map Editing Toolbar.
2) If necessary, the link that we will be connecting to will be split  if no node exists at the desired connection point. In this case, a split is required.
3) Add a link between the TAZ and the new node, as seen below.
4) Copy the attributes for another centroid connector for TAZ 843 to the new link.
5) Delete any extra or incorrect centroid connectors.



5.10 Moving TAZ Centroids

The location of a TAZ centroid affects how the zone will load onto the roadway network since it will drive how far the centroid connectors are from the roadway. Shorter centroid connector will be favored over longer centroid connectors, given all other factors equal. This is one reason why the location of each TAZ centroid is important. As seen below for TAZ 843 (See figure below), the centroid connect loading is roughly the same on both sides, and will likely cause equal number of trips to use each centroid connector. Based on aerial analysis, it seems that the TAZ has access to a major arterial via Isbel Drive. If more development occurs at this TAZ, it may be warranted to relocate the centroid to a more centralized area or to the new center of activity.





To move a TAZ centroid connector:

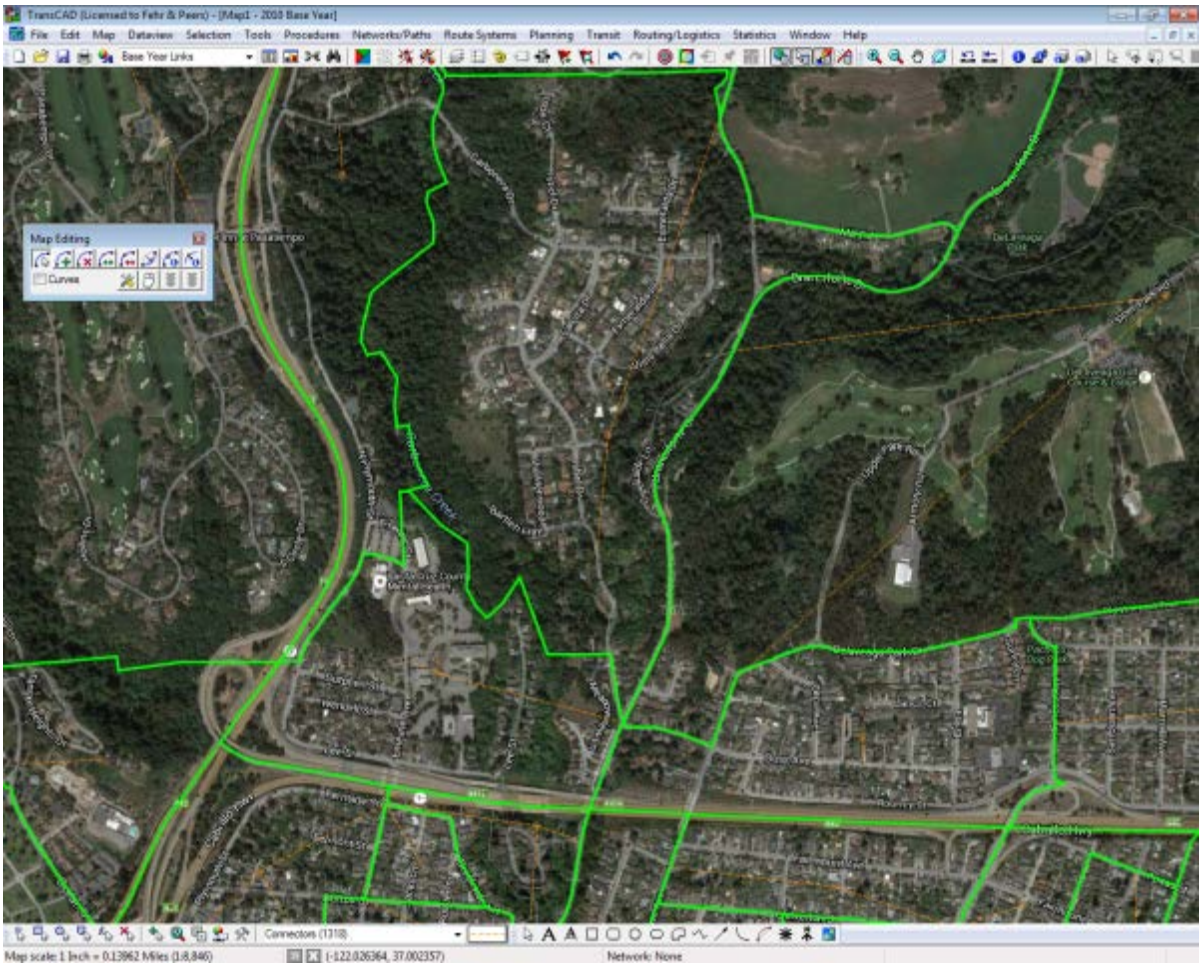
1) For ease, show the nodes layer and make a selection set of just centroid connectors. The image above also has the TAZ number displayed.
2) Ensure the link layer is the active layer.

3) Enable the Map Editing toolbox.

4) Click on modify line  and select the node to be moved. All lines connected to that node will be selected.

5) Click on the node again and move to the desired location. All line connected to it will maintain their connection.

6) Once the location is satisfactory, accept the changes by clicking on the save edits button. The TAZ centroids are now updated as shown below.



5.11 Modifying TAZ Centroid Node Attributes

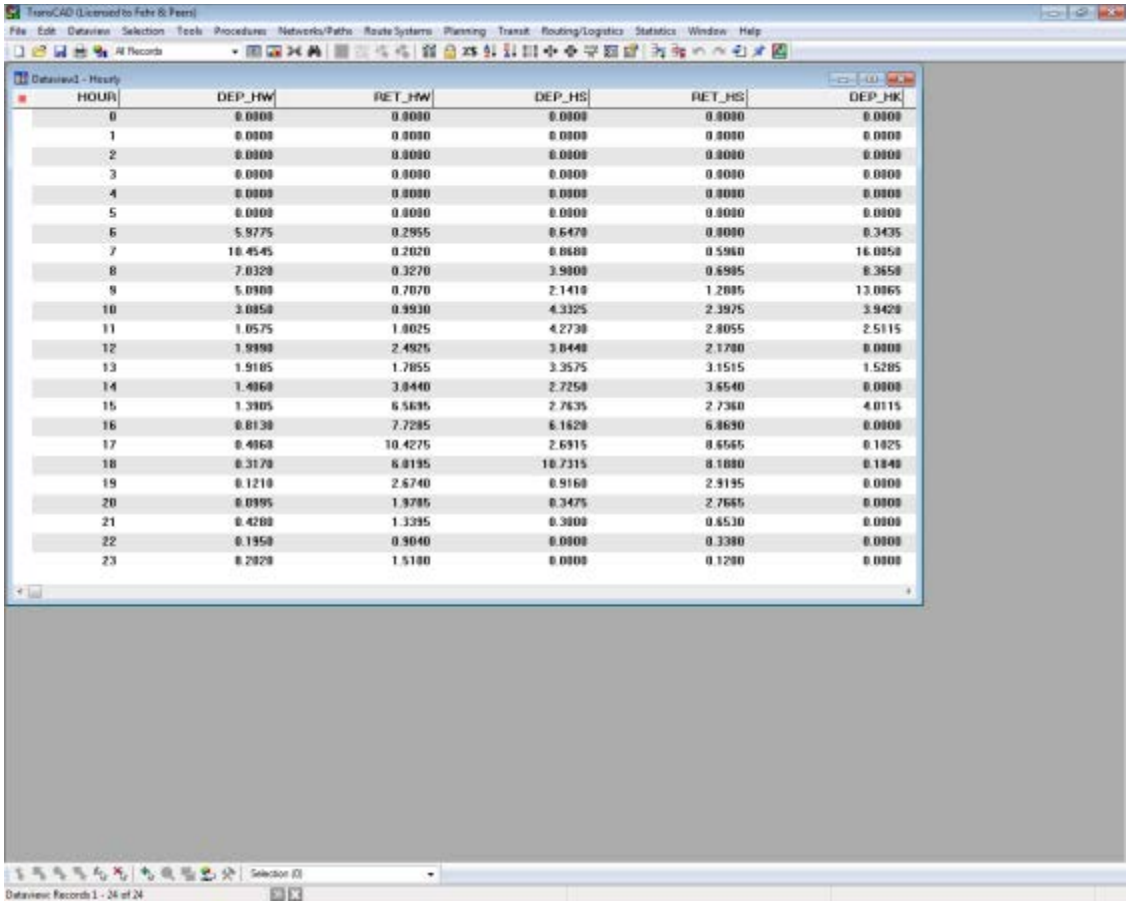
Modifying the centroid node attributes is very much like modifying the roadway link attributes. Modifications are done using the Info tool by selecting the desired node or modifying any attributes directly in the data view. To edit many node values at once, you can first select the nodes that need to be edited, if not all the nodes; and then fill the node attributes with the values you want for those nodes in the selection.

6 EDITING OTHER DATA

6.1 Editing Tabular Data

The model is set up such that most of the input files are in .csv format, which allows users editing input data directly through EXCEL or other text editors, outside of TransCAD. However there are a few input files in binary format (*.bin), which requires to be modified under TransCAD.

1) Open the hourly distribution file (Hourly.bin) under TransCAD.



2) Hourly data can be changed directly in this window. When you are finished, close the window. TransCAD saves the file automatically, so there is no 'undo' function when editing .bin file under TransCAD.

3) The same procedure can be used to edit other types of tabular data (.bin or .dbf) such as the MODE.DBF file that defines the modes and parameters used in the transit skimming and assignment procedures.

6.2 Editing CSV Files

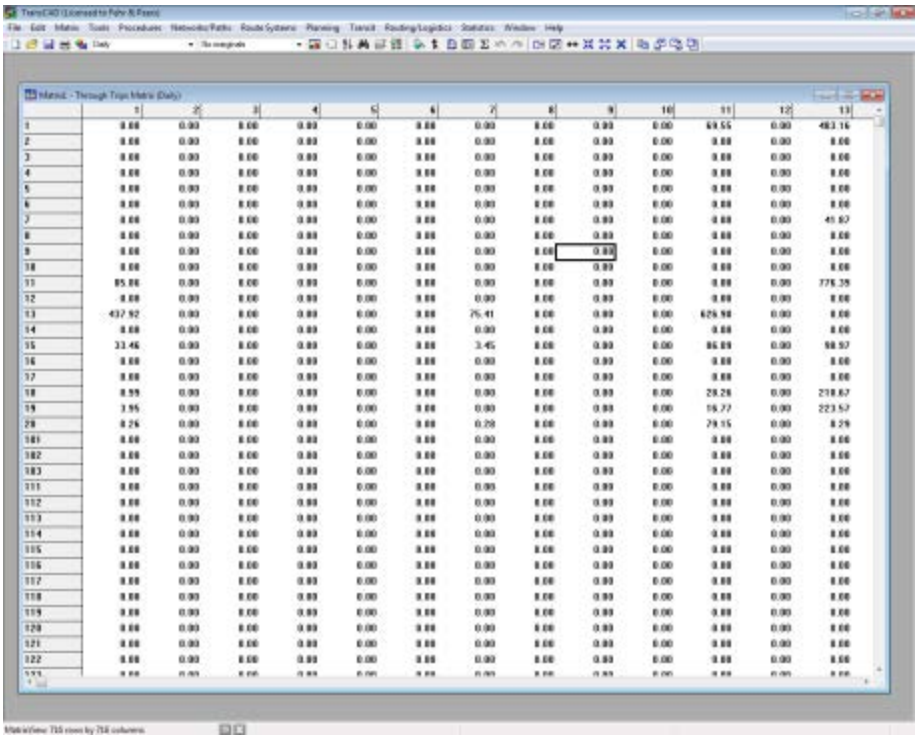
1) Open the period specific Turn Penalty file (Turn_Penalties_AM_2010.csv) in EXCEL. Columns A and B refer to From Link and To Link, while Column C indicates the turning penalty and the turn is prohibited if null.

	A	B	C
1	35349	19313	
2	35349	19314	
3	19402	19315	
4	19402	19317	
5	9941	13738	
6	33104	47366	
7	36598	23103	
8			
9			
10			
11			

2) Data can be edited directly in EXCEL but saved as a *.csv file.

6.3 Editing Matrices

1) Open the Through Trips file (Through_Trips_2010.mtx) under TransCAD



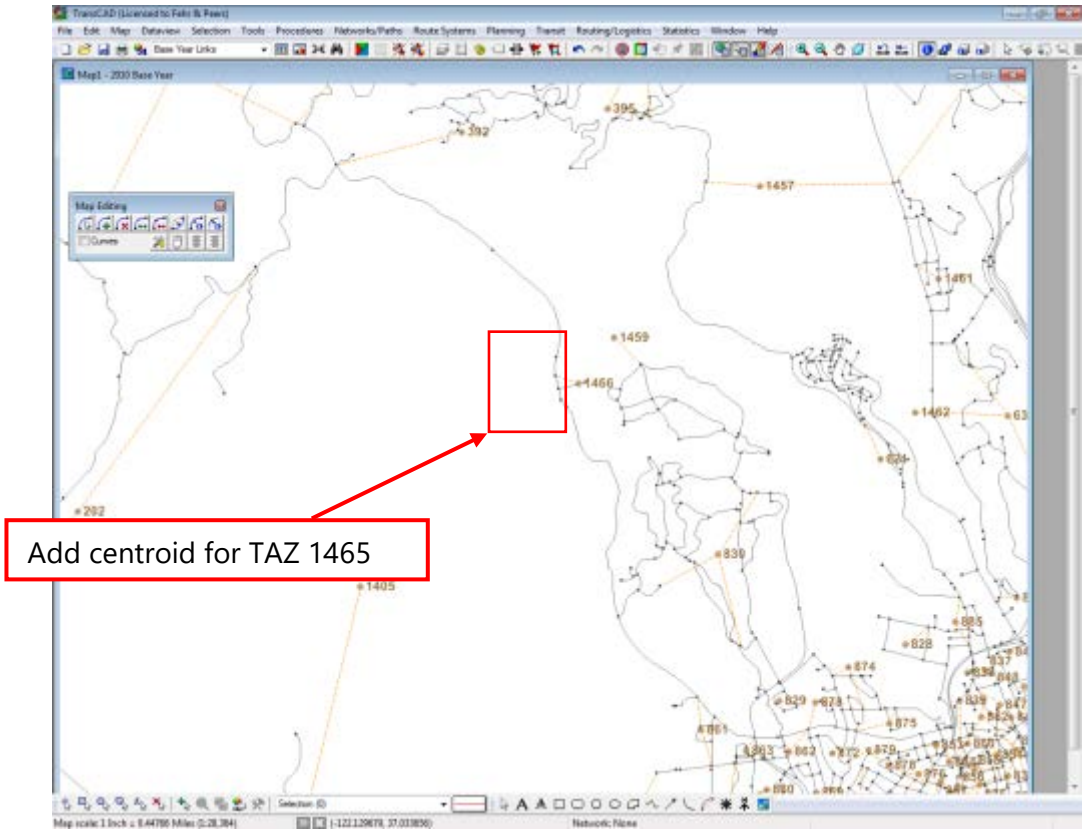
2) Edit the data in any cell directly in this window.

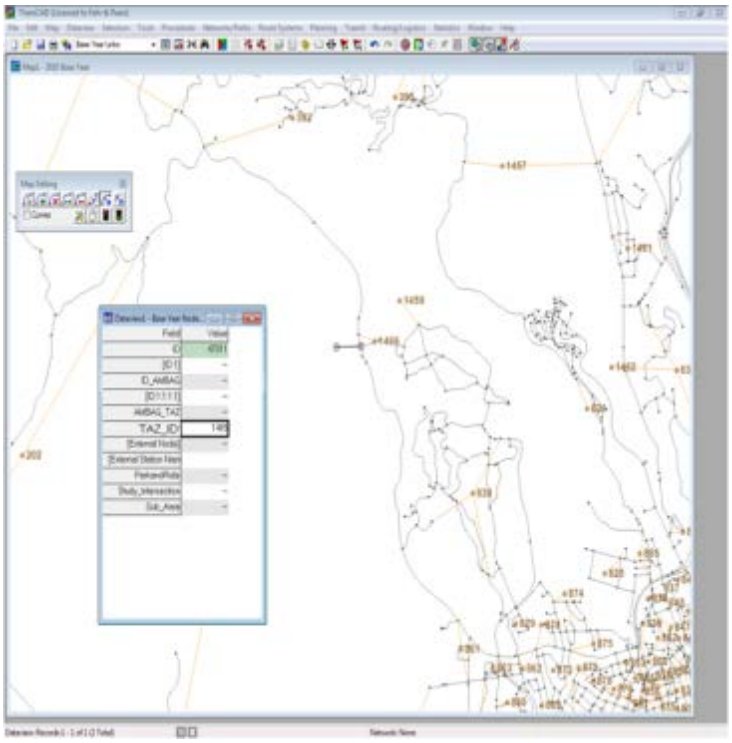
3) TransCAD saves the file automatically, so there is no 'undo' function when editing .mtx file under TransCAD.

6.4 Adding Centroids

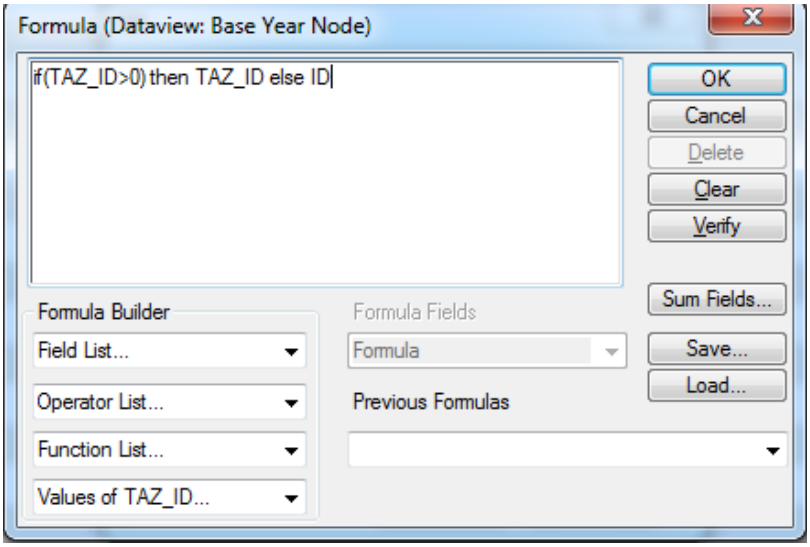
Although not required for the model to function, it is highly recommended that the TAZ shape file be modified prior to adding new centroids so that the area, land use, and connectivity of the new centroid are based on the area of the TAZ. The number of centroids and centroid locations in the highway network should be consistent with the SCCRTC TAZ shape file. If a new TAZ is added in the TAZ shape file, a new centroid is going to be coded in and then connects to the highway network through centroid connectors. However in TransCAD, when adding a new node, TransCAD will automatically number the node ID. To ensure the newly added centroid with required TAZ number, the following steps are described to accomplish this.

1) Open the highway network (Santa_Cruz_BaseYear_Highway.dbd). Add a new node (centroid) to the highway network, representing the new TAZ with TAZ ID 1465. Click on this new node (centroid), input the new TAZ ID, 1465 in this example, in the "TAZ_ID" field in the Base Year Node file as shown in figure below.

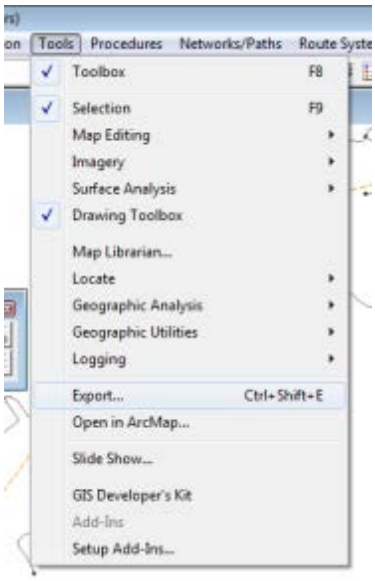




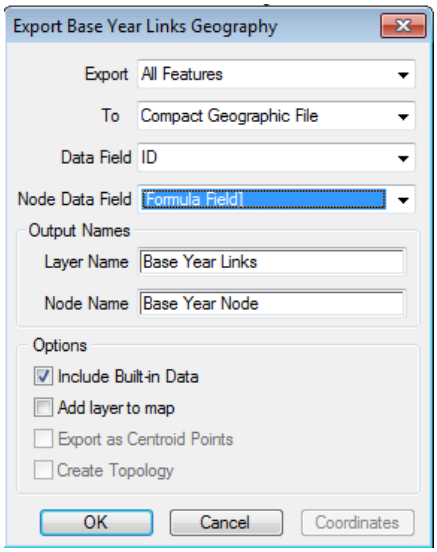
2) To ensure the newly added TAZ is coded as the required ID, set the Node layer of the network file the current layer, go to Dataview > Formula Fields. Type in the following formula "if (TAZ_ID>0) then TAZ_ID else ID" into the Formula section. This will create a new "Formula Field" in the node database.



3) To export the new network, make sure the link layer is active, go to Tools > Export



4) Click the button for "Node Data Field." Then select "Formula Field."



5) After clicking "OK". The new network will be generated with updated ID field.

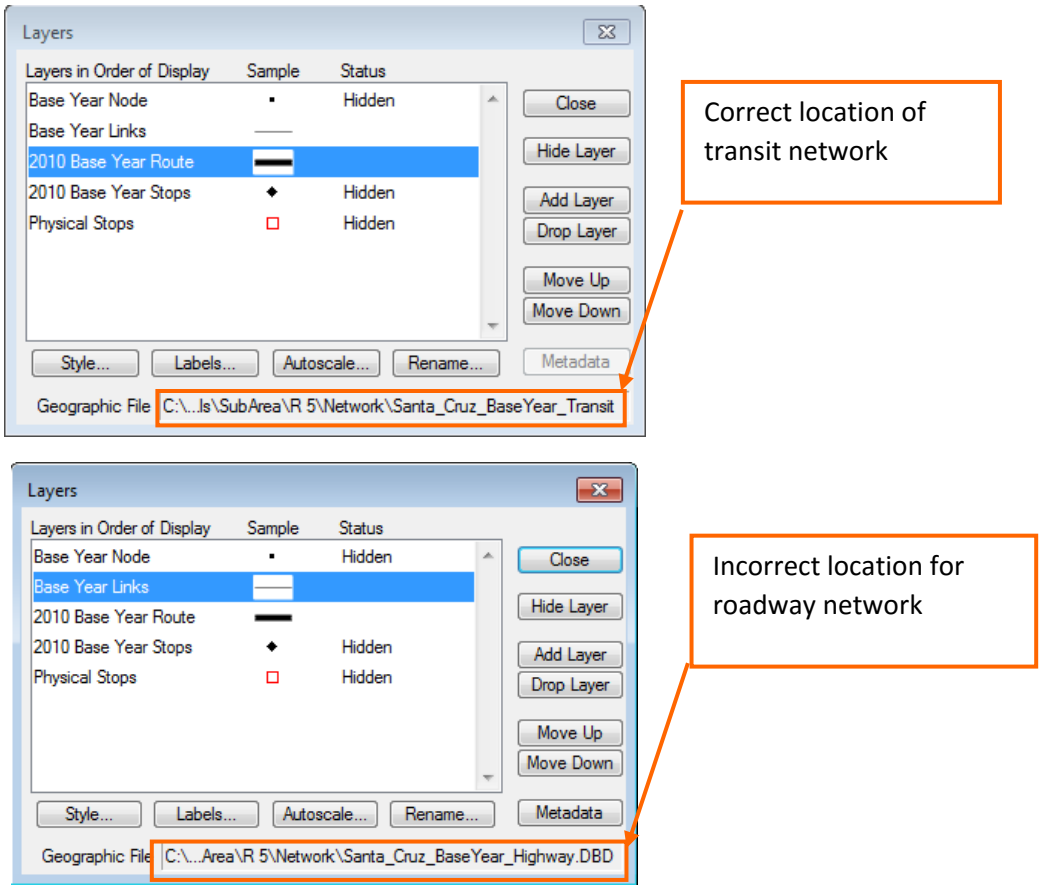
If link IDs are changed during the addition or splitting/joining of roadways, a similar process as described for node renumbering can be implemented, with the Data Field being the appropriate variable for link ID.

7 TRANSIT ROUTES

7.1 Displaying Transit Routes

The transit network is a separate system from the roadway network geographic database. The transit route system is named Santa_Cruz_BaseYear_Transit.rts, which includes a set of geographic databases for transit routes and transit stops, as well as the underlying highway network. The transit network is always associated and linked to a highway network. To link a correct underlying roadway network is essential.

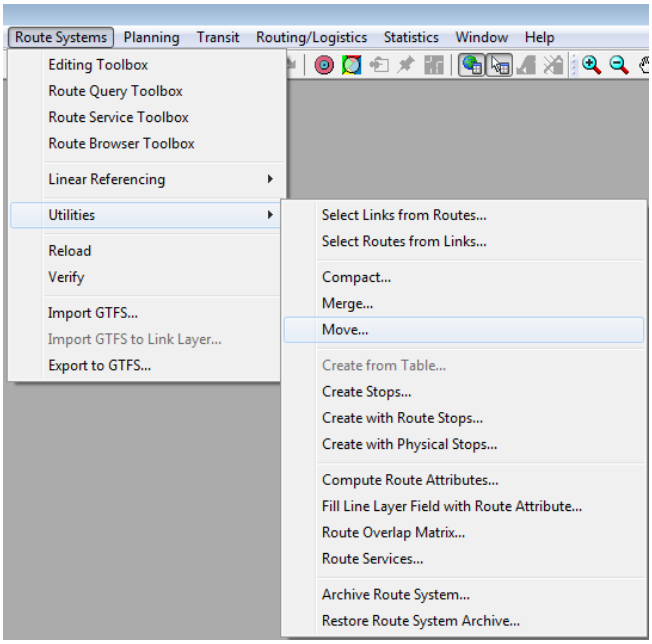
To check what underlying highway network the transit network is associated with, open the transit network file (.rts), and in the layer manager, there will be a roadway network layer. Select the layer and the file path will be displayed at the bottom of the layer manager window, as shown below:



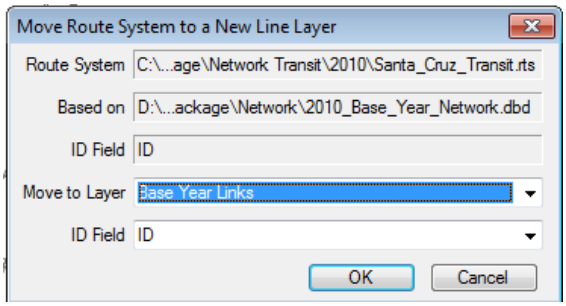
Both the transit and roadway network file should be in the same folder. If the roadway network being referenced is a roadway network in another folder, which can occur if files are copied over from another local or network drive, then they must be re-referenced.

To link a roadway network to a transit route system:

1) Close all files in TransCAD
2) Open the roadway network in TransCAD that you want the transit network to be associated with.
3) Go to **Route Systems – Utilities - Move** and select the route system



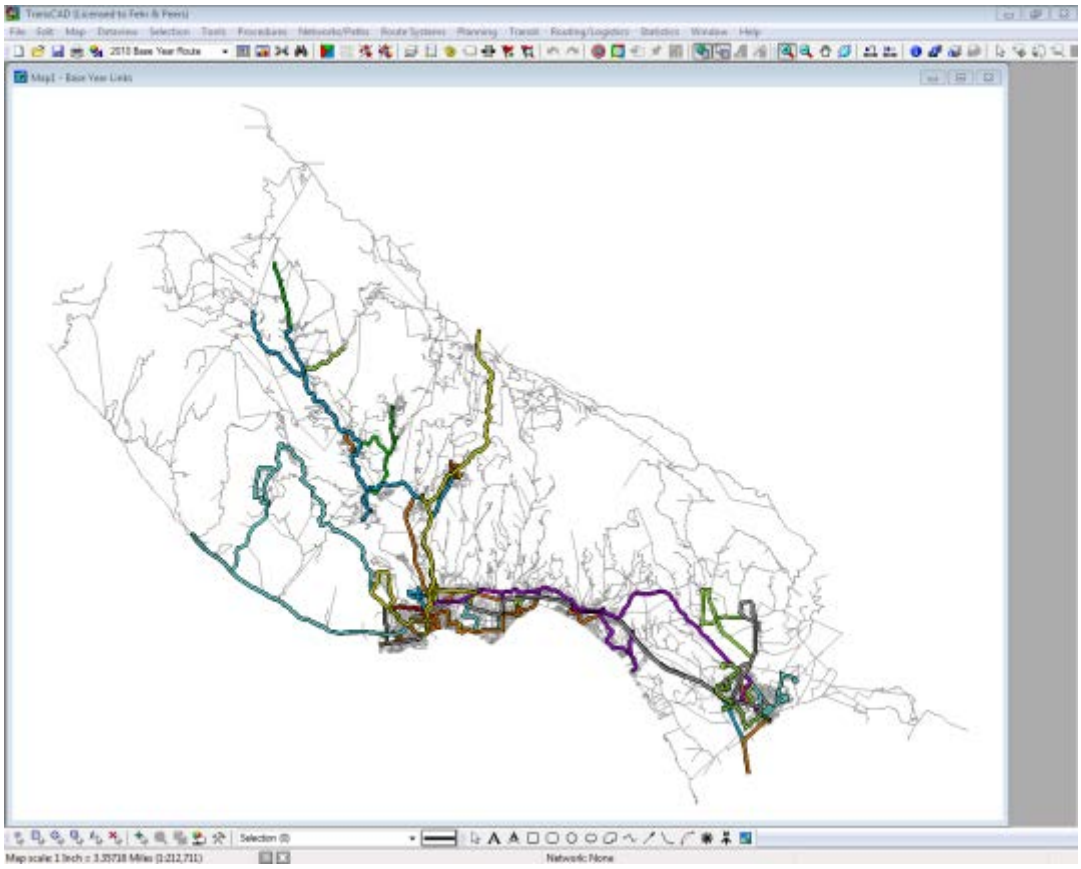
4) Choose the route system (*.rts) when prompted (.Inputs\Networks\)
5) In the dialog box, check to make sure the details are correct. Click OK. Close all the files



6) Open the transit network .rts file in TransCAD, and open the layers manager to check if the correct highway network is linked.

To view the transit network, open the .rts file in TransCAD, and the transit routes and the underlying highway network are both shown in the TransCAD window. Do not open the highway network separately.

1) To view the transit routes, open the route system, named Santa_Cruz_BaseYear_Transit.rts under the Inputs\Networks directory, in TransCAD. The transit route system will be shown in TransCAD as below.



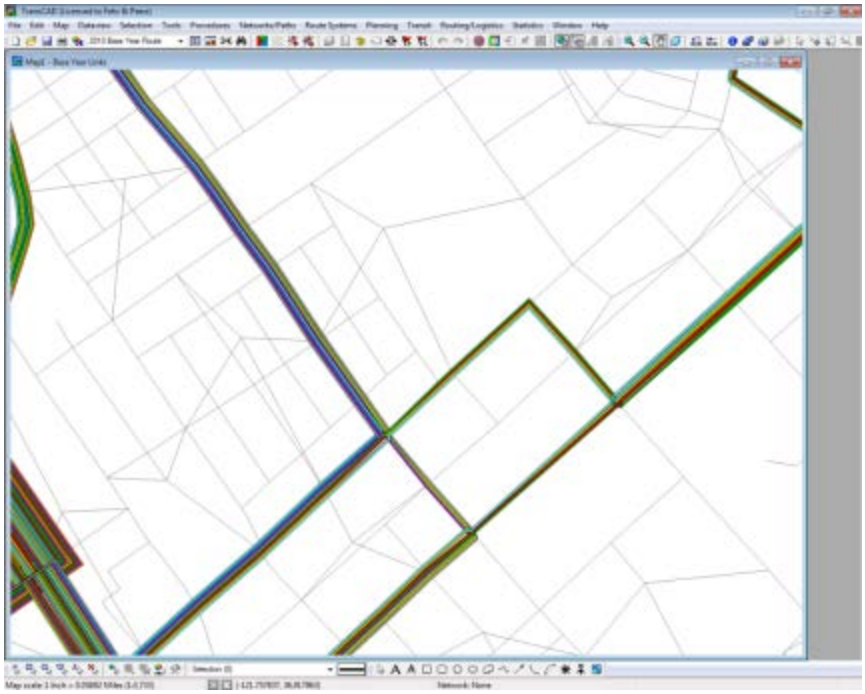
2) Zooming into a smaller area to view the route system, you can see the alignments of transit routes in different colors, operating on highway links. Given that transit routes often share right-of-way, it is common to have multiple transit services operating on the same highway links, as shown below by using the info tool on a link with operating transit route. In this specific example, you can see that at least 4 different lines travel along this specific roadway link.

Dataview1 - 2010 Base Year Route Info

Route_Name	Route 391	Route 618	Route 336A	Route 433A	Ro
Route_ID	391	618	988	1085	
Route	079-63	079-63	17-81	17-81	
[Short Name]	79	79	17	17	
[Long Name]	Presidio-San Jose Express	Presidio-San Jose Express	Amtrak Highway 17 Expre	Amtrak Highway 17 Expre	Amtrak Highway
Description					
Agency	–	–	–	–	
Mode	4	4	4	3	
URL			h	h	
Color	0	0	0	0	
[Text Color]	16777215	16777215	16777215	16777215	1
Trip	450426-201205-MST-Wee	450426-201205-MST-Wee	2456384-20131S-vs20131	2457546-20131S-vs20131	2460816-20131S
Sign	San Jose Express	San Jose Express	17 - Santa Cruz Metro	17 - Santa Cruz Metro	17 - Santa Cr
Service	201205-MST-Weekday-5	201205-MST-Weekday-5	20131S-vs20131S-Week	20131S-vs20131S-Week	20131S-vs20131
[Agency Name]	Monterey-Salinas Transit	Monterey-Salinas Transit	Santa Cruz Metro	Santa Cruz Metro	Santa Cr
[Agency URL]	http://www.mst.org	http://www.mst.org	http://www.scmtd.c	http://www.scmtd.c	http://www
[Agency Phone]	888-MST-BUS1	888-MST-BUS1	(831)425-860	(831)425-860	(831
[Start Time]	–	–	–	–	

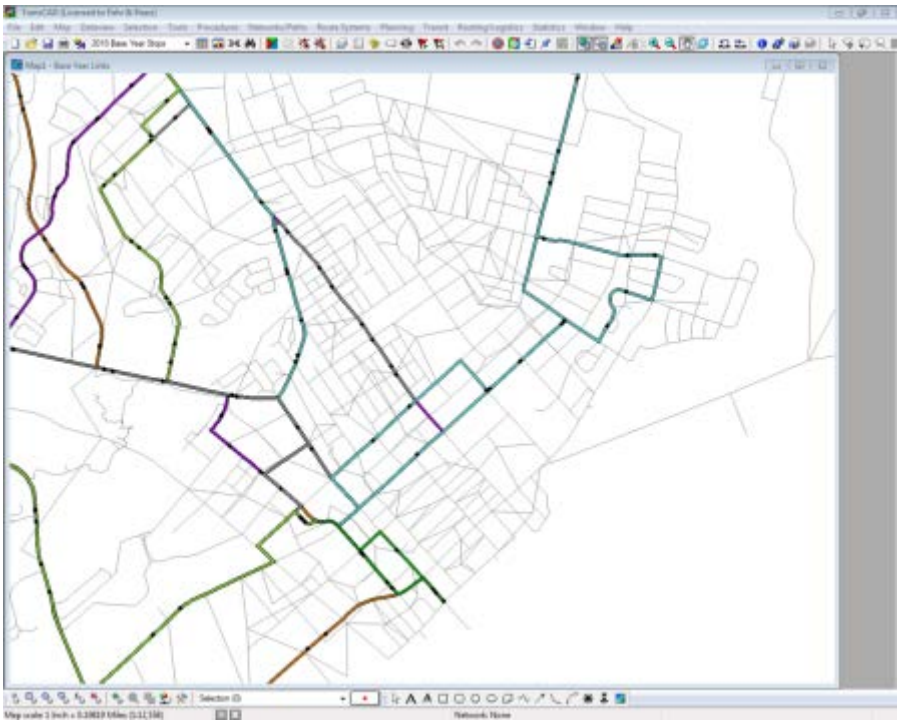
The default display method displays all the transit lines on the centerline, therefore it is hard to see how many lines are traveling along each link. To make the transit lines easier to see, under Map Layers  ,

select the 2010 Base Year Route, which are the transit routes. Click style and under offset, select Around Centerline. Click OK then Close. Now you will see all the transit routes operating on the highway links, as shown below.



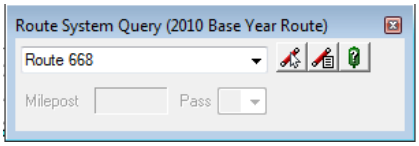
7.2 Displaying Transit Stops

When the transit route system is open in TransCAD, by default, only the routes are shown. The stops layer is also included, however, it is not shown by default. To display transit stops, simply choose the stops layer in the layer manager and click Show Layer. Doing so will yield the map below.

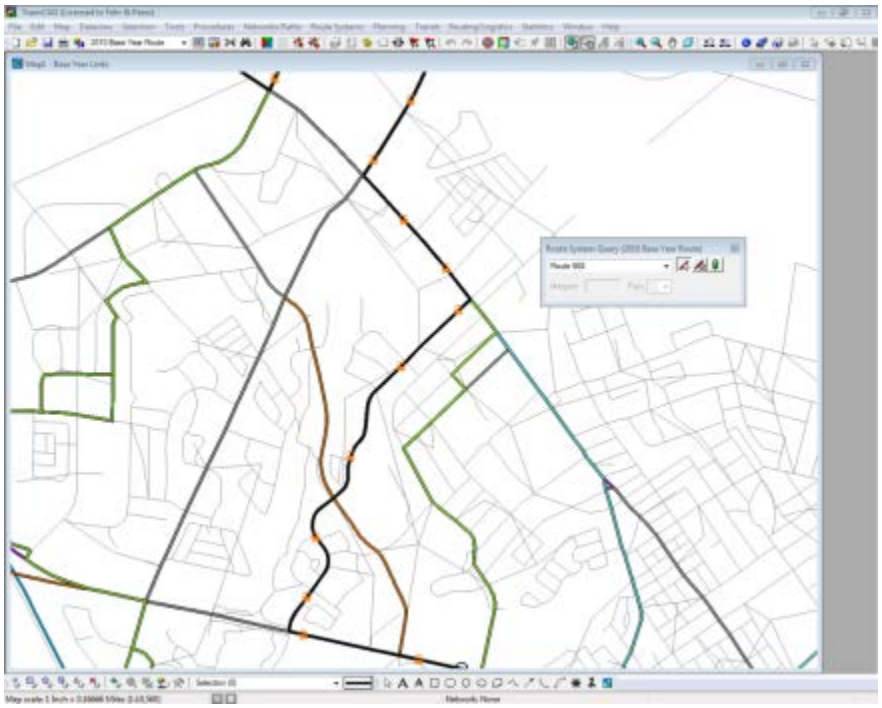


Although this does show all of the transit stops, it is not very user friendly. It does not graphically show what line the stops are associated to, and the way to get any information is to click on each stop with the information tool. Displaying the stops in this fashion is not very helpful.

Alternatively, going to **Tools - Route System – Route Query Toolbox** will bring up the toolbox below:



With this toolbox, you are able to select any transit route and see the route on the map by itself and all the associated stops as shown below.



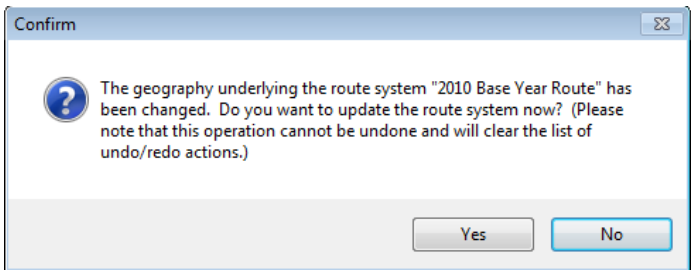
7.3 Verifying the Transit Network

The transit route system is dependent on the IDs of the links in the roadway network. When geographic edits are made to the roadway network, such as adding, removing, or splitting a link, these IDs may change and will no longer associate with the transit route system correctly. Some highway edits may affect more than just a simple transit system update, such as deleting link where routes run over, which will leave a "gap" in the transit route system, and ultimately not allow the model to run.

Fixing the route system errors will require the use of the route editor to fix the gap in the transit route system in order to ensure consistency between the roadway network IDs and the transit network IDs.

Whenever a transit route system is opened, TransCAD automatically checks the associated roadway network to see if it was recently modified. The first step is to ensure that the correct roadway network is associated to the transit route, as explained in section 6.2.

When the transit network is opened in TransCAD, if TransCAD detects that edits have been made to the roadway network, a message will display to update the transit route system, as can be seen below.

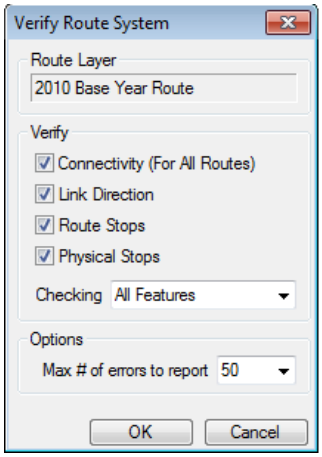


This dialog box should only display if modifications have been made to the roadway network. If modifications have been made, then click "Yes" and TransCAD will update the route system and make it consistent with the correct roadway network. If no edits have been made to the roadway network and the box comes up, it is very likely that the incorrect roadway network is associated to the transit network.

Once this update has been performed, the route system will be consistent with the roadway network, but not all of the gaps or errors due to the roadway network edits are necessarily fixed.

Before fixing the remaining transit network errors, we must first reload, or refresh, the transit network by going to **Route Systems – Reload**. This may take some time because it refreshes the entire transit network.

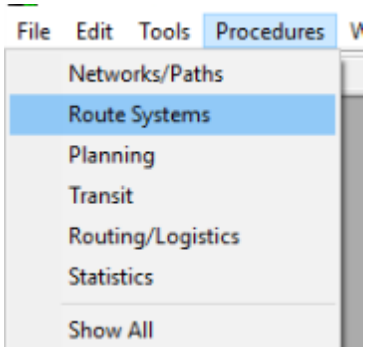
Next, we need to verify the transit network and determine where the gaps, among other errors, may be present. The verify utility is found under **Route Systems – Verify**. The dialog box below will display and ensure that all boxes are selected.



In the process of verifying transit route system, TransCAD will report any issues that arise. The detailed information for the transit errors in the report file can be used to fix the transit errors using the route editing toolbox. Once all of the errors have been resolved using the editor toolbox, reload and verify must be run again to ensure all errors are fixed.

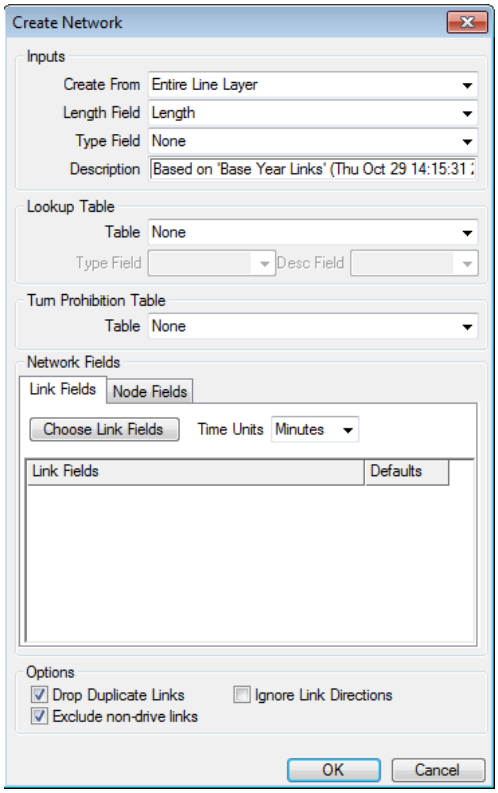
7.4 Editing the Transit Routes

The tool to edit the transit network is the Route Systems Editing Toolbox, which can be found under **Procedures** - **Route System - Editing Toolbox**.



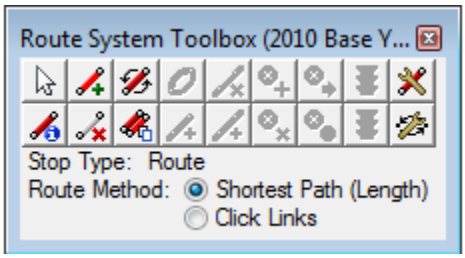
To begin editing, the active layer must be set to the transit routes (2010 Base Year Route). The editor requires a highway .NET file to assist in route editing, and may prompt to ask for one. If it does, you may choose the file named 2010_Base_Year_Network_AM.NET in the Outputs\Networks folder if you are building off a previous run, but most times you will need to create a new .net file based off the latest roadway network. To create a .NET file:

1) Open the roadway network file that the route system is based on.
2) Go to **Procedures - Networks/Paths – Create**. The dialog box below will display

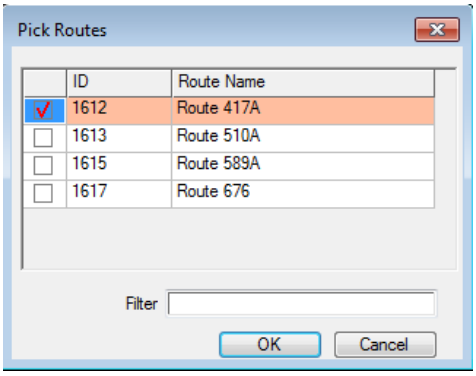


3) For the purposes of editing the route system, only the Length field is required, which is set to Length by default. Click OK
4) Enter a network filename and save to the desktop.

Now, a network has been created and is ready to be used by the route editor. Once created, the network file is automatically loaded, enabling the route system editing toolbox. The route system editing toolbox is shown below:



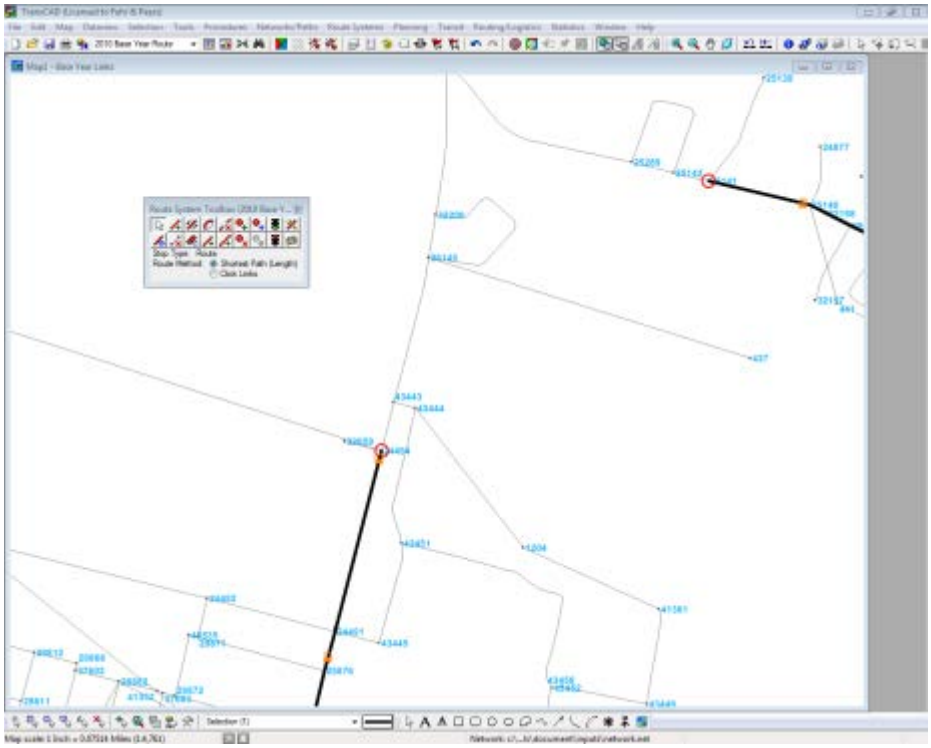
1) Click on the white arrow and click on a transit route
2) If multiple routes pass through the same highway link, a dialog box with all these routes will show up. Select the route you want to edit.



3) The toolbox provides all type of edits to the transit network, such as add/remove a line, reverse/duplicate a line, realign/extend a line, delete a section of a line, insert into a line, add/remove/move a stop, and edit route and stop information.

   For example, when fixing a gap in a transit route, the "Insert Into Route"  tool can be used. The example below illustrates a route with a gap from node 24494 to node 95141 and back.

   Using the  tool, you would click on node 24494, then double-click on 95141 to fill the gap. This will add the route in that direction. For the opposite direction, first click on 95141 and then double click on 24494.



7.5 Editing Transit attributes

Users can easily edit transit attributes such as headways, mode and/or name as follows. Same way to update transit stop attributes, by choosing the stop.

1) Click on the info icon 
2) Click on a transit line which needs editing, the route information is displayed. Click on the value that needs to be update and make a change. The changes will be saved to the route file.

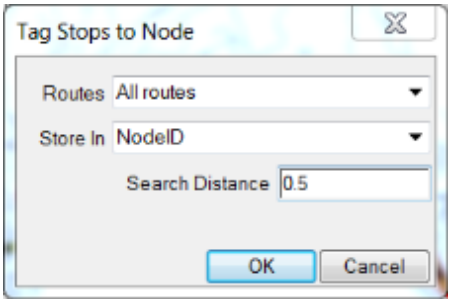
Dataview1 - 2035 MTP Routes Info

Route_Name	SC-Watsonville LRT	Watsonville-SC LRT
Mode	5	5
URL		
Color	–	–
[Text Color]	–	–
Trip		
Sign		
Service		
[Agency Name]	Santa Cruz Metro	Santa Cruz Metro
[Agency URL]		
[Agency Phone]		
[Start Time]	–	–
[End Time]	–	–
Length	–	–
Direction		
AM_Headway	90	90
PM_Headway	90	90
MD_Headway	90	90
NT_Headway	90	90
Fare	2.00	2.00
Peak_Headway_old	90.00	90.00
Offpeak_Headway_old	90.00	90.00
AMBAG_ID_1	SC-RTC-P02-RTC	SC-RTC-P02-RTC
AMBAG_ID_2		
AMBAG_ID_3		
Peak_Headway	90.00	90.00
Offpeak_Headway	90.00	90.00
In_Base	2.00	2.00

3) All the required transit route and stop attributes need to be filled out. That is, peak and off-peak headways, fares, mode, etc. for transit routes, while the NodeID and RealStop for transit stops.

   Given TransCAD does not allow multiple stops on the same transit routes connect to the same highway node, for those stops repeat the tagged highway nodes, their RealStop=0, otherwise =1.

To get the NodeID, go to **Transit -> Tag Stops to Node**, choose the stop variable to keep the highway node ID that the stop is associated with, and the search distance, as shown below. Then click OK and TransCAD will search the nearest highway node of each stop and tag the highway link ID to the stop.



7.6 Coding Rail Service or Routes with Exclusive Right of Way

To code a fixed guideway transit route with exclusive right of way, the transit-only links with functional class 44 needs to be coded to the highway network first. As explained in Section 5.8, those transit-only links represent the alignments of the transit segments with exclusive right of way, i.e., no auto or other non-transit vehicles can operate on those highway link.

Step 1: Code the transit-only links in the underlying highway network to represent the segments that a transit route operates with exclusive right of way.

Step 2: Follow the instructions in Section 8.4 to code the transit service along the transit-only links, and add transit stops accordingly. The travel times between neighboring stations are coded to the link variable “RAILTIME” of the transit-only links, assuming the travel times on the fixed-guideway are consistent and won’t be affected by the surrounding traffic condition.

Step 3: Associate each transit stop to the underlying highway nodes. For rail service or fixed guideway transit service, the underlying highway nodes are on the transit-only links, additional links need to be added to connect this underlying highway node to the highway network that auto can access, to ensure the access or egress between the highway system and this transit service.

Step 4: after editing the route alignment and stops, need to make sure all the key attributes in the routes system are filled out, following the instruction in Section 8.5.

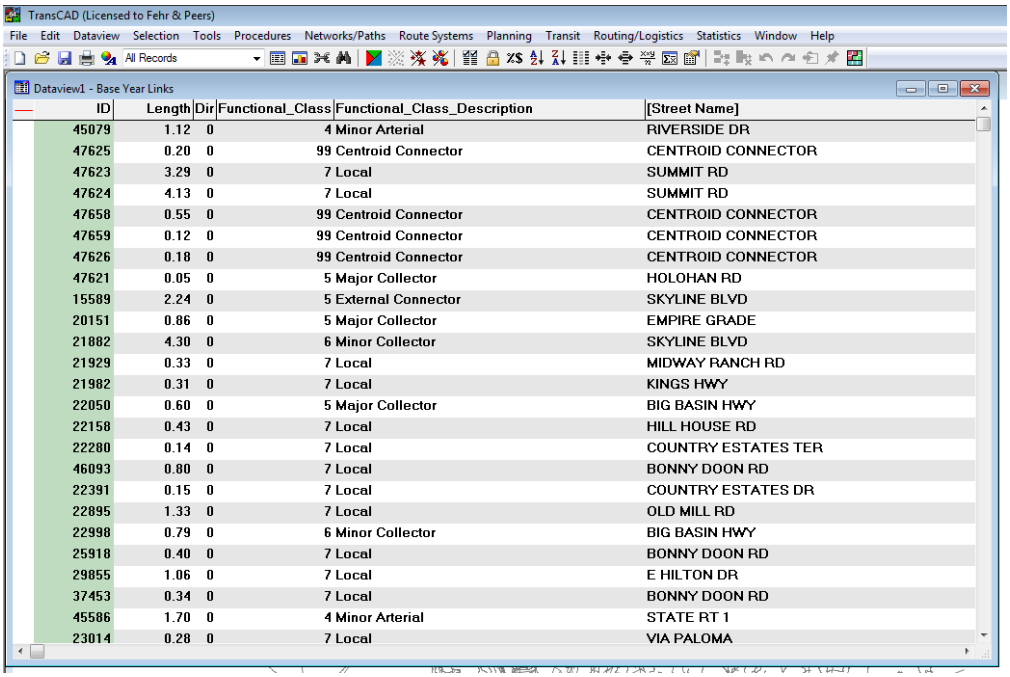
8 DISPLAYING THE RESULTS OF THE MODEL RUN

Most traffic modeling software packages produce loaded network files that have a field showing the assigned traffic volume as a link attribute. TransCAD is different in that it stores assigned link volumes (among other data) in a tabular file separate from the network file. The user must therefore manually join the network file and a volume output file using the common field (Link ID) in order to display the assigned volumes.

8.1 Displaying Assigned Volumes

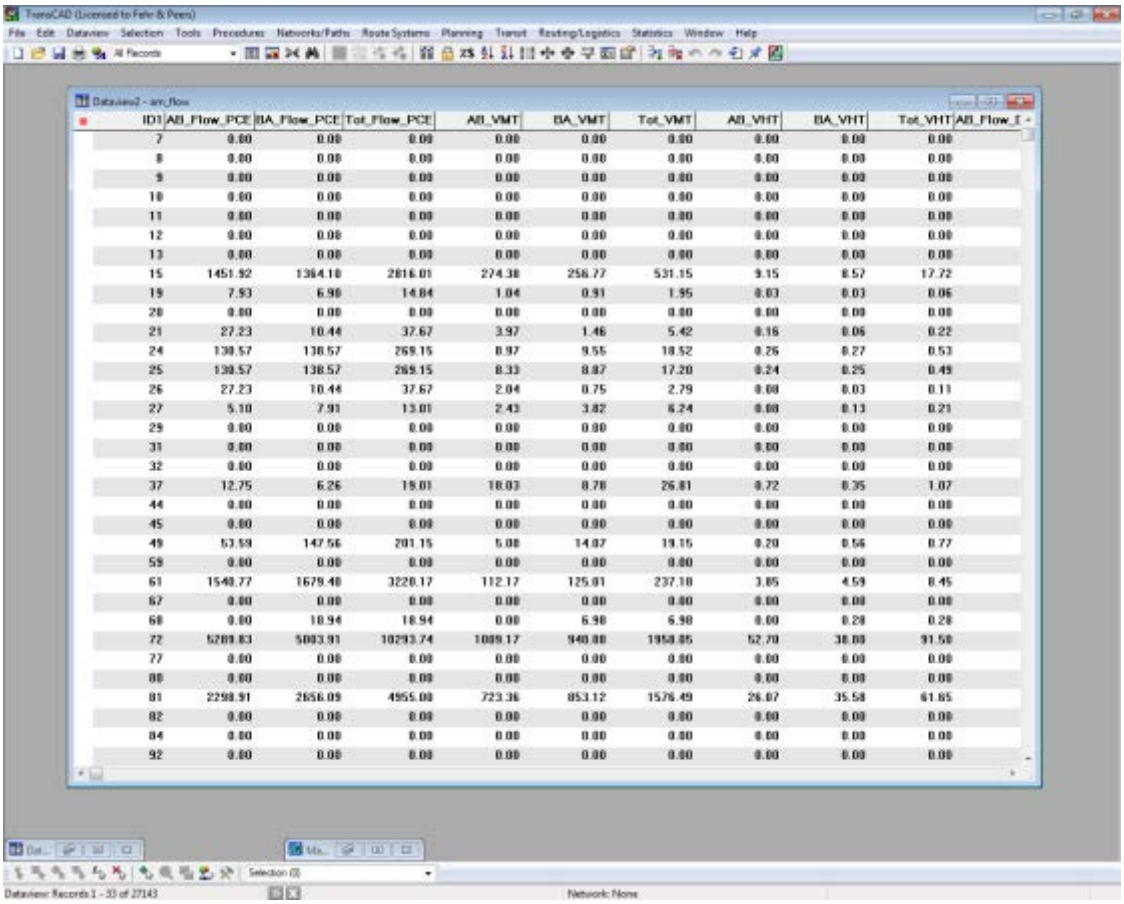
1) Open the roadway network file (Santa_Cruz_BaseYear_Highway.dbd). The link (streets) layer is displayed by default.

2) Click on the "New Dataview"  icon and a window like the one below will come up.



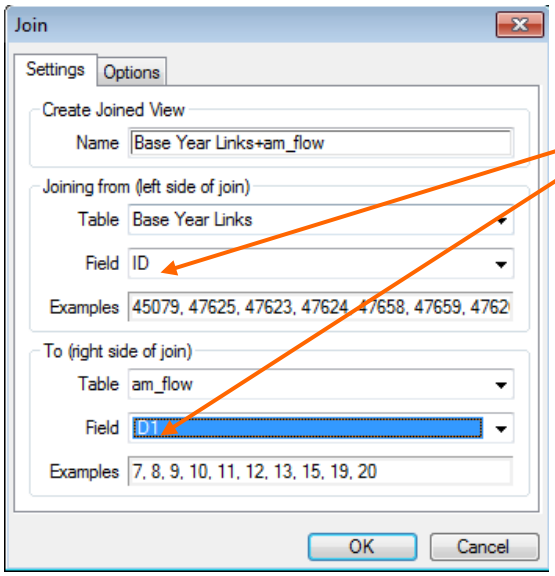
ID	Length	Dir	Functional_Class	Functional_Class_Description	[Street Name]
45079	1.12	0	4	Minor Arterial	RIVERSIDE DR
47625	0.20	0	99	Centroid Connector	CENTROID CONNECTOR
47623	3.29	0	7	Local	SUMMIT RD
47624	4.13	0	7	Local	SUMMIT RD
47658	0.55	0	99	Centroid Connector	CENTROID CONNECTOR
47659	0.12	0	99	Centroid Connector	CENTROID CONNECTOR
47626	0.18	0	99	Centroid Connector	CENTROID CONNECTOR
47621	0.05	0	5	Major Collector	HOLOHAN RD
15589	2.24	0	5	External Connector	SKYLINE BLVD
20151	0.86	0	5	Major Collector	EMPIRE GRADE
21882	4.30	0	6	Minor Collector	SKYLINE BLVD
21929	0.33	0	7	Local	MIDWAY RANCH RD
21982	0.31	0	7	Local	KINGS HWY
22050	0.60	0	5	Major Collector	BIG BASIN HWY
22158	0.43	0	7	Local	HILL HOUSE RD
22280	0.14	0	7	Local	COUNTRY ESTATES TER
46093	0.80	0	7	Local	BONNY DOON RD
22391	0.15	0	7	Local	COUNTRY ESTATES DR
22895	1.33	0	7	Local	OLD MILL RD
22998	0.79	0	6	Minor Collector	BIG BASIN HWY
25918	0.40	0	7	Local	BONNY DOON RD
29855	1.06	0	7	Local	E HILTON DR
37453	0.34	0	7	Local	BONNY DOON RD
45586	1.70	0	4	Minor Arterial	STATE RT 1
23014	0.28	0	7	Local	VIA PALOMA

3) Open a volume output file from the Final Assignment step (i.e., Assignment_XX.bin). Another dataview will open with the volume data, as shown below.



ID1	AB_Flow_PCE	BA_Flow_PCE	Tot_Flow_PCE	AB_VMT	BA_VMT	Tot_VMT	AB_VHT	BA_VHT	Tot_VHT	AB_Flow_E
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	1451.92	1364.10	2816.01	274.38	256.77	531.15	9.15	8.57	17.72	
19	7.93	6.90	14.84	1.04	0.91	1.95	0.03	0.03	0.06	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
21	27.23	10.44	37.67	3.97	1.46	5.42	0.16	0.06	0.22	
24	130.57	138.57	269.15	8.97	9.55	18.52	0.26	0.27	0.53	
25	130.57	138.57	269.15	8.33	8.87	17.20	0.24	0.25	0.49	
26	27.23	10.44	37.67	2.04	0.75	2.79	0.08	0.03	0.11	
27	5.10	7.91	13.01	2.43	3.82	6.24	0.08	0.13	0.21	
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
37	12.75	6.26	19.01	18.03	8.78	26.81	0.72	0.35	1.07	
44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
49	53.59	147.56	201.15	5.08	14.07	19.15	0.20	0.56	0.77	
59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
61	1540.77	1679.40	3220.17	112.17	125.01	237.18	3.85	4.59	8.45	
67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
68	0.00	18.94	18.94	0.00	6.98	6.98	0.00	0.28	0.28	
72	5289.83	5003.91	10293.74	1089.17	940.88	1958.05	52.70	38.80	91.50	
77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
81	2298.91	2656.09	4955.00	723.36	853.12	1576.49	26.87	35.58	61.65	
82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

4) Click **Dataview – Join**, or click on the "Join" icon  in the tool bar. The "Join" window will pop up. Select the field in each file that has a corresponding field with the same information in the other file.

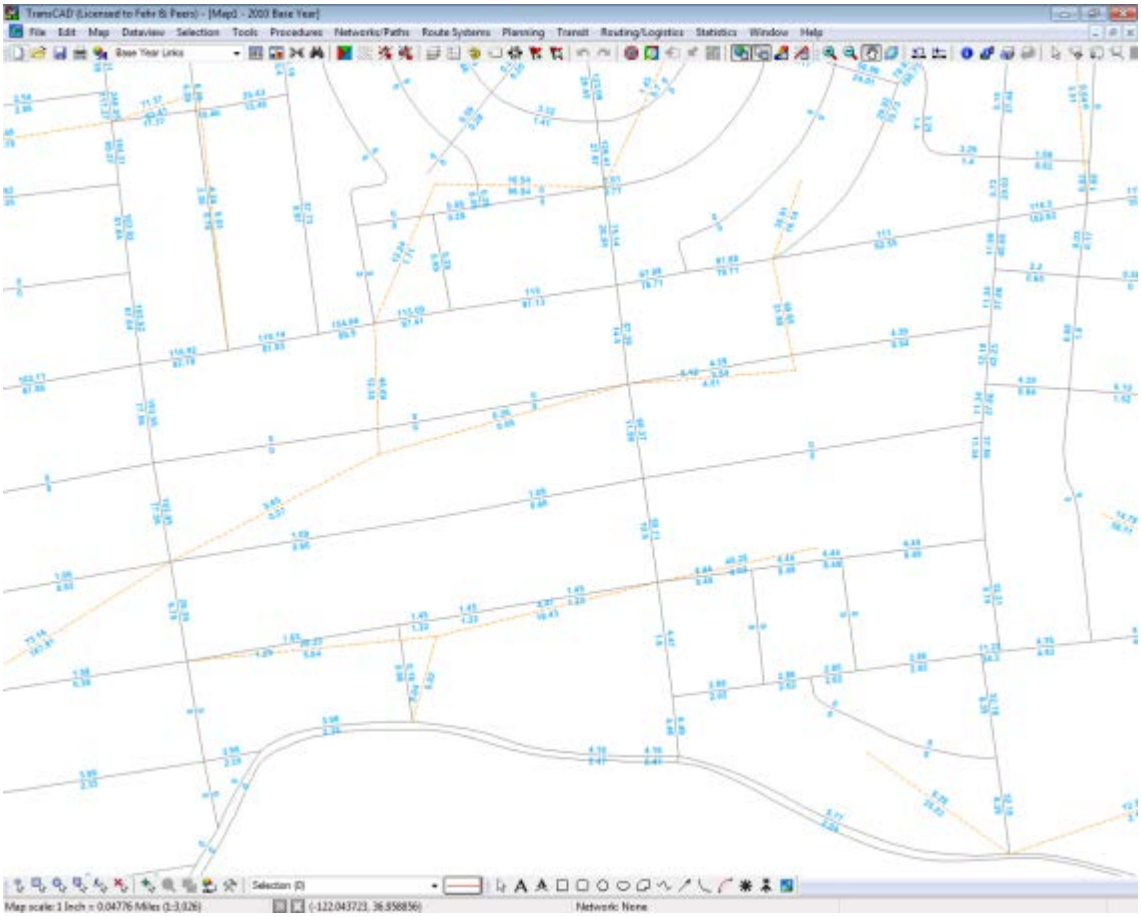


To join databases, you must identify a field that is shared between the two databases

5) Then click "OK." The two database sets are now joined, as seen below, which means the volume data can be accessed from the network. If you scroll across the table, you will find that it now contains the fields from both files. If there are field names that are used in both files, TransCAD will change them slightly to keep the names unique (the altered field names are temporary and will automatically revert to their original names when the files are no longer joined).

6) Now, make the roadway network the active window, click the "Labels" icon  in the tool bar. The Label window will appear. Display the AM directional volume by selecting AB_Flow / BA_Flow in the Field section. Select other options (Allow Duplicates, Font, Size, Color, etc.) as necessary. Other results data in this file that can also be displayed along the network includes AB_VMT/BA_VMT, AB_VHT/BA_VHT, AB_Speed/BA_Speed.

7) When you are finished, TransCAD will display the assigned volumes in a figure like the one shown below.



8) A bandwidth plot with these volumes can be created by going to **Map > Scaled Symbol Theme** and choosing the AB Flow /BA Flow field, and selecting Map Wizard. Manual intervals and bandwidth sizes can be specified if desired.

MC_Summary	**Final Assignment**	**Summary of Mode Choice model results**
HwyVol_AM/MD/PM/NT_Summary.bin (or .xls)	Final Assignment	Summary of Highway assignment results for AM, Midday, PM, and night time periods.
HwyVol_AMPH/PMPH_Summary.bin (or .xls)	Final Assignment	Summary of Highway assignment results for AM and PM peak hour.
HwyVol_DY_Summary.bin (or .xls)	Final Assignment	Summary of daily Highway assignment results.
TrnAsgn_Summary.bin (or .xls)	Final Assignment	Summary of transit assignment results.