



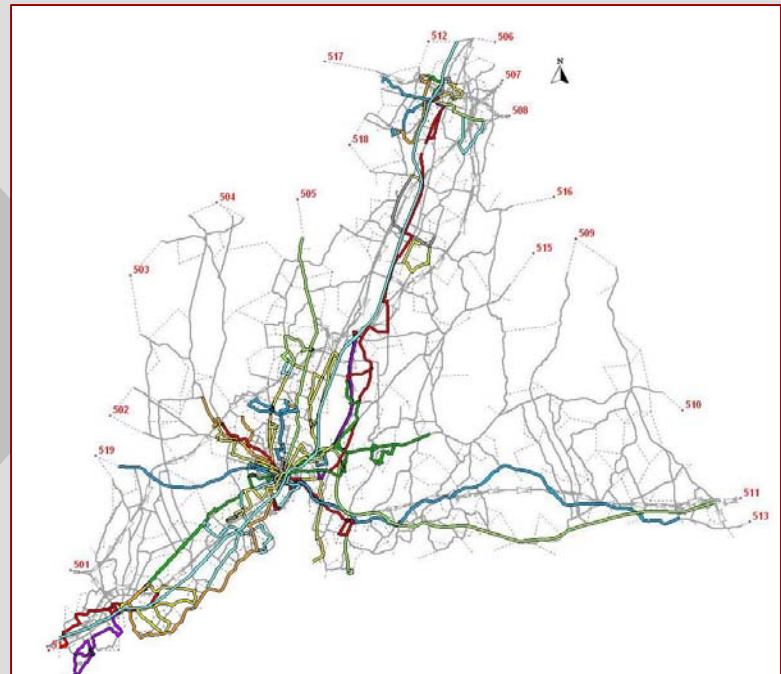
# Travel Demand Model Update

## South Central Regional Council of Governments

*Greater New Haven Area, Connecticut*

*Prepared for:*  
**SCRCOG**

*June 2010*



## Background

The SCRCOG Travel Demand Model (TDM) is a traditional four-step model and includes transit model component. In 2002, the SCRCOG TDM was migrated to TransCAD software with a revised base year and future year 2025 model scenarios. This report documents the latest update to the TDM performed in June 2010 with a base year of 2010 and future year no-build model for 2040.

## Street Network

The model street network was updated with new streets and connectors to reflect the current road conditions with respect to travel speeds and lane capacities. Effectively, the base year was updated to 2010 from 2002. The future year scenario is 2040. Several zone connectors were modified to connect accurately to the neighboring streets. Since the future year scenario is no-build conditions, the street network is essentially same in both the model scenarios. **Figure 1** shows the extent of the regional model with roadway network, transit route network and external stations.

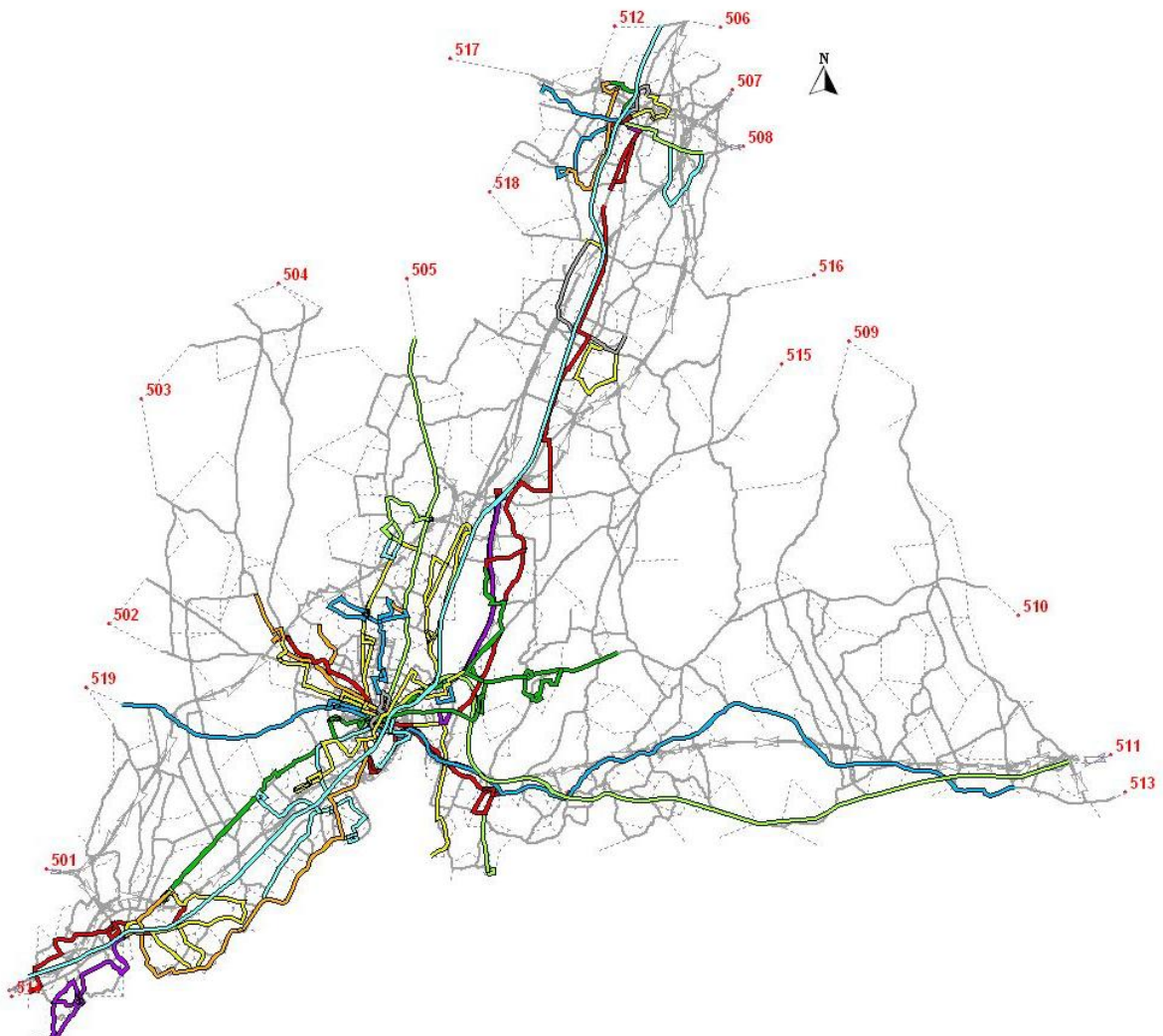


Figure 1. SCRCOG June2010 Model Update – Roadway and Transit Network

Average Daily Traffic (ADT) count data was obtained from Connecticut Department of Transportation for the years 2007 and 2009 and the street network was updated with latest count data. AM and PM peak hour data was unavailable hence the peak hour traffic counts were not updated in the model.

## Transit Route System

The transit route system file was recreated to include all the bus and rail transit routes in the region. Route and schedule information from all the regional providers such as CT Transit, Milford Transit, Meriden Transit, Wallingford Transit, Metro North, Amtrak and Shore Line East was collected and the route system was updated in TransCAD. Walk-access and Drive-access links are used in the network to load transit trips from each TAZ. The percentage of population and employment that is within a quarter mile from a transit stop was updated for each TAZ and stored in the zonal database file. **Table 1** shows all the routes included in the transit route system. Each route was coded with respective transit stops, peak and offpeak headways and fares.

Amtrak	Meriden RtA Kohls Plaza
B Congress Avenue	Meriden RtA Westfield
B Whalley Avenue	Meriden RtB SMeriden
C North Haven	Meriden RtB YaleAcres
CX1 Church_Chapel from Kohls	Meriden RtC EMain St
Comm Conn Downtown AM	Meriden RtC WMain St
Comm Conn Downtown PM	Milford Rt2
Comm Conn Seargent AM	Milford Rt3
Comm Conn Seargent PM	Milford Rt4
D Dixwell	O Route1
D Grand Ave	O Winchester Ave
Electric Trolley No Fare	Q1 Lombard St Loop
F East Haven	Q2 Beverly Hills
F West Chapel	Q3 Walmart
G1_G3	Q4 Amity Shopping Center
G2	S Local
J Kimberly	Shore Line East
J Whitney	Union Station Garage
L N Branford AM	Wallingford Local
L North Branford	Z1 West Hills
M 3/4 Washington Ave - State St	Z3 City Point and Z2 Long Wharf
MetroNorth	

**Table 1. Transit Routes in the Model Network**

Since the future year scenario is no-build conditions, the transit route system is essentially the same in both model scenarios.

## TAZ

There are 485 Traffic Analysis Zones (TAZ) in the model. External stations were regrouped after reviewing the external data from the previous model version and as a result five new external stations were added. Altogether the model now has 505 TAZs. **Table 2** shows the socio-economic data input to the two model scenarios.

Regional Model Total	2010	2040
Households	216396	237072
Population	555456	608374
Retail Employment	33117	40953
Non-Retail Employment	255968	314928
Total Employment	289091	355882

**Table 2. SCRCOG June2010 Model Update – Revised Socio-economic Data Summary**

Population and employment forecasts were collected from several existing sources in order to update the socio-economic data to 2010 and 2040. For forecasting population projections, the Connecticut State Data Center population projections were used and extrapolated to 2040. The employment statistics from American Community were used to develop 2010 employment numbers by city. The Connecticut Department of Labor regional employment growth forecast percentage of 0.77% from 2006 to 2016 was assumed to continue until 2040 and the growth rates were adjusted based on municipality type. **Table 3** shows the result of population and employment forecasts that were developed as part of the June2010 model update.

City	Group	Population Growth Rate 2000 to 2010	2010 Model Population	Population Annual Growth Rate 2000 to 2040	2040 Model Population	Employment Growth Rate 2000 to 2010	2010 Model Employment	Employment Annual Growth Rate 2000 to 2040	2040 Model Employment
Bethany	Suburban	9.18%	5,503	0.74%	6,757	4.47%	1,833	0.30%	1,978
Branford	Urban Periphery	1.47%	29,101	0.15%	30,428	-1.88%	13,433	0.77%	18,584
East Haven	Urban Periphery	0.81%	28,425	-0.04%	27,799	8.37%	7,348	0.77%	9,204
Guilford	Suburban	6.52%	22,789	0.55%	26,622	7.76%	8,825	0.30%	9,232
Hamden	Urban Periphery	1.50%	57,765	0.03%	57,707	8.96%	22,488	0.77%	28,020
Madison	Suburban	10.07%	19,658	0.82%	24,754	4.47%	5,615	0.30%	6,059
Meriden	Urban Periphery	4.76%	61,017	0.49%	70,918	4.39%	25,190	0.77%	32,757
Milford	Urban Periphery	2.88%	53,800	0.31%	59,239	-0.37%	29,939	0.77%	40,793
New Haven	Urban Core	-3.50%	119,310	0.10%	128,666	14.86%	87,260	0.93%	110,017
North Branford	Suburban	4.97%	14,602	0.49%	16,896	4.47%	4,289	0.30%	4,628
North Haven	Suburban	1.53%	23,397	0.21%	25,080	11.66%	24,546	0.30%	24,780
Orange	Suburban	2.79%	13,594	0.35%	15,211	4.47%	8,890	0.30%	9,593
Wallingford	Suburban	4.63%	45,019	0.44%	51,290	12.70%	28,666	0.50%	31,051
West Haven	Urban Core	-0.23%	52,237	0.21%	56,961	-2.31%	16,801	0.93%	24,907
Woodbridge	Suburban	2.87%	9,238	0.28%	10,054	4.47%	3,970	0.30%	4,284
<b>TOTAL</b>	<b>Region</b>		<b>555,455</b>		<b>608,382</b>		<b>289,093</b>		<b>355,887</b>

**Table 3. Population and Employment Forecasts by City**

External station data in the model was input as traffic counts at the respective stations. The external station volume table was updated to reflect current traffic volumes, revised locations of the external stations and transit shares. A nominal growth rate of 1% per year was used to forecast future year 2040 external station volumes. The external-external trips matrix was also updated accordingly.

### Model Parameters

The trip balancing procedure in the model was modified to correct the internal-external trip balancing. The number of iterations for each trip type for the gravity trip distribution procedure was increased from 10 to 30 iterations. The transit share for each external station was revised based on updated traffic counts. The model scenarios were run using the toolbox with five feedback iterations.

### Validation

Overall, results from the auto/highway assignment indicate that the model is well calibrated across the region. **Figure 2** shows the count vs. flow chart and the R-square value of 0.90 indicates a good fit. Count data was unavailable to update the 2002 model screenline data. The RMSE value for the overall model is 34% which is well within the reasonable range of less than 40%.

The trip length distribution analysis indicates an average trip length of 15 minutes that matches the regional travel time statistics from 2000 census data.

The future year assignment results were verified for reasonableness and for sensitivity to population and employment growth. **Figures 3 and 4** show the base year and future year model flows with volume to capacity ratio identifiers.

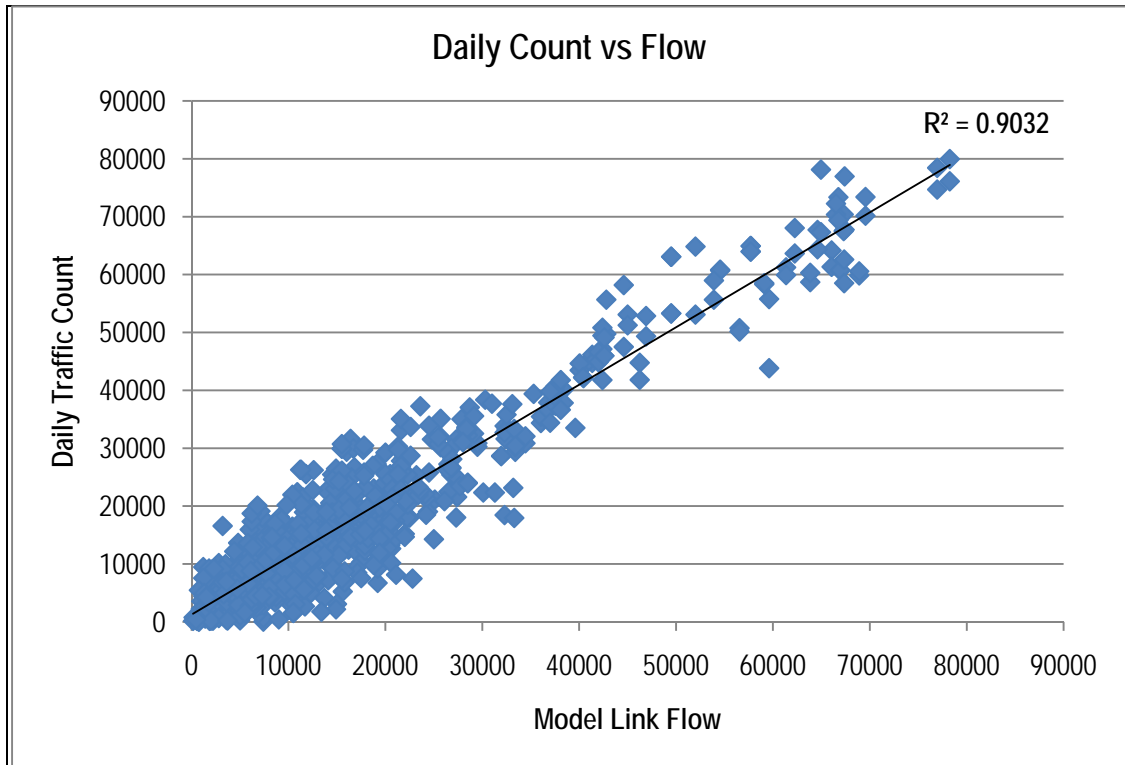


Figure 2. Count vs. Flow Comparison

