Churton Street Congestion Analysis Report

Prepared for:
The Town of Hillsborough
Hillsborough, North Carolina

By
DCHC MPO
September 9, 2010

I. Introduction

- The main purpose of this analysis is to assess current traffic congestion causes on Churton Street, and develop and evaluate alternatives to reduce congestion or maintain an acceptable Level of Service (LOS) on the street.

- Since the 2010 data set is not available and the FY2035 Long Range Transportation Plan (LRTP) has been developed on May, 2009, base and target analysis years are set as FY2015 and FY2035.

- In the Town of Hillsborough area, two coordinated signal corridors are maintained by NC DOT: 14 signals on Churton Street between NC 57 and Oakdale Dr. and 5 signals on NC 86 between US 70 business and Hampton Pointe Drive. Recently, NC DOT completed the re-timing, phasing, and coordinating work on the Churton Street corridor using on-site field observation methodology, and the NC 86 corridor will be completed soon.

II. Triangle Regional Travel Demand Model (TRM) review

1. Socio-Economic data review

It is important to understand socioeconomic (SE) data since travel demand forecasting results and the accuracy of the results are heavily dependent on the SE data.
Two socioeconomic data sets are reviewed in this section: one estimated by the Town of Hillsborough and one used by the Triangle Regional Travel Forecasting Model.

1.1. Town of Hillsborough data

TRM_ID*	TAZ	2005			2015			2035		
		Housing	pop	Employ	Housing	pop	Employ	Housing	pop	Employ
1882	330002	832	1973	144	932	2210	854	1232	2922	1590
1883	330003	386	915	6	560	1328	20	658	1560	25
1884	330004	323	766	604	403	956	936	528	1252	1354
1885	330005	267	633	369	352	835	666	409	970	998
1886	330006	239	567	15	264	626	53	314	745	63
1887	330008	471	1117	126	531	1259	263	631	1496	404
1891	330012	366	868	318	404	958	934	464	1100	995
1892	330013	369	875	226	540	1281	370	580	1375	499
1893	330014	192	455	398	207	491	1244	230	545	1451
1894	330015	207	491	1501	550	1304	2169	653	1549	2221
1895	330016	105	249	1182	125	296	1289	205	486	1457
1896	330017	555	1316	689	1095	2597	1696	1635	3877	2875
1897	330018	800	1897	543	899	2132	1215	1047	2483	1396
1977	376005	38	90	31	64	152	97	201	477	320
SUM		*5150*	*12213*	*6152*	*6926*	*16425*	*11806*	*8787*	*20838*	*15648*

*) The detailed Traffic Analysis Zone (TAZ) location is shown in section 1.5.

1.2. Compared with previous scenario data (%)

TRM_ID	TAZ	2005 (FY05/FY02)			2015 (FY15/FY05)			2035 (FY35/FY25)		
		Housing	pop	Employ	Housing	pop	Employ	Housing	pop	Employ
1882	330002	0.01	0.01	0.13	0.12	0.12	4.93	0.19	0.19	0.02
1883	330003	1.64	1.64	0.50	0.45	0.45	2.33	0.00	0.00	0.25
1884	330004	0.00	0.00	(0.44)	0.25	0.25	0.55	0.09	0.09	0.30
1885	330005	0.00	0.00	0.54	0.32	0.32	0.80	0.05	0.05	0.32
1886	330006	0.13	0.13	1.50	0.10	0.10	2.53	0.09	0.09	0.26
1887	330008	0.00	0.00	(0.21)	0.13	0.13	1.09	0.07	0.07	(0.17)
1891	330012	0.22	0.22	(0.43)	0.10	0.10	1.94	0.07	0.07	0.02
1892	330013	1.35	1.35	0.10	0.46	0.46	0.64	0.00	0.00	0.24
1893	330014	0.03	0.03	(0.63)	0.08	0.08	2.13	0.04	0.04	0.05
1894	330015	1.38	1.38	0.09	1.66	1.66	0.45	0.00	0.00	0.00
1895	330016	0.00	0.00	0.39	0.19	0.19	0.09	0.00	0.00	0.00
1896	330017	0.00	0.00	0.46	0.97	0.97	1.46	0.00	0.00	0.00
1897	330018	0.04	0.04	(0.50)	0.12	0.12	1.24	0.05	0.05	0.05
1977	376005	0.00	0.00	2.10	0.68	0.68	2.13	0.13	0.13	0.88

1.3. TRM original data sets

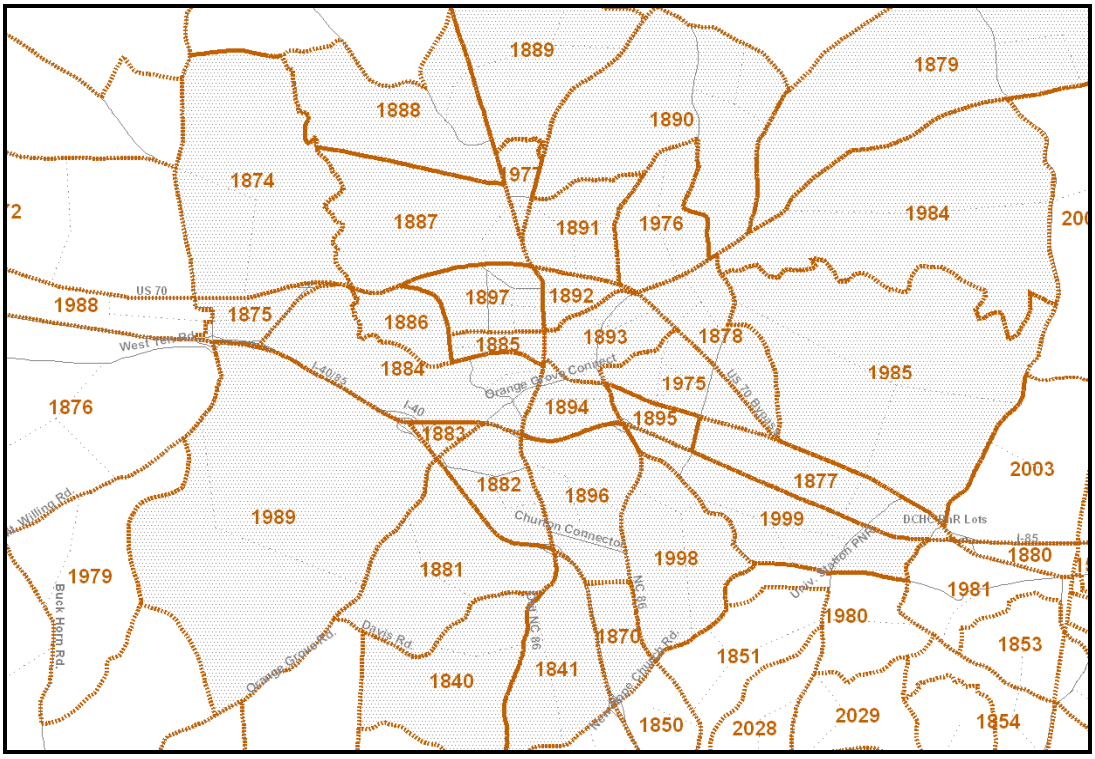
TRM_ID	TAZ	2005			2015			2035		
		Housing	pop	Employ	Housing	pop	Employ	Housing	pop	Employ
1882	330002	855	1973	144	1099	2547	854	1250	2903	1114
1883	330003	481	1141	6	658	1560	20	658	1560	10
1884	330004	327	766	604	418	982	919	925	2182	1317
1885	330005	269	633	227	292	688	666	444	1048	519
1886	330006	240	567	15	460	1089	33	582	1377	45
1887	330008	472	1117	104	533	1262	173	785	1860	435
1891	330012	370	868	318	616	1451	954	618	1454	922
1892	330013	372	875	226	483	1138	345	484	1138	323
1893	330014	194	455	398	209	491	1244	211	493	1412
1894	330015	207	491	1501	651	1544	2169	714	1692	2597
1895	330016	105	249	883	107	254	1289	105	250	1457
1896	330017	569	1316	689	1006	2350	1596	1580	3703	2928
1897	330018	808	1897	543	908	2132	1195	960	2258	1314
1977	376005	38	90	21	64	152	27	194	460	33
SUM		*5307*	*12438*	*5679*	*7504*	*17640*	*11484*	*9510*	*22378*	*14426*

1.4. Comparison of TRM and Town of Hillsborough data (%, TRM/ToH)

TRM_ID	TAZ	2005			2015			2035		
		Housing	pop	Employ	Housing	pop	Employ	Housing	pop	Employ
1882	330002	0.03	(0.00)	0.00	0.18	0.15	0.00	0.01	(0.01)	(0.30)
1883	330003	0.25	0.25	0.00	0.18	0.17	0.00	0.00	(0.00)	(0.60)
1884	330004	0.01	0.00	0.00	0.04	0.03	(0.02)	0.75	0.74	(0.03)
1885*	330005	0.01	(0.00)	(0.38)	(0.17)	(0.18)	0.00	0.09	0.08	(0.48)
1886	330006	0.00	0.00	0.00	0.74	0.74	(0.38)	0.85	0.85	(0.29)
1887	330008	0.00	0.00	(0.17)	0.00	0.00	(0.34)	0.24	0.24	0.08
1891	330012	0.01	0.00	0.00	0.52	0.51	0.02	0.33	0.32	(0.07)
1892	330013	0.01	(0.00)	0.00	(0.11)	(0.11)	(0.07)	(0.17)	(0.17)	(0.35)
1893	330014	0.01	(0.00)	0.00	0.01	0.00	0.00	(0.08)	(0.10)	(0.03)
1894	330015	0.00	0.00	0.00	0.18	0.18	0.00	0.09	0.09	0.17
1895	330016	0.00	(0.00)	(0.25)	(0.14)	(0.14)	0.00	(0.49)	(0.49)	0.00
1896	330017	0.03	(0.00)	0.00	(0.08)	(0.10)	(0.06)	(0.03)	(0.04)	0.02
1897	330018	0.01	(0.00)	0.00	0.01	0.00	(0.02)	(0.08)	(0.09)	(0.06)
1977	376005	0.00	(0.00)	(0.32)	0.00	0.00	(0.72)	(0.03)	(0.03)	(0.90)
SUM		0.03	0.02	(0.08)	0.08	0.07	(0.03)	0.08	0.07	(0.08)

*) the shaded cells indicate downtown area.

1.5. TAZ map in TRM model



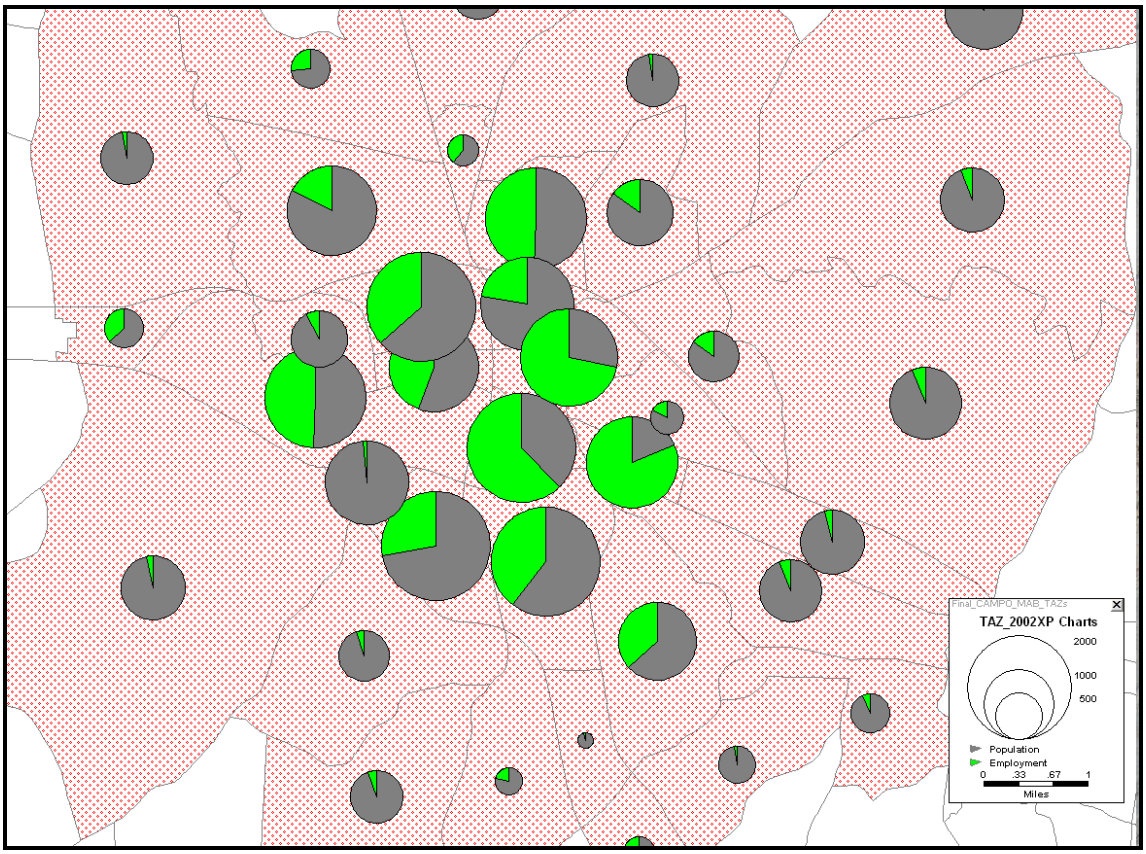
1.6. Summary of SE data comparison

After reviewing an official version of TRM and Town of Hillsborough socioeconomic data, the Town of Hillsborough data is adopted for this analysis. Since TRM's SE data are produced by a Control Total Methodology, sometimes the TRM data is not the same as the original data provided by a jurisdiction.

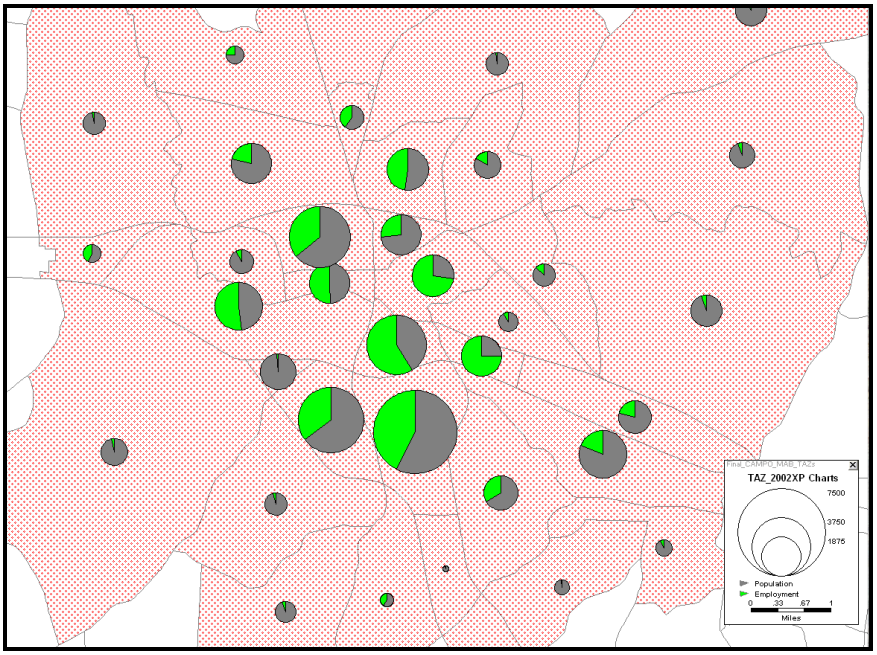
1.7. Population versus Employment

The numbers of population and employment in a TAZ are shown in the two figures below. It is important to understand the numbers in a TAZ since population is closely related with the amount of trip production and employment is associated with the amount of trip attraction in a TAZ. The Grey and Green colors indicate the population and employment, and the pie size represents the total amount of both numbers in a TAZ.

1.7.1.FY2015



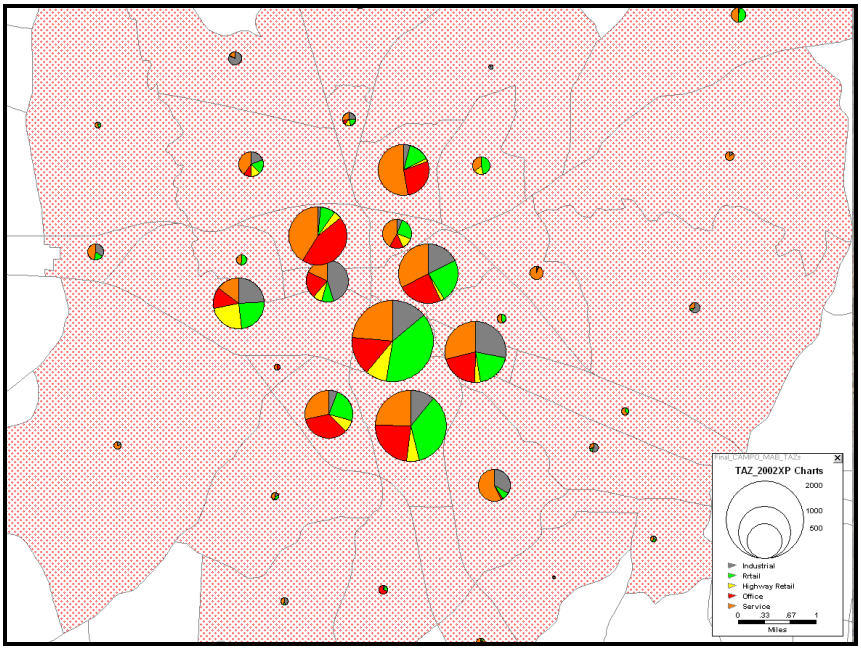
1.7.2.FY2035



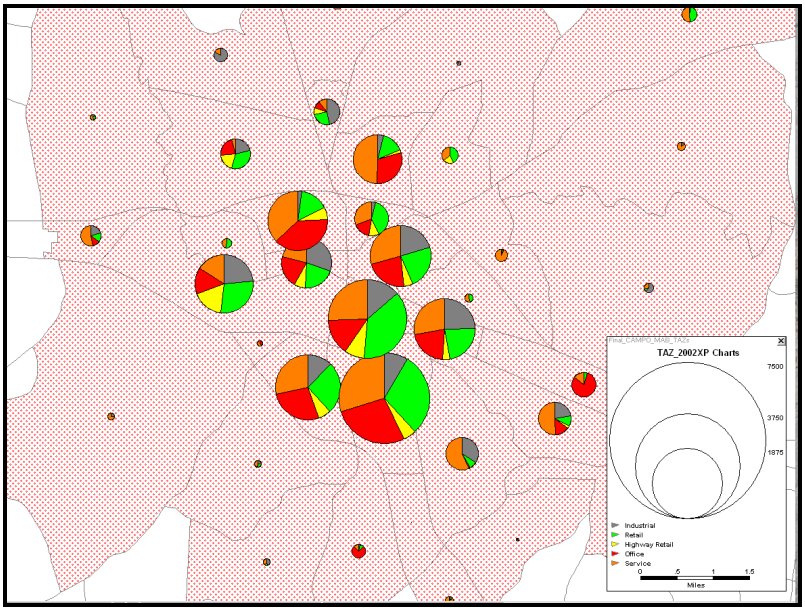
1.8. Employment Type

Each employment type has different trip attraction rates by time of day in the TRM model. The differences are shown in the figures below: the color of Grey, Green, Yellow, Red, and Orange represents the amount of employment in the industrial, retail, highway retail, office, and service sectors. Again, the pie size indicates the total amount of employment in each TAZ.

1.8.1.FY2015



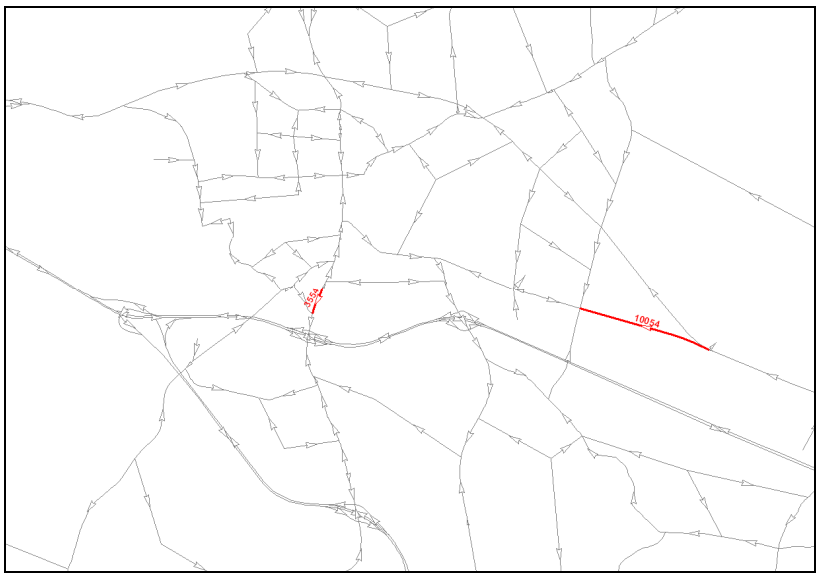
1.8.2.FY2035



2. Model Validation

The TRM model is a regional demand forecasting model covering CAMPO and DCHC MPO areas. It is important to ensure that the model can be applicable for a subarea analysis. Using the recent NC DOT's Annual Average Daily Traffic (AADT) data, the model's capability is reviewed. The figure below shows two comparison links and the result is shown in the following table. It is noted that the AADT is usually based on consecutive 48 hours of data collection with adjustment rate, not on 365 days. In other words, the AADT is an estimated number.

2.1. FY2005 vs. Traffic Count



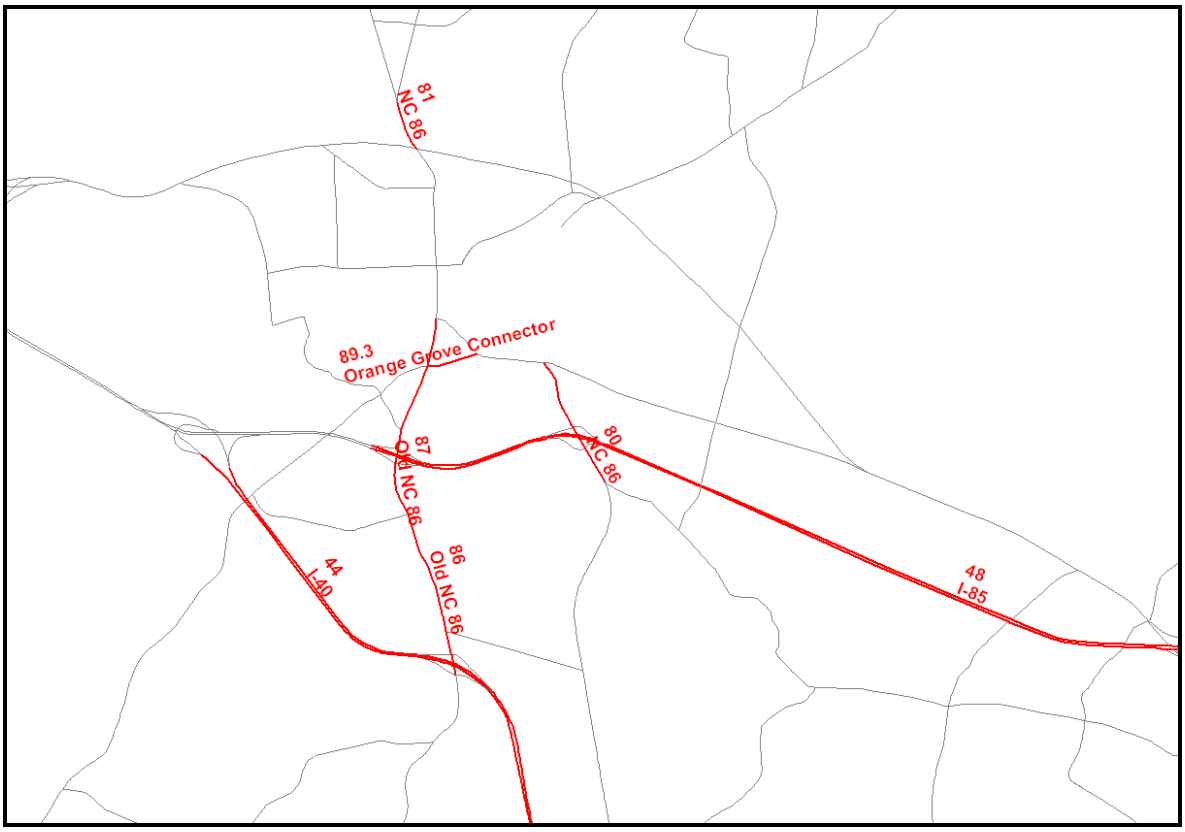
Location Volume		Count			TRM_FY05			***TRM/Count (%)***			HAF*	Others	
		AM (4h)	PM (4h)	Daily	AM (4h)	PM (4h)	Daily	***AM (4h)***	***PM (4h)***	***Daily***	PM	HWY ID	Count ID
Churton St	NB	1651	2530	8150	1290	1546	5680	**78%**	**61%**	**70%**	106%	3554	20670080
	SB	1953	2430	8607	1255	1509	5608	**64%**	**62%**	**65%**			
	Tot	3604	4960	16757	2545	3055	11288	***71%***	***62%***	***67%***			
US70 BUS	EB	223	403	1244	168	548	1622	**75%**	**136%**	**130%**	109%	10054	40670109
	WB	357	386	1321	345	210	1441	**97%**	**54%**	**109%**			
	Tot	580	789	2565	513	758	3063	***88%***	***96%***	***119%***			

* HAF: Hourly Adjustment Factor for converting TRM flow on PM peak period

3. Overview of existing and future conditions at the Town of Hillsborough

3.1. Six planned Projects with capacity addition by FY2035 in LRTP, 2009

Six projects providing capacity addition by FY 2035 in Long Range Transportation Plan are shown in the figure below with the project name and LRTP ID; this information will help the development of alternative scenarios to define which project or a combination of projects are crucial to relieve future congestion on Churton Street.



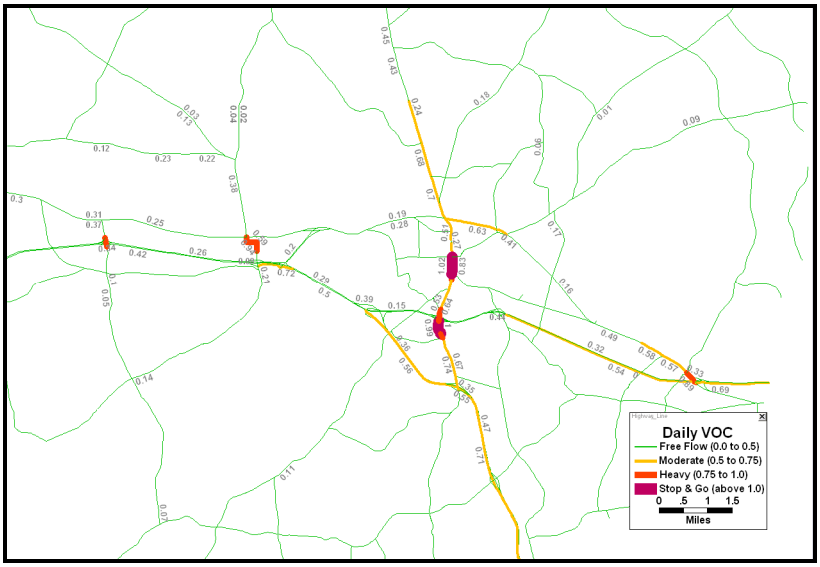
3.2. Congestion review (v/c)

Volume-to-Capacity ratio (V/C) is a good indicator of congestion during daily or specific peak-time periods. To examine the congestion levels among the base analysis year (FY2015, current demand and supply), target analysis year with no-build (FY2035 demand and current supply), and target analysis year with the six project cases (FY2035 demand and, new supply), multiple models were analyzed. The results on daily, AM & PM peak periods are shown in the figures below: the Green, Orange, Red, and Purple colors indicate the forecasted congestion levels in free flow, moderate, heavy, and stop & go conditions.

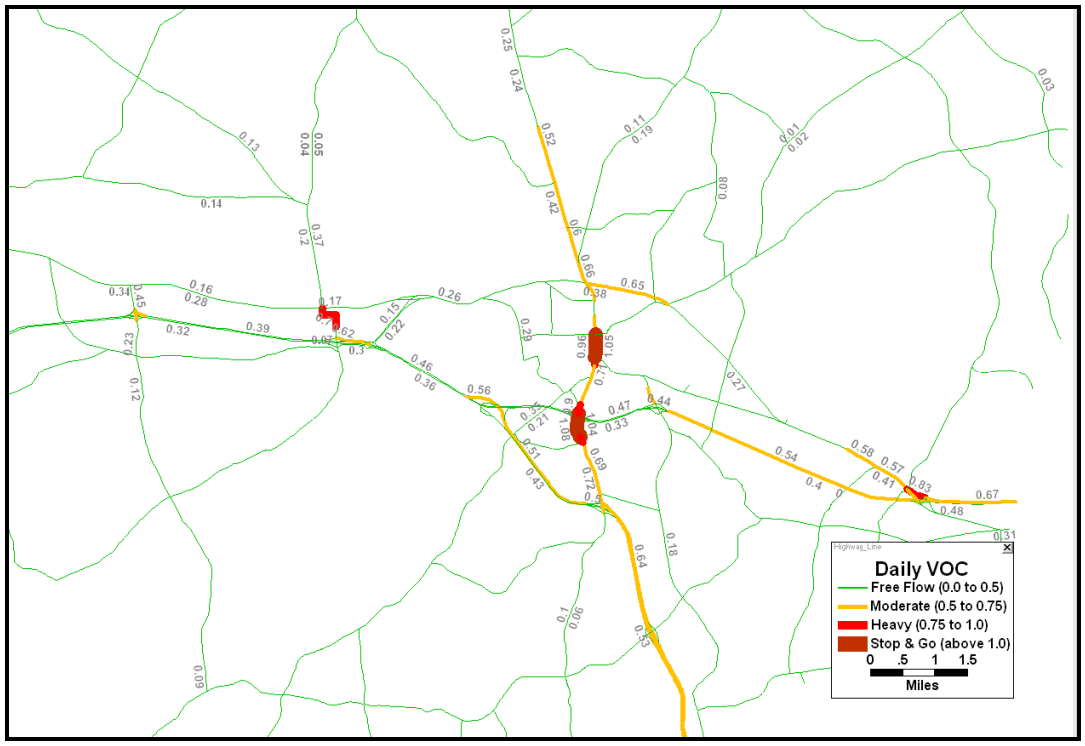
3.2.1.FY2015

3.2.1.1. Daily congestion

3.2.1.2. AM peak period (6~10 AM)

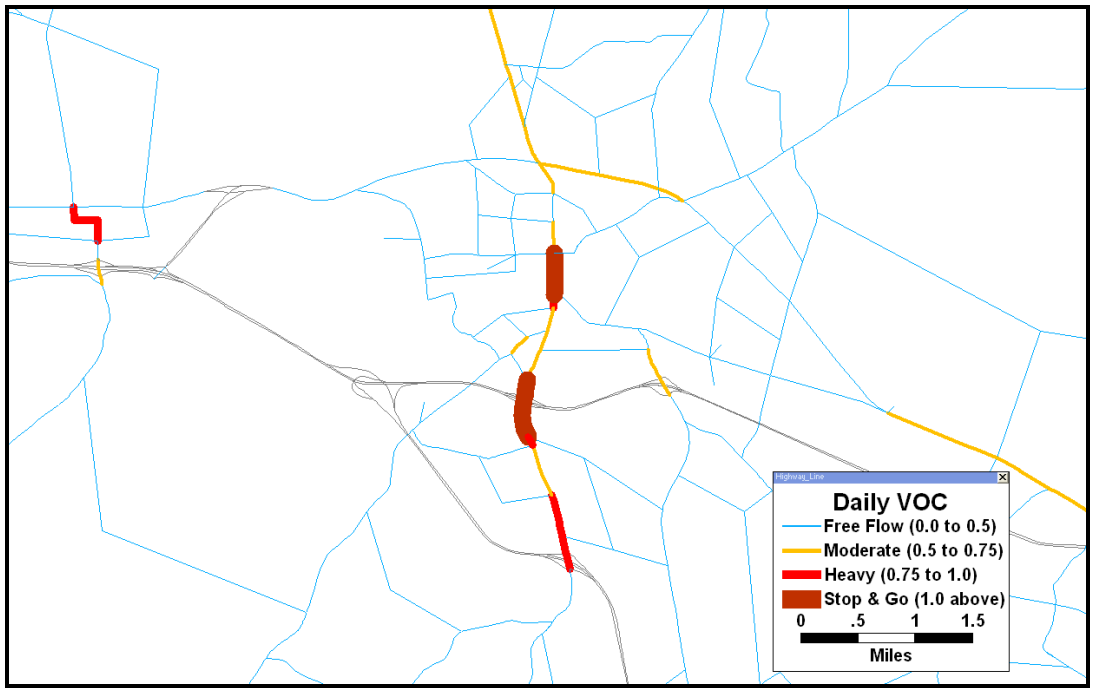


3.2.1.3. PM peak period (15:30 ~ 19:30)

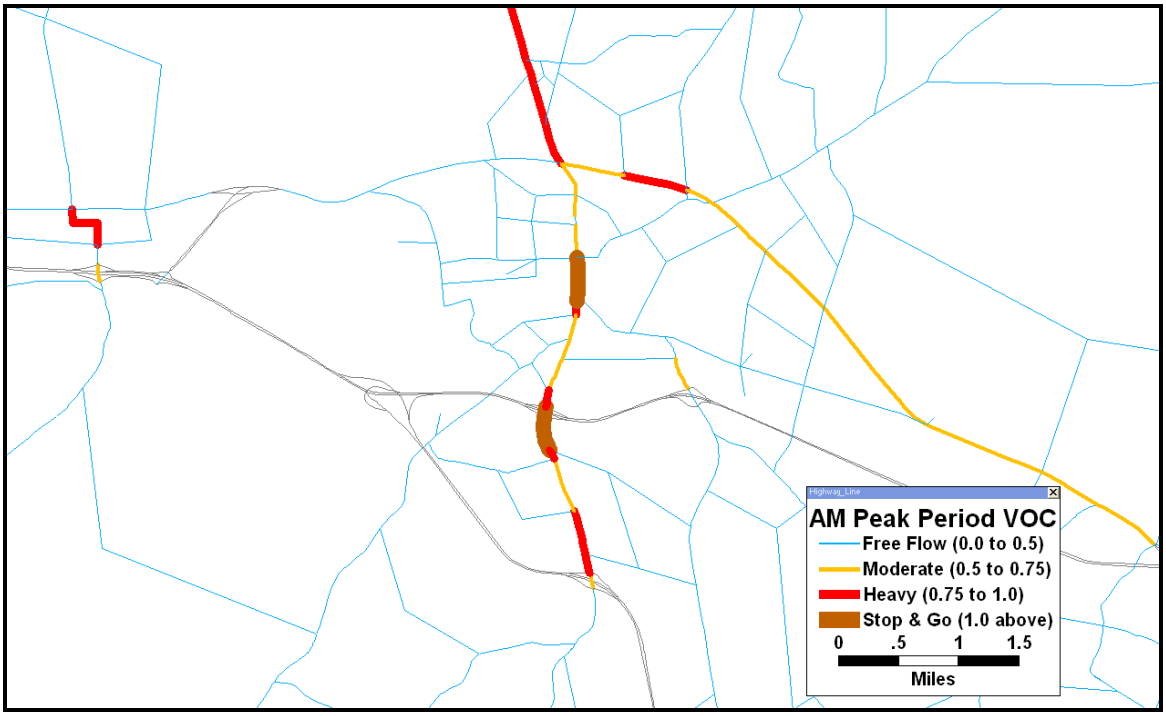


3.2.2. FY2035 with No Build Scenario

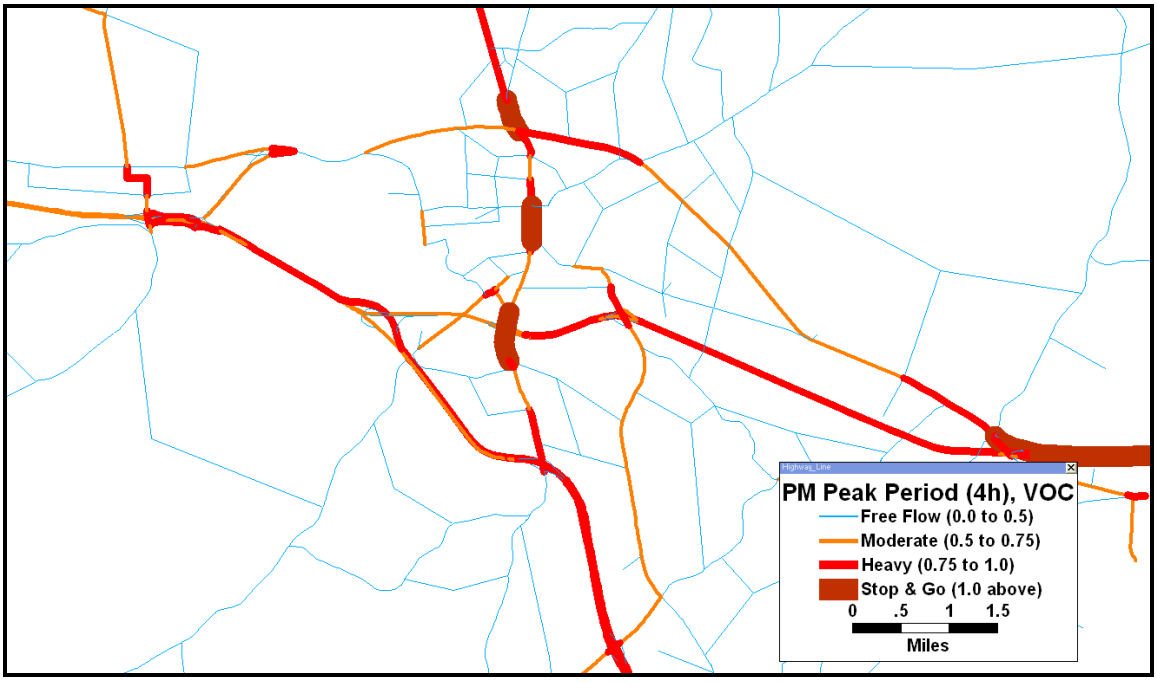
3.2.2.1. Daily congestion



3.2.2.2. AM peak period (6~10AM)

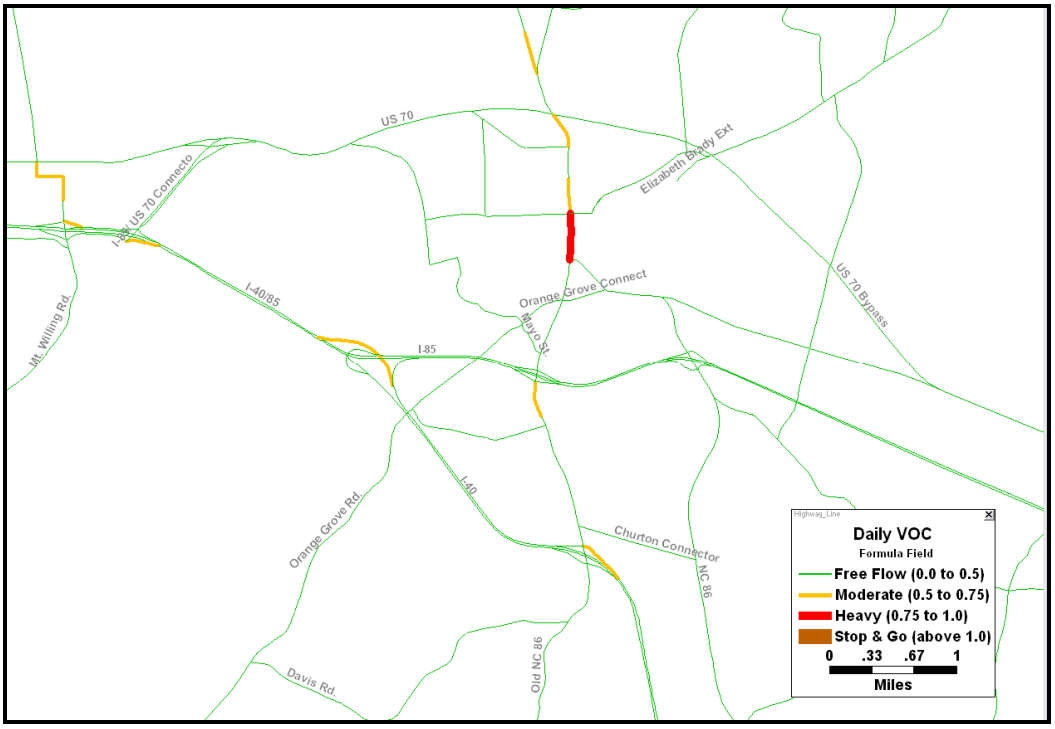


3.2.2.3. PM peak period (15:30~19:30)

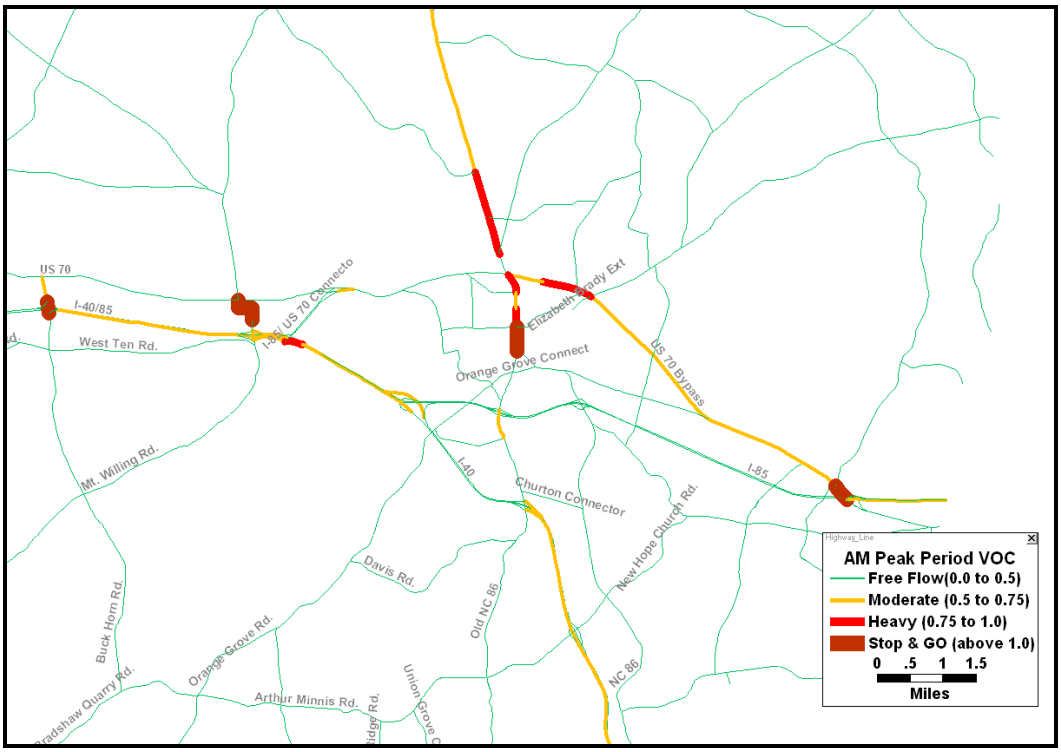


3.2.3.FY2035 with 6 capacity projects

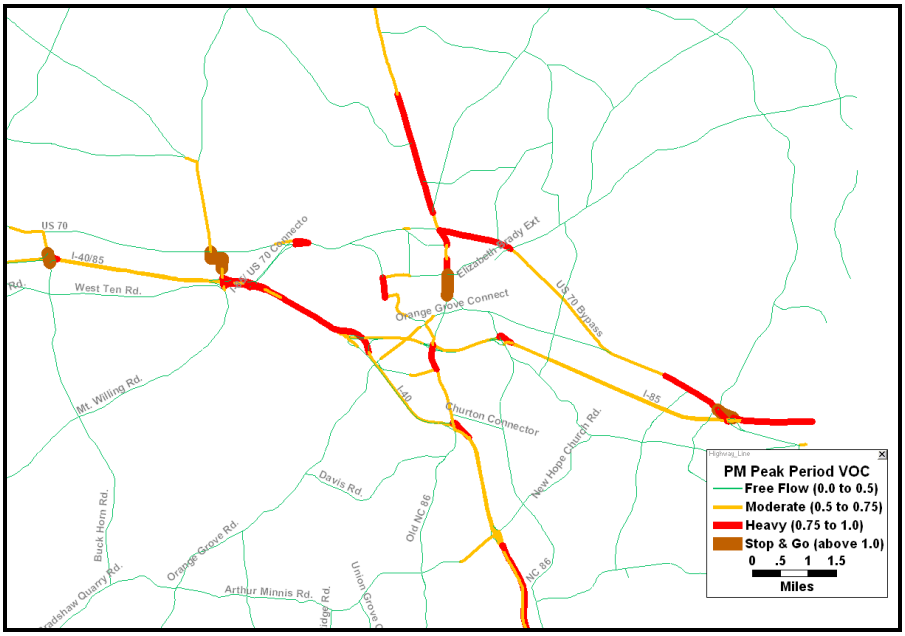
3.2.3.1. Daily congestion



3.2.3.2. AM peak period (6~10AM)



3.2.3.3. PM peak period (15:30~19:30)

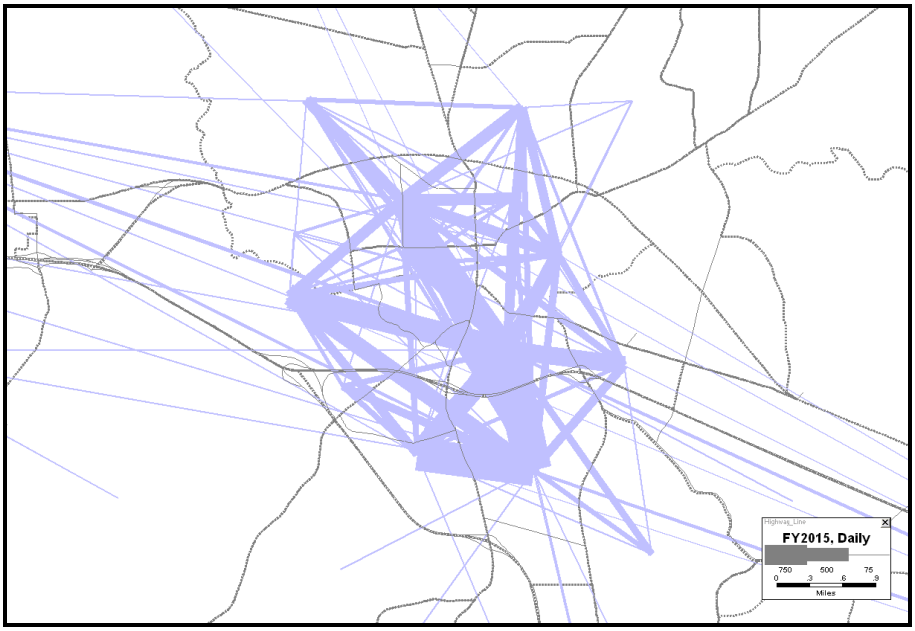


3.3. Desire Lines (Flows of vehicle from CBD)

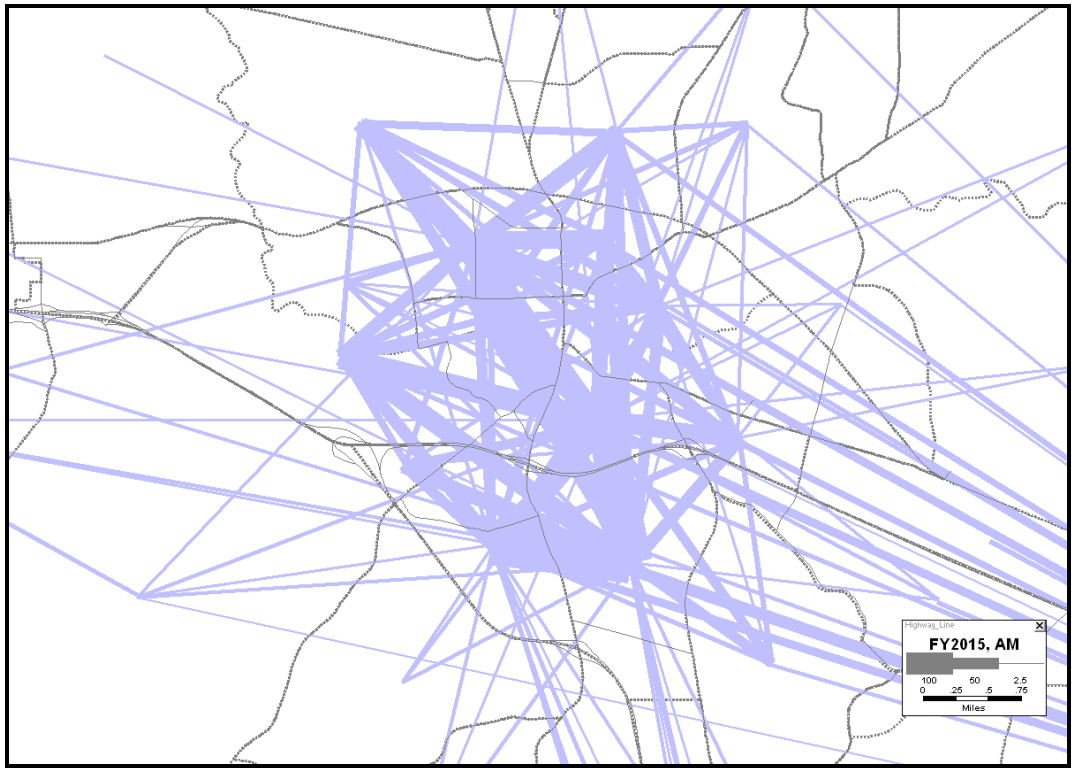
A desire line analysis was conducted to figure out where vehicles from the Hillsborough downtown area are going to or coming from within the region. The results are shown in the figures below. The line thickness in the figures represents relative traffic volume. The TRM model's results indicate that most vehicles are traveling between zones within the area.

3.3.1.FY2015

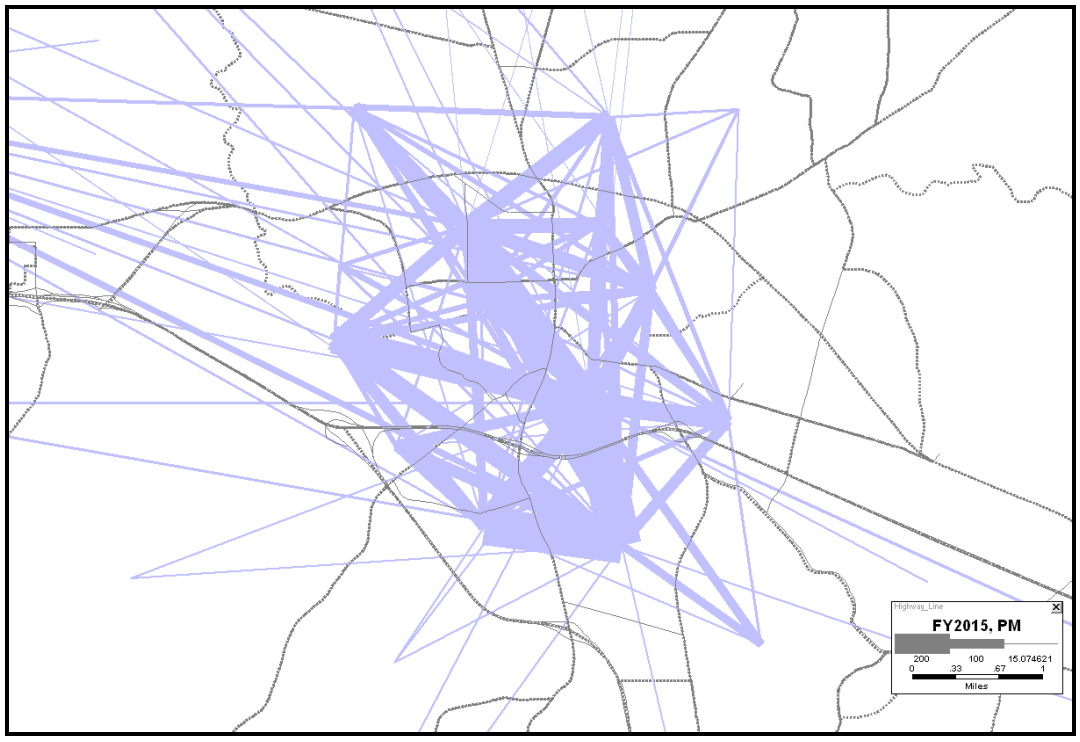
3.3.1.1. Daily desired lines



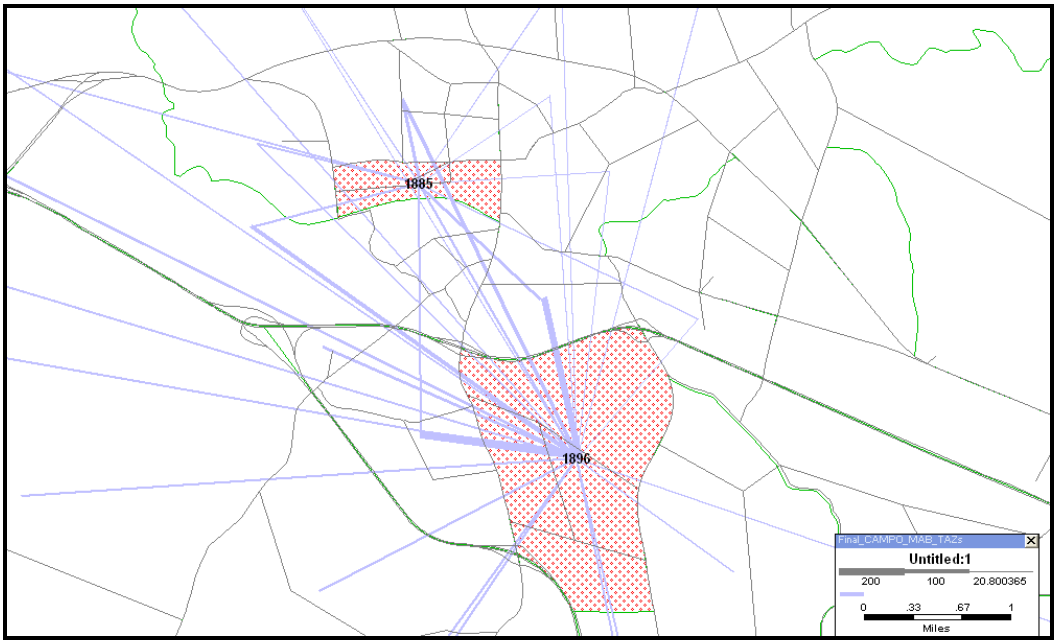
3.3.1.2. AM peak period desired lines



3.3.1.3. PM peak period desired lines

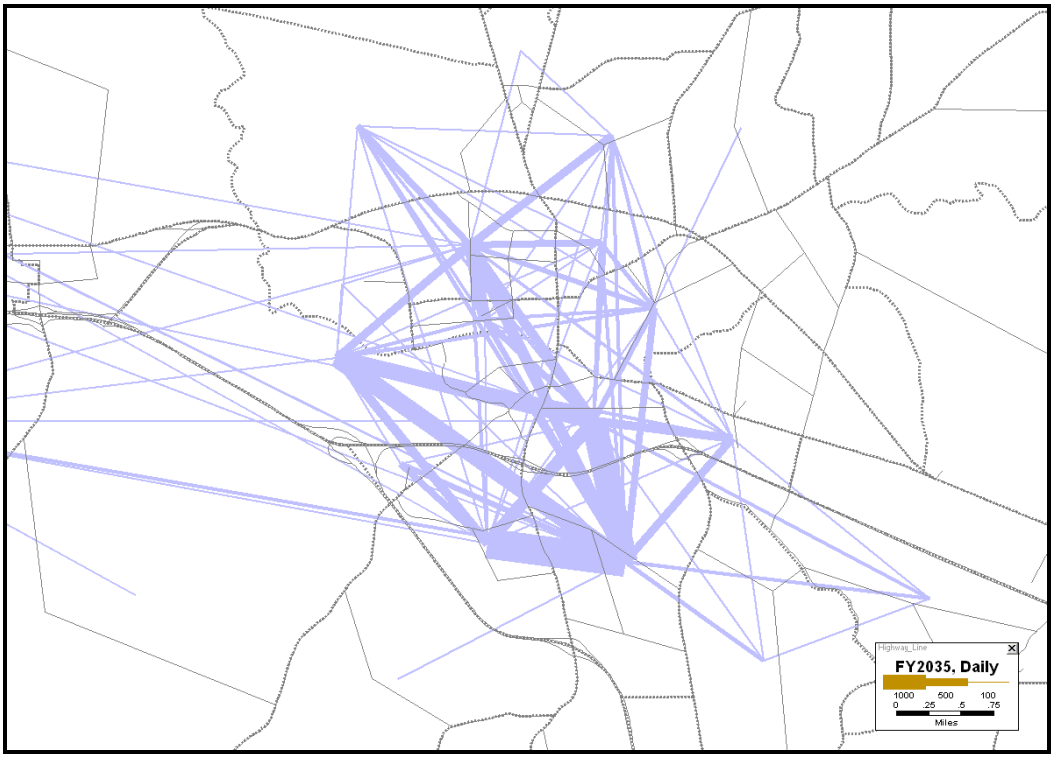


3.3.1.4. Daily desired lines - Two highest activity zones

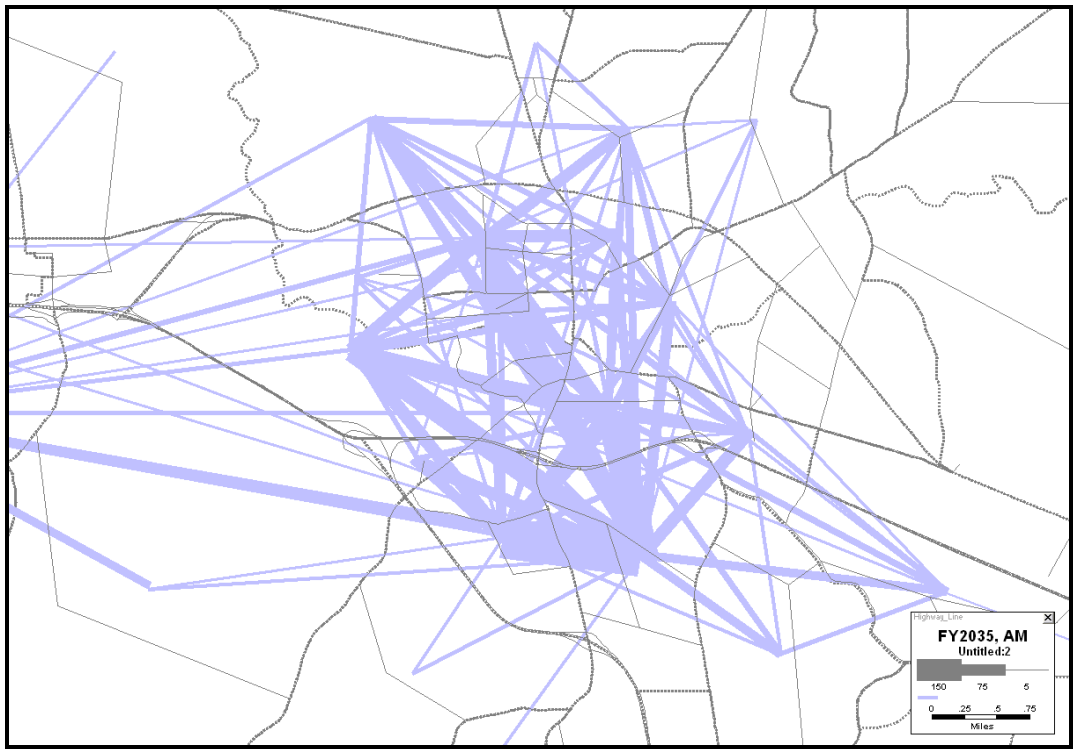


3.3.2.FY2035

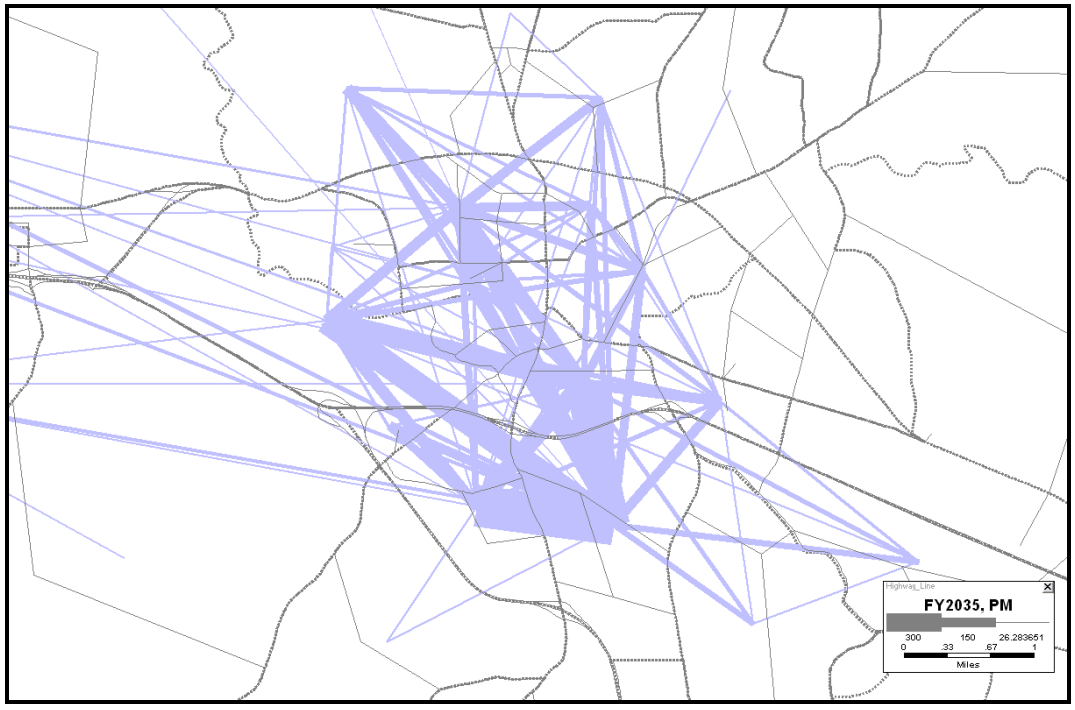
3.3.2.1. Daily desired lines



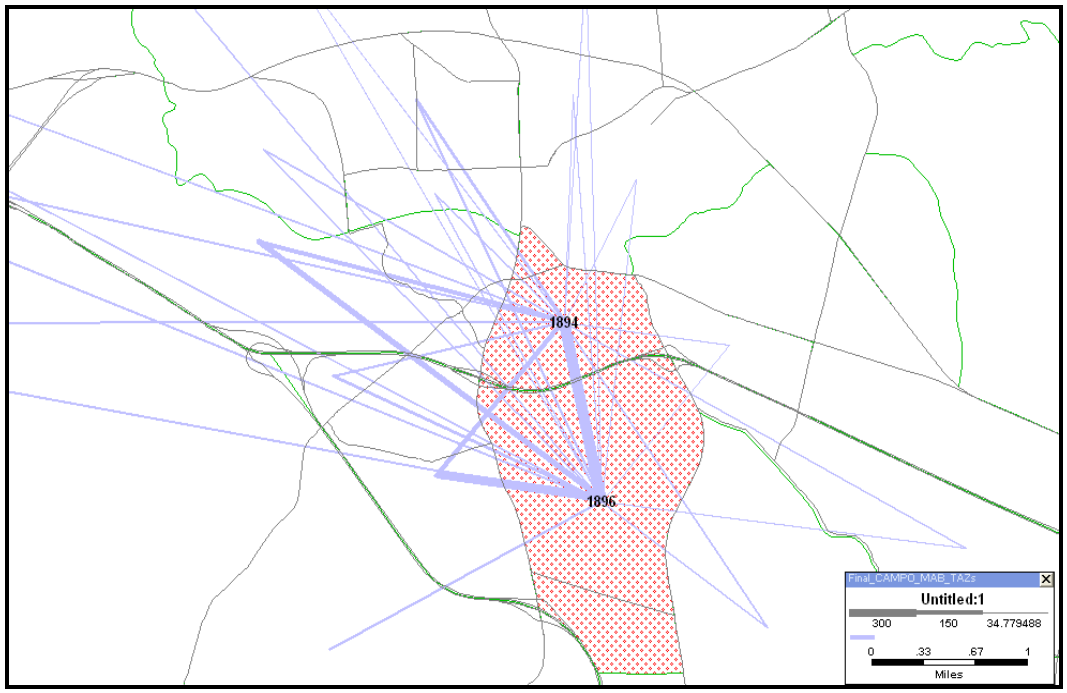
3.3.2.2. AM peak period desired lines



3.3.2.3. PM peak period desired lines



3.3.2.4. Daily desired lines - Two most high activity zone

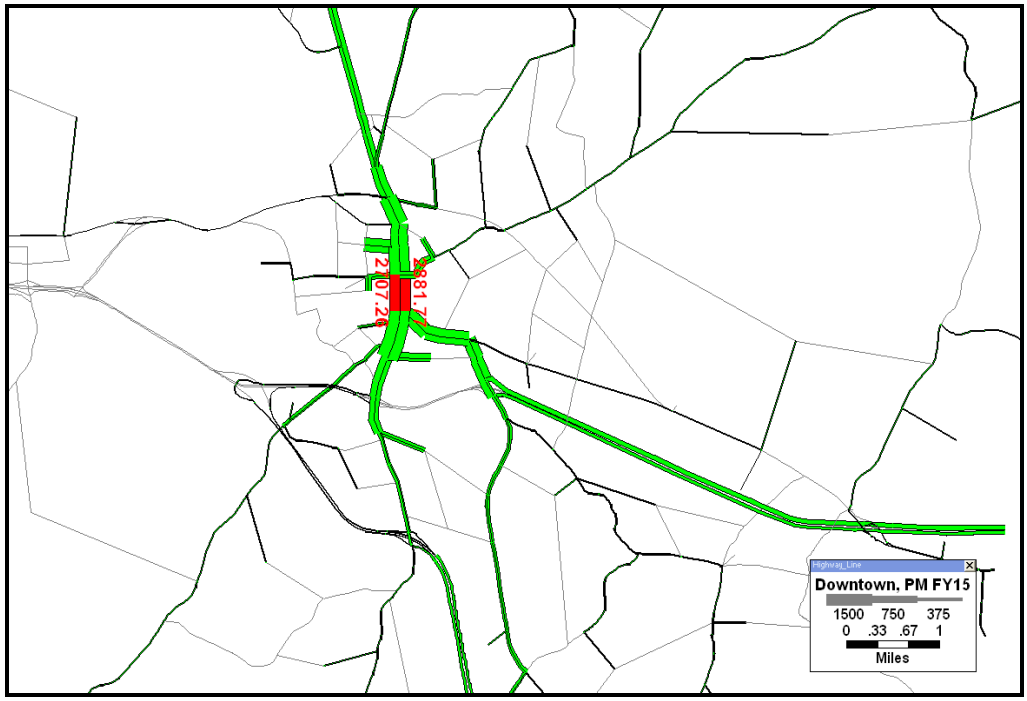


3.4. OD path review

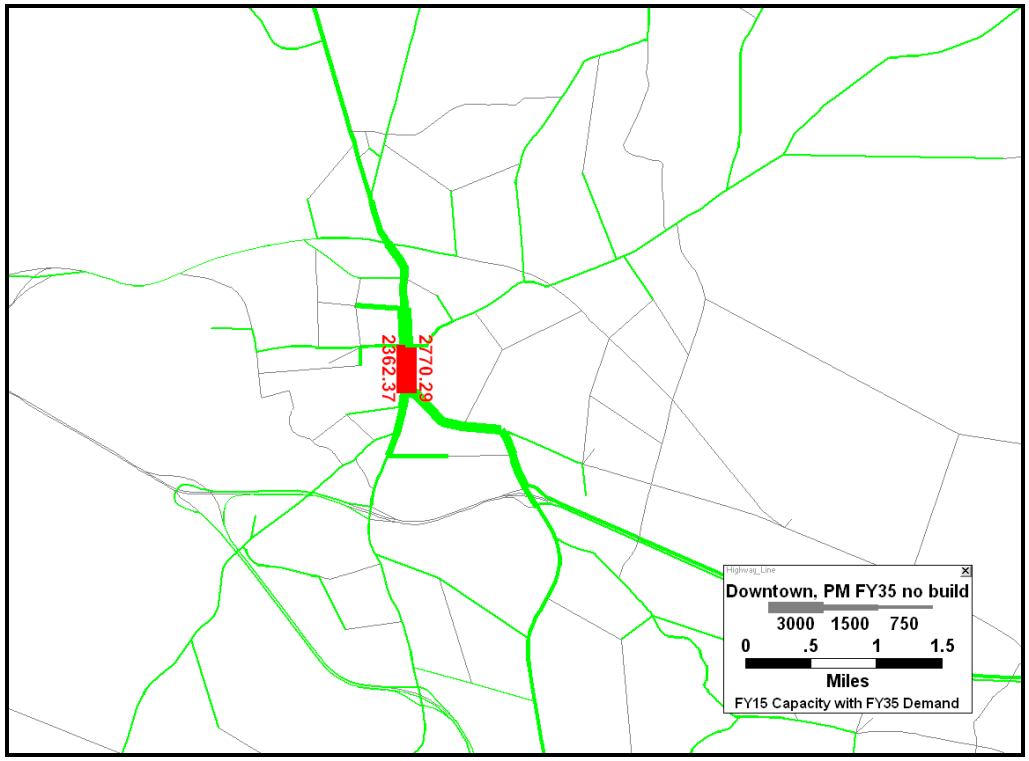
A selected link analysis was also conducted to understand origin and destination (OD) of the passing vehicles on the selected link. This analysis provides a clue whether the congestion was caused by through traffic or inter-Hillsborough traffic, and provides an initial thought for alternative development. In the figures below, the red colored link and numbers represent the selected link location and the assigned directional traffic volumes during the PM peak-hour periods, which are between 4:30 to 7:30 PM.

3.4.1.N-S bound at Downtown (PM only)

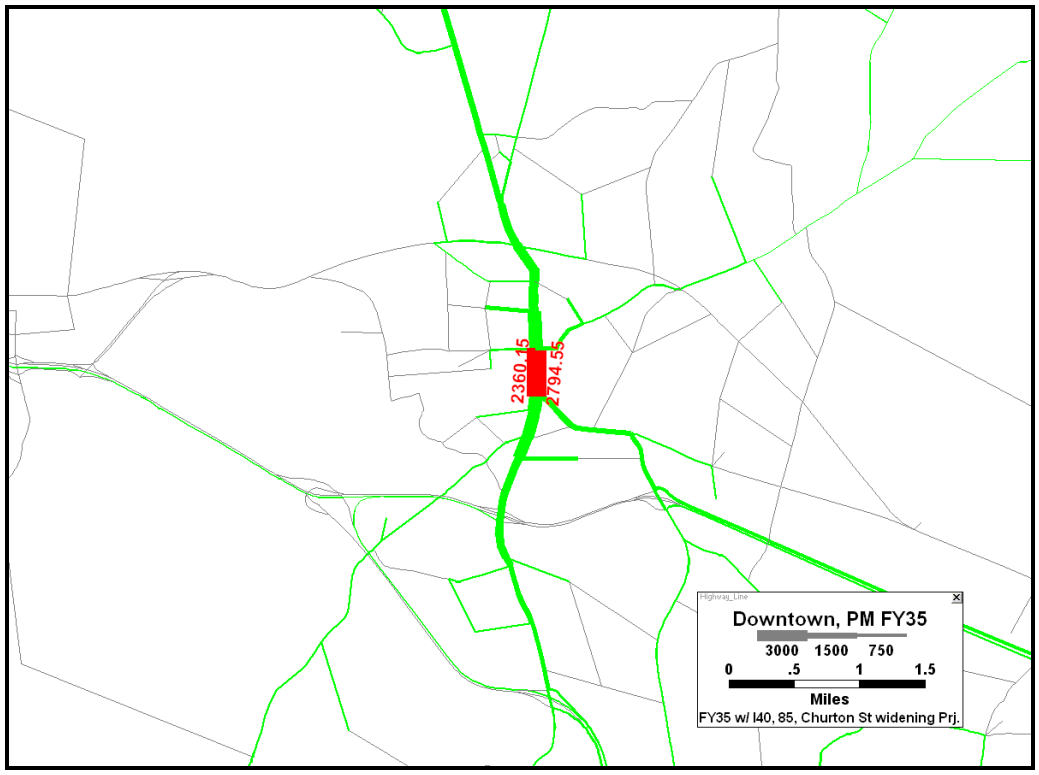
3.4.1.1. FY2015



3.4.1.2. FY2035, no build scenario

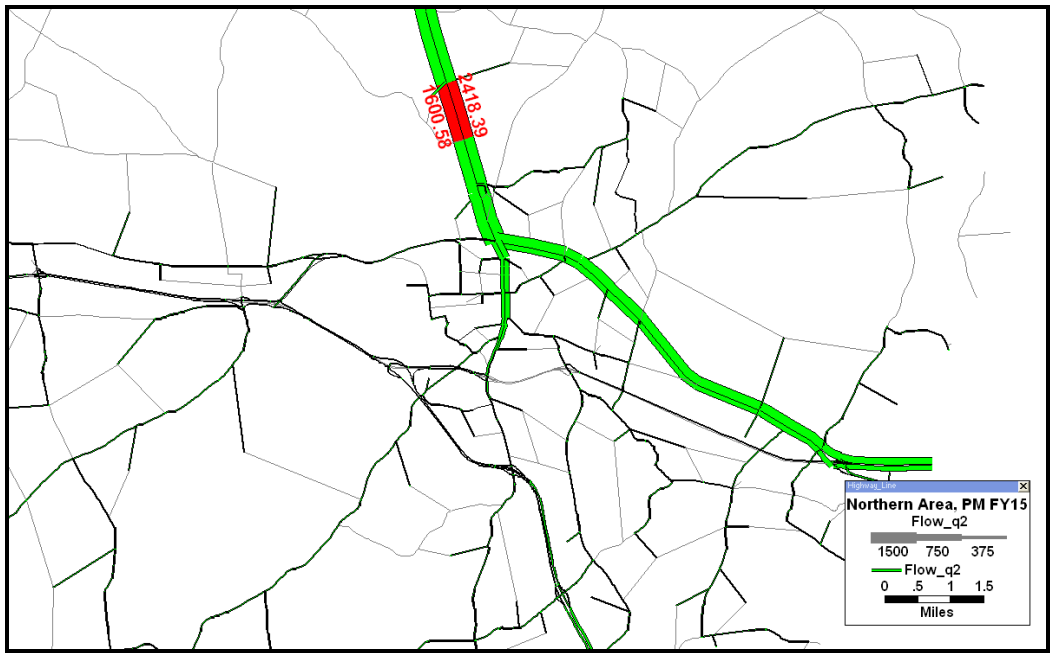


3.4.1.3. FY2035 with 6 capacity addition projects

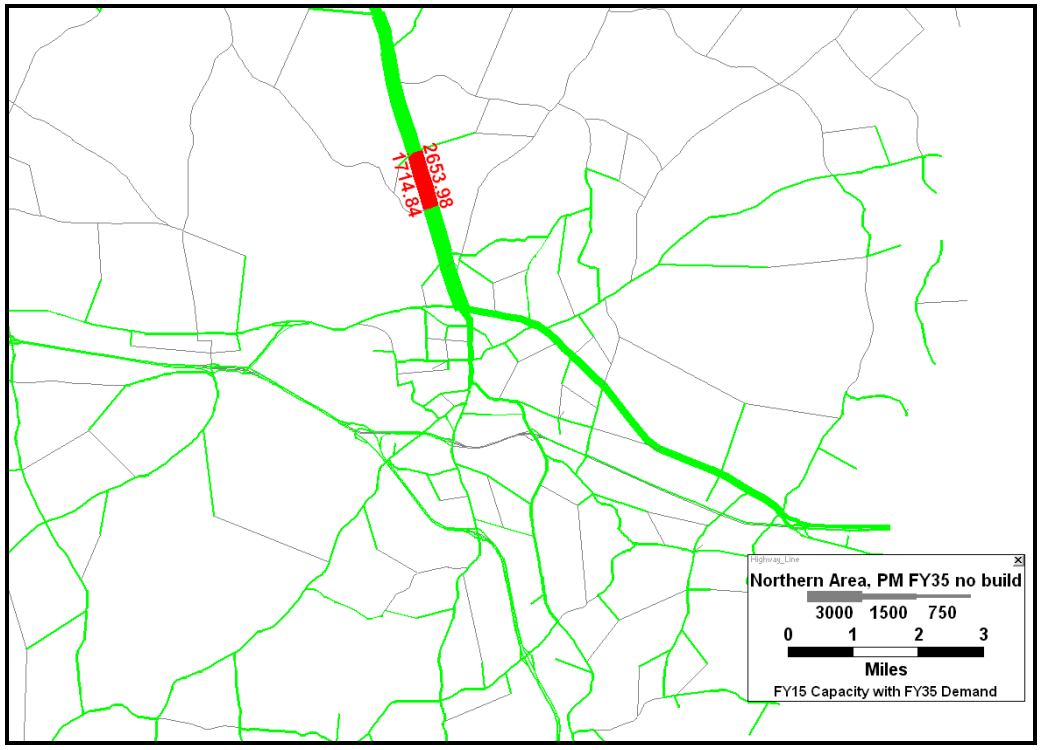


3.4.2.N-S bound at Northern area (PM peak period only)

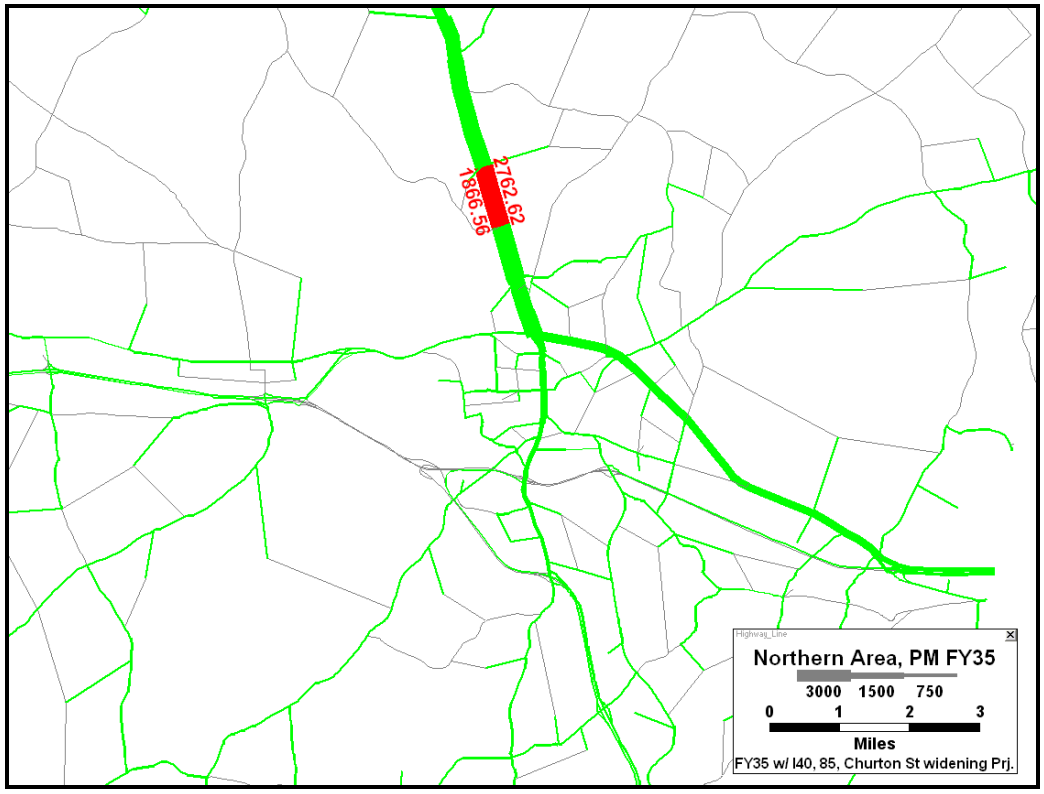
3.4.2.1. FY2015



3.4.2.2. FY2035, no build scenario

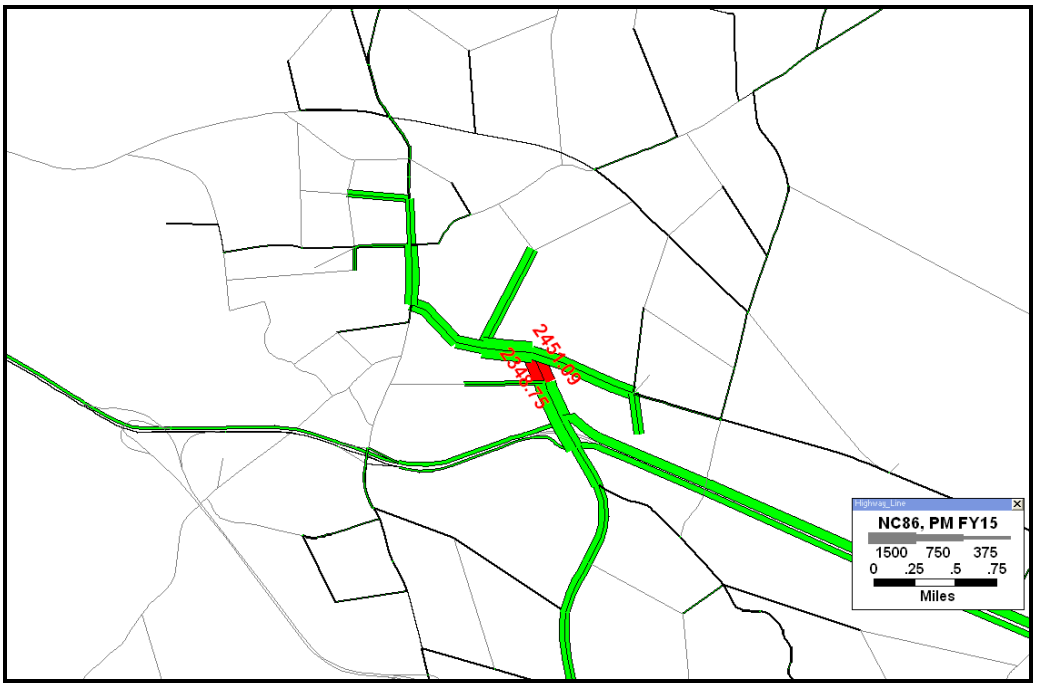


3.4.2.3. FY2035 with 6 capacity addition projects

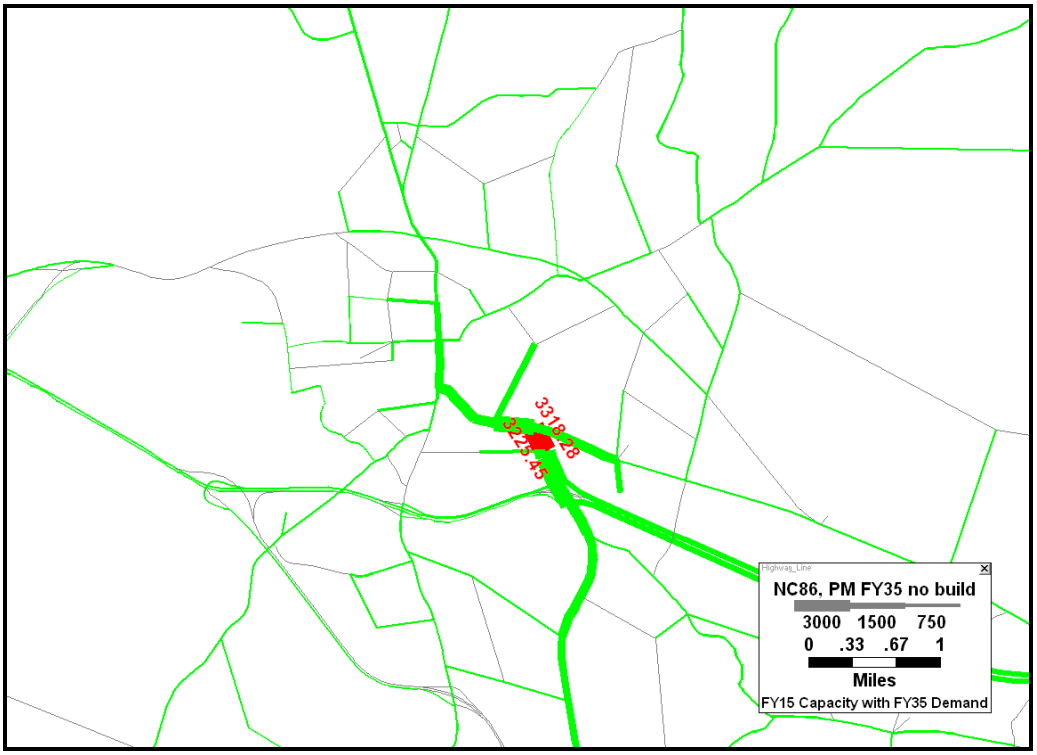


3.4.3.N-S bound on NC86 (not old 86), (PM only)

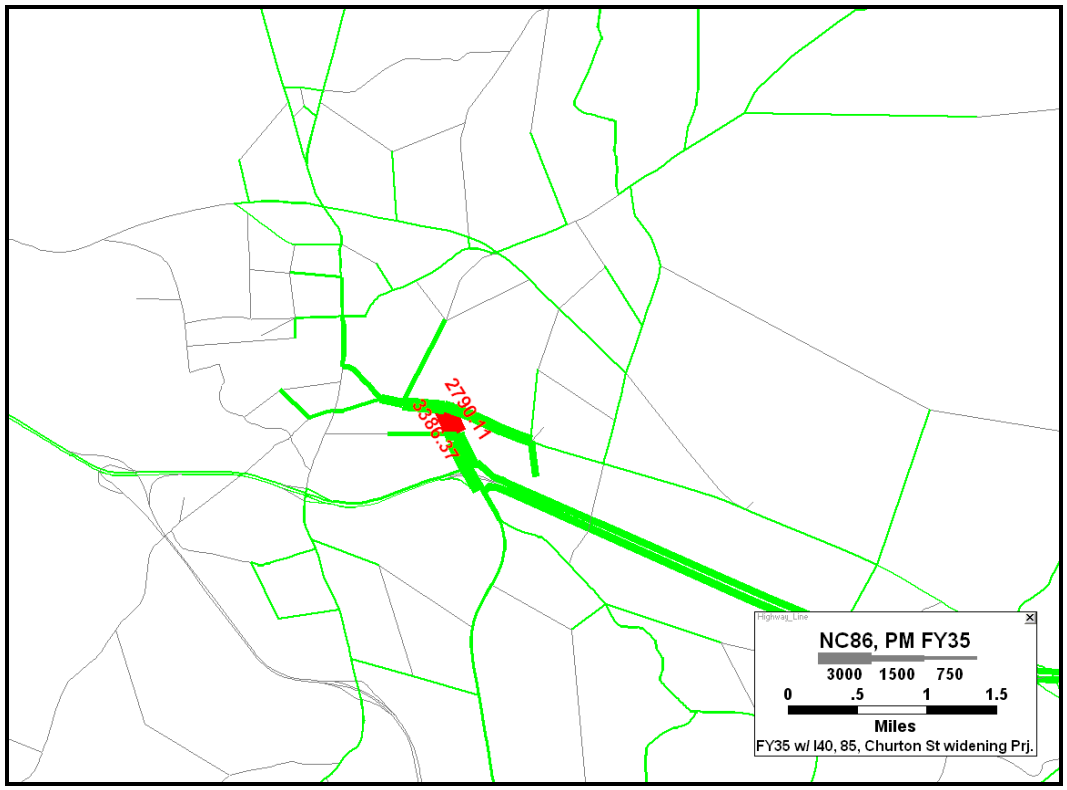
3.4.3.1. FY2015



3.4.3.2. FY2035, no build scenario

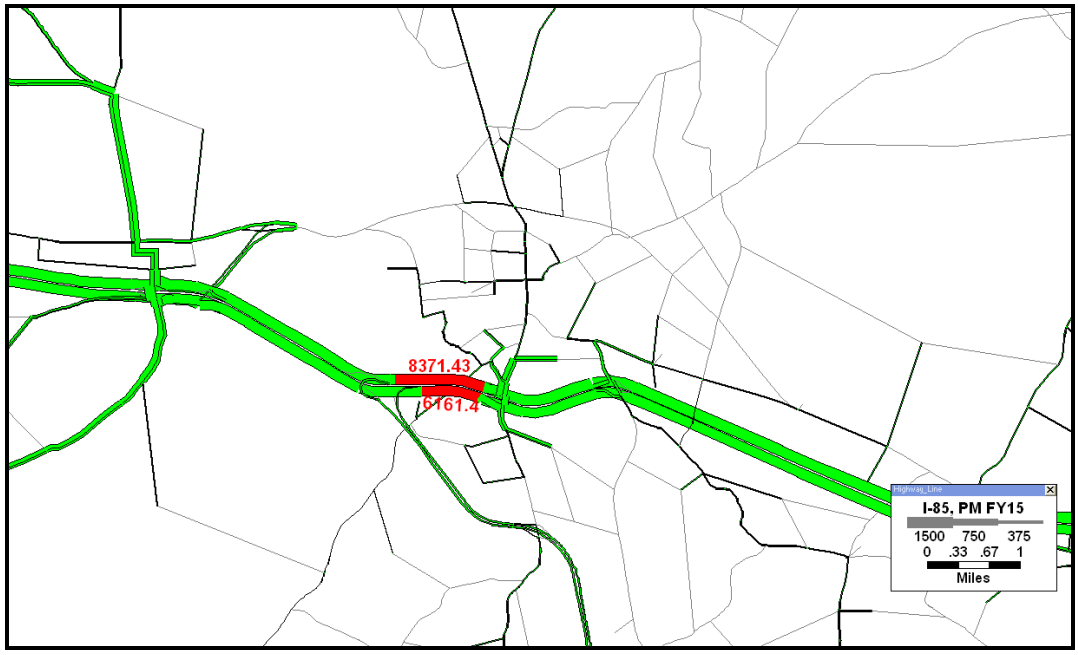


3.4.3.3. FY2035 with 6 capacity addition projects

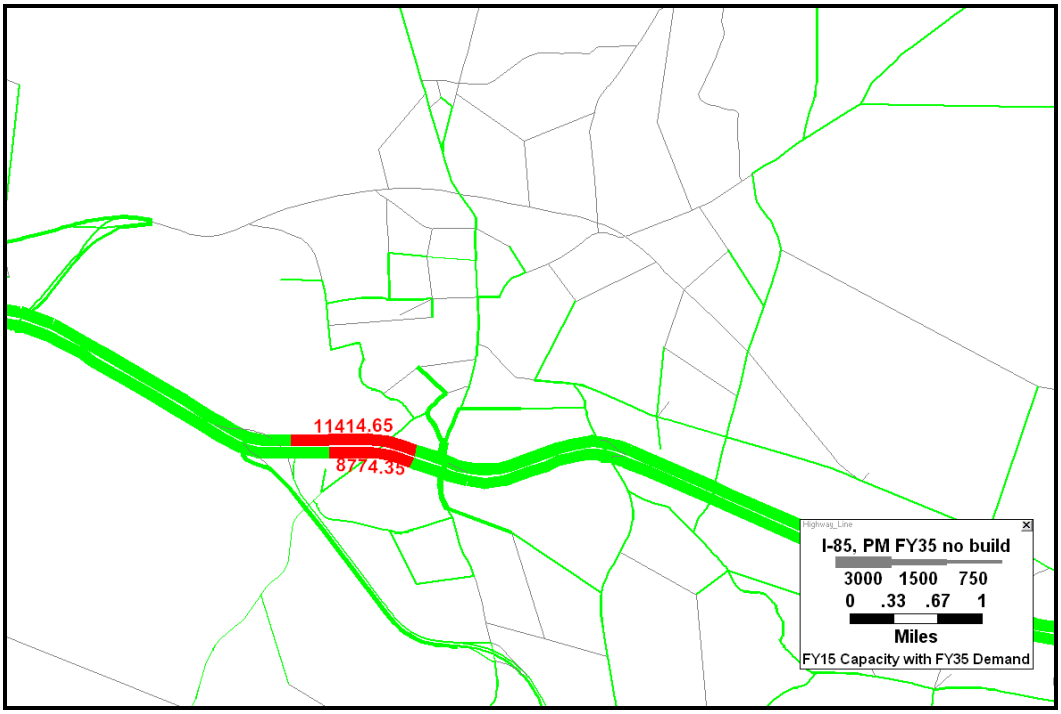


3.4.4.W-E bound on I-85 (PM only)

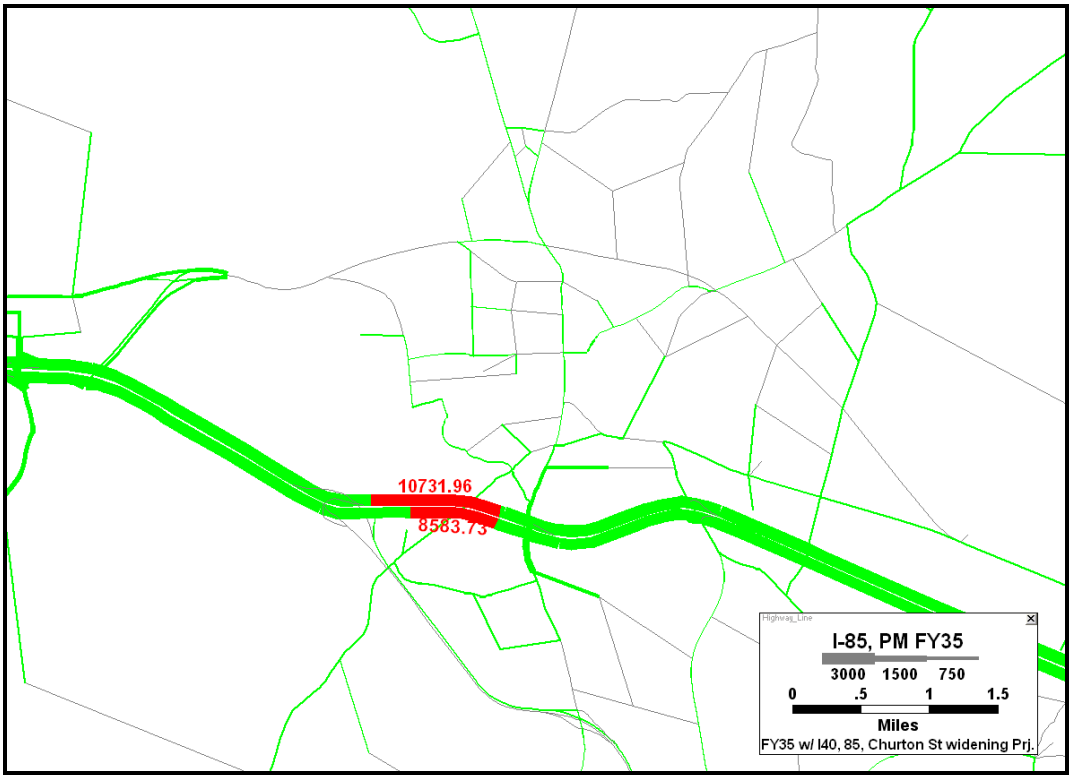
3.4.4.1. FY2015



3.4.4.2. FY2035, no build scenario



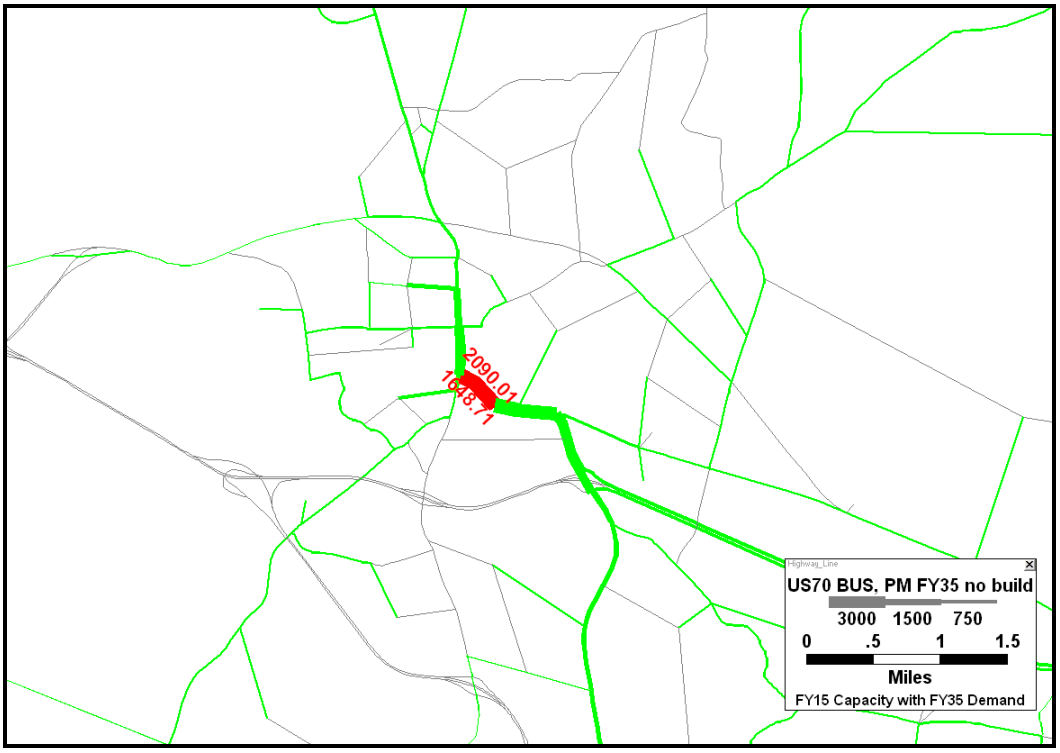
3.4.4.3. FY2035 with 6 capacity addition projects



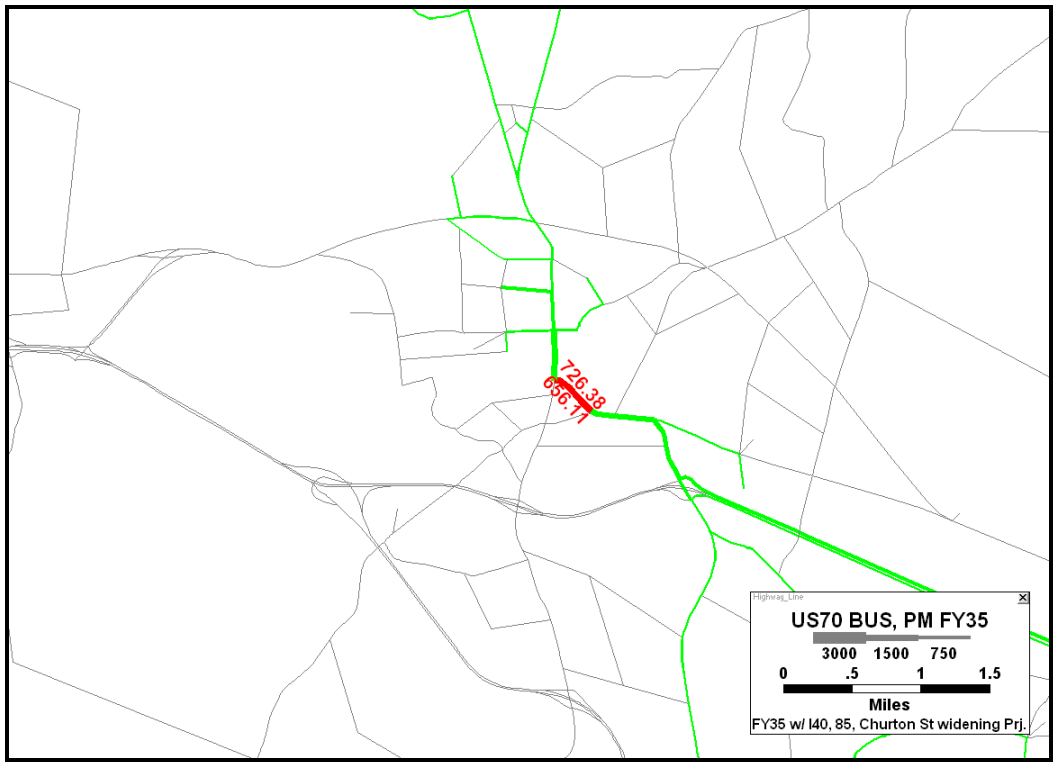
3.4.5.W-E bound on US70 Business (PM peak period only)

3.4.5.1. FY2015

3.4.5.2. FY2035, no build scenario

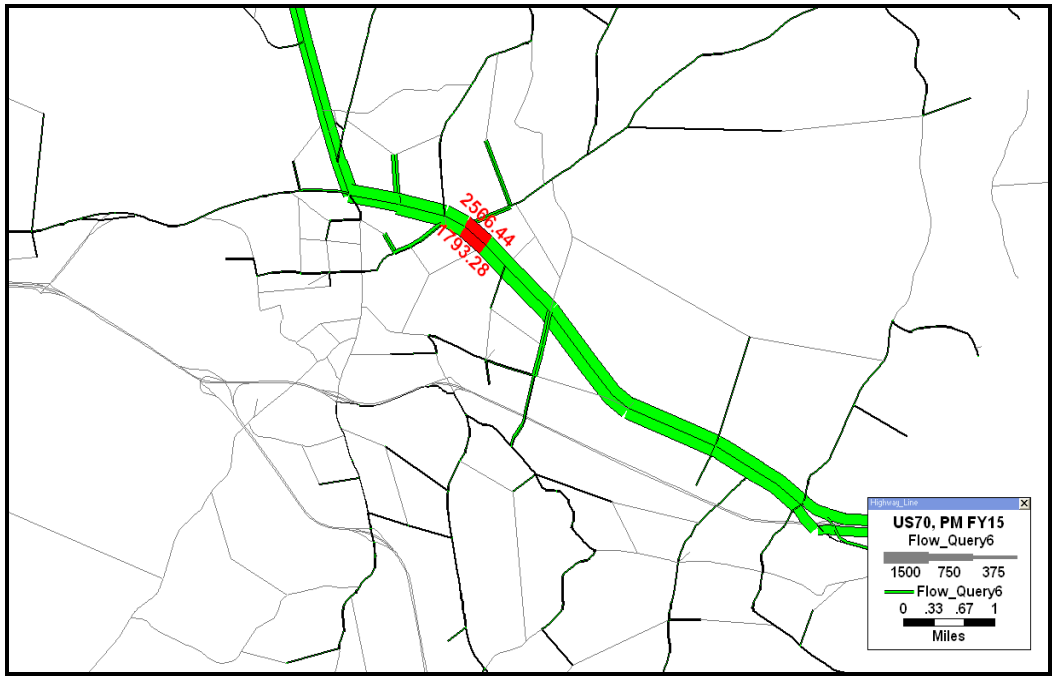


3.4.5.3. FY2035 with 6 capacity addition projects

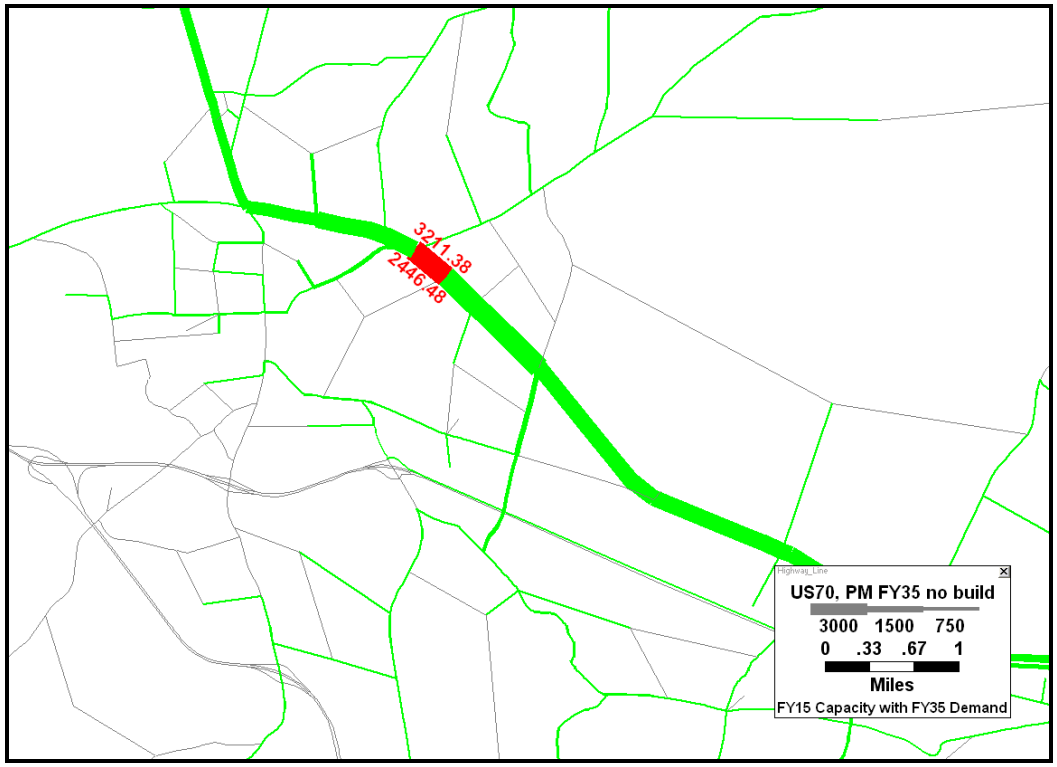


3.4.6.W-E bound on US70 Bypass (PM only)

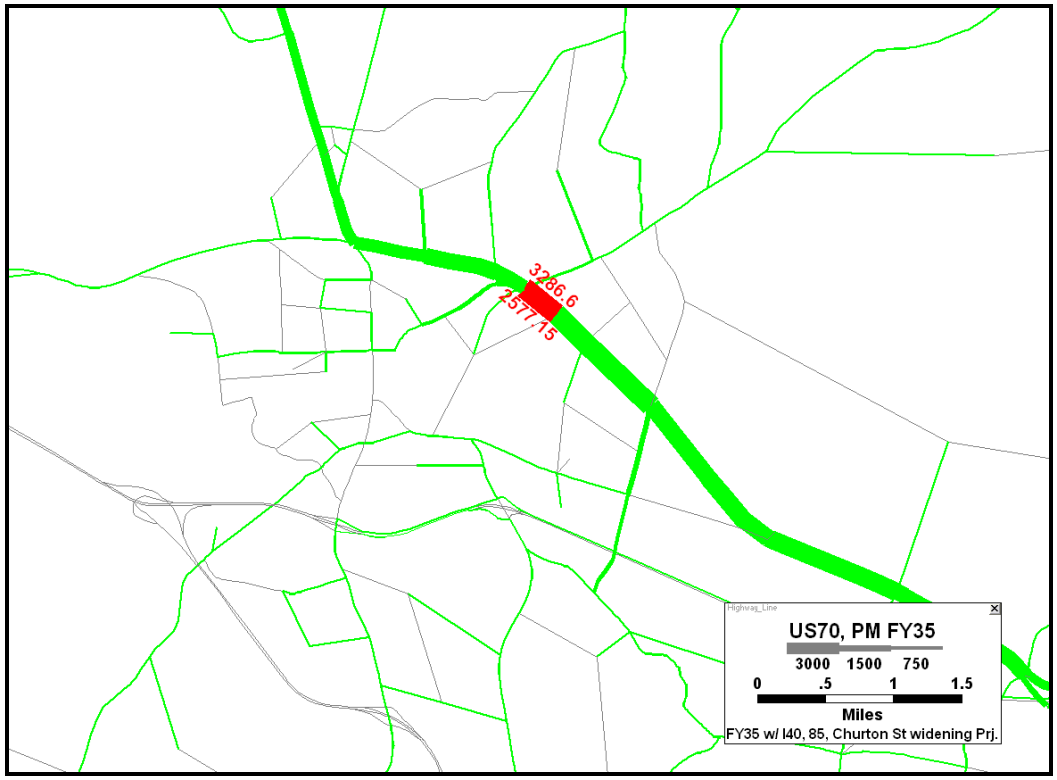
3.4.6.1. FY2015



3.4.6.2. FY2035, no build scenario



3.4.6.3. FY2035 with 6 capacity addition projects



4. Overview Summary

- S.E. Data: the Town of Hillsborough data is used for this analysis.
- Model Validation: On Churton St., TRM model estimates about 33% less on daily, and about 38% less during PM peak period. It is noted that, in an operational analysis aspect, actual congestion on the street is more severe than what the TRM model estimated. On US 70 Business, TRM model estimates about 19% more on daily, and about 4% less during PM peak period.
- Traffic condition: PM peak period is the most congested period. On Churton St., three segments (downtown, US 70 Bypass and I-85) will be severely congested on year 2035 if no capacity is added in the Town of Hillsborough area.

III. Alternative Analysis

1. Development of alternatives

1.1. Candidate projects in LRTP list

ID	Road Name	Project Limits		Existing # of Lanes	Proposed # of Lanes	Distance (miles)	LRTP ID	AQ Analysis Year
		From	To					
1	**I-85**	**I-40**	**The Durham Co line**	**4**	**8**	**7.35**	**48**	**2025**
2	**I-40**	**NC 86**	**I-85**	**4**	**6**	**7.32**	**44**	**2035**
3	Old NC 86 (Churton St)	I-40	US 70 BUS	2	4	7.20	86, 87	2035
4	NC 86	Old NC 10	US 70 BUS	2	4	1.0	80	2025
5	NC 86	US 70 Bypass	NC 57	2	4	0.42	81	2025
6	Orange Grove Connector	Orange Grove Rd	US 70	0	2	0.4	89.3	2025

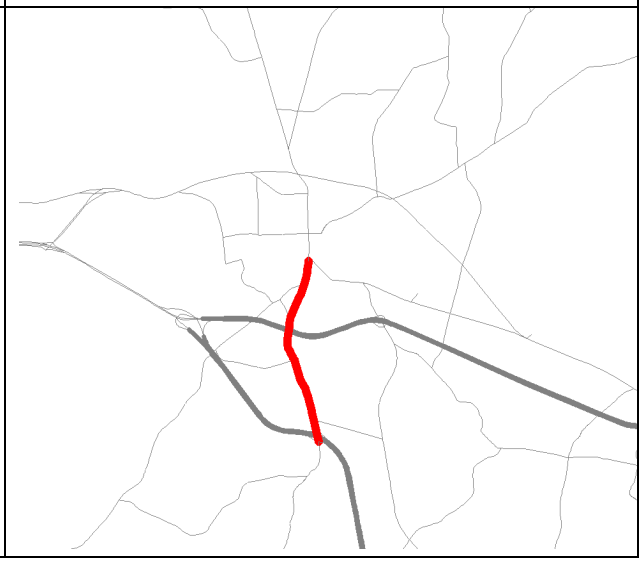
1.2. Candidate projects from planners

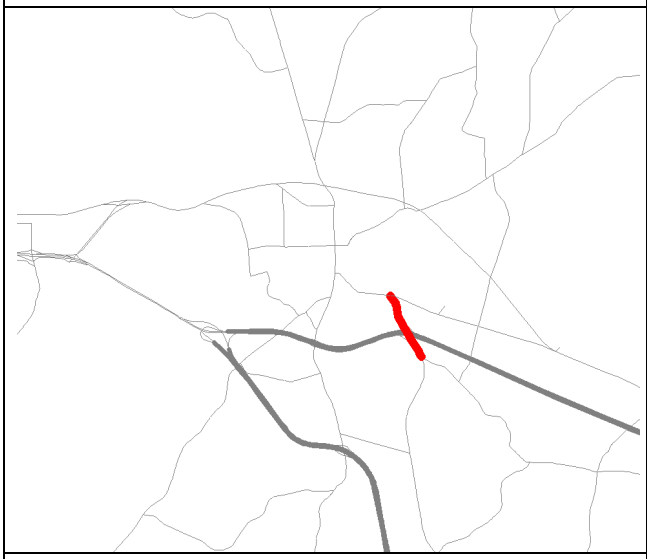
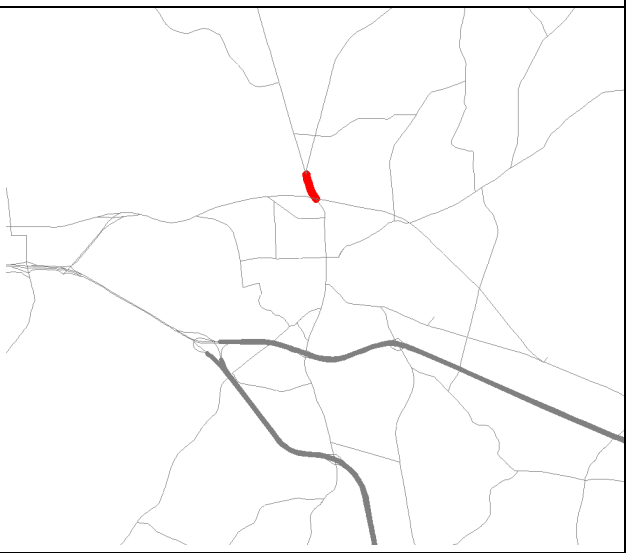
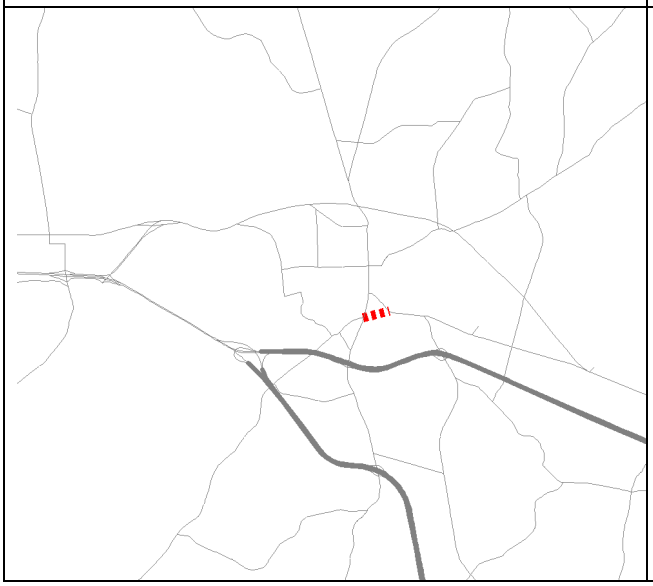
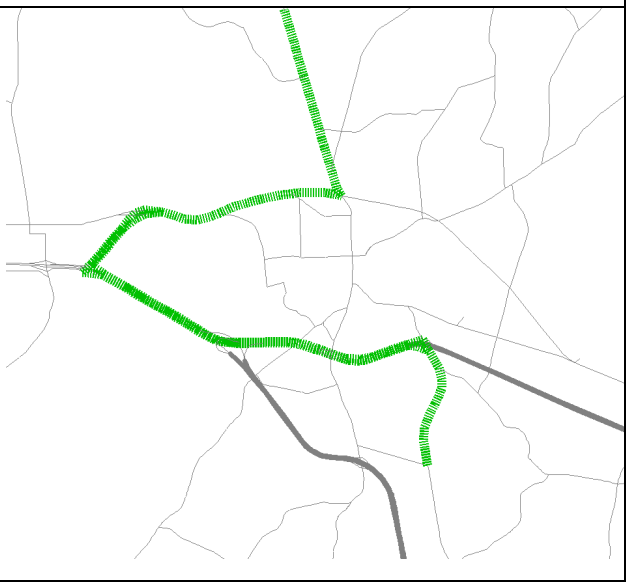
ID	Road Name	Project Limits		Existing # of Lanes	Proposed # of Lanes	Distance (miles)	LRTP ID	Other
		From	To					
7	West Connector	US 70 and Lawrence Rd.	I-40 Exit 261	0/2	3			M6
8	Eno Mountain Rd. alignment	Mayo St.	Eno Mountain Rd.	2	2	0.24		M4
9	Town circulating transit service	US70 Bypass	Waterstone Dr.	NA	NA	3.4		M5
10	Advanced Traveler Information Systems (ATIS) on US70	US70 @ I-85 Exit170	US 70 Connector @ I-85 Exit 160			10.5		M7
11	Exchange Park Ln. Connector	US 70	Exchange Park Ln.	0	2	0.04		M9
12	Downtown Traffic Improvement Project	US 70 Bypass	Waterstone Dr.	2	2	3.4		M8
13	West Ring, Phase 1	I-40	US 70 and W Hill Ave.	0	3			L1
14	West Ring, Phase 2	I-40	NC 86 and Coleman Loop Rd.	0	3			L2

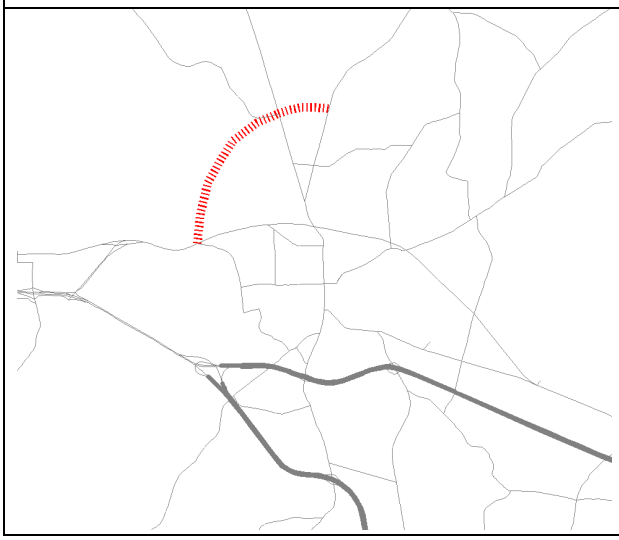
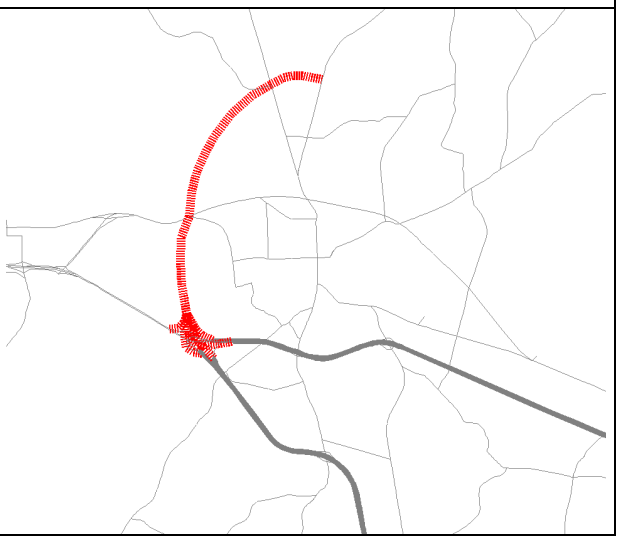
1.3. Proposed alternatives

During the kick-off meeting and 1st project meeting, the following alternatives were selected for the further comprehensive review.

- Base scenario should include I-40 and I-85 widening projects since their funding priorities / sources are more committed and different than other candidate projects in the previous table.
- The Eno Mountain Rd. and Mayo St. alignment project (ID 8) is excluded since there is no supply change. It is expected that short link length, lane configuration, or signal phasing & timing change in TRM is not sensitive to the model output; however, the TRM model is sensitive to capacity change on links.
- The Exchange Park Ln. connector project (ID 11) and Downtown TIP project (ID 12) are removed from the alternative list for an apple to apple comparison. The projects can be reviewed using other traffic operational analysis tools (i.e. TransModeler) if additional analysis time and data are available.
- 10 scenarios including base scenario will be analyzed. The scenarios are shown in the figures below. In the figure, each color and line has a different meaning;
  - Red color with solid line: a widening project,
  - Red color with dotted line: new project,
  - Green color with dotted line: Advanced Traveler Information System or signage with small improvement project, and
  - Purple color: bus route.

Alternative 0: Base Scenario	Alt 1: Churton Street widening (2→4 lanes, 7.2mi)
	

Alt 2: NC86 widening (2 → 4 lanes, 1.0 mile)	Alt 3: NC86 widening (2 → 4 lanes, 0.4mile)
	
Alt 4: Orange Grove new prj. (0 →2 lanes, 0.4 mile)	Alt 5: West ATIS
	

Alt 6: Downtown transit (Fare:$0.00, 8 stops, Peak/non-peak schedule: 15/30 minute)	Alt 7: US70 ATIS
	
Alt 8: Western Bypass new prj. (0→2 lanes, 2.9mi)	**Alt 9: Western Ring new prj. (0→4 lanes, 4.5mi)**
	

2. Analysis Methodology
   - Using TRM model with the modified year 2035 SE data, the predefined scenarios were analyzed.
   - Since the purpose of this analysis is to assess congestion relief on Churton Street or maintaining an acceptable congestion level on the street, the following five Measures Of Effectiveness on year 2035 PM peak period are selected:
     - Projected volume on Churton Street,
     - Travel time on Churton Street,
     - Average V/C on Churton Street, and

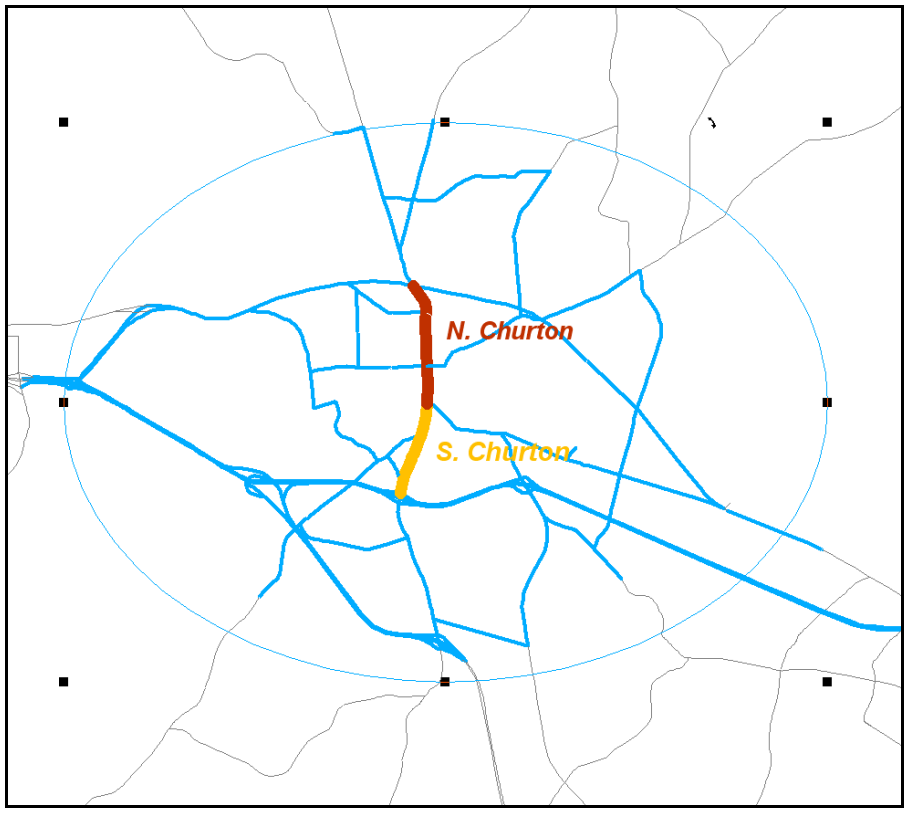
- VMT and Vehicle-Minutes-Traveled (VHT) for the Town of Hillsborough area (as defined in the figure below).

- For Advanced Traveler Information Systems (ATIS) projects, it is assumed that 10 % of direct through traffic on Churton Street from/to East, West, and North of Hillsborough will be diverted to the desired routes. The assumption is based on recent researches; Williams et al., http://www.ncdot.org/doh/preconstruct/tpb/research/download/2006-13FinalReport.pdf , 2008, and Horowitz et al., "Diversion from a Rural Work Zone with Traffic-Responsive Variable Message Signage System", Transportation Research Record No. 1824, 2003.

3. Analysis Results

3.1. Summary

- Summary
  - The figure below shows the analysis area; the blue colored links represent the surrounding area of the Town of Hillsborough. It is noted that Churton Street is divided by two parts to represent the constrained segments of a possible development; Red and Orange colors indicates the Northern and Southern parts of Churton St.
  - The analysis results are shown in the following Table. The results indicate that the alternative 9, 4 and 1 will reduce the congestion on Churton Street.
  - In addition, analysis of the Alternative 6 revealed that about 586 trips will use the planned transit services during PM peak periods.



St. Name	MOE	Dir	Base	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	Alt7	Alt8	Alt9
Churton Street (A+B)	Volume (vehicles)	NB	2,285	2,747	2,131	2,214	2,212	2,230	2,217	2,251	2,123	1,825
		SB	2,181	2,612	2,161	2,176	2,192	2,102	2,181	2,164	2,041	1,787
		Total	4,466	5,359	4,292	4,390	4,404	4,332	4,398	4,415	4,164	3,612
	Travel Time (minutes)	NB	6.9	**6.2**	6.4	6.4	**6.2**	6.8	6.5	6.8	**6.2**	**4.9**
		SB	5.8	**5.4**	5.8	5.8	**5.8**	5.6	5.8	5.8	**5.5**	**4.5**
		Max	6.9	**6.2**	6.4	6.4	**6.2**	6.8	6.5	6.8	**6.2**	**4.9**
	V/C	NB	0.85	**0.75**	0.79	0.82	0.82	0.82	0.82	0.83	**0.79**	**0.68**
		SB	0.81	**0.70**	0.80	0.81	0.81	0.78	0.81	0.80	**0.76**	**0.66**
		Max	0.85	**0.75**	0.80	0.82	0.82	0.82	0.82	0.83	**0.79**	**0.68**
North Churton St. (A)	Volume (vehicles)	NB	2,539	2,507	2,420	2,452	2,406	2,480	2,424	2,478	2,299	1,969
		SB	2,157	2,299	2,184	2,156	2,204	2,098	2,163	2,127	2,015	1,847
		Total	4,696	4,805	4,604	4,608	4,610	4,578	4,587	4,605	4,314	3,816
	Travel Time (minutes)	NB	4.5	4.5	4.2	4.1	**4.0**	4.4	4.1	4.4	**3.8**	**2.9**
		SB	3.4	3.7	3.5	3.3	**3.4**	3.3	3.4	3.3	**3.1**	**2.6**
		Max	4.5	4.5	4.2	4.1	**4.0**	4.4	4.1	4.4	**3.8**	**2.9**
	V/C	NB	0.93	0.92	**0.89**	0.90	**0.89**	0.91	**0.89**	0.91	**0.85**	**0.73**
		SB	0.80	0.85	**0.81**	0.79	**0.81**	0.77	**0.80**	0.78	**0.74**	**0.68**
		Max	0.93	0.92	**0.89**	0.90	**0.89**	0.91	**0.89**	0.91	**0.85**	**0.73**
South Churton St. (B)	Volume	NB	1,958	3,057	1,760	1,908	1,962	1,909	1,951	1,958	1,898	1,641
		SB	2,212	3,014	2,131	2,202	2,176	2,107	2,204	2,212	2,075	1,709
		Total	4,170	6,071	3,891	4,110	4,139	4,015	4,155	4,170	3,972	3,350
	Travel Time (minutes)	NB	2.4	**1.7**	**2.3**	2.3	**2.2**	2.3	2.4	2.4	**2.3**	**2.1**
		SB	2.5	**1.6**	**2.3**	2.5	**2.3**	2.4	2.5	2.5	**2.3**	**1.9**
		Max	2.5	**1.7**	**2.3**	2.5	**2.3**	2.4	2.5	2.5	**2.3**	**2.1**
	V/C	NB	0.73	**0.52**	0.66	0.71	0.73	0.71	0.73	0.73	**0.71**	**0.61**
		SB	0.83	**0.51**	0.80	0.82	0.81	0.79	0.82	0.83	**0.77**	**0.64**
		Max	0.83	**0.52**	0.80	0.82	0.81	0.79	0.82	0.83	**0.77**	**0.64**
Region wide	VMT, total		459,671	456,280	460,209	461,142	459,830	465,647	459,867	459,568	462,838	473,796
	VHT, total		534,280	527,164	530,635	532,722	532,089	NA	532,993	NA	532,542	509,826

4. Discussion
   - Analysis of the alternative combination: in terms of feasible budget constraints
     - Package plan (To be discussed and updated)
       - Package A: Alternative 1, 2, 3, and 4
       - Package B: Alternative 1, 2, 3,4, and 6
       - Package C: Alternative 1, 2, 3, 4, and ATIS projects
     - Analysis schedule (To be discussed and updated)
       - End of October, 2010

   - Even though the results of alternative 9 are superior, projects must be included in the Long Range Transportation Plan before funding can be requested or allocated.